Federal Energy Regulatory Commission
Office of Energy Projects
Washington, DC 20426

Final Environmental Impact Statement

HubLine/East to West Project

Algonquin Gas Transmission, LLC

Docket Nos. CP08-420-000, -001
FERC/EIS-0227F

Cooperating Agencies:

US Army Corps
of Engineers

September 2009

FEDERAL ENERGY REGULATORY COMMISSION
WASHINGTON, D.C. 20426

OFFICE OF ENERGY PROJECTS

In Reply Refer To:
OEP/DG2E/Gas 3
Algonquin Gas Transmission, LLC
Docket Nos. CP08-420-000, -001

FERC/EIS-0227F

TO THE PARTY ADDRESSED:

The staff of the Federal Energy Regulatory Commission (Commission or FERC) has prepared this final Environmental Impact Statement (EIS) to address Algonquin Gas Transmission, LLC's (Algonquin) proposed expansion of its natural gas pipeline system in the above-referenced dockets. The HubLine/East to West Project (E2W Project or Project) would involve replacement of existing pipeline facilities in New London County, Connecticut and modifications to an existing compressor station in Morris County, New Jersey.

The final EIS was prepared to satisfy the requirements of the National Environmental Policy Act (NEPA). The FERC is the lead agency for the preparation of this EIS. The U.S. Army Corps of Engineers (COE) and the U.S. Environmental Protection Agency (EPA) are cooperating agencies. A cooperating agency has jurisdiction by law or special expertise with respect to environmental impacts involved with the proposal and is involved in the NEPA analysis.

Based on the analysis in the EIS, the FERC staff concludes that construction and operation of the Project would result in some adverse environmental impacts. However, if the Project is constructed and operated in accordance with applicable laws and regulations, Algonquin's proposed mitigation, and the additional mitigation measures recommended by staff in the EIS, all impacts would be reduced to a less-than-significant level.

The E2W Project would provide 281,500 dekatherms per day of east to west natural gas transportation service for delivery to high growth markets in the Northeast. The Project would increase the diversity of supply by accessing natural gas from liquefied natural gas projects offshore of Massachusetts, increase Algonquin's system flexibility, and strengthen Algonquin's ability to mitigate capacity restrictions on the eastern end of the system.

The final EIS addresses the potential environmental effects of the construction and operation of the following facilities proposed by Algonquin:

- installation of 2.56 miles of 12-inch-diameter pipeline (E-3 System Replacement) that would replace a segment of an existing 6-inch-diameter pipeline in New London County, Connecticut;
- installation of minor aboveground facilities including one mainline valve and remote blow-off valve, one mainline remote control valve; one pig[1] launcher; and one pig receiver in New London County, Connecticut; and

[1] A pig is an internal tool that can be used to clean and dry a pipeline and/or to inspect it for damage or corrosion.

- piping modifications to the existing Hanover Compressor Station in Morris County, New Jersey to accommodate reverse flow and backhaul capability along Algonquin's system.

The final EIS has been placed in the public files of the FERC and is available for distribution and public inspection at:

Federal Regulatory Energy Commission
Public Reference Room
888 First St. NE; Room 2A
Washington, DC 20426
(202) 502-8371

A limited number of copies are available from the FERC's Public Reference Room identified above. These copies may be requested in hard copy or as .pdf files on a CD that can be read by a computer with a CD-ROM drive. The final EIS is also available for viewing on the FERC Internet website at www.ferc.gov. In addition, copies of the document have been mailed to federal, state, and local government agencies; elected officials; Native American tribes; local libraries and newspapers; intervenors in the FERC's proceeding; and other interested parties (i.e., affected landowners, miscellaneous individuals, and environmental groups who provided scoping comments, commented on the draft EIS, or asked to remain on the mailing list). Hard copies of the final EIS were mailed to those who specifically requested them, while all other parties on the mailing list were sent a CD of the final EIS. Hard copies of the final EIS can be viewed at the libraries in the Project area that are listed in Appendix A of the final EIS.

Additional information about the Project is available from the Commission's Office of External Affairs at **1-866-208-FERC** (3372) or on the FERC Internet website (www.ferc.gov) using the eLibrary link. Click on the eLibrary link, click on "General Search," and enter the docket number excluding the last three digits in the Docket Number field (i.e., CP08-420). Be sure you have selected an appropriate date range. For assistance, please contact FERC Online Support at FERCOnlineSupport@ferc.gov or toll free at 1-866-208-3676, or for TTY, contact (202) 502-8659. The eLibrary link on the FERC Internet website also provides access to the texts of formal documents issued by the Commission, such as orders, notices, and rulemakings.

In addition, the Commission now offers a free service called eSubscription that allows you to keep track of all formal issuances and submittals in specific dockets. This can reduce the amount of time you spend researching proceedings by automatically providing you with notification of these filings, document summaries, and direct links to the documents. To register for this service, go to the eSubscription link on the FERC Internet website.

Information concerning the involvement of the COE is available from Susan Lee at (978) 318-8494. Information concerning the involvement of the EPA is available from Timothy Timmermann at (617) 918-1025.

Kimberly D. Bose
Secretary

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ACRONYMS AND ABBREVIATIONS

µg/100 cm^2	micrograms per 100 square centimeters
ACHP	Advisory Council on Historic Preservation
Algonquin	Algonquin Gas Transmission, LLC
APAs	Aquifer Protection Areas
APE	area of potential effect
API	American Petroleum Institute
BA	Biological Assessment
bcf/d	billion cubic feet per day
CAA	Clean Air Act
CEEF	Connecticut Energy Efficiency Fund
CEQ	Council on Environmental Quality
Certificate	Certificate of Public Convenience and Necessity
CFR	Code of Federal Regulations
CGS	Connecticut General Statutes
CL&P	Connecticut Light and Power
CO	carbon monoxide
CO_2	carbon dioxide
COE	U.S. Army Corps of Engineers
Commission	Federal Energy Regulatory Commission
CTDEP	Connecticut Department of Environmental Protection
CTDPH	Connecticut Department of Public Health
CTIFD	Connecticut Inland Fisheries Department
CTNDDB	Connecticut Natural Diversity Data Base
CWA	Clean Water Act
dBA	decibels on the A-weighted scale
DOT	U.S. Department of Transportation
dth/d	dekatherms per day
E&SCP	Erosion and Sedimentation Control Plan
E2W Project	HubLine/East to West Project
EFH	Essential Fish Habitat
EI	Environmental Inspector
EIA	Energy Information Administration
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
EPAct	Energy Policy Act of 2005
ESA	Endangered Species Act of 1973
FERC	Federal Energy Regulatory Commission
FERC Plan	FERC's Upland Erosion Control, Revegetation, and Maintenance Plan
FERC Procedures	FERC's Wetland and Waterbody Construction and Mitigation Procedures
FR	Federal Register
FWS	U.S. Fish and Wildlife Service
GHG	greenhouse gas

GIS	geographic information systems
gpm	gallons per minute
HAPs	Hazardous Air Pollutants
HCAs	high consequence areas
HEL	highly erodible land
IMP	Integrity Management Program
L_{dn}	day-night equivalent sound level
$L_{eq(24)}$	24-hour equivalent sound level
LNG	liquefied natural gas
MAOP	maximum allowable operating pressure
MINES	Mines Master Index File
MLRA	Major Land Resource Area
MOA	Memorandum of Agreement
MP	milepost
MSA	Magnuson-Stevens Fishery Conservation and Management Act
msl	mean sea level
MW	megawatt
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NGA	Natural Gas Act
NHPA	National Historic Preservation Act
NOI	*Notice of Intent to Prepare an Environmental Impact Statement for the Proposed East to West HubLine Expansion Project, Request for Comments on Environmental Issues, and Notice of Public Scoping Meetings*
NO_x	nitrogen oxides
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRI	Nationwide Rivers Inventory
NSA	noise-sensitive area
NWI	National Wetlands Inventory
OEP	Office of Energy Projects
OPS	Office of Pipeline Safety
ORV	off-road vehicle
OSHA	U.S. Department of Labor, Occupational Safety and Health Administration
PCBs	polychlorinated biphenyls
PEM	palustrine emergent wetland
PFO	palustrine forested wetland
PGA	peak ground acceleration
PHEL	potentially highly erodible land
PHMSA	Pipeline and Hazardous Materials Safety Administration
$PM_{2.5}$	particulate matter less than 2.5 microns in aerodynamic diameter
PM_{10}	particulate matter less than 10 microns in aerodynamic diameter

Pre-Filing Process	pre-filing environmental review process
Project	HubLine/East to West Project
PSS	palustrine scrub-shrub wetland
RCV	remote control valve
ROD	Record of Decision
Secretary	Secretary of the Commission
SHPO	State Historic Preservation Office
SO_2	sulfur dioxide
SPCC Plan	Spill Prevention, Control, and Countermeasure Plan
SSURGO	Soil Survey Geographic
Supplemental NOI	*Supplemental Notice of Intent to Prepare an Environmental Impact Statement for the Proposed East to West HubLine Expansion Project and Request for Comments on Environmental Issues Related to an Alternative Pipeline Route Under Consideration*
TGPL	Tennessee Gas Pipeline System
UI	The United Illuminating Company
USC	United States Code
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
VOC	volatile organic compounds
WPAs	Wellhead Protection Areas

EXECUTIVE SUMMARY

The staff of the Federal Energy Regulatory Commission (Commission or FERC) has prepared this final Environmental Impact Statement (EIS) for the HubLine/East to West Project (E2W Project or Project) to fulfill the requirements of the National Environmental Policy Act (NEPA). The FERC is the lead agency for the preparation of this EIS. The U.S. Army Corps of Engineers (COE) and the U.S. Environmental Protection Agency (EPA) are cooperating agencies. A cooperating agency has jurisdiction by law or special expertise with respect to environmental impacts involved with the proposal and is involved in the NEPA analysis. The purpose of this document is to inform the public and permitting agencies about the potential adverse and beneficial environmental impacts of the proposed Project and its alternatives, and recommend mitigation measures that would avoid or reduce adverse impacts to the maximum extent practicable.

On September 10, 2007, in Docket No. PF07-15-000, we[1] approved a request by Algonquin Gas Transmission, LLC (Algonquin) to implement the Commission's pre-filing environmental review process in order to identify and address Project-related issues prior to the filing of an application. On June 9, 2008, in Docket No. CP08-420-000, Algonquin filed an application with the Commission under section 7(c) of the Natural Gas Act and Part 157 of the Commission's regulations. Algonquin requested a Certificate of Public Convenience and Necessity (Certificate) to construct, install, own, operate, and maintain an expansion of its existing interstate natural gas pipeline system in Massachusetts, Connecticut, Rhode Island, and New Jersey. On June 19, 2009, Algonquin filed an amendment to its application in Docket No. CP08-420-001, substantially reducing the scope of the E2W Project and eliminating all of the proposed facilities in Massachusetts and Rhode Island, and the majority of the proposed facilities in Connecticut. Algonquin's amended E2W Project, which is analyzed in this EIS, involves only modifications to an existing compressor station in New Jersey and the replacement of existing pipeline in Connecticut.

We prepared our analysis based on Algonquin's applications and subsequent filings; coordination with federal, state, and local agencies; public comments; information gathered at site visits; environmental information request responses; and our independent research.

PROPOSED ACTION

The E2W Project would provide 281,500 dekatherms per day of east to west natural gas transportation service for delivery to high growth markets in the Northeast. The Project would increase supply diversity by accessing natural gas from liquefied natural gas projects recently constructed or under construction offshore of Massachusetts at the east end of the Algonquin system. The Project would also increase Algonquin's system flexibility to manage contingencies such as operational or facility outages and strengthen its ability to mitigate other capacity restrictions on the eastern end of the system. The Project facilities would include:

- installation of 2.56 miles of 12-inch-diameter pipeline (E-3 System Replacement) that would replace a segment of an existing 6-inch-diameter pipeline in New London County, Connecticut;
- installation of minor aboveground facilities including one mainline valve and remote blow-off valve, one mainline remote control valve, one pig[2] launcher, and one pig receiver in New London County, Connecticut; and

[1] "We," "us," and "our" refer to the environmental staff of the Federal Energy Regulatory Commission's Office of Energy Projects.

[2] A pig is an internal tool that can be used to clean and dry a pipeline and/or to inspect it for damage or corrosion.

- modifications to the existing Hanover Compressor Station in Morris County, New Jersey to accommodate reverse flow and backhaul capability[3] along Algonquin's system.

With the exception of two short segments where the existing pipeline would be abandoned in place for a total of 700 feet, the E-3 System Replacement pipeline would be constructed within Algonquin's existing pipeline right-of-way using the lift and replace method. The majority of the associated aboveground facilities, located at the beginning and end of the pipeline route, also would be within Algonquin's existing right-of-way. Modifications to the Hanover Compressor Station are principally related to the piping and would take place within the existing, developed compressor station property. Algonquin proposes to begin construction of the Project in April of 2010 and place all of the Project facilities in service by November of 2010.

AGENCY AND PUBLIC INVOLVEMENT

In June, September, and October of 2007, and in March of 2008, Algonquin held a total of 30 open houses in various municipalities in Massachusetts and Connecticut to provide the public an opportunity to learn about the Project. As part of our pre-filing review process, we attended many of the open houses to explain the NEPA environmental review process to interested stakeholders and take comments about the Project.

On October 16, 2007, we issued a *Notice of Intent to Prepare an Environmental Impact Statement for the Proposed East to West HubLine Expansion Project, Request for Comments on Environmental Issues, and Notice of Public Scoping Meetings* (NOI) that briefly described the Project and the EIS process. The NOI was published in the Federal Register and mailed to more than 2,800 individuals and organizations. The NOI invited written comments on the environmental issues to be addressed in the EIS and listed the dates and locations of three public scoping meetings. The public scoping meetings were held in Randolph, Massachusetts; North Andover, Massachusetts; and Norwich, Connecticut on November 5, 7, and 8, 2007, respectively, to provide the general public an opportunity to learn more about the proposed Project and comment on issues to be addressed in the FERC's EIS. On April 14, 2008, we issued a Supplemental NOI describing an alternative pipeline route under serious consideration. The Supplemental NOI was published in the Federal Register and mailed to more than 3,000 individuals and organizations and opened a new comment period. To solicit comments and concerns from other jurisdictional federal and state resource agencies, we conducted an interagency scoping meeting on November 7, 2007, and participated in two interagency field visits on March 7 and 18, 2008.

Throughout the scoping process and coordination with other agencies, we received comments on a variety of environmental issues that we addressed in the draft EIS. The draft EIS was noticed in the Federal Register on November 14, 2008. The public was given 45 days to review and comment on the draft EIS both in the form of written comments and at two public comment meetings that were held in Stoughton, Massachusetts and Norwich, Connecticut on December 10 and 11, 2008, respectively. The public meetings on the draft EIS were conducted jointly with the COE to fulfill its Clean Water Act, section 404 Individual Permit public notice requirements. Transcripts of the public meetings, a summary of the interagency scoping meetings, and all written comments are part of the public record for the E2W Project and are available for viewing on the FERC Internet website (http://www.ferc.gov).[4]

[3] The American Gas Association defines a backhaul as a transaction that results in the transportation of gas in a direction opposite of the aggregate physical flow of gas in the pipeline. This is typically achieved when the transporting pipeline redelivers gas at a point(s) upstream from the point(s) of receipt.

[4] Using the "eLibrary" link, select "General Search" from the eLibrary menu and enter the docket number excluding the last three digits in the "Docket Number" field (i.e., PF07-15 and CP08-420). Select an appropriate date range.

The majority of comments and concerns that we received during the scoping process and draft EIS comment period are no longer applicable to the E2W Project due to Algonquin's application amendment that reduced the scope of the proposed facilities. Comments received on the draft EIS that remain applicable to the amended Project and our specific responses are provided in Appendix K of this final EIS.

ENVIRONMENTAL IMPACTS AND MITIGATION

We evaluated the impacts of the E2W Project on geology; soils; groundwater; surface waters; wetlands; vegetation; wildlife and aquatic resources; special status species; land use, recreation, special interest areas, and visual resources; socioeconomics (including transportation and traffic); cultural resources; air quality and noise; and reliability and safety. We also considered potential alternatives to the proposed Project and the cumulative impacts of the Project when compared with other past, present, and reasonably foreseeable actions in the Project area.

The major issues identified in our analysis of the Project include impacts on wetlands, sensitive vegetative and wildlife communities, cultural resources, and proximity of construction activities to residences. Where necessary, we recommend additional mitigation measures and revisions to some of Algonquin's resource-specific plans to further minimize or avoid these impacts. Section 5.2 of this EIS contains a compilation of the 15 mitigation measures that we recommend be attached as conditions to any Certificate the Commission may issue.

Based on Algonquin's wetland delineations, 12 wetlands would be crossed by the Project for a total crossing length of 2,448 feet. By locating the replacement pipeline through wetlands entirely within Algonquin's existing pipeline right-of-way, no new permanent wetland impacts would result. To reduce temporary construction impacts, Algonquin would limit its nominal construction right-of-way to 75 feet wide and implement its Project-specific Erosion and Sedimentation Control Plan (E&SCP) that incorporates many of the mitigation measures outlined in the FERC's Upland Erosion Control, Revegetation, and Maintenance Plan and Wetland and Waterbody Construction and Mitigation Procedures. Algonquin would implement a Project-specific Spill Prevention, Control, and Countermeasure Plan (SPCC Plan) to reduce the likelihood of a spill and to contain and cleanup a spill should one occur. Algonquin would also implement its Wetland Restoration Procedures for Temporary Wetland Impacts and its Invasive Plant Species Control Plan.

Vernal pools are ephemeral wetlands that provide sensitive wildlife habitat. Algonquin identified two vernal pools within 150 feet of the proposed construction right-of-way, neither of which are considered high or very high quality. A portion of one of the vernal pools would be directly impacted by the proposed construction right-of-way. Algonquin consulted with the Connecticut Department of Environmental Protection and developed site-specific mitigation measures to protect this vernal pool during construction and ensure appropriate restoration. We find these measures acceptable.

We have determined that no federally listed species potentially occur in the vicinity of the proposed E2W Project; therefore, required consultation under section 7 of the Endangered Species Act (ESA) is complete. Consultation with the Connecticut Natural Diversity Data Base did not identify any state-listed species along the proposed Project.

Algonquin's proposed construction work area would be located within 50 feet of 35 residential, commercial, or other structures. Algonquin would utilize special construction methods designed for working in confined areas to minimize construction-related impacts on these residences and structures. In addition, Algonquin has developed site-specific residential construction plans for the 23 residences located within 25 feet of the construction work area to inform affected landowners of proposed measures

to minimize disruption and to maintain access to the residences. We have reviewed these plans and determined that they would minimize impacts on residences to the extent practicable.

In locations where trees that serve as a visual buffer would be removed, Algonquin would discuss screening issues with individual landowners during easement negotiations. In areas where all visual screening is removed, Algonquin would consider strategic planting of fast-growing evergreens. We requested that Algonquin provide site-specific justification for all areas where a wider than nominal construction right-of-way and temporary extra workspaces would be needed and specify the land use (vegetative cover type) that would be affected.

Algonquin completed cultural resources investigations along the proposed pipeline route and ancillary facilities and identified one site as significant and eligible for listing on the National Register of Historic Places. The Connecticut State Historic Preservation Officer (SHPO) agreed with the results of Algonquin's evaluations. Algonquin would provide a treatment plan for the eligible site to the FERC and the Connecticut SHPO when it is complete. To ensure that the FERC's responsibilities under the National Historic Preservation Act and its implementing regulations are met, we recommend that Algonquin file the treatment plan and comments of the Connecticut SHPO on the treatment plan, for review and approval by the Director of the Office of Energy Projects before treatment plans/mitigation measures may be implemented or construction may proceed. In addition, the FERC would need to execute a Memorandum of Agreement with the Connecticut SHPO for the resolution of adverse effects, and provide the Advisory Council on Historic Preservation an opportunity to comment.

ALTERNATIVES CONSIDERED

The No Action Alternative and the Postponed Action Alternative were considered, but would not meet the stated objectives of the Project. The use of alternative fuels, renewable fuels, and energy conservation programs was also considered but would not offer environmentally preferable, technically feasible, or viable alternatives to the proposed Project.

No existing pipeline system was identified in the Project area with the available capacity to deliver the volume of natural gas that would be delivered by Algonquin without the construction of new facilities that would result in similar or greater environmental impacts. Furthermore, we are not aware of any plans to expand an existing pipeline system that would meet the Project objectives within the same general timeframe as the E2W Project. For these reasons, the use of an existing pipeline system is not considered an environmentally preferable or viable alternative to the proposed Project.

Looping[5] a portion of Algonquin's existing E-3 system was considered a reasonable alternative to the proposed Project as Algonquin's analysis indicates that it would provide the same operational performance as its current proposal. However, because looping would require a larger permanent right-of-way width than the proposed Project and would result in greater long-term impacts, we concluded that looping the E-3 System is not environmentally preferable to the proposed E-3 System Replacement.

Based on our analysis, we believe that Algonquin's proposed Project, as modified by our recommended mitigation measures, is the preferred alternative that can meet the Project objectives.

[5] A loop is a segment of pipeline that is usually installed adjacent to an existing pipeline and connected to it at both ends. The loop allows more gas to be moved through the system.

CONCLUSION

We have determined that construction and operation of the E2W Project would result in some adverse environmental impacts. However, all impacts would be reduced to less-than-significant levels with the implementation of Algonquin's proposed mitigation measures and the additional measures we recommend in this EIS. This determination is based on a review of the information provided by Algonquin and further developed from data requests; field investigations; scoping; literature research; alternatives analysis; and contacts with federal, state, and local agencies, Native American tribes, and individual members of the public. We conclude that the Project would be an environmentally acceptable action. Although many factors were considered in this determination, the principal reasons are:

- the majority of the proposed pipeline would be within Algonquin's existing right-of-way and less than 0.2 acre of new permanent pipeline right-of-way would be required;
- Algonquin would protect natural and cultural resources and residential areas during construction and operation of the Project by implementing its E&SCP, SPCC Plan, Dust Control Plan, Site-specific Residential Construction Plans, Blasting Plan, Invasive Plant Species Control Plan, Wetland Restoration Procedures for Temporary Wetland Impacts, and Procedures Guiding the Discovery of Unanticipated Cultural Resources and Human Remains;
- no wetlands would be permanently affected;
- ESA consultations with the FWS have been completed;
- the appropriate consultations with the Connecticut SHPO and Native American tribes would be completed before Algonquin would be allowed to begin construction in any given area; and
- an environmental inspection and mitigation monitoring program would ensure compliance with all mitigation measures that become conditions of the FERC Certificate and other approvals.

1.0 INTRODUCTION

On June 9, 2008, Algonquin Gas Transmission, LLC (Algonquin), an indirect wholly owned subsidiary of Spectra Energy Corp., filed an application with the Federal Energy Regulatory Commission (Commission or FERC) under section 7(c) of the Natural Gas Act (NGA) and Part 157 of the Commission's regulations. The application was assigned Docket No. CP08-420-000 and was noticed in the Federal Register on June 20, 2008. Algonquin requested a Certificate of Public Convenience and Necessity (Certificate) from the FERC to construct, install, own, operate, and maintain an expansion of its existing interstate natural gas pipeline system in Massachusetts, Connecticut, Rhode Island, and New Jersey. In accordance with the requirements of the National Environmental Policy Act (NEPA), Algonquin's proposal, referred to as the HubLine/East to West Project (E2W Project or Project), was analyzed by the environmental staff of the FERC in a draft Environmental Impact Statement (EIS) that was issued on November 7, 2008.

On June 19, 2009, Algonquin filed an amendment to its application in Docket No. CP08-420-001. In the amendment, Algonquin substantially reduced the scope of the E2W Project and eliminated all of the Project facilities in Massachusetts and Rhode Island, and the majority of the proposed facilities in Connecticut. Algonquin's amended proposal would involve the construction and operation of 2.56 miles of 12-inch-diameter pipeline (E-3 System Replacement) and appurtenant ancillary facilities that would replace a segment of 6-inch-diameter pipeline in New London County, Connecticut. Algonquin also proposes to make piping modifications at the existing Hanover Compressor Station in Morris County, New Jersey to permit reverse flow of gas, along with backhaul capability,[1] along its entire mainline.

On June 24, 2009, Algonquin supplemented its amendment under section 7(b) of the NGA and Part 157 of the Commission's regulations in Docket No. CP08-420-001 seeking authorization to abandon the 2.56 miles of 6-inch-diameter pipeline on the E-3 System that would be replaced by the proposed E-3 System Replacement. Algonquin's amended application was noticed in the Federal Register on June 30, 2009.

The environmental staff of the FERC has prepared this final EIS to assess the environmental impact associated with the construction, operation, and abandonment of the facilities proposed by Algonquin in accordance with the requirements of NEPA.

Algonquin proposes to begin construction in April of 2010 and place all of the Project facilities in service by November of 2010. The proposed Project facilities and schedule are described in detail in section 2.0.

The vertical line in the margin identifies text that has been modified in this final EIS and differs from the corresponding text in the draft EIS.

1.1 PROJECT PURPOSE AND NEED

Algonquin states that the E2W Project would offer shippers the opportunity to access and transport up to 281,500 dekatherms per day (dth/d) of new supplies of natural gas, including revaporized liquefied natural gas (LNG), from the eastern end of the Algonquin system west into existing delivery points throughout the region to meet increasing demands for natural gas. Overall, the Project would allow Algonquin to take a significant step in transforming the Algonquin system from a pipeline system that

[1] The American Gas Association defines a backhaul as a transaction that results in the transportation of gas in a direction opposite of the aggregate physical flow of gas in the pipeline. This is typically achieved when the transporting pipeline redelivers gas at a point(s) upstream from the point(s) of receipt.

transports gas produced from the Gulf Coast and Appalachian regions east into a header system that is capable of receiving a diversified supply of natural gas at multiple points and that would accommodate projected growth in demand in the Northeast region. The additional capacity on Algonquin's system would enable LNG suppliers to market new gas supplies from the Northeast Gateway and proposed Neptune Deepwater Ports in offshore Massachusetts at the east end of the Algonquin system.

According to Algonquin, natural gas consumers, utilities, and electric generators located along the Algonquin system would benefit from increased supply access and enhanced competition among suppliers and upstream pipeline transportation providers. The E2W Project would increase Algonquin's system flexibility to manage contingencies such as operational or facility outages due to maintenance or repair, and would strengthen the operational ability to mitigate other capacity restrictions on the eastern end of the system.

Algonquin currently has executed binding amended precedent agreements[2] for the entire proposed 281,500 dth/d of additional firm transportation capacity. Table 1.1-1 lists Algonquin's shippers by contracted volumes and terms.

TABLE 1.1-1

HubLine/East to West Project Precedent Agreements

Shipper	Maximum Daily Transportation Quantity (dth/d)	Contract Term (years)
Excelerate Energy Limited Partnership	180,000	12
Suez LNG NA LLC	80,000	12
Narragansett Electric Co.	10,000	10
Yankee Gas Services Company	10,000	10
City of Norwich, Connecticut	1,500	10
Total Volume Contracted	281,500	

1.2 PURPOSE AND SCOPE OF THIS EIS

Our[3] principal purposes for preparing this EIS are to:

- identify and assess the potential impacts on the natural and human environment that would result from the implementation of the proposed Project;
- describe and evaluate reasonable alternatives to the proposed Project that would avoid or substantially lessen any significant adverse effects of the Project on the environment;
- identify and recommend specific mitigation measures, as necessary, to avoid or minimize significant environmental effects; and
- encourage and facilitate involvement by the public and interested agencies in the environmental review process.

The topics addressed in this EIS include alternatives; geology; soils; groundwater; surface waters; wetlands; vegetation; wildlife and aquatic resources; special status species; land use, recreation, special

[2] A precedent agreement is a binding contract under which one or both parties has the ability to terminate the agreement if certain conditions, such as receipt of regulatory approvals, are not met.

[3] "We," "us," and "our" refer to the environmental staff of the Federal Energy Regulatory Commission's Office of Energy Projects.

interest areas, and visual resources; socioeconomics (including transportation and traffic); cultural resources; air quality and noise; reliability and safety; and cumulative impacts. The EIS describes the affected environment as it currently exists, discusses the environmental consequences of the proposed Project, and compares the Project's potential impact to that of various alternatives. The EIS also presents our recommended mitigation measures.

The FERC is the lead agency for the preparation of this EIS. The U.S. Army Corps of Engineers (COE) and the U.S. Environmental Protection Agency (EPA) are cooperating agencies. A cooperating agency has jurisdiction by law or special expertise with respect to environmental impacts involved with the proposal and is involved in the NEPA analysis. The roles of the FERC and the cooperating agencies in the Project review process are described below. The major federal, state, and local permits, approvals, and consultations for the Project are discussed in section 1.6.

1.2.1 Federal Energy Regulatory Commission

The FERC is the federal agency responsible for evaluating applications filed for authorization to construct and operate interstate natural gas pipeline facilities. As such, the FERC is the lead federal agency for the preparation of this EIS in compliance with the requirements of NEPA, the Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA (Title 40 Code of Federal Regulations (CFR) Parts 1500-1508), and the FERC's regulations implementing NEPA (Title 18 CFR Part 380).

As the lead federal agency for the E2W Project, the FERC is required to comply with section 7 of the Endangered Species Act of 1973 (ESA), the Magnuson-Stevens Fishery Conservation and Management Act (MSA), section 106 of the National Historic Preservation Act (NHPA), and section 307 of the Coastal Zone Management Act of 1972. These and other statutes have been taken into account in the preparation of this EIS. The FERC will use the document to consider the environmental impact that could result if it issues Algonquin a Certificate under section 7 of the NGA.

The FERC will also consider non-environmental issues in its review of Algonquin's application. Authorization will be granted only if the FERC finds that the evidence produced on financing, rates, market demand, gas supply, existing facilities and service, environmental impacts, long-term feasibility, and other issues demonstrates that the Project is required by the public convenience and necessity. Environmental impact assessment and mitigation development are important factors in the overall public interest determination.

1.2.2 U.S. Army Corps of Engineers

The COE has jurisdictional authority pursuant to section 404 of the Clean Water Act (CWA) (33 United States Code (USC) 1344), which governs the discharge of dredged or fill material into waters of the United States, and section 10 of the Rivers and Harbors Act (33 USC 403), which regulates any work or structures that potentially affect the navigable capacity of a waterbody. Because the COE must comply with the requirements of NEPA before issuing permits under these statutes, it elected to cooperate in the preparation of the EIS. The COE would adopt the EIS per Title 40 CFR Part 1506.3 if, after an independent review of the document, it concludes that its comments and suggestions have been satisfied.

As an element of its review, the COE must consider whether the proposed Project represents the least environmentally damaging practicable alternative pursuant to the CWA section 404(b)(1) guidelines. The term practicable means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall Project purposes.

Although this document addresses environmental impacts associated with the proposed Project as they relate to the COE's jurisdictional authority, it does not serve as a public notice for any COE permits. Algonquin filed an application for a section 404/10[4] Individual Permit with the COE on June 16, 2008. The public notice for the permit was issued on November 4, 2008. The comment meetings on the draft EIS also served as the COE's comment meetings on the public notice. The COE's Record of Decision resulting from consideration of the EIS would formally document its decision on the proposed Project, including the section 404 (b)(1) analysis and required environmental mitigation commitments.

1.2.3 U.S. Environmental Protection Agency

The EPA has delegated water quality certification (section 401 of the CWA) to the jurisdiction of individual state agencies, but the EPA may assume this authority if no state program exists, if the state program is not functioning adequately, or at the request of a state. Water used for hydrostatic testing of pipelines that is point-source discharged into waterbodies requires a National Pollutant Discharge Elimination System permit (section 402 of the CWA) issued by the state with EPA oversight. In addition, the EPA has the authority to review and veto COE decisions on section 404 permits.

The EPA also has jurisdictional authority to control air pollution under the Clean Air Act (CAA) (42 USC Chapter 85) by developing and enforcing rules and regulations for all entities that emit toxic substances into the air. Under this authority, the EPA has developed regulations for major sources of air pollution. The EPA has delegated the authority to implement these regulations to state and local agencies, while state and local agencies are allowed to develop their own regulations for non-major sources. The EPA also establishes general conformity applicability thresholds, with which a federal agency can determine whether a specific action requires a general conformity assessment.

In addition to its permitting responsibilities, the EPA is responsible for implementing certain procedural provisions of NEPA (e.g., publishing the Notices of Availability of the draft and final EISs in the Federal Register) to establish statutory timeframes for the environmental review process.

1.3 COORDINATION OF THE NEPA REVIEW

On August 27, 2007, Algonquin filed a request with the FERC to implement the Commission's pre-filing environmental review process (Pre-Filing Process) for the E2W Project. At that time, Algonquin was in the preliminary design stage of the Project and no formal application had been filed with the FERC. We approved Algonquin's request on September 10, 2007 and established a pre-filing docket number (PF07-15-000) to place information related to the Project into the public record. The purpose of the Pre-Filing Process is to encourage the early involvement of interested stakeholders, facilitate interagency cooperation, and identify and resolve issues before an application is filed with the FERC. The cooperating agencies agreed to conduct their environmental reviews of the Project in conjunction with the Commission's Pre-Filing Process.

1.4 AGENCY AND PUBLIC INVOLVEMENT

As part of the Pre-Filing Process, Algonquin mailed notification letters to landowners, government and agency officials, and the general public informing them about the Project and inviting them to attend open houses to learn about the Project. Notifications of the open houses were also published in local newspapers and sent to local media and municipal offices. Between June of 2007 and late March of 2008, Algonquin held a total of 30 open houses in various municipalities in Massachusetts

[4] As a result of the reduction in Project scope, a section 10 permit is no longer required.

and Connecticut. We attended many of these open houses to explain the NEPA environmental review process to interested stakeholders and take comments about the Project.

Additional contacts Algonquin has had with landowners regarding the proposed Project include establishing a single point of contact within Algonquin to answer questions and provide information, establishing a website at http://www.easttowestexpansion.com, and sending notification letters to affected landowners that its Certificate application was filed with the FERC. On June 17, 2009, after the reduction in Project scope, Algonquin sent letters to all previously affected landowners, informing them whether their property remains affected by the amended Project.

On October 16, 2007, we issued a *Notice of Intent to Prepare an Environmental Impact Statement for the Proposed East to West HubLine Expansion Project, Request for Comments on Environmental Issues, and Notice of Public Scoping Meetings* (NOI) that briefly described the Project and the EIS process. The NOI was published in the Federal Register and mailed to more than 2,800 individuals and organizations. The NOI invited written comments on the environmental issues to be addressed in the EIS and listed the dates and locations of three public scoping meetings. The public scoping meetings were held in Randolph, Massachusetts; North Andover, Massachusetts; and Norwich, Connecticut on November 5, 7, and 8, 2007, respectively, to provide the general public an opportunity to learn more about the proposed Project and comment on issues to be addressed in the FERC's EIS. On April 14, 2008, we issued a Supplemental NOI describing an alternative pipeline route under serious consideration. The Supplemental NOI was published in the Federal Register and mailed to more than 3,000 individuals and organizations and opened a new comment period. To solicit comments and concerns from other jurisdictional federal and state resource agencies, we conducted an interagency scoping meeting on November 7, 2007, and participated in two interagency field visits on March 7 and 18, 2008.

Throughout the scoping process and coordination with other agencies, we received comments on a variety of environmental issues that were addressed in the draft EIS. On November 14, 2008, the draft EIS was formally noticed (Notice of Availability) in the Federal Register indicating that it was available for review and comment. The draft EIS was mailed to federal, state, and local government agencies; elected officials; Native American tribes and regional organizations; local libraries and newspapers; intervenors in the FERC's proceeding; and other interested parties (i.e., affected landowners, other interested individuals, and environmental and public interest groups who provided scoping comments or asked to remain on the mailing list). The public was given 45 days after the date of publication in the Federal Register to review and comment on the draft EIS both in the form of written comments and at two public meetings held in Stoughton, Massachusetts and Norwich, Connecticut on December 10 and 11, 2008, respectively. The 45-day comment period for receiving written comments on the draft EIS closed on December 29, 2008. Written comments were received from federal, state, and local agencies; companies and organizations; individuals; and Algonquin.

Transcripts of the Commission's public meetings, summaries of the interagency scoping meetings, and all written comments received are part of the public record for the E2W Project and are available for viewing on the FERC Internet website (http://www.ferc.gov).[5] The majority of comments and concerns that we received during the scoping process and draft EIS comment period are no longer applicable to the E2W Project due to Algonquin's application amendment that reduced the scope of the proposed facilities. Table 1.4-1 of this final EIS lists the environmental issues that were identified during the scoping process that remain applicable to the amended Project and indicates the section of the final EIS in which each issue is addressed. Comments received on the draft EIS that remain applicable to the amended Project and our specific responses are provided in Appendix K of this final EIS.

[5] Using the "eLibrary" link, select "General Search" from the eLibrary menu and enter the docket number excluding the last three digits in the "Docket Number" field (i.e., PF07-15 and CP08-420). Select an appropriate date range.

TABLE 1.4-1

Issues Identified and Comments Received During the Scoping Process if Applicable to the Amended HubLine/East to West Project

Issue/Specific Comment	Final EIS Section Addressing Comment
GENERAL	
Project purpose and need	1.1
Pre-Filing environmental review process, its use in Project development, agency coordination, landowner notifications and communications, public participation	1.3, 1.4
Compliance with environmental permits	1.6
Plans for abandonment of the pipeline segments that are being replaced	2.2.1.3, 2.3.1, 4.8.1
Right-of-way width requirements and configurations	2.2.1.1, 4.8.1
Depth of cover	2.3.1
Timeframe and cost estimate for the proposed facilities	2.4, 4.9.7
Future Project expansion	2.7
Measures to avoid, minimize, and mitigate adverse impacts on the environment	4.0, Appendix B, Appendix C, Appendix D, Appendix E, Appendix F, Appendix G, Appendix H
ALTERNATIVES	
Consideration of alternative routes (including the no-build alternative)	3.0
GEOLOGY	
Impacts of blasting and proposed mitigation measures related to residences/structures, water wells, and wildlife	2.3.2, Appendix E
SOILS	
Erosion and sediment control	Appendix B
WATER QUALITY AND AQUATIC RESOURCES	
Storage of hazardous materials and fuel oil, and spill reporting procedures	4.3.1.7, Appendix C
Impacts on groundwater, reservoirs, existing hydrology, and drinking water supply, including Wellhead Protection, and Public Water Supply Areas	4.3
Dewatering methods and procedures	2.3.1, 2.3.2, Appendix B
Waterbody crossing time windows, methods, and mitigation and restoration measures	2.3.2, 4.3.2.3, 4.6.2.2, Appendix B
Impacts on fishery resources, including spawning runs, coldwater fishery streams, and essential fish habitat	4.6.2.2, 4.6.2.3
WETLANDS	
Impacts on wetlands and vernal pools	4.4.2, 4.6.1.4
Restoration of wetlands and wetland mitigation	4.4.2, 4.4.4, Appendix B, Appendix G, Appendix H

TABLE 1.4-1 (cont'd)

Issues Identified and Comments Received During the Scoping Process if Applicable to the Amended HubLine/East to West Project

Issue/Specific Comment	Final EIS Section Addressing Comment
VEGETATION	
Impacts on mature trees, including restoration plans	4.5.2, 4.8.3.1, Appendix B
Revegetation of areas cleared during construction	4.5.2, Appendix B, Appendix H
Plans for invasive species control (e.g., common reed)	4.5.4, Appendix G
SPECIAL STATUS SPECIES	
Agency coordination and requirements	4.7.1
Evaluation of potential impacts on threatened or endangered species and their habitat	4.7.2
LAND USE	
Eminent domain and compensation process	4.8.2
Control of off-road vehicle traffic	4.8.3.1
Impacts on existing residences and structures during construction and operation	2.3.2, 4.8.3.1, Appendix D
Impacts on recreational and special interest areas	4.8.4
Visual impacts along the right-of-way	4.8.6
SOCIOECONOMICS	
Employment opportunities for local contractors and laborers	4.9.1
Assessment of and impacts on community public safety resources	4.9.3
Traffic impacts associated with the Project	4.9.4
Impacts on house, business, and land values, potential for increased insurance rates	4.9.6
Community compensation	4.9.7
CULTURAL RESOURCES	
Tribal consultation and impacts on tribal lands and areas of cultural importance to Native American tribes	4.10.2
Impacts on culturally and historically significant properties	4.10.4
AIR QUALITY	
Consistency with the emissions limits and standards	4.11.1.1
Impacts on air quality resulting from compressor station operation	4.11.1.2
Greenhouse gas emissions	4.11.1.2
RELIABILITY AND SAFETY	
Sensitive receptors (e.g., schools and hospitals) near the Project facilities and pipeline density standards	4.12.1
Emergency response plans, evacuation plans and coordination with community public safety services	4.12.1
Remote detection of potential issues (e.g., pipeline leaks), safety of pipeline operation	4.12.1
Ability of pipelines to withstand damage from natural events (e.g., lightning strikes, earthquakes)	4.12.2
Potential impacts associated with acts of terrorism	4.12.3

The final EIS was filed with the EPA and mailed to applicable federal, state, and local government agencies; elected officials; Native American tribes; local libraries and newspapers; intervenors to the FERC's proceeding; and other interested parties (i.e., landowners, miscellaneous individuals, and environmental groups who provided scoping comments, commented on the draft EIS, or asked to remain on the mailing list). Landowners along the currently proposed E-3 System Replacement that were identified by Algonquin after the issuance of the draft EIS were also sent a copy of the final EIS. The formal Notice of Availability indicating that the final EIS is available for review and comment was published in the Federal Register. The distribution list for the final EIS is in Appendix A.

In accordance with CEQ regulations implementing NEPA, no agency decision on the proposed action may be made until 30 days after the EPA publishes the Notice of Availability of the final EIS in the Federal Register. However, the CEQ regulations provide an exception to this rule when an agency decision is subject to a formal internal appeal process that allows other agencies or the public to make their views known. This is the case at the FERC, where any Commission decision on the proposed action would be subject to a 30-day rehearing period. Therefore, the FERC decision may be made at the same time that notice of the final EIS is published by the EPA, allowing the appeal periods to run concurrently.

After notice of the final EIS is published by the EPA, the COE would issue its own Record of Decision (ROD) adopting the EIS. The ROD would include the COE's section 404(b)(1) analysis. After issuance of the ROD, the COE could issue the section 404 permit.

1.5 NONJURISDICTIONAL FACILITIES

We have not identified any nonjurisdictional facilities associated with the E2W Project.

1.6 PERMITS, APPROVALS, CONSULTATIONS, AND REGULATORY REQUIREMENTS

Table 1.6-1 lists the major federal, state, and local permits, approvals, and consultations identified for the construction and operation of the E2W Project. Table 1.6-1 also provides Algonquin's anticipated date for commencing formal permit and consultation procedures. Algonquin would be responsible for obtaining all permits and approvals required to implement the proposed Project regardless of whether they appear in this table.

TABLE 1.6-1

Major Permits, Approvals, and Consultations for the HubLine/East to West Project [a]

Agency	Permit/Approval/ Consultation	Agency Action	Status/Anticipated Date for Commencing Formal Permit and Consultation Procedures
FEDERAL			
Advisory Council on Historic Preservation	Section 106 Consultation, National Historic Preservation Act (NHPA)	Has the opportunity to comment if the Project may affect cultural resources that are either listed on or eligible for listing on the National Register of Historic Places (NRHP).	Consultation will be initiated by the Federal Energy Regulatory Commission (FERC), if necessary
FERC	Certificate of Public Convenience and Necessity	Determine whether the construction and operation of a natural gas pipeline project is in the public interest. Assess environmental impacts under the National Environmental Policy Act.	Pending
U.S. Department of the Army Corps of Engineers (COE)	Section 404, Clean Water Act (CWA) Permit	Consider issuance of a section 404 permit for the placement of dredge or fill material into waters of the United States, including jurisdictional wetlands.	Application submitted June 16, 2008
U.S. Environmental Protection Agency, Region I	Section 404, CWA	Review CWA, section 404 wetland dredge-and-fill applications to the COE with 404(c) veto power for wetland permits issued by the COE.	Consultation through the COE process
U.S. Fish and Wildlife Service	Section 7 Endangered Species Act Consultation	Lead agency for finding of impacts on federally listed or proposed species.	Consultation complete
	Fish and Wildlife Coordination Act	Provide comments to prevent loss of and damage to wildlife resources.	Consultation complete
	Migratory Bird Treaty Act	Provide comments to prevent loss of and damage to wildlife resources.	Consultation complete
CONNECTICUT			
Connecticut Siting Council	Review and certification of energy facilities	Consultation regarding the E-3 System Replacement.	Consultation ongoing
Connecticut Department of Environmental Protection	Water Quality Certification pursuant to section 401 of the CWA	Review and consider issuance of water quality certification.	Application submitted June 27, 2008; information request responses submitted September 8, 2008; November 6, 2008; and May 25, 2009
	Inland Wetlands and Watercourses - Wetland Permit (sections 22a-36 through 22a-45a)	Consider issuance of wetland crossing permits.	Filed at local municipal level, see below
Connecticut Department of Environmental Protection – Hydrostatic Testing	General Permit for discharges of hydrostatic water from new tanks and pipelines to waters of the U.S. (section 22a-430b of the CT General Statutes (CGS))	Consider issuance of permit for hydrostatic test water discharge.	4th Quarter 2009

TABLE 1.6-1 (cont'd)

Major Permits, Approvals, and Consultations for the HubLine/East to West Project [a]

Agency	Permit/Approval/ Consultation	Agency Action	Status/Anticipated Date for Commencing Formal Permit and Consultation Procedures
Connecticut Department of Environmental Protection – Stormwater and Dewatering Wastewater from Construction Activities	General Permit for the discharge of stormwater and dewatering wastewaters from construction activities (section 22a-430b of the CGS)	Consider issuance of permit for stormwater and dewatering from construction.	4th Quarter 2009
Connecticut Department of Transportation	Encroachment Permit	Consider issuance of encroachment permit for activities in state highway rights-of-way.	4th Quarter 2009
Connecticut Department of Environmental Protection – Wildlife Division	State-listed threatened and endangered species consultations	Consult on state endangered species that may be affected by the Project.	Consultation ongoing
Connecticut Commission on Culture and Tourism	Comment on the Project under section 106, NHPA	Has the opportunity to comment if the Project may affect cultural resources that are either listed on or eligible for listing on the NRHP.	Consultation ongoing
Connecticut Office of the State Archaeologist	Comment on the Project under section 106, NHPA	Has the opportunity to comment if the Project may affect cultural resources that are either listed on or eligible for listing on the NRHP.	Consultation ongoing
Norwich Inland Wetlands & Watercourses Commission	Inland Wetlands and Watercourses - Wetland Permit (sections 22a-36 through 22a-45a of the CGS)	Consider issuance of wetland permit.	Application approved December 12, 2008
NEW JERSEY			
New Jersey Department of Environmental Protection	Special Activity Transition Area Waiver Individual Permit (Application No. 1412-06-0008.1); issued November 16, 2007	Consider issuance of wetland permit.	Minor modifications to existing permit, 3rd Quarter 2009

[a] Consultations with Native American tribes are discussed in section 4.10.2.

2.0 PROJECT DESCRIPTION

2.1 PROPOSED FACILITIES

Algonquin proposes to modify its existing 1,100-mile-long natural gas transmission pipeline system in Connecticut and New Jersey. The E2W Project would involve the construction and operation of a replacement pipeline, modifications to an existing compressor station, and other aboveground facilities as described below. An overview map of the Project location and facilities is provided on figure 2.1-1. Detailed maps showing the pipeline route and aboveground facilities are provided on figure 2.1-2.

2.1.1 Pipeline Facilities

The proposed pipeline, referred to as the E-3 System Replacement, would consist of 2.56 miles of 12-inch-diameter pipeline that would replace a segment of existing 6-inch-diameter pipeline from Algonquin's E31-1 valve site to the E-4 Tap on the existing E-3 System pipeline in the City of Norwich, Connecticut. With the exception of two short segments where the pipeline would be abandoned in place, the E-3 System Replacement would be installed within Algonquin's existing right-of-way by using the lift and replace method.

The maximum allowable operating pressure (MAOP) of the E-3 System Replacement would be 750 pounds per square inch gauge. The maximum design capacity of the expanded Algonquin system would increase from approximately 2.1 billion cubic feet per day (bcf/d) to 2.5 bcf/d.

2.1.2 Aboveground Facilities

Modifications to existing facilities and new aboveground facilities proposed by Algonquin as part of the E2W Project include (see table 2.1.2-1):

- modifications to the existing Hanover Compressor Station in Morris County, New Jersey to accommodate reverse flow and backhaul capability along Algonquin's system; and
- installation of appurtenant ancillary facilities including one pig[1] launcher; one pig receiver; one mainline valve and remote blow-off valve; and one mainline remote control valve (RCV); in New London County, Connecticut.

TABLE 2.1.2-1

Aboveground Facilities Associated with the HubLine/East to West Project

Facility	Approximate Milepost	Pipeline System	Location (Municipality, County, State)
Compressor Station Modifications			
Hanover Compressor Station	39.5	Mainline	Township of Hanover, Morris, NJ
Pig Launcher and Receiver Facilities			
Beginning-of-E-3 System Pig Launcher	0.0	E-3 System	City of Norwich, New London, CT
End-of-E-3 System Pig Receiver	2.56	E-3 System	City of Norwich, New London, CT
Mainline Valves and Remote Blow-off Valves			
Mainline Valve and Remote Blow-off Valve	0.0	E-3 System	City of Norwich, New London, CT
Mainline RCV	2.56	E-3 System	City of Norwich, New London, CT

[1] A pig is an internal tool that can be used to clean and dry a pipeline and/or to inspect it for damage or corrosion.

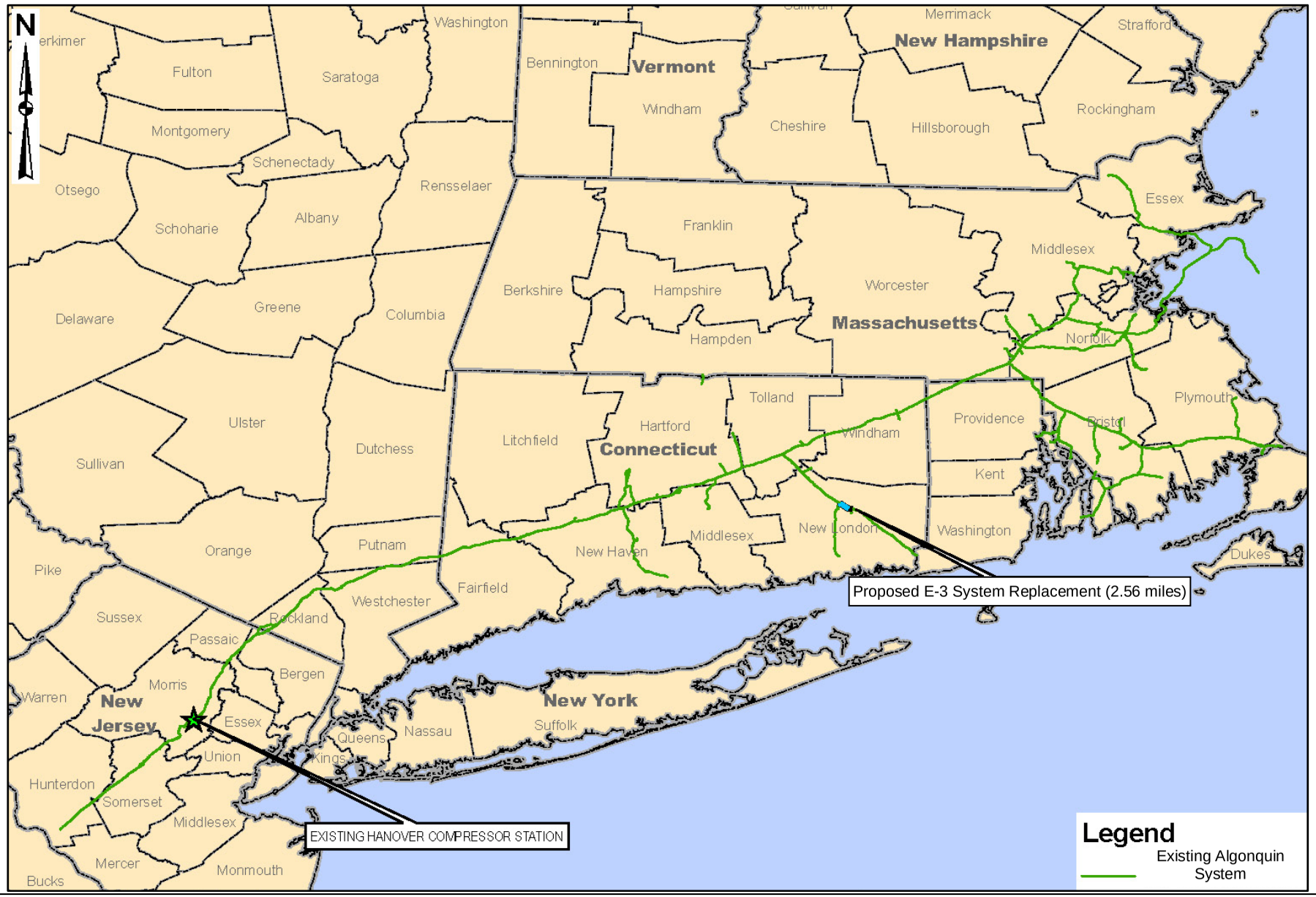

Figure 2.1-1
HubLine/East to West Project
Project Overview Map

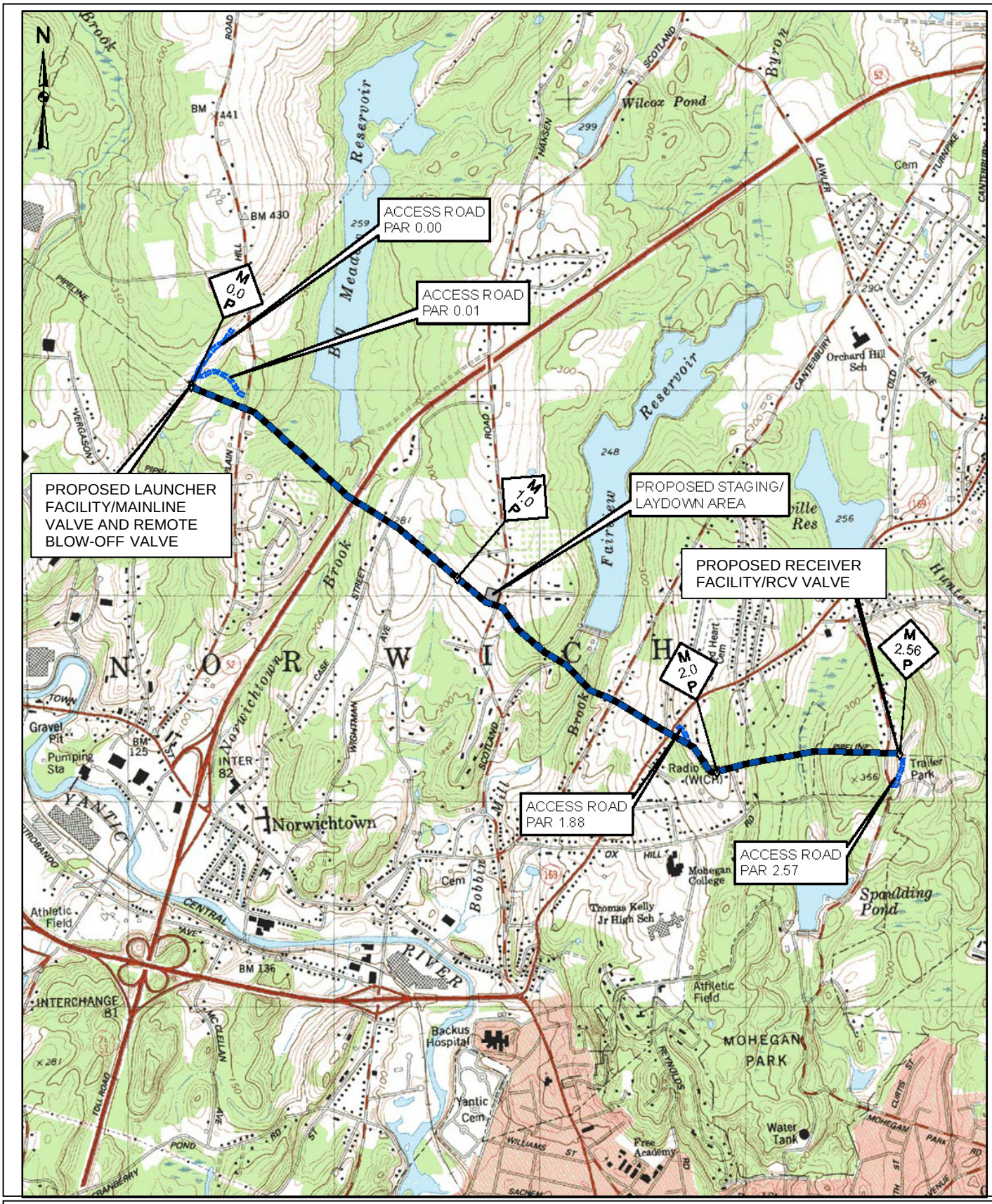

Figure 2.1-2
HubLine/East to West Project
Facility Location Maps
(Sheet 1 of 2)

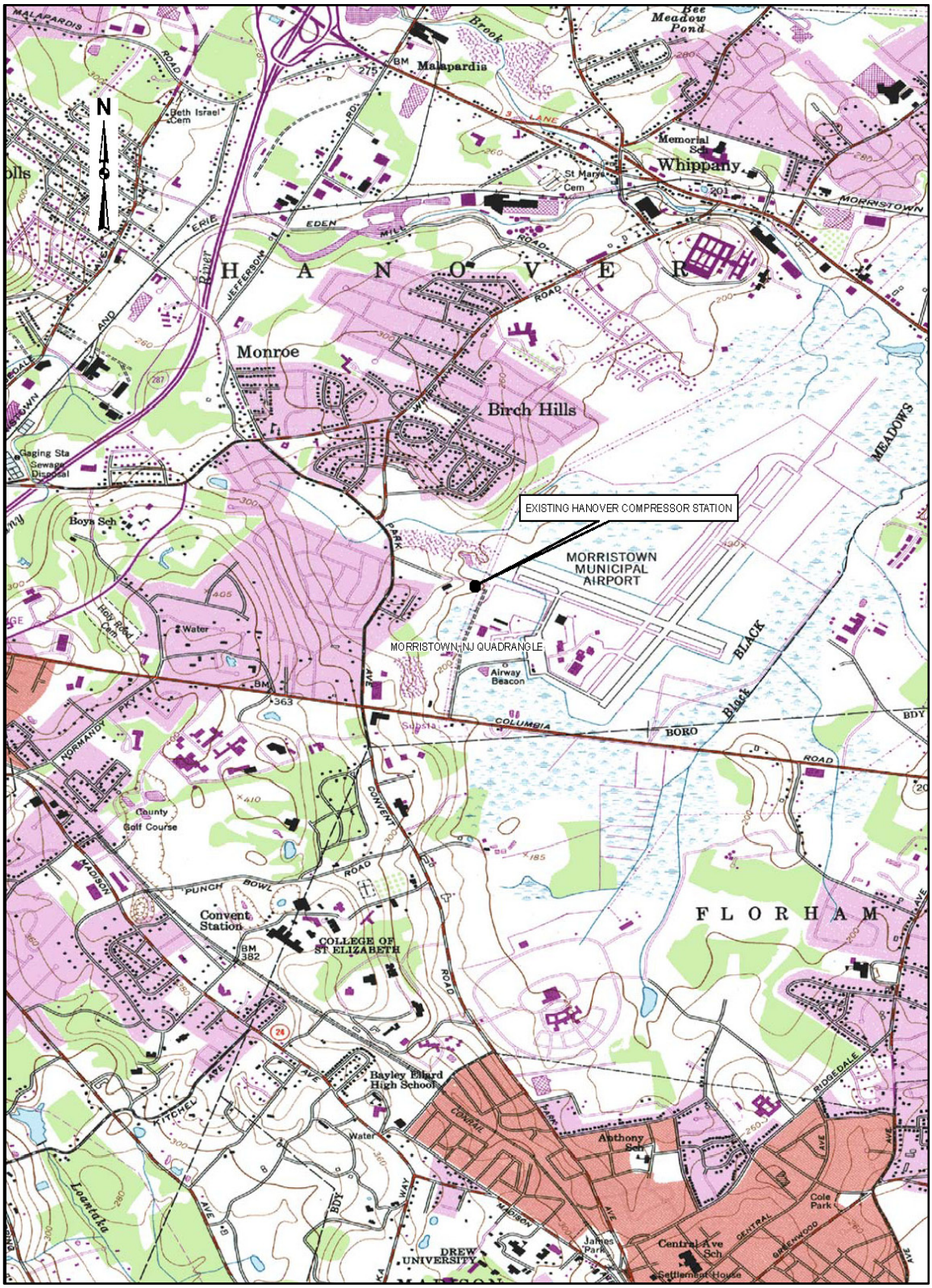

Figure 2.1-2
HubLine/East to West Project
Facility Location Maps
(Sheet 2 of 2)

The modifications to the existing Hanover Compressor Station are principally related to the piping and would take place within the existing, developed compressor station property. These modifications consist of five new valves and minor below grade piping. All of the valves and piping would be buried. The remaining aboveground facilities, located at the beginning and end of the proposed E-3 System Replacement, would be new facilities. The majority of these facilities would be located within Algonquin's existing right-of-way.

2.2 LAND REQUIREMENTS

Table 2.2-1 summarizes the land requirements for the E2W Project. A detailed description and breakdown of land requirements and use is presented in section 4.8.1. Construction of the E2W Project would disturb approximately 32.1 acres of land, including the pipeline facilities, aboveground facilities, and access roads. Approximately 10.6 acres of the 32.1 acres used for construction would be required for operation of the Project. Of this total, about 9.2 acres would be for the permanent pipeline right-of-way, 0.5 acre would be for the aboveground facilities, and 0.9 acre would be for permanent access roads associated with the proposed facilities. The remaining 21.5 acres of land would be restored and allowed to revert to former use.

TABLE 2.2-1

Summary of Land Requirements Associated with the HubLine/East to West Project Facilities

Facility	Land Affected During Construction (acres)	Land Affected During Operation (acres)
Pipeline Facilities [a]	29.3	9.2
Aboveground Facilities		
Hanover Compressor Station [b]	0.0	0.0
Beginning of E-3 System Pig Launcher	1.3	0.4
End-of-E-3 System Pig Receiver	0.6	0.1
Valves	0.0	0.0
Aboveground Facilities Total	1.9	0.5
Access Roads	0.9	0.9
Project Total	32.1	10.6

[a] Construction impacts are based on the proposed 75-foot-wide nominal construction right-of-way and areas where the right-of-way is wider than the nominal configuration as well as staging areas and extra workspaces at feature crossings. Construction impacts associated with the pipeline facilities include the existing permanent pipeline right-of-way. Operation impacts are based on a 30-foot-wide permanent right-of-way and include the areas inside the existing maintained Algonquin pipeline right-of-way.

[b] The modifications at the existing Hanover Compressor Station would occur within the existing, developed compressor station property. The existing environment at the Hanover Compressor Station is analyzed in the FERC's October 2006 *Northeast (NE)-07 Project Final Supplemental Environmental Impact Statement* (FERC/EIS-0195F). Unless otherwise specified, impacts associated with the compressor station modifications are not discussed in the remainder of the EIS.

2.2.1 Pipeline Facilities

Of the approximately 29.3 acres of land that would be disturbed during construction of the pipeline facilities, about 23.5 acres would be disturbed by the pipeline right-of-way and 5.8 acres would be disturbed by temporary extra workspace. Operation of the pipeline facilities would require about 9.2 acres of land, the majority of which would be within Algonquin's existing pipeline right-of-way.

2.2.1.1 Right-of-Way Configuration

Algonquin proposes to use a nominal 75-foot-wide construction right-of-way during the installation of the proposed pipeline, consisting of 30 feet of permanent right-of-way and 45 feet of temporary construction workspace. During construction, Algonquin would use a 50-foot-wide working side and a 25-foot-wide non-working (spoil) side. The majority of the permanent right-of-way would consist of Algonquin's 30-foot-wide existing, cleared permanent right-of-way. The typical, nominal right-of-way configuration proposed by Algonquin is provided on figure 2.2.1-1. The construction procedures that would be followed are described in section 2.3.

2.2.1.2 Additional Temporary Workspace

In addition to the nominal 75-foot-wide construction right-of-way configuration described above, Algonquin has requested a wider construction right-of-way in some locations due to the presence of steep slopes, the need for additional storage for topsoil segregation, and staging areas. The areas are listed in table 4.8.1-3 in section 4.8.1 along with our recommendation to approve or deny Algonquin's request. Additional or alternative areas could be identified in the future due to changes in site-specific construction requirements. Algonquin would be required to file information on each of those areas for our review and approval prior to use.

2.2.1.3 Abandonment Locations

A total of approximately 700 feet of pipeline would be abandoned in place at the crossings of Interstate 395/Norwichtown Brook and wetland E3-W2. Additional discussion of the abandoned facilities is presented in sections 2.3.1 and 4.8.1.

2.2.2 Aboveground Facilities

Construction of the aboveground facilities would affect 1.9 acres of land, of which 0.5 acre would be permanently converted to industrial uses for operation of these facilities. The modifications to the existing Hanover Compressor Station would take place within the existing fenceline of the developed property and would not require any additional land for construction or operation (see table 2.2-1).

2.2.3 Access Roads

Algonquin proposes to use four access roads to access the right-of-way during construction and operation, all of which are existing roads. Two of the roads would require some improvement to move equipment and materials to the construction right-of-way. The proposed access roads would affect about 0.9 acre of land during construction, all of which would be retained for operation and maintenance of the pipeline facilities for the life of the Project. The roads would be maintained by Algonquin's operations personnel to provide continuing access to the facilities. The locations, lengths, and acres of the proposed access roads are listed in table 2.2.3-1.

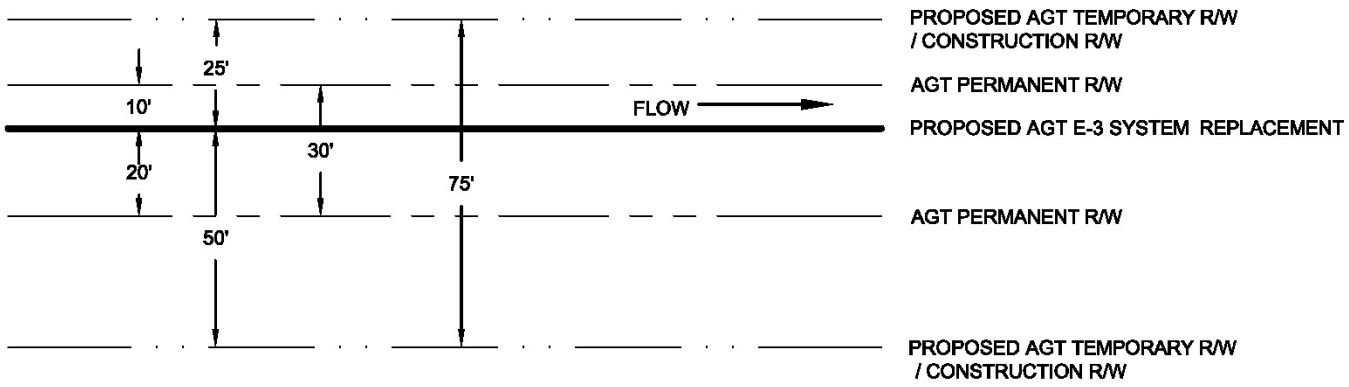

Figure 2.2.1-1
HubLine/East to West Project
Typical Nominal Right-of-Way Configuration for the E-3 System Replacement

TABLE 2.2.3-1

Access Roads Associated with the HubLine/East to West Project

Access Road Number [a]	Approximate Milepost	Approximate Length (feet)	Land Affected During Construction (acres)	Land Affected During Operation (acres)
PAR 0.00 [b]	0.0	1,500	0.0	0.0
PAR 0.01	0.0	960	0.4	0.4
PAR 1.88 [b]	1.9	340	0.2	0.2
PAR 2.57 [b]	2.6	550	0.3	0.3
Total			0.9	0.9

[a] PAR = permanent access road.

[b] This is an existing road currently being used to access Algonquin's existing facilities.

2.3 CONSTRUCTION PROCEDURES

The E2W Project would be designed, constructed, tested, and operated in accordance with all applicable requirements included in the U.S. Department of Transportation (DOT) regulations in Title 49 CFR Part 192,[2] *Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards*; and other applicable federal and state regulations, including U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) requirements. These regulations are intended to ensure adequate protection for the public and to prevent natural gas pipeline accidents and failures. Among other design standards, Part 192 specifies pipeline material and qualification, minimum design requirements, and protection from internal, external, and atmospheric corrosion.

To reduce construction impacts, Algonquin would implement its Project-specific Erosion and Sedimentation Control Plan (E&SCP) (see Appendix B). Algonquin's E&SCP is based on the mitigation measures contained in the FERC's Upland Erosion Control, Revegetation, and Maintenance Plan (FERC Plan) and Wetland and Waterbody Construction and Mitigation Procedures (FERC Procedures),[3] as well as guidelines from the COE, the U.S. Fish and Wildlife Service (FWS), and the U.S. Department of Agriculture (USDA).

To avoid or minimize the potential for harmful spills and leaks during construction, Algonquin has developed a Spill Prevention Control and Countermeasure Plan (SPCC Plan) (see Appendix C). Algonquin's SPCC Plan describes spill and leak preparedness and prevention practices, procedures for emergency preparedness and incident response, and training requirements. Additional discussion of the SPCC Plan is presented in section 4.3.1.7. Other resource-specific plans (e.g., Blasting Plan, Dust Control Plan, Wetland Restoration Procedures for Temporary Wetland Impacts, Invasive Plant Species Control Plan) that have been developed for the proposed Project are discussed in more detail in section 4.0.

[2] Pipe design regulations for steel pipe are contained in subpart C, Part 192. Section 192.105 contains a design formula for the pipeline's design pressure. Sections 192.107 through 192.115 contain the components of the design formula, including yield strength, wall thickness, design factor, longitudinal joint factor, and temperature derating factor, which are adjusted according to the project design conditions, such as pipe manufacturing specifications, steel specifications, class location, and operating conditions. Pipeline operating regulations are contained in subpart L, Part 192.

[3] The FERC Plan and Procedures are a set of construction and mitigation measures that were developed in collaboration with other federal and state agencies and the natural gas pipeline industry to minimize the potential environmental impacts of the construction of pipeline projects in general. The FERC Plan can be viewed on the FERC Internet website at http://www.ferc.gov/industries/gas/enviro/uplndctl.pdf. The FERC Procedures can be viewed on the FERC Internet website at http://www.ferc.gov/industries/gas/enviro/wetland.pdf.

2.3.1 General Pipeline Construction Procedures

Standard pipeline construction is composed of specific activities that make up the linear construction sequence. This section describes the general procedures proposed by Algonquin for the construction of the pipeline facilities. Figure 2.3.1-1 shows the typical steps of cross-country pipeline construction. Algonquin currently plans to use one general construction crew or "spread" to build the pipeline, with an average crew size of approximately 75 workers. The modifications to the Hanover Compressor Station would require one station contractor using approximately 25 workers.

A large percentage of the pipeline along the E-3 System Replacement would involve removing the existing pipeline and replacing it with a larger diameter pipeline, which is referred to in this EIS as the lift and replace method. This method would generally involve excavating a trench to remove the existing pipe; widening and deepening the trench (as appropriate) in order to accommodate the new, larger diameter pipeline; and installing the replacement pipe in approximately the same location as the old pipe using the standard cross-country construction methods discussed below. However, in certain situations (e.g., a long duration between removal and installation), the trench might be backfilled following the removal of the existing pipeline, then re-excavated at a later date to allow for the installation of the replacement pipeline.

A total of approximately 700 feet of pipeline would be abandoned in place at the crossings of Interstate 395/Norwichtown Brook and wetland E3-W2. Before removal or abandonment in place, the pipe would be emptied of all gas and cleaned using cleaning pigs to remove all foreign matter. The openings would then be capped and filled with appropriate material and sealed before abandonment. In areas where the existing pipeline is cased, the carrier pipe would be removed, and the casing pipe would be filled with appropriate material, capped, and abandoned in place.

If any of the pipeline to be removed has been coated with products that contain asbestos (pipelines coated with asphaltic materials often use felt outer wraps that typically contain asbestos), Algonquin would follow its standard operating procedure for removal and proper disposal of these materials.

Survey and Staking

Before the start of construction, Algonquin would complete land or easement acquisition. Algonquin would then mark the limits of the approved work area (i.e., the construction right-of-way boundaries and temporary extra workspaces) and the pipeline centerline, and flag the location of approved access roads. Affected landowners would be notified prior to surveying and staking activities. Wetland boundaries and other environmentally sensitive areas would be marked or fenced for protection. Prior to construction, Algonquin's contractors would contact the "Call Before You Dig" or "One Call" system to verify and mark all underground utilities (i.e., cables, conduits, and pipelines) to prevent accidental damage during construction.

Clearing and Grading

The construction work area would be cleared and graded where necessary to provide a relatively level surface for trench excavating equipment and a sufficiently wide workspace for the passage of heavy construction equipment. Stumps, brush, and tree limbs would be removed from the right-of-way to approved disposal locations or made available to landowners upon request. Timber would be removed from the right-of-way to approved locations and sold for lumber or pulp, or chipped on the right-of-way.

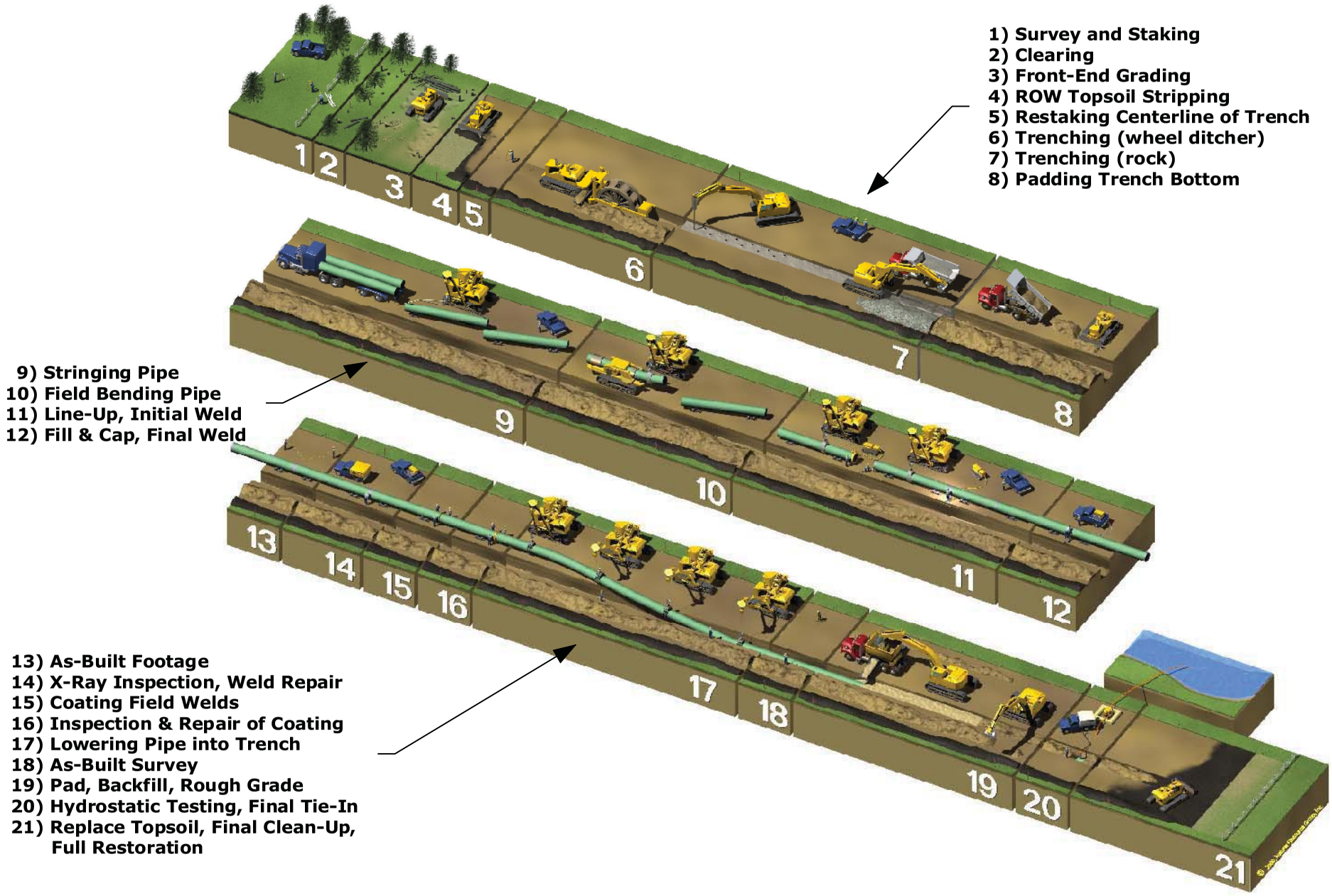

Figure 2.3.1-1
HubLine/East to West Project
Typical Pipeline Construction Sequence

In agricultural and residential areas, up to 12 inches of topsoil would be stripped from either the full work area or from the trench and subsoil storage area. Topsoil segregation would be conducted in wetland areas where standing water is not present and the soils are not saturated or frozen. Topsoil would be stockpiled separately from the trench spoil along the edge of the construction right-of-way for respreading during restoration.

Trenching

The trench would be excavated with a backhoe or ditching machine to a depth sufficient to provide the minimum cover required by DOT specifications. Typically, the trench would be approximately 5 to 6 feet deep to allow for at least 3 feet of cover. In areas with consolidated rock, the minimum cover would be 18 inches. In certain areas, deeper burial would be required resulting in an increased trench depth. In areas where mechanical equipment cannot break up and loosen the bedrock, blasting may be required (see sections 2.3.2 and 4.1.3.5).

Pipe Stringing, Bending, and Welding

Steel pipe would be procured in 40-foot lengths (referred to as joints), protected with an epoxy coating applied at the factory, and shipped to the Project area. The individual joints would be transported to the right-of-way by stringing truck and placed on temporary supports along the excavated trench in a single, continuous line or "strung." Some bending of the pipe would be required to enable the pipeline to follow natural grade changes and direction changes of the right-of-way. Following stringing and bending, the joints of pipe would be aligned and welded according to applicable American Petroleum Institute (API) standards and Algonquin specifications. Radiographic or ultrasonic inspections of each weld would be performed as outlined in Title 49 CFR Part 192. Welds that did not meet the API Standard 1104 and Algonquin's established specifications would be repaired or removed.

Lowering-in and Backfilling

Before the pipeline is lowered in, the trench would be inspected to be sure it is free of rocks and other debris that could damage the pipe or protective coating. If water is present in the trench, dewatering may be necessary to allow for inspection of the trench. Where trench dewatering is needed, water would be discharged off the right-of-way to a stable, vegetated upland area and/or filtered through a filter bag or siltation barrier. In areas of bedrock, a sand bedding or padding made of sand bags or clay may be installed in the bottom of the trench to protect the pipeline. After the pipe is lowered into the trench, final tie-in welds would be made and inspected, and the trench would be backfilled. Large rock not suitable for use as backfill material would be windrowed along the edge of the right-of-way (with the landowner's permission), used to construct off-road vehicle (ORV) barriers, used as riprap for streambank stabilization (where allowed by applicable regulatory agencies), or hauled off the right-of-way and disposed of in an approved area. Algonquin would negotiate with the landowner and obtain permission to permanently store rock along, over, through, or across the right-of-way.

Hydrostatic Testing

After burial, the pipeline would be cleaned with pigs and tested to ensure that the system is capable of withstanding the operating pressure for which it was designed. This procedure is called hydrostatic testing and is accomplished using pressurized water in the pipeline. The E-3 System Replacement would be tested in one continuous test section and in accordance with Algonquin's requirements and DOT specifications (Title 49 CFR Part 192). The timing of hydrostatic testing would depend on the final schedule for construction (see section 2.4). Additional discussion of hydrostatic testing is presented in section 4.3.2.6. The applicable permits are listed in table 1.6-1.

Cleanup and Restoration

Within 20 days of backfilling the trench (10 days in residential areas), all work areas would be final graded and restored to preconstruction contours and natural drainage patterns as closely as possible. If seasonal or other weather conditions prevent compliance with these timeframes, temporary erosion controls would be maintained until conditions allow completion of final cleanup. Agricultural areas disturbed by construction would be tested for compaction and plowed with a paraplow or other deep tillage implement as needed. Algonquin is requesting an alternative measure from the FERC Plan and does not propose to conduct compaction testing and mitigation in residential areas. We are recommending this request be denied (see section 4.2.2). Surplus construction material and debris would be removed from the right-of-way unless the landowner approves otherwise. Excess rock/stone would be removed from at least the top 12 inches of soils in agricultural and residential areas and, at the landowner's request, in other areas. Landowners are also at liberty to negotiate certain specific construction requirements and restoration measures directly with Algonquin.

Algonquin would conduct restoration activities in accordance with landowner agreements, permit requirements, and written recommendations on seeding mixes, rates, and dates obtained from the local soil conservation authority or other duly authorized agency and in accordance with its E&SCP. Additional discussion of restoration activities is presented in sections 4.2.2, 4.4.2, and 4.5.2.

2.3.2 Special Construction Techniques

Construction across roads, highways, rugged topography, wetlands, waterbodies, and residential areas; and areas of shallow bedrock may require special construction techniques. These are briefly described below. Applicable permits are listed in table 1.6-1.

Road and Highway Crossings

Construction across paved and unpaved roads and highways would be in accordance with the requirements of applicable road crossing permits and approvals. These features would be crossed using either conventional open-cut or road bore methods. Algonquin would design all road crossings in accordance with Title 49 CFR Part 192.

The open-cut method would require temporary closure of the road to traffic and establishment of detours. If no reasonable detour is feasible, at least one lane of the road being crossed would be kept open to traffic, except during brief periods when it is essential to close the road to install the pipeline. If the roadway surface is paved, the pavement over the trenchline would be cut, removed, and disposed of properly. The trench would be excavated and the pipe installed using the standard cross-country construction methods described above. The material used for backfilling and methods of placement would comply with the requirements of the permitting agency. If the roadway surface was paved, the paving would be properly restored in accordance with the permit requirements.

Boring requires the excavation of pits on both sides of the feature to be crossed to the depth of the pipeline and the use of equipment to bore a hole under the feature that is slightly larger than the diameter of the pipe. Once the hole is bored, a prefabricated pipe section would be pushed through the borehole. Any voids between the pipe section and the subsoil would be filled with grout (a sand and cement mix) to prevent settlement of the roadway surface. A casing pipe would be installed as required or when there is a likelihood of encountering rock during the boring.

Crossings of private driveways would be coordinated with residents to minimize access impacts. All roadway surfaces would be quickly restored to the specifications of the Connecticut Department of

Transportation as outlined in the permit requirements. Roadway markings and striping would be added as necessary.

Rugged Topography

In areas of side-slopes and rolling terrain, leveling would be required to establish safe working conditions on the construction right-of-way. Following clearing activities in these areas, grading tractors would build a level grade for the excavation of the trench, the stringing of the pipe, and the movement of equipment and vehicles. The pipeline trench would be constructed along the newly graded right-of-way. Following backfill and final grading, the original contours would be restored as nearly as practicable and stabilized following the measures in Algonquin's E&SCP (see Appendix B). Any springs or seeps found in the cut would be carried downslope through polyvinyl chloride pipe and/or gravel French drains installed as part of the cut restoration.

Wetland Crossings

Based on Algonquin's field surveys, the proposed pipeline route would cross 12 wetlands at 15 locations (see table 4.4.1-1 in section 4.4.1). The crossing of delineated wetlands would be in accordance with federal and state permits and follow the measures in Algonquin's E&SCP, which is based on the FERC Procedures, except where alternative measures to the FERC Procedures are requested and approved by the FERC and other jurisdictional agencies. Wetland resources are discussed further in section 4.4. The existing pipeline at the crossing of wetland E3-W2 and wetland areas crossed as part of the Interstate 395/Norwichtown Brook bore would be abandoned in place to avoid additional impacts on the wetland resources.

Construction equipment working in wetlands would be limited to that essential for right-of-way clearing, excavating the trench, fabricating and installing the pipeline, backfilling the trench, and restoring the right-of-way. The method of pipeline construction used in wetlands would depend largely on the stability of the soils at the time of construction. In areas of saturated soils or standing water, low-ground-weight construction equipment and/or timber riprap, prefabricated equipment mats, or terra mats would be used to reduce rutting and the mixing of topsoil and subsoil. In unsaturated wetlands, the top 12 inches of topsoil from the trenchline would be stripped and stored separately from the subsoil.

Where wetland soils are saturated and/or inundated, the pipeline may be installed using the push-pull technique. The push-pull technique would involve stringing and welding the pipeline outside of the wetland and excavating the trench through the wetland. The water that seeps into the trench would be used to "float" the pipeline into place together with a winch and flotation devices. After the pipeline is floated into place, the floats would be removed and the pipeline would sink into place. Pipe installed in saturated wetlands is typically coated with concrete or equipped with set-on weights to provide negative buoyancy. After the pipeline sinks to the bottom of the trench, a trackhoe working on equipment mats would backfill the trench and complete cleanup.

Because little or no grading would occur in wetlands, restoration of contours would be accomplished during backfilling. Equipment mats, terra mats, and timber riprap would be removed from wetlands following backfilling. Where wetlands are located at the base of slopes, permanent interceptor dikes and trench plugs would be installed in upland areas adjacent to the wetland boundary. Temporary sediment barriers would be installed where necessary until revegetation of adjacent upland areas is successful.

In the absence of specific recommendations, non-agricultural wetlands would be seeded with annual ryegrass at a rate of 40 pounds per acre. Lime and fertilizer would not be used in wetlands.

Waterbody Crossings

Four waterbodies, including two perennial waterbodies and two intermittent streams would be crossed by the proposed pipeline route. The waterbodies that would be crossed and Algonquin's proposed crossing method for each are listed in table 4.3.2-1 in section 4.3.2. The waterbody crossings would be constructed in accordance with federal, state, and local permits and, for those waterbodies that have perceptible flow at the time of construction, in accordance with Algonquin's E&SCP, which is based on the FERC Procedures, except where alternative measures to the FERC Procedures are requested and approved by the FERC and other jurisdictional agencies. Algonquin has identified specific construction methods it would use at each waterbody, including the dry and wet open-cut, flume or dam and pump, and bore construction methods. These construction methods are described below.

Dry Open-Cut Construction Method – For waterbodies without flow at the time of construction Algonquin would utilize the dry open-cut method, which involves the standard cross-country construction methods described in section 2.3.1. After backfilling, the streambanks would be re-established to approximate preconstruction contours and stabilized, and erosion and sediment control measures would be installed across the construction right-of-way to reduce streambank and upland erosion and sediment transport into the waterbody.

Flume Construction Method – The flume method is a standard dry waterbody crossing construction method that involves diverting the flow of water across the construction work area through one or more flume pipes placed in the waterbody with sand bags or equivalent dam diversion structures placed upstream and downstream of the trench area. The water flow would be diverted through the flume pipes, thereby isolating the water flow from the construction area between the dams. Flume pipes would be left in place during pipeline installation and until final cleanup of the streambed and bank was completed.

Dam and Pump Construction Method – The dam and pump method is a standard dry waterbody crossing construction method that may be used as an alternative to the flume method. This method is similar to the flume crossing method except that pumps and hoses would be used instead of flumes to move water across the construction work area. After the pipeline installation and backfilling, the dams would be removed and the banks restored and stabilized.

Wet Open-Cut Construction Method – The wet open-cut construction method involves trench excavation, pipeline installation, and backfilling in a waterbody without controlling or diverting streamflow (i.e., the stream would flow through the work area throughout the construction period). The trench would be excavated across the stream using trackhoes or draglines working on equipment bridges and/or from the streambanks. Following pipe installation and backfilling, the streambanks would be re-established to approximate preconstruction contours and stabilized. Erosion and sediment control measures would be installed across the right-of-way to reduce streambank and upland erosion and sediment transport into the waterbody.

Bore Construction Method – The bore method involves installing the pipeline beneath a feature without surface disturbance to the feature during the crossing. One of the perennial waterbodies (i.e., Norwichtown Brook) would be crossed as part of the Interstate 395 bore. The existing pipe would be abandoned in place at this crossing to avoid additional impacts on Norwichtown Brook.

Residential Areas

There are 35 residences located within 50 feet of the proposed construction work area, of which 23 are located within 25 feet. In areas where a minimum distance of 25 feet cannot be maintained between a residence and the construction work area, Algonquin would use the stove-pipe or drag-section

construction method. The stove-pipe method involves installing one joint of pipe at a time whereby the welding, weld inspection, and coating activities are all performed in the open trench, thereby reducing the width of the construction right-of-way. At the end of each day after the pipe is lowered-in, the trench is backfilled and/or covered with steel plates or timber mats. The length of excavation performed each day cannot exceed the amount of pipe installed. Algonquin also calls this technique the sewer line method.

The drag-section method involves the trenching, installation, and backfill of a prefabricated length of pipe containing several segments all in 1 day. As in the stove-pipe method, the trench is backfilled and/or covered with steel plates or timber mats at the end of each day after the pipe is lowered in. Use of the drag-section technique typically requires adequate staging areas outside of the residential and/or commercial/industrial congestion for assembly of the prefabricated sections.

In general, construction through or near residential areas would be done in a manner to ensure that all construction activities minimize adverse impacts on residences and that cleanup is prompt and thorough. Access to homes would be maintained, except for the brief periods essential for laying the new pipeline. Algonquin would implement other general measures to minimize construction-related impacts on all residences and other structures located within 50 feet of the construction right-of-way as described in detail in section 4.8.3.1. Private property such as fences, gates, driveways, and roads disturbed by pipeline construction would be restored to original or better condition upon completion of construction activities.

In addition, Algonquin has provided site-specific residential construction plans to inform affected landowners of proposed measures to minimize disruption and to maintain access to the residences located within 25 feet of the construction work area. These plans are described in section 4.8.3.1 and included in Appendix D.

Blasting

Blasting would be required where solid rock makes other trenching methods impractical. Based on soils data, it appears that blasting may be needed along approximately 0.4 mile of the route. Algonquin has prepared a Blasting Plan to minimize the effects of blasting and ensure safety during blasting operations (see Appendix E). All blasting techniques would comply with federal, state, and local regulations governing the safe storage, handling, firing, and disposal of explosive materials. Additional discussion of blasting is presented in section 4.1.3.5.

2.3.3 Aboveground Facility Construction Procedures

Construction of the proposed aboveground facilities, including the pig launcher, pig receiver, and valves, would involve site clearing and grading as needed to establish appropriate contours for the facilities. Following installation of the equipment, the sites would be graveled, as necessary, and fenced.

2.4 CONSTRUCTION SCHEDULE AND COST

Construction of the proposed pipeline facilities and modifications to the Hanover Compressor Station would begin in April and June 2010, respectively and continue until late 2010. The projected in-service date of the Hanover Compressor Station is October 2010 and of the E-3 System Replacement is November 2010. Additional details of Algonquin's construction plans and workforce are provided in section 4.9.1. The proposed Project would cost approximately $28,608,000, of which $20,618,000 would be for the E-3 System Replacement and $7,990,000 would be for the Hanover Compressor Station modifications.

2.5 ENVIRONMENTAL COMPLIANCE INSPECTION AND MITIGATION MONITORING

In preparing construction drawings and specifications for the Project, Algonquin would incorporate mitigation measures identified in its permit applications as well as additional requirements of federal, state, and local agencies. Algonquin would provide the construction contractors with copies of applicable environmental permits as well as copies of "approved for construction" Environmental Construction Alignment Sheets and construction drawings and specifications.

Algonquin would develop an environmental training program for its construction personnel that is tailored to the proposed Project and its requirements. This includes training regarding proper field implementation of its E&SCP and other Project-specific plans and mitigation measures. Environmental training would be conducted before and during construction.

At least one Environmental Inspector (EI) would be designated to ensure compliance with the Project's environmental requirements during active construction and restoration. Due to the reduced scope of the E2W Project, the EI role may be carried out by the Resident Engineer/Chief Inspector who has overall authority on the construction spread or a Craft Inspector as designated by Algonquin. The EI would have peer status with all other activity inspectors. The EI would have authority to stop activities that violate the measures set forth in the Project documents and authorizations and would have the authority to order corrective action. The specific responsibilities of the EI are outlined in Algonquin's E&SCP (see Appendix B).

After construction, Algonquin would conduct follow-up inspections of all disturbed upland areas for the first and second growing seasons (as needed) to determine the success of restoration. Restoration would be considered successful in agricultural areas if crop yields are similar to adjacent undisturbed portions of the same field. In other upland areas, restoration would be considered successful if the right-of-way surface condition is similar to adjacent undisturbed lands, construction debris is removed, proper drainage has been restored, and a uniform 70 percent vegetative cover is present. For at least 2 years following construction, Algonquin would submit quarterly reports to the FERC that document any problems identified by Algonquin or landowners and describe the corrective actions taken to remedy those problems.

Algonquin would monitor the success of wetland revegetation annually for the first 3 years (or as required by permit) after construction, or longer, until wetland revegetation is successful. Wetland revegetation would be considered successful when the cover of herbaceous and/or woody species is at least 80 percent of the type, density, and distribution of the vegetation in adjacent wetland areas that were not disturbed by construction. If revegetation is not successful at the end of 3 years, or if there is a need for invasive plant species control measures, Algonquin would develop and implement (in consultation with the COE and other applicable federal and state agencies and a professional wetland ecologist) a plan to actively revegetate the wetland with native wetland herbaceous and woody plant species.

After construction, we would continue to conduct oversight inspection and monitoring. If it is determined that any of the proposed monitoring timeframes are not adequate to assess the success of restoration, Algonquin would be required to extend its post-construction monitoring programs.

2.6 OPERATION, MAINTENANCE, AND SAFETY CONTROLS

Algonquin currently operates and maintains its existing system in compliance with DOT regulations provided in Title 49 CFR Part 192, the Commission's guidance at Title 18 CFR Part 380.15, and the maintenance provisions of Algonquin's E&SCP. When completed, the E2W Project would be operated in conjunction with the existing system and subject to the same operation and maintenance

procedures. No new permanent employees would be added to operate and maintain the new pipeline and aboveground facilities.

Maintenance activities would include regularly scheduled gas-leak surveys and measures necessary to repair any potential leaks. Vegetation on the upland portions of the permanent right-of-way would be maintained no more frequently than once every 3 years with the exception of a 10-foot-wide corridor centered over the pipeline that may be maintained annually in an herbaceous state. Similarly, a 10-foot-wide herbaceous corridor would be maintained in wetland areas. In addition, trees and shrubs greater than 15 feet in height that are located within 15 feet of the pipeline would be removed from the permanent right-of-way in wetland areas. Riparian areas adjacent to all waterbodies would be allowed to permanently revegetate with native species to at least 25 feet from the mean high water mark.

The pipeline facilities would be clearly marked at line-of-sight intervals and at road crossings and other key points. The markers would indicate the presence of the pipeline and provide a telephone number and address where a company representative could be reached in the event of an emergency or before any excavation in the area of the pipeline by a third party. Algonquin participates in the "Call Before You Dig" and "One Call" programs and other related pre-excavation notification organizations in the states in which it operates.

Weekly aerial and monthly ground inspections by pipeline personnel would identify soil erosion that may expose the pipe; dead vegetation that may indicate a leak in the line; conditions of the vegetative cover and erosion control measures; unauthorized encroachment on the right-of-way, such as building and other substantial structures; and other conditions that could present a safety hazard or require preventive maintenance or repairs. The pipeline cathodic protection system would also be monitored and inspected periodically to ensure proper and adequate corrosion protection.

2.7 FUTURE PLANS AND ABANDONMENT

Algonquin has not identified plans for future expansion of its system or abandonment of the Project facilities beyond those discussed in this EIS.

3.0 ALTERNATIVES

Alternatives to the E2W Project were evaluated to determine whether they would be reasonable and environmentally preferable to the proposed action. These alternatives included the No Action or Postponed Action Alternative and system alternatives.

The evaluation criteria for selecting potentially reasonable and environmentally preferable alternatives include whether they:

- are technically and economically feasible and practical;
- offer significant environmental advantage over the proposed Project; and
- meet the Project objectives within the same general timeframe as the proposed Project.

As described in section 1.1, the stated objectives of the E2W Project are to provide:

- 281,500 dth/d of additional east to west transportation service to New England and other Northeast markets;
- increased diversity of supply by accessing natural gas from the LNG projects recently constructed or under construction at the east end of Algonquin's system; and
- increased reliability of the existing natural gas system by eliminating delivery bottlenecks on the eastern end of Algonquin's system.

In conducting a reasonable alternatives analysis, it is important to recognize the environmental advantages and disadvantages of the proposed action in order to focus the analysis on those alternatives that may reduce impacts and offer a significant environmental advantage. A detailed discussion of the environmental consequences of the Project (both positive and negative) is included in section 4.0.

Using the evaluation criteria discussed above and subsequent environmental comparisons, each alternative was considered to the point where it was clear that the alternative was either not reasonable, would result in greater environmental impacts that could not be readily mitigated, offered no potential environmental advantages over the proposed Project, or could not meet the Project's objectives. Alternatives that appeared to result in less than or similar levels of environmental impact were reviewed in greater detail.

The analysis was based on information provided by Algonquin, field reconnaissance, aerial photographs, U.S. Geological Survey (USGS) topographic maps, other publicly available environmental data, agency consultations, public scoping comments, and our independent research.

3.1 NO ACTION OR POSTPONED ACTION ALTERNATIVE

The action triggering this environmental review was Algonquin's application to the FERC for a Certificate. This environmental review will also satisfy the COE's NEPA responsibilities in considering issuance of a section 404 Individual Permit for activities associated with the Project. The agencies have three courses of action in considering the proposed Project. They may: 1) grant the approval with or without conditions; 2) deny the approval; or 3) postpone action pending further study.

If the No Action Alternative is selected by denying the proposal, the short and long-term environmental impacts identified in section 4.0 of this document would not occur. If the agencies postpone action on the application, the environmental impacts identified in section 4.0 would be delayed or, if Algonquin decided not to pursue the Project, the impacts would not occur. In addition, if either the

No Action Alternative or the Postponed Action Alternative is selected, the stated objectives of Algonquin's proposal would not be met.

Natural gas is regionally important in the production of electricity and other industrial activities as well as for space heating and cooking. The Energy Information Administration (EIA) estimates that natural gas currently accounts for an estimated 24.5 percent of the energy consumption in New England (EIA, 2009). The EIA also projects that consumption of natural gas in the United States will increase by about 0.2 percent per between 2007 and 2030. Diversity of supply, increased transportation infrastructure, and a more reliable and secure delivery system will be important to meet the projected demand for natural gas in the Northeast. If the proposed Project was denied or a decision postponed, it is possible that Algonquin's customers would pursue alternative energy sources and energy conservation practices to offset the demand for natural gas in the markets targeted by the E2W Project. A discussion of the ability of such resources or practices to meet the Project objectives is provided below.

3.2 ENERGY AND ENERGY CONSERVATION ALTERNATIVES

3.2.1 Renewable Energy

Renewable energy sources, including wind, hydropower, municipal solid wastes, solar, wood, and other biomass, are projected to have a role in meeting the country's future energy needs. The EIA estimates that renewable sources account for about 9.9 percent of New England's total energy consumption and predicts that consumption of renewable energy in the United States will increase by 2.1 percent between 2007 and 2030 (EIA, 2009). Information on the status of different types of renewable energy technologies in New England is presented below.

Wind power is a proven technology that has experienced significant technological advancements, reductions in installation costs, improved turbine performance, and reduced maintenance costs over the last 20 years. In this region, a number of wind sites exist offshore of Massachusetts or in the mountainous areas of northern Maine, New Hampshire, and Vermont, but in the later case, existing transmission line infrastructure is insufficient to bring that power to the southern parts of New England and, in the former case, significant regulatory hurdles must be overcome. Hydroelectric generation is fully commercialized, including both run-of-river and large impoundment-type projects ranging in capacity from less than 1 megawatt (MW) to hundreds of MWs. However, the EIA (2009) predicts there will be little new hydroelectric capacity developed through 2030. Thus it appears that hydroelectric facilities will not provide a substantial amount of additional energy to New England in the foreseeable future. Combustion of biomass is a proven technology using biomass feedstocks that, if properly grown, represent a renewable resource. However, the most probable areas for developing these generating facilities are located in northern New England where biomass is most abundant (EIA, 2007). Another type of renewable energy is solar energy. Photovoltaic power systems convert sunlight directly into electricity. These systems are not well-suited for use as large-scale generation in New England due to relatively low direct insulation, higher capital costs, and lower efficiencies.

An underlying issue associated with most renewable energy types is their limited interchangeability with natural gas. Most large-scale renewable energy projects generate electricity. Although natural gas is used for this purpose, it also has a number of other direct uses (e.g., for space heat and cooking) that cannot be served by electricity without major personal investment and infrastructure modifications (e.g., replacing a natural gas furnace with an electric heating system). In conclusion, while it is clear that the generation and consumption of renewable energy in New England is projected to grow, renewable energy sources as an alternative to natural gas use are either not physically or commercially available in the region or have not been developed to the point where they would be viable substitutes for natural gas at this time.

3.2.2 Nuclear Energy

Energy from nuclear power is important regionally and currently accounts for an estimated 11.1 percent of New England's annual energy consumption (EIA, 2009). Moreover, increased use of nuclear power is seen by some as a means of reducing greenhouse gas (GHG) emissions associated with the burning of fossil fuels.

The Energy Policy Act of 2005 (EPAct) incorporated a wide range of measures to support current nuclear plants and provided important incentives for building new nuclear plants, and several companies are expected to submit applications for licenses to construct and operate new nuclear power plants over the next several years (Nuclear Energy Institute, 2008). However, none of these proposed plants are in New England and, because the subject of nuclear power remains a polarizing issue, any plans to construct new or expand existing plants in the region would likely face significant public opposition. Furthermore, there are environmental and regulatory challenges concerning safety and security, the disposal of toxic materials (spent fuel), and alterations to hydrological/biological systems that would need to be addressed before any new plants could be constructed. For these reasons, nuclear power is not currently a viable alternative to the E2W Project.

3.2.3 Fossil Fuels

An insufficient supply of natural gas could cause many of Algonquin's northeastern customers to use or pursue the option of using other fossil fuels, such as coal or oil, for their energy supplies. Many natural gas power plants have the option of switching to fuel oil if natural gas becomes unavailable or prohibitively expensive. Residential customers may also seek the option of using other fossil fuels to heat and power their homes, although this would likely require significant personal investment because most residential systems are not designed for fuel switching. In addition, increased use of other fossil fuels would lead to increased emissions of combustion byproducts, including sulfur oxides, nitrogen oxides (NO_x), hydrocarbons, and carbon dioxide (CO_2).

Compared to other fossil fuels, natural gas is a relatively clean and efficient fuel. Combustion of fuels such as oil or coal can generate 60 to 110 percent more CO_2 than natural gas. Other emissions from oil or coal combustion, including GHG emissions, are also significantly higher than those from natural gas. The use of other fossil fuels in place of natural gas would not only increase atmospheric pollution, but would also result in secondary impacts associated with production (e.g., coal mining and oil drilling), transportation (e.g., oil tankers, rail cars, and pipelines), and refining.

For these reasons, alternatives that result in the use of other fossil fuels are not environmentally preferable to the E2W Project.

3.2.4 Energy Conservation Alternative

Energy conservation measures are playing an increasing role in reducing future energy demand in the United States. At the federal level, the EPAct provides guidelines to diversify America's energy supply and reduce dependence on foreign sources of energy, increase residential and businesses energy efficiency and conservation (Energy Star Program), improve vehicular energy efficiency, and modernize the domestic energy infrastructure.

State-led initiatives have also contributed to energy conservation in the region. In the interest of implementing energy conservation measures that are cost-effective and easy to live with, the State of Connecticut partnered with the state's utility companies to establish the Connecticut Energy Efficiency Fund (CEEF). The CEEF supports a variety of energy efficiency programs that provide financial incentives to help reduce statewide energy consumption (CEEF, 2008). These programs are implemented by Connecticut Light & Power (CL&P) and The United Illuminating Company (UI) and are funded by

their customers through the combined public benefits charge on their electric bills, reviewed by the Energy Conservation Management Board, approved by the Connecticut Department of Public Utility Control, and administered by the CL&P and UI (Connecticut Energy Information, 2008). Through the CEEF, energy efficiency programs offer incentives to help lower operating costs and improve productivity while alleviating potential electricity shortages and reducing stress on Connecticut's transmission lines by reducing overall energy consumption and reducing load during periods of peak critical demand (CEEF, 2008).

Although both federal and state energy conservation measures continue to play a role in slowing the increase in energy consumption, these measures are not anticipated to eliminate an increase in consumption. The EIA estimates total national energy consumption will still grow 0.5 percent between 2007 and 2030 and natural gas consumption will grow 0.2 percent over the same period (EIA, 2009). Given the projected increase in energy consumption both regionally and nationally, existing energy conservation programs cannot fully offset the projected growth in demand for additional energy. Thus, energy conservation alone would not preclude the need for the E2W Project and is not currently a viable alternative for Algonquin's customers.

3.3 SYSTEM ALTERNATIVES

System alternatives would make use of other existing, modified, or proposed pipeline systems to meet the stated objectives of the proposed Project. A system alternative would make it unnecessary to construct all or part of the proposed Project, although some modifications or additions to another existing pipeline system may be required to increase its capacity, or another entirely new system may need to be constructed. Such modifications or additions would result in environmental impact; however, the impact could be less than, similar to, or greater than that associated with construction of the proposed Project. The purpose of identifying and evaluating system alternatives is to determine whether potential environmental impacts associated with the construction and operation of the proposed facilities could be avoided or reduced while still allowing the stated basic objectives of the Project to be met.

In order to be viable system alternatives to the E2W Project, other systems or modified systems would need to meet the stated Project objectives.

3.3.1 Other Existing Pipeline System Alternatives

Algonquin's E-3 System is the only system serving the southeastern Connecticut and southwestern Rhode Island market areas. The Tennessee Gas Pipeline (TGPL) system is the only other system located within reasonable proximity to the proposed pipeline facilities (see figure 3.3.1-1). However, the TGPL system is located more than 30 miles east of Algonquin's E-3 System and, to support the market areas serviced by the E-3 System, construction of a new pipeline from the TGPL system would be required. The modifications necessary to achieve this would have greater environmental impact than the E2W Project. In addition, the use of the TGPL system as an alternative would not enable the delivery of gas supplies from the two recently approved LNG terminals located offshore of Massachusetts. Natural gas originating from these LNG terminals would pass through Algonquin's existing HubLine Pipeline, but TGPL does not currently have a direct interconnection with the HubLine Pipeline. Lastly, unless a TGPL expansion project that includes all of the above elements is currently being planned, it is unlikely that such a project would be able to meet the stated objectives of the E2W Project within the same general timeframe.

For the reasons specified above, use of an existing pipeline system is not considered a viable alternative to the proposed Project and, therefore, was eliminated from further consideration.

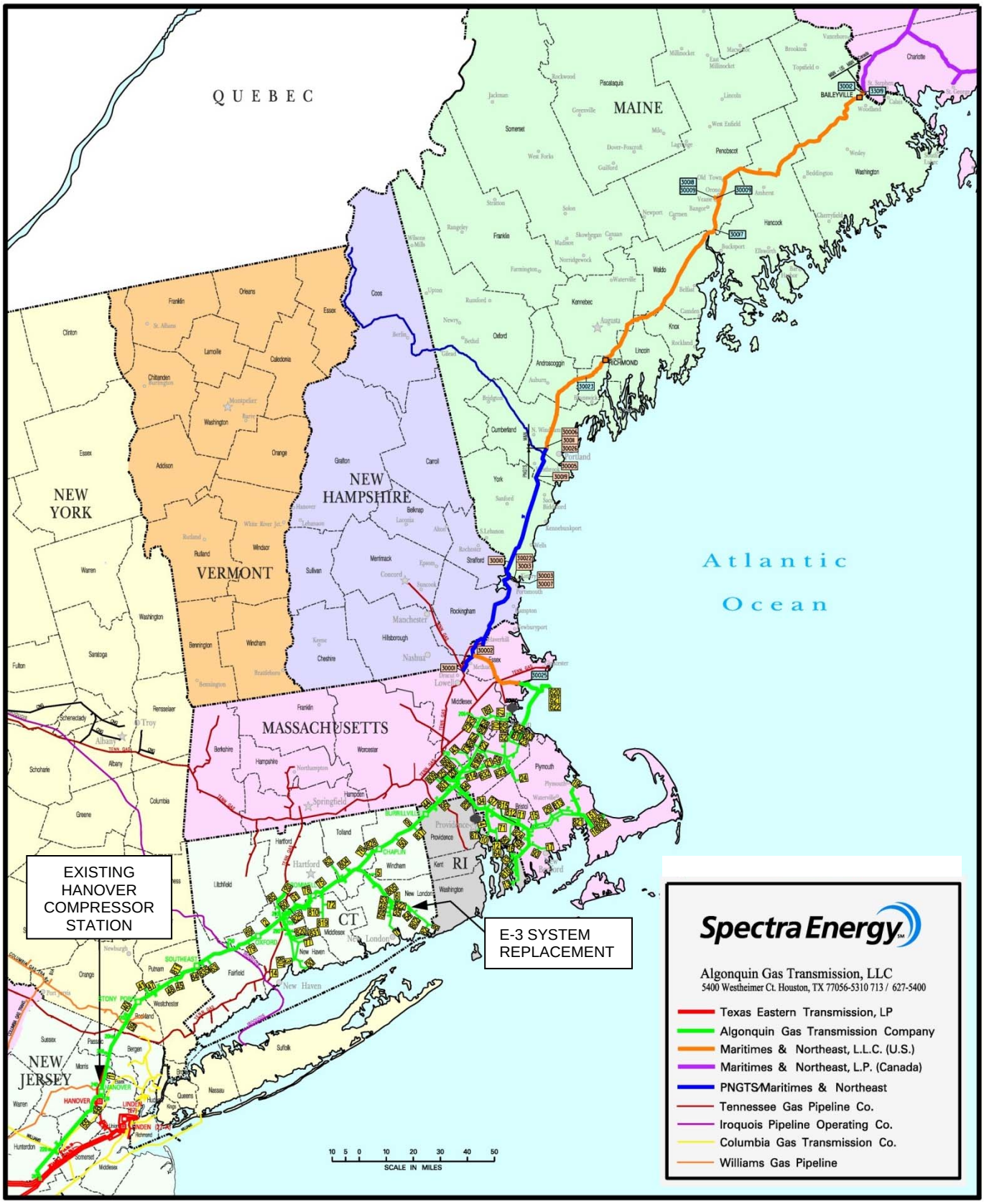

Figure 3.3.1-1
HubLine/East to West Project
Existing Pipeline Systems and Proposed Facilities

3.3.2 E-3 System Replacement Alternatives

The proposed modifications to the E-3 System were chosen to meet the delivery requirements of the shippers and to optimize operational performance of the system. In its Certificate application to the FERC, Algonquin indicated that small pressure fluctuations along the existing E-1 System are magnified on the E-3 System due to the small diameter of the existing E-3 System pipelines (the two E-3 System pipelines are 4 and 6 inches in diameter, respectively). This magnification can result in an unacceptable degradation in the delivery pressure along the E-3 System. The delivery volumes requested by Algonquin's customers would exacerbate the problem and contribute to the degradation in delivery pressure. To address this limitation, Algonquin evaluated two options: its current proposal involving the replacement of a section of the E-3 System pipeline with larger diameter pipe; and an alternative that would involve looping[1] a portion of the E-3 System. Algonquin's analysis concluded that the two pipeline modification options would provide comparable operational performance. Under the current proposal, all but approximately 0.2 acre of the permanent right-of-way for the replacement pipeline and associated aboveground facilities would be located within the existing permanent right-of-way. Looping would require a larger permanent right-of-way width, which would result in greater long-term impacts than the proposed E-3 System Replacement. Because there are no relative operational advantages to looping the E-3 System and looping would result in greater permanent impacts outside Algonquin's existing facilities, looping the E-3 System is not environmentally preferable to the proposed replacement of the section of the E-3 System pipeline between mileposts (MPs) 0.0 and 2.56 with a larger diameter pipeline.

Construction of a new compressor station in lieu of modifications to the pipeline was evaluated; however, this option would require the alteration and use of additional land, result in greater permanent visual and noise impacts, and require more operation and maintenance than a pipeline. For these reasons, the use of new compression in lieu of the proposed modifications to the E-3 System was not considered to be a reasonable alternative.

3.4 ROUTE ALTERNATIVES

Route alternatives are typically identified to determine if impacts could be avoided or reduced on environmentally sensitive resources, such as wetland areas, waterbody crossings, and public open space. Algonquin selected the proposed pipeline facility location and design because it would provide increased system reliability and capacity while minimizing environmental impacts relative to other sections of the E-3 System. With the exception of approximately 700 feet where the existing pipeline would be abandoned in place, the proposed E-3 System modifications would be constructed within Algonquin's existing, previously disturbed right-of-way using the lift and replace method. Any alternatives to the proposed route would require the development of a new pipeline right-of-way or expansion of an existing right-of-way, which would result in greater environmental impacts. Furthermore, the few public comments associated with pipeline routing have been addressed by Algonquin through construction workspace modifications (see section 4.8.3.1). For these reasons, we believe that no environmentally preferable alternative exists; therefore, an evaluation of specific pipeline route alternatives is not warranted.

3.5 ABOVEGROUND FACILITY SITE ALTERNATIVES

Algonquin's proposed aboveground facilities are piping-related modifications that would be located within the fenceline of the existing Hanover Compressor Station or new facilities at the beginning

[1] A loop is a segment of pipeline that is usually installed adjacent to an existing pipeline and connected to it at both ends. The loop allows more gas to be moved through the system.

and end of the proposed E-3 System Replacement that would be primarily within Algonquin's existing right-of-way. These facilities are necessary to meet the purpose, need, and contractual requirements of the E2W Project. Because the locations of the new aboveground facilities are dictated by the location of the E-3 System Replacement pipeline and no significant environmental resources would be impacted by these facilities, we conclude that no environmentally preferable alternative exists.

4.0 ENVIRONMENTAL ANALYSIS

This section describes the affected environment as it currently exists and discusses the environmental consequences of the E2W Project. The discussion is organized by the following major resource topics: geology; soils; water resources; wetlands; vegetation; wildlife and aquatic resources; special status species; land use, recreation, special interest areas, and visual resources; socioeconomics (including transportation and traffic); cultural resources; air quality and noise; reliability and safety; and cumulative impacts.

The environmental consequences of constructing and operating the E2W Project would vary in duration and significance. Four levels of impact duration were considered: temporary, short term, long term, and permanent. Temporary impact generally occurs during construction with the resource returning to preconstruction condition almost immediately afterward. Short-term impact could continue for up to 3 years following construction. Impact was considered long term if the resource would require more than 3 years to recover. A permanent impact could occur as a result of any activity that modifies a resource to the extent that it would not return to preconstruction conditions during the life of the Project.

Algonquin, as part of its proposal, developed certain mitigation measures to reduce the impact of the Project. In some cases, we determined that additional mitigation measures could further reduce the Project's impacts. Our additional mitigation measures appear as bulleted, boldfaced paragraphs in the text of this section and are also included in section 5.2. We will recommend to the Commission that these measures be included as specific conditions of the Certificate the Commission may issue to Algonquin for this Project. The cooperating agencies will consider these additional mitigation measures as part of their permit decisions.

The conclusions in this EIS are based on our analysis of the environmental impact and the following assumptions:

- Algonquin would comply with all applicable laws and regulations;
- the proposed facilities would be constructed as described in section 2.0 of this EIS; and
- Algonquin would implement the mitigation measures included in its applications and supplemental submittals to the FERC and cooperating agencies.

4.1 GEOLOGY

4.1.1 Geologic Setting

Pipeline Facilities

The landscape in the area of the proposed Project has been shaped by multiple glacial events. The predominant unconsolidated surficial geologic unit in the Project area is glacial till of late Wisconsinan-age (12,000 to 10,000 years ago). More recent unconsolidated alluvium and organic deposits and bedrock outcrops also occur at the surface in the Project area. Based on available mapping, 98 percent of the proposed pipeline route crosses areas with a thin layer of till or bedrock at the surface (Connecticut Department of Environmental Protection (CTDEP), 1995). The remaining 2 percent of the route is underlain by glacial till that is greater than 10 to 15 feet thick.

Topography along the E-3 System Replacement generally consists of moderately hilly terrain with elevations ranging from 200 to 365 feet above mean sea level (msl). Over most of the Project area, natural topographic slope and contours would be temporarily altered by the small-scale grading of the construction right-of-way that is necessary to provide a level and safe work surface for equipment and by trenching activities. After completion of construction, Algonquin would restore topographic contours and drainage conditions as closely as feasible to their preconstruction condition. Therefore, construction and operation of the proposed pipeline would not materially alter the existing geologic conditions of the Project area.

Aboveground Facilities and Access Roads

The aboveground facilities and access roads associated with the Project would be located within the same general physiographic and geologic setting as the proposed pipeline route described above. Construction and operation of these facilities would not materially alter existing geologic conditions in the Project area.

4.1.2 Mineral Resources

Pipeline Facilities

Mineral resources in Connecticut consist mainly of construction sand and gravel and crushed stone. In 2005, construction sand and gravel and crushed stone accounted for more than 99 percent of the non-fuel mineral income in Connecticut. Other mineral resources in Connecticut include granite, quartzite, sandstone, and lime (USGS, 2005). Historically, no oil or gas exploration and production has occurred in Connecticut (Biewick, 2008).

Based on a review of USGS topographic maps and aerial photography, no active mining activities occur in the Project area and no planned mining activities have been identified. Although portions of the proposed pipeline route would be located in proximity to potentially extractable mineral deposits, the E-3 System Replacement would be constructed within or directly adjacent to the existing Algonquin pipeline right-of-way, which already precludes surface mining operations. Therefore, construction and operation of the E-3 System Replacement would not result in a significant, additional restriction to current or future mining operations in the area.

Aboveground Facilities and Access Roads

Based on a review of USGS topographic maps and aerial photography, no apparent active mining operations were identified within 2,500 feet of the aboveground facilities or access roads.

4.1.3 Geologic Hazards

Geologic hazards are natural, physical conditions that can result in damage to land and structures or injury to people. Such hazards typically include seismicity (e.g., earthquakes, surface faults, and soil liquefaction), landslides, flash flooding, and ground subsidence. Conditions necessary for the development of other geologic hazards, including regional subsidence, avalanches, and volcanism, are not present in the Project area. In general, the potential for geologic hazards to significantly affect construction or operation of the proposed pipeline is low.

The aboveground facilities and access roads would be located in the same general vicinity of the proposed pipeline route. Construction activities at the majority of these facilities would be largely confined to previously disturbed areas and would not create an increased threat from geologic hazards.

4.1.3.1 Seismicity

Earthquakes and Surface Faults

The majority of significant earthquakes around the world are associated with tectonic subduction zones, where one crustal plate is overriding another (e.g., the Japanese islands), or where plates are sliding past each other (e.g., California). Unlike these highly active tectonic regions, the east coast of the United States is located on the "trailing edge" of the North American continental plate, which is relatively seismically quiet.

Earthquakes, however, do occur in the Project area, largely due to trailing edge tectonics and residual stress release from past orogenic (mountain building) events. Although the Project area is characterized by low magnitude events that have been recorded since the mid-16th century, there is a low probability of an earthquake of significant intensity or seismic disturbance in the Project area. In addition, the proposed facilities would not cross any surface faults that have been active in the Quaternary Period (2 million years ago to the present) (National Atlas of the United States, 2008; USGS, 2006a).

The E-3 System Replacement and associated aboveground facilities would be constructed to meet federal standards outlined in Title 49 CFR Part 192. These are the same regulations that govern the construction and operation of natural gas pipelines throughout the country, including areas with greater seismic hazards. Thus, the proposed facilities would be able to withstand both the intensity and duration of transient ground motions resulting from seismic activity in the Project area.

Soil Liquefaction

Soil liquefaction is a phenomenon often associated with seismic activity in which saturated, non-cohesive soils temporarily lose their strength and liquefy (i.e., behave like viscous liquid) when subjected to forces such as intense and prolonged ground shaking. Soil conditions necessary for soil liquefaction to occur would likely be present in the Project area. However, due to the low potential for strong and prolonged ground shaking associated with a seismic event to occur, the potential for soil liquefaction to occur is also low.

4.1.3.2 Landslides

Landslides involve the down slope movement of earth materials under a force of gravity due to natural or man-made causes. The proposed Project is generally within an area of low landslide incidence and susceptibility (Radbruch-Hall et al., 1982; Godt, 1997). If areas are identified where slope instability could occur during wet periods, erosion control measures specified in Algonquin's E&SCP (see Appendix B) would be implemented to reduce the potential for slope failure to occur.

4.1.3.3 Flash Flooding

The potential for flash flooding to occur and significantly impact construction or operation of the proposed Project is low. The greatest potential for flash flooding to occur along waterbodies in the Project area is associated with tropical storms, which are usually accompanied by significant precipitation over a short period of time. The potential effects associated with high rainfall events during construction would be mitigated by implementing the measures in Algonquin's E&SCP. Following construction, each waterbody crossing would be periodically inspected for signs of erosion and remediated, as necessary.

4.1.3.4 Ground Subsidence

Common causes of ground subsidence include the presence of karst terrain, underground mining, and significant fluid withdrawal such as in oil-producing regions.

Karst features such as sinkholes, caves, and caverns can form as a result of the long-term action of groundwater on soluble carbonate rocks (e.g., limestone and dolostone). However, the geologic conditions necessary for the development of karst terrain are limited to the western portions of Connecticut. Based on Davies et al. (1984), no karst features are present in the vicinity of the E2W Project.

Underground mining poses risks to engineered structures due to the potential of the overlying strata to collapse into the void formed by the extraction of minerals. Based on a review of available data, Algonquin did not identify any underground mining activities in the Project area. Therefore, the E2W Project would not be subject to hazards associated with underground mines.

The proposed Project is not located in an area of oil and gas production; therefore, regional subsidence from petroleum production would not impact the Project.

4.1.3.5 Shallow Bedrock and Blasting

Although shallow bedrock is not a geologic hazard in itself, blasting activities associated with the occurrence of shallow bedrock can create a potential hazard to nearby structures. The typical depth of the trench that would be necessary to install the pipeline would be about 5 to 6 feet along the proposed route. In areas where mechanical equipment cannot break up or loosen the bedrock, blasting would be required before excavation. Based on available soils data, it appears that blasting may be needed along approximately 0.4 mile of the route.

Algonquin has prepared a Blasting Plan to minimize the effects of blasting and ensure safety during blasting operations (see Appendix E). All blasting techniques would comply with federal, state, and local regulations governing the safe storage, handling, firing, and disposal of explosive materials. Algonquin would conduct pre-blasting inspections to assess and document the condition of all structures, wells, springs, and utilities within 150 feet, or farther if required by local or state regulations, of the construction right-of-way. To minimize damage to adjacent areas and structures during blasting,

Algonquin's contractors would take precautionary measures including the use of matting or other suitable cover, as necessary, to prevent fly-rock from damaging adjacent areas, posting warning signals, flags, or barricades, and the dissemination of blast warning signals in the area of blasting. The contractor would keep a record of each blast, along with a seismograph report, to be submitted to the Algonquin blasting inspector. Following the completion of blasting operations, an independent contractor would examine the condition of all structures within 150 feet, or as required by state or local ordinances. These measures would minimize the potential for blasting to damage structures in proximity to the blasting activity. Furthermore, Algonquin has stated that, if any blasting-related damages are identified, Algonquin would either provide compensation to the affected landowner or arrange for the necessary repairs. We reviewed Algonquin's Blasting Plan and find it acceptable.

4.2 SOILS

4.2.1 Existing Soil Resources

The soils crossed by the proposed Project were identified and assessed using the Soil Survey Geographic (SSURGO) database (USDA, 2003) and the Soil Survey of New London County, Connecticut (USDA, 1983). The SSURGO database is a digital version of the original county soil surveys developed by the USDA, Natural Resources Conservation Service (NRCS) for use with geographic information systems (GIS). It provides the most detailed level of soils information for natural resource planning and management. The attribute data within the SSURGO database give the proportionate extent of the component soils and their properties for each soil map unit (USDA, 1995). Additional information about the soils in the Project area was obtained from Official Soil Series Descriptions (USDA, 2004).

4.2.1.1 Pipeline Facilities

The majority of the soils that would be crossed by the proposed pipeline route consist of deep to very deep, moderately well to well drained, sandy and loamy textured soils formed in glacial till. Areas of poorly to very poorly drained, mineral and organic soils are located in depressions and drainageways within the glacial deposits.

We evaluated the soils along the proposed pipeline route to identify prime farmland and major soil characteristics that could affect construction or increase the potential for adverse construction-related soil impacts. The soil characteristics evaluated include erosion potential, whether the soils are hydric, the potential for compaction, the presence of stones or rocks, depth to bedrock, and revegetation concerns.

Prime Farmland

The USDA defines prime farmland as "land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, and oilseed crops" (USDA, 1993). This designation includes cultivated land, pasture, woodland, or other lands that are either used for food or fiber crops, or are available for these uses. Approximately 26 percent (8.2 acres) of the soils that would be crossed by the proposed pipeline route are considered prime farmland.

Erosion by Water and Wind

Erosion is a continuing natural process that can be accelerated by human disturbance. Factors such as soil texture, structure, slope, vegetative cover, rainfall intensity, and wind intensity can influence the degree of erosion. Soils most susceptible to erosion by water are typified by bare or sparse vegetative cover, non-cohesive soil particles with low infiltration rates, and moderate to steep slopes. Wind-induced erosion often occurs on dry soil where vegetative cover is sparse and strong winds are prevalent.

Approximately 12 percent (3.7 acres) of the soils along the proposed pipeline route are designated as highly erodible land (HEL) that is susceptible to erosion by water. An additional 34 percent (11.0 acres) of the soils along the proposed pipeline route are designated as potentially highly erodible land (PHEL). PHEL consists of those soils that have the potential to be highly erodible, but cannot be designated as HEL without a field determination of slope percent and length. None of the soils that would be crossed by the proposed pipeline route are considered susceptible to wind erosion.

Hydric Soils

Hydric soils are defined as "soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part" (Federal Register, 1994). Soils that are artificially drained or protected from flooding (e.g., by levees) are still considered hydric if the soil in its undisturbed state would meet the definition of a hydric soil. Approximately 2 percent (0.5 acre) of the soils crossed by the proposed pipeline route are considered hydric soils.

Compaction Potential

Soil compaction modifies the structure and reduces the porosity and moisture-holding capacity of soils. The degree of compaction depends on moisture content and soil texture. Fine-textured soils (i.e., sandy clay loam or finer) with poor internal drainage that are moist or saturated during construction are the most susceptible to compaction and rutting. Approximately 4 percent (1.2 acres) of the soils crossed by the proposed pipeline route are considered prone to compaction.

Stony/Rocky and Shallow-to-Bedrock Soils

Stony/rocky soils are identified as soils that have a very gravelly, extremely gravelly, cobbley, stony, boulder, or shaly modifier to the textural class of the surface layer, or have a surface layer that contains greater than 5 percent (weight basis) stones larger than 3 inches in diameter. Approximately 30 percent (9.6 acres) of the area crossed by the proposed pipeline route contains stony/rocky soils.

Approximately 4 percent (1.2 acres) of the soils crossed by the proposed pipeline route are underlain by shallow bedrock (less than 5 feet from the surface). Blasting or other special construction techniques may be required in these areas during installation of the E-3 System Replacement (see section 4.1.3.5).

Revegetation Potential

The revegetation potential of soils crossed by the proposed Project was evaluated based on the soil surface texture, slope, and drainage class. Soils that have a coarse surface texture (i.e., sandy loam or coarser) and are moderately well to excessively drained may prove to be difficult to revegetate because drier soils have less water to aid in seed germination and the eventual establishment of new vegetation. The coarser-textured soils also have a lower water holding capacity following precipitation, which could result in moisture deficiencies in the root zone and create unfavorable conditions for many plants. In addition, steep slopes (greater than 8 percent) along the pipeline route may make the establishment of vegetation difficult. About 85 percent (27.2 acres) of the proposed pipeline route would cross soils with revegetation concerns.

4.2.1.2 Aboveground Facilities

Construction and operation of the aboveground facilities would affect 1.9 acres of soils, of which 0.5 acre would be permanently converted to commercial/industrial uses. None of the soils at the proposed facilities are considered prime farmland.

4.2.1.3 Access Roads

The proposed access roads would impact about 0.9 acre of land, none of which is considered prime farmland.

4.2.2 General Impacts and Mitigation

Construction activities such as clearing, grading, trench excavation, backfilling, and the movement of construction equipment along the right-of-way may affect soil resources. Clearing removes protective vegetative cover and exposes the soil to the effects of wind, rain, and runoff, which increases the potential for soil erosion and sedimentation of sensitive areas. Grading, spoil storage, and equipment traffic can compact soil, reducing porosity and increasing runoff potential. Trenching of stony/rocky or shallow-to-bedrock soils can bring stones or rock fragments to the surface that could interfere with agricultural practices and hinder restoration of the right-of-way. Construction activities can also affect soil fertility and facilitate the dispersal and establishment of weeds.

To reduce the impacts of construction on soils, Algonquin would implement its Project-specific E&SCP (see Appendix B) that incorporates many of the mitigation measures outlined in the FERC Plan and Procedures. Algonquin's E&SCP includes measures to control erosion and sedimentation during construction and to ensure proper revegetation for erosion control following construction.

We reviewed Algonquin's E&SCP and find the majority of it acceptable. In its E&SCP, however, Algonquin does not propose to conduct compaction testing and mitigation in residential areas. Algonquin's E&SCP states that topsoil would either be segregated or replaced in residential areas, thereby resulting in minimal compaction and providing a suitable medium for grass. Algonquin also states that most yard areas that are sown in grass do not require deep root penetration and that if deeper root penetration is needed, the subsequent freeze-thaw cycles of the upper portions of the subsoil would provide natural mitigation of any compacted areas of the right-of-way within 2 to 3 years. This differs from the FERC Plan, which specifies soil compaction testing to be performed in residential areas disturbed by construction and the appropriate mitigation measures to be implemented in severely compacted areas. While we recognize that the segregation or replacement of the topsoil would minimize compaction of the surface layer in residential areas, the compaction of subsoil layers could create drainage problems in the soils and restrict the root growth of various types of plants, including grasses under certain conditions. We do not believe that Algonquin's explanation supports a contention that testing for and relieving compaction in residential areas is either unnecessary or technically infeasible. Because Algonquin does not propose an alternative measure that would provide equal or better environmental protection as the FERC Plan, **we recommend that:**

- **Algonquin should revise its E&SCP to include soil compaction testing and mitigation measures consistent with sections V.C.1 and V.C.3 of the FERC Plan. Algonquin should file the revised E&SCP with the Secretary of the Commission (Secretary) for review and written approval by the Director of the Office of Energy Projects (OEP) <u>prior to construction</u>.**

Contamination from spills or leaks of fuels, lubricants, and coolant from construction equipment could adversely affect soils. The effects of contamination are typically minor because of the low frequency and volumes of spills and leaks. Algonquin's SPCC Plan identifies preventive measures to reduce the likelihood of a spill and specifies measures to contain and clean up a spill should one occur (see Appendix C). Implementation of Algonquin's SPCC Plan would effectively reduce the potential impact on soils from spills of the hazardous materials used during construction.

Previously existing contaminated soils could be encountered at historic landfills and other hazardous waste sites during Project construction. However, based on a review of available databases and a subsequent review of files at the CTDEP, no contaminated or potentially contaminated sites were identified within 1,000 feet of the proposed pipeline facilities.

4.3 WATER RESOURCES

4.3.1 Groundwater Resources

4.3.1.1 Existing Groundwater Resources

Groundwater resources in the Project area include unconsolidated sand and gravel aquifers underlain by crystalline bedrock aquifers. The sand and gravel aquifers primarily comprise ice-contact, outwash, and lake-bottom sediments that were deposited in pre-glacial bedrock valleys and water-filled depressions. Water wells in the sand and gravel aquifers typically range in depth between 10 and 100 feet and yield between 10 and 1,000 gallons per minute (gpm). The quality of water is adequate for most uses, but may contain high concentrations of iron and manganese (USGS, 1995). In general, groundwater within these aquifers follows topographic contours and discharges to surface waterbodies.

Crystalline bedrock aquifers are formed of igneous and metamorphic rocks with very low water transmission rates and generally small water storage capacity. Water wells in the crystalline bedrock aquifers range in depth between 100 and 400 feet and yield between 1 to 25 gpm, primarily from joints, fractures, faults, and bedding planes. The groundwater quality from the crystalline bedrock aquifers is generally suitable for most uses but may cause corrosion of pipes and appliances (USGS, 1995).

4.3.1.2 Sole Source Aquifers

The EPA defines a sole or principal source aquifer as one that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer. These areas can have no alternative drinking water source(s) that could physically, legally, and economically supply all those who depend upon the aquifer for drinking water. All designated sole or principal source aquifers are referred to as "sole source aquifers." The Project would not cross any sole source aquifers.

4.3.1.3 State Designated Aquifers

Connecticut Water Quality Standards provide a groundwater quality classification scheme that differentiates groundwater by designated use and discharge restrictions. The E-3 System Replacement would be located within groundwater quality class GA, which is given to areas where existing private and potential public or private supplies of water suitable for drinking without treatment are present.

4.3.1.4 Wellhead and Aquifer Protection Areas

Wellhead Protection Areas (WPAs) are established through state wellhead protection programs as required by the Safe Drinking Water Act. WPAs are delineated around a public water supply well or well field on the basis of groundwater travel times. The CTDEP refers to wellhead protection areas as Aquifer Protection Areas (APAs). The E-3 System Replacement would not cross any APAs.

4.3.1.5 Water Supply Wells and Springs

Algonquin conducted a review of the available GIS data from the CTDEP's geospatial data (CTDEP, 2000) to determine if any public water supply wells would be located within 150 feet of the construction work area. Additionally, Algonquin has consulted landowners regarding the locations of private wells and springs on their properties. As shown in table 4.3.1-1, five private water supply wells were identified within 150 feet of the Project. Algonquin has not identified any public water supply wells or springs within 150 feet of the construction work area for any of the Project facilities.

TABLE 4.3.1-1

Water Supply Wells and Springs within 150 feet of the Construction Work Area for the HubLine/East to West Project [a]

Municipality	Supply Type	Approximate Milepost	Approximate Distance from Pipeline (feet)	Approximate Distance from Construction Work Area (feet)
Norwich	Private	0.2	72	22
Norwich	Private	0.4	72	22
Norwich	Private	0.8	64	38
Norwich	Private	1.2	106	65
Norwich	Private	2.0	68	42

[a] Algonquin is continuing to conduct field surveys to collect well and spring location information and would file final information on the locations of wells and springs when surveys are complete.

4.3.1.6 Potential Contaminated Groundwater

Sites identified with 1,000 feet of a pipeline centerline are generally considered to be indicators that a higher potential exists to encounter contamination during construction. Algonquin reviewed federal, state, and local government databases and initially identified two potential sources of groundwater contamination within 1,000 feet of the pipeline centerline. A subsequent review of files at the CTDEP did not identify any sites within 1,000 feet of the E-3 System Replacement centerline.

4.3.1.7 General Impacts and Mitigation

Pipeline construction activities are not likely to significantly impact groundwater resources because the majority of construction would involve shallow, temporary, and localized excavation. The depth to groundwater in the Project area would generally be below the trench excavation depth. However, shallow aquifers could sustain minor, indirect impacts from changes in overland water flow and recharge caused by clearing and grading of the proposed right-of-way. In addition, near-surface soil compaction caused by heavy construction vehicles could reduce the soil's ability to absorb water in these isolated areas. During construction, local water table elevations could be affected by trenching and backfilling, which could temporarily impact wells in close proximity to the construction area. In areas where groundwater is near the surface, trench excavation may intersect the water table in low-lying areas. These minor, direct and indirect impacts would be temporary and would not significantly affect groundwater resources. These potential impacts would be avoided or further minimized by the use of construction techniques contained in Algonquin's E&SCP (see Appendix B).

Unconfined aquifers and shallow groundwater areas could be vulnerable to contamination caused by inadvertent surface spills of hazardous materials used during construction. Accidental spills and leaks associated with equipment operation, refueling, maintenance, or storage pose the greatest risk to groundwater resources. If not cleaned up, contaminated soils could continue to leach and add pollutants to groundwater long after a spill has occurred. Implementation of the measures in Algonquin's SPCC Plan (see Appendix C) would minimize the potential for groundwater impacts associated with an inadvertent spill of fuel, oil, and other hazardous fluids. We reviewed Algonquin's SPCC Plan and find the majority of it acceptable. As specified in Algonquin's SPCC Plan, no hazardous materials would be stored and no refueling would occur within 100 feet of wetlands or waterbodies. The SPCC Plan does not, however, specify restrictions on refueling near private or public water supply wells. Therefore, to minimize the potential for an inadvertent spill of fuel to impact nearby wells, **we recommend that:**

- **Algonquin should revise its SPCC Plan to prohibit refueling within 200 feet of any private water supply well and 400 feet of any public water supply well. Algonquin should file the revised SPCC Plan with the Secretary for review and written approval by the Director of OEP prior to construction.**

Implementation of Algonquin's revised SPCC Plan would adequately address the storage and transfer of hazardous materials and petroleum products, and the response to be taken in the event of a spill. Therefore, the potential for the Project to contaminate local aquifers or water supply wells would be minimal.

Blasting activities associated with the occurrence of shallow bedrock can create a potential hazard to nearby water supply wells. Where blasting is necessary, it would be done in accordance with Algonquin's Blasting Plan (see section 4.1.3.5 and Appendix E). If blasting is required near water supply wells, blasting loads would be reduced as much as possible. In addition, Algonquin would conduct pre- and post-construction testing of all existing private water supply wells within 150 feet of the construction work area. If blasting or construction activities temporarily impair the quality or yield of a water supply well, Algonquin would either provide a temporary source of water (e.g., bottled) to residents until the damaged water well is restored to its former capacity and quality or compensate the landowner for the damages. If the water is used for farming or livestock operations, temporary water would be trucked from a municipal water source until the water supply well is repaired or replaced. In the unlikely event that water quality or yield is permanently impaired as a result of blasting or other construction activities based on post-construction testing, Algonquin would arrange for the water supply well to be repaired or replaced. To ensure final well and spring locations are identified prior to construction and that proposed mitigation measures are appropriate, **we recommend that:**

- **Prior to construction, Algonquin should file with the Secretary the field verified locations, by milepost, of all water supply wells and springs within 150 feet of the construction work area. Within 30 days of placing the facilities in service, Algonquin should file a report with the Secretary discussing whether any complaints were received concerning well yield or water quality and how each was resolved.**

4.3.2 Surface Water Resources

4.3.2.1 Existing Surface Water Resources

Pipeline Facilities

Waterbodies along the proposed pipeline route were identified using Algonquin's aerial photo-based alignment sheets, USGS topographic maps, and field surveys conducted in 2007 and 2008. The E-3 System Replacement would cross the Thames River major drainage basin (CTDEP, 2008a). Within this basin, the pipeline would cross waterbodies at four locations including two perennial waterbody crossings and two intermittent waterbody crossings. Table 4.3.2-1 lists these four waterbodies by name, location, crossing width, flow and fishery type, FERC classification, state water quality classification, and proposed crossing method.

Aboveground Facilities and Access Roads

No waterbodies are present at any of the aboveground facility sites or crossed by the proposed access roads.

TABLE 4.3.2-1

Waterbodies Crossed by the HubLine/East to West Project Pipeline Route

Milepost	Waterbody Name	Crossing Width (feet)	Flow Type (Perennial/ Intermittent/Tidal)	FERC Classification	Fishery Type [a]	State Water Quality Classification [b]	Proposed Crossing Method [c]
0.1	Unnamed Tributary to Norwichtown Brook	7	Intermittent	Minor	Non-classified	A	Open Cut
0.6	Norwichtown Brook	8	Perennial	Minor	Coldwater	A	Horizontal Bore
1.2	Unnamed Tributary to Bobbin Mill Brook	1	Intermittent	Minor	Non-classified	A	Open Cut
1.5	Bobbin Mill Brook	10	Perennial	Minor	Warmwater	A	Flume or Dam and Pump

[a] Fishery type classifications were determined through consultations with the Connecticut Inland Fisheries Department. A "non-classified" designation indicates that a waterbody has not been classified by the fishery resource agency.

[b] State Designations and Use Descriptions

A – These waters are appropriate for fish, aquatic life and wildlife habitat, potential drinking water supply, recreation, navigation, and industrial or agricultural water supply.

[c] The proposed crossing methods are described in section 2.3.2.

4.3.2.2 General Impacts and Mitigation

Pipeline construction could affect surface waters in several ways. Clearing and grading of streambanks, in-stream blasting and trenching, trench dewatering, and backfilling could affect waterbodies through modification of existing aquatic habitat, an increased rate of in-stream sediment loading, increased turbidity levels, reduced dissolved oxygen concentrations, stream warming, and introduction of chemical discharges from fuels/lubricants.

The clearing and grading of the waterbody banks would disturb the riparian vegetation and soils, exposing the site(s) to erosion/deposition. Heavy equipment used during construction could compact upland and riparian soils, which could greatly reduce infiltration and cause greater runoff to waterbodies. Refueling of vehicles and storage of fuel, oil, or other hazardous materials near surface waters and spills from equipment working in waterbodies could create a potential for contamination, which, if a spill were to occur, could degrade downstream water quality and aquatic habitat.

The greatest potential impact of pipeline construction on surface waters would result from an increase in sediment loading to the waterbody. The highest levels of sediment would be generated by use of the wet open-cut method, which Algonquin plans to use for the two intermittent waterbody crossings (Unnamed Tributary to Norwichtown Brook and Unnamed Tributary to Bobbin Mill Brook) if they are flowing at the time of construction. However, because these two waterbodies are less than 10 feet wide at the crossing location, the amount of sediment generated would be minor and short term. If these waterbodies are not flowing at the time of construction, they would be crossed using the standard dry open-cut construction method. Use of the standard dry open-cut method would further decrease the amount of sediment generated.

Sediment generated at the Bobbin Mill Brook crossing would be reduced by use of the flume or dam and pump method, both of which are considered a dry crossing method. Temporary construction-related impacts would be limited primarily to short periods of increased turbidity before installation of the pipeline when the upstream and downstream dams are installed, and following installation of the pipeline when the dams are pulled and flow across the restored work area is re-established.

Norwichtown Brook would be crossed using the horizontal bore method. Use of this method would eliminate direct sediment impacts.

Long-term impacts associated with pipeline operations and maintenance would be relatively minor and limited to periodic clearing of the vegetation within the permanent right-of-way at waterbody crossings. These maintenance activities would follow the measures outlined in Algonquin's E&SCP, which are consistent with the measures outlined in the FERC Procedures.

The COE and the EPA are the two federal agencies that regulate construction activities within waterbodies. In Connecticut, section 401 Water Quality Certification would be required from the CTDEP. Algonquin would construct all waterbody crossings in accordance with the requirements of these permitting agencies. In addition, Algonquin would implement the mitigation measures described in its E&SCP (see Appendix B) during construction across all waterbodies.

4.3.2.3 Sensitive Waterbodies

Waterbodies may be considered sensitive to pipeline construction for a number of reasons, including, but not limited to: the width of the crossing; waterbodies that contain threatened or endangered species or critical habitat; waters that support fisheries of special concern; waterbodies that are associated with certified vernal pools; and rivers on or designated to be added to the Nationwide Rivers Inventory (NRI) or a state river inventory. Other factors that can provide the basis for sensitivity include waterbodies located in sensitive and protected watershed areas; waterbodies and intermittent drainages that have steep banks, potentially unstable soils, high volume flows, and actively eroding banks; and surface waters that have important riparian areas.

The E-3 System Replacement would cross one sensitive waterbody (Norwichtown Brook) at MP 0.6 of the proposed pipeline route. Norwichtown Brook has been designated a coldwater fishery stream by the Connecticut Inland Fisheries Department (CTIFD). Algonquin would install the E-3 System Replacement under Norwichtown Brook using a horizontal bore and abandon the existing pipeline in place at the crossing. Because no in-stream work would occur, direct impacts on the aquatic resources within this waterbody would be avoided. Algonquin would minimize the potential for indirect impacts by installing the pipeline during the time window for coldwater fisheries outlined in its E&SCP (June 1 through September 30).

No designated Wild and Scenic Rivers would be crossed by the Project. According to the CTDEP, no federally or state-listed fish species are known to occur in any of the waterbodies crossed within the Project area.

4.3.2.4 Public Watershed Areas

Public watershed areas include municipal watersheds and associated reservoirs as well as any state or locally designated surface water protection areas. The E-3 System Replacement does not cross any surface water protection zones. However, it is located within 3 miles of five waterbodies designated as Class AA surface waters (CTDEP, 2002). Class AA waters are designated for existing or proposed drinking water supplies. Algonquin has initiated consultation with the Connecticut Department of Public Health (CTDPH) to determine which of these five waterbodies are designated as potable drinking water and would file updated information regarding surface water intakes and potable drinking water supplies within the Project area once consultations with the CTDPH have been completed.

Potential impacts on the areas crossed by the pipeline route would be temporary and of short duration. Implementation of Algonquin's E&SCP and SPCC Plan would avoid or minimize environmental effects and there would be no long-term impacts on these areas due to construction and operation of the proposed facilities.

4.3.2.5 Extra Workspaces Within 50 Feet of Waterbodies

Algonquin's E&SCP stipulates that all temporary extra workspaces should be located at least 50 feet from waterbodies except where an alternative measure has been approved by the FERC. Based on the current alignment, Algonquin would maintain a 50-foot setback of temporary extra workspace from all waterbodies.

4.3.2.6 Groundwater and Surface Water Uses During Construction

Hydrostatic Test Water

Algonquin would verify the integrity of the E-3 System Replacement before placing it into service by conducting hydrostatic testing. Hydrostatic testing involves filling the pipeline with water, pressurizing it, and then checking for pressure losses due to pipeline leakage. Algonquin is proposing to use a clean municipal water source(s) obtained from municipal supplies, local vendors, or other approved sources/locations for hydrostatically testing the pipeline. Because groundwater supply wells contribute to the public water supply (i.e., municipal water) in some areas along and adjacent to the proposed Project facilities, groundwater could be indirectly used during hydrostatic testing of the pipeline facilities. The estimated hydrostatic test water requirements for the E-3 System Replacement are approximately 80,600 gallons. This small volume of water would have a negligible impact on groundwater supplies.

The E-3 System Replacement would be tested in one continuous test section. Test water would contact only new pipe and no chemicals would be added. Test water would be pumped into the beginning of the pipeline at MP 0.0, pressurized to design test pressure, and maintained at that pressure for about 8 hours. If leaks are found, the leaks would be repaired, and the pipeline would be retested until specifications are met. When completed, the test water would be discharged into a well-vegetated and stabilized upland area within or adjacent to the construction work area near MP 2.56. Potential impacts associated with the discharge of hydrostatic test water would be minimized by implementing measures contained in Algonquin's E&SCP (see Appendix B).

Dust Control Water

Water would also be used to control fugitive dust during construction, as described in Algonquin's Dust Control Plan (see Appendix F). Algonquin proposes to obtain water from municipal sources and would acquire the necessary state and local approvals. The quantity of water to be used for dust control would be dependent on field conditions during construction but is anticipated to be small. The use of municipal water for dust control would have a negligible impact on groundwater supplies. Additional discussion of the Dust Control Plan is presented in section 4.11.1.2.

4.4 WETLANDS

Wetlands are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of wetland vegetation adapted for life in saturated soil conditions (COE, 1987). Wetlands can be a source of substantial biodiversity and serve a variety of functions that include providing wildlife habitat, recreational opportunities, flood control, and naturally improving water quality.

Wetlands in the Project area are regulated at the federal, state, and local levels. On the federal level, the COE has authority under section 404 of the CWA to review and issue permits for activities that would result in the discharge of dredged or fill material into waters of the United States, including wetlands. Section 401 of the CWA requires that proposed dredge and fill activities under section 404 be reviewed and certified by the designated state agency so that the proposed Project would meet state water quality standards. The designated state agency in Connecticut is the CTDEP. Wetlands in Connecticut are also regulated at the local level through municipal Inland Wetland and Watercourses Commissions.

4.4.1 Existing Wetland Resources

Pipeline Facilities

Wetlands were delineated mostly during the summer of 2007 using the methodology described in the 1987 COE Wetland Delineation Manual, Technical Report Y-87-1 (COE, 1987) and the new wetland jurisdictional determination process (Rapanos Guidance memorandum). The Rapanos Guidance memorandum provides direction to ensure that jurisdictional determinations under the CWA are consistent with the Supreme Court decision in the Rapanos and Carabell litigation. Algonquin conducted surveys for the presence of invasive wetland species during its wetland delineations. A wetland delineation report was completed based on field data collected prior to May 2008, and was submitted to the COE with Algonquin's application for a section 404/10[1] Individual Permit on June 16, 2008. Algonquin's application for a section 401 Water Quality Certification was submitted to the CTDEP on June 27, 2008.

Algonquin's field surveys identified 12 wetlands along the E-3 System Replacement that would be crossed at 15 locations. The location, wetland identifier, FWS National Wetlands Inventory (NWI) classification, crossing length, and approximate acreage of each wetland that would be affected by construction and operation of the Project are listed in table 4.4.1-1. Purple loosestrife and common reed were the most prevalent nuisance species identified.

Aboveground Facilities and Access Roads

No wetlands were identified at any of the aboveground facility sites or along any of the proposed access roads.

4.4.1.1 Wetland Types

Wetland types were assigned based on the NWI classifications as described in Cowardin et al. (1979). This classification is a hierarchical system based primarily on the general classification into marine, estuarine, palustrine (freshwater wetland), riverine (stream), or lacustrine (lake) systems, and the dominant vegetation layer. The basic wetland types that were delineated in the proposed Project area are discussed below.

[1] As a result of the reduction in Project scope, a section 10 permit is no longer required.

TABLE 4.4.1-1

Wetlands Crossed by the HubLine/East to West Project Pipeline Route

Beginning Milepost	Wetland Identifier	NWI Classification [a]	Crossing Length (feet)	Wetland Acreage Affected by Construction	Wetland Acreage Affected by Operation [b]
0.1	E3-W1	PFO/PEM	268	0.4	0.0
0.3	E3-W2	PFO/PSS	302	0.5	0.0
0.5	E3-W3	PFO/PSS	313	0.3	0.0
0.6	E3-W3	PFO/PSS	120	0.1	0.0
0.7	E3-W5	PFO/PSS	59	0.1	0.0
0.9	E3-W6	PFO/PSS	319	0.4	0.0
1.0	E3-W7	PEM	133	0.2	0.0
1.2	E3-W8	PFO/PEM	163	0.1	0.0
1.2	E3-W8	PFO/PEM	25	<0.1	0.0
1.2	E3-W8	PFO/PEM	78	0.1	0.0
1.4	E3-W9	PFO	67	<0.1	0.0
1.5	E3-W11	PFO/PEM	69	0.1	0.0
1.6	E3-W12	PFO/PEM	159	0.1	0.0
2.1	E3-W13	PFO/PEM	154	0.2	0.0
2.3	E3-W14	PFO/PEM	219	0.3	0.0
Project Total			2,448	2.8	0.0

[a] NWI Classifications (Cowardin et al., 1979):
PEM – Palustrine emergent wetland
PSS – Palustrine scrub-shrub wetland
PFO – Palustrine forested wetland

[b] Vegetation maintenance during operation of the pipeline would not impact any wetlands outside Algonquin's existing, maintained right-of-way. Therefore, there would be no additional permanent impacts on wetlands.

Note: The totals shown in this table may not equal the sum of addends due to rounding.

Palustrine Forested Wetlands (PFO)

Forested wetland cover types are dominated by trees and shrubs that have developed a tolerance to a seasonal high water table. In order to be characterized as forested, a wetland must be dominated by trees and shrubs that are at least 20 feet tall (Cowardin et al., 1979). Forested wetlands typically have a mature tree canopy that, depending upon the species and density, can have a broad range of understory and groundcover community components. The majority of the forested wetlands in the Project area are classified as palustrine forested broad-leaved deciduous, including red maple swamps and hardwood floodplain communities. These wetlands typically occur in areas where the topography is low and flat or along waterbodies.

Palustrine Scrub-Shrub Wetlands (PSS)

Palustrine scrub-shrub wetlands include areas that are dominated by saplings and shrubs that typically form a low and compact structure less than 20 feet tall (Cowardin et al., 1979). The structure and composition of vegetation within this cover type may be influenced by water regime and, where located within existing right-of-way, by utility maintenance practices. Most scrub-shrub communities are seasonally flooded and often saturated to the surface. Many of the scrub-shrub wetlands along the proposed pipeline route are associated with forested wetlands as part of larger wetland complexes.

Palustrine Emergent Wetlands (PEM)

Palustrine emergent wetlands are characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens (Cowardin et al., 1979). The freshwater emergent wetlands include areas commonly referred to as marshes, wet meadows, and beaver flowage communities. Freshwater emergent wetlands along the proposed pipeline route are often associated with forested wetlands as part of larger wetland complexes. Vegetation found in emergent wetlands consists of a variety of submergent, emergent, and other rooted herbaceous species.

Some palustrine emergent wetlands along the proposed pipeline route are dominated primarily by invasive species, such as purple loosestrife and common reed. These communities are particularly common in previously disturbed areas.

4.4.2 General Impacts and Mitigation

Construction of the E-3 System Replacement would result in a total of 2.8 acres of temporary wetland impacts. This includes 1.5 acres of non-forested wetlands (emergent and scrub-shrub wetlands) and 1.3 acres of forested wetlands. Vegetation maintenance during operation of the pipeline would not impact any wetlands outside Algonquin's existing, maintained right-of-way. Therefore, there would be no additional permanent impacts on wetlands. No wetlands would be impacted by the construction or operation of the proposed aboveground facilities or access roads.

The primary impact of pipeline construction and right-of-way maintenance activities on wetlands would be the temporary alteration of wetland vegetation. Other types of impacts associated with construction of the pipeline facilities could include temporary changes in wetland hydrology and water quality. Trenching and backfilling activities would also temporarily impact wetlands because the backfill material is considered to be fill, even if the original material excavated is put back in the same location. During construction, failure to segregate topsoil over the trenchline in non-saturated wetlands could result in the mixing of the topsoil with the subsoil. This disturbance could result in altered biological activities and chemical conditions in wetland soils and could affect the re-establishment and natural recruitment of native wetland vegetation after restoration. In addition, inadvertent compaction and rutting of soils during construction could result from the movement of heavy machinery and the transport of pipe sections. The resulting alteration of the natural hydrologic patterns could inhibit seed germination or increase the potential for siltation in wetlands. The discharge of stormwater, trench water, or hydrostatic test water could result in silt-laden water entering a wetland and cause the release of chemical and nutrient pollutants from sediments. Construction clearing activities and disturbance of wetland vegetation could also temporarily affect the wetland's capacity to buffer flood flows and/or control erosion.

These effects would be greatest during and immediately following construction. The majority of these effects would be short term in nature and would cease when or shortly after the wetlands are restored and seeded. Following construction, new wetland vegetation would become established, which would eventually transition back into a community with functionality similar to that of the wetland before construction. In emergent wetlands, the herbaceous vegetation would regenerate quickly (typically within 1 to 3 years).

Following revegetation, there would be no permanent impact on emergent wetland vegetation in the maintained right-of-way because these areas naturally consist of and would remain as open and herbaceous communities. Although Algonquin's E&SCP allows annual maintenance of a 10-foot-wide strip centered over the pipeline to facilitate corrosion/leak surveys, it does not generally mow or otherwise maintain herbaceous wetland vegetation in the pipeline right-of-way.

The duration of the impact on scrub-shrub and forested wetlands would be longer. Woody vegetation may take several years to regenerate and the re-establishment of large woody vegetation would be precluded on a portion of the permanent right-of-way by routine vegetation maintenance activities during operation of the pipeline. However, vegetation maintenance in wetland areas would be limited to within Algonquin's existing, maintained right-of-way and would not represent new permanent impacts.

To reduce the impacts of construction on wetland resources, Algonquin would use a 75-foot-wide right-of-way and implement its E&SCP (see Appendix B), Wetland Restoration Procedures for Temporary Wetland Impacts (see Appendix H), and Invasive Plant Species Control Plan (see Appendix G). In addition, Algonquin would comply with the conditions of its COE section 404 permit conditions and CTDEP section 401 permit.

Algonquin would conduct post-construction monitoring of the right-of-way in affected wetlands. These efforts would include monitoring the success of wetland revegetation annually for at least 3 years after construction, or longer until wetland revegetation is successful. The post-construction monitoring efforts would also include documenting occurrences of exotic invasive species to compare to preconstruction conditions and implementation of remediation efforts to control the spread of invasive wetland plant species (see section 4.5.4 and Appendix G).

4.4.3 Extra Workspace In or Within 50 Feet of Wetlands

Algonquin's E&SCP stipulates that temporary extra workspaces should be located at least 50 feet from wetlands except where an alternative measure has been approved by the FERC. Algonquin identified three areas where it believes site-specific conditions do not allow for a 50-foot setback of temporary extra workspace from wetlands. Table 4.4.3-1 lists the locations of these areas and the reasons why Algonquin believes a reduced setback is justified. Based on our review, we have determined that the workspaces listed in table 4.4.3-1 are justified and, therefore, recommend approval of Algonquin's requests for a reduced setback.

TABLE 4.4.3-1

Areas Where Algonquin has Requested Temporary Extra Workspace In or Within 50 feet of Wetlands

Wetland ID	Milepost	Size (feet (length by width))	Distance from Resource (feet)	Justification	Approval Status
E3-W2	0.4	100 x 50	35	Staging area for the Bog Meadow Road crossing and a wetland crossing.	Approval Recommended
E3-W4/E3-W5	0.6	100 x 50	25/40	Staging area for the Interstate 395 crossing and a wetland crossing.	Approval Recommended
E3-W12	1.6	100 x 50	10	Staging area for the Canterbury Turnpike crossing and a wetland crossing.	Approval Recommended

Algonquin's E&SCP (see Appendix B) includes an extra workspace wetland setback variance table (table C-1) that lists the locations, dimensions, and distance from resource of the extra workspaces that have been approved to be located within 50 feet of wetlands. However, some of the workspaces listed in table C-1 have been modified or removed from the current alignment. To ensure that the E&SCP correctly lists the approved wetland setback variances, **we recommend that:**

- **Algonquin should revise table C-1 of its E&SCP to be consistent with the approved workspaces listed in table 4.4.3-1. Algonquin should file the revised E&SCP with**

the Secretary for review and written approval by the Director of OEP prior to construction.

4.4.4 Compensatory Mitigation

As discussed in section 4.4.1, Algonquin filed its section 404 application with the COE on June 16, 2008 and its section 401 Water Quality Certification application with the CTDEP on June 27, 2008. At the time of these applications, the E2W Project would have resulted in the permanent conversion of approximately 4.4 acres of forested wetlands to scrub-shrub and emergent wetlands and the permanent fill of approximately 0.1 acre of forested wetland for a permanent access road. As a result of these permanent wetland impacts, Algonquin was required to develop a compensatory wetland mitigation plan. Due to the reduction in Project scope, no forested wetlands would be permanently affected by the E2W Project. The COE and the CTDEP have agreed that natural regeneration of wetlands would be sufficient mitigation for the Project and a compensatory wetland mitigation plan is no longer required.

4.5 VEGETATION

4.5.1 Existing Vegetation Conditions

The proposed E2W Project is located within the Northeast Coastal Zone ecoregion (USGS, 2006b). Ecoregions are areas that have similar environmental resources and ecosystems that include climate, physiography, geology, hydrology, soils, vegetation, wildlife, and land uses (EPA, 2007a). The dominant vegetation type that would be affected within this ecoregion is the central hardwoods-hemlock-white pine region (DeGraaf et al., 1992).

Many of the native vegetation communities within the Northeast Coastal Zone ecoregion have been altered by the expansion of urban, suburban, and agricultural areas. This has resulted in a number of non-forested vegetation types. The specific vegetation cover types that would be affected by the Project are discussed below. Wetland vegetation communities that would be affected by the Project are discussed in section 4.4.1.1. A comprehensive list of common plant species within each vegetation community type is provided in table 4.5.1-1.

TABLE 4.5.1-1

Vegetation Cover Types Occurring Along the HubLine/East to West Project

Vegetation Community	General Description	Common Species
Upland forest	This vegetation community consists of all forested upland habitats.	This forest type is dominated by populations of red oak, black oak, white oak, hickories, Eastern hemlock, and white pine.
Early successional-upland scrub-shrub	This vegetation community consists of all non-forested, non-wetland habitats including upland scrub-shrub, old fields, pasture, open land, agricultural land, herbaceous grasslands, utility rights-of-way, landscape, and residential/ developed land.	Common species found in these habitats include gray birch saplings, red cedar, common juniper, buckthorn, multiflora rose, sheep laurel, sweet fern, bracken fern, hayscented fern, Queen Anne's lace, lowbush blueberry, bayberry, meadowsweet, red clover, black-eyed susan, raspberries, greenbriars, various goldenrod species, grasses, and forbs.

Pipeline Facilities

The proposed pipeline route would cross four distinct vegetation cover types: upland forest; wetland forest; early successional-upland scrub-shrub (which includes open land, open field communities, herbaceous grasslands, agriculture, scrub-shrub, and residential/developed land); and open, non-forested wetland vegetation communities.

The primary vegetation cover type that would be crossed by the proposed pipeline facilities is the early successional-upland scrub-shrub cover type. This community covers about 63 percent of the pipeline route. The next most prevalent vegetation cover type is upland forest, which covers about 27 percent of the pipeline route. The remainder of the pipeline route is covered by non-forested wetlands (5 percent) and forested wetlands (5 percent).

Aboveground Facilities

Early successional-upland scrub-shrub (open land and residential) and upland forest comprise 96 percent of the vegetation that would be impacted by the aboveground facilities. Commercial/industrial land, which is not a representative cover type, comprises the remainder of the land within the footprint of these facilities.

Access Roads

Early successional-upland scrub-shrub (open land and residential) comprises all the vegetation that would be affected by the access roads.

4.5.2 General Impacts and Mitigation

Table 4.5.2-1 summarizes the approximate acreage of forest land and non-forest land that would be affected during construction and operation of the E-3 System Replacement. Additional information on land use impacts is presented in section 4.8.1. Impacts on wetland vegetation are discussed in section 4.4.2.

TABLE 4.5.2-1

Acres of Vegetation Cover Types Affected by Construction and Operation of the E-3 System Replacement [a]

	Upland Forest		Wetland Forest		Early Successional-Upland Scrub-Shrub [b]		Open, Non-forested Wetland		Total Forest		Total Early Successional and Open, Non-forested Wetland	
	Const	Oper	Const	Oper	Const	Oper	Const	Oper	Const	Oper	Const	Oper
Pipeline Total	8.0	0.2	1.3	0.0	18.4	9.0	1.5	0.0	9.3	0.2	19.9	9.0

[a] Total acreage is equal to the sum of the acres of the four vegetative cover types. Total acres do not include open water and non-vegetated areas. Construction impacts are based on the proposed nominal 75-foot-wide construction right-of-way and temporary extra workspace and include the existing permanent pipeline right-of-way. Operation impacts are based on a 30-foot-wide permanent easement for the proposed pipeline route.

[b] This vegetation cover type includes upland scrub-shrub, old fields, pasture, open land, agricultural land, herbaceous grasslands, utility rights-of-way, landscape, and residential/developed land.

Pipeline Facilities

Construction of the pipeline facilities would include temporary and permanent impacts on the vegetation cover types previously described. The primary impact of the pipeline facilities on vegetation would be the cutting, clearing, and/or removal of existing vegetation to provide a safe working area for personnel and equipment. The degree of impact would depend on the type and amount of vegetation affected, the rate at which the vegetation would regenerate after construction, and the frequency of vegetation maintenance conducted during operation. Construction of the proposed pipeline would disturb a total of about 29.2 acres of vegetation, of which about 31 percent would be within Algonquin's existing, previously disturbed right-of-way. By locating the proposed pipeline within the existing right-of-way, Algonquin would reduce the area of new disturbance and, therefore, would reduce impacts on vegetation. The remaining 69 percent of vegetation disturbance associated with construction would be outside Algonquin's existing right-of-way.

Secondary effects associated with disturbances to vegetation could include increased soil erosion (see section 4.2.1.1), increased potential for the introduction and establishment of invasive weedy species (see section 4.5.4), and a local reduction in available wildlife habitat (see section 4.6.1.2).

Algonquin would implement measures outlined in its E&SCP (see Appendix B) to minimize impacts on vegetation and promote successful revegetation following construction.

After cleanup and reseeding of the right-of-way, the herbaceous components of the early successional-upland scrub-shrub cover type would typically regenerate quickly. Any areas containing

landscape cover (residential) would be restored within the temporary construction right-of-way immediately after construction as part of site-specific plans and agreements with landowners (see section 4.8.3).

Longer-term impacts would occur on woody shrubland cover because shrubland areas would be reseeded only with herbaceous species and the shrub species that would recolonize the right-of-way from adjacent areas would require several years to re-establish their woody canopy.

The greatest impact would be on forested areas because of the time required to restore the woody vegetation to its preconstruction condition. Construction in forest lands would remove the large, mature tree canopy over the width of the construction right-of-way, which would change the structure and environment of the forest area. The clearing of trees from the construction right-of-way could also affect the remaining trees along the edge of the right-of-way due to mechanical damage to trunks and branches, root impacts from soil disturbance and compaction, or a reduction in stability following removal of adjacent supporting trees.

Algonquin would monitor all disturbed areas for the first and second (as necessary) growing season in upland areas and at least 3 years in wetlands to ensure successful restoration. The revegetation monitoring in wetland areas would also assess the establishment of undesirable exotic plant species (see section 4.5.4).

Routine maintenance of the right-of-way, as outlined in Algonquin's E&SCP, would be required to allow continued access for routine pipeline patrols, maintaining access in the event of emergency repairs, and visibility during aerial patrols.

Aboveground Facilities

Construction of the aboveground facilities would affect 1.9 acres of land including 0.9 acre of upland forest. Operation of the aboveground facilities would permanently convert 0.1 acre of upland forest to commercial/industrial uses.

Access Roads

The proposed access roads would permanently disturb about 0.9 acre of early successional-upland scrub-shrub vegetation (open land and residential). No forest land would be impacted during access road upgrades or use.

4.5.3 Vegetation Communities of Special Concern or Value

Algonquin consulted with federal and state resource agencies to determine if any federally or state-listed endangered or threatened plant species (including federal and state species of special concern) or their designated communities occur within the proposed E2W Project area. Based on these consultations, no federally or state-listed plant species or significant natural communities would be affected by the E-3 System Replacement, aboveground facilities, or access roads.

4.5.4 Noxious Weeds and Other Invasive Plant Species

Noxious weeds and other invasive plants are non-native, undesirable native, or introduced species that are able to exclude and out compete desirable native species, and thereby decrease overall species diversity. Noxious weeds often invade and persist in areas after disturbance (e.g., after construction of a pipeline) and can hinder restoration. Other aggressive plant species, both native and introduced, may also

out compete desirable native and other beneficial species. Noxious weeds are addressed by Executive Order 13112 (February 1999), which directs federal agencies to prevent the introduction of invasive species; provide for their control; and minimize the economic, ecological, and human health impacts that invasive species cause. The order further specifies that a federal agency shall not authorize, fund, or carry out actions likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless it has determined that the benefits of such actions outweigh the potential harm caused by invasive species and that all feasible and prudent measures to minimize risk of harm would be taken in conjunction with the actions.

Algonquin conducted surveys for the presence of invasive species during its wetland delineations and developed an Invasive Plant Species Control Plan that would be implemented during construction and operation of the proposed Project (see Appendix G). This plan contains a list of wetlands where invasive wetland plant species were observed during wetland surveys. The plan describes construction-phase mitigation, post-construction monitoring, and remediation that would be implemented to control the spread of invasive wetland plant species. The plan focuses on controlling the spread of two foreign and invasive wetland plant species, purple loosestrife and common reed, that have been identified by federal and state agencies as the most prevalent nuisance species within the proposed Project area.

Algonquin discussed the Invasive Plant Species Control Plan with the CTDEP during a meeting held on June 24, 2009. At that meeting, the CTDEP indicated to Algonquin that the plan is acceptable. We have reviewed the Invasive Plant Species Control Plan and also find it acceptable.

4.6 WILDLIFE AND AQUATIC RESOURCES

4.6.1 Wildlife

The E2W Project would cross terrestrial and wetland habitats that support a diversity of wildlife species. In general, the composition, structure, and distribution of a plant community in an area are referred to as vegetative cover. Wildlife species are directly dependent on the existing plant communities and would be attracted to an area if suitable cover or habitat is present.

4.6.1.1 Existing Wildlife Resources

Pipeline Facilities

As described in sections 4.4.1 and 4.5.1, the proposed pipeline would cross several distinct upland and wetland vegetation cover types. Each of these cover types (i.e., vegetation communities) provides nesting, cover, and foraging habitat for a variety of wildlife species. Other resources including open water also provide many of these same functions for wildlife species. Table 4.6.1-1 identifies the wildlife species that are common to the vegetation communities within the Project area.

4.6.1.2 General Impacts and Mitigation

Pipeline Facilities

The impact of the proposed Project on wildlife species and their habitats would vary depending on the requirements of each particular species and the existing habitat present along the proposed pipeline route. The cutting, clearing, and/or removal of existing vegetation would also affect wildlife by reducing the amount of available habitat. The degree of impact would depend on the type of habitat affected and the rate at which vegetation regenerates after construction.

The impacts of construction on wildlife would include the displacement of wildlife on the right-of-way and direct mortality of some individuals. It is expected that birds and larger mammals would leave the vicinity of the right-of-way as construction activities approach. Depending on the season, construction could also disrupt bird courting or nesting and breeding of other wildlife on and adjacent to the right-of-way. Many of these animals may relocate into similar habitats nearby; however, the lack of adequate territorial space could force some animals into suboptimal habitats. This could increase inter- and intra-specific competition and lower reproductive success and survival. The influx and increased density of animals in some undisturbed areas caused by these dislocations could also reduce the reproductive success of animals that are not displaced by construction. Additionally, some smaller, less mobile wildlife, such as small mammals and burrowing species, could be crushed by construction equipment or trapped in trenches. Bird nests located within the construction work area could be destroyed by clearing activities. The loss of these species could result in a decrease in the food stock available for predators of these species. These effects, however, would cease after construction, and it is expected that wildlife would return to the disturbed areas and adjacent, undisturbed habitats after right-of-way restoration is completed.

Habitat disturbance would be minimized through implementation of Algonquin's E&SCP, which includes measures to reseed disturbed areas with seed mixes determined in accordance with landowner agreements, permit requirements, and consultations with agency and non-agency stakeholders. A combination of both summer and winter cover would be established along the right-of-way to encourage wildlife use throughout the year.

TABLE 4.6.1-1

Typical Wildlife Species Found Within the Vegetation Communities Crossed by the HubLine/East to West Project

Vegetation Communities	Typical Wildlife Found within the Vegetation Communities
Early Successional-Upland Scrub-Shrub [a]	**Amphibians:** spotted salamander, red-spotted newt, Eastern American toad, wood frog, pickerel frog. **Reptiles:** Northern brown snake, Eastern garter snake, Northern black racer, Eastern smooth green snake, Eastern milk snake, Eastern box turtle. **Birds:** turkey vulture, red-tailed hawk, rough-legged hawk, ring-necked pheasant, mourning dove, yellow-billed cuckoo, chimney swift, Northern bobwhite, American woodcock, killdeer, Eastern screech-owl, ruby-throated hummingbird, Northern flicker, willow flycatcher, Eastern kingbird, tree swallow, Northern rough-winged swallow, bank swallow, cliff swallow, barn swallow, blue jay, American crow, black-capped chickadee, house wren, blue-gray gnatcatcher, Eastern bluebird, American robin, gray catbird, Northern mockingbird, Northern shrike, European starling, red-eyed vireo, blue-winged warbler, yellow-rumped warbler, yellow warbler, chestnut-sided warbler, prairie warbler, common yellowthroat, Northern cardinal, indigo bunting, Eastern towhee, American tree sparrow, chipping sparrow, field sparrow, song sparrow, white-throated sparrow, dark-eyed junco, common grackle, brown-headed cowbird, American goldfinch, house sparrow. **Mammals:** Virginia opossum, masked shrew, smoky shrew, Northern short-tailed shrew, hairy-tailed mole, little brown myotis, Keen's myotis, Eastern cottontail, New England cottontail, Eastern chipmunk, woodchuck, Southern red-backed vole, meadow vole, meadow jumping mouse, coyote, red fox, gray fox, raccoon, ermine, long-tailed weasel, striped skunk, white-tailed deer, bobcat.
Upland Forest [b]	**Amphibians:** spotted salamander, red-spotted newt, Northern dusky salamander, Northern two-lined salamander, Eastern American toad, Fowler's toad, Northern spring peeper, gray treefrog, wood frog. **Reptiles:** Eastern box turtle, northern brown snake, Northern redbelly snake, Eastern garter snake, northern black racer, Eastern milk snake. **Birds:** turkey vulture, hooded merganser, common merganser, Northern goshawk, broad-winged hawk, red-shouldered hawk, ruffed grouse, wild turkey, mourning dove, black-billed cuckoo, yellow-billed cuckoo, Eastern screech-owl, great horned owl, barred owl, ruby-throated hummingbird, yellow-bellied sapsucker, hairy woodpecker, downy woodpecker, Northern flicker, pileated woodpecker, Eastern wood-pewee, least flycatcher, great crested flycatcher, blue jay, American crow, black-capped chickadee, tufted titmouse, white-breasted nuthatch, brown creeper, winter wren, house wren, golden-crowned kinglet, blue-gray gnatcatcher, veery, wood thrush, gray catbird, cedar waxwing, blue-headed vireo, yellow-throated vireo, warbling vireo, Nashville warbler, black-throated green warbler, pine warbler, black and white warbler, American redstart, ovenbird, Northern waterthrush, scarlet tanager, Northern cardinal, rose-breasted grosbeak, Baltimore oriole, pine siskin, evening grosbeak. **Mammals:** Virginia opossum, masked shrew, smoky shrew, Northern short-tailed shrew, hairy-tailed mole, little brown myotis, Keen's myotis, big brown bat, Eastern pipistrelle, Eastern cottontail, New England cottontail, Eastern chipmunk, woodchuck, gray squirrel, red squirrel, Northern flying squirrel, white-footed mouse, Southern red-backed vole, woodland vole, woodland jumping mouse, coyote, red fox, gray fox, raccoon, ermine, long-tailed weasel, mink, striped skunk, white-tailed deer, bobcat.
Forested Wetland	**Amphibians:** spotted salamander, Jefferson salamander, Tremblay's salamander, Northern dusky salamander, red-backed salamander, Northern two-lined salamander, Eastern American toad, Fowler's toad, Northern spring peeper, gray treefrog, green frog, red-spotted newt, wood frog, pickerel frog. **Reptiles:** Common snapping turtle, Northern water snake, Northern brown snake, Northern redbelly snake, Eastern garter snake, Northern ringneck snake, Eastern milk snake, Northern black racer. **Birds:** Great blue heron, green-backed heron, wood duck, American black duck, common goldeneye, bufflehead, hooded merganser, common merganser, Northern goshawk, red-shouldered hawk, red-tailed hawk, ruffed grouse, wild turkey, American woodcock, yellow-billed cuckoo, Eastern screech-owl, Great-horned owl, barred owl, ruby-throated hummingbird, red-bellied woodpecker, downy woodpecker, hairy woodpecker, pileated woodpecker, Eastern wood-pewee, willow flycatcher, least flycatcher, great-crested flycatcher, blue jay, American crow, black-capped chickadee, tufted titmouse, white-breasted nuthatch, golden-crowned kinglet, blue-gray gnatcatcher, veery, wood thrush, gray catbird, cedar waxwing, blue-headed vireo, yellow-throated vireo, warbling vireo, Nashville warbler, yellow warbler, black-throated blue warbler, black and white warbler, American redstart, hooded warbler, ovenbird, Northern waterthrush, common yellowthroat, Canada warbler, scarlet tanager, Northern cardinal, rose-breasted grosbeak, Eastern towhee, swamp sparrow, white-throated sparrow, common grackle, Orchard oriole, Northern Oriole.

TABLE 4.6.1-1 (cont'd)

Typical Wildlife Species Found Within the Vegetation Communities Crossed by the HubLine/East to West Project

Vegetation Communities	Typical Wildlife Found within the Vegetation Communities
	Mammals: Virginia opossum, masked shrew, smoky shrew, Northern short-tailed shrew, star-nosed mole, little brown myotis, Keen's myotis, big brown bat, Eastern pipistrelle, Eastern cottontail, New England cottontail, Eastern chipmunk, gray squirrel, red squirrel, beaver, Northern flying squirrel, white-footed mouse, Southern red-backed vole, woodland vole, woodland jumping mouse, coyote, red fox, gray fox, raccoon, ermine, long-tailed weasel, mink, river otter, striped skunk, white-tailed deer, bobcat.
Scrub-shrub Wetland	**Amphibians:** spotted salamander, Jefferson salamander, red-spotted newt, Eastern American toad, Northern spring peeper, gray treefrog, green frog, American bullfrog, wood frog.
	Reptiles: Common snapping turtle, painted turtle, spotted turtle, Northern water snake, Northern brown snake, Northern redbelly snake, Eastern garter snake, Eastern milk snake, Northern black racer, Eastern smooth green snake.
	Birds: Great blue heron, green-backed heron, black-crowned night-heron, wood duck, American black duck, mallard, red-shouldered hawk, rough-legged hawk, sora, American woodcock, black-billed cuckoo, Great horned owl, willow flycatcher, tree swallow, barn swallow, Northern rough-winged swallow, winter wren, house wren, blue-gray gnatcatcher, gray catbird, cedar waxwing, blue-winged warbler, yellow warbler, chestnut-sided warbler, Northern waterthrush, Louisiana waterthrush, common yellowthroat, Canada warbler, Northern cardinal, American tree sparrow, song sparrow, swamp sparrow, white-throated sparrow, red-winged blackbird, common grackle, orchard oriole.
	Mammals: Virginia opossum, masked shrew, Northern short-tailed shrew, star-nosed mole, little brown myotis, Keen's myotis, big brown bat, Eastern pipistrelle, Eastern cottontail, New England cottontail, beaver, white-footed mouse, Southern red-backed vole, meadow vole, muskrat, meadow jumping mouse, coyote, red fox, gray fox, raccoon, ermine, long-tailed weasel, mink, river otter, striped skunk, white-tailed deer, bobcat.
Emergent Freshwater Wetland	**Amphibians:** spotted salamander, Jefferson salamander, red-spotted newt, Northern dusky salamander, Eastern American toad, Northern spring peeper, gray treefrog, bullfrog, green frog, pickerel frog, wood frog.
	Reptiles: Common snapping turtle, painted turtle, spotted turtle, Northern water snake, Northern brown snake, Northern redbelly snake, Eastern garter snake, Northern black racer, Eastern smooth green snake.
	Birds: Great blue heron, green-backed heron, black-crowned night-heron, wood duck, mute swan, Canada goose, green-winged teal, American black duck, mallard, Northern pintail, Northern shoveler, gadwall, hooded merganser, rough-legged hawk, Virginia rail, sora, American coot, killdeer, belted kingfisher, American woodcock, ring-billed gull, chimney swift, tree swallow, barn swallow, Northern rough-winged swallow, bank swallow, cliff swallow, fish crow, marsh wren, sedge wren, Northern shrike, common yellowthroat, American tree sparrow, swamp sparrow, red-winged blackbird, common grackle.
	Mammals: Virginia opossum, masked shrew, Northern short-tailed shrew, star-nosed mole, little brown myotis, Keen's myotis, big brown bat, Eastern pipistrelle, Eastern cottontail, New England cottontail, beaver, white-footed mouse, meadow vole, muskrat, meadow jumping mouse, coyote, red fox, gray fox, raccoon, log-tailed weasel, mink, striped skunk, river otter, white-tailed deer, bobcat.

[a] Includes upland scrub-shrub, old fields, pasture, open land, agricultural land, herbaceous grasslands, utility rights-of-way, landscape, and residential/developed land.

[b] Includes the central hardwoods-hemlock-white pine region.

In general, the construction and operation of the proposed Project is not expected to have an impact on wildlife populations because the amounts of the habitats that would be affected are relatively minor and are within and adjacent to Algonquin's existing, maintained right-of-way. This existing right-of-way is routinely maintained as part of regular facility operations to control vegetative growth thus establishing shrub and/or open field wildlife habitats.

Algonquin would monitor the revegetation of the right-of-way in all upland areas to determine the post-construction revegetative success for the first and second (as necessary) growing seasons to ensure adequate revegetation. Additional revegetation efforts would be conducted until revegetation is deemed successful. In wetland areas, Algonquin would monitor revegetation for at least 3 years in accordance with its E&SCP, Wetland Restoration Procedures for Temporary Wetland Impacts, and Invasive Plant Species Control Plan.

Aboveground Facilities and Access Roads

Construction of the aboveground facilities and access roads would result in the permanent conversion of 0.1 acre of upland forest habitat and 0.9 acre of early successional-upland scrub-shrub (open land and residential) habitat to commercial/industrial land.

4.6.1.3 Migratory Birds

A variety of migratory bird species, including both songbirds and raptors, utilize the vegetation communities identified along the proposed pipeline route. Migratory birds are species that nest in the United States and Canada during the summer, and then migrate south to the tropical regions of Mexico, Central and South America, and the Caribbean for the non-breeding season. Forty-five migratory bird species likely to occur within the region where the proposed Project is located are considered by the FWS to be birds of conservation concern. These include: whip-poor-will, red-headed woodpecker, bald eagle, peregrine falcon, sedge wren, wood thrush, golden-winged warbler, prairie warbler, blue-winged warbler, worm-eating warbler, Henslow's sparrow, Nelson's sharp-tailed sparrow, and Kentucky warbler (FWS, 2008). General impacts on birds are discussed in section 4.6.1.2.

Executive Order 13186 (January 2001) directs federal agencies to consider the effects of agency actions and plans on migratory birds, with emphasis on species of concern. Algonquin's current proposed schedule to begin clearing of the right-of-way in April of 2010 would coincide with the beginning of the nesting season (April to June) for a majority of the migratory birds in the Project area. Construction activities occurring during the nesting season could result in the mortality of eggs and young birds that have not yet fledged. However, construction activity and noise at the beginning of the nesting season would likely discourage the birds from nesting in the work area. This may displace some nesting activity but would likely result in less mortality of the adults and juveniles. The Project would also result in a temporary loss of habitat available to migratory birds. This effect would be mitigated by Algonquin's proposal to restore disturbed areas following construction. Further, by locating the majority of the proposed pipeline within Algonquin's existing right-of-way, impacts on habitat for migratory birds would be minimized. All maintenance clearing activities would be conducted outside of the April 15 to August 1 time window for migratory bird species. Overall, impacts on migratory birds would be minor and localized.

4.6.1.4 Sensitive or Managed Wildlife Habitats and Species

Algonquin consulted with the FWS and the CTDEP to identify significant or sensitive wildlife habitats in the Project area. During these consultations, vernal pools were the only sensitive wildlife habitat identified.

Vernal pools are ephemeral wetlands that fill annually from precipitation, runoff, and rising of the water table (Kenney and Burne, 2001). In most years, vernal pools dry out completely. This wet-dry cycle precludes fish populations from becoming established, yet provides temporary habitat for a host of wildlife species (Kenney and Burne, 2001). Vernal pools are variable in appearance, water source, surrounding habitat, plant and animal content, and many other factors, but in all cases vernal pools share two characteristics: they do not hold water permanently and they are free of breeding populations of fish (Kenney and Burne, 2001).

Numerous amphibian and invertebrate species have evolved life cycles adapted to the exploitation of a temporary wetland without the predation of fish. Some vernal pool species, termed obligate vernal pool species, are completely dependent upon ephemeral wetlands for part of their life cycle and include species such as wood frog, spadefoot toad, mole salamanders, and fairy shrimp (Kenney and Burne, 2001). These species are direct indicator species of vernal pools. Other species, termed facultative vernal pool species, are indirect indicators of vernal pools and other wetland habitats for their various life cycles. Facultative vernal pool species have physical or behavioral adaptations to deal with the wet-dry cycle of a vernal pool and require a pool that holds water for 2 to 3 months. Facultative vernal pool species include most frog species, a few reptiles, numerous insect larvae, fingernail clams, amphibious snails, and leeches (Kenny and Burne, 2001).

Within Connecticut, vernal pools are regulated at the federal, state, and in some cases, local levels. Because no certification program exists for vernal pools in Connecticut, the COE determines on a case-by-case basis which vernal pools fall within its jurisdiction. At the state level, vernal pools are subject to the jurisdiction of the CTDEP under the Connecticut Water Quality Standards pursuant to section 22a-426 of the Connecticut General Statutes (CGS) (CT-WQS 12-17-02). Local wetland agencies may have regulations that provide additional protection to vernal pools. Algonquin has indicated that it would address vernal pool regulations at the federal, state, and local levels during permitting of the proposed E2W Project.

Vernal pools and potential vernal pools were identified during field surveys along the E-3 System Replacement route (including associated temporary extra workspaces and access roads) during the spring and summer of 2007. Additional surveys were completed during April 2008 to confirm the known vernal pools and to evaluate the potential vernal pools identified during 2007. Table 4.6.1-2 summarizes the characteristics and provides the quality rating for the vernal pools identified during the field surveys. Two vernal pools were identified within 150 feet of the construction work area, neither of which are of very high or high quality. Vernal pool number E-3-VP-1 is located outside the construction right-of-way and would not be directly impacted by the Project. A portion of vernal pool number E-3-VP-2 would be directly impacted by the proposed 75-foot-wide construction right-of-way. Algonquin has stated that only the extreme northern fringe of the pool basin would be temporarily affected. The deeper portion of the pool, which is the better quality habitat, would be avoided.

Pipeline construction within vernal pools would have a number of potential impacts including alteration of a pool's capacity for holding water; direct disturbance to amphibian adults, eggs, and larvae; and removal of vegetation that could serve as egg attachment sites and cover. Removal of the forest canopy within or around a pool could lead to an increase in water temperature and rates of evapotranspiration. Local populations of forest-dwelling amphibians could be impacted by the permanent conversion of forested upland habitat adjacent to the pool to an herbaceous or shrub habitat type. Specific impacts would include the loss of shade and moisture, loose forest litter material, and coarse woody debris.

TABLE 4.6.1-2

Vernal Pool Characteristics for Vernal Pools Located Within 150 feet of the Construction Work Area for the HubLine/East to West Project

Vernal Pool ID / Wetland Association	Milepost	Town	Distance from the Pipeline	Hydrology Observations During Vernal Pool Surveys (Date)	Hydrology Observations During Wetland Surveys (Date)	Wildlife Species [a]	Dominant Vegetation Within Vernal Pool			Percent Forested (within 250 feet)	Quality Rating [b]
							Tree	Shrub	Herb		
E-3-VP-1/ E3-W10	1.4	Norwich	Outside of the proposed construction right-of-way and about 40 feet from the pipeline centerline.	Seasonally flooded (4/15/2008)	Seasonally flooded (6/19/2007)	WF SS	Red maple, white oak, white pine, black birch	Northern spicebush	N/A	75-100	Moderate
E-3-VP-2/ E3-W9	1.4	Norwich	Partially within the proposed construction right-of-way and about 30 feet from the pipeline centerline.	Seasonally flooded (4/15/2008)	Seasonally flooded (6/19/2007)	WF	Red maple, black birch, white pine, American beech	American beech	N/A	75-100	Low

[a] Wildlife species: WF = Wood Frog; SS = Spotted Salamander

[b] Vernal Pool Quality Rating Thresholds. The numerical values provided in the thresholds below refer to the number of egg masses recorded during the survey effort per species:
Moderate: 25-50 WF and/or 10-20 SS, 0-25 percent forested; or 10-25 WF and/or 5-10 SS, 25-50 percent forested
Low: 1-9 WF and/or 1-4 SS, 0-25 percent forested

N/A = Not applicable.

According to Algonquin, the 75-foot-wide construction right-of-way near vernal pool number E-3-VP2 along the E-3 System Replacement cannot be modified to avoid the entire pool because the full construction right-of-way width is necessary to stage equipment and materials and for spoil storage at the Reservoir Road crossing. At the pool basin within the right-of-way, the detritus layer would be removed and salvaged for restoration. Sediment barriers would be installed along the south edge of the right-of-way for erosion and sediment control and to act as a barrier to wildlife. This portion of the pool basin is located along the travel lane of the right-of-way and would not be excavated. Equipment mats would be placed along the affected portion of the pool basin to avoid rutting and soil mixing and compaction. Once construction is completed, the equipment mats would be removed and the pool basin would be restored to preconstruction condition. The salvaged detritus layer would be returned and spread within the pool basin. Algonquin provided these vernal pool construction and restoration mitigation measures to the CTDEP on October 7, 2008. Algonquin reviewed and discussed these measures with the CTDEP during a meeting held on June 24, 2009. At that meeting, the CTDEP indicated that these were acceptable measures to protect and restore vernal pool number E-3-VP2. We agree.

In addition to the measures described above, Algonquin would employ measures outlined in its E&SCP to further minimize or avoid impacts on vernal pools.

4.6.2 Aquatic Resources

4.6.2.1 Existing Aquatic Resources

Algonquin consulted with the FWS and the CTIFD to identify fishery resources in the proposed Project area. Section 4.3.2 provides a characterization of the waterbodies that would be crossed by the proposed E2W Project.

Pipeline Facilities

Classification of fisheries habitat within the proposed E2W Project area includes consideration of both chemical and biological characteristics. Physical and chemical properties used to determine fishery classification include water temperature, salinity, and whether the waterbody is part of a marine, estuarine, or freshwater system. Habitat classification also depends on the presence of certain fish species in the aquatic community that could use the habitat for reproduction. Coldwater fisheries habitat is typically characterized both by lower average water temperatures and by the ability to support breeding fish such as brook trout. Warmwater fisheries, which have a higher average temperature, are not able to support breeding for coldwater species and are characterized by fish such as largemouth bass, bluegill, pumpkinseed, and redbreast sunfish.

Fisheries may also be classified based on whether they support anadromous fish, which are marine-living fish that travel upstream to spawn in freshwater, or catadromous fish, which are freshwater-living fish that travel downstream to breed in saltwater. These fish species are collectively known as diadromous.

In Connecticut, there are 26 naturally occurring freshwater fish species (CTDEP, 2005). In addition to the known naturally occurring species, more than 50 non-native fish species have been released into Connecticut waters or imported into the state (CTDEP, 2005). Fishery resources along the proposed pipeline route are all freshwater and consist of one coldwater fishery and one warmwater fishery, Norwichtown Brook and Bobbin Mill Brook, respectively. No diadromous fisheries would be impacted by the proposed Project. Fish species known to occur in the Project area in Connecticut are summarized in table 4.6.2-1.

TABLE 4.6.2-1

Fish Species Known to Occur in Waterbodies Crossed by the HubLine/East to West Project Pipeline Route

Common Name	Binomial Nomenclature
Warmwater Fisheries (Freshwater)	
Bluegill	*Lepomis macrochirus*
Golden shiner	*Notemigonus crysoleucas*
Common shiner	*Notropis cornutus*
Largemouth bass	*Micropterus salmoides*
Pumpkinseed	*Lepomis gibbosus*
Redbreast sunfish	*Lepomis auritus*
Redfin pickerel	*Esox americanus americanus*
Swamp darter	*Etheostoma fusiforme*
Creek chubsucker	*Erimyzon oblongus*
Tessellated darter	*Etheostoma olmstedi*
Spottail shiner	*Notropis hudsonius*
Fallfish	*Semotilus corporalis*
Coldwater Fisheries (Freshwater)	
Blacknose dace	*Rhihichthys atratulus*
Longnose dace	*Rhihichthys cataractae*
White sucker	*Catostomus commersoni*
Brook trout	*Salvelinus fontinalis*

Aboveground Facilities and Access Roads

No waterbodies would be affected by construction and operation of the aboveground facilities or access roads. Therefore, Project activities at the aboveground facilities and access roads would not affect aquatic resources.

4.6.2.2 General Impacts and Mitigation

In-stream construction across waterbodies could have both direct and indirect effects on aquatic resources. The degree of impact would depend on the proposed crossing method, the existing conditions at each crossing location, the mitigation measures employed, and the timing of construction.

Construction impacts on fishery resources may include direct contact by construction equipment with food resources in the form of relatively immobile prey, increased sedimentation and water turbidity immediately downstream of the construction work area, alteration or removal of aquatic habitat cover and vegetation on adjacent banks, introduction of pollutants, impingement or entrainment of fish and other biota associated with the use of water pumps at dam and pump crossings, and downstream scour associated with the use of those pumps.

Long-term degradation of habitats could occur if the stream contours are permanently modified in the area of the crossing or the flow patterns are changed. Loss of riparian vegetation along the banks would reduce shade, potentially increasing water temperatures, diminish escape cover, and remove an important source of terrestrial food for aquatic organisms. Elevated water temperatures could, in turn, lead to reductions in levels of dissolved oxygen, which can negatively influence habitat quality and the fish populations that occupy these habitats.

Construction-related impacts on aquatic resources could also result from in-stream blasting. Algonquin does not anticipate the need for extensive blasting at waterbodies along the proposed route,

however, some limited blasting may be required to increase the depth and width of the existing trenches to accommodate the larger diameter pipeline. The potential adverse effects of blasting may include direct mortality of organisms in the immediate vicinity of the blast. Blasting could also have the same short-term adverse impacts as trenching, including reduced macroinvertebrate prey base, alteration of substrate characteristics, and loss of large woody debris and structure.

Accidental spills of construction-related fluids (e.g., oil, gasoline, or hydraulic fluids) on the landscape or directly into waterbodies could affect aquatic resources, depending on the type and quantity of the spill and the dispersal and attenuation characteristics of the waterbody.

Minimization and Mitigation Measures

Algonquin would minimize effects on aquatic resources through the use of various crossing methods, construction time windows, extra workspace restrictions, restoration procedures, and other mitigation measures contained in its E&SCP.

Algonquin would cross the one coldwater fishery (Norwichtown Brook) using the horizontal bore method, which would avoid direct impacts on the bed and banks of the waterbody. Algonquin would cross the one warmwater fishery (Bobbin Mill Brook) using a dry crossing method such as the flume or dam and pump crossing method (see section 4.6.2.3). Use of the flume or dam and pump method effectively isolates the area of impact on the construction right-of-way and, thus, substantially avoids many of the impacts that are associated with wet open-cut crossings.

Restoration, bank stabilization, and revegetation efforts as outlined in Algonquin's E&SCP would minimize the potential for erosion from the surrounding landscape. Adherence to the E&SCP would also maximize the potential for regrowth of riparian vegetation, thereby minimizing the potential for any long-term impacts associated with lack of shade and cover.

Implementation of Algonquin's construction, restoration, and mitigation procedures would minimize short-term impacts on fishery resources and the aquatic habitats upon which these fishery resources depend. Invertebrate populations would be expected to recolonize the crossing area and all temporary work areas would be returned to their original condition, including re-establishment of riparian cover. Furthermore, operation and routine maintenance of the pipeline right-of-way and aboveground facilities, which would be restricted to clearing and mowing vegetation on the permanent right-of-way, would not have any noticeable impact on fishery resources within the proposed Project area.

If blasting is necessary at the waterbody crossings, Algonquin would mitigate impacts on aquatic resources through several means. The blasting contractor would use delays and measures to dampen the blast. The nature of the material that would require blasting and the short duration of blasting activities would minimize the amount of fine-grained material released to the aquatic habitat. Furthermore, resident fish inhabiting the area would be dispersed as a result of the active drilling for the blast holes and preparation of the construction work area at the crossing. When blasting is completed, debris would be removed so as not to interfere with downstream flow. The tie-in crews would then excavate the trench, install the pipeline, and restore the area in accordance with Algonquin's E&SCP.

To minimize the potential for spills from equipment use, Algonquin would implement its SPCC Plan (see Appendix C).

4.6.2.3 Fisheries of Special Concern

Fisheries of special concern include waterbodies that support fisheries with important recreational value; contain coldwater fisheries; are included in special state fishery management regulations; or provide habitat for federally or state-listed endangered, threatened, or candidate fish species. Waterbodies that have significant economic value because of fish stocking programs, commercial fisheries, Essential Fish Habitat (EFH), or tribal harvest, are also considered fisheries of special concern.

Algonquin consulted with the FWS and the CTIFD to identify waterbodies that may contain federally or state-listed endangered, threatened, or candidate fish species and their habitat; coldwater fisheries; and other fisheries resources that could be considered fisheries of special concern. Based on these consultations, Norwichtown Brook was identified as the only fishery of special concern in the vicinity of the proposed Project. The proposed pipeline would cross Norwichtown Brook at MP 0.6, which according to the CTIFD, supports a native brook trout population. Measures Algonquin would implement to minimize impacts on aquatic resources in Norwichtown Brook are discussed in section 4.3.2.3.

No commercial fisheries, protected fish species, or EFH would be affected by the E2W Project.

4.7 SPECIAL STATUS SPECIES

4.7.1 Regulatory Requirements and Species Identification

Federal agencies are required by section 7 of the ESA (Title 19 USC Part 1536(c)), as amended (1978, 1979, and 1982), to ensure that any actions authorized, funded, or carried out by the agency do not jeopardize the continued existence of a federally listed endangered or threatened species, or result in the destruction or adverse modification of the designated critical habitat of a federally listed species. The action agency (i.e., the FERC) is required to consult with the FWS to determine whether federally listed endangered or threatened species or designated critical habitat are found in the vicinity of the proposed Project, and to determine the proposed action's potential effects on those species or critical habitats. For actions involving major construction activities with the potential to affect listed species or designated critical habitat, the FERC must report its findings to the FWS in a Biological Assessment (BA) for those species that may be affected. The FERC must submit its BA to the FWS and, if it is determined that the action may adversely affect a listed species, the federal agency must submit a request for formal consultation to comply with section 7 of the ESA. In response, the FWS would issue a Biological Opinion as to whether or not the federal action would likely jeopardize the continued existence of a listed species, or result in the destruction or adverse modification of designated critical habitat.

The ESA protects fish, wildlife, plants, and invertebrates that are federally listed as threatened or endangered. A federally listed endangered species is one that is in danger of extinction throughout all or a significant portion of its range. A federally listed threatened species is likely to become endangered in the foreseeable future throughout all or a significant portion of its range.

Protection is also afforded under the ESA to "critical habitat," which the FWS defines as specific areas both within and outside the geographic area occupied by a species on which are found those physical and biological features essential to its conservation. In addition to federal law, Connecticut has passed the Connecticut Endangered Species Act (CGS section 26-303) to protect state-listed endangered and threatened species.

Algonquin, as our non-federal representative, conducted informal consultations with the New England Office of the FWS and the Connecticut Natural Diversity Data Base (CTNDDB) to determine if any federally or state-listed endangered or threatened species (including federal and state species of special concern) or their designated critical habitats occur within the proposed E2W Project area. These consultations included the area crossed by the pipeline as well as the aboveground facility sites, and the access roads.

Based on these informal consultations, no federally listed species or their designated critical habitats and no state-listed species potentially occur in the general vicinity of the proposed E2W Project (Tur, 2007; Victoria, 2007).

4.7.2 Summary of Determinations of Effect for Federally and State-listed Species

To comply with section 7 of the ESA, the FERC staff informally consulted with the FWS regarding the presence of federally listed or proposed species in the Project area. Based on these consultations, it has been determined that the E2W Project would have no effect on federally listed species or their critical habitats. Further consultation or concurrence from the FWS is not required for "no effect" determinations. Thus, required consultations under section 7 of the ESA are complete unless new species are listed or new information becomes available indicating a potential Project effect on listed species or critical habitat that was not considered in this EIS.

Based on consultations with the CTNDDB and field surveys, no state-listed species were identified along the proposed Project; therefore, we conclude that no impacts on rare wildlife species or habitats would occur as a result of the Project.

4.8 LAND USE, RECREATION, SPECIAL INTEREST AREAS, AND VISUAL RESOURCES

4.8.1 Land Use

Pipeline Facilities

Land use impacts associated with the E2W Project would include the disturbance of existing land uses within the construction right-of-way during construction and retention of new and existing permanent right-of-way for operation of the pipeline.

Table 4.8.1-1 summarizes the acres of each land use type that would be affected by construction and operation of the Project. Construction of Algonquin's proposed pipeline facilities would temporarily affect a total of about 29.3 acres of land, including 23.4 acres for the pipeline right-of-way and 5.9 acres of temporary extra workspace. Of the 29.3 acres of land that would be affected by construction of the pipeline facilities, about 9.2 acres would be retained as permanent right-of-way. The remaining 20.1 acres used for temporary construction right-of-way and temporary extra workspace would be allowed to revert to prior uses following construction.

The land retained as permanent right-of-way would be located almost entirely within Algonquin's existing permanent right-of-way and would not result in additional permanent land use impacts. However, additional land outside the existing right-of-way would be required on both sides of the Interstate 395/Norwichtown Brook crossing to accommodate the offset from the existing pipeline that would be abandoned. In addition, Algonquin is proposing an expanded permanent easement around the aboveground facilities at the beginning and end of the E-3 System Replacement pipeline. Combined, these areas would represent approximately 0.2 acre of new permanent impacts outside the existing right-of-way. Certain activities such as the construction of aboveground structures, including houses, house additions, garages, patios, pools, or other objects not easily removable, or the planting of trees, would continue to be prohibited within the permanent right-of-way. To facilitate pipeline inspection, operation, and maintenance, the entire permanent right-of-way in upland areas would continue to be cleared of woody vegetation and maintained in an herbaceous/scrub-shrub vegetated state.

Impacts on agricultural, open, forested, and commercial/industrial land are discussed below. Impacts on residential areas are discussed in section 4.8.3.1. Wetlands and surface waters are discussed in sections 4.4 and 4.3.2, respectively. Impacts on transportation uses are discussed in section 4.9.4.

Agricultural Land –The proposed pipeline centerline would not cross any agricultural land. However, about 0.8 acre of agricultural land would be affected by the construction right-of-way and temporary extra workspace.

Construction on agricultural land would be conducted as described in section 2.3.1. The effects of construction on agricultural land are expected to be minor and short term. Short-term impacts on agricultural areas would include the loss of standing or row crops within the construction work area and the disruption of farming operations for the growing season during the year of construction. To reduce these impacts, Algonquin would adhere to the measures outlined in its E&SCP (see Appendix B) for agricultural areas.

TABLE 4.8.1-1

Acres of Land Affected by Construction and Operation of the HubLine/East to West Project

Facility	Agricultural Land [a]	Open Land [b]	Forest Land [c]	Commercial/ Industrial [d]	Residential [e]	Open Water	Total
E-3 System Replacement							
Temporary Construction Impacts	0.8	8.5	9.3	<0.1	10.6	<0.1	29.3
Permanent Right-of-Way	<0.1	6.3	0.2	0.0	2.6	<0.1	9.2
Aboveground Facilities							
Beginning of E-3 System Pig Launcher							
Temporary Construction Impacts	0.0	0.3	0.9	<0.1	0.0	0.0	1.3
Permanent Operational Impacts	0.0	0.3	0.1	0.0	0.0	0.0	0.4
End of E-3 System Pig Receiver							
Temporary Construction Impacts	0.0	0.0	0.0	0.0	0.6	0.0	0.6
Permanent Operational Impacts	0.0	0.0	0.0	0.0	0.1	0.0	0.1
Valves							
Temporary Construction Impacts	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Permanent Operational Impacts	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aboveground Facilities Total							
Temporary Construction Impacts	0.0	0.3	0.9	<0.1	0.6	0.0	1.9
Permanent Operational Impacts	0.0	0.3	0.1	0.0	0.1	0.0	0.5
Access Roads							
Permanent Access Roads	0.0	0.1	0.0	0.0	0.8	0.0	0.9
Project Total							
Temporary Construction Impacts	0.8	8.9	10.2	0.2	12.0	<0.1	32.1
Permanent Operational Impacts	<0.1	6.7	0.3	0.0	3.5	<0.1	10.6

[a] Agricultural land includes cultivated lands and active hayfields.

[b] Open land includes upland herbaceous and scrub-shrub areas, as well as non-forested wetlands.

[c] Forest land includes areas of upland deciduous, evergreen, and mixed forest, as well as forested wetlands.

[d] Commercial/Industrial land includes commercial land and transportation, communications, and utility rights-of-way not currently used for other purposes.

[e] Residential land includes areas where numerous homes exist within close proximity and consists of lawns, driveways, and landscaped areas.

Note: The totals shown in this table may not equal the sum of addends due to rounding.

Following construction, Algonquin would implement the restoration practices outlined in its E&SCP. Operation of the permanent pipeline right-of-way would occur on less than 0.1 acre of agricultural land, all of which would be within the existing permanent right-of-way. Agricultural uses would continue as before construction. Algonquin would monitor crops during the first growing season and, if necessary, the second growing season to determine if additional restoration is needed. Algonquin would address compensation for crop damage or production loss associated with construction and operation with each individual landowner.

Open Land – The proposed pipeline centerline would cross about 1.8 miles of open land. Approximately 8.5 acres of open land would be affected by the construction right-of-way and temporary extra workspace.

The majority of the open land that would be impacted by the E2W Project is associated with Algonquin's existing right-of-way. Construction-related impacts on open land would include the removal of vegetation and disturbance of the soils. These impacts would be temporary and short term and would be minimized by implementation of Algonquin's E&SCP. Following construction, most open land uses would be able to continue. However, as discussed above, some activities, such as the building of new commercial or residential structures, would continue to be prohibited on the permanent right-of-way. Operation of the pipeline facilities would occur on 6.3 acres of open land, the majority of which is within the existing permanent right-of-way.

Forest Land – The proposed pipeline centerline would not cross any forest land. However, approximately 9.3 acres of forest land would be affected by the construction right-of-way and temporary extra workspace.

Forest land affected by the Project consists mainly of the central hardwood-hemlock-white pine forest type. Algonquin would minimize forest land impacts by locating the majority of the proposed facilities within existing right-of-way and open land wherever possible. Construction of the pipeline facilities in forested areas would require the removal of trees to prepare the construction work areas. Although trees cleared within temporary construction work areas would be allowed to regenerate to preconstruction conditions following construction, impacts on forest resources within these areas would last for several years (see section 4.5.2).

Following construction, permanent impacts would occur over the maintained portion of the right-of-way due to clearing activities. In total, about 0.2 acre of forest land would be removed for operation of the pipeline, the majority of which is within the existing permanent right-of-way.

Commercial/Industrial Land – The proposed pipeline centerline would cross less than 0.1 mile of commercial/industrial land. Less than 0.1 acre of commercial/industrial land would be affected by the construction right-of-way and temporary extra workspace.

Commercial/industrial land uses could be temporarily impacted during pipeline construction by increased dust from exposed soils, construction noise, and traffic congestion. Algonquin would minimize impacts on commercial land uses by coordinating driveway crossings with business owners to provide access across the construction right-of-way. Algonquin would keep materials available onsite to create a temporary platform across the pipeline trench if the need arises. Road surfaces would be restored as soon as practicable so that normal access can resume, and commercial land uses would be restored to preconstruction conditions, or as specified in landowner agreements.

The E2W Project would cross 10 paved roadways. No railroads would be crossed by the proposed Project. The roadways would be crossed using conventional road bore methods or would be

open cut, depending on specific permit conditions, as described in section 2.3.2. Bore crossing methods allow the roadway to remain in service while the installation process takes place. As a result, there would be little or no disruption to traffic at roadway crossings that are crossed by the bore method. In the event of an open-cut crossing, impacts on roadways would include short-term traffic congestion and disruption. To minimize these impacts, Algonquin would implement appropriate traffic control measures to maintain traffic flow and adhere to all applicable DOT, state, and local regulations to ensure safe driving conditions.

Following construction, roadways would be restored to preconstruction conditions. Operation of the pipeline facilities would not impact any commercial/industrial land.

Residential Land – The proposed pipeline centerline would cross about 0.8 mile of residential land. Approximately 10.6 acres of residential land would be affected during construction of the pipeline facilities. Operation of the pipeline facilities would impact 2.6 acres of residential land, the majority of which is within Algonquin's existing permanent right-of-way.

Similar to commercial/industrial lands, residential land could be temporarily impacted during pipeline construction by increased dust from exposed soils, construction noise, and traffic congestion. Algonquin would construct through or near residential areas in a manner to ensure that construction activities minimize adverse impacts on residences and that cleanup is prompt and thorough. The location of existing residences and structures within 50 feet of the construction work area, and the impacts on and mitigation proposed for these residences and structures, are discussed in section 4.8.3.1.

Aboveground Facilities

The piping modifications at the existing Hanover Compressor Station would take place within the existing, developed compressor station property. No additional land would be required or disturbed during the modification or operation of this facility; thus, it will not be discussed further in this section.

The remaining aboveground facilities would be new facilities located at the beginning and end of the E-3 System Replacement. The majority of these facilities would be located within Algonquin's existing right-of-way. A total of approximately 1.9 acres of land would be required for construction of these facilities, 0.5 acre of which would be permanently retained for operation. The dominant land uses that would be affected by these facilities are forest land and residential land.

Abandoned Facilities

A total of approximately 700 feet of pipeline would be abandoned in place at the crossings of Interstate 395/Norwichtown Brook and wetland E3-W2. In these areas, the abandonment activities would occur within the proposed construction right-of-way and would not require any additional land. The proposed pipeline at the crossing of wetland E3-W2 would be located within Algonquin's existing right-of-way adjacent to the existing pipeline and would not result in the need for additional permanent right-of-way. The proposed pipeline at the crossing of Interstate 395/Norwichtown Brook would be located outside the existing right-of-way and would require an additional permanent easement. Additional discussion of the abandoned facilities is provided in section 2.3.1.

Algonquin has stated that it would work closely with the affected landowners regarding the abandonment of the pipeline sections. Algonquin would negotiate with each individual landowner to ensure that their concerns are met.

Access Roads

Algonquin proposes to use four access roads during construction and operation of the proposed Project, all of which are existing roads as listed in table 4.8.1-2. Two of the roads would require improvements (e.g., grading, trimming overhanging vegetation, replacing/installing culverts) based on the equipment that would utilize the road. The width of these access roads would generally be 20 feet.

TABLE 4.8.1-2

Access Roads Associated with the HubLine/East to West Project

Access Road Number	Land Use	Improvement Required	Approximate Length (feet)	Width (feet)	Permanent Impacts (acres)
PAR 0.00	Existing Dirt/Gravel Road	Yes	1,500	20	0.0
PAR 0.01	Existing Dirt Road	Yes	960	20	0.4
PAR 1.88	Existing Paved Road	No	340	20	0.2
PAR 2.57	Existing Paved Road	No	550	20	0.3
Total					0.9

Temporary Extra Workspace

As discussed in section 2.2.1.2, Algonquin has identified certain areas where it believes site-specific conditions require the use of temporary extra workspace outside of the proposed nominal 75-foot-wide construction right-of-way. Table 4.8.1-3 lists the locations of these temporary extra workspaces and their dimensions. Table 4.8.1-3 also lists the acreage of impact, the land use, and the reasons why Algonquin believes the additional workspace is justified. Based on our review, we have determined that all of the workspaces listed in table 4.8.1-3 are justified and, therefore, we recommend approval of Algonquin's requests.

4.8.2 Land Ownership and Easement Requirements

Pipeline operators must obtain easements from existing landowners to construct and operate proposed facilities, or acquire the land on which the facilities would be located. Easements can be temporary, granting the operator the use of the land during project construction (e.g., temporary extra workspaces, temporary access roads, contractor yards), or permanent, granting the operator the right to operate and maintain the facilities once constructed.

Algonquin's existing permanent easement associated with the E-3 System gives it the right to maintain the right-of-way as necessary for pipeline operation, including the removal of larger vegetation and trees, as needed. Because the majority of the proposed Project would be located within Algonquin's existing right-of-way, Algonquin would not need to acquire new easements or property to operate the proposed facilities in most areas. However, a new permanent easement for additional land outside of the existing right-of-way would be required for the crossing of Interstate 395/Norwichtown Brook and for the aboveground facilities at the beginning and end of the E-3 System Replacement pipeline. In addition, Algonquin would need to acquire temporary easements or the necessary land for areas outside the existing right-of-way that would be used during construction.

TABLE 4.8.1-3

Temporary Extra Workspaces Associated with the HubLine/East to West Project [a]

Beginning Milepost	Ending Milepost	Size (feet (length by width))	Acreage Affected	Land Use	Justification	Approval Status
0.00	0.04	315 x 50	0.4	Forested/Open Land	Staging area to support contractor mobilization/demobilization, preparation of a level work area for installation of the proposed pig launcher.	Approval Recommended
0.00	0.02	200 x 75	0.3	Forested/Open Land	Staging area to support contractor mobilization/demobilization, preparation of a level work area for installation of the proposed pig launcher.	Approval Recommended
0.06	0.08	100 x 50	0.1	Forested	Staging area to store and prepare timber mats and prefabricate pipe sections as required to support pipeline installation in the adjacent wetland.	Approval Recommended
0.15	0.17	105 x 50	0.1	Forested	Staging area for the Plain Hill Road crossing	Approval Recommended
0.17	0.19	100 x 50	0.1	Forested	Staging area for the Plain Hill Road crossing	Approval Recommended
0.27	0.29	100 x 50	0.1	Open Land	Staging area for wetland crossing.	Approval Recommended
0.36	0.38	100 x 50	0.1	Forested	Staging area for wetland crossing/ Bog Meadow Road crossing. This extra workspace is within 50 feet of wetland E3-W2 (see table 4.4.3-1).	Approval Recommended
0.44	0.48	200 x 50	0.2	Forested	Staging area for the Bog Meadow Road crossing as relocated downstream to reduce impacts on tree screening and staging area for wetland crossing.	Approval Recommended
0.57	0.59	150 x 50	0.2	Forested	Staging area for the Interstate 395/ Norwichtown Brook crossing. Additional staging needed due to steep rocky slope.	Approval Recommended
0.63	0.65	100 x 50	0.1	Forested	Staging area for the Interstate 395/ Norwichtown Brook crossing and a wetland crossing.	Approval Recommended
0.74	0.76	105 x 50	0.1	Residential	Staging area for the Case Street crossing.	Approval Recommended
0.76	0.81	215 x 15	0.1	Residential	Additional workspace for storage of segregated topsoil.	Approval Recommended
0.84	0.86	120 x 50	0.1	Forested	Staging area for wetland crossing as modified to avoid impact on a new landowner.	Approval Recommended
0.92	0.94	100 x 50	0.1	Agricultural	Staging area for wetland crossing placed in a previously cleared area.	Approval Recommended
0.97	0.99	100 x 50	0.1	Agricultural	Staging area for wetland crossing.	Approval Recommended
1.05	1.11	300 x 15	0.1	Residential	Additional workspace for storage of segregated topsoil	Approval Recommended
1.09	1.15	215 x 220	1.0	Residential	Staging/laydown area.	Approval Recommended

TABLE 4.8.1-3 (cont'd)

Temporary Extra Workspaces Associated with the HubLine/East to West Project [a]

Beginning Milepost	Ending Milepost	Size (feet (length by width))	Acreage Affected	Land Use	Justification	Approval Status
1.15	1.20	280 x 15	0.1	Residential	Linear staging due to close proximity of residences to Scotland Road crossing, wetland crossing, unnamed trib. to Bobbin Mill Brook crossing, and topsoil segregation through residential area.	Approval Recommended
1.15	1.17	55 x 5	<0.1	Residential	Staging area for the Scotland Road crossing.	Approval Recommended
1.20	1.22	100 x 50	0.1	Residential	Staging area for wetland/unnamed trib. to Bobbin Mill Brook crossing.	Approval Recommended
1.26	1.28	100 x 50	0.1	Forested	Staging area for wetland crossing.	Approval Recommended
1.39	1.41	125 x 25	0.1	Open Land/ Forested	Staging area for the Reservoir Road crossing and storage of stockpiled material from temporary stone wall removal.	Approval Recommended
1.48	1.49	100 x 50	0.1	Forested	Staging area for wetland/Bobbin Mill Brook crossing.	Approval Recommended
1.52	1.54	100 x 50	0.1	Forested	Staging area for wetland/Bobbin Mill Brook crossing.	Approval Recommended
1.56	1.58	100 x 50	0.1	Forested/ Residential	Staging area for the Canterbury Turnpike crossing as relocated upstream due to close proximity of residences.	Approval Recommended
1.63	1.64	100 x 50	0.1	Residential	Staging area for the Canterbury Turnpike crossing and a wetland crossing. This extra workspace is within 50 feet of wetland E3-W12 (see table 4.4.3-1).	Approval Recommended
1.72	1.76	140 x 70	0.2	Residential	Staging area for Beebe Road/ Harland Road crossings as relocated upstream due to close proximity of residences and to minimize mature tree clearing.	Approval Recommended
1.79	1.81	100 x 50	0.1	Residential	Staging area for Beebe Road/ Harland Road crossings.	Approval Recommended
1.84	1.89	265 x 65	0.3	Residential	Irregularly shaped staging area for Harland Road crossing and downstream congested residential construction techniques.	Approval Recommended
1.88	1.97	435 x 15	0.1	Residential	Linear staging area to support congested residential construction techniques.	Approval Recommended
2.04	2.05	50 x 10	<0.1	Residential	Additional workspace to provide access from Tower Hill Drive.	Approval Recommended
2.05	2.08	150 x 25	0.1	Forested/ Residential	Staging area for equipment and material storage from Tower Hill Drive access.	Approval Recommended
2.08	2.10	100 x 25	0.1	Forested/ Residential	Staging area for wetland crossing.	Approval Recommended
2.15	2.20	260 x 50	0.3	Forested	Staging area for wetland crossing and storage of stockpiled material from temporary stone wall removal.	Approval Recommended
2.29	2.31	110 x 50	0.1	Forested	Staging area for wetland crossing.	Approval Recommended

TABLE 4.8.1-3 (cont'd)

Temporary Extra Workspaces Associated with the HubLine/East to West Project [a]

Beginning Milepost	Ending Milepost	Size (feet (length by width))	Acreage Affected	Land Use	Justification	Approval Status
2.50	2.52	105 x 50	0.1	Residential	Staging area for Mohegan Park Road.	Approval Recommended
2.50	2.52	105 x 50	0.1	Residential	Additional staging area for Mohegan Park Road due to severe vertical slope and storage of stockpiled material from temporary stone wall removal.	Approval Recommended
2.52	2.56	180 x 25	0.1	Residential	Staging area for the Mohegan Park Road/Little Valley Court crossings.	Approval Recommended
Total			5.9			

[a] Includes areas where the construction right-of-way is wider than the nominal 75-foot-wide configuration as well as extra workspaces for staging areas and at feature crossings.

Note: The totals in this table may not equal the sum of addends due to rounding.

An easement agreement between a company and a landowner typically specifies compensation for losses resulting from construction, including losses of non-renewable and other resources, damages to property during construction, and restrictions on existing uses that would not be permitted on the permanent right-of-way after construction. Compensation would be based on a market study conducted by a licensed real estate appraiser.

If an easement cannot be negotiated with a landowner and the E2W Project is certificated by the FERC, Algonquin may use the right of eminent domain granted to it under section 7(h) of the NGA and the procedures set forth under the Federal Rules of Civic Procedure (Rule 71A) to obtain the right-of-way and temporary extra workspace areas necessary to construct and operate the Project. Algonquin would still be required to compensate the landowner for the right-of-way and damages incurred during construction. However, the level of compensation would be determined by a court according to state or federal law. In either case of a negotiated easement or right-of-way obtained via eminent domain, Algonquin would compensate landowners for use of the land. Eminent domain does not apply to lands under federal or tribal ownership but does apply to lands under state and local ownership.

4.8.3 Existing Residences, Commercial Facilities, and Planned Developments

4.8.3.1 Existing Residences and Commercial Facilities

Table 4.8.3-1 lists residences and other structures within 50 feet of the construction work area (i.e., construction right-of-way and temporary extra workspace) by milepost, and indicates the distance and orientation of each from the proposed work area. Algonquin's proposed construction work area would be located within 50 feet of 35 residential, commercial, or other structures (e.g., garages). Of this total, 23 residences would be within 25 feet of the construction work area.

The residential or other structures within 50 feet of the construction work area would be most likely to experience the effects of construction and operation of the Project. In general, as the distance to the construction work area increases, the impacts on residences decrease. In residential areas, the two most significant impacts associated with construction and operation of a pipeline are temporary disturbances during construction and the encumbrance of the permanent right-of-way, which would prevent the construction of permanent structures within the right-of-way.

Temporary construction impacts on residential areas could include inconvenience caused by noise and dust generated by construction equipment, personnel, and trenching of roads or driveways; ground disturbance of lawns; removal of trees, landscaped shrubs, or other vegetative screening between residences and/or adjacent rights-of-way; potential damage to existing septic systems or wells; and removal of aboveground structures such as fences, sheds, or trailers from within the right-of-way. Before mobilizing any equipment, Algonquin would stake the limits of disturbance and the centerline of the pipeline. Affected landowners would be notified at least 3 to 5 days before construction commences, unless more advance notice is requested by the landowner during easement negotiations.

If the construction right-of-way crosses a road, Algonquin would maintain access so residents have ingress/egress to their homes and workers and customers have access to businesses. If the road is open cut, one lane would remain open during construction or traffic would be detoured around the work area through the use of adjacent roadways. Traffic safety personnel would be present during construction periods, and signage and safety measures would be developed in compliance with applicable state and local roadway crossing permits. To the maximum extent practicable, Algonquin would schedule work within roadways to avoid commuter traffic and impacts on school bus schedules.

TABLE 4.8.3-1

Residences and Other Structures Within 50 feet of the Construction Work Area for the HubLine/East to West Project

Town	County, State	MP	Description of Structure	Approximate Distance from Construction Work Area (feet)	Approximate Distance and Direction from Pipeline Centerline (feet)
Norwich	New London, CT	0.16	Residential	15	65, South
Norwich	New London, CT	0.20	Residential	15	65, South
Norwich	New London, CT	0.70	Residential	20	70, South
Norwich	New London, CT	0.72	Residential	10	45, South
Norwich	New London, CT	0.76	Residential	41	66, North
Norwich	New London, CT	0.78	Residential	39	104, South
Norwich	New London, CT	1.02	Commercial	20	70, Southwest
Norwich	New London, CT	1.03	Residential	9	56, Southwest
Norwich	New London, CT	1.08	Residential	26	82, Northeast
Norwich	New London, CT	1.13	Residential	8	46, South
Norwich	New London, CT	1.17	Residential	10	19, South
Norwich	New London, CT	1.17	Residential	9	50, Northeast
Norwich	New London, CT	1.37	Residential	34	54, South
Norwich	New London, CT	1.38	Garage	2	22, South
Norwich	New London, CT	1.58	Residential	11	40, South
Norwich	New London, CT	1.59	Residential	35	108, North
Norwich	New London, CT	1.59	Residential	10	22, North
Norwich	New London, CT	1.63	Residential	42	142, South
Norwich	New London, CT	1.77	Residential	10	23, North
Norwich	New London, CT	1.79	Residential	28	78, South
Norwich	New London, CT	1.83	Residential	42	67, North
Norwich	New London, CT	1.85	Residential	10	32, South
Norwich	New London, CT	1.92	Residential	10	24, Northeast
Norwich	New London, CT	1.95	Residential	10	23, Northeast
Norwich	New London, CT	1.95	Residential	25	90, Southwest
Norwich	New London, CT	2.02	Residential	50	75, North
Norwich	New London, CT	2.03	Residential	28	78, South
Norwich	New London, CT	2.07	Residential	20	70, South
Norwich	New London, CT	2.49	Residential	9	34, North
Norwich	New London, CT	2.54	Residential	10	35, North
Norwich	New London, CT	2.56	Residential	10	38, South
Norwich	New London, CT	2.56	Residential	11	36, North
Norwich	New London, CT	2.57	Residential	10	37, South
Norwich	New London, CT	2.57	Residential	19	63, South
Norwich	New London, CT	2.58	Residential	19	70, North

Algonquin would utilize special construction methods designed for working in confined areas such as residential and commercially developed areas. These special construction methods are described in Algonquin's E&SCP. Algonquin would implement the following general measures to minimize construction-related impacts on all residences and other structures located within 50 feet of the construction right-of-way:

- attempt to maintain a minimum distance of 25 feet between any residence or business establishment and the edge of the construction work area;
- fence the boundary of the construction work area to ensure that construction equipment and materials, including the spoil pile, remain within the construction work area;

- install safety fence at the edge of the construction right-of-way for a distance of 100 feet on either side of a residence or business establishment;

- attempt to leave mature trees and landscaping intact within the construction work area unless the trees and landscaping interfere with the installation techniques or present unsafe working conditions;

- ensure piping is welded and installed as quickly as reasonably possible to minimize the amount of time a neighborhood is affected by construction;

- backfill the trench as soon as possible after the pipe is laid or temporarily place steel plates over the trench; and

- complete final cleanup, grading, and installation of permanent erosion control devices within 10 days after backfilling the trench, weather permitting.

Following construction, all residential areas would be restored to preconstruction conditions or as specified in written landowner agreements. Algonquin would reseed all disturbed lawns with a seed mixture acceptable to the landowner or comparable to the adjoining lawn. Landowners would be compensated for damages to ornamental shrubs and other landscape plantings, and would continue to have use of the right-of-way provided it does not interfere with the easement rights granted to Algonquin for construction and operation of the pipeline system. During the scoping period, landowners expressed concerns regarding ORV traffic along the right-of-way. In cooperation with landowners, Algonquin would make efforts to control unauthorized ORV traffic throughout the life of the Project, and signs, gates, and vehicle trails would be maintained as needed.

Algonquin provided site-specific residential construction plans to inform affected landowners of proposed measures to minimize disruption and to maintain access to the 23 residences located within 25 feet of the construction work area for the proposed facilities (see Appendix D). These site-specific construction plans include a dimensioned drawing depicting the residence in relation to the pipeline; workspace boundaries; the proposed permanent right-of-way; and nearby residences, structures, roads, and waterbodies. The site-specific plans also include a description of the construction techniques that Algonquin would use to reduce impacts on residences; and how Algonquin would ensure the trench is not excavated until the pipe is ready to be installed and that the trench would be backfilled immediately after pipe installation. In the draft EIS, we specifically asked for comments on the site-specific residential construction plans.

During the draft EIS comment period, two separate landowners commented on the placement of the construction right-of-way on their properties. Joshua and Lynn Perry expressed concern that the construction work area would be within 4 feet of the main building of their house and result in the removal of at least 30 mature trees, established shrubbery, and other landscaping and geographic features. Douglas and Mary Beth Lee requested that the construction right-of-way be shifted to avoid impacts on a forested area that provides a wooded buffer between the permanent pipeline right-of-way and a pond on their property. The Connecticut Siting Council also provided comments regarding the removal of the forested area on the Lee property. The comments of the Perrys, the Lees, and the Connecticut Siting Council and our specific responses to them are included in Appendix K.

To address these landowners' concerns, Algonquin adjusted the construction work area to maintain at least 34 feet between the workspace and the main building of the house and minimize tree clearing on the Perry's property and to maintain the forested buffer on the Lee's property. The revised

site-specific residential construction plans that illustrate Algonquin's efforts to address the landowner concerns are included in Appendix D of this final EIS.

Of the residences listed in table 4.8.3-1, 14 would be located within 10 feet of the proposed construction work area. Because of the increased potential for construction of the proposed Project to disrupt landscaping, utilities, and access to these residences, **we recommend that**:

- **Prior to construction, Algonquin should file with the Secretary evidence of landowner concurrence with the site-specific residential construction plans for all locations where the construction work area and fencing would be within 10 feet of a residence.**

We have found that providing a line of communication to landowners by the company assists in addressing construction and restoration issues in and near residential areas. Algonquin has not provided a discussion of how it intends to address landowner issues and concerns during and following construction. Therefore, **we recommend that:**

- **Algonquin should develop and implement an environmental complaint resolution procedure that remains active for at least 2 years following completion of construction of the E2W Project. The procedure should provide landowners with clear and simple directions for identifying and resolving their environmental mitigation problems/concerns during construction of the Project and restoration of the right-of-way. Algonquin should file the environmental complaint resolution procedure and mail the environmental complaint resolution procedure to each landowner whose property would be crossed by the respective Project with the Secretary prior to construction:**

  a. In its letter to affected landowners, Algonquin should:

    i. provide a local contact that the landowners should call first with their concerns; the letter should indicate how soon to expect a response;

    ii. instruct the landowners that, if they are not satisfied with the response, they should call Algonquin's Hotline, as applicable; the letter should indicate how soon to expect a response; and

    iii. instruct the landowners that, if they are still not satisfied with the response from Algonquin's Hotline, they should contact the Commission's Enforcement Hotline at (888) 889-8030, or at hotline@ferc.gov.

  b. In addition, Algonquin should include in its biweekly status reports a table that contains the following information for each problem/concern:

    i. the identity of the caller and the date of the call;

    ii. the identification number from the certificated alignment sheet(s) of the affected property and appropriate location by milepost;

    iii. a description of the problem/concern; and

    iv. an explanation of how and when the problem was resolved, will be resolved, or why it has not been resolved.

Implementation of Algonquin's general construction methods for working in proximity to residences and commercial facilities, site-specific residential construction plans, and our recommended environmental complaint resolution procedure would minimize disruption to residential and commercial areas to the extent practicable and promote restoration of these areas as soon as reasonably possible upon completion of construction.

4.8.3.2 Planned Developments

Algonquin contacted landowners and local officials in the City of Norwich to identify planned residential or commercial developments within 0.25 mile of the proposed facilities. No planned developments were identified within 0.25 mile of the E2W Project.

4.8.4 Recreation and Special Interest Areas

The proposed facilities would not cross any national or state designated Wild and Scenic Rivers, waterbodies listed on the NRI, Bureau of Land Management land, USDA land, Wetland Reserve Program land, Conservation Reserve Program land, registered natural landmarks, national forests, national parks, state parks, or Indian Reservations. However, the proposed facilities would affect two recreation and/or special interest areas. Table 4.8.4-1 lists the locations, land ownership, and crossing length for both of these areas. One of the areas is Mohegan Park, which would be crossed by the E-3 System Replacement between MPs 2.3 and 2.5. The park is owned by the City of Norwich and is currently considered as preserved open space that is open to the public. Activities available at the park include swimming, picnic areas, fishing, and nature trails. The park also houses flower gardens and a memorial rose garden.

TABLE 4.8.4-1

Recreation and Special Interest Areas Crossed by the HubLine/East to West Project

Mileposts	Name of Area	Land Ownership	Crossing Length (feet)	Area Affected (acres)	
				Construction	Operation [a]
2.3 – 2.5	Mohegan Park	City of Norwich	1,200	2.2	0.0
2.5 – 2.6	New Apostolic Church	Private	202	0.5	0.0

[a] The permanent right-of-way in these areas would be located entirely within Algonquin's existing permanent right-of-way and would not result in additional permanent impacts.

One of the primary concerns when crossing recreation and special interest areas is the impact of construction on the purpose for which the area was established (e.g., the recreational activities, public access, and resources the area aims to protect). Construction would alter visual aesthetics by removing existing vegetation and disturbing soils. Construction would also generate dust and noise, which could be a nuisance to recreational users. Construction could also interfere with or diminish the quality of the recreational experience by affecting wildlife movements or disturbing trails.

In general, impacts on recreational and special interest areas would be temporary and would be limited to the period of active construction, which typically would last only several days to several weeks in any one area. These impacts would be minimized by implementing Algonquin's E&SCP. Following construction, most open land uses would be able to continue. Algonquin would continue to consult with the landowners of recreation and special interest areas regarding the need for specific construction mitigation measures.

4.8.5 Hazardous Waste

Hazardous Waste Sites and Landfills

Sites identified within 1,000 feet of a pipeline centerline are generally considered to be indicators that a higher potential exists to encounter contamination during construction. Based on a review of 21 federal, state, and local government environmental databases, two potential hazardous waste sites were initially identified within 1,000 feet of the E-3 System Replacement centerline. A subsequent review of files at the CTDEP did not identify any sites within 1,000 feet of the pipeline centerline.

Algonquin would develop a Contamination Contingency Plan to address contaminated media if unexpectedly encountered during construction of the E2W Project. In general, if unanticipated hazardous materials/waste are encountered or suspected during construction, all construction work in the immediate vicinity would be halted until an appropriate course of action is determined. The plan would comply with all federal, state, and local regulations and would be submitted to the appropriate federal, state, and local regulatory agencies for review and approval.

Polychlorinated Biphenyl's

Polychlorinated biphenyls (PCBs) are a blend of chemical compounds that were used in a variety of industrial applications until their commercial manufacture was banned by the EPA in 1979. Before then, PCBs were introduced into many natural gas transmission lines in the United States through the use of PCB-containing lubricants at compressor station sites and in other operation and maintenance activities. Since 1981, the EPA has worked with pipeline operators to identify and remove PCBs from the nation's natural gas transmission systems.

Algonquin would treat any existing piping or equipment that has been in contact with natural gas in accordance with the EPA's PCB regulations contained within Title 40 CFR Part 761, as revised (CFR: June 29, 1998, Volume 63, No. 124), and in accordance with its Standard Operating Procedure. As described below, Algonquin's process of removing pipe and equipment from gas service includes liquids removal, inspecting for additional liquids during pipe removal, cutting and removal of pipe, sampling for the presence of PCBs within the removed parts, and appropriate disposal.

Liquids may be removed using pigging, draining valves and equipment, and purging methods. Pigging is required prior to removal of pipe and equipment except when the pipe or equipment cannot be pigged due to size or configuration. Purging of the line using nitrogen or air may be used to further dry the pipeline. Pipe and equipment would be inspected for liquids during removal at low points and water crossings. If liquids are found during the inspection process, they would be removed and handled appropriately.

The removed pipe and equipment would be transferred to an existing Algonquin maintenance facility where wipe sampling for PCBs would be conducted to classify the materials as unrestricted ($\leq$10 micrograms per 100 square centimeters ($\mu g/100\ cm^2$)), conditional (>10 and <100 $\mu g/100\ cm^2$) or restricted ($\geq$100 $\mu g/100\ cm^2$). Unrestricted materials may be stored without restriction and sold at Algonquin's discretion. Conditional and restricted material may be decontaminated or disposed of at a Toxic Substances Control Act landfill in accordance with all applicable federal and state regulations.

4.8.6 Visual Resources

Pipeline Facilities

Visual resources along the proposed pipeline route are a function of geology, climate, and historical processes, and include topographic relief, vegetation, water, wildlife, land use, and human uses and development. Although stretches of upland forest are present along the proposed route, the proposed pipeline would be installed almost entirely within Algonquin's existing right-of-way. As a result, along the majority of the proposed Project, visual resources have been previously affected by other activities.

Visual impacts associated with the construction right-of-way and temporary extra workspaces would include the removal of existing vegetation and the exposure of bare soils, as well as earthwork and grading scars associated with heavy equipment tracks, trenching, blasting (if required), rock formation alteration or removal, and machinery and tool storage. Other visual effects could result from the removal of large individual trees that have intrinsic aesthetic value; the removal or alteration of vegetation that may currently provide a visual barrier; or landform changes that introduce contrasts in visual scale, spatial characteristics, form, line, color, or texture.

Visual impacts would be greatest where the pipeline route parallels or crosses roads and the pipeline right-of-way may be seen by passing motorists, on residents where vegetation used for visual screening of Algonquin's existing right-of-way or for ornamental value would be removed, and in forested areas. The duration of visual impacts would depend on the type of vegetation that is cleared or altered. The impact of vegetation clearing would be shortest in areas consisting of short grasses and scrub-shrub vegetation and in agricultural lands, where the re-establishment of vegetation following construction would be relatively fast (generally less than 5 years). The impact would be greater in forest land, which would take many years to regenerate mature trees. The greatest potential visual impact would result from the removal of large specimen trees, which would take longer than other vegetation types to regenerate and would be prevented from re-establishing on the permanent right-of-way.

In locations where trees that serve as a visual buffer would be removed, Algonquin would discuss these screening issues with individual landowners during easement negotiations. In areas where all visual screening is removed, Algonquin would consider strategic planting of fast-growing evergreens. As discussed in section 4.8.1 and shown in table 4.8.1-3, we requested that Algonquin provide site-specific justification for all areas where a wider construction right-of-way or temporary extra workspaces would be needed and specify the land use (vegetative cover type) that would be affected by each extra workspace. Our impact assessment of each temporary extra workspace request took vegetative cover type into consideration to ensure unnecessary tree clearing is avoided and visual buffers are preserved to the extent reasonable and practicable.

After construction, all disturbed areas (excluding the footprint for aboveground facilities) would be restored in compliance with federal, state, and local permits; landowner agreements; and Algonquin's easement requirements.

Aboveground Facilities

The aboveground facilities associated with the E2W Project would be the most visible features and would result in long-term impacts on visual resources. The magnitude of these impacts depends on factors such as the existing landscape, the remoteness of the location, and the number of viewpoints from which the facility could be seen. The majority of these facilities would be located within Algonquin's existing right-of-way. As a result, the aboveground facilities would not result in a significant impact on the surrounding visual character of the Project area. Algonquin would continue to work with landowners and applicable agencies to address the need for visual screening of aboveground facilities.

Abandoned Facilities

In areas along the E-3 System Replacement where the pipeline would be abandoned in place, the existing pipeline is located below ground. Therefore, the abandonment of these segments would not result in additional permanent impacts on visual resources.

Access Roads

Algonquin proposes to use four existing roads for permanent right-of-way or aboveground facility access. These existing access roads are paved, gravel, or dirt roads that may be improved as needed for construction and operations/maintenance. Because these are existing roads, use as access roads would not result in significant increased impacts on visual resources.

4.9 SOCIOECONOMICS

Some of the potential socioeconomic effects from construction, operation, and maintenance of the Project are related to the number of construction workers that would work on the Project and their impact on population, public services, and temporary housing during construction. Other potential effects are related to construction, such as increased traffic or disruption of normal traffic patterns. Other effects associated with the Project include increased property tax revenue, increased job opportunities, and increased income associated with local construction employment.

The potential impact of the Project on land use and residences in the Project area is discussed in section 4.8.1. A discussion of the Project's effects on population and employment, housing, public services, transportation and traffic, and tax revenue is provided below as well as a discussion of the impact of the Project on property values.

4.9.1 Population, Economy, and Employment

Table 4.9.1-1 provides a summary of selected demographic and socioeconomic conditions for the E2W Project area. New London County, Connecticut has a population density of 389 people per square mile with a population of 264,519 (U.S. Census Bureau, 2008). The county-level civilian workforce is 137,481 people.

TABLE 4.9.1-1

Existing Economic Conditions in the Vicinity of the HubLine/East to West Project

State/County/ Municipality	Population (2008) [a]	Population Density (Persons/sq. mile, 2008) [a]	Per Capita Income (1999) [a]	Civilian Workforce (2000) [b]	Unemployment Rate, April-May 2009 (percent) [b]	Top Three Industries [c]
Connecticut	3,501,252	702.9	$28,766	1,875,100	7.9 [c]	E,M,R
New London County	264,519	389.0	$24,678	137,481	7.6 [c]	E,A,M
City of Norwich	36,324	1,274.9	$20,742	20,885	9.1 [c]	A,E,R

[a] Source: U.S. Census Bureau, Census, 2008..

[b] Source: Connecticut Department of Labor, Updated May 26, 2009. http://www.ctdol.state.ct.us/lmi/laus/lmlaus.htm.

[c] E = Education, health, and social services
M = Manufacturing
R = Retail trade
A = Arts, entertainment, recreation, accommodation, and food services

The major occupations in the Project area are in education, health, and social services. Manufacturing and retail trade are also main industries in the area. New London County had a lower county-wide per capita income of $24,678 compared to the state average of $28,766. The unemployment rate in New London County was 7.6 percent in May 2009.

Construction of the E2W Project would temporarily increase the population in the general vicinity of the Project area. Algonquin estimates that the construction of the E-3 System Replacement and associated aboveground facilities would begin in the April 2010 and continue until late 2010. One construction spread, with a workforce of about 75 workers will be required for construction of the pipeline and associated aboveground facilities.

The construction workforce would include both local and non-local workers. Algonquin anticipates that approximately 40 to 50 percent of the construction workers (about 30 to 38 workers) would be local hires. The local supply of construction workers needed for the E2W Project is expected to be derived from workers employed in the construction industry in Connecticut. Additional construction personnel hired from outside the Project area would include supervisory personnel and inspectors who would temporarily relocate to the Project area.

Project-area population impacts are expected to be temporary and proportionally small. The total population change would equal the total number of non-local construction workers, plus any family members accompanying them. Given the brief construction period, most non-local workers are not expected to be accompanied by their families. Assuming 60 percent of the total construction workforce is non-local (45 workers) and relocate to the Project area with family members, the population in the Project area would increase by approximately 117 people, based on a typical household size of 2.59 persons (U.S. Census Bureau, 2008). Given the population of New London County (264,519), the addition of 117 people would result in less than a 0.1 percent change. Construction of the Project would have a negligible impact on the local population.

When completed, the E2W Project would be operated in conjunction with Algonquin's system. As a result, no new permanent employees would be added to operate and maintain the pipeline and aboveground facilities associated with the Project.

4.9.2 Housing

Housing statistics for New London County, Connecticut are presented in table 4.9.2-1. In 2000, New London County had 10,839 vacant housing units with rental vacancy rates of 6.4 percent.

TABLE 4.9.2-1

Housing Statistics in the Vicinity of the HubLine/East to West Project

State/County	Owner Occupied	Renter Occupied	Median Monthly Housing Costs [a]	For Seasonal or Occasional Use [b, c]	Vacant Housing Units [b]	Rental Vacancy Rate (percent)	Number of Hotels/ Motels [d]
Connecticut	922,957 [a]	400,474 [a]	886	23,517	106,807	8.0 [e]	N/A[f]
New London County	72,324 [d]	31,808 [d]	562	33,273 rental units, 5,236 additional seasonal	10,839	6.4 [d]	39

Source:

[a] U.S. Census Bureau, 2005-2007 American Community Survey, 3-year Estimates.

[b] Source: U.S. Census Bureau, Census 2000.

[c] Seasonal housing units are those intended for occupancy only during certain seasons of the year and are found primarily in resort areas. Housing units held for occupancy by migratory labor employed in farm work during the crop season are tabulated as seasonal. As of the first quarter 1986 vacant seasonal mobile homes are being counted as a part of the seasonal housing inventory. U.S. Census Bureau, 2000.

[d] E-podunk. 2007. http://www.epodunk.com/.

[e] U.S. Census Bureau, Housing and Household Economic Statistics Division February 20, 2008.

[f] The number of hotels/motels on a state level is highly variable and not applicable for this Project.

Temporary housing availability varies seasonally and geographically within the communities near the proposed facilities. Temporary housing is available in the form of daily, weekly, and monthly rentals in motels, hotels, campgrounds, and recreational vehicle parks. The demand for temporary housing in the

Project area is generally greatest during the summer months when tourism is at its highest. Table 4.9.2-1 provides the vacant housing units and median monthly housing costs along with the number of hotels/motels in the towns closest to the proposed facilities. Other available temporary housing such as bed and breakfast facilities, apartments, and vacation properties, as well as those in other towns/cities within commuting distance of the Project area (e.g., Hartford and New Haven, Connecticut) are not included. Therefore, the availability of temporary housing is substantially greater than presented in table 4.9.2-1.

The E2W Project is expected to have a short-term positive impact on the area rental industry through increased demand and higher rates of occupancy; however, no significant impacts on the local housing markets are expected. Assuming that the local construction workers do not require housing, a total of 45 housing units for non-local workers may be required during peak construction activities. Given the vacancy rate (6.4 percent) and the available housing options in the Project area, construction crews should not encounter difficulty in finding temporary housing.

4.9.3 Public Services

Services and facilities available in New London County include hospitals, full-service law enforcement, paid and volunteer fire departments, and schools. Each municipality in the socioeconomic impact area has its own local police department and fire department. New London County also has a Sheriff's department. In addition, New London County has an independent school district operating its own public school system with the exception of a few regional schools. The small influx of non-local workers and associated family members required for the Project would result in minor, temporary, or no impact on local community facilities and services.

4.9.4 Transportation and Traffic

The local road and highway system in the vicinity of the proposed Project facilities is readily accessible by interstate highways, U.S. highways, state highways, secondary state highways, county roads, and private roads. The principal north-south roadway is Interstate 95 and the principal east-west roadway is Interstate 90. Most local public roads in the vicinity of the E2W Project are paved. Construction of the proposed Project could result in minor, short-term impacts along some roads and highways due to the movement and delivery of equipment and materials. To the extent feasible, existing public and private road crossings along the proposed pipeline route would be used as the primary means of accessing the right-of-way. Algonquin proposes to use four access roads during construction and operation of the Project, all of which are existing roads as discussed in section 2.2.3.

The E2W Project would cross 10 public roads. These roads are listed in table 4.9.4-1 along with the proposed construction method. Figure 4.9.4-1 shows the state highways that would be crossed by the Project. All roads would be crossed using either the conventional open-cut or road bore method depending on permit conditions. These crossing methods are described in section 2.3.2. Road crossing permits would be obtained from applicable agencies. Permit conditions would ultimately dictate the crossing method and the day-to-day construction activities at road crossings. No railroads would be crossed.

To minimize traffic delays at open-cut road crossings, Algonquin would establish detours before cutting these roads. If no reasonable detours are feasible, at least one traffic lane of the road would be left open, except for brief periods when road closure would be required to lay the pipeline. Appropriate traffic management and signage would be set up and necessary safety measures would be developed in compliance with applicable permits for work in the public roadway. Algonquin would make arrangements with local officials to have traffic safety personnel present during periods of construction.

TABLE 4.9.4-1

Public Roads Crossed by the HubLine/East to West Project [a]

Milepost	Roadway Name	Road Surface	Municipality	Proposed Construction Method
0.2	Plain Hill Road	Asphalt	Norwich	Open Cut
0.4	Bog Meadow Road	Asphalt	Norwich	Open Cut
0.6	Interstate 395 (Connecticut Turnpike)	Asphalt	Norwich	Bore
0.7	Case Street	Asphalt	Norwich	Open Cut
1.2	Scotland Road	Asphalt	Norwich	Open Cut
1.4	Reservoir Road	Asphalt	Norwich	Open Cut
1.6	Canterbury Turnpike	Asphalt	Norwich	Open Cut
1.8	Beebe Road	Asphalt	Norwich	Open Cut
1.8	Harland Road	Asphalt	Norwich	Open Cut
2.5	Mohegan Park	Asphalt	Norwich	Open Cut

[a] Does not include public roadways that have never been developed or have been abandoned and are no longer used but are depicted on the Project alignment sheets based solely on tax map data.

The daily commuting of the construction workforce to the Project area could also temporarily affect traffic and create roadside parking hazards. Algonquin estimates that a maximum of 75 people would be working on the pipeline route at any one time. To minimize potential effects on traffic associated with these workers, Algonquin would encourage construction workers to share rides to the construction right-of-way. Contractors may also provide buses to move workers from common parking areas to the construction work area. Algonquin would schedule construction work within roadways and specific crossings to avoid commuter traffic and school buses to the greatest extent practical.

Because pipeline construction work is generally scheduled to take advantage of daylight hours, workers would commute to and from the pipeline right-of-way during off-peak hours (e.g., before 7:00 a.m. and after 6:00 p.m.). Additionally, construction would move sequentially along the proposed pipeline route; therefore, traffic flow impacts would be temporary on any given section of roadway.

In addition to the construction workforce, the delivery of construction equipment and materials to the construction work area could temporarily congest existing transportation networks at specific locations. Equipment would be dropped off in one location and would then move in a linear direction along the right-of-way. As a result, most equipment would be located on the pipeline right-of-way and would not significantly affect traffic on local roads after its initial delivery.

Algonquin and its contractors would comply with local weight restrictions and limits, and would keep roads free of soil that may be deposited by construction equipment. The surfaces of roadways in the general area are not expected to be affected by heavy equipment because such equipment would be restricted to off-roadway operation once it reaches the E2W Project area. The need for road detours and traffic control measures associated with the movement of large construction vehicles may temporarily increase the work load of county law enforcement.

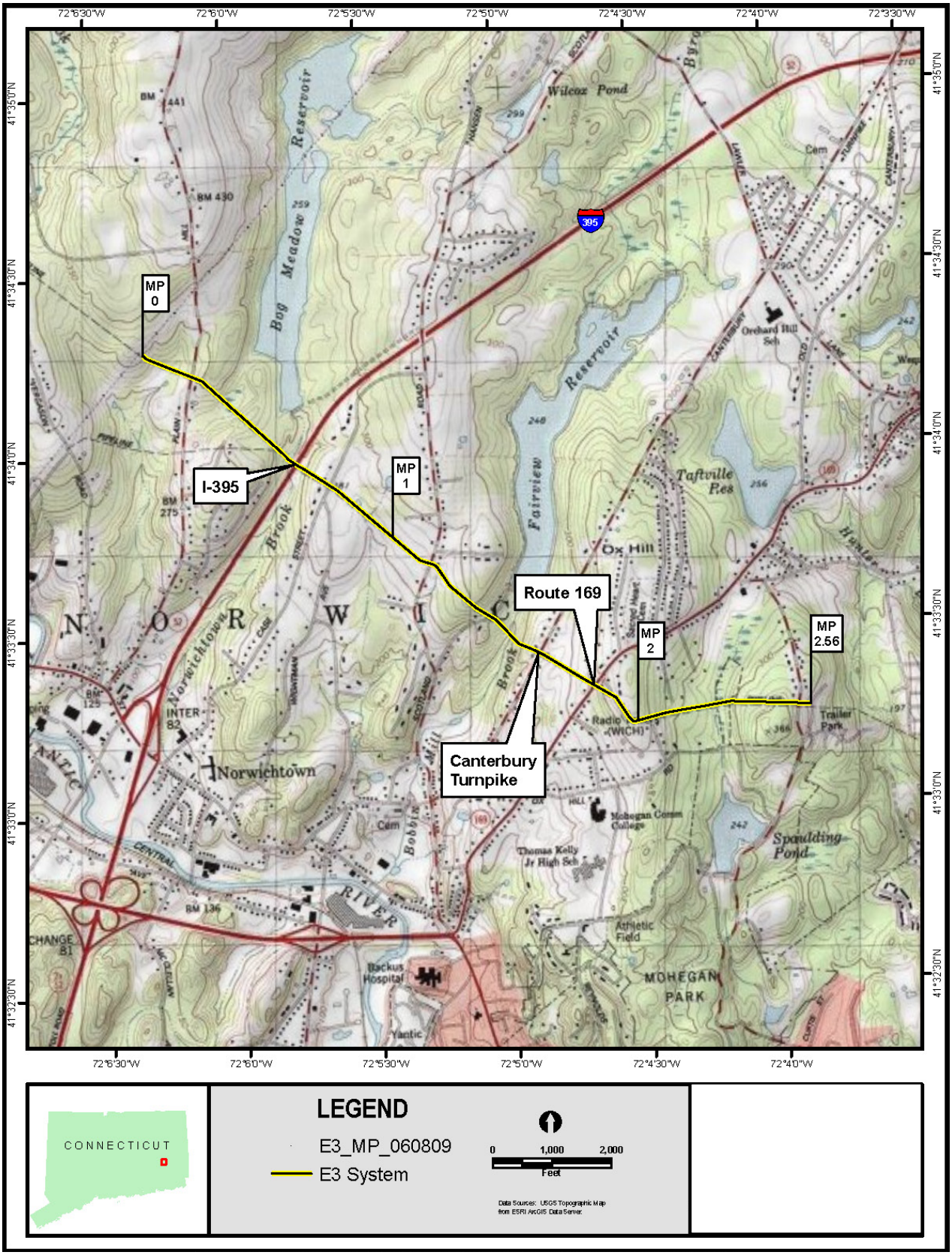

Figure 4.9.4-1
HubLine/East to West Project
State Highway Crossings in Connecticut

4.9.5 Agriculture

Project construction and operation would result in the temporary disturbance of 0.8 acre of agricultural land (i.e., cultivated fields and hayfields) and permanent disturbance of less than 0.1 acre (see section 4.8.1). No areas currently in commercial timber production would be affected.

Algonquin would negotiate fair compensation for loss of crop production with each affected landowner and would conduct post-construction monitoring of crossed agricultural lands to identify areas that might need additional restoration.

4.9.6 Property Values

Comments were received during the scoping process regarding property devaluation and increases in insurance rates associated with the proposed Project. It is not anticipated that the E2W Project would negatively impact any property values outside the proposed pipeline right-of-way. Landowners who believe that their property values have been negatively impacted can appeal to the local tax agency for reappraisal and reduction of taxes.

In 2001, Allen, Williford & Seale, Inc. prepared a study for the Interstate Natural Gas Association of America Foundation, Inc. to determine the impact of natural gas pipelines on real estate. The results of the study revealed that there is no significant impact on property sales located along natural gas pipelines and that the pipeline size or the product carried did not impact the sale price. The study also revealed that there were no significant impacts on demand for properties within the geographically diverse areas and the presence of a pipeline did not impede development of the surrounding properties, had no significant impact on development decisions (e.g., lot size), and did not impact specific property types more or less severely than other property types (Allen, Williford & Seale, Inc., 2001).

We are not aware of any situations where property owners' insurance rates have increased as a result of the location or proximity of aboveground or belowground high pressure natural gas pipeline facilities, nor are we aware of any situation where a landowner's ability to obtain insurance was affected.

4.9.7 Tax Revenues

Construction and operation of the Project would have beneficial impacts on local sales tax revenue. Table 4.9.7-1 provides the estimated payroll, cost of materials purchased locally, and sales tax revenues associated with construction of the E2W Project. Payroll taxes would also be collected from the workers employed on the Project. Algonquin anticipates that the total payroll for the Project would be approximately $9.3 million during the construction phase. Construction payroll would be approximately $6.7 million in Connecticut and approximately $2.6 million in New Jersey.

TABLE 4.9.7-1

Socioeconomic Impact Resulting from Construction and Operation of the HubLine/East to West Project

	Construction			Operation
State	Construction Payroll (Total)	Cost of Materials Purchased (Total)	Gross Plant Taxes (annual)	Ad Valorem (2009-2018)
Connecticut	6,712,515	1,533,921	20,618,165	13,387,779 [a]
New Jersey	2,624,990	1,547,261	7,990,191	0
Total	9,337,505	3,081,182	28,608,356	13,387,779

[a] Averaged between 2009-2018.

These activities would temporarily increase the tax revenue for the state. Project operation and maintenance activities would result in long-term benefits from an estimated $400,000 in annual property taxes. Algonquin estimates that the E2W Project would contribute approximately $13.4 million in ad valorem taxes (2009 to 2018) within the area affected by the Project. The amount paid would be determined by the value of the facilities and corresponding tax rates.

Project construction would result in short-term, beneficial impacts in terms of increased payroll and local material purchases. Because about 40 to 50 percent of the workers are expected to be local, and non-local workers would temporarily relocate to the Project vicinity, a substantial portion of the payroll would be spent with local vendors and businesses. Algonquin estimates that some additional money would be spent locally on the purchase of equipment and materials. While most of the materials for E2W Project construction would be purchased from national vendors, common supplies (e.g., stone and concrete) would be purchased, as available, from vendors within New London County, Connecticut. Construction of the E2W Project would also result in increased state and local sales tax revenues associated with the purchase of some construction materials as well as goods and services by the construction workforce. The approximate cost of materials is $3.1 million.

4.10 CULTURAL RESOURCES

Section 106 of the NHPA (16 USC 470) requires that federal agencies take into account the effects of their undertakings (including the issuance of Certificates) on properties listed on or eligible for listing on the National Register of Historic Places (NRHP) and to provide the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on the undertaking. Algonquin, as our non-federal representative, is assisting the FERC in meeting its obligations under section 106 and the implementing regulations in Title 36 CFR Part 800.

4.10.1 Cultural Resources Surveys

4.10.1.1 Survey Methodology

Where surveys were required, Algonquin conducted a site file search and literature review to identify previously recorded cultural resources within 1 mile of the proposed Project. Algonquin conducted a survey for standing structures and architectural resources along a 1,000-foot-wide corridor centered on the proposed pipeline centerline. The survey corridor for archaeological sites was 200 feet wide centered on the proposed pipeline centerline (which included typical temporary extra workspaces), as well as one temporary extra workspace that extended outside the 200-foot-wide survey corridor. The survey corridor for access roads was 25 feet wide.

4.10.1.2 New Jersey

The New Jersey State Historic Preservation Office (SHPO) recommended that the proposed modifications to the existing Hanover Compressor Station in Morris County would have no effect on historic properties and no cultural resources surveys would be required. We concur.

4.10.1.3 Connecticut

Aboveground Resources

The E-3 System Replacement and Associated Aboveground Facilities – There are no historic architectural properties listed on or eligible for listing on the NRHP within the direct or indirect area of potential effect (APE) for the pipeline route or access roads. One aboveground historic property was identified within the indirect APE of the temporary extra workspace that is adjacent to the pipeline construction work area. This aboveground resource is an 1890 residence located at 180 Scotland Road in Norwich. Indirect effects on this property were determined to be temporary and minor, and no further work was recommended. The Connecticut SHPO commented stating that the Project would have no effect on aboveground historic properties. We concur..

Archaeological Sites

The E-3 System Replacement and Associated Aboveground Facilities – Four archaeological sites were located during the survey. Of these sites, two isolated finds or find spots were recommended as not eligible for listing on the NRHP and no further work is recommended. The other two sites, the Tower Hill Road and Spaulding Pond sites, were recommended as potentially eligible for listing on the NRHP and additional evaluations were recommended to determine the NRHP eligibility of these sites. The Connecticut SHPO agreed with these recommendations.

Algonquin completed evaluations at the Tower Hill Road and Spaulding Pond sites and the results indicate that the Tower Hill Road site is significant and eligible for listing on the NRHP. The results also indicate that the Spaulding Pond site is not eligible for listing on the NRHP and no further work is recommended. The Connecticut SHPO agreed with the results of the evaluations. We concur.

Algonquin would provide a treatment plan for the Tower Hill Road site to the FERC and the Connecticut SHPO when it is complete. We have included a recommendation in section 4.10.4 to ensure the Connecticut SHPO and the ACHP have an opportunity to comment on the treatment plan prior to construction.

Stone Wall Surveys – Algonquin submitted a Stone Wall Survey and Restoration Plan for the E-3 System Replacement to the FERC and the Connecticut SHPO. The document provides an inventory of all stone walls that would be intersected and potentially impacted by the Project, photographs of the stone walls, and a plan for restoration of each wall regardless of any formal NRHP designation. The Connecticut SHPO commented that field stone walls possess historic and cultural importance and warrant consideration for the NRHP. Although the Project is considered to be an effect on the walls, the Connecticut SHPO has accepted the proposed Stone Wall Restoration Plan as a condition of its finding of no adverse effect. We concur.

4.10.2 Native American Consultation

Algonquin consulted the Mashantucket Pequot Tribe, the Mohegan Tribe, the Connecticut Indian Affairs Commission, and the Eastern Pequot Tribal Nation (not federally recognized) in Connecticut to provide them an opportunity to comment on the proposed Project. The FERC sent copies of the NOI to these same tribes.

No responses have been received to date from the Connecticut Indian Affairs Commission, the Mohegan Tribe, or the Eastern Pequot Tribal Nation. The Mashantucket Pequot Tribe requested that it be consulted regarding potential impacts on locations of tribal significance within the vicinity of the Project in Connecticut. Additionally, the Mashantucket Pequot Tribe requested that it be notified of any Native cultural materials encountered in the vicinity of the Project.

On April 4, 2008, in response to a request from the FERC, Algonquin contacted Kathleen Knowles, of the Mashantucket Pequot Tribe, inquiring as to whether the Project facilities in Connecticut would cross the Mashantucket Pequot Reservation. Ms. Knowles indicated that: "all of the archaeological sites, sites of traditional, cultural, and historic significance within S.E. CT and S.W. RI are of concern to the Mashantucket Pequot Tribe and, therefore, should be included in the consultation process."

On April 7, 2008, Algonquin and its archaeological consultant met with representatives from the Mashantucket Pequot Tribe to gather information from the tribe and to listen to concerns about the Project. Representatives from the tribe were given a tour of the E-3 System Replacement right-of-way before the reduction in the Project scope and indicated a particular interest in sites that are located in an area that is of traditional cultural and religious significance to the Mashantucket Pequot Tribe but no longer affected by the Project. The Tower Hill Road site is not within this area of cultural and religious significance; however, Algonquin will continue to provide the tribe with Project updates pertaining to the site mitigation plans and findings.

4.10.3 Unanticipated Discoveries Procedures

Algonquin has prepared a plan to be used in the event any unanticipated historic properties or human remains are encountered during construction.[2] The plan provides for the notification of interested parties, including Indian Tribes, in the event of any discovery. The Connecticut SHPO provided

[2] The Unanticipated Discoveries Procedures can be viewed on the FERC Internet website at http://www.ferc.gov as part of Algonquin's Environmental Report filed on June 9, 2008. Using the "eLibrary" link, select "Advanced Search" from the eLibrary menu and enter 20080612-0112 in the "Accession Number" field. They are also available for public inspection at the FERC's Public Reference Room in Washington, DC (call (202) 502-8317 for instructions).

comments on the plan. Algonquin revised the plan in response to the comments. We find the revised plan to be acceptable.

4.10.4 General Impacts and Mitigation

Construction and operation of the pipeline and associated facilities could affect historic properties. Direct effects could include destruction or damage to all, or a portion of an archaeological site, or alteration or removal of a historic property. Indirect effects could include the introduction of visual, atmospheric, or audible elements that affect the setting or character of a historic property.

Compliance with section 106 of the NHPA has not been completed for the proposed Project. The FERC, in consultation with the Connecticut SHPO, has determined that the Tower Hill Road site is eligible for listing on the NRHP and cannot be avoided. Algonquin must prepare a treatment plan, in consultation with the appropriate parties, to mitigate adverse effects. The FERC would need to execute a Memorandum of Agreement (MOA) with the Connecticut SHPO for the resolution of adverse effects, and provide the ACHP an opportunity to comment in accordance with Title 36 CFR Part 800.6. Implementation of the treatment plan would occur only after certification of the Project and the FERC provides written notification to proceed.

To ensure that the FERC's responsibilities under the NHPA and its implementing regulations are met, **we recommend that:**

- **Algonquin should not begin implementation of any treatment plans/mitigation measures (including archaeological data recovery); construction of facilities; or use of all staging, storage, or temporary work areas and new or to-be-improved access roads until:**

  a. Algonquin files with the Secretary the treatment plan for the Tower Hill Road site, and the Connecticut SHPO's comments on the treatment plan;

  b. the FERC executes an MOA with the Connecticut SHPO, and provides the ACHP with an opportunity to comment; and

  c. the Director of OEP notifies Algonquin in writing that the treatment plan/mitigation measures may be implemented and/or construction may proceed.

  All material filed with the Secretary containing location, character, and ownership information about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering: "CONTAINS PRIVILEGED INFORMATION - DO NOT RELEASE."

4.11 AIR QUALITY AND NOISE

4.11.1 Air Quality

4.11.1.1 Existing Air Quality and Regulatory Requirements

The piping changes at the existing Hanover Compressor Station and activities associated with installation of the E-3 System Replacement pipeline and associated aboveground facilities would generate air emissions during construction. No additional compression would be needed at the Hanover Compressor Station, and Algonquin does not anticipate an increase in the hours of operation or fuel use of the existing combustion turbines and compressor engines following the piping modifications. Therefore, with the exception of GHG emissions, there would be no air emissions generated by the Project facilities or activities during operation.

The primary pollutants emitted by construction activities are NO_x, volatile organic compounds (VOC), particulate matter less than 10 microns in aerodynamic diameter (PM_{10}), particulate matter less than 2.5 microns in aerodynamic diameter ($PM_{2.5}$), sulfur dioxide (SO_2), and carbon monoxide (CO).

Air quality in the United States is regulated by federal statutes in the CAA and its amendments. Other state and local regulations have been promulgated that further regulate air quality. The air quality regulations that are potentially applicable to the E2W Project include:

- National Ambient Air Quality Standards (NAAQS);
- Conformity of General Federal Actions; and
- State-level diesel idling regulations.

National Ambient Air Quality Standards – Ambient air quality is protected by federal, state, and local regulations. The EPA has developed NAAQS for certain criteria pollutants. These criteria pollutants are: nitrogen dioxide, SO_2, PM_{10}, $PM_{2.5}$, CO, ozone, and lead. States and municipalities are free to adopt ambient air quality standards more stringent than the federal NAAQS; however, Connecticut and New Jersey have adopted the federal NAAQS.

Areas are designated Attainment, Unclassifiable, Nonattainment, or Maintenance on a pollutant-by-pollutant basis. Areas where the ambient air pollutant concentration is determined to be below the applicable ambient air quality standard are designated Attainment. Areas where no data are available are designated Unclassifiable. Areas where the ambient air concentration is greater than the applicable ambient air quality standard are designated Nonattainment. Areas that have been designated Nonattainment but have since demonstrated compliance with the ambient air quality standard(s) are designated Maintenance for that pollutant. Maintenance areas are treated similarly to Attainment areas for the permitting of stationary sources; however, specific provisions may be incorporated through the state's approved maintenance plan to ensure that the air quality would remain in compliance with the ambient air quality standard(s) for that pollutant.

The status of areas in Connecticut and New Jersey that would be affected by the E2W Project can be found in Title 40 CFR Part 81.307 and 331, respectively, and shown in table 4.11.1-1. Both New London County, Connecticut is designated Nonattainment for ozone. Morris County, New Jersey is designated Nonattainment for ozone and $PM_{2.5}$.

TABLE 4.11.1-1

Attainment Status for Counties Affected by the HubLine/East to West Project

County, State	Attainment/Unclassifiable	Nonattainment [a]
New London County, CT	SO_2, NO_x, PM_{10}, $PM_{2.5}$, and CO	O_3 (1-hour serious, 8-hour moderate)
Morris County, NJ	SO_2, NO_x, PM_{10}, and CO	O_3 (1-hour severe-17, 8-hour moderate), $PM_{2.5}$

[a] Although the 1-hour ozone standard has been replaced by the 8-hour ozone standard, the 1-hour ozone designations will remain in effect until the states have modified their regulations to implement the 8-hour standard.

[b] Carbon monoxide Attainment area with a maintenance plan.

SO_2 = Sulfur dioxide.
NO_x = Nitrogen oxides.
PM_{10} = Particulate matter less than 10 microns in aerodynamic diameter.
$PM_{2.5}$ = Particulate matter less than 2.5 microns in aerodynamic diameter.
CO = Carbon monoxide.
O_3 = Ozone.

Conformity of General Federal Actions – A conformity analysis must be conducted by the lead federal agency if a federal action would result in the generation of emissions that would exceed the conformity threshold levels (*de minimis*) of the pollutant(s) for which an air basin is in Nonattainment or designated Attainment with a maintenance plan. According to section 176(c)(1) of the CAA (Title 40 CFR Part 51.853), a federal agency cannot approve or support any activity that does not conform to an approved State Implementation Plan. Conforming activities or actions should not, through additional air pollutant emissions:

- cause or contribute to new violations of the NAAQS in any area;
- increase the frequency or severity of any existing violation of any NAAQS; or
- delay timely attainment of any NAAQS or interim emission reductions.

General conformity assessments must be completed when the total direct and indirect emissions of a planned project would equal or exceed specified pollutant thresholds per year in each Nonattainment area or Attainment area with a maintenance plan. FERC staff reviewed information provided by Algonquin regarding direct and indirect project emissions and determined that the proposed Project would not exceed the relevant general conformity *de minimis* thresholds. Therefore, a conformity analysis is not required for the proposed Project.

State-level Diesel Idling Regulations - Connecticut and New Jersey have developed standards to limit emissions from diesel engines through idling restrictions (i.e., 310 CMR 7.111b; Regulation of Connecticut State Agencies Title 22a section 22a-174-19; and New Jersey Administrative Code Title 7, Chapter 27, Subchapter 14). The construction phase of the proposed Project would result in the generation of diesel combustion emissions associated with the operation of construction equipment and vehicles that would be subject to the applicable diesel idling regulations for the state in which the activities would occur.

4.11.1.2 Air Emission Impacts and Mitigation

Construction Emissions

Construction activities for the proposed facilities would result in temporary increases in emissions of some pollutants at the existing Hanover Compressor Station and along the pipeline route due to the use of equipment powered by diesel fuel or gasoline engines. Construction activities would also result in the temporary generation of fugitive dust due to land clearing, ground excavation, and cut and fill operations.

Indirect emissions during the construction portion of the Project would be generated by delivery vehicles and construction worker commuting.

Algonquin estimated emissions from construction activities based upon the anticipated types of non-road and on-road equipment and their projected level of use, including estimates for emissions associated with construction work travel to and from the construction site. Small amounts of natural gas (methane) would be released during blowdown events during construction. Algonquin does not plan to use open burning for vegetation clearing; therefore, no emissions from open burning activities have been included in the estimates. Table 4.11.1-2 presents the estimated construction emissions.

TABLE 4.11.1-2

Estimated Construction Emissions for the HubLine/East to West Project (tons)

Construction Activity	NO_x	CO	$PM_{10}/PM_{2.5}$	SO_2	VOC	HAPS
E-3 System Replacement	5.67	27.79	0.17	0.24	1.38	0.084
Piping Modifications at the Hanover Compressor Station	1.17	11.15	0.06	0.06	0.51	0.014

NO_x = Nitrogen oxides.
CO = Carbon monoxide.
PM_{10} = Particulate matter less than 10 microns in aerodynamic diameter.
$PM_{2.5}$ = Particulate matter less than 2.5 microns in aerodynamic diameter.
SO_2 = Sulfur dioxide.
VOC = Volatile organic compounds.
HAPS = Hazardous Air Pollutants.

Additionally, Algonquin estimated fugitive particulate (dust) emissions from the compressor station modification and pipeline construction activities, including fugitive particulate emissions from travel on paved roadways. Table 4.11.1-3 presents the estimated fugitive particulate emissions from construction activities.

TABLE 4.11.1-3

Estimated Fugitive Particulate Emissions from Construction of the HubLine/East to West Project (tons)

Construction Activity	TSP	PM_{10}	$PM_{2.5}$
E-3 System Replacement	35.16	35.16	35.16
Paved Roadway Fugitive Emissions	5.92	0.93	0.09

TSP = Total suspended particulate.
PM_{10} = Particulate matter less than 10 microns in aerodynamic diameter.
$PM_{2.5}$ = Particulate matter less than 2.5 microns in aerodynamic diameter.

Algonquin has provided a Project-specific Dust Control Plan (see Appendix F) that specifies mitigation measures for dust abatement. These measures include:

- wet suppression through the application of water using water trucks;
- reducing vehicular speed for vehicles and equipment traveling along the construction right-of-way;
- installing gravel pad entrances at the intersection of the right-of-way and each paved intersection to reduce the tracking of mud and soil from the right-of-way onto the paved roadway;

- the use of a palliative such as calcium chloride; and
- temporary mulching or seeding of spoil piles.

In accordance with the Dust Control Plan, the need to implement dust control measures during construction would be assessed daily by the contractor and the EI. The contractor would be responsible for implementing the appropriate measure(s). The EI would monitor the contractor's compliance with the plan and would have the authority to order corrective action. We reviewed Algonquin's Dust Control Plan and find it acceptable.

The construction phase of the proposed Project would also result in the generation of diesel combustion emissions associated with the operation of construction equipment and vehicles. These construction activities would be subject to diesel idling restrictions developed by Connecticut and New Jersey. Algonquin's estimate of construction-related emissions for the E2W Project presented in table 4.11.1-2 includes diesel combustion emissions. Algonquin has committed to employ best management practices when operating construction equipment and would comply with all applicable state regulations regarding equipment operation with a goal to minimize diesel emissions to the extent feasible.

Because the construction emissions generated by the proposed Project would be temporary in nature and Algonquin would use best management practices to mitigate construction emissions to the extent practicable, the construction emissions would not result in significant impacts on air quality.

Greenhouse Gas Emissions

CO_2 emissions are a product of natural and anthropogenic activities, including fossil fuel combustion. Although CO_2 is not a regulated pollutant with respect to the CAA, it is associated with GHG emissions, along with other gases such as methane and chlorofluorocarbons.

Construction of the E2W Project would generate emissions of CO_2 as a primary product of combustion of the diesel and gas engines used to power construction equipment and vehicles. Emissions from anticipated pipeline blowdown events would also result from the construction activities. Blowdowns involve the evacuation of gas, which enables piping to be taken out of or placed in service. The estimated GHG emissions for construction of the proposed Project are provided in table 4.11.1-4.

TABLE 4.11.1-4

Estimated Greenhouse Gas Emissions from Construction of the HubLine/East to West Project (tons)

Construction	CO_2	CH_4	N_2O	CO_2e [a]
E-3 System Replacement	1,142.71	4.12	0.02	1,253.18
Piping Modifications at the Hanover Compressor Station	449.19	0.02	0.01	452.11
Total	1,591.90	4.14	0.03	1,705.29

[a] CO_2e was calculated using the Intergovernmental Panel on Climate Change Fourth Assessment Report Global Warming Potentials.

CO_2 = Carbon dioxide.
CH_4 = Methane.
N_2O = Nitrous oxide.
CO_2e = Carbon dioxide equivalents.

The operation of the E2W Project would result in some GHG emissions associated with natural gas (methane) released as a result of pipeline repair or maintenance activities. The natural gas released to

the atmosphere during periodic blowdown events would also result in direct GHG emissions. Blowdown events during operation are typically associated with major repairs, maintenance, or emergency events at compressor station sites or at remote blow-off valve sites. Algonquin is proposing one new remote blow-off valve at MP 0.0 of the E-3 System Replacement. Algonquin utilizes best management practices during pipeline operation to minimize, to the extent practicable, the release of natural gas to the atmosphere. Algonquin has estimated that these types of blowdown events would occur approximately every 7 to 10 years. The estimated GHG emissions for operation of the Project are provided in table 4.11.1-5.

TABLE 4.11.1-5

Estimated Greenhouse Gas Emissions from Operation of the HubLine/East to West Project

Facility	Blowdown Event (MCF)	CH_4 (tons per event)	Projected CO_2e [a] (tons per event)
E-3 System Replacement	395	8	193
Total	395	8	193

[a] CO_2e calculated using the Intergovernmental Panel on Climate Change Fourth Assessment Report Global Warming Potentials.

MCF = 1,000 cubic feet.

CH_4 = Methane.

CO_2e = Carbon dioxide equivalents.

The GHG emissions from the construction and operation of the E2W Project would be negligible. Additionally, natural gas is a lower CO_2 emitting fuel as compared to other fuel sources (e.g., fuel oil). Because fuel oil is widely used as an alternative to natural gas in the region in which the E2W Project would be located, it is anticipated that the Project would result in the displacement of some fuel oil use, thereby regionally offsetting some GHG emissions.

4.11.2 Noise

4.11.2.1 Noise Regulatory Requirements

Construction of the Project facilities may affect overall noise levels in the Project area. The ambient sound level of a region usually comprises a combination of natural and artificial sounds. At any location, both the magnitude and frequency of environmental noise may vary considerably over the course of the day and throughout the week. Variation is caused in part by changing weather conditions, the effects of seasonal vegetative cover, and human activities. Two measurements used by federal agencies for the time-varying quality of environmental noise known to affect people are the 24-hour equivalent sound level ($L_{eq(24)}$) and the day-night equivalent sound level (L_{dn}). The $L_{eq(24)}$ is the level of steady sound with the same total (equivalent) energy as the time-varying sound of concern, averaged over a 24-hour period. The L_{dn} is the $L_{eq(24)}$ with 10 decibels of the A-weighted scale (dBA) added to nighttime sound levels between the hours of 10:00 PM and 7:00 AM to account for people's greater sensitivity to sound during nighttime hours. The human ear's threshold of perception for noise change is 3 dBA.

In 1974, the EPA published *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. This publication evaluated the effects of environmental noise with respect to health and safety. The EPA has determined that noise levels should not exceed 55 dBA L_{dn}, which is the level that protects the public from indoor and outdoor activity interference (EPA, 1974). This noise level has been useful for federal and state agencies to establish noise limitations for various noise sources. A 55 dBA L_{dn} noise level equates to 48.6 dBA $L_{eq(24)}$ (i.e., a

facility that does not exceed a continuous noise impact of 48.6 dBA $L_{eq(24)}$ would not exceed 55 dBA L_{dn}). The FERC has adopted this EPA guidance.

Connecticut's established noise regulations (Title 22a, Part 69, Section 22a-69-1/2/3/4) do not apply to construction noise or emergency activities (e.g., an emergency blowdown event). They do, however, apply to routine maintenance activities that would be performed at the aboveground facilities associated with the E-3 System Replacement and to blowdown events associated with routine maintenance that would occur at the remote blow-off valve at MP 0.0. These regulations establish standard noise limits emitting from a sound source, as measured at certain Noise Zones (i.e., land use category) when emitted from other Noise Zones (i.e., land use category). Table 4.11.2-1 summarizes the Noise Zone Standards that establish noise level requirements.

TABLE 4.11.2-1

Summary of Connecticut Noise Zone Standards and Noise Limits

Noise Zone/Class Emitter	Receptor Class C	Receptor Class B	Receptor Class A/Day	Receptor Class A/Night
Class C Emitter	70 dBA	66 dBA	61 dBA	51 dBA
Class B Emitter	62 dBA	62 dBA	55 dBA	45 dBA
Class A Emitter	62 dBA	55 dBA	55 dBA	45 dBA

dBA = decibels on the A-weighted scale.
Class A Noise Zone = generally defined as residential land use.
Class B Noise Zone = generally defined as commercial land use.
Class C Noise Zone = generally defined as industrial land use.

According to the Connecticut noise regulations, where mixed land use exists, the least restrictive of the class categories apply. In the case of the remote blow-off valve proposed for MP 0.0 of the E-3 System Replacement, the noise level that corresponds to a Class C Emitter to a Receptor Class A would apply. Therefore, the blow-off valve noise generated during maintenance activities should not exceed 51 dBA at the adjacent Class A Noise Zone (i.e., property line of the nearby residence).

The New Jersey Noise Control Act (Chapters 29, 29B), and Hanover Township, in which the Hanover Compressor Station is located, regulates continuous noise generating sources, such as the noise generated by the operation of the Hanover Compressor Station. These regulations do not apply to the construction noise that would be generated by the Hanover Compressor Station modifications.

4.11.2.2 Noise Level Impacts and Mitigation

Construction Noise

Noise would be generated during construction of the pipeline and associated aboveground facilities and the modifications at the existing Hanover Compressor Station. Pipeline construction is similar to an assembly line, with crews conducting separate but sequential activities. Depending on the distance between each crew in the assembly line, construction activities in any one area could last from several weeks to several months on an intermittent basis. Construction equipment would be operated on an as-needed basis during this period. While individuals in the immediate vicinity of the construction activities would experience an increase in noise, this effect would be temporary and local. Nighttime noise is not expected to increase during construction because most construction activities would be limited to daytime hours. Algonquin has committed to implementing noise mitigation measures during construction activities, including ensuring that sound muffling devices are provided as standard, and that construction equipment is maintained in good working order. If construction-related noise disturbances

occur at nearby noise-sensitive areas (NSAs), Algonquin would implement additional mitigation measures to minimize temporary disturbance from construction noise. Algonquin would comply with all applicable noise ordinances during construction of the proposed facilities.

Operational Noise

The proposed modifications to the existing Hanover Compressor Station would only involve piping modifications to accommodate reverse flow, which would not result in a change to the current station sound level contributions. In addition to the noise generated during normal station operation, periodic blowdown events occur at the existing Hanover Compressor Station that generate additional noise. No change in blowdown duration is anticipated due to the compressor station modifications; typical blowdown duration is approximately 15 seconds. Because Algonquin anticipates a decrease in operation of the Hanover Compressor Station as a result of the E2W Project, the frequency of blowdown events at this station is anticipated to decrease accordingly. Therefore, no further analysis of operational noise from the Hanover Compressor Station is required.

Remote Blow-off Valve – Algonquin has proposed to install one new remote blow-off valve at MP 0.0 of the E-3 System Replacement. Algonquin has committed to comply with federal, state, and local noise ordinances, and, if necessary, to employ a silencer in addition to the proposed filter/separator to ensure the noise level at nearby NSAs associated with blowdown events does not exceed the 51 dBA limit set by the State of Connecticut.

4.12 RELIABILITY AND SAFETY

The transportation of natural gas by pipeline involves some risk to the public in the event of an accident and subsequent release of gas. The greatest hazard is a fire or explosion following a major pipeline rupture. Methane, the primary component of natural gas, is colorless, odorless, and tasteless. It is not toxic, but is classified as a simple asphyxiate, possessing a slight inhalation hazard. If breathed in high concentration, oxygen deficiency can result in serious injury or death.

Methane has an ignition temperature of 1,000 degrees Fahrenheit and is flammable at concentrations between 5 percent and 15 percent in air. Unconfined mixtures of methane in air are not explosive. However, a flammable concentration within an enclosed space in the presence of an ignition source can explode. It is buoyant at atmospheric temperatures and disperses rapidly in air.

4.12.1 Safety Standards

The DOT is mandated to provide pipeline safety under Title 49, USC Chapter 601. The Pipeline and Hazardous Materials Safety Administration's (PHMSA), Office of Pipeline Safety (OPS) administers the national regulatory program to ensure the safe transportation of natural gas and other hazardous materials by pipeline. It develops safety regulations and other approaches to risk management that ensure safety in the design, construction, testing, operation, maintenance, and emergency response of pipeline facilities. Many of the regulations are written as performance standards that set the level of safety to be attained and allow the pipeline operator to use various technologies to achieve safety. The PHMSA ensures that people and the environment are protected from the risk of pipeline incidents. This work is shared with state agency partners and others at the federal, state, and local level. Section 5(a) of the Natural Gas Pipeline Safety Act provides for a state agency to assume all aspects of the safety program for intrastate facilities by adopting and enforcing the federal standards, while section 5(b) permits a state agency that does not qualify under section 5(a) to perform certain inspection and monitoring functions. A state may also act as the DOT's agent to inspect interstate facilities within its boundaries; however, the DOT is responsible for enforcement action. The majority of the states have either section 5(a) certifications or section 5(b) agreements, while nine states act as interstate agents. Connecticut and New Jersey both have section 5(a) certifications.

The DOT pipeline standards are published in Parts 190-199 of Title 49 of the CFR. Part 192 of 49 CFR specifically addresses natural gas pipeline safety issues.

Under a Memorandum of Understanding on Natural Gas Transportation Facilities (Memorandum) dated January 15, 1993 between the DOT and the FERC, the DOT has the exclusive authority to promulgate federal safety standards used in the transportation of natural gas. Section 157.14(a)(9)(vi) of the FERC's regulations require that an applicant certify that it will design, install, inspect, test, construct, operate, replace, and maintain the facility for which a Certificate is requested in accordance with federal safety standards and plans for maintenance and inspection, or shall certify that it has been granted a waiver of the requirements of the safety standards by the DOT in accordance with section 3(e) of the Natural Gas Pipeline Safety Act. The FERC accepts this certification and does not impose additional safety standards other than the DOT standards. If the Commission becomes aware of an existing or potential safety problem, there is a provision in the Memorandum to promptly alert the DOT. The Memorandum also provides for referring complaints and inquiries made by state and local governments and the general public involving safety matters related to pipelines under the Commission's jurisdiction.

The FERC also participates as a member of the DOT's Technical Pipeline Safety Standards Committee, which determines if proposed safety regulations are reasonable, feasible, and practicable.

The pipeline and aboveground facilities associated with the E2W Project would be designed, constructed, operated, and maintained in accordance with or to exceed the DOT Minimum Federal Safety Standards in Title 49 CFR Part 192. These regulations, which are intended to protect the public and to prevent natural gas facility accidents and failures, include specifications for material selection and qualification; minimum design requirements; and protection of the pipeline from internal, external, and atmospheric corrosion.

The standards in the federal regulations become more stringent as the human population density increases. Part 192 also defines area classifications, based on population density in the vicinity of the pipeline, and specifies more rigorous safety requirements for populated areas. The class location unit is an area that extends 220 yards on either side of the centerline of any continuous 1-mile length of pipeline. The four area classifications are defined as follows.

- Class 1 – Location with 10 or fewer buildings intended for human occupancy;
- Class 2 – Location with more than 10 but less than 46 buildings intended for human occupancy;
- Class 3 – Location with 46 or more buildings intended for human occupancy or where the pipeline lies within 100 yards of any building, or small well-defined outside area occupied by 20 or more people on at least 5 days a week for 10 weeks in any 12-month period; and
- Class 4 – Location where buildings with four or more stories aboveground are prevalent.

Based on current population densities, the entire E-3 System Replacement would be located in a Class 3 area.

Class locations representing more populated areas require higher safety factors in pipeline design, testing, and operation. For example, pipe wall thickness and pipeline design pressures, spacing between valves, hydrostatic test pressures, MAOP, inspection and testing of welds, and frequency of pipeline patrols and leak surveys must conform to higher standards in more populated areas. If a subsequent increase in population density adjacent to the right-of-way indicates a change in class location for the pipeline, Algonquin would be required to reduce the MAOP or replace the segment with pipe of sufficient grade and wall thickness to comply with the DOT code of regulations for the new class location.

In 2002, Congress passed an act to strengthen the Nation's pipeline safety laws. The Pipeline Safety Improvement Act of 2002 (HR 3609) was passed by Congress on November 15, 2002, and signed into law by the President in December 2002. No later than December 17, 2004, gas transmission operators must develop and follow a written Integrity Management Program (IMP) that contains all of the elements described in Part 192.911 and addresses the risks on each covered transmission pipeline segment. Specifically, the law establishes an IMP that applies to all high consequence areas (HCAs). The DOT (68 Federal Register (FR) 69778, 69 FR 18228, and 69 FR 29903) defines HCAs as they relate to the different class zones, potential impact circles, or areas containing an identified site as defined in Part 192.903 of the DOT regulations.

The OPS published a series of rules from August 6, 2002 to May 26, 2004 (69 FR 29903), that defines HCAs where a gas pipeline accident could do considerable harm to people and their property and requires an IMP to minimize the potential for an accident. This definition satisfies, in part, the Congressional mandate in Title 49, USC 60109 for the OPS to prescribe standards that establish criteria for identifying each gas pipeline facility in a high-density population area.

Once a pipeline operator has determined the HCAs on its pipeline, it must apply the elements of its IMP to those segments of the pipeline within HCAs. The DOT regulations specify the requirements for the IMP at Part 192.911. The pipeline integrity management rule for HCAs requires inspection of the entire pipeline in HCAs every 7 years. The HCAs have been determined based on the relationship of the pipeline centerline to other nearby structures and identified sites. One area, located between MPs 2.4 and 2.56 of the proposed pipeline route, would be classified as an HCA. Algonquin has identified seven sensitive receptors (i.e., residences) within 100 feet of the construction work area within this area.

Algonquin would implement various public safety measures during construction in all residential areas and has developed site-specific residential construction plans for the residences within 25 feet of the construction work area (see section 4.8.3.1 and Appendix D). Algonquin does not anticipate the need for a night watchman along the pipeline right-of-way during construction but would secure such services if the need arises.

Part 192 prescribes the minimum standards for operating and maintaining pipeline facilities, including the requirement to establish a written plan governing these activities. Under Part 192.615, Algonquin established an emergency plan that includes procedures (e.g., coordination of emergency response with local officials) to minimize the hazards in a natural gas pipeline emergency.

Algonquin maintains a monitoring system that includes a gas control center that monitors system pressures, flows, and customer deliveries on its entire system and is staffed 24 hours a day, 7 days a week, 365 days a year from Houston, Texas. Algonquin also staffs area and sub-area offices along its pipeline route with personnel who can provide the appropriate response to emergency situations and direct safety operations as necessary. Furthermore, Algonquin's pipeline systems are equipped with remote control valves that can be operated remotely by the gas control center. In the event of an emergency, usually evidenced by a sudden loss of pressure, the remote control valves allow for a section of pipeline to be isolated from the rest of the system. Data acquisition systems are also present at all of Algonquin's meter stations; if system pressures fall outside a predetermined range, an alarm is activated and notice is transmitted to the gas control center. Algonquin would incorporate the E2W Project into its existing gas monitoring and control systems.

Weekly aerial and monthly ground inspections by pipeline personnel would identify soil erosion that may expose the pipe; dead vegetation that may indicate a leak in the line; conditions of the vegetative cover and erosion control measures; unauthorized encroachment on the right-of-way such as buildings and other substantial structures; and other conditions that could present a safety hazard or require preventive maintenance or repairs. Algonquin would also perform annual leak detection surveys of the proposed pipeline facilities. These surveys would be instrumental in early detection of leaks and would reduce the likelihood for pipeline failure.

Algonquin representatives would meet with the emergency services departments of the City of Norwich and New London County on an ongoing basis as part of its liaison program. Algonquin would provide these departments with emergency numbers and verbal, written, and mapping descriptions of the pipeline system. This liaison program would identify the appropriate fire, police, and public officials and the responsibilities of each organization that may respond to a gas pipeline emergency, and coordinate mutual assistance in responding to emergencies. A liaison with public authorities and local utilities would be maintained in all locations along the pipeline. A current list of those to be contacted is maintained and includes the Area Manager at Algonquin's Cromwell Office in Connecticut.

Algonquin holds periodic training sessions to review operating and emergency procedures with operations employees. These sessions include safe operation of facilities, including meter stations and compressor stations; safe operation of pipeline valves and other equipment; hazardous material handling

procedures; public liaison programs; and general operating procedures. The proposed E2W Project facilities would be operated and maintained in accordance with these procedures. Algonquin employs well qualified personnel whose credentials are in accordance with Connecticut safety standards.

Should Algonquin personnel need to conduct excavation activities on the right-of-way, Algonquin would notify the affected landowners and the applicable "Call Before You Dig" or "One Call" before beginning the work. In addition, Algonquin would perform an annual mailing to all landowners within 660 feet of the pipeline. The mailing would provide information on pipeline safety and contact information and provide a response card in case the landowner had any specific questions to be addressed.

4.12.2 Pipeline Accident Data

Since February 9, 1970, Title 49 CFR Part 191 has required all operators of transmission and gathering systems to notify the DOT of specific types of incidents that occurred during operation of the natural gas transmission and gathering systems nationwide. The DOT changed reporting requirements after June 1984 to reduce the amount of data collected. However, because the 14.5-year period from 1970 through June 1984 provides a larger universe of data and more basic report information than subsequent years, it has been subject to detailed analysis, as discussed below.

From February 1970 through June 1984, the dominant incident cause was outside forces, constituting 53.8 percent of all service incidents. Outside forces incidents result from the encroachment of mechanical equipment such as bulldozers and backhoes; earth movements due to soil settlement, washouts, or geologic hazards; weather effects such as winds, storms, and thermal strains; and willful damage. An analysis of the outside forces incidents shows that human error in equipment usage was responsible for approximately 75 percent of outside forces incidents. Since April 1982, operators have been required to participate in "One Call" public utility programs in populated areas to minimize unauthorized excavation activities in the vicinity of pipelines. The "One Call" program is a service used by public utilities and some private sector companies (e.g., oil pipelines and cable television) to provide preconstruction information to contractors or other maintenance workers on the underground location of pipes, cables, and culverts. The 1986 through 2007 data show that the portion of incidents caused by outside forces has decreased to 36.0 percent.

The frequency of service incidents is strongly dependent on pipeline age. While pipelines installed since 1950 exhibit a fairly constant level of service incident frequency, pipelines installed before that time have a significantly higher rate, partially due to corrosion. Older pipelines have a higher frequency of corrosion incidents, because corrosion is a time-dependent process. Further, new pipe generally uses more advanced coatings and cathodic protection to reduce corrosion potential. The use of both an external protective coating and a cathodic protection system, required on all pipelines installed after July 1971, significantly reduces the rate of failure compared to unprotected or partially protected pipe. Older pipelines also have a higher frequency of outside forces incidents partly because their location may be less well known and less well marked than newer lines. In addition, the older pipelines contain a disproportionate number of smaller diameter pipelines, which are more easily crushed or broken by mechanical equipment or earth movements.

The available data show that natural gas pipelines continue to be a safe, reliable means of energy transportation. Based on approximately 320,000 miles in service, the rate of public fatalities for the nationwide mix of transmission and gathering lines in service is 0.01 per year per 1,000 miles of pipeline. Using this rate, the pipeline facilities associated with the E2W Project would result in 0.00003 public fatalities every year, which equates to one public fatality about every 39,000 years. This would represent only a slight increase in risk to the nearby public.

4.12.3 Terrorism

Safety and security concerns have changed the way pipeline operators as well as regulators must consider terrorism, both in approving new projects and in operating existing facilities. The Office of Homeland Security is tasked with the mission of coordinating the efforts of all executive departments and agencies to detect, prepare for, prevent, protect against, respond to, and recover from terrorist attacks within the United States. The Commission, in cooperation with other federal agencies, industry trade groups, and interstate natural gas companies is working to improve pipeline security practices, strengthen communications within the industry, and extend public outreach in an ongoing effort to secure pipeline infrastructure.

The Commission is faced with a dilemma in how much information can be offered to the public while still providing a significant level of protection to the facility. Consequently, energy facility design plans and location information have been removed from its website to ensure that sensitive information filed under Critical Energy Infrastructure Information is not readily available (RM02-4-000 and PL02-1-000 issued February 20, 2003).

The likelihood of future acts of terrorism or sabotage occurring at the proposed Project facilities, or at any of the myriad natural gas pipeline or energy facilities throughout the United States is unpredictable given the disparate motives and abilities of terrorist groups. The continuing need to construct facilities to support the future natural gas pipeline infrastructure is not diminished from the threat of any such future acts.

4.13 CUMULATIVE IMPACTS

Cumulative impacts may result when the environmental effects associated with a proposed project are superimposed on, or added to, either temporary (construction-related) or permanent (operation-related) impacts associated with past, present, or reasonably foreseeable future projects. Although the individual impact of each separate project may be minor, the additive or synergistic effects of multiple projects could be significant.

Table 4.13-1 lists present or reasonably foreseeable future projects or activities that may cumulatively or additively impact resources that would be affected by construction and operation of the E2W Project. Construction schedules of the future projects depend on factors such as economics, funding, and regulatory considerations. Projects and activities included in this analysis are generally those of comparable magnitude and nature of impact, and are located within the same municipalities that would be affected by the E2W Project. With some exceptions, more geographically distant projects are not assessed because their impact would generally be localized and, therefore, would not contribute significantly to cumulative impacts in the proposed Project area.

Impacts associated with the E2W Project and the projects listed in table 4.13-1 could have cumulative effects on resources such as soils, vegetation and wildlife, land use, recreation, visual resources, socioeconomics, transportation and traffic, cultural resources, air quality, and noise. However, the E2W Project is not anticipated to significantly add to the adverse effects on these resources for the following reasons:

- impacts on resources such as wetlands, waterbodies, vegetative communities, and soils would be minor and short term and would only represent a small portion of the available resources in the region;
- all temporary impacts on wetlands would be restored;
- there would be no new permanent wetland impacts; and
- resources affected by other projects (e.g., noise, air, and dust impacts) may be too far from the E2W Project to result in an additive effect.

Of the nine projects we reviewed that would affect similar resources, we determined that three would not have a cumulative impact because they would not be constructed within the same timeframe as the E2W Project. The majority of the impacts of the proposed Project would be temporary or short term and minimized by implementation of the various resource-specific plans developed by Algonquin. Because Algonquin would restore all disturbed areas to preconstruction conditions, the overall impact on resources from the E2W Project would be reduced on a regional basis. For these reasons, we conclude that the E2W Project would not significantly add to cumulative impacts on resources on a regional scale.

TABLE 4.13-1

Existing or Proposed Activities with the Potential to Cumulatively Affect Resources of Concern for the HubLine/East to West Project

State/Project	Municipality	Description	Anticipated Construction Schedule
Connecticut			
MGM Grand at Foxwoods Expansion	Ledyard	An approximate 45-acre addition to the existing Foxwoods Resort and Casino complex.	Construction completed in May 2008.
Norwich State Hospital Site Remediation	Preston	Environmental remediation of 60-acre Norwich State Hospital site in the southeastern section of the city (Laurel Hill section).	July 2009 to September 2010.
Norwich Harbor Seawall Project	Norwich	Conversion of sheet steel pilings to prefabricated concrete block for the final phase at Harbor on Thames River.	Construction ongoing. To be completed December 2009.
Dog Pound Project	Norwich	Expansion and modernization of a dog pound.	Design 90 percent complete. Construction expected in 2010.
Brownfield Waterfront Cleanup for 26 Shipping Street	Norwich	Cleanup of a 1.5-acre, city-owned Brownfield (former mill) site in a waterfront area with high redevelopment potential.	Ongoing.
City of Norwich Sidewalk Construction Project	Norwich	Construction of approximately 4 miles of sidewalks along several state highways to accommodate increased pedestrian traffic from nearby casinos.	In design phase.
City of Norwich Road Construction Project	Norwich	Milling and paving of 15 miles of existing roads as part of a federal aid project.	75 to 80 percent complete for 2009. Expected to extend into 2010 construction season.
Norwich Public Utilities Wastewater Facilities Upgrade Project	Norwich	The first phase includes installation of equipment to improve the ability of the plant to process waste and allow it to become energy independent.	Project will be phased for next 5 years.
Fitch Hill/Fairview Reservoir Storage Tank Repair	Norwich	Repair of the Fitch Hill and Fairview Reservoir storage tanks and upgrade of Fairview's pumping stations.	To be completed prior to winter 2009.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 SUMMARY OF THE FERC STAFF'S ENVIRONMENTAL ANALYSIS

We have determined that construction and operation of the E2W Project would result in some adverse environmental impacts. However, all impacts would be reduced to less-than-significant levels with the implementation of Algonquin's proposed mitigation measures and the additional measures we recommend in this EIS. This determination is based on a review of the information provided by Algonquin and further developed from data requests; field investigations; scoping; literature research; alternatives analysis; and contacts with federal, state, and local agencies, Native American tribes, and individual members of the public. We conclude that if the Project is constructed and operated in accordance with applicable laws and regulations, Algonquin's proposed mitigation, and our additional mitigation measures, it would be an environmentally acceptable action. The environmental effects of constructing and operating the proposed Project and Algonquin's proposed and our additional mitigation measures are summarized below. We are recommending that these mitigation measures be attached as conditions to any authorization issued by the Commission. These mitigation measures are presented in section 5.2.

5.1.1 Geology

With the exception of two short segments where the existing pipeline would be abandoned in place for a total of 700 feet, the E-3 System Replacement pipeline would be installed within Algonquin's existing right-of-way by using the lift and replace method. The majority of the associated aboveground facilities would also be installed within Algonquin's existing right-of-way. Construction and operation of the proposed pipeline and aboveground facilities would not materially alter the geologic conditions of the Project area. After completion of construction, Algonquin would restore topographic contours and drainage conditions as closely as feasible to their preconstruction condition. Seismic hazards, landslides, flash flooding, and subsidence are unlikely to impact the Project facilities.

Blasting would be necessary in areas of shallow bedrock that could not be excavated by conventional methods. Based on soils data, blasting may be needed along approximately 0.4 mile of the pipeline route. All blasting activities would be conducted in strict compliance with Algonquin's Blasting Plan and in accordance with federal, state, and local regulations governing the safe storage, handling, firing, and disposal of explosive materials. We reviewed Algonquin's Blasting Plan and find it acceptable.

5.1.2 Soils

Construction of the pipeline and aboveground facilities could expose soils to erosional forces, compact soils, affect soil fertility, bring rock to the surface, and facilitate the dispersal and establishment of weeds. Algonquin proposes to mitigate these potential impacts by implementing measures included in its Project-specific E&SCP Plan. Algonquin's E&SCP includes measures to control erosion and sedimentation during construction and to ensure proper revegetation. Algonquin's proposed measures to minimize impacts on soils are appropriate and consistent with our Plan and Procedures with the exception that Algonquin does not propose to conduct compaction testing and mitigation in residential areas. Because compaction of subsoil layers could create drainage problems in the soils and restrict the root growth of various types of plants, including grasses under certain conditions, we are recommending that Algonquin revise its E&SCP to include soil compaction testing and mitigation measures consistent with sections V.C.1 and V.C.3 of the FERC Plan.

We would conduct regular inspections of the right-of-way during both the construction and restoration phases. In addition, Algonquin would implement an environmental inspection and monitoring program, including post-construction monitoring of mitigation practices to ensure their successful implementation. Revegetated areas would be monitored following construction for the first and second (as necessary) growing season in upland areas; wetlands would be monitored for at least 3 years to ensure successful restoration. Algonquin would prepare activity reports during this period documenting any problems identified and describing corrective actions taken to remedy these problems. These reports would be submitted to the FERC and the COE on a quarterly basis. These quarterly reports would be part of the public record for the E2W Project and available for viewing on the FERC Internet website (http://www.ferc.gov).[1] If, after 2 years, it is determined that the areas crossed by the pipeline have not been restored successfully, Algonquin would implement additional restoration measures. We believe Algonquin's environmental inspection and monitoring program is adequate.

5.1.3 Water Resources

Groundwater

For the majority of the Project, groundwater levels are generally well below the land surface that would be affected by construction activities. The Project would not cross any sole source aquifers or APAs and no public water supply wells or springs have been identified within the construction work area. To date, five private water supply wells have been identified within 150 feet of the construction work area.

Algonquin would conduct pre- and post-construction testing of all existing private water supply wells within 150 feet of the construction work area. If construction activities temporarily impair the quality or yield of a water supply well, Algonquin would either provide a temporary source of water (e.g., bottled) to residents until the damaged water well is restored to its former capacity and quality or compensate the landowner for the damages. In the unlikely event that water quality or yield is permanently impaired as a result of blasting or other construction activities, Algonquin would arrange for the water supply well to be repaired or replaced.

Algonquin is continuing to conduct field surveys to verify the location of water supply wells and springs and would file information on the locations when surveys are complete. To ensure final well and spring locations are identified prior to construction and that proposed mitigation measures are appropriate, we are recommending that Algonquin file field verified locations, by milepost, of all water supply wells and springs within 150 feet of the construction work area. We are also recommending that Algonquin file a report within 30 days of placing the facilities in service, discussing whether any complaints were received concerning well yield or water quality and how each was resolved.

Accidental spills and leaks associated with equipment operation, refueling, maintenance, or storage pose the greatest risk to groundwater resources. Implementation of Algonquin's SPCC Plan would minimize the potential for groundwater impacts associated with an inadvertent spill of fuel, oil, and other hazardous fluids. The SPCC Plan identifies preventive measures to reduce the likelihood of a spill and specifies measures to contain and clean up a spill should one occur. We reviewed Algonquin's SPCC Plan and find the majority of it acceptable. The SPCC Plan does not, however, specify restrictions on refueling near private or public water supply wells. Therefore, we are recommending that Algonquin revise its SPCC Plan to prohibit refueling within 200 feet of any private water supply well and 400 feet of any public water supply well.

[1] Using the "eLibrary" link, select "General Search" from the eLibrary menu and enter the docket number excluding the last three digits in the "Docket Number" field (i.e., CP08-420). Select an appropriate date range.

Surface Waters

Two perennial waterbodies and two intermittent streams would be crossed by the pipeline. The two perennial waterbodies, Norwichtown Brook and Bobbin Mill Brook, are designated coldwater and warmwater fishery resources, respectively. All four waterbodies are considered minor waterbodies (less than or equal to 10 feet wide). The waterbody crossings would be constructed in accordance with federal, state, and local permits and using the measures in Algonquin's E&SCP.

The greatest potential impact of pipeline construction on surface waters would result from an increase in sediment loading to the waterbody. The highest levels of sediment would be generated by use of the open-cut method, which Algonquin plans to use for the two intermittent waterbody crossings (Unnamed Tributary to Norwichtown Brook and Unnamed Tributary to Bobbin Mill Brook). Because these two intermittent waterbodies are less than 10 feet wide at the crossing location, the amount of sediment generated would be minor and would decline rapidly when the streambed disturbance ceases.

Less sediment would be generated at Bobbin Mill Brook where the flume or dam and pump method, both of which are considered a dry crossing method, would be used. Temporary construction-related impacts would be limited primarily to short periods of increased turbidity before installation of the pipeline when the upstream and downstream dams are installed, and following installation of the pipeline when the dams are pulled and flow across the restored work area is re-established. Norwichtown Brook would be crossed using the horizontal bore method and would not be directly affected by construction.

Groundwater and Surface Water Uses During Construction

Algonquin is proposing to use a clean municipal water source(s) for hydrostatic testing of the pipeline. The estimated hydrostatic test water requirements for the E-3 System Replacement are approximately 80,600 gallons. This small volume of water would have a negligible impact on groundwater supplies.

The E-3 System Replacement would be tested in one continuous test section. Test water would contact only new pipe and no chemicals would be added. When completed, the test water would be discharged into a well-vegetated and stabilized upland area within or adjacent to the construction work area near MP 2.56. Potential impacts associated with the discharge of hydrostatic test water would be minimized by implementing measures contained in Algonquin's E&SCP.

5.1.4 Wetlands

Based on Algonquin's wetland delineations, 12 wetlands in 15 locations would be crossed by the Project resulting in 2.8 acres of wetland impacts. This includes 1.5 acres of non-forested wetlands (emergent and scrub-shrub wetlands) and 1.3 acres of forested wetlands. The impact on emergent and scrub-shrub wetlands would be temporary and short term because these cover types typically regenerate quickly and would transition back into a community functioning similar to preconstruction wetlands. However, the clearing of forested wetlands would result in long-term impact because of the slow growth rate of trees.

Vegetation maintenance during operation of the pipeline would not impact any wetlands outside Algonquin's existing, maintained right-of-way; therefore, there would be no additional permanent impacts on wetlands. No wetlands would be impacted by construction or operation of the proposed aboveground facilities or access roads.

To reduce the impacts of construction on wetland resources, Algonquin would use a 75-foot-wide right-of-way and implement its E&SCP, Wetland Restoration Procedures for Temporary Wetland Impacts, and Invasive Plant Species Control Plan. These plans would adequately minimize impacts on wetland resources.

Algonquin's E&SCP stipulates that temporary extra workspaces should be located at least 50 feet from wetlands except where an alternative measure has been approved by the FERC. Algonquin identified three areas where it believes site-specific conditions do not allow for a 50-foot setback of temporary extra workspace from wetlands (see table 4.4.3-1 in section 4.4.3). Based on our review, we have determined that Algonquin's requests are justified. Algonquin's E&SCP, however, includes an extra workspace wetland setback variance table (table C-1) that includes some workspaces that have been modified or removed from the current alignment. To ensure that the E&SCP correctly lists the approved wetland setback variances, we are recommending that Algonquin revise table C-1 of its E&SCP to be consistent with the approved workspaces listed in table 4.4.3-1.

Algonquin would conduct post-construction monitoring of the right-of-way in affected wetlands. These efforts would include monitoring the success of wetland revegetation annually for at least 3 years after construction, or longer until wetland revegetation is successful. The post-construction monitoring efforts would also include documenting occurrences of exotic invasive species to compare to preconstruction conditions and implementation of remediation efforts to control the spread of invasive wetland plant species.

Due to the reduction in Project scope that occurred after issuance of the draft EIS, no forested wetlands would be permanently affected by the E2W Project and the COE and the CTDEP have agreed that a compensatory wetland mitigation plan is not required. Algonquin would comply with the COE's section 404 and the CTDEP's section 401 permit conditions.

5.1.5 Vegetation

Construction would result in temporary and permanent impacts on vegetative cover types. The primary impact of the pipeline facilities on vegetation would be the cutting, clearing, and/or removal of existing vegetation within the construction work area. Secondary effects associated with disturbances to vegetation could include increased soil erosion, increased potential for the introduction and establishment of invasive weedy species, and a local reduction in available wildlife habitat.

The primary vegetation cover type that would be crossed by the proposed pipeline facilities is the early successional-upland scrub-shrub cover type. This community covers about 63 percent of the pipeline route. The next most prevalent vegetation cover type is upland forest, which covers about 27 percent of the pipeline route. The remainder of the pipeline route is covered by non-forested wetlands (5 percent) and forested wetlands (5 percent). No federally or state-listed plant species or significant natural communities would be affected by the E-3 System Replacement and associated aboveground facilities.

The majority of the E-3 System Replacement pipeline would be installed within Algonquin's existing right-of-way using the lift and replace method. The exception is the crossings of Interstate 395/Norwichtown Brook and wetland E3-W2 where a total of approximately 700 feet of pipeline would be abandoned in place. In these areas, the abandonment activities would occur within the proposed construction right-of-way and would not require any additional land. The proposed pipeline at the crossing of wetland E3-W2 would be located within Algonquin's existing right-of-way adjacent to the existing pipeline and would not result in the need for additional permanent right-of-way. The proposed pipeline at the crossing of Interstate 395/Norwichtown Brook would be located outside the existing right-of-way and would require an additional permanent easement. By installing the pipeline primarily within

the existing right-of-way, Algonquin would reduce the area of new disturbance and, therefore, reduce impacts on vegetation. Algonquin would implement measures in its E&SCP to minimize impacts on vegetative resources and to allow for restoration of vegetative communities.

Following construction, Algonquin would seed all previously vegetated portions of the construction work area and monitor post-construction revegetative success for the first and second (as necessary) growing season in upland areas and at least 3 years in wetlands. Following restoration, Algonquin would retain a 30-foot-wide permanent right-of-way for the E-3 System Replacement pipeline, the majority of which would be located within its existing, previously disturbed right-of-way. Routine maintenance of the right-of-way would be required to allow access for routine pipeline patrols and visibility during aerial patrols as well as to maintain access in the event emergency repairs are needed. In upland areas, the entire right-of-way may be mowed every 3 years. However, to facilitate periodic corrosion surveys a 10-foot-wide strip centered on the pipeline can be mowed annually to maintain herbaceous growth. In wetlands, Algonquin would not conduct vegetation maintenance across the full width of the permanent right-of-way, but instead would limit maintenance to optional mowing of a 10-foot-wide strip centered over the pipeline and cutting trees and shrubs greater than 15 feet in height that are within 15 feet of the pipeline centerline. Vegetation maintenance of the right-of-way adjacent to waterbodies would consist of maintaining a riparian strip within 25 feet of a waterbody. Algonquin would not apply herbicides for general right-of-way maintenance.

5.1.6 Wildlife and Aquatic Resources

In total, the pipeline facilities would affect about 18.4 acres of early successional upland scrub-shrub wildlife habitat, 8.0 acres of upland forest habitat, 1.5 acres of non-forested wetland habitat, and 1.3 acres of forested wetland habitat. The impacts of construction on wildlife would include the displacement of wildlife on the right-of-way and the potential mortality of some individuals. Construction could also temporarily disrupt courting or nesting and breeding of some species. These effects would cease after construction, and wildlife would return to the newly disturbed areas and adjacent undisturbed habitats after right-of-way restoration is complete.

Habitat disturbance would be minimized through implementation of Algonquin's E&SCP, which includes measures to reseed disturbed areas with seed mixes determined in accordance with landowner agreements, permit requirements, and consultations with agency and non-agency stakeholders. A combination of both summer and winter cover would be established along the right-of-way to encourage wildlife use throughout the year.

In general, the construction and operation of the proposed Project is not expected to have an impact on wildlife populations because the amounts of the habitats that would be affected are relatively minor and are within and adjacent to Algonquin's existing, maintained right-of-way. This existing right-of-way is routinely maintained as part of regular facility operations to control vegetative growth thus establishing shrub and/or open field wildlife habitats.

Vernal pools are ephemeral wetlands that provide sensitive wildlife habitat. Algonquin's surveys identified two vernal pools within 150 feet of the construction work area, neither of which are considered high or very high quality. The extreme northern fringe of one of the vernal pool basins would be directly impacted by the proposed construction right-of-way. The deeper portion of the pool, which is the better quality habitat, would be avoided. Algonquin has stated that the 75-foot-wide construction right-of-way near this vernal pool cannot be modified to avoid the entire pool due to construction constraints. Algonquin developed specific mitigation measures (e.g., removal of the detritus layer, installation of sediment barriers, and use of equipment mats) to protect this vernal pool during construction. Once construction is completed, the equipment mats would be removed and the pool basin would be restored to

preconstruction condition. The salvaged detritus layer would be returned and spread within the pool basin. Algonquin reviewed and discussed these measures with the CTDEP during a meeting held on June 24, 2009. At that meeting, the CTDEP indicated that these were acceptable measures to protect and restore the vernal pool.

Fishery resources that would be crossed by the proposed Project include one coldwater fishery (Norwichtown Brook) and one warmwater fishery (Bobbin Mill Brook). Algonquin proposes to install the pipeline under Norwichtown Brook using a horizontal bore and abandon the existing pipeline in place at the crossing. Because no in-stream work would occur, direct impacts on the aquatic resources within this waterbody would be avoided. Algonquin would minimize the potential for indirect impacts by installing the pipeline during the timing window for coldwater fisheries outlined in its E&SCP (June 1 through September 30).

In-stream construction across Bobbin Mill Brook could have both direct and indirect effects on aquatic resources. Algonquin would minimize the effects of the Project on aquatic resources through the use of a dry crossing method, construction timing windows, extra workspace restrictions, restoration procedures, and other mitigation measures outlined in its E&SCP. Adherence to the E&SCP would restore the streambed and banks to preconstruction conditions and maximize the potential for regrowth of riparian vegetation, thereby minimizing the potential for any long-term impacts.

To minimize the potential for spills from equipment use to impact aquatic resources, Algonquin would implement measures contained in its SPCC Plan. The SPCC Plan states that refueling or other handling of hazardous materials within 100 feet of a waterbody would not be allowed and that Algonquin would conduct routine inspections of tank and storage areas to reduce the potential for spills or leaks of hazardous materials.

5.1.7 Special Status Species

To comply with section 7 of the ESA, we informally consulted with the FWS regarding the presence of federally listed or proposed species in the Project area. Based on these consultations, we have determined that no federally listed species potentially occur in the vicinity of the proposed E2W Project and, therefore, the E2W Project would have no effect on federally listed species or their critical habitats. Required consultations under section 7 of the ESA are complete unless new species are listed or new information becomes available indicating a potential Project effect on listed species or critical habitat that was not considered in this EIS.

Based on consultations with the CTNDDB and field surveys, no state-listed species were identified along the proposed Project. Therefore, we conclude that no impacts on rare wildlife species or habitats would occur as a result of the Project.

5.1.8 Land Use, Recreation, Special Interest Areas, and Visual Resources

Construction of Algonquin's proposed pipeline facilities would temporarily affect a total of about 29.3 acres of land, including 23.4 acres for the pipeline right-of-way and 5.9 acres of temporary extra workspace. Of the 29.3 acres of land that would be affected by construction of the pipeline facilities, about 9.2 acres would be retained as permanent right-of-way. The remaining 20.1 acres used for temporary construction right-of-way and temporary extra workspace would be allowed to revert to prior uses following construction.

The land retained as permanent right-of-way would be located almost entirely within Algonquin's existing permanent right-of-way and would not result in additional permanent land use impacts.

However, additional land outside the existing right-of-way would be required on both sides of the Interstate 395/Norwichtown Brook crossing to accommodate the offset from the existing pipeline that would be abandoned. In addition, Algonquin is proposing an expanded permanent easement around the aboveground facilities at the beginning and end of the E-3 System Replacement pipeline. Combined, these areas would represent approximately 0.2 acre of new permanent impacts outside the existing right-of-way.

Algonquin has identified certain areas where it believes site-specific conditions require the use of temporary extra workspace outside of the nominal 75-foot-wide construction right-of-way. We requested that Algonquin file a table listing the locations of these temporary extra workspaces and their dimensions, the acreage of impact, the land use, and the reasons why Algonquin believes the additional workspace is justified. Based on our review, we have determined that Algonquin's requests are justified.

Residential land would be the primary land use affected by construction of the Project. Algonquin's proposed construction work area is located within 50 feet of 35 residential, commercial, or other structures (e.g., garages). Of this total, 23 residences are within 25 feet of the construction work area. Temporary construction impacts on residential areas could include inconvenience caused by noise and dust generated by construction equipment, personnel, and trenching of roads or driveways; ground disturbance of lawns; removal of trees, landscaped shrubs, or other vegetative screening between residences and/or adjacent rights-of-way; potential damage to existing septic systems or wells; and removal of aboveground structures, such as fences, sheds, or trailers, from within the right-of-way.

Algonquin would implement general measures to minimize construction-related impacts on all residences and other structures located within 50 feet of the construction right-of-way and has provided site-specific residential construction plans to inform affected landowners of proposed measures to minimize disruption and to maintain access to the residences located within 25 feet of the construction work area. We reviewed these plans and determined that they would minimize impacts on residences to the extent practicable.

Where residences are located within 10 feet of the proposed construction work area, there is an increased potential for construction of the Project to disrupt landscaping, utilities, and access to these residences. We are recommending that Algonquin file evidence of landowner concurrence with the site-specific residential construction plans for all locations where construction work areas and fencing would be within 10 feet of a residence. To ensure Algonquin has a system in place to address landowner issues and concerns during construction, we are recommending that Algonquin develop and implement an environmental complaint resolution procedure that remains active for at least 2 years following completion of construction of the E2W Project.

Along the pipeline route, visual impacts would be greatest in forested areas where the route parallels or crosses roads, in areas where vegetation provides visual screening or ornamental value, and at aboveground facility sites. Impacts on visual resources would be minimized by locating the majority of the proposed pipeline within Algonquin's existing right-of-way. Construction within or adjacent to existing rights-of-way minimizes vegetation clearing for the construction work area and permanent right-of-way and also minimizes new fragmentation of vegetation. After construction, all disturbed areas (excluding the footprint for aboveground facilities) would be restored in compliance with federal, state, and local permits; landowner agreements; and Algonquin's easement requirements. The aboveground facilities associated with the E2W Project would be small structures located at the beginning and end of the E-3 System Replacement. The majority of these facilities would be located within Algonquin's existing right-of-way and would not result in a significant impact on the surrounding visual character of the Project area.

In locations where trees that serve as a visual buffer would be removed, Algonquin would discuss these screening issues with individual landowners during easement negotiations. In areas where all visual screening is removed, Algonquin would consider strategic planting of fast-growing evergreens. As discussed above, we requested that Algonquin provide site-specific justification for all areas where a wider construction right-of-way and temporary extra workspaces would be needed and specify the land use (vegetative cover type) that would be affected by each extra workspace. Our impact assessment of each temporary extra workspace request took vegetative cover type into consideration to ensure unnecessary tree clearing is avoided and visual buffers are preserved to the extent reasonable and practicable.

5.1.9 Socioeconomics

Construction of the Project would not have a significant impact on local populations, housing, employment, or the provision of community services. There would be minor temporary increases in traffic levels due to the commuting of the construction workforce to the Project area as well as the movement of construction vehicles and delivery of equipment and materials to the construction right-of-way. Construction of the Project would temporarily increase the demand for public services such as emergency response, medical, and traffic control but these effects would be offset by increases in local government revenues. The only long-term socioeconomic effect of the Project is likely to be beneficial, based on the increase in tax revenues that would accrue to the counties affected by the Project.

5.1.10 Cultural Resources

Algonquin consulted with the Connecticut SHPO and has completed cultural resources investigations along the proposed pipeline route and ancillary facilities. One aboveground cultural resource and four below ground cultural resources were recorded during surveys of the proposed Project. One site that could not be avoided (the Tower Hill Road site) is recommended eligible for listing on the NRHP. Algonquin would provide a treatment plan for the Tower Hill Road site to the FERC and the Connecticut SHPO when it is complete. The FERC would need to execute an MOA with the Connecticut SHPO for the resolution of adverse effects, and provide the ACHP an opportunity to comment in accordance with Title 36 CFR Part 800.6.

Algonquin completed a Stone Wall Survey and Restoration Plan for all stone walls that would be intersected and potentially impacted by the proposed Project. Algonquin would reconstruct affected walls following construction.

To ensure that the FERC's responsibilities under the NHPA and its implementing regulations are met, we are recommending that Algonquin not begin implementation of any treatment plans/mitigation measures (including archaeological data recovery); construction of facilities; or use of all staging, storage, or temporary work areas and new or to-be-improved access roads until it files the treatment plan for the Tower Hill Road site and the comments of the Connecticut SHPO on the treatment plan, the FERC executes an MOA with the Connecticut SHPO and provides the ACHP an opportunity to comment, and the Director of OEP notifies Algonquin that treatment plans/mitigation measures may be implemented and/or construction may proceed.

5.1.11 Air Quality and Noise

The piping changes at the existing Hanover Compressor Station and activities associated with installation of the E-3 System Replacement pipeline and associated aboveground facilities would generate air emissions during construction. No additional compression would be needed at the Hanover

Compressor Station, and Algonquin does not anticipate an increase in the hours of operation or fuel use of the existing combustion turbines and compressor engines following the piping modifications.

The construction activities that would be the greatest emissions-generating activities include clearing, grading, and trenching operations. These construction activities would occur in daylight hours during the construction period, except in situations where a specific activity would need to be completed without stopping (e.g., road crossings, hydrostatic testing). The intermittent and short-term emissions generated by these activities would include fugitive particulate emissions (i.e., dust) from soil disruption, and combustion emissions from the construction equipment. Emissions associated with construction equipment include PM_{10}, $PM_{2.5}$, NO_x, CO, SO_2, VOC, and small amounts of air toxics. These emissions could result in minor, temporary impacts on air quality in the vicinity of pipeline installation.

Algonquin has prepared a Dust Control Plan that specifies mitigation measures for dust abatement during construction. Algonquin has also committed to employ best management practices when operating construction equipment and would comply with all applicable state regulations regarding equipment operation with a goal to minimize diesel emissions to the extent feasible. We reviewed Algonquin's Dust Control Plan and best management practices and find them acceptable. Because the construction emissions generated by the proposed Project would be temporary in nature and Algonquin would use best management practices to mitigate construction emissions to the extent practicable, the construction emissions would not result in significant effects on air quality.

Because the Project is a replacement of existing facilities, no increase in GHG emissions is expected. The operation of the E2W Project would result in some GHG emissions associated with natural gas (methane) released as a result of pipeline repair or maintenance activities. Algonquin is proposing one new remote blow-off valve at MP 0.0 of the E-3 System Replacement. Algonquin has estimated that typical blowdown events would occur approximately every 7 to 10 years. Algonquin utilizes best management practices during pipeline operation to minimize, to the extent practicable, the release of natural gas to the atmosphere. Therefore, the GHG emissions from the E2W Project would be negligible.

Noise would be generated during construction of the pipeline and aboveground facilities. The proposed modifications at the Hanover Compressor Station would consist only of piping changes to accommodate reverse flow; therefore, there would be no change to the noise contribution from the station. The construction noise would be temporary and intermittent because equipment would be operated on an as-needed basis during daylight hours. Pipeline construction generally proceeds at rates ranging from several hundred feet to 1 mile per day. However, construction activities in any one area could last for longer durations based upon sensitive resources or terrain.

Intermittent blowdown events associated with facility operation would generate some noise. Algonquin has committed to comply with federal, state, and local noise ordinances. If necessary, Algonquin would employ a silencer in addition to a filter/separator to ensure the noise level at nearby NSAs associated with blowdown events does not exceed the 51 dBA limit set by the State of Connecticut.

5.1.12 Reliability and Safety

The pipeline and aboveground facilities associated with the E2W Project would be designed, constructed, operated, and maintained to meet or exceed the DOT Minimum Federal Safety Standards in Title 49 CFR Part 192 and other applicable federal and state regulations. These regulations, which are intended to protect the public and to prevent natural gas facility accidents and failures, include specifications for material selection and qualification; odorization of gas; minimum design requirements; and protection of the pipeline from internal, external, and atmospheric corrosion. By designing and

operating the proposed Project in accordance with the applicable standards, the Project would not result in a significant increased public safety risk.

The pipeline facilities would be clearly marked at line-of-sight intervals and at other key points to indicate the presence of the pipeline. The pipeline system would be inspected by air and on the ground to observe right-of-way conditions and identify unauthorized encroachment on the right-of-way, and other conditions that could present a safety hazard or require preventive maintenance or repairs. Algonquin would perform annual leak detection surveys of the proposed pipeline facilities, which would be instrumental in early detection of leaks and reduce the likelihood for pipeline failure.

Algonquin representatives would meet with the emergency services departments along the proposed pipeline facilities on an ongoing basis as part of its liaison program. Algonquin would provide these departments with emergency numbers and verbal, written, and mapping descriptions of the pipeline system. This liaison program would identify the appropriate fire, police, and public officials and the responsibilities of each organization that may respond to a gas pipeline emergency, and coordinate mutual assistance in responding to emergencies. A liaison with public authorities and local utilities would be maintained at all locations along the pipeline.

5.1.13 Cumulative Impacts

When the impacts of the E2W Project are considered additively with the impacts of other past, present, or reasonably foreseeable future projects, there is some potential for cumulative effect on resources such as soils, vegetation and wildlife, land use, recreation, visual resources, socioeconomics, transportation and traffic, cultural resources, air quality, and noise.

The majority of the impacts of the proposed Project would be temporary or short term and minimized by implementation of the various resource-specific plans developed by Algonquin. Because Algonquin would restore all disturbed areas to preconstruction conditions, the overall impact on resources from the E2W Project would be reduced on a regional basis. For these reasons, we conclude that the E2W Project would not significantly add to cumulative impacts on resources on a regional scale.

5.1.14 Alternatives

We evaluated several alternatives to the E2W Project to determine whether they would be reasonable and environmentally preferable to the proposed Project. The No Action Alternative and the Postponed Action Alternative were considered. If the FERC and/or another federal agency with approval authority were to deny or postpone action on Algonquin's applications, the environmental impacts associated with the Project would be avoided or postponed. However, the stated objectives of the Project would not be met.

The use of alternative fuels, renewable fuels, and energy conservation programs was considered but would not offer environmentally preferable, technically feasible, or viable alternatives to the proposed Project in a similar timeframe.

Alternatives involving the use of existing pipeline systems operated by companies other than Algonquin were evaluated. No existing pipeline system was identified in the Project area with the available capacity to deliver the volume of natural gas that would be delivered by Algonquin without the construction of new facilities. Any such expansion would result in environmental impacts that could be similar to or greater than the impacts associated with the E2W Project. Furthermore, we are not aware of any plans to expand an existing pipeline system that would meet the Project objectives within the same

general timeframe. For these reasons, the use of an existing pipeline system is not considered a viable alternative to the proposed Project.

Looping a portion of Algonquin's existing E-3 system was considered a reasonable alternative to the proposed Project because Algonquin's analysis concluded that it could provide the same performance as its current proposal. Under the current proposal, all but approximately 0.2 acre of the permanent right-of-way for the replacement pipeline and associated aboveground facilities would be located within the existing permanent right-of-way. Looping would require a larger permanent right-of-way width, which would result in greater long-term impacts than the proposed E-3 System Replacement. Because there are no relative operational advantages to looping the E-3 System and looping would result in greater permanent impacts outside Algonquin's existing facilities, we conclude that looping the E-3 system is not environmentally preferable to the proposed replacement of the section of the E-3 System pipeline between MPs 0.0 and 2.56 with a larger diameter pipeline.

Construction of a new compressor station in lieu of modifications to the pipeline was evaluated; however, this option would require the alteration and use of additional land, result in greater permanent visual and noise impacts, and require more operation and maintenance than a pipeline. For these reasons, the use of new compression in lieu of the proposed modifications to the E-3 System was not considered to be a reasonable alternative.

Typically, route alternatives are identified to determine if impacts could be avoided or reduced on environmentally sensitive resources. With the exception of approximately 700 feet where the existing pipeline would be abandoned in place, the proposed E-3 System Replacement pipeline would be constructed within Algonquin's existing right-of-way using the lift and replace method. Any alternatives to the proposed route would require the development of a new pipeline right-of-way or expansion of an existing right-of-way, which would result in greater environmental impacts. For these reasons, we believe that no environmentally preferable alternative exists; therefore, an evaluation of specific pipeline route alternatives is not warranted.

Algonquin's proposed aboveground facilities are piping-related modifications that would be located within the fenceline of the existing Hanover Compressor Station or new facilities at the beginning and end of the proposed E-3 System Replacement that would be primarily within Algonquin's existing right-of-way. These facilities are necessary to meet the purpose, need, and contractual requirements of the E2W Project. Because the locations of the new aboveground facilities are dictated by the location of the E-3 System Replacement pipeline and no significant environmental resources would be impacted by these facilities, we conclude that no environmentally preferable alternative exists.

We have determined that Algonquin's proposed Project, as modified by our recommended mitigation measures, is the preferred alternative that can meet the Project objectives.

5.2 FERC STAFF'S RECOMMENDED MITIGATION

If the Commission authorizes the proposed E2W Project, we recommend that the following measures be included as specific conditions of the Commission's Order. We believe these measures would further mitigate environmental impacts associated with construction and operation of the Project.

1. Algonquin shall follow the construction procedures and mitigation measures described in its application, supplemental filings (including responses to staff data requests), and as identified in the EIS, unless modified by the Order. Algonquin must:

a. request any modification to these procedures, measures, or conditions in a filing with the Secretary;
b. justify each modification relative to site-specific conditions;
c. explain how that modification provides an equal or greater level of environmental protection than the original measure; and
d. receive approval in writing from the Director of OEP **before using that modification**.

2. The Director of OEP has delegated authority to take whatever steps are necessary to ensure the protection of all environmental resources during construction and operation of the project. This authority shall allow:

   a. the modification of conditions of the Commission's Order; and
   b. the design and implementation of any additional measures deemed necessary (including stop work authority) to ensure continued compliance with the intent of the environmental conditions as well as the avoidance or mitigation of adverse environmental impact resulting from project construction and operation.

3. **Prior to any construction**, Algonquin shall file an affirmative statement with the Secretary, certified by a senior company official, that all company personnel, EIs, and contractor personnel will be informed of the EI's authority and have been or will be trained on the implementation of the environmental mitigation measures appropriate to their jobs **before** becoming involved with construction and restoration activities.

4. The authorized facility locations shall be as shown in the EIS, as supplemented by filed alignment sheets, and shall include all of the staff's recommended workspaces as identified in tables 4.4.3-1 and 4.8.1-3 of the EIS. **As soon as they are available, and prior to the start of construction**, Algonquin shall file with the Secretary any revised detailed survey alignment maps/sheets at a scale not smaller than 1:6,000 with station positions for all facilities approved by the Order. All requests for modifications of environmental conditions of the Order or site-specific clearances must be written and must reference locations designated on these alignment maps/sheets.

   Algonquin's exercise of eminent domain authority granted under NGA section 7(h) in any condemnation proceedings related to the Order must be consistent with these authorized facilities and locations. Algonquin's right of eminent domain granted under NGA section 7(h) does not authorize it to increase the size of its natural gas pipeline to accommodate future needs or to acquire a right-of-way for a pipeline to transport a commodity other than natural gas.

5. Algonquin shall file with the Secretary detailed alignment maps/sheets and aerial photographs at a scale not smaller than 1:6,000 identifying all route realignments or facility relocations, and staging areas, pipe storage and ware yards, new access roads, and other areas that would be used or disturbed and have not been previously identified in filings with the Secretary. Approval for each of these areas must be explicitly requested in writing. For each area, the request must include a description of the existing land use/cover type, and documentation of landowner approval, whether any cultural resources or federally listed threatened or endangered species would be affected, and whether any other environmentally sensitive areas are within or abutting the area. All areas shall be clearly identified on the maps/sheets/aerial photographs. Each area must be approved in writing by the Director of OEP **prior to construction** in or near that area.

   This requirement does not apply to temporary extra workspaces allowed by Algonquin's E&SCP or minor field realignments per landowner needs and requirements that do not affect other landowners or sensitive environmental areas such as wetlands.

Examples of alterations requiring approval include all route realignments and facility location changes resulting from:

a. implementation of cultural resources mitigation measures;
b. implementation of endangered, threatened, or special concern species mitigation measures;
c. recommendations by state regulatory authorities; and
d. agreements with individual landowners that affect other landowners or would affect sensitive environmental areas.

6. **Within 60 days of the acceptance of the Certificate and before construction begins,** Algonquin shall file an Implementation Plan with the Secretary for review and written approval by the Director of OEP. Algonquin must file revisions to the plan as schedules change. The plan shall identify:

a. how Algonquin will implement the construction procedures and mitigation measures described in its applications and supplements (including responses to staff data requests), identified in the EIS, and required by the Order;
b. how Algonquin will incorporate these requirements into the contract bid documents, construction contracts (especially penalty clauses and specifications), and construction drawings so that the mitigation required at each site is clear to onsite construction and inspection personnel;
c. the number of EIs assigned to the Project, and how Algonquin will ensure that sufficient personnel are available to implement the environmental mitigation;
d. company personnel, including EIs and contractors, who will receive copies of the appropriate material;
e. the location and dates of the training and instructions Algonquin will give to all personnel involved with construction and restoration (initial and refresher training as the Project progresses and personnel change), with the opportunity for OEP staff to participate in the training session;
f. the company personnel (if known) and specific portion of Algonquin's organization having responsibility for compliance;
g. the procedures (including use of contract penalties) Algonquin will follow if noncompliance occurs; and
h. for each discrete facility, a Gantt or PERT chart (or similar project scheduling diagram), and dates for:

    i. the completion of all required surveys and reports;
    ii. the mitigation training of onsite personnel;
    iii. the start of construction; and
    iv. the start and completion of restoration.

7. **Beginning with the filing of its Implementation Plan**, Algonquin shall file updated status reports with the Secretary on a **biweekly** basis **until all construction-related activities, including restoration, are complete.** On request, these status reports will also be provided to other federal and state agencies with permitting responsibilities. Status reports shall include:

a. an update on Algonquin's efforts to obtain the necessary federal authorizations;
b. the current construction status of the Project, work planned for the following reporting period, and any schedule changes for stream crossings or work in other environmentally sensitive areas;

c. a listing of all problems encountered and each instance of noncompliance observed by the EI(s) during the reporting period (both for the conditions imposed by the Commission and any environmental conditions/permit requirements imposed by other federal, state, or local agencies);
d. a description of corrective actions implemented in response to all instances of noncompliance, and their cost;
e. the effectiveness of all corrective actions implemented;
f. a description of any landowner/resident complaints that may relate to compliance with the requirements of the Order, and the measures taken to satisfy their concerns; and
g. copies of any correspondence received by Algonquin from other federal, state, or local permitting agencies concerning instances of noncompliance, and Algonquin's response.

8. Algonquin must receive written authorization from the Director of OEP **before commencing service** from the Project. Such authorization will only be granted following a determination that rehabilitation and restoration of the right-of-way and all other areas affected by the Project are proceeding satisfactorily.

9. **Within 30 days of placing the authorized facilities in service**, Algonquin shall file an affirmative statement with the Secretary, certified by a senior company official:

a. that the facilities have been constructed in compliance with all applicable conditions, and that continuing activities will be consistent with all applicable conditions; or
b. identifying which of the Certificate conditions Algonquin has complied with or will comply with. This statement shall also identify any areas affected by the Project where compliance measures were not properly implemented, if not previously identified in filed status reports, and the reason for noncompliance.

10. Algonquin shall revise its E&SCP to include soil compaction testing and mitigation measures consistent with sections V.C.1 and V.C.3 of the FERC Plan. In addition, Algonquin shall revise table C-1 of its E&SCP to be consistent with the approved workspaces listed in table 4.4.3-1 of the final EIS. Algonquin shall file the revised E&SCP with the Secretary for review and written approval by the Director of OEP **prior to construction**. *(sections 4.2.2 and 4.4.3)*

11. Algonquin shall revise its SPCC Plan to prohibit refueling within 200 feet of any private water supply well and 400 feet of any public water supply well. Algonquin shall file the revised SPPC Plan with the Secretary for review and written approval by the Director of OEP **prior to construction**. *(section 4.3.1.7)*

12. **Prior to construction**, Algonquin shall file with the Secretary the field verified locations, by milepost, of all water supply wells and springs within 150 feet of the construction work area. **Within 30 days of placing the facilities in service**, Algonquin shall file a report with the Secretary discussing whether any complaints were received concerning well yield or water quality and how each was resolved. *(section 4.3.1.7)*

13. **Prior to construction**, Algonquin shall file with the Secretary evidence of landowner concurrence with the site-specific residential construction plans for all locations where the construction work area and fencing would be within 10 feet of a residence. *(section 4.8.3.1)*

14. Algonquin shall develop and implement an environmental complaint resolution procedure that remains active for at least 2 years following completion of construction of the E2W Project. The procedure shall provide landowners with clear and simple directions for identifying and resolving

their environmental mitigation problems/concerns during construction of the Project and restoration of the right-of-way. Algonquin shall file the environmental complaint resolution procedure and mail the environmental complaint resolution procedure to each landowner whose property would be crossed by the Project with the Secretary **prior to construction**.

a. In its letter to affected landowners, Algonquin shall:

   i. provide a local contact that the landowners should call first with their concerns; the letter should indicate how soon to expect a response;
   ii. instruct the landowners that, if they are not satisfied with the response, they should call Algonquin's Hotline, as applicable; the letter should indicate how soon to expect a response; and
   iii. instruct the landowners that, if they are still not satisfied with the response from Algonquin's Hotline, they should contact the Commission's Enforcement Hotline at (888) 889-8030, or at hotline@ferc.gov.

b. In addition, Algonquin shall include in its biweekly status reports (see condition no. 7) a table that contains the following information for each problem/concern:

   i. the identity of the caller and the date of the call;
   ii. the identification number from the certificated alignment sheet(s) of the affected property and appropriate location by milepost;
   iii. a description of the problem/concern; and
   iv. an explanation of how and when the problem was resolved, will be resolved, or why it has not been resolved. *(section 4.8.3.1)*

15. Algonquin **shall not begin implementation** of any treatment plans/mitigation measures (including archaeological data recovery); **construction** of facilities; **or use** of all staging, storage, or temporary work areas and new or to-be-improved access roads **until**:

   a. Algonquin files with the Secretary the treatment plan for the Tower Hill Road site, and the Connecticut SHPO's comments on the treatment plan;
   b. the FERC executes an MOA with the Connecticut SHPO, and provides the ACHP with an opportunity to comment; and
   c. the Director of OEP notifies Algonquin in writing that the treatment plan/mitigation measures may be implemented and/or construction may proceed.

   All material filed with the Secretary containing location, character, and ownership information about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering: **"CONTAINS PRIVILEGED INFORMATION - DO NOT RELEASE."** *(section 4.10.4)*

APPENDIX A

FINAL EIS DISTRIBUTION LIST FOR THE
HUBLINE/EAST TO WEST PROJECT

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FINAL EIS DISTRIBUTION LIST FOR THE HUBLINE/EAST TO WEST PROJECT

Federal Agencies

Advisory Council on Historic Preservation, DC
- Director, Cultural Resources

Army Corps of Engineers, MA
- New England Division
  - Karen Adams, Chief Permits Branch A
  - Susan Lee
  - Ted Lento, Project Manager
  - Cori Rose
- Office of the Chief of Army Engineers

Council on Environmental Quality, DC
- Director for NEPA Oversight

Department of Agriculture, CT
- Natural Resources Conservation Service
  - Margo Wallace, State Conservationist

Department of Agriculture, DC
- Forest Service
  - Deputy Chief, National Forest System
  - Director of Lands
  - Ecosystem Management Coordination
- Natural Resources Conservation Service
  - National Environmental Coordinator
- Office of Finance and Management

Department of Agriculture, NJ
- Natural Resources Conservation Service
  - Thomas Drewes, State Conservationist

Department of Commerce, CT
- National Oceanic and Atmospheric Administration, National Marine Fisheries Service
  - Ronald Goldberg, Acting Administrator

Department of Commerce, DC
- National Oceanic and Atmospheric Administration
  - Director, Ecology and Conservation
- Office of the Secretary
  - Senior Policy Advisor

Department of Commerce, MA
- National Oceanic and Atmospheric Administration, National Marine Fisheries Service
  - Chris Boelke, Fisheries Biologist

Department of Commerce, MD
- National Marine Fisheries Service, Office of Habitat Protection, Marine Resource
  - Habitat Specialist

Department of Energy, DC
- Natural Gas Regulatory Activities
  - Manager
- Office of Environmental Compliance
- Office of Intergovernmental Affairs

Federal Agencies (cont'd)

Department of Health and Human Services, GA
- Centers for Disease Control and Prevention

Department of Housing and Urban Development, DC
- Director of Environment

Department of Justice, DC
- Land and Natural Resources Division

Department of Labor, DC
- Office of Regulatory Economics

Department of State, DC
- Office of Environment/Health

Department of the Interior, DC
- Land and Minerals Management
  - Deputy Assistant Secretary
- Minerals Management Service
  - Deputy Director
- Office of Environmental Policy and Compliance
  - Director

Department of the Interior, NH
- Fish and Wildlife Service
  - Anthony Tur, Fish and Wildlife Biologist
  - Maria Tur

Department of the Interior, NJ
- Fish and Wildlife Service
  - Clifford G. Day, Administrator, New Jersey Field Office
  - Steve Mars
  - John C. Staples, Asst Supervisor

Department of Transportation, DC
- Environmental Policies Team Leader
- Pipeline and Hazardous Materials Safety Administration, Office of Pipeline Safety
  - Administrator

Department of Transportation, NJ
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  - Community Assistance and Technical Services

Environmental Protection Agency, DC
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- Region 1
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Library of Congress, DC
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APPENDIX B

EROSION AND SEDIMENTATION CONTROL PLAN

EROSION AND SEDIMENTATION CONTROL PLAN

Company: Algonquin Gas Transmission, LLC

Project: **HubLine/East to West Project**

Location: **Connecticut and New Jersey**

Person Responsible: TBD
Address: **Spectra Energy Corp**
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Effective January 17, 2003

TABLE OF CONTENTS

APPENDICES

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1. INTRODUCTION

1.1 Purpose of this Plan

This Erosion and Sedimentation Control Plan (Plan) has been prepared for use by the Company and its contractors as a guidance manual for minimizing erosion of disturbed soils and transportation of sediments off the right-of-way (ROW) and into sensitive resources (wetlands, streams, and residential areas) during natural gas pipeline construction. The procedures developed in this Plan, which represent the Company's best management practices, are designed to accommodate varying field conditions while maintaining rigid minimum standards for the protection of environmentally sensitive areas.

This Plan is designed to provide specifications for the installation and implementation of soil erosion and sediment control measures while permitting adequate flexibility to use the most appropriate measures based on site-specific conditions. The intent of this Plan is to provide general information on the pipeline construction process and to describe specific measures that will be employed during and following construction to minimize impacts to the environment along the pipeline ROW.

The goal of this Plan is to preserve the integrity of environmentally sensitive areas and to maintain existing water quality by implementing the following objectives:

- Minimize the extent and duration of disturbance;
- Protect exposed soil by diverting runoff to stabilized areas;
- Install temporary and permanent erosion control measures; and
- Establish an effective inspection and maintenance program.

1.2 Guidelines and Requirements

The measures described in this Plan have been developed based on guidelines from the Federal Energy Regulatory Commission (FERC), United States Army Corps of Engineers (COE), the United States Fish and Wildlife Service (USF&W), the United States Department of Agriculture, and the Natural Resource Conservation Service, as well as from the Company's significant experience and practical knowledge of pipeline construction and effective environmental protection measures. Lessons and insights gained during pipeline construction projects along the Company's pipeline system and comments from agency representatives are also incorporated into this Plan.

Any deviation from the placement of the structures specified in the construction drawings, or changes in the design of control measures as set forth in this Plan, must be approved by the Company's Environmental Construction Permitting Department and must have the concurrence from the appropriate permitting agency.

Pursuant to changes in the FERC regulations, interstate pipeline companies are now required to comply with the FERC's Upland Erosion Control, Revegetation, and Maintenance Plan and the FERC's Wetland and Waterbody Construction and Mitigation Procedures (Plan and Procedures, 1/17/2003 Version), unless approval to deviate from the Plan and Procedures is received from the appropriate state agency.

The following identifies the differences between this Plan and the FERC's Plan and Procedures as well as the reasons behind the differences:

1. FERC Plan (Section V.C.1 and V.C.3): Perform compaction testing in residential areas disturbed by construction activities and perform appropriate soil compaction mitigation in severely compacted residential areas.

   This Plan: Compaction testing and mitigation are not required in residential areas.

   Reason to Deviate: This Plan requires that topsoil either be segregated or replaced in residential areas. Topsoil that is segregated or replaced results in little compaction and provides a suitable medium for grass. Most yard areas that are sown in grass do not require deep root penetration. In the event that the grass needs deeper root penetration, the subsequent freeze-thaw cycles of the upper portions of the subsoil will provide natural mitigation of any compacted areas of the ROW within 2-3 years. Post-construction monitoring will be conducted during this timeframe as discussed in Section 8.1.

2. FERC Procedures (Section VI.B.1.b): The project sponsor shall file with the Secretary for review and written approval by the director, a site-specific construction plan and site-specific explanation of the conditions that will not permit a 50-foot extra work area setback from wetland boundaries.

   This Plan: Algonquin is requesting written approval from the Director for the extra work space variances described in Table C-1 located in Appendix C below.

   Reason to Deviate: The 50-foot wetland setback for the extra work spaces could not be maintained due to a variety of construction limitations, including steep slopes, congested road crossing requirements and other topographic conditions. Site specific explanations for each extra work space variance requested are identified in Table C-1 in Appendix C below.

1.3 Surveys, Permits, and Notifications

The Company shall perform the required environmental field surveys and acquire the necessary environmental permits prior to start of construction of the project. The Company shall notify the appropriate federal and state agencies prior to, during, and/or subsequent to the construction of the project, as identified in the Clearance Package/ Permit Book.

1.4 Inquiries

Inquiries regarding this Plan should be addressed to the Manager, Environmental Construction Permitting Department; shown on the front cover; P.O. Box 1642; Houston, Texas 77056. For field conditions requiring an immediate response, contact the Area Manager at the address shown on the front cover.

2. SUPERVISION AND INSPECTION

To effectively mitigate project-related impacts, the Plan must be properly implemented in the field. Quick and appropriate decisions in the field regarding critical issues such as stream and wetland crossings, placement of erosion controls, trench dewatering, spoil containment, and other construction related items are essential.

To ensure that the Plan is properly implemented, at least one Environmental Inspector (EI) will be designated by the Company for each construction spread during active construction or restoration. The EI will have peer status with all other activity inspectors and will report directly to the Resident Engineer/ Chief Inspector who has overall authority on the construction spread. On smaller projects, the EI role may be carried out by the Resident Engineer/ Chief Inspector or a Craft Inspector, as designated by the Company. The EI will have the authority to stop activities that violate the environmental conditions of the FERC certificate (if applicable), other federal and state permits, or landowner requirements, and to order corrective action.

2.1 Responsibilities of the Environmental Inspector

At a minimum, the EI shall be responsible for:

1. Ensuring compliance with the requirements of this Plan, the construction drawings, the environmental conditions of the FERC certificate (if applicable), proposed mitigation measures, other federal or state environmental permits and approvals, and environmental requirements in landowner easement agreements;
2. Identifying, documenting, and overseeing corrective actions, as necessary to bring an activity back into compliance;
3 Verifying that the limits of authorized construction work areas and locations of access roads are properly marked before clearing;
4 Verifying the location of signs and highly visible flagging marking the boundaries of sensitive resource areas, waterbodies, wetlands, or areas with special requirements along the construction work area;
5 Identifying erosion/sediment control and stabilization needs in all areas;
6 Identifying locations for dewatering structures and interceptor dikes to ensure they will not direct water into known cultural resources sites or locations of sensitive resources;
7 Verifying that trench-dewatering activities do not result in the deposition of sand, silt, and/or sediment near the point of discharge into a wetland or waterbody. If such deposition is occurring, the dewatering activity shall be stopped. The design of the discharge shall be changed by the EI to prevent reoccurrence;
8 Ensuring that subsoil and topsoil are tested in agricultural areas to measure compaction and determine the need for corrective action;

9 Advising the Chief Inspector when conditions (such as wet weather) make it advisable to restrict construction activities to avoid excessive rutting;

10 Ensuring restoration of contours and topsoil;

11 Verifying that the soils imported for agricultural or residential use have been certified as free of noxious weeds and soil pests, unless otherwise approved by the landowner;

12 Determining the need for and ensuring that erosion controls are properly installed and maintained, daily if necessary; to prevent sediment flow into wetlands, waterbodies, sensitive areas, and onto roads;

13 Inspecting temporary erosion control measures at least:

a. On a daily basis in areas of active construction or equipment operation;
b. On a weekly basis in areas with no construction or equipment operation; and
c. Within 24 hours of each 0.5 inch of rainfall.

14 Ensuring the repair of all ineffective temporary erosion control measures within 24 hours of identification;

15 Identifying areas that should be given special attention to ensure stabilization and restoration after the construction phase;

16 Ensuring that the Contractor implements and complies with the Company's Spill Prevention Control and Countermeasure (SPCC) Plan; and

17 Keeping records of compliance with the environmental conditions of the FERC certificate (if applicable), proposed mitigation measures, and other Federal or state environmental permits during active construction and restoration.

2.2 Environmental Training for Construction

If required by the FERC certificate, environmental training will be given to both the Company personnel and contractor personnel whose activities will impact the environment during pipeline construction. The level of training will be commensurate with the type of duties of the personnel. All construction personnel from the chief inspector, EI, craft inspectors, contractor job superintendent to loggers, welders, equipment operators, and laborers will be given some form of environmental training. In addition to the EI, all other construction personnel are expected to play an important role in maintaining strict compliance with all permit conditions to protect the environment during construction. Training will be given prior to the start of construction and throughout the construction process, as needed, and will cover the following issues:

- The specifics of this Plan and the SPCC Plan;
- Job or activity specific permit requirements;
- Company policies and commitments;
- Cultural resource procedures and restrictions;

- Threatened and endangered species restrictions; and
- Any other pertinent information related to the job.

3. CONSTRUCTION TECHNIQUES FOR NATURAL GAS PIPELINES

3.1 Typical ROW Requirements

Pipeline construction workspace requirements are a function of pipe diameter, equipment size, topography, geological rock formations, location of construction such as at road crossings or river crossings, pipeline crossovers, methods of construction such as boring or open-cut construction, or existing soil conditions encountered during construction. As the diameter of the pipeline being installed increases, so does the depth of trench, excavated spoil material, equipment size, and ultimately the amount of construction work space that will be required to construct the project. All construction activities are restricted to the ROW limits identified on the construction drawings. However, in limited, non-wetland areas, the construction ROW width may be expanded by up to 25 feet without approval from the FERC for the following situations:

1. To accommodate full construction ROW topsoil segregation;

2. To ensure safe construction where topographic conditions (i.e., side-slopes) or soil limitations exist; and

3. For truck turn-around areas where no reasonable alternative access exits in limited, non-wetland or non-forested areas.

Use of these limited areas is subject to landowner approval and compliance with all applicable survey, mitigation, and reporting requirements.

The U.S. Department of Transportation (DOT) and Occupational Safety and Health Administration (OSHA) have established minimum size and area requirements for worker safety involving construction activities. See Figures 1, 2, and 3 for typical construction ROW widths. Additional construction ROW may be required at specific locations to construct a pipeline including, but not limited to, steep side or vertical slopes, road crossings, crossovers, areas requiring topsoil segregation, and staging areas associated with wetland and waterbody crossings. These locations are shown on the construction drawings.

3.2 Access Roads

All access to the construction ROW will be limited to existing roads and minimized in wetlands to the extent practical. Additional access roads to the ROW are required at various points along the project ROW where other road crossings (paved or gravel/state/local roads) do not exist. Examples of types of access used include abandoned town roads, railroad ROWs, powerline service roads, logging roads and farm roads. Improvements to access roads (i.e., grading, placing gravel, replacing/installing culverts, and trimming overhanging vegetation) may be required due to the size and nature of the equipment that would utilize the road (Figure 4).

1. Access to the ROW during construction and restoration activities is permitted only by the new or existing access roads identified on the construction drawings.

2. Contractor shall maintain safe conditions at all road crossings and access points during construction and restoration. All access roads will be maintained during construction by grading and the addition of gravel or stone when necessary.

3. Contractor will implement all appropriate erosion and sedimentation control measures for construction/improvement of access roads.

4. Contractor shall ensure that all paved road surfaces utilized during construction are kept free of mud and debris to the extent practical.

5. If rock access pads are required by the permitting agencies in residential or active agricultural areas, rock shall be placed on nonwoven geotextile fabric to facilitate rock removal after construction (Figure 5).

6. All access roads across a waterbody must use an equipment bridge in accordance with Section 5.2.2.

7. The only access roads, unless otherwise permitted, that can be used in wetlands other than the construction ROW are those existing roads requiring no modification and no impact on the wetland.

8. Limit construction equipment operating in wetland areas to that needed to clear the ROW, dig the trench, fabricate and install the pipeline, backfill the trench, and restore the ROW. All other construction equipment shall use access roads located in upland areas to the maximum extent practical. Where access roads in upland areas do not provide reasonable access, limit all other construction equipment to one pass through the wetland using the ROW, whenever practical.

9. For access through a saturated wetland, unless otherwise authorized by agency permits, use timber mats or an equivalent (Figure 6).

3.3 Pipe and Contractor Wareyards

Pipe and contractor wareyards are required for storing and staging equipment, pipe, fuel, oil, pipe fabrication, and other construction related materials. The Contractor shall perform the following measures at pipe and contractor wareyards:

1. Strip and segregate topsoil in agricultural lands;

2. Install erosion control structures as directed by the EI, outlined in this Plan, or identified on the construction drawings, and maintain them throughout construction and restoration activities;

3. Implement and comply with the SPCC Plan; and

4. Restore and revegetate all disturbed areas in accordance with the measures outlined in this Plan and as directed by the EI.

3.4 Off-ROW Disturbance

With certain exceptions, which are required in order to comply with FERC Plan and Procedures, all construction activities are restricted to within the limits identified on the construction drawings (exceptions include the installation of slope breakers, installation of energy-dissipating devices, installation of dewatering structures, and drain tile repair which are subject to applicable survey requirements). However, in the event that off-ROW disturbance occurs, the following measures will be implemented:

1. The EI will immediately report the occurrence to the Chief Inspector and ROW Agent;

2. The conditions that caused the disturbance will be evaluated by the Chief Inspector and the EI, and they will determine whether work at the location can proceed under those conditions; and

3. If deemed necessary by the Chief Inspector and EI, one or more of the following corrective actions will be taken: immediate restoration of the original contours, seeding and mulching of the disturbed area, and/or installation of erosion control devices. The Company's Environmental Construction Permitting Department will be notified as soon as practical.

3.5 Construction Sequence

Natural gas pipelines are installed using conventional overland buried pipeline construction techniques. These activities are necessary for the installation of a stable, safe, and reliable transmission facility consistent with DOT requirements and regulations. This section provides an overview of the equipment and operations necessary for the installation of a natural gas pipeline, describes potential impacts that may occur from each operation, and identifies the measures that will be implemented to control these potential impacts. This section also discusses in detail the erosion and sediment control techniques that apply to each construction activity including clearing, grading, trenching, lowering-in of pipe, backfilling, and hydrostatic testing. ROW restoration will be addressed in Section 3.6.

Installation of the pipeline will typically proceed from one end of the construction spread to the other in an assembly line or "mainline" fashion. The spacing between the individual crews responsible for each interdependent activity is based on anticipated rate of progress. The activities listed below are normally performed in the following sequence:

- Survey and Flag the ROW;
- Clearing the ROW;
- Installing temporary sediment barriers;
- Grading the ROW;
- Installing temporary interceptor dikes;
- Trenching/excavating the trench;
- Pipe stringing and bending;

- Welding and weld inspection;
- Trench dewatering;
- Lowering the pipe into the trench;
- Backfilling the trench;
- Hydrostatic testing of pipe; and
- ROW restoration and clean-up.

Obstacles to the mainline technique are often encountered and are not considered to be out of the ordinary. These obstacles, which include side hill crossings, rock, wetlands, streams, roads, and residential areas, do not normally interrupt the assembly line flow.

3.5.1 Clearing

- Clearing operations will include the removal of vegetation within the construction ROW. Various clearing methods will be employed depending on tree size, contour of the land, and the ability of the ground to support clearing equipment. Vegetative clearing will either be accomplished by hand or by cutting equipment. The following procedures will be standard practice during clearing:

1. Prior to beginning the removal of vegetation, the limits of clearing will be established and identified in accordance with the construction drawings;

2. All construction activities and ground disturbance will be confined to within the ROW shown on the construction drawings;

3. Clearly mark and protect trees to be saved as per landowner requests or as otherwise required;

4. All brush and trees will be felled into the construction ROW to minimize damage to trees and structures adjacent to the ROW. Trees that inadvertently fall beyond the edge of the ROW will be immediately moved onto the ROW and disturbed areas will be immediately stabilized;

5. Trees will be chipped or cut into lengths identified by the landowner and then stacked at the edge of the ROW or removed;

6. Brush and limbs may be disposed of in one or more of the following ways depending on local restrictions, applicable permits, construction Line List stipulations, and landowner agreements:

    a. Stockpiled along the edge of the ROW;
    b. Burned;
    c. Chipped, spread across the ROW in upland areas, and plowed in; or
    d. Hauled off site.

7. Existing surface drainage patterns will not be altered by the placement of timber or brush piles at the edge of the construction ROW.

3.5.2 Installing Temporary Sediment Barriers

Sediment barriers, which are temporary erosion controls intended to minimize the flow of sediment and to prevent the deposition of sediments into sensitive resources, shall be installed following vegetative clearing operations. They may be constructed of materials such as silt fence, staked straw bales, compacted earth (e.g., drivable berms across travel lanes), sandbags, or an equivalent material as identified by the EI (Figures 7, 8, 9, 10). Hay bales may be used in lieu of straw bales with the following restrictions – hay bales shall not be used for mulching and the Contractor is responsible for their removal and disposal.

1. Install temporary sediment barriers at the base of slopes adjacent to road crossings and at waterbody and wetland crossings in accordance with Sections 5.2.4 and 6.2.2 respectively.

2. Do not stake or trench in place straw bales used on equipment bridges or on mats across the travel lane.

3. Inspect temporary sediment barriers daily in areas of active construction to ensure proper functioning and maintenance. In other areas, sediment barriers will be inspected and maintained on a weekly basis throughout construction, and within 24 hours following storm events.

4. Maintain all temporary sediment barriers in place until permanent revegetation measures are successful or the upland areas adjacent to wetlands, waterbodies, or roads are stabilized.

5. Remove temporary sediment barriers from an area when replaced by permanent erosion control measures or when the area has been successfully restored as specified in Section 8.1.

3.5.3 Grading

The construction ROW will be graded as needed to provide a level workspace for safe operation of heavy equipment used in pipeline construction. The following procedures will be standard practice during grading:

3.5.3.1 Topsoil Segregation

Topsoil segregation methods will be used in all residential areas and when the construction ROW is wider than 30 feet in annually cultivated or rotated agricultural lands, cultivated pastures, hayfields, and other areas at the landowner's or land managing agency's request.

a. Prevent the mixing of topsoil with subsoil by stripping topsoil from either the full work area or from the trench line and subsoil storage area (ditch plus spoil side method) as stipulated in the Construction Contract or Line List (Figure 11).

b. Segregate at least 12 inches of topsoil in deep soils with more than 12 inches of topsoil. In soils with less than 12 inches of topsoil, make every effort to segregate the entire topsoil layer.

c. Where topsoil segregation is required, maintain separation of salvaged topsoil and subsoil throughout all construction activities.

d. For wetlands, segregate the top 12 inches of topsoil within the ditchline, except in areas where standing water is present or soils are saturated or frozen.

e. Leave gaps in the topsoil piles for the installation of temporary interceptor dikes to allow water to be diverted off ROW.

f. Topsoil replacement (i.e., importation of topsoil) may be used as an alternative to topsoil segregation if approved by the landowner and Chief Inspector.

g. Never use topsoil for padding, backfill or trench plugs.

3.5.3.2 Tree Stump Removal and Disposal

a. Remove tree stumps in upland areas along the entire width of the permanent ROW to allow adequate clearance for the safe operation of vehicles and equipment. Stumps within the temporary ROW will be removed or ground to a suitable height that will allow the safe passage of equipment, as stipulated by the Chief Inspector or EI.

b. Dispose of stumps by one of the following methods, pending approval by the Chief Inspector and the landowner, and in accordance with regulatory requirements:

- Buried at a Company-approved off-site location (except in wetlands and agricultural areas);
- Burned;
- Chipped, spread across the ROW in upland areas, and plowed in; or
- Ground to grade in wetlands, excess chips will be removed for proper disposal.

c. Grading operations and tree stump removal in wetland areas will be conducted in accordance with Section 6.2.1.

3.5.3.3 Rock Disposal

Rock (including blast rock) will be disposed of in one or more of the following ways:

a. Buried on the ROW or in approved construction work areas either in the ditchline or as fill during grade cut restoration in accordance with the Construction specifications. In cultivated/ agricultural lands, wetlands, and residential areas, rock may only be backfilled to the top of the existing bedrock profile;

b. Windrowed per written landowner agreement with the Company;

c. Removed and disposed of at a Company-approved site; or

d. Used as riprap for stream bank stabilization where allowed by an applicable regulatory agency(s) (Figure 34).

3.5.4 Installing Temporary Interceptor Dikes

1. Temporary interceptor dikes, which are temporary erosion control measures intended to reduce runoff velocity and divert water off the construction ROW, shall be installed following grading operations (Figure 12). The interceptor dikes are to be installed on all disturbed areas as necessary to avoid excessive erosion. Temporary interceptor dikes may be constructed of materials such as compacted soil, silt fence, staked straw bales, or sand bags. Hay bales may be used in lieu of straw bales with the following restrictions – hay bales shall not be used for mulching and the Contractor is responsible for their removal and disposal.

   Temporary slope breakers must be installed on slopes greater than 5 percent where the base of the slope is less than 50 feet from waterbody, wetland or road crossing at the spacing indicated below (closer spacing should be used if necessary). Where the base of the slope is equal or greater than 50 feet from a waterbody, wetland, or road crossing, install interceptor dikes at a spacing necessary to avoid excessive erosion.

Slope (%)	**Spacing (feet)**
<5	No Structure
5 - 15	300
> 15 - 30	200
> 30	100

2. Direct the outfall of each temporary interceptor dike to a stable, well vegetated area or construct an energy-dissipating device (silt fence, staked straw bales, erosion control fabric) at the end of the interceptor dike.

3. Position the outfall of each temporary interceptor dike to prevent sediment discharge into wetlands, waterbodies, or other sensitive resources.

4. Install temporary interceptor dikes across the entire ROW at all waterbody and wetland crossings, as well as the base of slopes adjacent to roads, when directed by the EI.

5. Drivable berms, which are smaller versions of interceptor dikes constructed of compacted soil or sand bags, may be used in place of staked straw bales at the entrances and exits of travel lanes at road crossings, waterbodies, and wetlands. They are installed the width of the travel lane at the start of the equipment crossing and made low enough to allow equipment and other vehicles to pass. Yet, they reduce and divert water runoff from sensitive environmental resources.

6. Inspect temporary interceptor dikes daily in areas of active construction to insure proper functioning and maintenance. In other areas, the interceptor dikes will be inspected and maintained on a weekly basis throughout construction, and within 24 hours following storm events.

3.5.5 Trenching

The trench centerline will be staked after the construction ROW has been prepared. In general, a trench will be excavated to a depth that will permit burial of the pipe with a minimum of 3 feet of cover (Figure 13). Overland trenching may be accomplished using a conventional backhoe or a rotary wheel-ditching machine. In shale or rocky areas where the use of the wheel-ditching machine is limited, a tractor-drawn ripper will be employed to break and loosen hard substratum material. In areas where rock cannot be ripped, drilling and blasting may be required. A backhoe may then be used to remove rock and soil from the ditch.

The following procedures will be standard practice during ditching:

1. Flag drainage tiles damaged during ditching activities for repair; and
2. Place spoil at least 10 feet upgradient from the edge of waterbodies. Spoil will be contained with erosion and sedimentation control devices to prevent spoil materials or heavily silt-laden water from transferring into waterbodies and wetlands or off of the ROW.

3.5.5.1 Temporary Trench Plugs

Temporary trench plugs are barriers within the ditch that segment the continuous open trench. They typically consist of compacted subsoil or sandbags (soft) placed across the ditch or composed of unexcavated portions of the ditch (hard). Along steep slopes, they serve to reduce erosion and sedimentation in the trench and minimize dewatering problems at the base of slopes where sensitive environments such as waterbodies and wetlands are frequently located. In addition, they provide access across the trench for wildlife and livestock.

a. Do not use topsoil for installing temporary soft trench plugs.

b. Coordinate with the landowner to identify optimal locations for the placement of temporary hard trench plugs designed to provide access for livestock.

c. Temporary trench plugs may be used in conjunction with interceptor dikes to prevent water in the trench from overflowing into sensitive resource areas (Figure 14). Attempt to divert trench overflow to a well-vegetated off-ROW location or construct an energy-dissipating device.

3.5.6 Trench Dewatering

Trench dewatering may be periodically required along portions of the proposed pipeline prior to and/or subsequent to installation of the pipeline to remove collected water from the trench.

1. Trench dewatering will be conducted (on or off the construction ROW) in such a manner that does not cause erosion and does not result in heavily silt-laden water flowing into any waterbody or wetland.

2. The intakes of the hoses used to withdraw the water from the trench will be elevated and screened to minimize pumping of deposited sediments.

3. Water may be discharged into areas where adequate vegetation is present adjacent to the construction ROW to function as a filter medium.

4. Where vegetation is absent or in the vicinity of waterbody/ wetland areas, water will be pumped into a filter bag (Figure 15) or through a structure composed of sediment barriers. When using filter bags, secure the discharge hose to the bag with a clamp.

5. Remove dewatering structures as soon as possible after the completion of dewatering activities.

3.5.7 Pipe Installation

3.5.7.1 Stringing and Bending

Following trench excavation, pipe sections will be delivered to the construction site by truck or tracked vehicle, and strung out along the trench. Individual pipe sections will be placed on temporary supports or wooden skids and staggered to allow room for work on the exposed ends. Certain pipe sections will be bent, as necessary, to conform to changes in slope and direction of the trench.

3.5.7.2 Welding and Weld Inspection

Once the bending operation is complete, the pipe sections will be welded together on supports using approved welding procedures that comply with Company welding specifications. After welding, the welds will be inspected radiographically or ultrasonically to ensure their structural integrity.

3.5.7.3 Lowering-in

Lowering-in consists of placing the completed pipeline sections into the trench where a tie-in weld will be made. Lowering-in is usually accomplished with two or more sideboom tractors acting in unison and spaced so as not to buckle or otherwise damage the pipe. The pipeline will be lifted from the supports, swung out over the trench, and lowered directly into the trench. The equipment uses a "leap frogging" technique requiring sufficient area to safely move around other tractors within the construction ROW to gain an advanced position on the pipe.

3.5.8 Backfilling

Backfilling consists of covering the pipe with the earth removed from the trench or with other fill material hauled to the site when the existing trench spoil is not adequate for backfill. Backfilling will follow lowering-in of the pipeline as close as is practical.

In areas where the trench bottom is irregularly shaped due to consolidated rock or where the excavated spoil materials are unacceptable for backfilling around the pipe, padding material may be

required to prevent damage to the pipe. This padding material will generally consist of sand or screened spoil materials from trench excavation.

1. Under no circumstances shall topsoil be used as padding material.

2. Excess rock, including blast rock, may be used to backfill the trench to the top of the existing bedrock profile in accordance with Company specifications. Rock that is not used to backfill the trench will be treated as described in Section 3.5.3.3.

3. Any excess material will be spread within the ROW in upland areas and land contours will be roughed-in to match adjacent topography.

4. The trench may be backfilled with a crown over the pipe to compensate for compaction and settling. Openings will be left in the completed trench crown to restore pre-construction drainage patterns. Crowning shall not be used in wetland areas.

3.5.8.1 Permanent Trench Plugs

Permanent trench plugs are intended to slow subsurface water flow and erosion along the trench and around the pipe in sloping terrain (Figures 16, 17). Permanent trench plugs will be constructed with sand bags or an equivalent as identified in the permit requirements. On severe slopes greater than 30 percent, "Sakrete" may be used at the discretion of the Chief Inspector.

a. Topsoil shall not be used to construct trench plugs.

b. Permanent trench plugs, which are used in conjunction with interceptor dikes, shall be installed at the locations shown on the construction drawings or as determined by the EI. If not shown, use the following spacing:

Slope (%)	**Spacing (feet)**
<5	No Structure
5 - 15	300
> 15 - 30	200
> 30	100

c. Trench plugs shall be installed at the base of slopes adjacent to waterbodies and wetlands, and where needed to avoid draining of a resource.

3.5.9 Hydrostatic Testing

Once the pipeline is completed and before it is placed into service, it will be hydrostatically tested for structural integrity. Hydrostatic testing involves filling the pipeline with clean water and maintaining a test pressure in excess of normal operating pressures for a specified period of time (typically 8 hours). The testing procedure involves filling the pipeline with test water, performing the pressure test, and discharging the test water.

1. The EI shall notify appropriate state agencies (as identified in the Hydrostatic Test Package) of the intent to use specific test water sources at least 48 hours before testing activities (unless waived in writing).

2. Pumps used for hydrostatic testing within 100 feet of any waterbody or wetland shall be operated and refueled in accordance with the SPCC Plan.

3. Do not use state-designated exceptional value waters, waterbodies that provide habitat for federally listed threatened or endangered species, or waterbodies designated as public water supplies, unless appropriate federal, state, and/or local permitting agencies grant written permission. Use only the water sources identified in the Clearance Package/Permit Book.

4. Screen the intake hose to prevent entrainment of fish and other aquatic life.

5. Maintain ambient, downstream flow rates to protect aquatic life, provide for all waterbody uses, and provide for downstream withdrawals of water by existing users.

6. Locate hydrostatic test manifolds outside wetlands and riparian areas to the greatest extent practical.

7. For an overland discharge of test water from a new pipeline, dewater into an energy dissipation device constructed of straw bales (Figures 18, 19).

8. For an overland discharge of test water from an existing pipeline, dewater into an energy dissipation device constructed of straw bales and absorbent booms (Figure 18). If required by the appropriate permitting agency, the test water may be discharged through an appropriate filtration system including frac tanks and/ or carbon filters.

9. Dewater only at the locations shown on the construction drawings or locations identified in the Hydrostatic Test Package.

10. Locate all dewatering structures in a well-vegetated and stabilized area, if practical, and attempt to maintain at least a 50-foot vegetated buffer from adjacent waterbody/wetland areas. If an adequate buffer is not available, sediment barriers or similar erosion control measure must be installed.

11. Regulate discharge rate, use energy dissipation device(s), and install sediment barriers, as necessary, to prevent erosion, streambed scour to aquatic resources, suspension of sediments, flooding or excessive stream flow.

12. Do not discharge into state-designated exceptional value waters, waterbodies which provide habitat for federally listed threatened or endangered species, or waterbodies designated as public water supplies, unless appropriate federal, state, and local permitting agencies grant written permission.

13. The EI shall sample and test the source water and discharge water in accordance with the permit requirements.

3.6 ROW Restoration and Final Cleanup

Restoration of the ROW will begin after pipeline construction activities have been completed. Restoration measures include the re-establishment of final grades and drainage patterns as well as the installation of permanent erosion and sedimentation control devices to minimize post-construction erosion. Residential areas will be restored in accordance with Section 4.3.3. Property shall be restored as close to its original condition as practical unless otherwise specified by the landowner.

1. The Contractor shall make every reasonable effort to complete final cleanup of an area (including final grading and installation of permanent erosion control structures) within 20 days after backfilling the trench in that area (within 10 days in residential areas). If seasonal or other weather conditions prevent compliance with these time frames, maintain temporary erosion controls (temporary interceptor dikes and sediment barriers) until conditions allow completion of cleanup.

2. The disturbed ROW will be seeded within 6 working days of final grading, weather and soil conditions permitting.

3. If final cleanup and seeding cannot be completed and is delayed until the next recommended growing season, the winter stabilization measures in Section 3.6.4 shall be followed.

4. Grade the ROW to pre-construction contours.

5. Spread segregated topsoil back across the graded ROW to its original profile.

6. Remove excess rock from at least the top 12 inches of soil to the extent practical in all rotated and permanent cropland, hayfields, pastures, residential areas, and other areas at the landowner's request. The size, density, and distribution of rock on the construction ROW should be similar to adjacent areas not disturbed by construction. The landowner may approve other provisions in writing.

7. A travel lane may be left open temporarily to allow access by construction traffic if the temporary erosion control structures are installed, regularly inspected and maintained. When access is no longer required, the travel lane must be removed and the ROW restored.

8. Remove all construction debris (used filter bags, skids, trash, etc.) from the ROW unless the landowner or land managing agency approves otherwise. Grade or till the ROW to leave the soil in the proper condition for planting.

3.6.1 Permanent Erosion Control

3.6.1.1 Permanent Interceptor Dikes

Permanent interceptor dikes are intended to reduce runoff velocity, divert water off the construction ROW, and prevent sediment deposition into sensitive resources (Figure 12). Permanent interceptor dikes will be constructed of compacted soil. Sand bags or some functional equivalent may be used when directed by the EI.

a. Install permanent interceptor dikes in all areas, except cultivated areas and lawns, at the locations shown on the construction drawings or as directed by the EI. If not shown, use the spacing outlined for temporary interceptor dike installation in Section 3.5.4.

b. Install permanent interceptor dikes across the entire ROW at all waterbody and wetland crossings, and at the base of slopes adjacent to roads. When the ROW parallels an existing utility ROW, permanent interceptor dikes may be installed to match existing interceptor dikes on the adjacent undisturbed pipeline ROW.

c. Construct interceptor dikes with a 2 to 8 percent outslope to divert surface flow to a stable vegetative area without causing water to pool or erode behind the interceptor dike. In the absence of a stable vegetative area, install an energy-dissipating device at the end of the interceptor dike (Figure 12).

d. Interceptor dikes may extend slightly (about 4 feet) beyond the edge of the construction ROW to effectively drain water off the disturbed area. Where interceptor dikes extend beyond the edge of the construction ROW, they are subject to compliance with all applicable survey requirements.

e. Install chevron-style interceptor dikes on slopes when directed by the EI (Figure 20).

f. Install a rock-lined drainage swale along the ROW with restricted drainage features when directed by the EI. The drainage swale is generally 8 feet wide and a maximum of 18-24 inches deep (Figure 21).

g. On slopes greater than 30 percent, install interceptor dikes with erosion control fabric on the swale side.

3.6.1.2 Erosion Control Fabric

a. Install erosion control fabric at interceptor dike outlets and drainage swales as necessary or as directed by the EI (Figure 12, 21).

b. Install erosion control fabric or matting on slopes greater than 30 percent adjacent to roads or waterbodies (Figure 22). Anchor the erosion control fabric or matting with staples or other appropriate devices in accordance with the manufacturers' recommendations.

c. The EI will direct the installation of high-velocity erosion control fabric on the swale side of permanent interceptor dikes (Figure 23).

3.6.2 Revegetation and Seeding

Successful revegetation of soils disturbed by project-related activities is essential. Seeding will be conducted using the following requirements:

1. Fertilize and add soil pH modifiers in accordance with the recommendations in Appendix B. Incorporate recommended soil pH modifier and fertilizer into the top 2 inches of soil as soon as practical after application;

2. Seed all disturbed areas within 6 working days of final grading, weather and soil conditions permitting;

3. Prepare seedbed in disturbed areas to a depth of 3 to 4 inches to provide a firm seedbed. When hydroseeding, scarify the seedbed to facilitate lodging and germination of seed;

4. Seed disturbed areas in accordance with the seed mixes, rates, and dates in Appendix B, except in upland areas where landowners or a land management agency may request alternative seed mixes. Seeding is not required in actively cultivated croplands unless requested by the landowner.

5. Perform seeding of permanent vegetation within the recommended seeding dates as outlined in Appendix B. If seeding cannot be done within those dates, use appropriate temporary erosion control measures discussed in Section 3.5.2 and perform seeding of permanent vegetation at the beginning of the next recommended seeding season. Mulch in accordance with Section 3.6.3. Lawns may be seeded on a schedule established with the landowner;

6. Base seeding rates on Pure Live Seed (PLS). Use seed within 12 months of seed testing;

7. Treat legume seed with an inoculant specific to the species using the manufacturer's recommended rate of inoculant appropriate for the seeding method (broadcast, drill, or hydroseeding); and

8. Uniformly apply and cover seed in accordance with Appendix B. In the absence of any recommendations from the local soil conservation authorities, landowner, or land managing agency to the contrary. A seed drill equipped with a cultipacker is preferred for application, but broadcast or hydroseeding can be used at double the recommended seeding rates. Where seed is broadcast, firm the seedbed with a cultipacker or roller after seeding. In rocky soils, or where site conditions may limit the effectiveness of this equipment, other alternatives may be appropriate (e.g., use of a chain drag) to lightly cover seed after application, as approved by the EI.

3.6.3 Mulch

Mulch is intended to stabilize the soil surface and shall consist of weed-free straw or hay, wood fiber hydromulch, erosion control fabric, or some functional equivalent as approved by the EI and Chief Inspector. Hay shall not be used for mulch.

1. Mulch **before** seeding if:

   a. Final cleanup, including final grading and installation of permanent erosion control measures, is not completed in an area within 20 days after the trench in that area is backfilled (10 days in residential areas); or

   b. Construction or restoration activity is interrupted for extended periods, such as when seeding cannot be completed due to seeding period restrictions.

   NOTE: When mulching before seeding, increase mulch application on all slopes within 100 feet of waterbodies and wetlands to a rate of 3 tons/acre of straw or equivalent.

2. Apply mulch on all slopes (except in actively cultivated cropland) concurrent with or immediately after seeding, where necessary, to stabilize the soil surface and to reduce wind and water erosion. Spread mulch uniformly over the ROW at a rate of 2 tons/acre of straw or equivalent.

3. Mulch with woodchips only under the following conditions with prior approval from the Chief Inspector or the EI:

   a. Do not use more than 1 ton/acre; and

   b. Add the equivalent of 11 lbs/acre available nitrogen (at least 50 % of which is slow release).

4. Ensure that mulch is anchored to minimize loss by wind and water. Anchoring may be achieved by wet soil conditions (when approved by the EI), mechanical means, or with liquid mulch binders.

5 When anchoring with liquid mulch binders, use rates recommended by the manufacturer. **Do not use liquid mulch binders within 100 feet of wetlands and waterbodies.**

6. Install and anchor erosion control fabric, such as jute thatching, or bonded fiber blankets, on waterbody banks at the time of final bank recontouring. Anchor the erosion control fabric with staples or other appropriate devices.

3.6.4 Winter Stabilization

In the event that the final phases of construction occur too late in the year for cleanup activities to adequately proceed, the following procedures will be implemented along the disturbed ROW at those locations until final restoration measures can be completed. The Company will file for review and written approval from the FERC, a winterization plan if construction continues into the winter season

where conditions could delay successful decompaction, topsoil replacement, or seeding until the following spring.

1. Install permanent interceptor dikes at specified intervals on all slopes, or as directed by the EI;

2. Install temporary sediment barriers adjacent to stream and wetland crossings, as well as other critical areas;

3. Seed and mulch the ROW and seed segregated topsoil piles in accordance with Appendix B; and

4. Remove flumes from waterbody crossings to reestablish natural stream flow.

3.7 Unauthorized Vehicle Access to ROW

The Company will offer to install and maintain measures to control unauthorized vehicle access to the ROW based on requests by the manager or owner of forested lands. These measures may include:

- Signs;
- Fences with locking gates;
- Slash and timber barriers, pipe barriers, or a line of boulders across the ROW; or
- Conifers or other appropriate shrubs with a mature height of 4 feet or less across the ROW.

4. SPECIAL CONSTRUCTION METHODS

The Company will utilize the following specialized construction procedures for agricultural areas, road crossings, and residential areas along the pipeline project. The project construction drawings, Line Lists, and Construction Contract will indicate the locations where specialized construction methods will be used.

4.1 Agricultural Areas

4.1.1 Drain Tiles

1. Attempt to locate existing drain tiles and irrigation systems.

2. Develop procedures for constructing through drain tiled areas, maintaining irrigation systems during construction, and repairing drain tiles and irrigation systems after construction.

3. Engage qualified drain tile specialists, as needed, to conduct or monitor repairs to drain tile systems affected by construction. Use drain tile specialist from the project area, if available.

4. Probe all drainage tile systems within the area of disturbance to check for damage.

5. Repair damaged drain tiles to their original condition (Figure 24). Filter-covered drain tiles may not be used unless the local soil conservation authorities and the landowner agrees in writing prior to construction.

6. Ensure that the depth of cover over the new pipeline is sufficient to avoid interference with drain tile systems (existing or proposed). For adjacent pipeline loops in agricultural areas, install the new pipeline with at least the same depth of cover as the existing pipeline(s).

4.1.2 Irrigation

1. Maintain water flow in crop irrigation systems, unless shutoff is coordinated with affected parties.

2. Repair any damage to the systems as soon as practical.

4.1.3 Soil Compaction Mitigation

1. Test topsoil and subsoil for compaction at regular intervals in agricultural areas disturbed by construction activities. Conduct tests on the same soil type under similar moisture conditions in undisturbed areas to identify approximate preconstruction conditions. Use penetrometers or other appropriate devices to conduct tests.

2. Plow severely compacted agricultural areas with a paraplow or other deep tillage implement. In areas where topsoil has been segregated, plow the subsoil before replacing the segregated topsoil. Alternatively, make arrangements with the landowner to plant and plow under a “green manure” crop, such as alfalfa, to decrease soil bulk density and improve soil structure. If subsequent construction and cleanup activities result in further compaction, conduct additional tilling.

4.2 Road Crossings

Unpaved private and public roads supporting minimal traffic volumes are usually crossed by boring or by means of an open cut, if this method is approved by the owner or appropriate road management agency. An open cut crossing may involve closing the road to all traffic and constructing an adequate detour around the crossing area, or excavating one-half of the road at a time allowing through traffic to be maintained

(Figure 25). The trench for an open cut crossing is excavated with a backhoe or similar equipment, all backfill is compacted, and the road resurfaced. All state, national, and interstate highways as well as all railroads must be crossed by boring (Figure 26), unless the crossing permit allows an open cut crossing. Access roads shall be used in accordance with Section 3.2.

4.3 Residential Areas

4.3.1 Construction Procedures

Specialized construction procedures will be utilized in areas of heavy residential or commercial/ industrial congestion where residences or business establishments lie greater than 25 feet but less than 50 feet from the edge of the construction ROW.

1. Install safety fence at the edge of the construction ROW for a distance of 100 feet on either side of the residence or business establishment.

2. Attempt to maintain a minimum distance of 25 feet between any residence/business establishment and the edge of the construction work area for a distance of 100 feet on either side of the residence/business establishment.

3. Attempt to leave mature trees and landscaping intact within the construction work area unless the trees and landscaping interfere with the installation techniques or present unsafe working conditions.

4.3.2 Construction Techniques

In addition to the previously identified specialized procedures, smaller "spreads" of labor and equipment, operating independent of the mainline work force, will utilize either the stove pipe or drag section pipeline construction techniques in those areas of congestion where a minimum distance of 25 feet cannot be maintained between the residence (or business establishment) and the edge of the construction work area. In no case shall the temporary work area be located within 10 feet of a residence unless the landowner agrees in writing, or the area is within the existing maintained ROW. The following techniques shall be utilized for a distance of 100 feet on either side of the residence or business establishment at the locations identified in the Construction Contract and/or Line List.

1. The stove pipe construction technique is a less efficient alternative to the mainline method of construction, typically used when the pipeline is to be installed in very close proximity to an

existing structure or when an open trench would adversely impact a commercial/industrial establishment. The technique involves installing one joint of pipe at a time whereby the welding, weld inspection, and coating activities are all performed in the open trench. At the end of each day after the pipe is lowered-in, the trench is backfilled and/or covered with steel plates or timber mats. The length of excavation performed each day cannot exceed the amount of pipe installed.

2. The drag section construction technique, while less efficient than the mainline method, is normally preferred over the stove pipe alternative. This technique involves the trenching, installation, and backfill of a prefabricated length of pipe containing several segments all in one day. At the end of each day after the pipe is lowered-in, the trench is backfilled and/or covered with steel plates or timber mats. Use of the drag section technique will typically require adequate staging areas outside of the residential and/or commercial/industrial congestion for assembly of the prefabricated sections.

4.3.3 Cleanup and Restoration

1. Reseed all disturbed lawns with a seed mixture acceptable to landowner or comparable to the adjoining lawn.

2. Landowners shall be compensated for damages to ornamental shrubs and other landscape plantings based on the appraised value as set forth in the Guide for Plant Appraisal, authored by the Council of Tree and Landscape Appraisers (CTLA), 8th Edition and published in 1992 by the International Society of Arboriculture.

3. Landowners shall be compensated for damages in a fair and reasonable manner, and as specified in the damage provision within the controlling easement on each property.

5. WATERBODY CROSSINGS

The following section describes the construction procedures and mitigation measures that will be used for pipeline installations at waterbodies. The intent of these procedures is to minimize the extent and duration of project related disturbances within waterbodies.

5.1 Waterbody Definitions

The term "**waterbody"** as used in this Plan includes any natural or artificial stream, river, or drainage with perceptible flow at the time of crossing, and other permanent waterbodies such as ponds and lakes. In this Plan, waterbodies are characterized into three main categories depending on the width of the waterbody. The categories are as follows:

- A **"minor waterbody"** includes all waterbodies less than or equal to 10 feet wide at the water's edge at the time of construction.
- An "**intermediate waterbody"** includes all waterbodies greater than 10 feet wide but less than or equal to 100 feet wide at the water's edge at the time of construction.
- A "**major waterbody"** includes all waterbodies greater than 100 feet wide at the water's edge at the time of construction.
- A "**state designated waterbody**" includes all perennial waterbodies that support coldwater fisheries and warmwater fisheries considered significant by the state.
- A "**non-state designated waterbody**" includes intermittent drainage ditches, intermittent streams, and perennial warmwater streams **not** considered significant by the state.

The waterbody crossing procedures described in this Plan comply with the Section 404 Nationwide permit program terms and conditions (33 CFR Part 330).

5.2 General Waterbody Procedures

Pipeline construction across waterbody channels may result in short term water quality impacts. Decisions regarding waterbody crossing techniques will be based on agency consultations. Mobilization of construction equipment, trench excavation, and backfilling will be performed in a manner that will minimize the potential for erosion and sedimentation within the waterbody channel. Erosion control measures will be implemented to confine water quality impacts within the immediate construction area and to minimize impacts to downstream areas. The length of the crossing, the sensitivity of the area, existing conditions at the time of the crossing, and permit requirements will determine the most appropriate measures to be used.

5.2.1 Time Window for Construction

1. Unless expressly permitted or further restricted by the appropriate state agency in writing on a site-specific basis, instream work, except that required to install or remove equipment bridges, must occur during the following time windows:
   a. Coldwater Fisheries – June 1 through September 30; and
   b. Coolwater and Warmwater Fisheries – June 1 through November 30.

5.2.2 Temporary Equipment Bridges

A temporary equipment bridge is a structure that may be installed across a waterbody to provide a means for construction equipment to cross the stream while minimizing impacts to the channel bottom or banks.

1. Until the equipment bridge is installed, only clearing equipment and equipment necessary for installation of equipment bridges may cross the waterbody and the number of crossings shall be limited to one crossing per piece of equipment, unless otherwise authorized by the appropriate permitting agency.

2. Construct equipment bridges to maintain unrestricted flow and to prevent soil from entering the waterbody. Examples of such bridges include:
   a. Equipment pads and culverts (Figure 27);
   b. Clean crushed stone and culverts (Figure 28);
   c. Flexi-float or portable bridges (Figure 29); or
   d. Equipment pads or railroad car bridges without culverts
3. Construct crossings as close to perpendicular to the axis of the waterbody channel.

4. Design and maintain each equipment bridge to withstand the highest flows that would occur. Align culverts/flumes to prevent bank erosion or streambed scour. If necessary, install energy dissipating devices downstream of the culverts.

5. Do not use soil to construct or stabilize equipment bridges.

6. Design and maintain equipment bridges to prevent soil from entering the waterbody.

7. Remove equipment bridges as soon as practical after permanent seeding unless agency permits authorized that the bridge remains in place.

8. If there will be more than 1 month between final cleanup and the beginning of permanent seeding and reasonable alternative access to the ROW is available, remove equipment bridges as soon as practical after final cleanup.

5.2.3 Clearing and Grading

1. Confine construction activities and ground disturbance to within the ROW boundaries shown on the construction drawings.

2. Restrict extra work areas (such as staging areas and additional spoil storage areas) to those shown only on the construction drawings. All extra work areas must be located at least 50 feet away from the water's edge, except where the adjacent upland consists of actively cultivated or rotated cropland or other disturbed land. If site-specific conditions do not permit a 50-foot setback, the Company can receive written approval from the FERC to locate these extra work areas closer than 50 feet from the water's edge.

3. If the pipeline parallels a waterbody, attempt to maintain at least 15 feet of undisturbed vegetation between the waterbody (and any adjacent wetland) and the ROW except at the crossing location.

4. Clear the ROW adjacent to all waterbodies *up to the high water bank* (where discernible).

5. Immediately remove all cut trees and branches that inadvertently fall into a waterbody and stockpile in an upland area on ROW for disposal.

6. Grade the ROW adjacent to waterbodies *up to within 10 feet of the high water bank*, leaving an ungrubbed vegetative strip intact.

7. Clearing and grading operations may proceed through the 10-foot vegetative strip **only on the working side of the ROW** in order to install the equipment bridge and travel lane. Use temporary sediment barriers to prevent the flow of bank spoil into the waterbody.

8. Maintain adequate flow rates to protect aquatic life and prevent the interruption of existing downstream uses.

5.2.4 Installing Temporary Erosion and Sediment Control

1. Install sediment barriers immediately after initial disturbance of the waterbody or adjacent upland. Sediment barriers must be properly maintained throughout construction and reinstalled as necessary (such as after backfilling of the trench), until replacement by permanent erosion controls or restoration of adjacent upland areas is complete.

2. Install sediment barriers across the entire construction ROW at all waterbody crossings, where necessary to prevent the flow of sediments into the waterbody. Temporary or removable sediment barriers such as interceptor dikes or drivable berms as described in Section 3.5.4 may be used in lieu of sediment barriers in front of equipment bridges or timber mats across the travel lane. These temporary sediment barriers can be removed during the construction day, but must be reinstalled after construction has stopped for the day and/or when heavy precipitation is imminent.

3. Install sediment barriers as necessary along the edge of the construction ROW to contain spoil and sediment within the ROW where waterbodies are adjacent or parallel to the construction ROW.

4. Use trench plugs at all waterbody crossings to prevent diversion of water into upland portions of the pipeline trench and to keep any accumulated trench water out of the waterbody. Trench plugs shall be of sufficient size to withstand upslope water pressure.

5.2.5 Various Types of Crossings

Construction at waterbodies will be conducted using two principal crossing methods, a "dry" crossing and a "wet" crossing. The "dry" crossing procedure is further divided into a flumed crossing and a dam and pump crossing. These methods are designed to maintain downstream flow at all times and to isolate the construction zone from the stream flow by channeling the water flow through a flume pipe or by damming the flow and pumping the water around the construction area. The overall objective is to minimize siltation of the waterbody and to facilitate trench excavation of saturated spoil. Unless approved otherwise by the appropriate state agency, pipeline construction and installation must occur using one of the two "dry" crossing methods for waterbodies state-designated as either coldwater or significant coolwater or warmwater fisheries. The flumed and dam and pump crossing methods are applicable to waterbodies up to 30 feet wide at the water's edge at the time of construction. The two "dry" crossings are further described below in Sections 5.2.5.2 and 5.2.5.3.

The "wet" crossing procedure involves open cutting the waterbody without isolating the construction zone from the stream flow. The objective of this method is to complete the waterbody crossing as quickly as practical in order to minimize the duration of impacts to aquatic resources. All streams, their classifications, timing windows, and crossing procedures will be identified in the Clearance Package/Permit Book and on the construction drawings. Table 6-1 outlines the general procedures to be followed at all waterbody crossings.

5.2.5.1 General Crossing Procedures

1. Dewater trench in accordance with the procedures described in Section 3.5.6.

2. For minor waterbodies:

    a. Place all spoil from the waterbody within the construction ROW at least 10 feet from the water's edge or in the extra work areas shown on the construction drawings. Use sediment barriers to prevent flow of spoil or heavily silt-laden water into the waterbody.

3. For intermediate waterbodies:

    a. Less than 30 feet in width, place all spoil from the waterbody within the construction ROW at least 10 feet from the water's edge or in the extra work areas shown on the construction drawings. Use sediment barriers to prevent flow of spoil or heavily silt-laden water into the waterbody.

b. Greater than 30 feet in width, spoil may be temporarily sidecast into the waterbody provided that site specific approval is received from the appropriate permitting agency.

4. For major waterbodies:

   a. Place all upland bank spoil from the waterbody within the construction ROW at least 10 feet from the water's edge or in the extra work areas shown on the construction drawings. Use sediment barriers to prevent flow of spoil or heavily silt laden water into the waterbody.

   b. Sidecasting is permitted in major waterbodies upon approval from the appropriate permitting agencies.

5. Restore and stabilize the banks and channel in accordance with Section 5.2.6.

5.2.5.2 Flumed Crossing

The flumed crossing method utilizes a flume pipe(s) to transport stream flow across the disturbed area and allows trenching to be done in drier conditions (Figure 30). The flume pipe(s) installed across the trench will be sized to accommodate anticipated stream flows. This method is utilized for perennial waterbodies (minor and intermediate) up to 30 feet wide that are state designated fisheries including coldwater fisheries and warmwater fisheries considered significant by the state. Flumes are generally not recommended for use on a watercourse with a broad unconfined channel, unstable banks, a permeable substrate, excessive stream flow, or where the installation and construction of the flume crossing will adversely affect the bed or banks of the stream.

1. Cross all minor waterbodies that are state-designated fisheries, as identified in the Clearance Package/ Permit Book, using a dry crossing technique (Figures 30, 31).

2. All construction equipment must cross state-designated fisheries on an equipment bridge as specified in Section 5.2.2.

4. The flumed crossing shall be installed as follows:

   a. Install flume pipe(s) after blasting and other rock breaking measures (if required), but before trenching;

   b. Properly align flume pipe(s) to prevent bank erosion and streambed scour;

   c. Use sand bags or equivalent dam diversion structure to provide a seal at either end of the flume to channel water flow (some modifications to the stream bottom may be required to achieve an effective seal);

   d. **Do not remove flume pipe** during trenching, pipe laying (thread pipe underneath the flume pipe(s)), or backfilling activities, or initial streambed restoration efforts unless authorized by agency permits; and

   e. Remove all flume pipes and dams that are not also part of the equipment bridge as soon as final cleanup of the stream bed and bank is complete.

5.2.5.3 Dam and Pump Crossing

The dam and pump method is presented as an alternative dry crossing procedure to the flumed crossing. The dam and pump crossing is accomplished by utilizing pumps to transport stream flow across the disturbed area (Figure 31). This method involves placing sandbags across the existing stream channel upstream from the proposed crossing to stop water flow and downstream from the crossing to isolate the work area. Pumps are used to pump the water across the disturbed area and back into the stream further downstream. This method is intended for use at perennial waterbodies (minor and intermediate) up to 30 feet wide and state designated fisheries including coldwater fisheries and warmwater fisheries considered significant by the state. The dam and pump procedure allows for more space and flexibility during trenching and pipe installation, which shortens the duration of time spent at the waterbody.

1. The dam and pump method may be used for crossings of waterbodies where pumps can adequately transfer stream flow volumes around the work area, and where there are no concerns about sensitive species passage.

2. Implementation of the dam and pump crossing method will meet the following performance criteria:

    a. Use sufficient pumps, including onsite backup pumps, to maintain downstream flows;

    b. Construct dams with materials that prevent sediment and other pollutants from entering the waterbody (e.g., sandbags or clean gravel with plastic liner);

    c. Screen pump intakes

    d. Prevent streambed scour at pump discharge; and

    e. Monitor the dam and pumps to ensure proper operation throughout the waterbody crossing.

3. The dam and pump crossing shall be installed as follows:

    a. Install and properly seal sandbags at the upstream and downstream location of the crossing;

    b. Create an in-stream sump using sandbags if a natural sump is unavailable for the intake hose;

    c. Initiate pumping of the stream around the work area prior to excavating the trench;

    d. Screen all intake hoses to prevent the entrainment of fish and other aquatic life;

    e. Direct all discharges from the pumps through energy dissipaters to minimize scour and siltation;

    f. Monitor pumps <u>at all times</u> until construction of the crossing is completed; and

    g. Following construction, remove the equipment crossing and sandbag dams.

5.2.5.4 Wet Crossing

This construction technique is typically used to cross waterbodies that are non state-designated as well as intermediate and major waterbodies with substantial flows that cannot be effectively culverted or pumped around the construction zone using the dry crossing techniques (Figure 32). Non-state designated waterbodies include perennial warmwater streams not considered significant by the state, intermittent drainage ditches, and intermittent streams.

The wet-ditch crossing shall be installed as follows:

1. For minor waterbodies:

    a. Equipment bridges are not required at non state-designated fisheries (e.g. agricultural or intermittent drainage ditches). However, if an equipment bridge is used, it must be constructed in accordance with Section 5.2.2;

    b. Limit use of equipment operating in the waterbody to that needed to construct the crossing;

    c. Complete trenching and backfilling in the waterbody (not including blasting and other rock breaking measures) within 24 continuous hours; and

    d. If a flume is installed within the waterbody during mainline activities, it can be removed just prior to lowering in the pipeline. The 24-hour timeframe starts as soon as the flume is removed.

2. For intermediate waterbodies:

    a. Limit use of equipment operating in the waterbody to that needed to construct the crossing. All other construction equipment must cross on an equipment bridge as specified in Section 5.2.2; and

    b. Attempt to complete trenching and backfill work within the waterbody (not including blasting and other rock breaking measures) within 48 continuous hours, unless site-specific conditions make completion within 48 hours infeasible.

3. For major waterbodies:

    a. Company will develop site-specific crossing plans to be submitted for approval by the FERC and the appropriate permitting agency; and

    b. Construct the crossing in accordance with the measures contained in this Plan to the maximum extent practical.

5.2.6 Restoration

1. Return all waterbody banks to preconstruction contours or to stable angle of repose as approved by the EI.

2. Use clean gravel or native cobbles for the upper 12 inches of trench backfill in all waterbodies identified in the Clearance Package/Permit Book as coldwater fisheries.

3. For wet crossings, stabilize waterbody banks and install temporary sediment barriers within 24 hours of completing the crossing. For dry crossings, complete bank stabilization before returning flow to the waterbody channel.

4. Limit the placement of riprap to the slopes along the disturbed waterbody crossing.

5. Install erosion control fabric along waterbodies with low flow conditions (Figure 33).

6. Revegetate disturbed riparian areas with conservation grasses and legumes in accordance with the recommended Upland Seed Mix in Appendix B. In the event that final cleanup is deferred more than 20 days after the trench is backfilled, all slopes within 100 feet of waterbodies shall be mulched with 3 tons/acre of straw.

7. Remove all temporary sediment barriers when replaced by permanent erosion controls or when restoration of adjacent upland areas is successful as specified in Section 8.1.

8. Install a permanent interceptor dike and a trench plug at the base of slopes near each waterbody crossed. Locate the trench plug immediately upslope of the interceptor dike. Permanent interceptor dikes may not be installed in agricultural areas.

Table 5-1: General Waterbody Crossing Procedures

WATERBODY CROSSING ACTIVITIES	WATERBODY TYPE					
	MINOR		INTERMEDIATE		MAJOR	
	Non-State[1] Designated	State[2] Designated	Non-State[3] Designated	State[2] Designated	Non-State[3] Designated	State[2] Designated
Flumed Crossing (Dry) *Section 5.2.5.2, Figure 30*		X		X		
Dam and Pump Crossing (Dry) *Section 5.2.5.3, Figure 31*		X		X		
Wet Crossing *Section 5.2.5.4, Figure 32*	X		X	X	X	X
Construction timing window during the year *Section 5.2.1*		X		X		X
Time to complete construction of crossing (not including blasting) [4]	24 Hours		48 Hours			
Equipment bridge required [5]		X	X	X	X	X

[1] Includes agricultural intermittent drainage ditches, intermittent streams, and perennial warmwater streams not considered significant by the state.

[2] Includes all perennial waterbodies that support coldwater fisheries and warmwater fisheries considered significant by the state.

[3] Includes perennial warmwater streams not considered significant by the state.

[4] If a flume is installed within the waterbody during mainline activities, it can be removed just prior to lowering in the pipeline. The 24-hour timeframe starts as soon as the flume is removed.

[5] An equipment bridge may not be required for a waterbody being crossed by a horizontal directional drill.

6. WETLAND CROSSINGS

6.1 Definition

The term "**Wetland**" as used in this Plan includes any area that satisfies the requirements of the current Federal methodology for identifying and delineating wetlands. Wetland areas have been delineated prior to construction and are identified on the construction drawings.

The wetland crossing procedures described in this Plan comply with the Section 404 Nationwide permit program terms and conditions (33 CFR Part 330). The requirements outlined below do not apply to wetlands in actively cultivated or rotated cropland. Standard upland protective measures including workspace and topsoiling requirements, will apply to these agricultural wetlands.

6.2 General Procedures

6.2.1 Clearing and Grading

1. Limit construction activity and ground disturbance in wetland areas to a construction ROW width of 75 feet or as shown on the construction drawings. With written approval from the FERC for site-specific conditions, construction ROW width within the boundaries of federally delineated wetlands may be expanded beyond 75 feet.

2. Wetland boundaries and buffers must be clearly marked in the field with signs and /or highly visible flagging until construction-related ground disturbing activities are complete.

3. Restrict extra work areas (such as staging areas and additional spoil storage areas) to those shown only on the construction drawings. All extra work areas must be located at least 50 feet away from wetland boundaries, except where the adjacent upland consists of actively cultivated or rotated cropland or other disturbed land. If site-specific conditions do not permit a 50-foot setback, the Company can receive written approval from the FERC to locate these extra work areas closer than 50 feet from the wetland.

4. Aboveground facilities shall not be located in any wetland, except as permitted or where the location of such facilities outside of wetlands would prohibit compliance with DOT regulations.

5. If standing water or saturated soils are present, or if construction equipment causes ruts or mixing of the topsoil and subsoil in wetlands, use low-ground-weight construction equipment or operate normal equipment on timber riprap, prefabricated equipment mats or terra mats on the working side of the ROW during clearing operations. Do not use more than two layers of timber riprap to stabilize the ROW.

6. Cut vegetation just above ground level and grind stumps to ground level, leaving existing root systems in place. Immediately remove all cut trees and branches from the wetland and stockpile in an upland area on ROW for disposal.

7. Limit pulling of tree stumps and grading activities to directly over the trenchline. Do not grade or remove stumps or root systems from the rest of the ROW in wetlands unless the Chief Inspector and EI determine that safety-related construction constraints require removal of tree stumps from under the working side of the ROW.

8. Do not cut trees outside of the construction ROW to obtain timber for riprap or equipment mats.

9. Cleared materials (slash, logs, brush, wood chips) shall not be permanently placed within wetland areas.

6.2.2 Temporary Erosion and Sediment Control

1. Install sediment barriers immediately after initial ground disturbance at the following locations:
   a. Within the ROW at the edge of the boundary between wetland and upland;
   b. Across the entire ROW immediately upslope of the wetland boundary to prevent sediment flow into the wetland;
   c. Along the edge of the ROW, where the ROW slopes toward the wetland, to protect adjacent, off ROW wetland; and
   d. Along the edge of the ROW as necessary to contain spoil and sediment within the ROW through wetlands.

2. Maintain all sediment barriers throughout construction and reinstall as necessary (such as after backfilling of the trench) until replaced by permanent erosion controls or restoration of adjacent upland areas is complete in accordance with Section 8.1.

6.2.3 Crossing Procedure

1. Minimize the length of time that topsoil is segregated and the trench is open.

2. Do not use rock, soil imported from outside the wetland, tree stumps, or brush riprap to stabilize the ROW.

3. Perform topsoil segregation in accordance with Section 3.5.3.1 and trench dewatering in accordance with Section 3.5.6.

4. Assemble the pipeline in an upland area unless the wetland is dry enough to adequately support skids and pipe.

5. Use “push pull” or “float” techniques to place the pipe in the trench where water and other site conditions allow.

6. Install trench plugs and/or seal the trench bottom as necessary to maintain the original wetland hydrology at locations where the pipeline trench may drain a wetland.

7. Install a permanent interceptor dike and a trench plug at the base of slopes near the boundary between the wetland and adjacent upland areas. In addition, install sediment barriers as outlined in Section 3.5.2. Permanent interceptor dikes shall not be installed in agricultural areas.

8. Restore segregated topsoil to its original position after backfilling is complete. When required, additional fill material imported from off the ROW must be approved by the EI. The original wetland contours and flow regimes will be restored to the extent practical.

6.2.4 Cleanup and Restoration

1. Revegetate the ROW with annual ryegrass at 40 lbs/acre PLS or with the recommended Wetland Seed Mix in Appendix B, unless standing water is present.

2. **Do not use lime or fertilizer in wetland areas.**

3. Mulch the disturbed ROW only when required by the appropriate land management or state agency, as identified in the Clearance Package/Permit Book.

4. In the event that final cleanup is deferred more than 20 days after the trench is backfilled, all slopes adjacent to wetlands shall be mulched with 3 tons/acre of straw for a minimum of 100 feet on each side of the crossing.

5. Remove all timber riprap and prefabricated equipment mats upon completion of construction.

6. Develop specific procedures in coordination with the appropriate land management or state agency, where necessary, to prevent the invasion or spread of undesirable exotic vegetation (such as purple loose strife and *Phragmites*).

7. Ensure that all disturbed areas permanently revegetate in accordance with Section 8.1.

8. Remove temporary sediment barriers located at the boundary between wetland and adjacent upland areas after upland revegetation and stabilization of adjacent upland areas are successful as specified in Section 8.1.

7. SPILL PREVENTION CONTROL

7.1 The Contractor shall adhere to the Company's SPCC Plan at all times.

1. Do not store hazardous materials, chemicals, fuels, or lubricating oils within 100 feet of any wetland, waterbody or within any designated municipal watershed area where feasible. If the 100-foot setback cannot be met, this activity can be performed within the 100-foot setback, with EI approval, if done in accordance with the SPCC Plan.

2. Refuel all construction equipment at least 100 feet from any wetland or waterbody, where feasible. If the 100-foot setback cannot be met, this activity can be performed within the 100-foot setback, with EI approval, if done in accordance with the SPCC Plan.

3. Do not perform fondu or concrete coating activities within 100 feet of any wetland or waterbody. If the 100-foot setback cannot be met, these activities can be performed within the 100-foot setback, with EI approval, if done in accordance with the SPCC Plan.

8. POST CONSTRUCTION ACTIVITIES

8.1 Post-Construction Monitoring

All projects conducted under this Plan, with the exception of insitu pipe replacements (i.e. DOT-mandated replacements, line lowerings, and anomaly repairs), shall meet the monitoring requirements set forth in this section. Company personnel shall perform the following:

1. Establish and implement a program to monitor the success of restoration upon completion of construction and restoration activities;

2. Conduct follow-up inspections of all disturbed upland areas after the first growing season and if necessary, the second growing season (normally 3 to 9 months and 15 to 21 months after seeding, respectively) to determine the success of revegetation;

3. Revegetation in non agricultural areas shall be considered successful if the vegetative cover is sufficient to prevent the erosion of soils on the disturbed ROW and density and cover are similar to that in adjacent undisturbed area. Sufficient coverage in upland areas is defined when vegetation has a uniform 70 percent vegetative coverage. In agricultural areas, revegetation shall be considered successful if crop yields are similar to adjacent undisturbed portions of the same field. Revegetation efforts (such as fertilizing or reseeding) will continue until revegetation is successful;

4. Restoration shall be considered successful if the ROW surface condition is similar to adjacent undisturbed lands, construction debris is removed (unless requested otherwise by the land owner or land managing agency), revegetation is successful, and proper drainage has been restored;

5. Monitor and correct problems with drainage and irrigation systems resulting from pipeline construction in active agricultural areas until restoration is successful;

6. Make efforts to control unauthorized off-road vehicle use, in cooperation with the landowner, throughout the life of the project. Maintain signs, gates, and vehicle trails as necessary;

7. Monitor and record the success of wetland revegetation annually for the first 3 years (or as required by permit) after construction, or longer, until wetland revegetation is successful. Wetland revegetation will be considered successful when the cover of herbaceous and/or woody species is at least 80 percent of the type, density, and distribution of the vegetation in adjacent wetland areas that were not disturbed by construction. If revegetation is not successful at the end of 3 years, the Company shall develop and implement (in consultation with a professional wetland ecologist) a plan to actively revegetate the wetland with native wetland herbaceous and woody plant species; and

8. Inspect all temporary remaining erosion and sedimentation controls during routine patrols to ensure proper functioning. Any deficiencies found will be reported and corrected as needed. Once the area has revegetated and stabilized, the erosion controls will be removed.

8.2 Post-Construction Maintenance

All projects conducted under this Plan, with the exception of insitu pipe replacements (i.e. DOT-mandated replacements, line lowerings, and anomaly repairs), shall meet the maintenance requirements set forth in this section. The following requirements restrict the amount of vegetation maintenance that can occur on new pipeline facilities. Where the newly established pipeline ROW is located on other existing ROWs not affiliated with the Company, the easement holder or owner will continue to maintain their ROWs using procedures specified in their vegetative management programs.

8.2.1 Uplands

Routine maintenance of the ROW is required to allow continued access for routine pipeline patrols, maintaining access in the event of emergency repairs, and visibility during aerial patrols. In upland areas, maintenance of the ROW will involve clearing the entire ROW of woody vegetation.

1. Routine vegetation maintenance clearing shall be conducted no more frequently than once every 3 years. However, to facilitate periodic corrosion and leak surveys, a 10-foot wide corridor centered on the pipeline may be maintained annually in a herbaceous state.

2. In no case shall routine vegetation maintenance clearing occur between April 15 and August 1 of any year.

8.2.2 Waterbodies and Wetlands

1. Vegetation maintenance practices on the construction ROW adjacent to waterbodies will consist of maintaining a riparian strip that measures 25 feet back from the mean high water mark. This riparian area will be allowed to permanently revegetate with native plant species across the entire ROW.

2. Vegetation maintenance practices over the full width of the construction ROW in wetlands is prohibited.

3. To facilitate periodic corrosion and leak surveys at wetlands and waterbodies, a 10-foot wide corridor centered on the pipeline may be maintained in an herbaceous state. Trees and shrubs greater than 15 feet in height that are located within 15 feet of the pipeline may be cut and removed from the ROW.

4. Herbicides or pesticides shall not be used in or within 100 feet of a wetland or waterbody, except as specified by the appropriate land management or state agency.

8.3 Reporting

The Company shall maintain records that identify by milepost:

1. Method of application, application rate, and type of fertilizer, pH modifying agent, seed, and mulch used;
2. Acreage treated;
3. Dates of backfilling and seeding; and
4. Names of landowners requesting special seeding treatment and a description of the follow-up actions.

For the FERC-certificated projects, the Company will file quarterly activity reports documenting problems, including those identified by the landowner, and corrective actions taken for at least 2 years following construction.

A wetland revegetation monitoring report identifying the status of the wetland revegetation efforts will be filed at the end of 3 years following construction, and annually thereafter until revegetation is successful.

APPENDIX A

FIGURES

APPENDIX B

SEED MIX RECOMMENDATIONS

SEED MIX RECOMMENDATIONS

"NORTHERN ZONE"[1]

UPLAND AREAS

Lime	4.0 tons/acre
Fertilizer	1000 lbs./acre (10-20-20)
Mulch (Wheat Straw)	3.0 tons/acre

1. **Upland Seed Mix** — 75 lbs./acre Pure Live Seed (PLS)

Kentucky Bluegrass	20%
Red Fescue[2]	20%
Kentucky 31 Tall Fescue[2]	15%
Redtop	10%
Perennial ryegrass	20%
White clover	5%
Birdsfoot Trefoil (Minimum 20% hard seed)	10%

2. **Pasture Mix** — 20 lbs./acre PLS

(For use only in disturbed pasture areas with landowner's permission.)

Kentucky Bluegrass	31%
Medium Red clover	26%
Norcen Trefoil	17%
Poly Perennial Rye	26%

3. **Recommended Seeding Dates:**

(For the establishment of temporary or permanent vegetation.)

Spring:	March 15 - May 30
Fall:	August 1 - October 15

WINTER STABILIZATION

If restoration can not occur prior to October 15, seed the ROW with 1.5 bushels per acre of winter rye or similar variety of rye as requested by the landowner. Mulch ROW at 3.0 tons per acre with wheat straw, including areas adjacent to streams and wetland crossings. Seed segregated topsoil piles with winter rye and mulch at a rate of 3.0 tons per acre.

WETLAND AREAS

DO NOT USE LIME OR FERTILIZER !!!

Mulch (Wheat Straw)	3.0 tons/acre

1. **Wetland Seed Mix**

Annual Ryegrass	40 lbs./acre PLS

[1] The Northern Zone is generally defined as extending north from the Northern borders of Arkansas and Tennessee.

[2] Fescue must be endophyte-free.

SEED MIX RECOMMENDATIONS

"SOUTHERN ZONE"[1]

UPLAND AREAS

Lime (agricultural limestone)	2.5 tons/acre
Fertilizer (6-12-12)	950 lbs./acre
Mulch (Oats,Wheat or Bermudagrass Straw)	3.0 tons/acre

1. **Seed Mixture**[2]

Sorghum, Sudangrass, or Sudangrass Hybrids[3]	40 lbs/acre Pure Live Seed (PLS)
Kentucky 31 Tall Fescue[4]	10 lbs/acre PLS
Big Bluestem	10 lbs/acre PLS
Indiangrass	10 lbs/acre PLS
Bermudagrass	10 lbs/acre PLS
Sericea Lespedeza[5]	10 lbs/acre PLS
White Clover[5]	5 lbs/acre PLS
Birdsfoot Trefoil[5]	10 lbs/acre PLS

2. **Recommended seeding dates:**

(For establishment of temporary or permanent vegetation.)

Spring:	March 15 - May 30
Fall:	August 1 - October 15

WINTER STABILIZATION

If restoration can not occur prior to October 15, seed the ROW with 1.5 bushels per acre of winter rye or similar variety of rye as requested by the landowner. Mulch ROW at 3.0 tons per acre with wheat straw, including areas adjacent to stream and wetland crossings. Seed segregated topsoil piles with winter rye and mulch at a rate of 3.0 tons per acre.

WETLAND AREAS

DO NOT USE LIME OR FERTILIZER !!!

Mulch (Oats, Wheat, or Bermudagrass Straw)	3.0 tons/acre

1. **Wetland Seed Mix**:

Annual Ryegrass	40 lbs/acre PLS

[1] The Southern Zone is generally defined as extending south from the Northern borders of Arkansas and Tennessee.

[2] An alternative seed mixture may be requested by the landowner(s).

[3] These species may be sold under the following trade names: DeKalb SX17 , Greentreat II, Greentreat III, Tastemaker DR, Tastemaker III, FFR202, or Sordan 79.

[4] Fescue must be endophyte-free.

[5] Legumes should be treated with a species specific inoculate prior to seeding. Legume seed and soil should be scarified.

APPENDIX C

EXTRA WORK SPACE WETLAND SETBACK VARIANCE TABLE C-1

TABLE C-1

Extra Work Space Wetland Setback Variance Table

State, Facility, Wetland/Waterbody Name, Location	Compliance Issue	MP	ATWS Size	Distance from Resource Area (feet)	ATWS Justification
E-3 System					
E3-W2	ATWS 50-foot Setback Requirement	0.37	100 x 50	35 feet	Spoil/material storage for the Bog Meadow Road crossing.
Norwichtown Brook (E3-S2)	ATWS 50-foot Setback Requirement	0.57	100 x 50	10 feet	Spoil/material storage for Route I-395 horizontal bore.
E3-W4	ATWS 50-foot Setback Requirement	0.63	100 x 50	10 feet	Spoil/material storage for Route I-395 horizontal bore.
E3-W10	ATWS 50-foot Setback Requirement	1.40	100x50	25 feet	Spoil/material storage at the Reservoir Road crossing.
E3-W12	ATWS 50-foot Setback Requirement	1.64	100 x 50	10 feet	Spoil/material storage at the Canterbury Turnpike crossing.

APPENDIX C

SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN/
PREPAREDNESS, PREVENTION, AND CONTINGENCY PLAN

SPECTRA ENERGY TRANSMISSION

SPILL PREVENTION CONTROL AND COUNTERMEASURE (SPCC) PLAN/ PREPAREDNESS, PREVENTION, AND CONTINGENCY (PPC) PLAN

Prepared By:

Environmental Construction Permitting
5400 Westheimer Court, 5I56
Houston, TX 77056-5310

Effective February 18, 2003

Table of Contents

1.0 General Description

Spectra Energy Transmission, LLC (Company) has prepared a Spill Prevention Control and Countermeasure (SPCC) Plan which incorporates the Preparedness, Prevention, and Contingency (PPC) Plan, as well as emergency provisions. The Company's overall objective is to develop a functional contingency plan that meets all applicable federal, state, and local emergency response programs. This plan is designed to minimize hazards to human health and/or the environment from any unplanned sudden or non-sudden releases of oils, toxic, hazardous, or other polluting materials to the air, soil, surface water or groundwater. This plan also addresses unanticipated release of hydrostatic test water, especially in areas where the pipelines have been treated with mercaptan and in areas of known PCB contamination.

The Company's objective is to develop a functional contingency plan to be used on pipeline construction projects in accordance with all federal, state, and local emergency response programs. This plan was prepared to meet the requirements of the:

- Federal Water Pollution Control Act
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980
- Resource Conservation and Recovery Act
- Toxic Substances Control Act

This plan identifies:

- Type and quantity of material handled
- Measures taken for spill preparedness and prevention
- Company and Contractor emergency response procedures
- Responsibilities of designated emergency coordinators
- Emergency Evacuation Plan
- Spill incident reporting procedures
- Arrangements with local emergency response teams

2.0 Controlled Copy List of Contingency Plans

The Environmental Construction Permitting (ECP) group in Engineering Services is responsible for the accuracy of the plan related to regulatory issues, coordination and distribution of the plan, and the preparation of any necessary revisions to the plan.

A copy of the contingency plan and any revisions will be:

- Maintained at the construction field office
- Maintained by Company Emergency Coordinator (EC)
- Distributed by ECP to the engineering teams and to the transmission field offices
- Distributed by the engineering teams to the appropriate local representatives

The controlled copy list of holders of the contingency plan representing the primary response units includes:

Department	Location
Environmental Construction Permitting	Houston
Houston Environment, Health & Safety (Houston EHS)	Houston
Engineering (Project Team Director)	Various
Transmission (Director, Technical Services)	Houston
Transmission - Division Environmental Coordinator (DEC)	Division Office
Transmission (Area Superintendent)	Area Office
Police Department	Local
Fire Department	Local
Hospital	Local
Emergency Medical Team	Local

2.1 Amendments to the Contingency Plan

The contingency plan will be amended when one of the following occurs:

- Plan proves to be ineffective in an emergency
- Material and waste inventory needs updating
- Changes to Federal or State regulations
- Changes to Local regulations where applicable

At least once every five years there will be a review, evaluation, and re-certification of the plan to be coordinated by the Manager of ECP. Portions of this plan not affecting the overall scope or design may be changed without re-certification.

3.0 Material and Waste Inventory

The Material and Waste Inventory (Appendix A, Table I) will be completed by the Contractor prior to construction. This table provides a list of chemicals used or stored at the site that have the potential of causing environmental degradation or endangerment of public health and safety through accidental releases. This list includes nutrients, such as fertilizers and sanitary wastes; solid waste, such as scrap metals, masonry products and other construction raw materials and debris; construction chemicals, such as paints, soil additives and acids for cleaning; petroleum products, such as fuels and lubricants; and other materials including concrete wash from mixers, explosives, etc.

Material Safety Data Sheets for all hazardous substances listed in Table I will be included in Appendix A and are to be provided by the contractor. Other potential waste from this site, not included in Table I, would include construction debris, rock and excess soil.

4.0 Spill and Leak Preparedness and Prevention

The purpose of this section is to demonstrate that the construction site is adequately equipped to meet preparedness and prevention requirements, as required under the Hazardous Waste Management Regulations.

4.1 Employee Training

Contractors and company personnel are to be trained in hazardous waste management procedures that will enable them to respond effectively to emergencies by familiarizing them with emergency procedures, emergency equipment, and emergency communication systems. Personnel who handle, sample, or come in direct contact with oils or hazardous matter are to undergo basic training stressing the importance of pollution control. Spill prevention control procedures are to be thoroughly explained during the training briefings which will be conducted by the Contractor Superintendent (Contractor Emergency Coordinator) and the Company Chief Inspector (Company Emergency Coordinator) or their designated representative on the job site. The Company Emergency Coordinator (EC) is responsible for maintaining verification of the training.

Before construction, all project Chief Inspectors and Environmental Inspectors will receive a copy of this SPCC Plan and an approved list of emergency response contractors (see Table III). Inspectors will be trained regarding equipment maintenance, fuel and hazardous material handling, spill prevention procedures and spill response, as specified herein.

All personnel involved in the construction of the proposed facilities will be aware of the SPCC/PPC Plan. Regular training briefings will be conducted on an as required basis by the Contractor Superintendent and the Company Chief Inspector on the job site. These briefings shall include the following:

- Precautionary measures to prevent spills
- Potential sources of spills, including equipment failure or malfunction
- Standard operating procedures in the event of a spill
- Applicable notification requirements
- Equipment, materials and supplies available for clean-up of a spill

4.2 Security

Note: Include project site specific security information here (see Appendix A, Table V).

Hazardous wastes and waste containing PCBs greater than 50 ppm will be stored in a secured location (i.e. fenced, locked, etc.). Fuel storage areas will be located to minimize, as much as possible, tampering by unauthorized personnel during non-operational hours.

4.3 Prevention and Preparedness

It is unlikely that a discharge from the construction site into waters of the state will occur. The construction site should have onsite spill prevention and control facilities, as well as routine inspections of tank and container storage areas that help reduce the potential for oil and hazardous material releases to the soil or surface waters. In areas where hazardous materials are required to be stored or utilized within a wetland, the contractor is required to prepare and submit for approval a secondary containment plan prior to working in the wetland area.

Generally, minor spills or leaks will be contained within secondary containment areas. Areas where potential spills and leaks may occur are listed in Appendix A, Table VI (listing to be completed by Company EC).

4.3.1 Tanks

The Contractor will take the following precautions to prevent a spill from occurring within tank storage areas:

- Operate only those tanks for fuel and material storage, which meet the approval of the Company;
- Single wall tanks shall be provided with temporary secondary containment that will hold at least 110% of the tank capacity of the largest tank inside the containment area;
- Remove any precipitation from the containment area to maintain the available containment volume at 110% of the volume of material stored. Inspect the precipitation first for evidence of oil, including a sheen, or other contaminants. If a sheen or other indicators of oil or contamination is present, collect the material for proper disposal off-site;
- Use only self-supporting tanks constructed of carbon steel or other materials compatible with the contents of each tank;
- PCB (50 ppm or greater) storage tanks shall be double-walled or have secondary containment that will hold 200% capacity of the tank;
- Elevate tanks a maximum of two (2) feet above grade;
- Tank storage shall be located in areas that are at least 100 feet from all water-bodies, wetlands, and designated municipal watershed areas, with certain exceptions as approved ECP and EHS and listed in Appendix A, Table IV;
- All tanks shall be inspected daily for leaks and deterioration by the Contractor EC or designee. The results of all inspections shall be recorded on the "Inspection Log" (Houston EHS SOP Form # 19-18). Copies of form 19-18 for unsatisfactory storage area inspections are to be distributed to Houston EHS and the project manager. Leaking and/or deteriorated tanks shall be repaired or replaced as soon as the condition is first detected;
- Keep tanks and secondary containment drains closed when not in use;
- Ensure vehicle mounted tanks are equipped with flame/spark arrestors on all vents to prevent self ignition;
- Do not store incompatible materials in sequence in tanks prior to decontamination. (A general list of potentially incompatible materials that may be used during construction are included in Appendix A, Table I);
- Decontaminate tanks used to store hazardous materials prior to use at a different construction location if there is the potential to contaminate the next material to be placed in the tank. The tanks should always be decontaminated if they are to be returned to a vendor. The tanks should also be decontaminated if they are being returned a Company yard and no immediate specific same service use is scheduled;
- If a tank contains a Hazardous Material, then transportation should follow the steps outlined in Environmental SOP Chapter 4 – Waste Transportation.

4.3.2 Containers

The Contractor will take the following precautions to prevent a spill from occurring within container storage areas:

- For drum storage, reference Environmental SOP 3-D (Drum Specifications) and Appendix B of the SOP's (explanation of DOT Drum Markings). Company EC is to have a copy of the current Environmental SOP's;
- Ensure containers remain closed when not in use;

- All containers with a storage capacity of greater than 55 gallons shall have temporary containment (see Appendix A, Table I for type of temporary containment);
- Small cans of gasoline, diesel, solvents, etc., should be stored within the temporary containment or within secured trailers or vehicles when not in use;
- Do not store incompatible materials in sequence in containers prior to decontamination. (A general list of potentially incompatible materials that may be used during construction are included in Appendix A, Table I);
- Decontaminate containers used to store hazardous materials prior to use at a different construction location if there is the potential to contaminate the next material to be placed in the container. The containers should always be decontaminated if they are to be returned to a vendor. The containers should also be decontaminated if they are being returned a Company yard and no immediate specific same service use is scheduled;
- If a container contains a Hazardous Material, then transportation should follow the steps outlined in Environmental SOP Chapter 4 – Waste Transportation;
- No incompatible material shall be stored together in the same containment area;
- Leaking and/or deteriorated containers shall be replaced as soon as the condition is first detected;
- Container storage shall be located in areas that are at least 100 feet from all water-bodies, wetlands, and designated municipal watershed areas, with certain exceptions as approved ECP and EHS and listed in Appendix A, Table IV;
- All container storage and containment areas being used to store waste or products shall be per the guidelines described in SOP-10, Facility Inspections.

4.3.3 Loading/Unloading Areas

The Contractor will take the below listed precautions to prevent a spill from occurring within loading and unloading areas when those areas are located at the construction site. Company personnel shall be present during loading and unloading activities.

- Transferring of liquids and refueling shall only occur in pre-designated and pre-approved locations that are at least 100 feet from all water-bodies and wetlands. Exceptions may be approved by the Environmental Inspector if no reasonable alternatives are available and secondary containment is used. Certain exceptions are listed in Appendix A;
- All loading/unloading areas will be closely monitored to prevent any leaks and spills;
- The area beneath loading/unloading location shall be inspected for spills before and after each use;
- All hose connections shall utilize drip pans at the hose connections while loading/unloading liquids. If a leak or spill occurs, the loading/unloading operation will be stopped and the spill will be contained, cleaned up and collected prior to continuing the operation;
- All outlets of the tank trucks shall be inspected prior to leaving the loading and unloading area to prevent possible leakage from the truck while in transit;
- Each refueling vehicle shall have a sufficient number of shovels, brooms, 10 mil polyethylene sheeting, and fire protection equipment to contain a moderate oil/fuel spill;

- Any service vehicle used to transport lubricants and fuel must be equipped with an emergency response kit. At a minimum, this kit must include:
  - 25 lbs of granular oil absorbent
  - 10, 48" x 3" oil socks
  - 5, 17" x 17" oil pillows
  - 1, 10" x 4" oil boom
  - 20, 24" x 24" x 3/8" oil mats
  - Garden size, 6 mil, polyethylene bags
  - 10 pair of latex gloves
  - 1, 55-gallon polyethylene open-head drum;

  In addition, a smaller chemical response kit shall be available which contains:
  - 1 bag of loose chemical pulp
  - 2 to 3, 17" x 17" chemical pillows
  - 2, 48" x 3" chemical socks
  - 5, 18" x 18" x 3/8" adsorbent mats
  - garden-size, 6 mil, polyethylene bags
  - 10 pair of latex gloves,
  - 1, 30-gallon polyethylene open-head drum
  - hazardous waste labels.

4.3.4 Concrete Coating Areas for Field Joints

Concrete coating of field joints shall be performed at least 100 feet from the edge of all water-bodies; Where topographic conditions and/or work space limitations necessitate application of concrete coating within 100 feet of a water-body, sufficient containment measures shall be implemented so as to eliminate the spill of any concrete coating materials into a wetland or waterbody. Containment such as the following (or equivalent as approved by Company EC in a secondary containment plan to be submitted by the Contractor) shall be used:

- Concrete coating materials shall be temporarily stored in an earthen berm with a polyethylene underling lining of 10 mil thickness, or in a portable containment tray constructed of steel plate measuring a minimum of four (4) feet square by one (1) foot deep;
- Portable-mechanical mixing equipment, if required, shall be operated within a containment area constructed of temporary earthen berms and polyethylene underling lining a minimum of 10 mil thickness;
- Manual mixing of concrete materials in a portable container (such as a 55 gallon drum cut in half, or equivalent) shall be performed within an earthen berm with polyethylene underling lining of 10 mil thickness, or within a portable containment tray constructed of steel plate, measuring a minimum of four (4) feet square by one (1) foot deep.

4.4 Emergency Equipment

The construction site/contractor ware yard will have adequate manpower and equipment necessary to divert any spill from reaching water bodies and wetland areas. Emergency equipment shall include, but is not limited to shovels, backhoes, dozers, front-end loaders, oil absorbent booms, pillows, socks and/or mats, granular oil absorbent and chemical absorbent pulp. A list of emergency response equipment and personal protective equipment is provided in Appendix A, Table II.

5.0 Contingency Plan and Emergency Procedures

Emergency response procedures have been developed for this construction project to provide guidance in responding to fires, explosions, oils or hazardous waste, or hazardous waste constituents to the air, land or waters of the state regardless of the quantity involved in the incident.

For unanticipated release of hydrostatic test waters, the company will utilize Best Management Practices, as described in the Company Erosion and Sediment Control Plan as soon as possible after the release.

5.1 Responsibilities Of Company And Contractor Personnel

The Contractor and Company on-site personnel have responsibilities for spill prevention, control and countermeasures. For some projects, as specified by the Company, a Company Area Field Construction Office, staffed with appropriate environmental compliance personnel, will perform the ECP responsibilities.

If notification is given that an evacuation is necessary, all personnel will evacuate the construction area via the primary evacuation route (site specific map with evacuation route to be attached for plant projects) and await further instructions from the EC. If direct access to the primary evacuation route is restricted by fire, spill, smoke, or vapor, facility personnel will evacuate the facility via alternate evacuation routes to the nearest accessible open area.

5.1.1 First Responder

Any individual who first observes a spill or any other imminent or actual emergency situation will take the following steps:

- Assess the situation to determine if the situation poses an immediate threat to human health or the environment.
- Identify hazardous substances involved, if any.
- Report the emergency or spill to the Company and Contractor EC(s) immediately.
- Standby at a safe distance and keep others away.
- Activate emergency shutdown, if necessary.

The Contractor Superintendent will act as the EC for the Contractor. The Chief Inspector will act as the EC for the Company. The responsibilities of the EC will be as follows:

5.1.2 Contractor EC Responsibilities

The Contractor EC will coordinate the response to all spills which occur as a result of Contractor operations. The Contractor will not coordinate the response of spills of pipeline liquids, hazardous wastes, or the unanticipated release of hydrostatic test waters, these spills will be coordinated by the Company EC.

Contractor EC Responsibilities:

- Determine any immediate threat to human health, the environment, and the neighboring community;
- Ensure personnel safety and evacuate if necessary.
- Identify source, character, amount, and extent of release;
- Determine if hazardous substances are involved;
- Inform the Company EC and follow instructions;
- Direct and document remediation efforts to contain and control spill release;
- Document remedial efforts;
- Coordinate cleaning and disposal activities;

5.1.3 Company Responsibilities

The Company EC will be responsible for coordinating the clean up of all spills of pipeline liquids, hazardous wastes, and any unanticipated release of hydrostatic test water.

5.1.4 Company EC Responsibilities

Upon notification of pipeline liquid spills, hazardous materials spills, or the unanticipated release of hydrostatic test waters:

- Assess situation for potential threat to human health, environment and the neighboring community;
- Implement evacuation, if necessary;
- Activate emergency shutdown, if necessary;
- Ensure personnel safety;
- Control source as conditions warrant;
- Notify immediately the Emergency Spill Hotline at 1-800-735-6364 (select the appropriate transmission division) and those listed in Appendix A, Table III immediately for spills that meet the following criteria:
    a. one (1) pound or more of a solid material (excluding HDD mud) spilled on land
    b. five (5) gallons or more of a liquid spilled on land
    c. creates a sheen on water
    d. unanticipated release of hydrostatic test water;
- If necessary, notify the local fire department, law enforcement authority, or health authority as appropriate. The following information should be provided:
    a. name of the caller and callback number
    b. the exact location and nature of the incident
    c. the extent of personnel injuries and damage
    d. the extent of release
    e. the material involved, and appropriate safety information;
- Ensure that waste or product which may be incompatible with a released material is kept away from the affected area;
- Keep any potential ignition source away from emergency area, if spilled material is flammable;
- Minimize affected area with appropriate containment or diking;
- Assemble required spill response equipment as required (protective clothing, gear, heavy equipment, pumps, absorbent material, empty drums, etc.)
- Place spilled material in appropriate containers, in accordance with the Environment Standard Operating Procedures;

- Label and store containers in accordance with the Environmental Standard Operating Procedures;
- Coordinate waste disposal and equipment decontamination with Houston EHS;
- Terminate response;
- Ensure that all emergency response equipment is fully functional. Any equipment that cannot be reused shall be replaced;
- For spills of PCB's, contact Houston EHS for special spill response requirements related to PCB spills;
- Assist with the coordination of cleanup and disposal activities as described in Sections 5.2, 5.3 and 5.4;
- If necessary, contact outside remediation services, in coordination with Houston EHS, to assist with clean up;
- Complete Waste Removal Storage and Disposal Record Form (WRSDR and WDR Forms to be obtained from Houston EHS) to track waste generated during this project;
- Complete Field Spill Report (Environmental SOP 19-6) and distribute accordingly;
- For unanticipated release of hydrostatic test waters, notify state contact if required by state permit in accordance with timeframes required by state permit;
- When required by permit, arrange for immediate sampling of the test water (from the pipe or a representative sample of released water where possible), or soil where the test water was released, and water from adjacent water-body if test water was released into the water-body. Analysis of the samples will be in accordance with hydrostatic test discharge permit criteria plus, where applicable, mercaptans;
- Local Right of Way agent will notify township manager and/or mayor.

5.1.5 Division Environmental Coordinator (DEC) Responsibilities

- Provide technical assistance on spill cleanup procedures
- Determine if the release requires reporting to non-project specific regulatory agencies
- Provide written and verbal reports to the above regulatory agencies
- Contact outside remediation services through consultation with Houston EHS
- Coordinate with Houston EHS and arrange for the transport of hazardous waste and waste containing PCB's
- Coordinate with ECP relative to any project specific permit requirements

5.1.6 Environmental Construction Permitting (ECP) Responsibilities

- Determine if the release requires reporting to any project specific permitting agencies
- Provide written and verbal reports as required
- Coordinate with DEC

5.2 Spill Clean-Up/Waste Disposal Procedures

The following identifies the clean-up and control measures to be utilized in the event of a spill of oil, fuel or a hazardous substance or unanticipated release of hydrostatic test water.

5.2.1 Oil/Fuel Spills

- Ensure no immediate threat to surrounding landowners or environment;
- Remediate small spills and leaks as soon as feasible. Use adsorbent pads whenever possible to reduce the amount of contaminated articles;
- Restrict the spill by stopping or diverting flow to the oil/fuel tank;
- If the release exceeds the containment system capacity, immediately construct additional containment using sandbags or fill material. Every effort must be made to prevent the seepage of oil into soils and waterways;
- If a release occurs into a facility drain or nearby stream, immediately pump any floating layer into drums. For high velocity streams, place oil booms or hay bales between the release area and the site boundary and downstream of affected area. As soon as possible, excavate contaminated soils and sediments;
- After all recoverable oil has been collected and drummed, place contaminated soils and articles in containers;
- For larger quantities of soils, construct temporary waste piles using plastic liners placing the contaminated soils on top of the plastic and covered by plastic. Plastic-lined roll-off bins should be leased for storing this material as soon as feasible;
- Label the drum following the procedures outlined in the Company's Environmental Procedures Manual;
- Move drum to secure staging or storage area;
- Document and report cleanup activities to the Company EC as soon as feasible.
- If environmentally sensitive resources (wetlands, water-bodies) exist in the area, ensure that Best Management Practices as described in Company's E&SCP are utilized to minimize impact to these resources;

5.2.2 Hazardous Substance Releases

- Ensure no immediate threat to surrounding landowners or environment;
- Identify the material and quantity released;
- Block off drains and containment areas to limit the extent of the spill. Never wash down a spill with water;
- Ensure that Personal Protective Equipment and containers are compatible with the substance;
- Collect and reclaim as much of the spill as possible using a hand pump or similar device. Containerize contaminated soils in an appropriate DOT container in accordance with the Company's Environmental Standard Operating Procedures Manual. (Note: Environmental SOP's are located in all division and area offices and kept by all engineering teams.) Never place incompatible materials in the same drum;
- Sample the substance for analysis and waste profiling, according to instructions from the Houston EHS;
- Decontaminate all equipment in a contained area and collect fluids in drums;
- Label the drum following Houston EHS SOP's;
- Move the drum to secure staging or storage area;
- Document and report activities to Houston EHS as soon as feasible.

- If environmentally sensitive resources (wetlands, water-bodies) exist in the area, ensure that Best Management Practices as described in Company's E&SCP are utilized to minimize impact to these resources;

5.2.3 Unanticipated Release of Hydrostatic Test Water

- Ensure no immediate threat to surrounding landowners or environment;
- If environmentally sensitive resources (wetlands, water-bodies) exist in the area, ensure that Best Management Practices as described in Company's E&SCP are utilized to minimize impact to these resources;

5.3 Disposal of Contaminated Materials/Soils

- The Contractor shall work with the Houston EHS to characterize waste generated during this project. All wastes generated, as a result of spill response activities will be analyzed to determine if hazardous, or if PCBs are greater than 1 ppm. Knowledge of the contaminant(s) may be applied to classify the waste/spill materials as determined by Houston EHS;
- The Contractor is responsible for the proper disposal of wastes generated during this project that is determined by Houston EHS to be non-hazardous and to contain PCBs less than 1 ppm. This includes obtaining applicable authorizations and registrations per Environmental SOP 1-D-3 for waste disposal;
- Houston EHS is responsible for the proper disposal of hazardous wastes and PCB wastes containing PCBs greater than 1 ppm generated during this project, including obtaining applicable EPA Identification Numbers;
- Hazardous wastes and waste containing PCBs shall be stored in a secured location (i.e. fenced, locked, etc.) until such time as this material is transported off-site. At no time will hazardous waste be stored for a period exceeding 90 days nor a waste with PCBs greater than 50 ppm be stored for a period exceeding 30 days.

5.4 Equipment Cleaning/Storage

- Upon completion of remedial activities, the Contractor shall be responsible for decontaminating emergency response equipment used to remediate a spill resulting from their operations. The Company will be responsible if the spill is hazardous material, pipeline liquids, or hydrostatic test water;
- Waste disposal for any contaminated waste generated as a result of the decontamination process shall be the responsibility of Houston EHS.
- The Contractor shall be responsible for replacing all spent emergency response equipment prior to resuming construction activities if spill resulted from their operations;
- Reusable personal protective equipment shall be tested and inventoried by the Contractor prior to being placed back into service;

6.0 Housekeeping Program

The construction area will be maintained in a neat and orderly manner. Solid wastes, such as food wrappings, cigarette butts and packets, styrofoam cups and plates, and similar wastes will be disposed of off-site, not in the construction excavation area. Any spills or leaks will be cleaned up as

expeditiously as possible. Trash will be routinely collected for off-site disposal. Container storage areas will be maintained in a neat and orderly manner.

7.0 External Factors

There will be no direct effect on the construction site due to a power outage or snowstorm. In the event of a flood or strike, all tanks and containers would be removed from the right-of-way and placed in a secure area.

APPENDIX "A" - TABLES

TABLE I - Material And Waste Inventory

Oil and Fuel to be used or stored on site during construction:

Commercial Chemicals to be used or stored on site during construction:

Hazardous and Non-Hazardous Wastes to be used or stored on site during construction:

Incompatible Materials to be used or stored on site during construction:

Type of Temporary Containment containers to be used:

TABLE I TO BE COMPLETED BY CONTRACTOR

TABLE II - Emergency Response And Personal Protective Equipment

Spill Response:

Equipment	Quantity	Location

Fire Protection:

Equipment	Quantity	Location

Personnel Protection:

Equipment	Quantity	Location

TABLE II TO BE COMPLETED BY CONTRACTOR EC

TABLE III – Key Emergency Contacts

The list of key personnel who will be contacted in the event of an emergency or spill incident include the following:

1. **Company Emergency Contacts** Contact Name Phone Number

1. Company Emergency Coordinator
   (within 15 minutes of incident)

2. 24-hour spill emergency hotline (DEC) 1-800-735-6364
   (within 15 minutes of incident)

3. Project Manager

4. Project Environmental Lead (PEL)
   (within 60 minutes of incident)

5. Field Construction (Houston Office)

2. **Contractor Emergency Contact**

1. Contractor Emergency Coordinator

3. **Local Authorities** – As necessary

Department	Number
State Police	
Local Police	
Local Fire Department	
Hospital	
Ambulance	

4. **Environmental Agencies**

Notification to be made by DEC and PEL representative

5. **Potential Environmental Remedial Service Contractors** (verify prior to issuing project specific SPCC Plan)

Clean Harbors Environmental Services, Inc. -Howard Alexander (800) 782-8805

Safety-Kleen (FS), Inc. Edward A. Mitchell (281) 478-7700

U. S. A. Environment - Cesar Garcia (713) 425-6925 or cell phone (832) 473-5354

WRS Infrastructure and Environment Inc. Steve Maxwell Cell phone 281 731-0886

TABLE III TO BE COMPLETED BY COMPANY EC

TABLE IV - Tank And Container Storage Exception Areas

(Tank and container storage shall be located in areas that are at least 100 feet from all water-bodies and wetlands).

The below exceptions have been approved by ECP and EHS.

1.

2.

3.

4.

TABLE V – Project Site Specific Security Information

TABLE VI – Areas for Potential Leaks and Spills

1.

2.

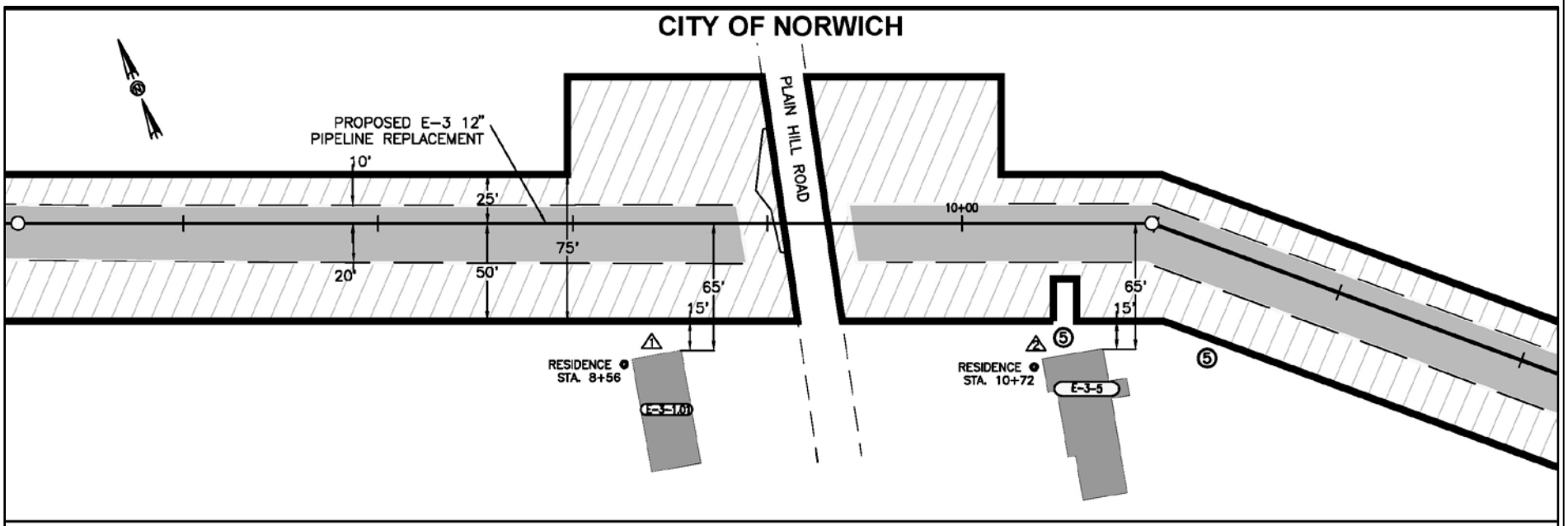
3.

4.

APPENDIX “B” - MSDS SHEETS

APPENDIX D

SITE-SPECIFIC RESIDENTIAL CONSTRUCTION PLANS
FOR THE HUBLINE/EAST TO WEST PROJECT



DESCRIPTION:

⚠1 AT SURVEY STATION 8+56 THERE IS A RESIDENCE 15' RIGHT OF THE CWA AND 65' RIGHT OF THE CENTERLINE OF THE PROPOSED E-3 12" PIPELINE REPLACEMENT.

⚠2 AT SURVEY STATION 10+72 THERE IS A RESIDENCE 15' RIGHT OF THE CWA AND 65' RIGHT OF THE CENTERLINE OF THE PROPOSED E-3 12" PIPELINE REPLACEMENT.

LEGEND

- PROPOSED PIPELINE
- EXISTING PIPELINE
- CONSTRUCTION WORK AREA
- PERMANENT EASEMENT
- EDGE OF PAVEMENT

NOTES:

1. (CWA) REFERS TO THE CONSTRUCTION WORK AREA
2. SAFETY FENCE WILL BE INSTALLED AT THE EDGE OF THE CONSTRUCTION RIGHT-OF-WAY FOR A DISTANCE OF 100' FEET ON EITHER SIDE OF THE RESIDENCE.

CONSTRUCTION TECHNIQUES:

ONE OF THE FOLLOWING TECHNIQUES SHALL BE UTILIZED FOR A LONGITUDINAL DISTANCE OF 100' FEET EITHER SIDE OF THE RESIDENCE

1. THE SEWER LINE TECHNIQUE TYPICALLY USED WHEN THE PIPELINE IS TO BE INSTALLED IN VERY CLOSE PROXIMITY TO AN EXISTING STRUCTURE OR WHEN AN OPEN DITCH WOULD ADVERSELY IMPACT A COMMERCIAL/INDUSTRIAL ESTABLISHMENT. THE TECHNIQUE INVOLVES INSTALLING PIPE ONE JOINT AT A TIME WHEREBY THE WELDING, X-RAY AND COATING ACTIVITIES ARE ALL PERFORMED IN THE OPEN TRENCH. AT THE END OF EACH DAY THE NEWLY INSTALLED PIPE IS BACKFILLED OR THE OPEN TRENCH IS COVERED WITH STEEL PLATES OR TIMBER MATS.
2. THE DRAG SECTION CONSTRUCTION TECHNIQUE INVOLVES THE TRENCHING, INSTALLATION AND BACKFILL OF A PREFABRICATED LENGTH OF PIPE CONTAINING SEVERAL SEGMENTS ALL IN ONE DAY. AT THE END OF EACH DAY THE NEWLY INSTALLED PIPE IS BACKFILLED AND/OR COVERED WITH STEEL PLATES OR TIMBER MATS.

GRAPHIC SCALE

0 50' 100'

PRELIMINARY 6/11/2009

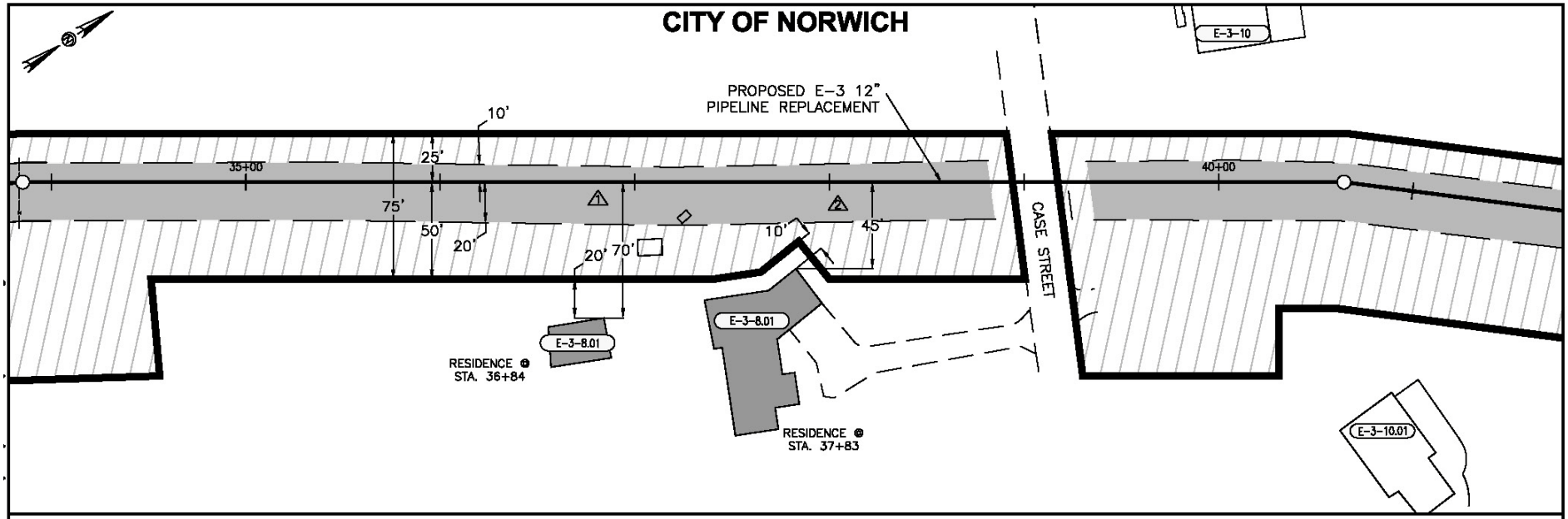
D-1

Appendix D

HubLine/East to West Project

Site-Specific Residential Construction Plans

(Sheet 1 of 11)



LEGEND

- PROPOSED PIPELINE
- EXISTING PIPELINE
- CONSTRUCTION WORK AREA
- PERMANENT EASEMENT
- EDGE OF PAVEMENT

DESCRIPTION:

⚠1 AT SURVEY STATION 36+84 THERE IS A RESIDENCE 20' RIGHT OF THE CWA AND 70' RIGHT OF THE CENTERLINE OF THE PROPOSED E-3 12" PIPELINE REPLACEMENT.

⚠2 AT SURVEY STATION 37+83 THERE IS A RESIDENCE 10' RIGHT OF THE CWA AND 45' RIGHT OF THE CENTERLINE OF THE PROPOSED E-3 12" PIPELINE REPLACEMENT.

NOTES:

1. (CWA) REFERS TO THE CONSTRUCTION WORK AREA
2. SAFETY FENCE WILL BE INSTALLED AT THE EDGE OF THE CONSTRUCTION RIGHT-OF-WAY FOR A DISTANCE OF 100' FEET ON EITHER SIDE OF THE RESIDENCE.

CONSTRUCTION TECHNIQUES:

ONE OF THE FOLLOWING TECHNIQUES SHALL BE UTILIZED FOR A LONGITUDINAL DISTANCE OF 100' FEET EITHER SIDE OF THE RESIDENCE

1. THE SEWER LINE TECHNIQUE TYPICALLY USED WHEN THE PIPELINE IS TO BE INSTALLED IN VERY CLOSE PROXIMITY TO AN EXISTING STRUCTURE OR WHEN AN OPEN DITCH WOULD ADVERSELY IMPACT A COMMERCIAL/INDUSTRIAL ESTABLISHMENT. THE TECHNIQUE INVOLVES INSTALLING PIPE ONE JOINT AT A TIME WHEREBY THE WELDING, X-RAY AND COATING ACTIVITIES ARE ALL PERFORMED IN THE OPEN TRENCH. AT THE END OF EACH DAY THE NEWLY INSTALLED PIPE IS BACKFILLED OR THE OPEN TRENCH IS COVERED WITH STEEL PLATES OR TIMBER MATS.
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GRAPHIC SCALE

0 50' 100'

REDUCED SCALE

PRELIMINARY 10/9/2008

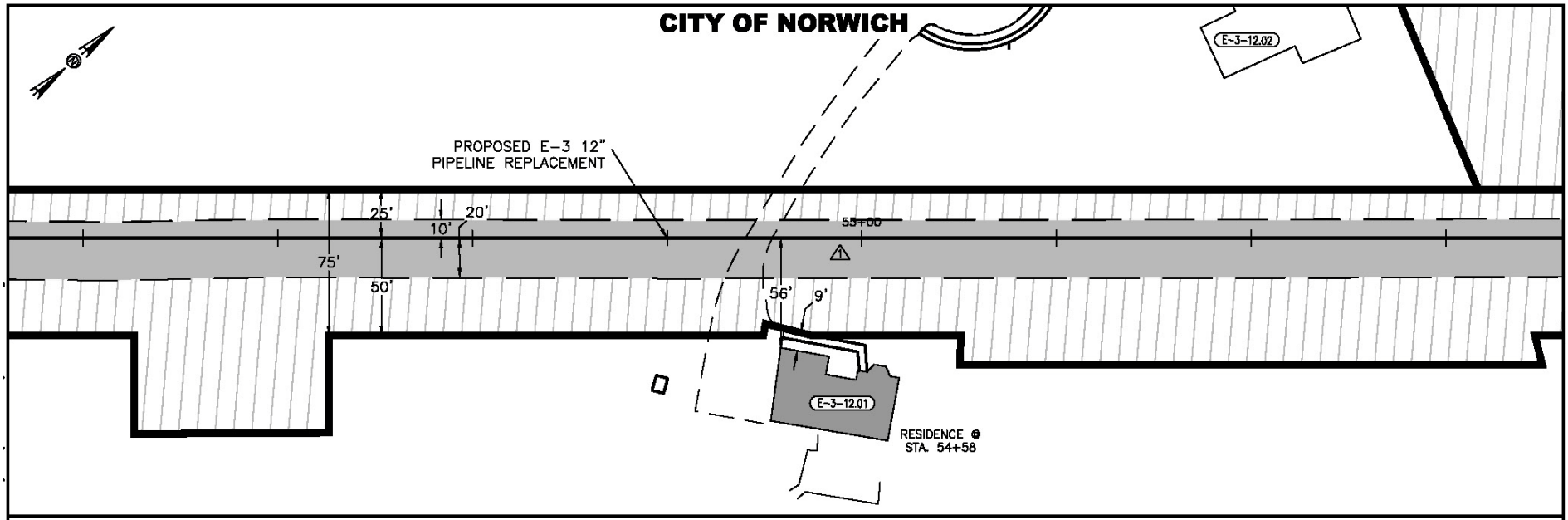
D-2

Appendix D

HubLine/East to West Project

Site-Specific Residential Construction Plans

(Sheet 2 of 11)



DESCRIPTION:

⚠ AT SURVEY STATION 54+58 THERE IS A RESIDENCE 9' RIGHT OF THE CWA AND 56' RIGHT OF THE CENTERLINE OF THE PROPOSED E-3 12" PIPELINE REPLACEMENT.

LEGEND

- PROPOSED PIPELINE
- EXISTING PIPELINE
- CONSTRUCTION WORK AREA
- PERMANENT EASEMENT
- EDGE OF PAVEMENT

NOTES:

1. (CWA) REFERS TO THE CONSTRUCTION WORK AREA
2. SAFETY FENCE WILL BE INSTALLED AT THE EDGE OF THE CONSTRUCTION RIGHT-OF-WAY FOR A DISTANCE OF 100' FEET ON EITHER SIDE OF THE RESIDENCE.

CONSTRUCTION TECHNIQUES:

ONE OF THE FOLLOWING TECHNIQUES SHALL BE UTILIZED FOR A LONGITUDINAL DISTANCE OF 100' FEET EITHER SIDE OF THE RESIDENCE

1. THE SEWER LINE TECHNIQUE TYPICALLY USED WHEN THE PIPELINE IS TO BE INSTALLED IN VERY CLOSE PROXIMITY TO AN EXISTING STRUCTURE OR WHEN AN OPEN DITCH WOULD ADVERSELY IMPACT A COMMERCIAL/INDUSTRIAL ESTABLISHMENT. THE TECHNIQUE INVOLVES INSTALLING PIPE ONE JOINT AT A TIME WHEREBY THE WELDING, X-RAY AND COATING ACTIVITIES ARE ALL PERFORMED IN THE OPEN TRENCH. AT THE END OF EACH DAY THE NEWLY INSTALLED PIPE IS BACKFILLED OR THE OPEN TRENCH IS COVERED WITH STEEL PLATES OR TIMBER MATS.
2. THE DRAG SECTION CONSTRUCTION TECHNIQUE INVOLVES THE TRENCHING, INSTALLATION AND BACKFILL OF A PREFABRICATED LENGTH OF PIPE CONTAINING SEVERAL SEGMENTS ALL IN ONE DAY. AT THE END OF EACH DAY THE NEWLY INSTALLED PIPE IS BACKFILLED AND/OR COVERED WITH STEEL PLATES OR TIMBER MATS.

GRAPHIC SCALE

0 50' 100'

REDUCED SCALE

PRELIMINARY 10/9/2008

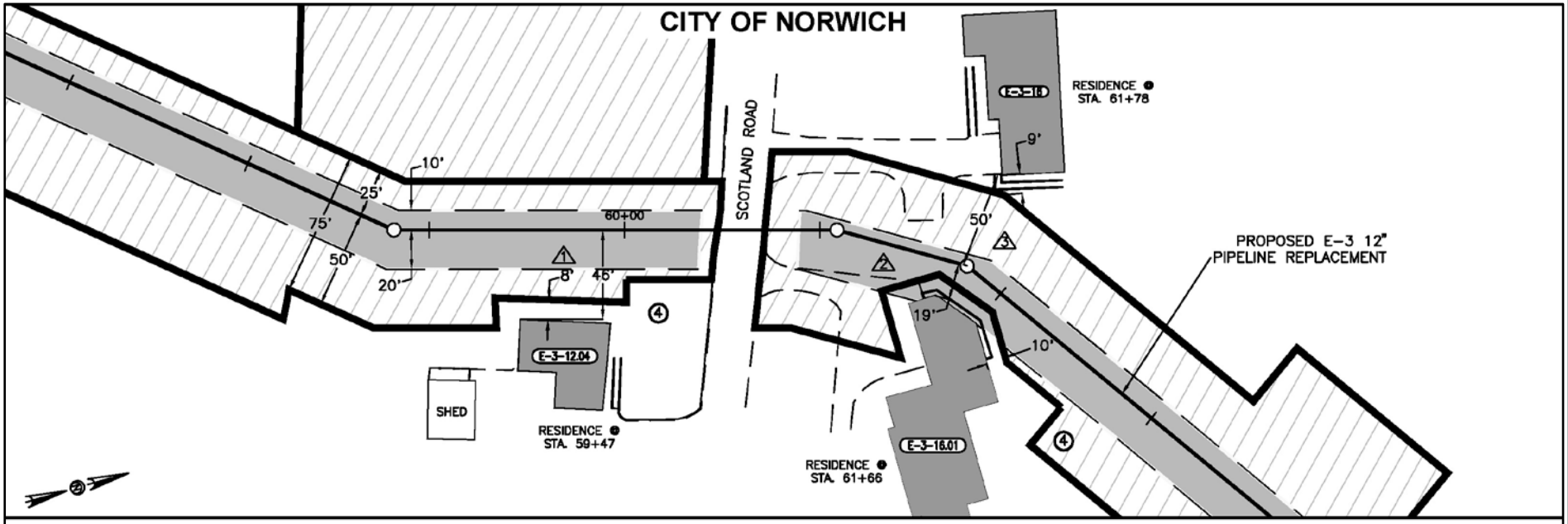
D-3

Appendix D

HubLine/East to West Project

Site-Specific Residential Construction Plans

(Sheet 3 of 11)



LEGEND

- PROPOSED PIPELINE
- EXISTING PIPELINE
- CONSTRUCTION WORK AREA
- PERMANENT EASEMENT
- EDGE OF PAVEMENT

DESCRIPTION:

1. AT SURVEY STATION 59+47 THERE IS A RESIDENCE 8' RIGHT OF THE CWA AND 46' RIGHT OF THE CENTERLINE OF THE PROPOSED E-3 12" PIPELINE REPLACEMENT.
2. AT SURVEY STATION 61+66 THERE IS A RESIDENCE 10' RIGHT OF THE CWA AND 19' RIGHT OF THE CENTERLINE OF THE PROPOSED E-3 12" PIPELINE REPLACEMENT.
3. AT SURVEY STATION 61+78 THERE IS A RESIDENCE 9' LEFT OF THE CWA AND 50' LEFT OF THE CENTERLINE OF THE PROPOSED E-3 12" PIPELINE REPLACEMENT.

NOTES:

1. (CWA) REFERS TO THE CONSTRUCTION WORK AREA
2. SAFETY FENCE WILL BE INSTALLED AT THE EDGE OF THE CONSTRUCTION RIGHT-OF-WAY FOR A DISTANCE OF 100' FEET ON EITHER SIDE OF THE RESIDENCE.

CONSTRUCTION TECHNIQUES:

ONE OF THE FOLLOWING TECHNIQUES SHALL BE UTILIZED FOR A LONGITUDINAL DISTANCE OF 100' FEET EITHER SIDE OF THE RESIDENCE

1. THE SEWER LINE TECHNIQUE TYPICALLY USED WHEN THE PIPELINE IS TO BE INSTALLED IN VERY CLOSE PROXIMITY TO AN EXISTING STRUCTURE OR WHEN AN OPEN DITCH WOULD ADVERSELY IMPACT A COMMERCIAL/INDUSTRIAL ESTABLISHMENT. THE TECHNIQUE INVOLVES INSTALLING PIPE ONE JOINT AT A TIME WHEREBY THE WELDING, X-RAY AND COATING ACTIVITIES ARE ALL PERFORMED IN THE OPEN TRENCH. AT THE END OF EACH DAY THE NEWLY INSTALLED PIPE IS BACKFILLED OR THE OPEN TRENCH IS COVERED WITH STEEL PLATES OR TIMBER MATS.
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GRAPHIC SCALE

0 50' 100'

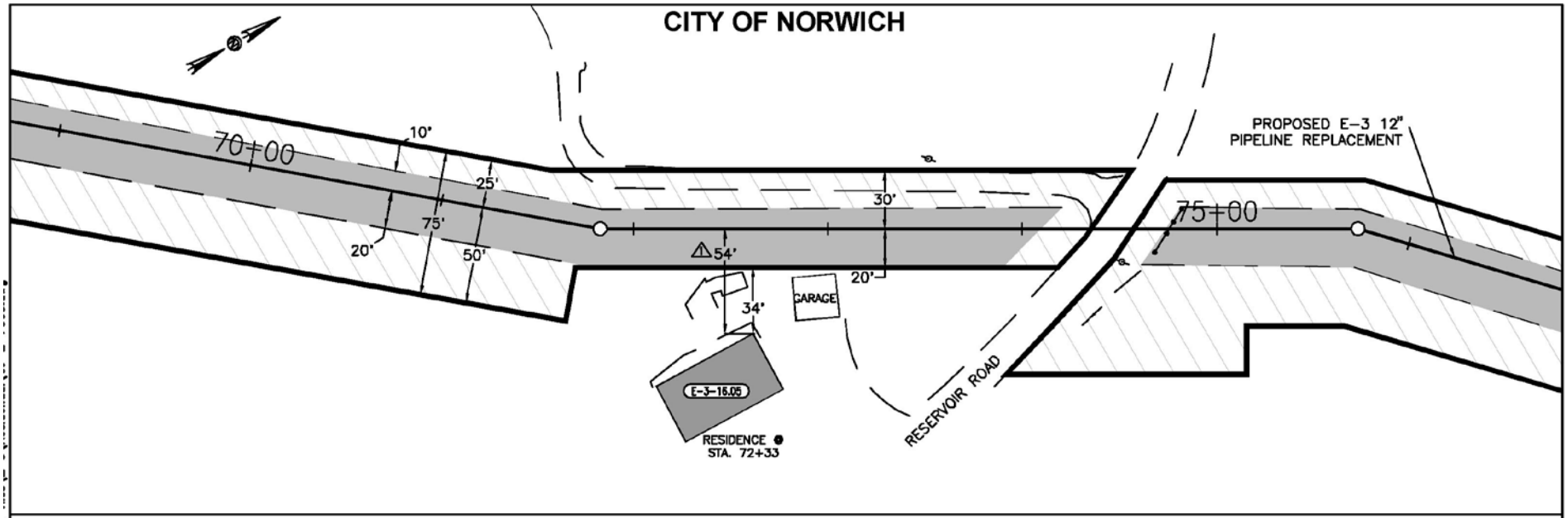
PRELIMINARY 6/11/2009

Appendix D

HubLine/East to West Project

Site-Specific Residential Construction Plans

(Sheet 4 of 11)



LEGEND

- PROPOSED PIPELINE
- EXISTING PIPELINE
- CONSTRUCTION WORK AREA
- PERMANENT EASEMENT
- EDGE OF PAVEMENT

DESCRIPTION:

⚠ AT SURVEY STATION 72+46 THERE IS A RESIDENCE 34' RIGHT OF THE CWA AND 54' RIGHT OF THE CENTERLINE OF THE PROPOSED E-3 12" PIPELINE REPLACEMENT.

NOTES:

1. (CWA) REFERS TO THE CONSTRUCTION WORK AREA
2. SAFETY FENCE WILL BE INSTALLED AT THE EDGE OF THE CONSTRUCTION RIGHT-OF-WAY FOR A DISTANCE OF 100' FEET ON EITHER SIDE OF THE RESIDENCE.

CONSTRUCTION TECHNIQUES:

ONE OF THE FOLLOWING TECHNIQUES SHALL BE UTILIZED FOR A LONGITUDINAL DISTANCE OF 100' FEET EITHER SIDE OF THE RESIDENCE

1. THE SEWER LINE TECHNIQUE TYPICALLY USED WHEN THE PIPELINE IS TO BE INSTALLED IN VERY CLOSE PROXIMITY TO AN EXISTING STRUCTURE OR WHEN AN OPEN DITCH WOULD ADVERSELY IMPACT A COMMERCIAL/INDUSTRIAL ESTABLISHMENT. THE TECHNIQUE INVOLVES INSTALLING PIPE ONE JOINT AT A TIME WHEREBY THE WELDING, X-RAY AND COATING ACTIVITIES ARE ALL PERFORMED IN THE OPEN TRENCH. AT THE END OF EACH DAY THE NEWLY INSTALLED PIPE IS BACKFILLED OR THE OPEN TRENCH IS COVERED WITH STEEL PLATES OR TIMBER MATS.
2. THE DRAG SECTION CONSTRUCTION TECHNIQUE INVOLVES THE TRENCHING, INSTALLATION AND BACKFILL OF A PREFABRICATED LENGTH OF PIPE CONTAINING SEVERAL SEGMENTS ALL IN ONE DAY. AT THE END OF EACH DAY THE NEWLY INSTALLED PIPE IS BACKFILLED AND/OR COVERED WITH STEEL PLATES OR TIMBER MATS.

GRAPHIC SCALE

0 50' 100'

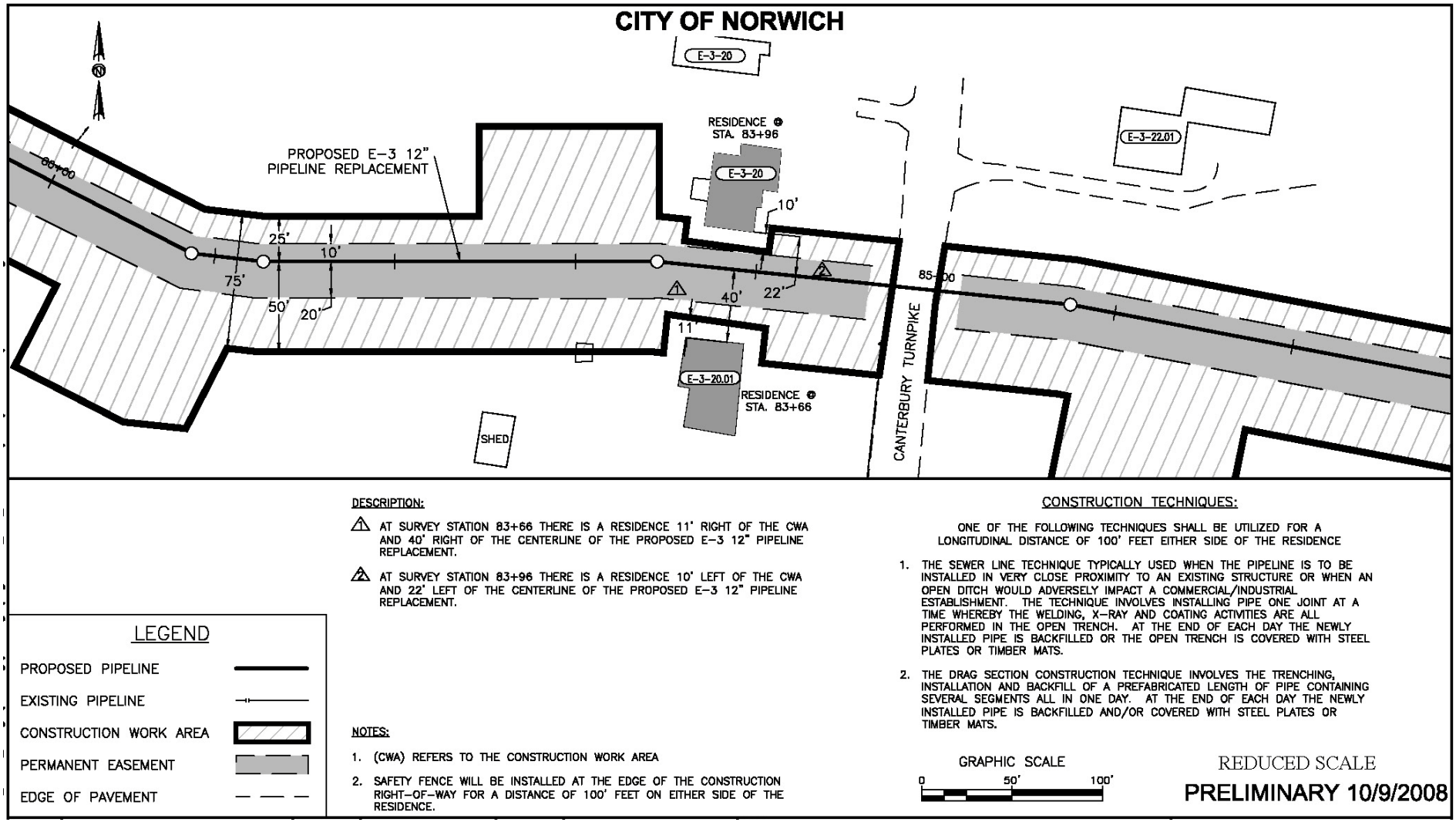
PRELIMINARY 8/31/2009

Appendix D

HubLine/East to West Project

Site-Specific Residential Construction Plans

(Sheet 5 of 11)

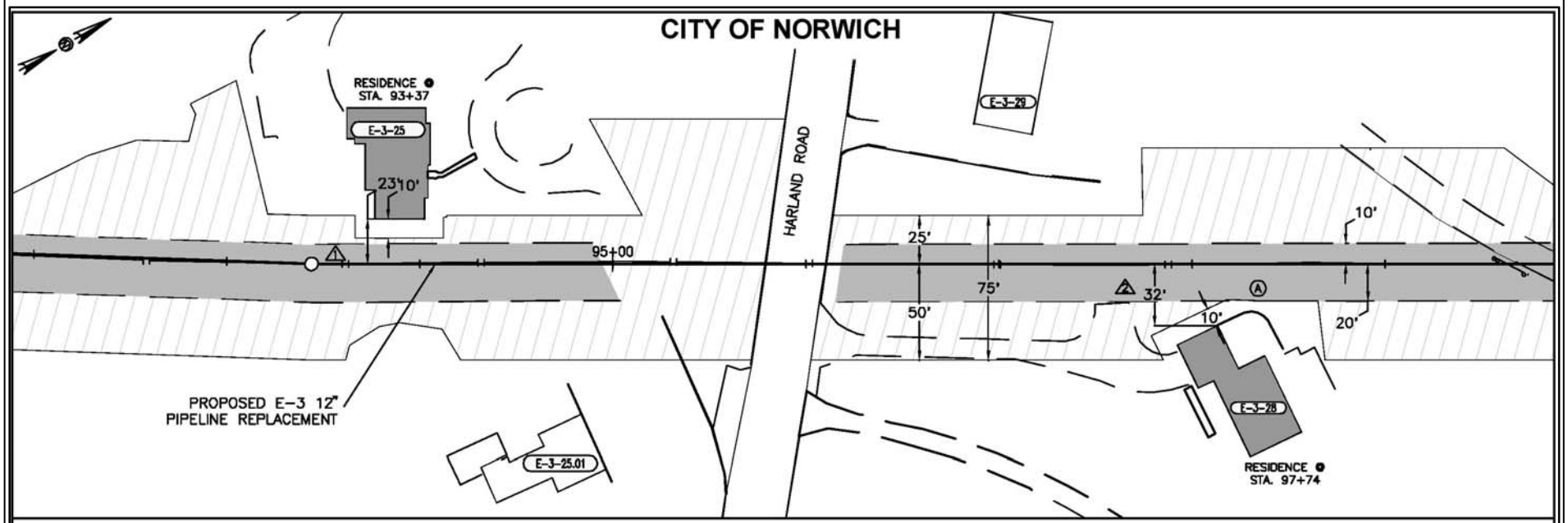


Appendix D

HubLine/East to West Project

Site-Specific Residential Construction Plans

(Sheet 6 of 11)



DESCRIPTION:

1. AT SURVEY STATION 93+37 THERE IS A RESIDENCE 10' LEFT OF THE CWA AND 23' LEFT OF THE CENTERLINE OF THE PROPOSED E-3 12" PIPELINE REPLACEMENT.
2. AT SURVEY STATION 97+74 THERE IS A RESIDENCE 10' RIGHT OF THE CWA AND 32' RIGHT OF THE CENTERLINE OF THE PROPOSED E-3 12" PIPELINE REPLACEMENT.

LEGEND

- PROPOSED PIPELINE
- EXISTING PIPELINE
- CONSTRUCTION WORK AREA
- PERMANENT EASEMENT
- EDGE OF PAVEMENT

NOTES:

1. (CWA) REFERS TO THE CONSTRUCTION WORK AREA
2. SAFETY FENCE WILL BE INSTALLED AT THE EDGE OF THE CONSTRUCTION RIGHT-OF-WAY FOR A DISTANCE OF 100' FEET ON EITHER SIDE OF THE RESIDENCE.

CONSTRUCTION TECHNIQUES:

ONE OF THE FOLLOWING TECHNIQUES SHALL BE UTILIZED FOR A LONGITUDINAL DISTANCE OF 100' FEET EITHER SIDE OF THE RESIDENCE

1. THE SEWER LINE TECHNIQUE TYPICALLY USED WHEN THE PIPELINE IS TO BE INSTALLED IN VERY CLOSE PROXIMITY TO AN EXISTING STRUCTURE OR WHEN AN OPEN DITCH WOULD ADVERSELY IMPACT A COMMERCIAL/INDUSTRIAL ESTABLISHMENT. THE TECHNIQUE INVOLVES INSTALLING PIPE ONE JOINT AT A TIME WHEREBY THE WELDING, X-RAY AND COATING ACTIVITIES ARE ALL PERFORMED IN THE OPEN TRENCH. AT THE END OF EACH DAY THE NEWLY INSTALLED PIPE IS BACKFILLED OR THE OPEN TRENCH IS COVERED WITH STEEL PLATES OR TIMBER MATS.
2. THE DRAG SECTION CONSTRUCTION TECHNIQUE INVOLVES THE TRENCHING, INSTALLATION AND BACKFILL OF A PREFABRICATED LENGTH OF PIPE CONTAINING SEVERAL SEGMENTS ALL IN ONE DAY. AT THE END OF EACH DAY THE NEWLY INSTALLED PIPE IS BACKFILLED AND/OR COVERED WITH STEEL PLATES OR TIMBER MATS.

GRAPHIC SCALE

0 50' 100'

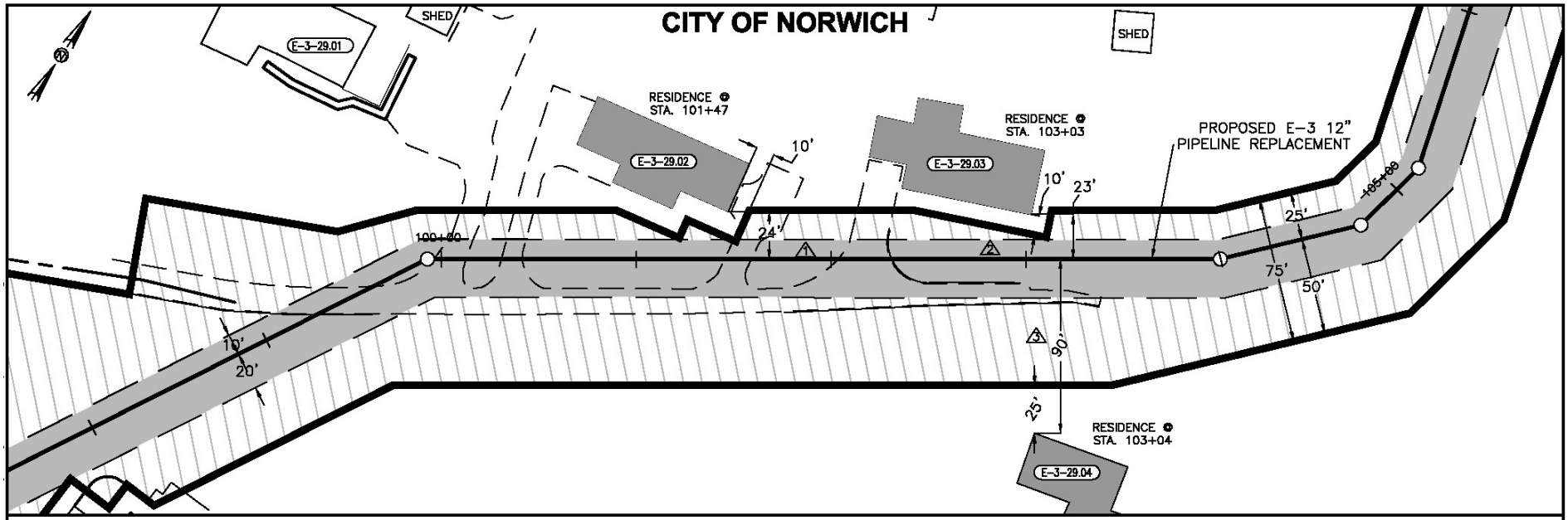
PRELIMINARY 9/9/2009

Appendix D

HubLine/East to West Project

Site-Specific Residential Construction Plans

(Sheet 7 of 11)



DESCRIPTION:

1. AT SURVEY STATION 101+47 THERE IS A RESIDENCE 10' LEFT OF THE CWA AND 24' LEFT OF THE CENTERLINE OF THE PROPOSED E-3 12" PIPELINE REPLACEMENT.
2. AT SURVEY STATION 103+03 THERE IS A RESIDENCE 10' LEFT OF THE CWA AND 23' LEFT OF THE CENTERLINE OF THE PROPOSED E-3 12" PIPELINE REPLACEMENT.
3. AT SURVEY STATION 103+04 THERE IS A RESIDENCE 25' RIGHT OF THE CWA AND 90' RIGHT OF THE CENTERLINE OF THE PROPOSED E-3 12" PIPELINE REPLACEMENT.

LEGEND

- PROPOSED PIPELINE
- EXISTING PIPELINE
- CONSTRUCTION WORK AREA
- PERMANENT EASEMENT
- EDGE OF PAVEMENT

NOTES:

1. (CWA) REFERS TO THE CONSTRUCTION WORK AREA
2. SAFETY FENCE WILL BE INSTALLED AT THE EDGE OF THE CONSTRUCTION RIGHT-OF-WAY FOR A DISTANCE OF 100' FEET ON EITHER SIDE OF THE RESIDENCE.

CONSTRUCTION TECHNIQUES:

ONE OF THE FOLLOWING TECHNIQUES SHALL BE UTILIZED FOR A LONGITUDINAL DISTANCE OF 100' FEET EITHER SIDE OF THE RESIDENCE

1. THE SEWER LINE TECHNIQUE TYPICALLY USED WHEN THE PIPELINE IS TO BE INSTALLED IN VERY CLOSE PROXIMITY TO AN EXISTING STRUCTURE OR WHEN AN OPEN DITCH WOULD ADVERSELY IMPACT A COMMERCIAL/INDUSTRIAL ESTABLISHMENT. THE TECHNIQUE INVOLVES INSTALLING PIPE ONE JOINT AT A TIME WHEREBY THE WELDING, X-RAY AND COATING ACTIVITIES ARE ALL PERFORMED IN THE OPEN TRENCH. AT THE END OF EACH DAY THE NEWLY INSTALLED PIPE IS BACKFILLED OR THE OPEN TRENCH IS COVERED WITH STEEL PLATES OR TIMBER MATS.
2. THE DRAG SECTION CONSTRUCTION TECHNIQUE INVOLVES THE TRENCHING, INSTALLATION AND BACKFILL OF A PREFABRICATED LENGTH OF PIPE CONTAINING SEVERAL SEGMENTS ALL IN ONE DAY. AT THE END OF EACH DAY THE NEWLY INSTALLED PIPE IS BACKFILLED AND/OR COVERED WITH STEEL PLATES OR TIMBER MATS.

GRAPHIC SCALE

0 50' 100'

REDUCED SCALE

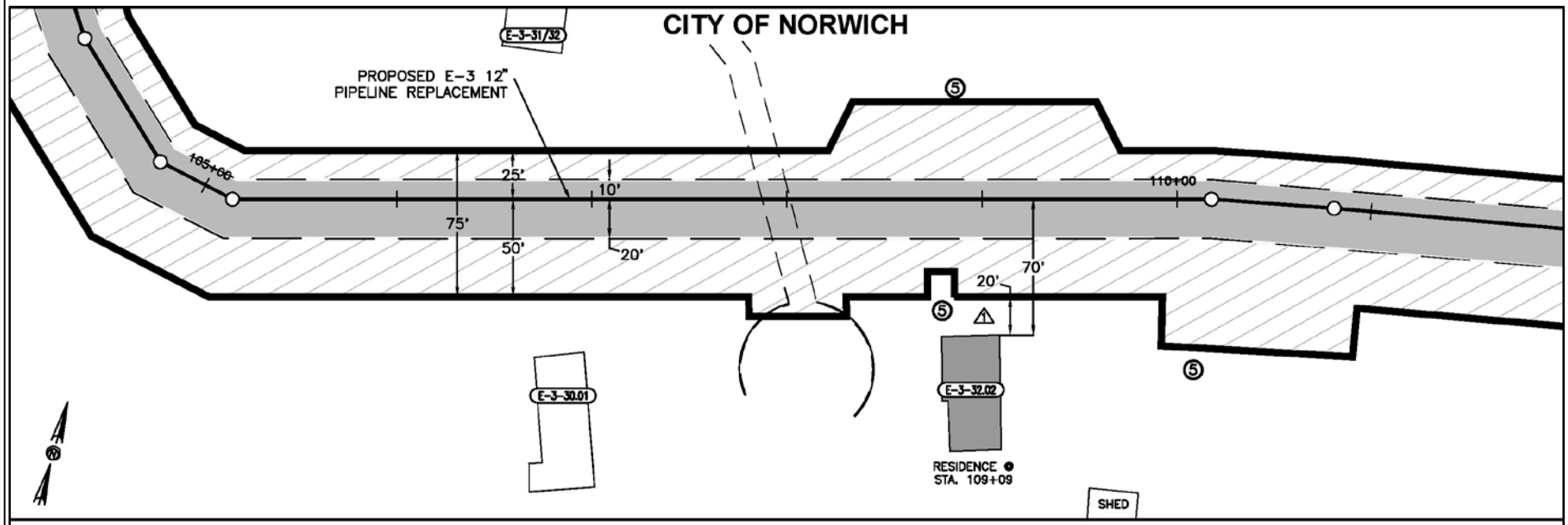
PRELIMINARY 10/9/2008

Appendix D

HubLine/East to West Project

Site-Specific Residential Construction Plans

(Sheet 8 of 11)



DESCRIPTION:

⚠ AT SURVEY STATION 109+09 THERE IS A RESIDENCE 20' RIGHT OF THE CWA AND 70' RIGHT OF THE CENTERLINE OF THE PROPOSED E-3 12" PIPELINE REPLACEMENT.

CONSTRUCTION TECHNIQUES:

ONE OF THE FOLLOWING TECHNIQUES SHALL BE UTILIZED FOR A LONGITUDINAL DISTANCE OF 100' FEET EITHER SIDE OF THE RESIDENCE

1. THE SEWER LINE TECHNIQUE TYPICALLY USED WHEN THE PIPELINE IS TO BE INSTALLED IN VERY CLOSE PROXIMITY TO AN EXISTING STRUCTURE OR WHEN AN OPEN DITCH WOULD ADVERSELY IMPACT A COMMERCIAL/INDUSTRIAL ESTABLISHMENT. THE TECHNIQUE INVOLVES INSTALLING PIPE ONE JOINT AT A TIME WHEREBY THE WELDING, X-RAY AND COATING ACTIVITIES ARE ALL PERFORMED IN THE OPEN TRENCH. AT THE END OF EACH DAY THE NEWLY INSTALLED PIPE IS BACKFILLED OR THE OPEN TRENCH IS COVERED WITH STEEL PLATES OR TIMBER MATS.
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LEGEND

- PROPOSED PIPELINE
- EXISTING PIPELINE
- CONSTRUCTION WORK AREA
- PERMANENT EASEMENT
- EDGE OF PAVEMENT

NOTES:

1. (CWA) REFERS TO THE CONSTRUCTION WORK AREA
2. SAFETY FENCE WILL BE INSTALLED AT THE EDGE OF THE CONSTRUCTION RIGHT-OF-WAY FOR A DISTANCE OF 100' FEET ON EITHER SIDE OF THE RESIDENCE.

GRAPHIC SCALE

0 50' 100'

PRELIMINARY 6/11/2009

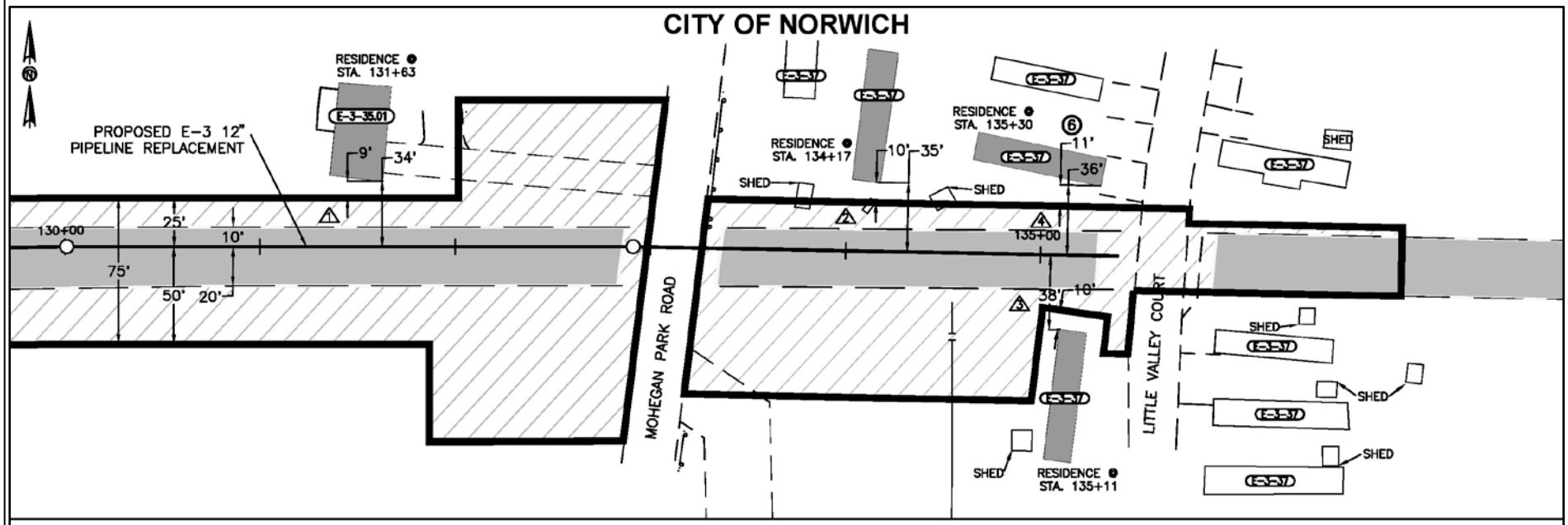
D-9

Appendix D

HubLine/East to West Project

Site-Specific Residential Construction Plans

(Sheet 9 of 11)



LEGEND

- PROPOSED PIPELINE
- EXISTING PIPELINE
- CONSTRUCTION WORK AREA
- PERMANENT EASEMENT
- EDGE OF PAVEMENT

DESCRIPTION:

1. AT SURVEY STATION 131+63 THERE IS A RESIDENCE 9' LEFT OF THE CWA AND 34' LEFT OF THE CENTERLINE OF THE PROPOSED E-3 12" PIPELINE REPLACEMENT.
2. AT SURVEY STATION 134+17 THERE IS A RESIDENCE 10' LEFT OF THE CWA AND 35' LEFT OF THE CENTERLINE OF THE PROPOSED E-3 12" PIPELINE REPLACEMENT.
3. AT SURVEY STATION 135+11 THERE IS A RESIDENCE 10' RIGHT OF THE CWA AND 38' RIGHT OF THE CENTERLINE OF THE PROPOSED E-3 12" PIPELINE REPLACEMENT.
4. AT SURVEY STATION 135+30 THERE IS A RESIDENCE 11' LEFT OF THE CWA AND 36' LEFT OF THE CENTERLINE OF THE PROPOSED E-3 12" PIPELINE REPLACEMENT.

NOTES:

1. (CWA) REFERS TO THE CONSTRUCTION WORK AREA
2. SAFETY FENCE WILL BE INSTALLED AT THE EDGE OF THE CONSTRUCTION RIGHT-OF-WAY FOR A DISTANCE OF 100' FEET ON EITHER SIDE OF THE RESIDENCE.

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GRAPHIC SCALE

0 50' 100'

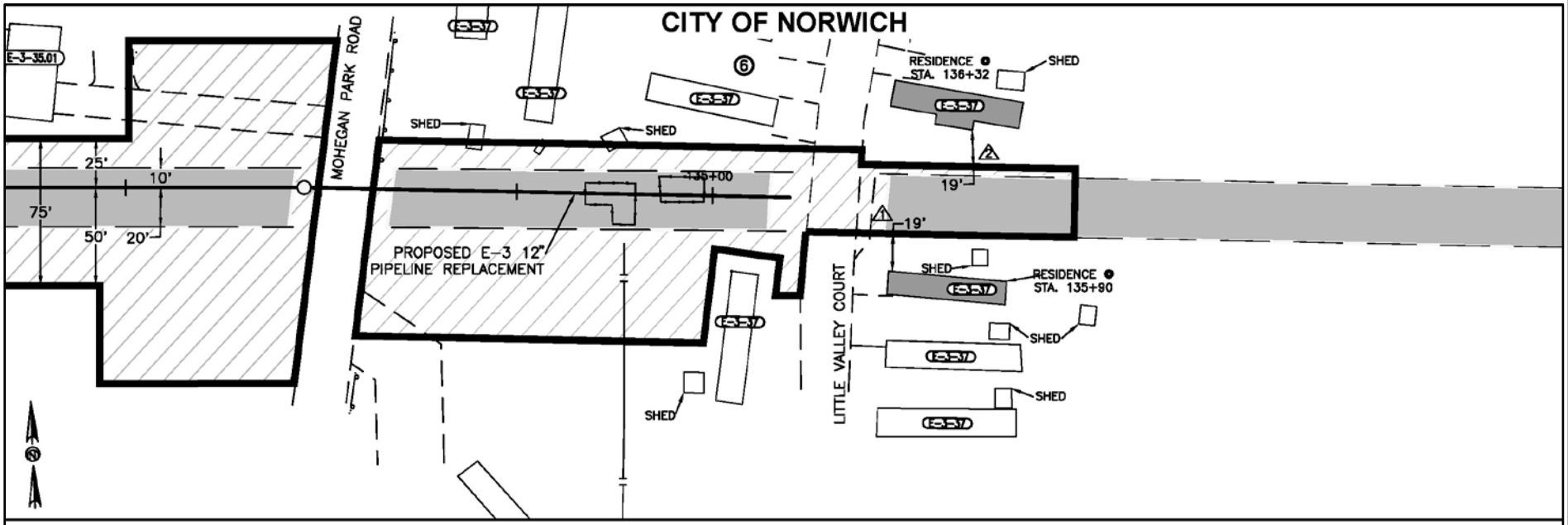
PRELIMINARY 6/11/2009

Appendix D

HubLine/East to West Project

Site-Specific Residential Construction Plans

(Sheet 10 of 11)



DESCRIPTION:

⚠1 AT SURVEY STATION 135+90 THERE IS A RESIDENCE 19' RIGHT OF THE CWA.

⚠2 AT SURVEY STATION 136+32 THERE IS A RESIDENCE 19' LEFT OF THE CWA.

LEGEND

- PROPOSED PIPELINE
- EXISTING PIPELINE
- CONSTRUCTION WORK AREA
- PERMANENT EASEMENT
- EDGE OF PAVEMENT

NOTES:

1. (CWA) REFERS TO THE CONSTRUCTION WORK AREA
2. SAFETY FENCE WILL BE INSTALLED AT THE EDGE OF THE CONSTRUCTION RIGHT-OF-WAY FOR A DISTANCE OF 100' FEET ON EITHER SIDE OF THE RESIDENCE.

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GRAPHIC SCALE

0 50' 100'

PRELIMINARY 6/11/2009

Appendix D

HubLine/East to West Project

Site-Specific Residential Construction Plans

(Sheet 11 of 11)

APPENDIX E

BLASTING PLAN FOR THE
HUBLINE/EAST TO WEST PROJECT

Algonquin Gas Transmission, LLC

HubLine/East to West Project

Blasting Plan

June 2009

TABLE OF CONTENTS

1.0 Introduction

This Blasting Plan ("Plan") describes the blasting program that will be implemented during construction of the Algonquin Gas Transmission, LLC ("Algonquin") HubLine/East to West Project ("E2W Project" or "Project"). This Plan addresses blasting for the proposed route alignment to be filed with the Federal Energy Regulatory Commission ("FERC") in May 2008.

This Plan includes a brief description of the pipeline alignment, and overall physiological setting and bedrock geology in the vicinity of the project. Information on shallow to bedrock soils and bedrock outcroppings is taken from the local published soil maps (and unpublished maps in progress) as acquired from the Natural Resources Conservation Service ("NRCS"). General bedrock type is also discussed. A map depicting the location of the E2W Project pipeline route is provided in Figure 1-1.

Information for blast and rip characteristics of the bedrock may be evaluated at least in a general sense, and applied towards an appropriate bedrock excavation method. The hard and intact nature of the unweathered igneous bedrock (basalts and granites) and metamorphic bedrock (slates, phyllites, schists and quartzites) dictate what blasting methods will be utilized. Soft bedrock, such as sedimentary or weathered igneous and metamorphic rock, may possibly be removed by ripping. The relative scarcity of soft sedimentary rock in New England suggests that ripping will be limited to weathered zones. Weathered bedrock is highly variable, as glaciation has removed most of the weathered rock that existed. Weathered zones generally occur in pockets that were protected from the ice.

Other geologic features may control the effects of blasting. Rock fabric, or the arrangements of minerals, determines intrinsic rock strength, and thus influences rock excavation. Joint spacing, bedding, and foliation also influence rock excavation. Lithologic generalizations of New England rock type include:

- granitic rock is invariably resistant, except where weathered.
- granulitic (high temperature-high pressure metamorphic rock with gniessic texture) and migmatitic (cooled rock having reached the boundary between metamorphism and magmatism) rock are also equally resistant.
- ultramafic (rich ferromagnesium) rocks are highly fractured and almost always require blasting. Other metamorphic rock along the geothermal gradient may have a wide range of susceptibility to blasting or ripping. It is the most difficult to predict of the hard rocks. Degrees of intensity of metamorphism can be further deduced from the minerals that schists contain; and
- sedimentary rock is generally amenable to ripping.

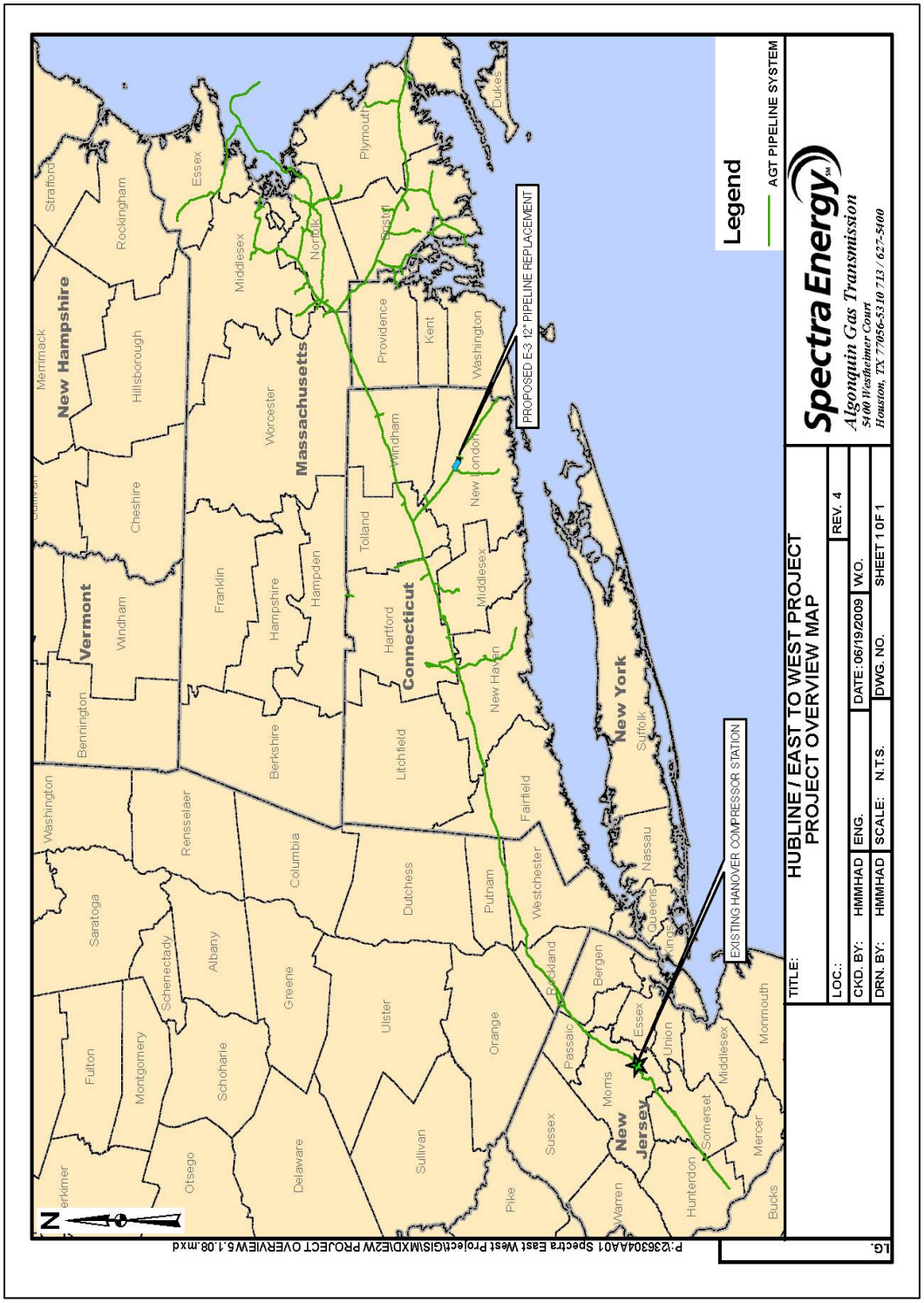

FIGURE 1-1 - HubLine/East to West Project Location

2.0 Project Alignment

The proposed Project consists of:

a) E-3 System – install approximately 2.56 miles of 12-inch-diameter pipeline that will replace a segment of an existing 6--inch-diameter pipeline from milepost ("MP") 0.0 to MP 2.56. The Project is located entirely within the City of Norwich, New London County, Connecticut.

b) Installation of ancillary facilities for the pipeline which will consist of mainline valves and other appurtenant facilities

3.0 Geologic Setting

3.1 Physiography

The geology of the Project area is comprised of glacial deposits overlying bedrock formed by continental collisions and subsequent expansion. The following summarizes the physiography, topography, and the surficial and subsurface geology of the Project area. Resource Report 6 provides additional information on geology.

Connecticut

Connecticut geology can be loosely divided into Eastern and Western Uplands divided by a Central Valley where the Connecticut and Quinnipiac Rivers flow. Upland areas consist of folded and altered crystalline and metamorphic bedrock blanketed by till with limited glacial outwash and finer deposits. geologic structure of these areas formed during collisions of continental land masses. The Central Valley is a rift valley that formed during the separation of Pangea and contains a greater array and dispersion of glacial outwash sediments and finer glacial lake bottom sediments. Continental collisions resulted in the hilly nature of the topography in the area of the E-3 System.

3.2 Topography

Connecticut

The topography of the E-3 System pipeline route generally consists of moderately hilly terrain with elevation ranges from approximately 100 feet to 365 feet.

3.3 Surficial Geology

Surficial geology of the E2W Project area is dominated by glacial till, sand and gravel, and finer silt and clay deposits and more recent swamp and alluvium deposits.

Advancing glaciers laid down a layer of till atop bedrock. Till is a dense diamict generally consisting of gravel and fine silt and clay. As glaciers melted and retreated, meltwater deposited sand and gravel (stratified drift) over till deposits. Fine sand, silt, and clay were deposited where meltwater ponded to form glacial lakes. Alluvial and swamp deposits are the most recent surficial deposits and overlie glacial sediments. Since sand and gravel and finer sediments overlie till deposits, areas where these sediments occur are not expected to require blasting of shallow bedrock. Till thickness and composition are expected to vary, and areas of till occurrence might have shallow bedrock or be too compact to excavate, requiring blasting. A review of surficial geology maps provided information regarding the nature of deposits expected in the Project area.

Connecticut

Surficial geology along the Connecticut portions of the E2W Project is comprised of till, sand and gravel, and finer deposits. Data on the surficial geology of Connecticut portions of the Project was compiled using a geographic information system ("GIS") data layer maintained by the Connecticut Department of Environmental Protection ("CTDEP"). Thin till deposits are expected to be less than 10 to 15 feet thick and may also include areas of bedrock outcrops. Thick till deposits are expected to be greater than 10 to 15 feet thick, allowing sufficient overburden for trenching without blasting bedrock.

The E-3 System crosses thin till or bedrock between MPs 0.00 and 1.04 and between MPs 1.09 and 2.56. The pipeline crosses thick till for a short distance between MPs 1.04 and 1.09.

3.4 Subsurface Geology

Connecticut

The Connecticut portion of the E2W Project (E-3 System) is located in the Iapetos Terrane of the Eastern Uplands lithotectonic subdivision. The Iapetos Terrane was created during a continental collision that was part of the formation of the supercontinent Pangaea approximately 450 to 250 million years ago. As such, the bedrock in the Iapetos Terrane is generally folded and metamorphosed. The following provides a summary of the bedrock that underlies the Project area by milepost. Information on bedrock lithologies was obtained from the Bedrock Geological Map of Connecticut. The bedrock geology is further described below.

Yantic Member of the Tatnic Hill Formation (Otay) (Iapteos Terrane) – The Yantic Member of the Tatnic Hill Formation is a gray to dark gray, fine to medium grained schist.

Fly Pond Member of the Tatnic Hill Formation (Otaf) (Iapteos Terrane) – The Fly Pond Member of the Tatnic Hill Formation is a light gray, medium grained calc-silicate gneiss.

Tatnic Hill Formation (Ota) (Iapteos Terrane) – The Tatnic Hill Formation is a gray to dark gray, medium grained gneiss or schist.

Quinnebaug Formation (Oq) (Iapetos Terrane) – The Quinnebaug Formation is a gray to dark gray, medium grained, well layered gneiss.

Preston Gabbro Diorite Phase (Opd) (Iapetos Terrane) – The diorite phase of the Preston Gabbro is a medium to dark gray, streaked, medium grained diorite.

Preston Gabbro (Op) (Iapetos Terrane) – The Preston Gabbro is a mafic, medium to coarse grained, massive igneous rock.

Table 3-2 shows where the lithotectonic subdivisions occur along the E-3 System in Connecticut.

TABLE 3-2

Subsurface Geology of the E2W Project

Milepost	Geologic Symbol-Unit	Geologic Age
E-3 System		
0.00-0.31	Otay – Yantic Member of Tatnic Hill Fmn	Ordovician
0.31-0.62	Otaf – Fly Pond Member of Tatnic Hill Fmn	Ordovician
0.62-2.56	Ota – Tatnic Hill Formation	Ordovician

3.5 Active Faults

While there are hundreds of old fault lines in New England, seismologists have not found any correlation between the frequency of modern earthquakes and the location of these old fault lines. There are a few minor faults along E-3 pipeline in Connecticut. One of the most well known faults in Connecticut is the eastern border fault which begins south of New Haven (the exact origin is under water) and extends for 130 miles north to Keene, New Hampshire. However, this fault has remained inactive for 140 million years, and the few small earthquakes that occur in Connecticut have never been found to be related to a specific fault.

3.6 Bedrock (less than five feet below the surface)

Depth to bedrock is less than 60 inches (5 feet) along approximately 1.42 miles of the E-3 System. Table 3-3 in Appendix A indicates the mileposts where shallow bedrock occurs.

3.7 Soil Hazards

The characteristics of the major soil types, vegetative cover, and slope are important factors in determining the potential for soil hazards. With regards to blasting, there are areas identified along the E2W Project that are prone to introduction of rocks into topsoil during excavation and backfilling. Other issues of potential soil hazards include areas along the pipeline route that are prone to severe erosion, are designated as prime farmland, hydric, prone to compaction, and soils with poor or very poor revegetation potential. Resource Report 7 provides additional information on soils. Table 3-3 in Appendix A delineates the soil hazards by milepost. Information regarding the hazards was compiled from the referenced USDA County Soil Surveys.

4.0 Pre-Blast Inspection

As required by the FERC, Algonquin shall conduct pre-blast surveys, with landowner permission, to assess the conditions of structures, wells, springs, and utilities within

150 feet of the proposed construction ROW. Should local or state ordinances require inspections in excess of 150 feet from the work, the local or state ordinances shall prevail. The survey will include:

- Informal discussions to familiarize the adjacent property owners with blasting effects and planned precautions to be taken on this project;
- Determination of the existence and location of site specific structures, utilities, septic systems and wells;
- Detailed examination, photographs, and/or video records of adjacent structures and utilities; and
- Detailed mapping and measurement of large cracks, crack patterns, and other evidence of structural distress.

The results will be summarized in a condition report that will include photographs and be completed prior to the commencement of blasting.

5.0 Monitoring of Blasting Activities

General Blasting

During blasting, Algonquin contractors will take precautions to minimize damage to adjacent areas and structures. Precautions include:

- Dissemination of blast warning signals in the area of blasting
- Backfilling with subsoil (no topsoil to be used) or blasting mats.
- Blast warning in congested areas, in shallow water bodies, or near structures that could be damaged by fly-rock.
- Use of matting or other suitable cover, as necessary, to prevent fly-rock from damaging adjacent protected natural resources.
- Posting warning signals, flags, or barricades.
- Following Federal and State procedures and regulations for safe storage, handling, loading, firing, and disposal of explosive materials.
- Manning adjacent pipelines at valves for emergency response as appropriate.

Excessive vibration will be controlled by limiting the size of charges and by using charge delays, which stagger each charge in a series of explosions.

If the contractor has to blast near buildings or wells, a qualified independent contractor will inspect structures or wells within 150 feet, or farther if required by local or state regulations, of the construction right-of-way prior to blasting, and with landowner permission. Post-blast inspections by the company's representative will also be performed as warranted. All blasting will be performed by registered blasters and monitored by experienced blasting inspectors. Recording seismographs will be installed by the contractor at selected monitoring stations under the observation of Algonquin personnel. During construction, the contractor will submit blast reports for each blast and keep detailed records as described in Section 6.7.

As appropriate, effects of each discharge will be monitored at the closest adjacent facilities by seismographs.

If a charge greater than eight pounds per delay is used, the distance of monitoring will be in accordance with the U.S. Bureau of Mines Report of Investigations 8507.

To maximize its responsiveness to the concerns of affected landowners, Algonquin will evaluate all complaints of well or structural damage associated with construction activities, including blasting. A toll-free landowner hotline will be established by Algonquin for landowners to use in reporting complaints or concerns. In the unlikely event that blasting activities temporarily impair a well water, Algonquin will provide alternative sources of water or otherwise compensate the owner. If well or structural damage is substantiated, Algonquin will either compensate the owner for damages or arrange for a new well to be drilled.

Algonquin has a Spill, Prevention, Control and Countermeasure Plan ("SPCC Plan") that addresses the handling of construction fuel and other materials. The SPCC Plan provides a set of minimum requirements to be used by the contractor in developing their own project-specific SPCC Plan. The SPCC Plan is included in the Algonquin's E2W Project, *Erosion and Sediment Control Plan ("E&SCP").*

6.0 Blasting Specifications

Algonquin has adopted the standard practices for blasting operations of Spectra Energy. The potential for blasting along the pipeline to affect any wetland, municipal water supply, waste disposal site, well, septic system, or spring will be minimized by controlled blasting techniques and by using mechanical methods for rock excavation as much as possible. Controlled blasting techniques have been effectively employed by Algonquin and other companies to protect active gas pipelines within 15 feet of trench excavation. The following text presents details of procedures for powder blasting, as extracted from Spectra Energy specifications and applied to Algonquin's E2W Project.

6.1 General Provisions

The contractor will provide all personnel, labor, and equipment to perform necessary blasting operations related to the work. The contractor will provide a permitted blaster possessing all permits required by the states in which blasting is required during construction, and having a working knowledge of state and local laws and regulations that pertain to explosives.

Project blasting will be done in accordance with 27 CFR Part 55, 30 CFR §715.19, National Fire Protection Association 495 - Explosive Materials Code; the above Spectra Energy Specification; 527 CMR 13.00, Connecticut General Statute 29-349 and all other state and local laws, when required; and regulations applicable to obtaining, transporting, storing, handling, blast initiation, ground motion monitoring, and disposal of explosive materials and/or blasting agents.

The contractor shall be responsible for supplying explosives and blasting materials that are perchlorate-free in order to eliminate the potential for perchlorate contamination of ground water.

The contractor shall be responsible for securing and complying with all necessary permits required for the transportation, storage, and use of explosives. The contractor shall be responsible for all damages or liabilities occurring on or off the right-of-way resulting from the use of explosives. When the use of explosives is necessary to perform the work, the contractor shall use utmost care not to endanger life or adjacent property, and shall comply with all applicable laws, rules, and regulations governing the storage, handling, and use of such explosives.

Blasting activities will strictly adhere to all local, state, and federal regulations applying to controlled blasting and blast vibration limits in regard to structures and underground utilities. In addition to following state and federal blasting guidelines, Algonquin will contact each municipality along the proposed route to determine local ordinances or guidelines for blasting (refer to Table 6-1).

TABLE 6-1

Contacts and Related Permitting Required Prior to Blasting Along the E2W Project

Jurisdiction	Contact	Agency	Permit/Regulation
Norwich, Connecticut	Kenneth Scandariato, Fire Chief 860-892-6085	Fire Department	Notification and Permit

The construction contractor will be made aware of all applicable procedures and local requirements and it will ultimately be the contractor's responsibility to notify officials and receive appropriate blasting permits and authorization.

Typically, local regulations require copies of the blasting contractor's certificate of insurance and license. In some jurisdictions, a certificate of bond will also be required, as well as a qualified person hired to oversee the blasting procedure.

The Chief Inspector ("CI") or designated representative shall have the opportunity to witness all rock excavations or other use of explosives. The contractor shall conduct all blasting operations in a safe manner which will not cause harm to the existing pipelines and structures in the vicinity. If the CI determines that any project blasting operation have been conducted in an unsafe manner, the CI will notifiy the Contractor of the unsafe activity. If any further unsafe actions occur on the part of the blasting firm, the CI will request that the Contractor terminate the contract of the blasting firm and hire another blasting company.

Any failure to comply with the appropriate law and/or regulations is the sole liability of the contractor. The contractor and the contractor's permitted blaster shall be responsible for the conduct of all blasting operations, which shall be subject to inspection requirements.

A blasting fact sheet will be distributed to landowners where blasting is proposed, and affected landowners will be contacted prior to any blasting activities.

6.2 Storage Use at Sites

Explosives and related materials shall be stored in approved facilities required under the applicable provisions contained in 27 CFR Part 55, Commerce in Explosives. The handling of explosives may be performed by the person holding a permit to use explosives or by other employees under his or her direct supervision provided that such employees are at least 21 years of age. While explosives are being handled or used, smoking shall not be permitted, and no one near the explosives shall possess matches, open light or other fire or flame within 50 feet of the explosives, in accordance with OSHA requirements. Suitable devices for lighting safety fuses are exempt from this requirement. No person shall handle explosives while under the influence of intoxicating liquors or narcotics at any time during construction of the Project. Original containers or Class II magazines shall be used for taking detonators and other explosives from storage magazines to the blasting area. Partial reels of detonating cord do not need to be in closed containers unless transported over public highways. Containers of explosives shall not be opened in any magazine or within 50 feet of any magazine. In opening kegs, or wooden cases, no sparking metal tools shall be used; wooden wedges and either wood, fiber or rubber mallets shall be used. Non-sparking metallic slitters may be used for opening fiberboard cases.

No explosive materials shall be located or stored where they may be exposed to flame, excessive heat, sparks, or impact.

Explosives or blasting equipment that are obviously deteriorated or damaged shall not be used. Explosive materials shall be protected from unauthorized possession and shall not be abandoned.

No attempt shall be made to fight a fire if it is determined that the fire cannot be contained or controlled before it reaches explosive materials. In such cases, all personnel shall be immediately evacuated to a safe location and the area shall be guarded from entry by spectators or intruders.

No firearms shall be discharged into or in the vicinity of a vehicle containing explosive materials or into or in the vicinity of a location where explosive materials are being handled, used, or stored.

6.3 Pre-Blast Operations

The contractor is required to submit a planned schedule of blasting operations to the CI or his designated representative for approval, prior to commencement of any blasting or pre-blast operation, which indicates the maximum charge weight per delay, hole size, spacing, depth, and blast layout. If blasting is to be conducted adjacent to an existing Algonquin pipeline, approval must be received from the Algonquin Transmission department. The contractor shall provide this schedule to the CI at least five working days prior to any pre-blast operation for approval and use. Where residences are within 50 feet of the blasting operation the CI may require notification in excess of five days. The blasting schedule is to include the blast geometry, drill hole dimensions, type and size of charges, stemming, and delay patterns and should also include a location survey of any dwelling or structures that may be affected by the proposed operation. Face material shall be carefully examined before drilling to determine the possible presence of unfired explosive material. Drilling shall not be started until all remaining butts of old holes are examined for unexploded charges, and if any are found, they shall be re-fired before work proceeds. No person shall be allowed to deepen the drill holes that have contained explosives.

Drill holes shall be large enough to permit free insertion of cartridges of explosive materials. Drill holes shall not be collared in bootlegs or in holes that have previously contained explosive materials. Holes shall not be drilled where there is a danger of intersecting another hole containing explosive material. Charge loading shall be spread throughout the depth of the drill hole or at the depths or rock concentration in order to obtain the optimum breakage of rock.

Loading and firing shall be performed or supervised only by a person possessing an appropriate blasting permit. All drill holes shall be inspected and cleared of any obstruction before loading. No holes shall be loaded except those to be fired in the next round of blasting. After loading, all remaining explosives shall be immediately returned to an authorized magazine.

A maximum loading factor of 3½ pounds of explosive per cubic yard of rock shall not be exceeded. However, should this loading fail to effectively break up the rock, a higher loading factor shall be allowed if the charge weight per delay is reduced by a proportional amount and approved by the CI.

Each borehole shall be primed with detonating cord thus eliminating blasting caps in boreholes for trench blasting. Detonating cord should be limited to 25 grains to prevent blowing stemming out of the drill hole. Boreholes shall be delayed in pairs with a minimum of 17 milliseconds ("ms"); 25 ms delays may be used with prior approval of the CI. Slightly longer delays may be used over steep hills with prior approval of the CI. Primers shall not be assembled closer than 50 feet (15.25 m) from any magazine. Primers shall be made up only when and as required for immediate needs.

Tamping shall be done only with wood rods without exposed metal parts, but non-sparking metal connectors may be used for jointed poles. Plastic tamping poles may be used, provided the authority having jurisdiction has approved them. Violent tamping shall be avoided.

Recommended stemming material shall consist of crushed stone with d_{50} = 3/8 inch, which will not bridge over like dirt and will completely fill voids in the hole.

When safety fuse is used, the burning rate shall be determined and in no case shall fuse lengths less than 120 seconds be used. The blasting cap shall be securely attached to the safety fuse with a standard ring type cap crimper.

Pneumatic loading of blasting agents in blast holes primed with electric blasting caps or other static-sensitive initiation systems shall comply with the following requirements:

- A positive grounding device shall be used for the equipment to prevent accumulation of static electricity;
- A semi-conductive discharge hose shall be used; and
- A qualified person shall evaluate all systems to assure that they will adequately dissipate static charges under field conditions.

No blasting caps or other detonators shall be inserted in the explosives without first making a hole in the cartridge for the cap with a wooden punch of proper size or standard cap crimper.

After loading for a blast is completed, all excess blasting caps or electric blasting caps and other explosives shall immediately be removed from the area and returned to their separate storage magazines.

6.4 Discharging Explosives

Persons authorized to prepare explosive charges or conduct blasting operations shall use every reasonable precaution, including, but not limited to, warning signals, flags, barricades, or woven wire mats to ensure the safety of the general public and workmen.

The contractor shall obtain Algonquin's approval and provide them at least 24-hour notice prior to the use of any explosives. The contractor shall comply with local and state requirements for pre-blast notifications, such as "Dig-Safe", which requires a 72 hour notice.

Whenever blasting is being conducted in the vicinity of gas, electric, water, fire alarm, telephone, telegraph and steam utilities, the blaster shall notify the appropriate representatives of such utilities at least 24 hours in advance of blasting. Verbal notice shall be confirmed with written notice. In an emergency, the local authority issuing the original permit may waive this time limit.

Blasting operations, except by special permission of the authority having jurisdiction, shall be conducted during daylight hours.

When blasting is done in congested areas or in proximity to a significant natural resource, structure, railway, or highway or any other installation that may be damaged, the blast shall be backfilled before firing or covered with a mat, constructed so that it is capable of preventing fragments from being thrown. In addition, all other possible precautions shall be taken to prevent damage to livestock and other property and inconvenience to the property owner or tenant during blasting operation. Any rock scattered outside the right-of-way by blasting operations shall immediately be hauled off or returned to the right-of-way.

Cap and fuse shall not be used to initiate blasts in congested areas or adjacent to highways open to traffic.

Precautions shall be taken to prevent accidental discharge of electric blasting caps from currents induced by radar and radio transmitters, lightning, adjacent power lines, dust and snow storms, or other sources of extraneous electricity. These precautions shall include:

- Suspension of all blasting operations and removal of all personnel from the blasting area during the approach and progress of an electrical storm;

- The posting of all signs warning against the use of mobile radio transmitters on all roads within 350 feet (107 m) of blasting operations; and

- Observance of the latest recommendations with regard to blasting in the vicinity of radio transmitters or power lines, as set forth in the IME Safety Library Publication No. 20, Safety Guide for the Prevention of Radio Frequency Radiation Hazards in the Use of Electric Blasting Caps.

Only electric blasting caps shall be used for blasting operations in congested districts, or on highways, or adjacent to highways open to traffic, except where sources of extraneous electricity make such use dangerous.

When electric blasting caps are used, stray current tests shall be made as frequently as necessary. Maximum stray current shall not exceed 0.05 amperes through a 1-ohm resistor, measured at the location of the blasting cap. Non-electric initiating systems shall be used if extraneous currents exceed this limit. Electric detonators of different brands shall not be used in the same firing circuit. Blasters, when testing circuits to charged holes, shall use only blast galvanometers designed for this purpose.

No blast shall be fired until the blaster in charge has made certain that all surplus explosive materials are in a safe place, all persons and equipment are at a safe distance or under sufficient cover, and that an adequate warning signal has been given.

Only the person making leading wire connections in electrical firing shall fire the shot. All connections should be made from the bore hole back to the source of firing current, and the leading wires shall remain shorted until the charge is to be fired. After firing an electric blast from a blasting machine, the leading wires shall be immediately disconnected from the machine and short-circuited. If there are any misfires while using cap and fuse, all persons shall remain away from the charge for at least one hour. If electrical blasting caps are used and a misfire occurs, this waiting period may be reduced to 30 minutes. Misfires shall be handled under the direction of the person in charge of the blasting and all wires shall be carefully traced in search for the unexploded charges.

Explosives shall not be extracted from a hole that has once been charged or has misfired unless it is impossible to detonate the unexploded charge by insertion of a fresh additional primer.

6.5 Waterbody Crossing Blasting Procedures

To facilitate planning for blasting activities for waterbody crossings, rock drills or test excavations may be used in waterbodies to test the ditch-line during mainline blasting operations to evaluate the presence of rock in the trench-line. The excavation of the test pit or rock drilling is not included in the time window requirements for completing the crossing. For testing and any subsequent blasting operations, streamflow will be maintained through the site. When blasting is required, the FERC timeframes for completing in-stream construction begin when the removal of blast rock from the waterbody is started. If, after removing the blast rock, additional blasting is required, a new timing window will be determined in consultation with the Environmental Inspector. If blasting impedes the flow of the waterbody, the contractor can use a backhoe to restore the stream flow without triggering the timing window. The complete waterbody crossing procedures are included in the Algonquin's E&SCP.

6.6 Disposal of Explosive Materials

All explosive materials that are obviously deteriorated or damaged shall not be used and shall be destroyed according to applicable local, state, and federal requirements.

Empty containers and packages and paper on fiberboard packing materials that have previously contained explosive materials shall not be reused for any purpose. Such packaging materials shall be destroyed by burning at an approved outdoor location or by other approved method. All personnel shall remain at a safe distance from the disposal area.

All other explosive materials will be transported from the job site in approved magazines per local and/or state regulations.

6.7 Blasting Records

A record of each blast shall be made and submitted, along with seismograph reports, to the Algonquin blasting inspector. The record shall contain the following minimum data for each blast:

- Name of company or contractor;
- Location, date and time of blast;
- Name, signature and license number of contractor and of blaster in charge;
- Type of material blasted;
- Number of holes, depth of burden and stemming, and spacing;

- Diameter and depth of holes;
- Volume of rock in shot;
- Types of explosives used, specific gravity, energy release, pounds of explosive per delay, and total pounds of explosive per shot;
- Delay type, interval, total number of delays and holes per delay;
- Maximum amount of explosives per delay period of 17 milliseconds or greater;
- Power factor;
- Method of firing and type of circuit;
- Direction and distance in feet to nearest structure and utility neither owned or leased by the person conducting the blasting;
- Weather conditions;
- Type and height or length of stemming;
- If mats or other protection were used; and
- Type of detonators used and delay periods used.

The person taking the seismograph reading shall accurately indicate exact location of the seismograph if used, and shall also show the distance of the seismograph from the blast.

Seismograph records, where required, should include:

- Name of person and firm operating and analyzing the seismograph record;
- Seismograph serial number;
- Seismograph reading;
- Maximum number of holes per delay period of 17 milliseconds or greater.

7.0 Post-Blast Inspection

An independent contractor, with landowner permission, will examine the condition of structures within 150 feet, or as required by state or local ordinances, of the construction area after completion of blasting operations to identify any changes in the conditions of these properties or confirm any damages noted by the landowner. The independent contractor with landowner approval will conduct a resampling of

wells within 150 feet, or as required by state or local ordinances, of the construction area. Should any damage or change occur during the blasting operations, an additional survey of the affected property may be made.

APPENDIX A

SOILS CROSSED BY THE E2W PIPELINE FACILITIES

TABLE 3-3

Soils Crossed by the E2W Pipeline Facilities

Pipeline Facility Soil Association/ Series/Complex	Range of Slope (%)	Map Unit	Beginning Milepost	Ending Milepost	Approximate Crossing Length (ft) a/	Soil Erosion		USDA Farmland Designation	Hydric Soils	Compaction Potential d/	Depth - Bedrock (inches)	Revegetation Potential e/	Drainage Class
						Water Erosion b/	WEG c/						
E-3 System													
Ridgebury, Leicester, and Whitman soils, extr. stony	Level	3	0.00	0.10	36	Moderate	5	None	Yes	High	> 60	Moderate	Poorly
Charlton-Chatfield complex, very rocky	15- 45	73E	0.00	0.10	284	Moderate	3	None	No	Low	> 60	Moderate	Well
Sutton fine sandy loam, very stony	2 - 8	51B	0.00	0.10	208	Moderate	5	None	No	Moderate	> 60	Moderate	Moderately Well
Charlton-Chatfield complex, very rocky	3 - 15	73C	0.10	0.20	305	Moderate	3	None	No	Low	> 60	Moderate	Well
Ridgebury, Leicester, and Whitman soils, extr. stony	Level	3	0.10	0.20	223	Moderate	5	None	Yes	High	> 60	Moderate	Poorly
Charlton-Chatfield complex, very rocky	3 - 15	73C	0.20	0.30	490	Moderate	3	None	No	Low	> 60	Moderate	Well
Catden and Freetown soils	Level	18	0.20	0.30	38	Low	8	None	Yes	High	> 60	Moderate	Very Poorly

TABLE 3-3

Soils Crossed by the E2W Pipeline Facilities

Pipeline Facility Soil Association/ Series/Complex	Range of Slope (%)	Map Unit	Beginning Milepost	Ending Milepost	Approximate Crossing Length (ft) a/	Soil Erosion		USDA Farmland Designation	Hydric Soils	Compaction Potential d/	Depth - Bedrock (inches)	Revegetation Potential e/	Drainage Class
						Water Erosion b/	WEG c/						
Catden and Freetown soils	Level	18	0.30	0.40	284	Low	8	None	Yes	High	> 60	Moderate	Very Poorly
Canton and Charlton soils, very stony	3 - 8	61B	0.30	0.40	244	Moderate	5	None	No	Low	> 60	Moderate	Well
Sutton fine sandy loam, very stony	2 - 8	51B	0.40	0.50	415	Moderate	5	None	No	Moderate	> 60	Moderate	Moderately Well
Canton and Charlton soils, very stony	3 - 8	61B	0.40	0.50	113	Moderate	5	None	No	Low	> 60	Moderate	Well
Udorthents-Urban land complex	NA	306	0.50	0.60	47	Moderate	5	None	No	NA	> 60	NA	NA
Sutton fine sandy loam, very stony	2 - 8	51B	0.50	0.60	299	Moderate	5	None	No	Moderate	> 60	Moderate	Moderately Well
Canton and Charlton soils, very stony	3 - 8	61B	0.50	0.60	182	Moderate	5	None	No	Low	> 60	Moderate	Well
Udorthents-Urban land complex	NA	306	0.60	0.70	104	Moderate	5	None	No	NA	> 60	NA	NA
Canton and Charlton soils, very stony	3 - 8	61B	0.60	0.70	348	Moderate	5	None	No	Low	> 60	Moderate	Well

TABLE 3-3

Soils Crossed by the E2W Pipeline Facilities

Pipeline Facility Soil Association/ Series/Complex	Range of Slope (%)	Map Unit	Beginning Milepost	Ending Milepost	Approximate Crossing Length (ft) a/	Soil Erosion		USDA Farmland Designation	Hydric Soils	Compaction Potential d/	Depth - Bedrock (inches)	Revegetation Potential e/	Drainage Class
						Water Erosion b/	WEG c/						
Woodbridge fine sandy loam	0 - 3	45A	0.60	0.70	76	Moderate	3	Prime	No	Moderate	> 60	Moderate	Moderately Well
Woodbridge fine sandy loam	3 - 8	45B	0.70	0.80	146	Moderate	3	Prime	No	Moderate	> 60	Moderate	Moderately Well
Woodbridge fine sandy loam	0 - 3	45A	0.70	0.80	382	Moderate	3	Prime	No	Moderate	> 60	Moderate	Moderately Well
Woodbridge fine sandy loam	3 - 8	45B	0.80	0.90	281	Moderate	3	Prime	No	Moderate	> 60	Moderate	Moderately Well
Ridgebury, Leicester, and Whitman soils, extr. stony	Level	3	0.80	0.90	247	Moderate	5	None	Yes	High	> 60	Moderate	Poorly
Woodbridge fine sandy loam	3 - 8	45B	0.90	1.00	528	Moderate	3	Prime	No	Moderate	> 60	Moderate	Moderately Well
Woodbridge fine sandy loam	3 - 8	45B	1.00	1.10	528	Moderate	3	Prime	No	Moderate	> 60	Moderate	Moderately Well
Woodbridge fine sandy loam	3 - 8	45B	1.10	1.20	201	Moderate	3	Prime	No	Moderate	> 60	Moderate	Moderately Well
Paxton and Montauk fine sandy loams	3 - 8	84B	1.10	1.20	327	Moderate	3	Prime	No	Low	> 60	High	Well
Woodbridge fine sandy loam	3 - 8	45B	1.20	1.30	259	Moderate	3	Prime	No	Moderate	> 60	Moderate	Moderately Well

TABLE 3-3

Soils Crossed by the E2W Pipeline Facilities

Pipeline Facility Soil Association/ Series/Complex	Range of Slope (%)	Map Unit	Beginning Milepost	Ending Milepost	Approximate Crossing Length (ft) a/	Soil Erosion		USDA Farmland Designation	Hydric Soils	Compaction Potential d/	Depth - Bedrock (inches)	Revegetation Potential e/	Drainage Class
						Water Erosion b/	WEG c/						
Charlton-Chatfield complex, very rocky	3 - 15	73C	1.20	1.30	260	Moderate	3	None	No	Low	> 60	Moderate	Well
Hollis-Chatfield Rock outcrop complex	3 - 15	75C	1.20	1.30	9	High	3	None	No	Low	10 - 20	Low	Excessively
Hollis-Chatfield Rock outcrop complex	15- 45	75E	1.30	1.40	165	High	3	None	No	Low	10 - 20	Low	Excessively
Hollis-Chatfield Rock outcrop complex	3 - 15	75C	1.30	1.40	363	High	3	None	No	Low	10 - 20	Low	Excessively
Hollis-Chatfield Rock outcrop complex	15- 45	75E	1.40	1.50	99	High	3	None	No	Low	10 - 20	Low	Excessively
Charlton-Chatfield complex, very rocky	3 - 15	73C	1.40	1.50	106	Moderate	3	None	No	Low	> 60	Moderate	Well
Charlton-Chatfield complex, very rocky	15- 45	73E	1.40	1.50	323	Moderate	3	None	No	Low	> 60	Moderate	Well
Paxton and Montauk fine sandy loams	3 - 8	84B	1.50	1.60	121	Moderate	3	Prime	No	Low	> 60	High	Well

TABLE 3-3

Soils Crossed by the E2W Pipeline Facilities

Pipeline Facility Soil Association/ Series/Complex	Range of Slope (%)	Map Unit	Beginning Milepost	Ending Milepost	Approximate Crossing Length (ft) a/	Soil Erosion		USDA Farmland Designation	Hydric Soils	Compaction Potential d/	Depth - Bedrock (inches)	Revegetation Potential e/	Drainage Class
						Water Erosion b/	WEG c/						
Charlton-Chatfield complex, very rocky	15- 45	73E	1.50	1.60	407	Moderate	3	None	No	Low	> 60	Moderate	Well
Paxton and Montauk fine sandy loams	3 - 8	84B	1.60	1.70	528	Moderate	3	Prime	No	Low	> 60	High	Well
Charlton-Chatfield complex, very rocky	3 - 15	73C	1.70	1.80	326	Moderate	3	None	No	Low	> 60	Moderate	Well
Paxton and Montauk fine sandy loams	3 - 8	84B	1.70	1.80	202	Moderate	3	Prime	No	Low	> 60	High	Well
Paxton and Montauk fine sandy loams, very stony	3 - 8	85B	1.80	1.90	467	Moderate	5	None	No	Low	> 60	Moderate	Well
Charlton-Chatfield complex, very rocky	3 - 15	73C	1.80	1.90	61	Moderate	3	None	No	Low	> 60	Moderate	Well
Paxton and Montauk fine sandy loams, very stony	3 - 8	85B	1.90	2.00	405	Moderate	5	None	No	Low	> 60	Moderate	Well

TABLE 3-3

Soils Crossed by the E2W Pipeline Facilities

Pipeline Facility Soil Association/ Series/Complex	Range of Slope (%)	Map Unit	Beginning Milepost	Ending Milepost	Approximate Crossing Length (ft) a/	Soil Erosion		USDA Farmland Designation	Hydric Soils	Compaction Potential d/	Depth - Bedrock (inches)	Revegetation Potential e/	Drainage Class
						Water Erosion b/	WEG c/						
Paxton and Montauk fine sandy loams	3 - 8	84B	1.90	2.00	123	Moderate	3	Prime	No	Low	> 60	High	Well
Woodbridge fine sandy loam, very stony	3 - 8	46B	2.00	2.10	103	Moderate	5	None	No	Moderate	> 60	Moderate	Moderately Well
Paxton and Montauk fine sandy loams, very stony	3 - 8	85B	2.00	2.10	204	Moderate	5	None	No	Low	> 60	Moderate	Well
Paxton and Montauk fine sandy loams	3 - 8	84B	2.00	2.10	42	Moderate	3	Prime	No	Low	> 60	High	Well
Paxton and Montauk fine sandy loams	15- 25	84D	2.00	2.10	178	Moderate	3	None	No	Low	> 60	Moderate	Well
Woodbridge fine sandy loam, very stony	3 - 8	46B	2.10	2.20	319	Moderate	5	None	No	Moderate	> 60	Moderate	Moderately Well
Sutton fine sandy loam, very stony	2 - 8	51B	2.10	2.20	209	Moderate	5	None	No	Moderate	> 60	Moderate	Moderately Well
Ridgebury, Leicester, and Whitman soils, extr. stony	Level	3	2.20	2.30	182	Moderate	5	None	Yes	High	> 60	Moderate	Poorly

TABLE 3-3

Soils Crossed by the E2W Pipeline Facilities

Pipeline Facility Soil Association/ Series/Complex	Range of Slope (%)	Map Unit	Beginning Milepost	Ending Milepost	Approximate Crossing Length (ft) a/	Soil Erosion		USDA Farmland Designation	Hydric Soils	Compaction Potential d/	Depth - Bedrock (inches)	Revegetation Potential e/	Drainage Class
						Water Erosion b/	WEG c/						
Charlton-Chatfield complex, very rocky	15- 45	73E	2.20	2.30	8	Moderate	3	None	No	Low	> 60	Moderate	Well
Charlton-Chatfield complex, very rocky	3 - 15	73C	2.20	2.30	101	Moderate	3	None	No	Low	> 60	Moderate	Well
Sutton fine sandy loam, very stony	2 - 8	51B	2.20	2.30	237	Moderate	5	None	No	Moderate	> 60	Moderate	Moderately Well
Charlton-Chatfield complex, very rocky	15- 45	73E	2.30	2.40	211	Moderate	3	None	No	Low	> 60	Moderate	Well
Paxton and Montauk fine sandy loams, very stony	3 - 8	85B	2.30	2.40	317	Moderate	5	None	No	Low	> 60	Moderate	Well
Charlton-Chatfield complex, very rocky	3 - 15	73C	2.40	2.50	154	Moderate	3	None	No	Low	> 60	Moderate	Well
Paxton and Montauk fine sandy loams, very stony	3 - 8	85B	2.40	2.50	374	Moderate	5	None	No	Low	> 60	Moderate	Well

TABLE 3-3

Soils Crossed by the E2W Pipeline Facilities

Pipeline Facility Soil Association/ Series/Complex	Range of Slope (%)	Map Unit	Beginning Milepost	Ending Milepost	Approximate Crossing Length (ft) a/	Soil Erosion		USDA Farmland Designation	Hydric Soils	Compaction Potential d/	Depth - Bedrock (inches)	Revegetation Potential e/	Drainage Class
						Water Erosion b/	WEG c/						
Charlton-Chatfield complex, very rocky	3 - 15	73C	2.50	2.60	70	Moderate	3	None	No	Low	> 60	Moderate	Well
Charlton-Chatfield complex, very rocky	15- 45	73E	2.50	2.60	43	Moderate	3	None	No	Low	> 60	Moderate	Well
Udorthents-Urban land complex	NA	306	2.50	2.60	415	Moderate	5	None	No	NA	> 60	NA	NA

a/ Soil crossing lengths were simplified by rounding to the nearest whole number. The crossing lengths may differ slightly from actual lengths due to rounding.

b/ Water erodibility values were determined by rounding each specific soils type's soil horizons K factor values. High values ranged 0.02-.20, Moderate values ranged 0.20-0.40, and Low values ranged 0.40-0.69. K factors were provided by NRCS Soil Data Mart tabular data.

c/ Wind Erodibility Groups (WEG) were provided by NRCS Soil Data Mart tabular data.

d/ Compaction values were determined by drained class. High compaction values were very poorly drained and poorly drained, Moderate values were somewhat poorly drained to moderately well drained, and low values were well drained to excessively drained.

e/ The ability of soils within the Project area - support successful revegetation were determined by information provided by NRCS official series descriptions and County soils Surveys. Revegetation potential was determined by comparing drainage class, slope class, rock fragement modifiers, and rock outcrops association. Refer to 7.3.5 of this report for potential thresholds.

APPENDIX F

DUST CONTROL PLAN

Algonquin Gas Transmission, LLC
HubLine/East to West Project

Dust Control Plan

Prepared for:

Algonquin Gas Transmission, LLC
890 Winter Street, Suite 300
Waltham, MA 02451

Prepared by:

TRC Environmental
650 Suffolk Street
Lowell, MA 01854

June 2009

INTRODUCTION

Algonquin Gas Transmission, LLC ("Algonquin") has developed this Dust Control Plan ("DC Plan") for the HubLine/East to West Project ("E2W Project"). The purpose of the DC Plan is to identify potential sources of fugitive dust emissions that may occur during construction of the E2W Project and describe dust abatement measures to be implemented by Algonquin and the Contractor to control and suppress dust. Measures identified in this DC Plan apply to work within the project area defined as the construction right-of-way ("ROW"), access roads, additional temporary workspace ("ATWS"), and other areas used during construction of the E2W Project.

Algonquin and the Contractor will be thoroughly familiar with this DC Plan and its contents prior to initiating construction on the E2W Project.

DUST GENERATION AND MITIGATION PROCEDURES

Dust Generation

Construction activities coupled with certain weather conditions can create conditions that promote the production and dispersal of fugitive dust from a construction area. The amount of dust generated is a function of construction activities, soil type, moisture content, wind speed, frequency of precipitation, vehicle traffic, vehicle types, and roadway characteristics. During certain weather conditions, several construction activities could generate dust. These include:

- Grading;
- Trenching;
- Backfilling;
- Vehicle/equipment traffic along the ROW;
- Daily use of staging areas and contractor yards; and
- Tracking of mud/dirt onto paved roadways.

The mitigation procedures described below and the measures outlined in Algonquin's Soil Erosion and Sediment Control Plan ("E&SCP") will be implemented to control fugitive dust during and after construction.

Mitigation Procedures

Dust control will be implemented by Algonquin and the Contractor in areas of active construction. The primary means of dust control for the E2W Project will be wet suppression through the application of water using water trucks. Presently, no surface water sources are proposed to be used as a water source. Water will be obtained from municipal sources (hydrant) from locations to be determined along the pipeline routes in Connecticut. The application and quantity of water to be used for dust suppression will be commensurate with field conditions during construction. Proper state and local approvals will be acquired as needed to withdraw water from municipal sources.

Water spray will be regulated to avoid water pooling and the generation of mud that could be tracked onto paved roadways.

Vehicular speed will be reduced for all vehicles and equipment travelling along the construction ROW. In addition, construction gravel pad entrances will be installed at the interfaces of the ROW and each paved road intersection which will reduce the tracking of mud and soil onto the paved roadway. Excessive mud and soil tracked onto the roadway will be cleaned up by the Contractor. All cargo areas of open bodied haul trucks will be securely covered during material transport on public roadways.

Calcium chloride may be used to control dust instead of wet suppression, however, wet suppression will be the primary means of dust control. Calcium chloride will be uniformly applied by a mechanical spreader at 1½ pounds per square yard, unless otherwise specified.

In the event that fugitive dust is generated from spoil piles, wet suppression will be implemented. In addition, spoil piles may be temporarily mulched and/or temporarily seeded in accordance with Algonquin's E&SCP. Once construction is completed, all areas of disturbance will be restored to preconstruction condition and permanently seeded and mulched in accordance with Algonquin's E&SCP to revegetate and stabilize the ROW.

DUST CONTROL INSPECTION AND COMPLIANCE

Field inspection and the need to implement dust control measures will be assessed daily by the Contractor, project chief inspector ("CI"), and environmental inspector ("EI"). The dust control assessment will be based on several criteria including 1) the present and forecasted weather conditions, 2) the condition of previous problem areas, and 3) an assessment of existing soil conditions along the construction ROW. The Contractor will be responsible for implementing the appropriate measure(s).

APPENDIX G

INVASIVE PLANT SPECIES CONTROL PLAN
FOR THE HUBLINE/EAST TO WEST PROJECT

Algonquin Gas Transmission, LLC

Invasive Plant Species Control Plan for the HubLine/East to West Project

Prepared for:

Algonquin Gas Transmission, LLC
890 Winter Street
Suite 300
Waltham, MA 02451

Prepared by:

TRC Environmental
650 Suffolk Street
Lowell, MA 01854

June 2009

INTRODUCTION

Algonquin Gas Transmission, LLC ("Algonquin") has developed this Invasive Plant Species Control Plan to be implemented during construction and operation of the HubLine/East to West Project ("E2W Project" or "Project"). The purpose of the plan is to attempt to control the spread of two foreign and invasive wetland plant species, purple loosestrife (*Lythrum salicaria*) and common reed (*Phragmites australis*), into wetland areas along the E2W Project area where they do not currently exist. Foreign and invasive plant species are defined as those that are either intentionally or unintentionally introduced into a geographic area to which they are not native. Not all foreign plant species are classified as nuisance species. However, when their populations grow in a given area to the point where they cannot be naturally controlled and begin to out-compete indigenous plant species, they may then be considered nuisance species. Purple loosestrife and common reed have established reputations within New England as being foreign invasive plant species. This prevention and control plan focuses on these two species because they have been identified by federal and state agencies as the most prevalent nuisance species within the project area. In addition to the prevention and control measures described below, Algonquin will continue to work with the Connecticut Department of Environmental Protection regarding the control of invasive wetland plant species.

Purple Loosestrife

Purple loosestrife is an herbaceous exotic which is believed to have been introduced into this country from Europe sometime in the early 1800s (Stuckey, 1980). It is a perennial that can grow to heights of 6 feet and taller, and is easily recognized from a distance by its elongated spike of purple flowers blooming between July and September. Purple loosestrife prefers moist, highly organic soils but can tolerate a wide range of conditions (Urbatsch 2003). Considered a nuisance plant species, purple loosestrife is able to out-compete native species found in salt marshes, wet meadows and swamps. Due in part to the lack of natural predators (Rendall, 1989) and its ability to produce and disperse up to 2.5 million viable seeds per plant annually (Welling and Becker, 1990), it has been successful in establishing a widely distributed range across the United States.

Purple loosestrife can form monotypic stands which eliminate biodiversity. Although it is considered a minor food source for muskrats, white-tailed deer and rabbit, these mammals utilize only a portion of the stems and tend to cut back the plant to the point where it grows back with renewed vigor (Anderson, 1995). In general, purple loosestrife is considered to provide little food, poor cover, and few nesting materials for wildlife (Mann 1991). Waterfowl nesting becomes more difficult as clumps of purple loosestrife restrict access to open water and offer concealing passageways for predators such as foxes and raccoons (Mal et al. 1992).

Common Reed

Common reed is a communal perennial grass which grows up to 14 feet in height and is found in a variety of disturbed tidal and non-tidal wetlands. Common reed is especially common in alkaline and brackish (slightly saline) environments; however, common reed does not require nor even prefer these habitats to freshwater areas (Haslam 1972, 1971). Its growth is greater in fresh water but it may be outcompeted in these areas by other species that cannot tolerate brackish, alkaline or acidic waters. It is easily distinguished by its inflorescence which is 8 to 16 inches long and displays purple or white flower clusters from mid-summer to early fall (Tiner, 1987). This grass reproduces primarily through vegetative methods whereby rhizomes send up new shoots (Brown, 1979). This technique allows the plant to establish rapidly and to form dense stands (Tiner, 1987) that make it difficult for other plants to thrive. The major concern is that common reed has little wildlife value and its aggressive colonization in a

community causes a decline in species diversity. Thick stands of common reed form nearly impenetrable barriers to the movement of animals and large birds such as ducks, shorebirds, and wading birds (Capotosto et al. 2007). Common reed will grow up to twenty feet tall by raising the marsh elevation and by filling in the open water areas and brackish marshes (Capotosto et al. 2007).

Construction Phase Mitigation Measures

Both purple loosestrife and common reed are present within some of the wetlands along the E2W Project area and are summarized in Table 1 of Appendix A. As previously mentioned, the purpose of this invasive plant species control plan is to control the spread of invasive plants to areas where they do not presently occur. The following mitigation measures will be implemented during construction:

1) The Environmental Inspector will make every effort to ensure that prefabricated equipment mats as well as construction equipment are clean and free of excess dirt and mud prior to entering a wetland area that does not support purple loosestrife or common reed. As necessary, equipment cleaning areas will be designated to ensure that equipment is cleaned to the extent practicable.

2) Sediment/erosion control devices shall be installed across the pipeline right-of-way ("ROW") on slopes leading into wetlands and along the edge of the construction ROW to prevent spoil from migrating into these areas. This will also help to prevent the dispersion of seeds from invasive plant species into uninfested wetlands during construction.

3) Revegetation of wetlands shall be expedited by stripping the topsoil from over the trench, except in areas with standing water or heavily inundated soils, where no topsoil layer is evident, or where it exceeds the depth of the trench. Topsoil shall then be stockpiled separately from subsoil to ensure preservation of the native seed bank.

4) Following pipeline installation, the trench will be backfilled and the area recontoured to its original grade. Segregated topsoil shall be replaced as the surficial layer and natural drainage patterns restored to facilitate natural re-establishment of native vegetation.

5) The restored ROW will be seeded with an annual rye grass within 6 days of final regrading. Annual ryegrass will create a rapid cover over the disturbed ROW and help to prevent establishment of invasive species which typically colonize disturbed sites.

6) Expediting construction in and around wetlands and limiting the amount of equipment and construction activities within wetlands will reduce the amount and duration of disturbances. In addition, equipment used will be tracked or balloon-tired, or will be operating on top of prefabricated mats, timber riprap, or terra mats. This will minimize the amount of heavily disturbed soils in which invasive plants might colonize.

Post-Construction Monitoring for Invasive Plant Species

To ensure successful revegetation of native wetland species, wetland areas will be monitored for the first 3 to 5 years following pipeline construction and ROW restoration. Monitoring of the entire ROW promptly after construction will prevent the establishment of large populations of nuisance species, and problem areas would be quickly mitigated. During monitoring, emphasis will be placed on identifying the presence of purple loosestrife and common reed in wetlands that did not support these species prior to construction.

In the event that nuisance plant species spread into new ROW areas, Algonquin will implement removal and eradication measures. Available information suggests that control methods such as mowing, burning and flooding are largely ineffective (Urbatsch 2003). Hand removal can be effective but only for small populations or individual plants (Urbatsch 2003). Herbicides have been used with varying success on controlling purple loosestrife and with greater success at controlling common reed (Urbatsch 2003, Capotosto 2007). Accordingly, Algonquin will utilize the following measures in an effort to eradicate the invasive species:

1) Individual plants would be identified and hand pulled, including roots, before the end of the flowering season if their occurrence is no greater than 100 stems per acre. Plants will be removed from the ROW and burned or otherwise disposed of at an approved waste facility.

2) If the invasive plant species population is greater than 100 stems per acre, hand application of Glyphosate (e.g., Rodeo® or Roundup®), or a comparable herbicide, as recommended by the U.S. Army Corps of Engineers and appropriate state agencies, will be used. Application of the herbicide will only be at the approval of the landowner and appropriate state agencies.

3) Vegetation maintenance over the full width of the permanent ROW within wetlands will be prohibited. A corridor centered on the pipeline and up to 10 feet wide may be maintained as an herbaceous layer to facilitate periodic pipeline corrosion/leak surveys. Trees within 15 feet of the pipeline that are greater than 15 feet in height may also be selectively cut and removed within the permanent ROW. The restricted vegetation maintenance measures will promote the development of a dense layer of shrubs on the ROW, and will help to deter the growth of both common reed and purple loosestrife which are shade intolerant species.

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APPENDIX A

Table 1: Summary of Wetland Supporting Invasive Plant Species Along the E2W Project

TABLE 1

Summary of Wetlands Supporting Invasive Plant Species along the E2W Project

State/Facility	Wetland I.D.	NWI Classification a/	Enter MP	Exit MP	Common Reed (*Phragmites australis*)	Purple Loosestrife (*Lythrum salicaria*)	Comments
E-3 System							
	E3-W1	PFO/PEM	0.09	0.14			
	E3-W2	PFO/PSS	0.30	0.36	Yes	Yes	
	E3-W3	PFO/PSS	0.45	0.59			
	E3-W4	PFO/PEM	0.63	0.63			
	E3-W5	PFO/PSS	0.66	0.68			
	E3-W6	PFO/PSS	0.85	0.91	Yes		
	E3-W7	PEM	1.00	1.02			
	E3-W8	PFO/PEM	1.18	1.26			
	E3-W9	PFO	1.43	1.44			
	E3-W11	PFO/PEM	1.50	1.51			
	E3-W12	PFO/PEM	1.61	1.64			
	E3-W13	PFO/PEM	2.11	2.14			
	E3-W14	PFO/PEM	2.25	2.29	Yes		

a/ NWI Classifications
PEM - Palustrine emergent wetland
PSS - Palustrine scrub shrub wetland
PFO – Palustrine forested wetland

APPENDIX H

WETLAND RESTORATION PROCEDURES FOR TEMPORARY WETLAND IMPACTS FOR THE HUBLINE/EAST TO WEST PROJECT

Algonquin Gas Transmission, LLC

Wetland Restoration Procedures for Temporary Wetland Impacts for the HubLine/East to West Project

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INTRODUCTION

Algonquin Gas Transmission, LLC ("Algonquin") has developed this Wetland Restoration Plan ("WR Plan") for the HubLine/East to West Project ("E2W Project"). The purpose of the WR Plan is to document the specific practices that will be implemented to minimize potential adverse effects on wetlands and aquatic ecosystems during construction of the E2W Project. This WR Plan contains a summary of wetland impact mitigation measures presented in Algonquin's Erosion and Sediment Control Plan ("E&SC Plan"). The purpose of this WR Plan is to provide the U.S. Army Corps of Engineers ("ACOE") and other resource agencies with a comprehensive overview of the measures to be used during construction to minimize impacts, as well as details on how wetlands will be restored.

The lift and replacement of the E-3 System will result in a total of 2.8 acres of temporary wetland impact consisting of approximately1.5 acres of non-forested wetland 1.3 acres of forested wetland cover types. Most wetland impacts will occur during the construction phase; however, it is important to note that there will be no permanent cover type conversion of forested wetlands because the new pipeline will occupy the existing 30-foot wide permanent right-of-way ("ROW") and the portion of the forested wetland affected by construction will be allowed to regenerate back to a forested cover type. In addition, there will be no permanent fill of wetlands during construction of the pipeline. Restoration of wetland areas will be expedited by minimizing the duration of work and restoring the pre-construction topographic and hydrologic conditions.

Vegetation will be cut just above ground level, leaving the existing root systems in place. Removal of stumps in wetlands will be minimal along the E-3 System Pipeline in Connecticut as construction will consist of lift and replacement of the existing pipeline within the existing and regularly maintained pipeline ROW. Except in standing water, saturated soils, frozen conditions, or where ledge is encountered at the surface, the top 12 inches of hydric soils in wetlands over the trenchline will be segregated and stockpiled separately from subsoils. Once the trench is backfilled, the topsoil will be replaced over the trench to its original location and grades. This topsoil material typically contains an extensive seed bank and root propagules that aid in the reestablishment of herbaceous and some woody vegetation in disturbed areas.

Specific locations of wetlands are provided on the 1" = 100' scale project alignment sheets. The alignment sheets depict the wetland boundaries in relation to the proposed pipeline overlain on digitized aerial photography.

Algonquin's approach to wetland restoration involves a combination of substrate and hydrology restoration, and vegetation establishment involving natural succession processes as a key component. In Algonquin's experience this approach is effective in minimizing short and long-term impacts to all wetland types along the proposed project route.

WETLAND CONSTRUCTION MITIGATION

General Measures

Algonquin will minimize impacts to wetlands by implementing the following protective measures:

- Wetland boundaries and buffers will be clearly marked in the field with highly visible flagging and signs until construction-related ground disturbing activities are completed.

- Sediment barriers will be installed across the entire construction ROW immediately upslope of the wetland boundary at all wetland crossings to prevent sediment flow into the wetland.

- Where wetlands are adjacent to the construction ROW and the ROW slopes toward the wetland, sediment barriers will be installed along the edge of the construction ROW, as necessary, to prevent sediment flow into the wetland.

- Where the construction ROW passes through wetlands, sediment barriers will be installed along the edge of the construction ROW, as necessary, to contain spoil and sediment within the construction ROW.

- To expedite revegetation of wetlands, the top 1 foot of topsoil from the area disturbed by trenching will be segregated and stockpiled separately for restoration purposes. Immediately after backfilling is completed, the segregated topsoil will be restored to its original location. Exceptions to this procedure include areas with standing water, where saturated or frozen soils are present, and where no topsoil layer is evident or the topsoil layer exceeds the depth of the trench.

- Construction equipment operating within wetlands will be limited primarily to equipment needed to clear the construction ROW, dig the trench, fabricate and install the pipeline, backfill, and restore the construction ROW. All other construction equipment will use access roads in upland areas to the extent practicable.

- To minimize disturbance and compaction in wetlands with saturated soils or standing water, low ground weight construction equipment will be used, or equipment will operate from timber riprap, prefabricated equipment mats, or terra mats. Imported rock, stumps, brush, or off-site soil as temporary or permanent fill will be prohibited. Following construction, all materials used to support equipment on the construction ROW and stabilize the ROW will be removed.

To reduce disturbance to wetland soils, construction in and around wetlands will be expedited. The equipment utilized and amount of construction activities within wetlands will also be limited. Construction materials, including fuels, will not be stored within 100 feet of any surface water or wetland system, except under limited, highly controlled circumstances. All personnel handling fuels and other hazardous materials will be properly trained and all equipment will be in good operating order and inspected regularly. Construction equipment will not be refueled within 100 feet of any surface water or wetland system, except under limited, highly controlled circumstances. Each construction crew will have sufficient supplies of absorbent and barrier materials to allow the rapid containment and recovery of spilled materials and each foreman will be knowledgeable with spill reporting procedures. Construction equipment will not be washed in or near any wetland. The construction ROW will be inspected periodically during and after construction. Erosion control or restoration features will be repaired as needed and in a timely manner until permanent revegetation is successful.

The general wetland construction and mitigation procedures that will be followed by Algonquin are those as outlined by the FERC in its *Wetland and Waterbody Construction and Mitigation Procedures* (1/17/2003 version). The actions, as outlined below, are intended to minimize adverse environmental impacts to wetlands. Algonquin will use the best available technology by:

- Using the most appropriate equipment or machinery;

- Implementing appropriate maintenance and operation on the equipment or machinery, including adequate training, staffing, and working procedures;
- Using machinery and techniques that are designed to reduce drainage impacts to wetlands;
- Designing appropriate wetland crossings that will maintain water flows and accommodate fluctuating water tables;
- Routing the pipeline to minimize the number of wetland crossings;
- Maintaining adequate flow in wetlands to protect aquatic life and prevent the interruption of downstream uses;
- Assembling the pipeline in upland and use "push-pull" or "float" techniques to place the pipe in the trench;
- Limiting equipment operation in wetlands;
- Limiting removal of vegetation;
- Segregate wetland surface soils for restoration during backfilling;
- Using low-ground-weight construction equipment if standing water or saturated soils are present;
- Dewatering trenches in such a manner that no heavy silt-laden water flows into any wetland;
- Utilizing temporary sediment barriers;
- Where the pipeline trench may drain a wetland, a trench breaker will be constructed and/or the trench bottom will be sealed to maintain original hydrology; and
- Providing post-construction maintenance and monitoring to establish success of wetland revegetation and restoration.

Temporary Sediment Controls

Prior to any grading and trenching activities, a temporary sediment barrier (i.e., silt fence or straw bales) will be installed across the entire construction ROW immediately upslope of the wetland boundary. Erosion controls will be placed as needed parallel to the construction ROW within the wetland. The erosion and sedimentation barrier will be properly installed and maintained throughout the construction period to prevent sediment from flowing into adjacent undisturbed wetland areas.

Specific Wetland Crossing Methods

Algonquin will use one of three methods for crossing wetlands during construction depending on individual wetland soil conditions and degree of saturation. The actual method for crossing any given wetland will be determined by the Environmental Inspector ("EI"), Chief Inspector ("CI"), and Contractor

based on conditions encountered at the time of construction. The three typical wetland crossing methods are:

1) Standard Cross-Country Construction
2) Conventional Wetland Construction
3) Push/Pull Wetland Construction

Standard cross-country construction can be used in wetlands where soils are dry enough at the time of construction to support equipment. This method is typically used when construction occurs during the mid-to-late summer and early-to-mid fall, when water tables are lowest. This crossing method typically requires no additional equipment support for stability purposes. In addition, this method involves the segregation of topsoil from subsoil over the trenchline.

Conventional wetland construction will be used for crossing wetlands with saturated soils or soils otherwise unable to support mainline construction equipment. Where the soils are saturated, the construction ROW must be stabilized with prefabricated equipment mats, timber riprap, or terra mats during construction.

Push/pull wetland construction entails pushing or pulling a floating section of pre-assembled pipe into position over an inundated trench. The floats are removed and the concrete-coated pipe (or pipe with set on weights) sinks into the trench. The section of pipeline to be floated into place must be straight or nearly straight to be able to float within the confines of the excavated ditch. Algonquin will use this method in large wetland areas where soils are saturated and generally unable to support larger pieces of equipment, where water levels are high enough at the time of construction to float the pipeline into the trench, and where such levels can be maintained without damming. The push/pull method may require less clearing than either standard or conventional wetland construction because construction space is only required to allow the backhoe to traverse the wetland and to stockpile excavated soil. Only equipment needed to clear, excavate, set on the weights required for negative buoyancy, backfill and restore the trenchline will be permitted in the wetland area.

Cleanup/Restoration

The cleanup/final restoration phase is critical for mitigating long-term wetland impacts, and thus will be closely monitored by the EI. During the initial restoration phase, all construction debris will be removed from the ROW. Segregated topsoil will be replaced over the trenchline, and wetland contours and drainage patterns will be restored to approximate original condition by matching that which exists in adjacent undisturbed areas. Restoring the grade, drainage patterns, and replacing topsoil over the trench will promote the re-establishment of native hydrophytic vegetation. Surface rocks and boulders that had been windrowed during the construction phase will be distributed in a more natural configuration in the temporary work space area or hauled off-site. Prefabricated equipment mats and timber riprap access pads will be removed when access to the wetland is no longer required. Where the pipeline trench may affect wetland hydrology (e.g., drain the wetland), trench breakers will be installed or the trench bottom will be sealed as necessary to maintain the original wetland hydrology. In areas of sloped terrain, permanent slope breakers shall be constructed across the ROW to replace temporary erosion control barriers at wetland boundaries. These clean-up and final grading steps shall be completed within 10 working days after the pipeline is backfilled, weather conditions permitting.

Within 6 working days of restoration of the substrate, weather conditions permitting, wetlands will typically be seeded with annual ryegrass at a rate of 40 pounds per acre. The use of annual ryegrass in restoring wetlands is recommended by the FERC and the National Resources Conservation Services

("NRCS") and has been shown to stabilize effectively the site and serve as a nursery crop as the indigenous wetland vegetation reestablishes itself. The ryegrass quickly looses vigor during the first growing season and allows revegetation by native wetland plant species.

Construction Supervision and Inspection

As stated above, Algonquin will ensure implementation of the wetland restoration plan through its construction supervision and Environmental Inspection Program ("EIP"). Training of EIs will be undertaken to ensure that the EIs will be able to carry out their duties as described in this document. Construction activities will be in compliance with the E&SC Plan and with requirements of applicable federal, state and local environmental permits and approvals. The EIs will review all project documents (ROW descriptions, reports, permits, alignment sheets, aerial photography and relevant plans) prior to construction. The EIs will also be responsible for the following tasks to protect and mitigate impacts to wetlands:

- Verify the location of signs and highly visible flagging marking the boundaries of sensitive resource areas, wetlands, and waterbodies.
- Ensure the repair of all ineffective temporary erosion control measures by the Contractor within 24 hours of identification.
- Oversee restoration and revegetation of wetlands and adjacent upland areas, and monitoring of waterbodies.
- Ensure that all construction activities occur within authorized work areas and only approved access roads are used.
- Monitor collection and disposal of construction waste.
- Inspect construction activities daily to verify and document that Contractors are complying with the requirements of the E&SC Plan, the environmental provisions included in the construction drawings and construction line list, the environmental conditions and mitigation measures of the FERC Certificate, and with all applicable federal and state permit requirements.
- Maintain daily activity logs, prepare weekly progress reports, and complete other required documentation (including photos/videos) of construction activities.
- Identify potential problems and initiate appropriate actions prior to occurrence.
- Ensure that the soil profiles are restored as required.
- Educate other Company Inspectors about project specific environmental concerns.
- Provide notification concerning proposed construction activities to agencies as required in permits.
- Work directly with the water and wetland resource agencies to assure that Wetland Crossing Plans are properly implemented.

- Verify that trench dewatering activities do not result in the deposition of sand, silt, and/or sediment near the point of discharge into a wetland or waterbody. If such deposition is occurring, the dewatering activity will be stopped and the design of the discharge will be changed to prevent reoccurrence.

The EIs will be supervised by and be responsible to the CI who has overall authority over construction. The EI will report compliance problems, have "stop-task" and corrective action authority and make "stop-work" recommendations to the CI who has "stop-work" authority. At the direction of the CI, the EI will take the appropriate steps to redirect work as necessary.

Post-Construction Restoration Monitoring

As required by the FERC and specified in the E&SC Plan, Algonquin will conduct post-construction monitoring of all wetlands affected by construction, annually for 3 years, to assess the condition of revegetation and the success of restoration. Wetland revegetation shall be considered successful when the cover of herbaceous and/or woody species is at least 80 percent of the type, density, and distribution of the vegetation in adjacent wetland areas that were not disturbed by construction.

Upon determination of successful revegetation, sediment barriers will be removed and disposed of properly in accordance with the E&SC Plan.

If an area is not showing signs of re-establishment of native wetland vegetation or if there is a need for exotic invasive plant species control measures following construction, Algonquin shall consult with the ACOE and other applicable federal and state agencies to develop appropriate remedial actions. Algonquin shall produce quarterly monitoring reports and provide them to the FERC, ACOE, and other applicable agencies as requested. Please refer to the E2W Project Invasive Species Management Plan for more details regarding exotic invasive plant species controls.

WETLAND MITIGATION

On March 21, 2008, Algonquin met with the ACOE New England District to discuss preliminary considerations for wetland compensation for the Project. In that meeting, the ACOE indicated that they would only require compensation for new permanent forested wetland conversion as a result of ROW vegetation maintenance. The lift and replacement of the E-3 System will not result in new permanent forested wetland conversion as the new pipeline will occupy the existing 30-foot wide ROW easement. As a result, forested wetland areas temporarily affected by construction will be allowed to regenerate back into a forested cover type following construction. The Connecticut Department of Environmental Protection as indicated that the agency will require wetland compensation for temporary wetland impacts. Algonquin will continue to work with the Connecticut Department of Environmental Protection regarding wetland compensation options.

APPENDIX I

REFERENCES AND CONTACTS

APPENDIX I

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APPENDIX J

LIST OF PREPARERS

LIST OF PREPARERS

Federal Energy Regulatory Commission

Jones, Shannon – Project Manager; Water Resources; Wetlands; Vegetation; Wildlife and Aquatic Resources; Special Status Species; Land Use, Recreation, Special Interest Areas, and Visual Resources; Socioeconomics; Cumulative Impacts; Alternatives
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Holden, Steve – Deputy Project Manager, Introduction, Project Description, Geology, Soils, Cumulative Impacts
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B.A., Anthropology/Archaeology and Sociology, Hamline University

APPENDIX K

COMMENTS ON THE
DRAFT EIS AND RESPONSES

COMMENTS ON THE DRAFT EIS AND RESPONSES

Table K-1 lists comments that were received on the draft EIS that are no longer applicable due to the reduction in scope of the HubLine/East to West Project. These include the transcript of the public meeting at Stoughton, Massachusetts and written comment letters from state and local agencies, companies and organizations, individuals, and Algonquin that relate to facilities that have been eliminated from the amended Project. Because these comments are no longer applicable, we have not prepared comment responses. Copies of the transcript and the written comment letters are available for viewing on the FERC Internet website (http://www.ferc.gov).[1] The applicable comments and our specific responses begin on page K-2.

TABLE K-1

Comments Received on the Draft EIS that are No Longer Applicable to the Amended HubLine/East to West Project

Document Type/Commentor	Date
Public Meeting	
Public Meeting at Stoughton, Massachusetts	December 10, 2008
State Agencies	
Rhode Island Coastal Management Resources Council	January 12, 2009
Local Agencies	
Town of Canton Conservation Commission	December 29, 2008
Companies and Organizations	
139 Realty Trust	December 23, 2008
NSTAR Electric Company	December 29, 2008
Neposet River Watershed Association	December 29, 2008
Mass Audubon	December 29, 2008
TW Conroy LLC, TW Conroy 3 LLC, TW Conroy 5 LLC, Conroy Development Corporation	December 29, 2008
The Trustees of Reservations	December 29, 2008
Oak Woods Estate LLC/Issadore & Arons LLP	December 29, 2008; March 4, 2009
500 Washington LLC	January 6, 2009
Individuals	
Karen Ficorilli	December 29, 2008
Lawrence Wachira	March 25, 2009
Applicant	
Algonquin Gas Transmission, LLC	January 28, 2009

[1] Using the "eLibrary" link, select "General Search" from the eLibrary menu and enter the docket number excluding the last three digits in the "Docket Number" field (i.e., CP08-420). Select a date range of November 7, 2008 to March 25, 2009.

INDEX TO THE APPLICABLE COMMENTS

Comments on the Draft EIS and Responses

PUBLIC MEETINGS

BEFORE THE

FEDERAL ENERGY REGULATORY COMMISSION

- - - - - - - - - - - - - - - - - - - x

IN THE MATTER OF: : Docket Number

ALGONQUIN GAS TRANSMISSION, LLC : CP08-420-000

- - - - - - - - - - - - - - - - - - - x

Norwich City Hall Council Chambers

100 Broadway

Norwich, CT 06360

Thursday, December 11, 2008

The above-entitled matter came on for scoping meeting, pursuant to notice, at 7:10 p.m., Shannon Jones, presiding.

P R O C E E D I N G S

(7:10 p.m.)

MS. JONES: We'll go ahead and get started. Good evening and welcome. My name is Shannon Jones and I'm an environmental scientist with the Federal Energy Regulatory Commission, also referred to as the FERC.

Seated on my right is Lieutenant Colonel Stephen Lefebvre, he's the Deputy District Commander, U. S. Army Corps of Engineers in New England. To my right is -- my left is Amy Davis with Natural Resources Group. They're an environmental consulting firm that's been assisting the FERC in our review of this project.

This is a public comment meeting regarding Algonquin Gas Transmission's proposed hub line east to west project. We're here tonight to receive your comments on the draft Environmental Impact Statement that we've prepared. In addition, the Corps of Engineers is here tonight to gather comments regarding its permit process and review. NRG representatives are manning the sign-in table in the back there and they have some handouts that are helpful you might want to grab tonight. Also, if you have any questions during the meeting, please feel free to see Steve at the sign-in table.

Representatives from Algonquin are here tonight. They've brought detailed maps of the pipeline route which are

posted in the hall. After the formal portion of the meeting concludes, we'll all be available if you'd like to talk and directly review the maps with Algonquin or the FERC.

I'd like to provide a brief introduction to the FERC and our process. The FERC is an independent federal agency that regulates the interstate transmission of electricity, natural gas and oil. We're located in Washington, D.C., headed by five presidentially appointed commissioners and about 1200 staff. We review proposals and authorize construction of interstate natural gas pipelines, storage facilities and liquefied natural gas terminals. We also have jurisdiction over the licensing and inspection of hydroelectric projects and some electric transmission corridors.

The FERCs primary purpose is to oversee energy industries and the economic, environmental and safety interests of the American public. The FERC is the lead federal agency responsible for approving or denying this project. We're also working in formal cooperation with the Corps of Engineers, represented here tonight, and the EPA. These agencies have assisted in providing input and review of our work as we evaluate Algonquin's proposal.

Algonquin has requested authorization to construct approximately 31.4 miles of natural gas pipeline. Thirteen miles would be new 36-inch diameter pipeline

constructed in Norfolk County, Massachusetts, and 18.5 miles would be replacement of existing pipelines with larger diameter pipe in Norfolk County, Massachusetts and New London County, Connecticut.

The project also includes a new compressor station in Bristol County, Massachusetts called the Rehoboth compressor station. There will also be modifications to three existing compressor stations in Rhode Island, Connecticut and New Jersey and other appurtenant facilities necessary to safely operate pipelines. That includes valves, meter and regulator stations, pig launchers and receivers.

Algonquin's pipeline system has traditionally received gas supplies from the Gulf and Appalachian regions and delivered those supplies to the Northeast. This project would allow Algonquin to reverse flow and accept increased supplies of natural gas at the east end of its system for delivery to markets in the Northeast. Increased supplies include new LNG terminals constructed offshore in Massachusetts and in Canada.

Before any decisions are made, FERC Staff conducts an extensive environmental review to comply with the National Environmental Policy Act, also called NEPA. Over the past year, we've been compiling and analyzing data and comments from a variety of sources including the

applicant, the public, other resource agencies and our own independent analysis and field work. Our analysis findings and recommendations to ensure environmental impacts are minimized are summarized in the draft Environmental Impact Statement and we're prepared to take your comments on that document here tonight.

The draft Environmental Impact Statement, or EIS, was issued on November 7th and mailed to everyone on our environmental mailing list. We also brought limited copies of the document with us here tonight. The document is also available for download from our website at www.ferc.gov.

At this point, we're about three-quarters of the way through the formal comment period on the draft EIS. That comment period ends December 29th. There are a couple of ways we can take comments. You can provide verbal comments here tonight and, if you want to, there's a speaker sign-up list that Steve has at the table in the back. You could also provide us written comments by mailing a letter to the FERC or submitting your comments electronically through our website. There are instructions on how to do -- how to provide written comments in the first few pages of the draft EIS and we also have some yellow handouts at the table that provide those instructions as well.

If you are going to send us written comments, please try to get them in before December 29th so that we'll

have time to analyze your issues and provide an appropriate response. The Corps has a separate comment period and procedure for their permit review process, which Lieutenant Colonel Lefebvre will explain in a moment.

All of the comments provided to the FERC are placed in our public record and will be addressed in a revised version, called a final EIS -- a final EIS, excuse me. Written comments have equal stature to verbal comments in our review. All of the comments we receive will be listed in an appendix to the final EIS and we'll provide a response to each and every one of them. If you received a copy of the draft EIS, you're on our mailing list and will receive a copy of the final EIS. If you did not get a copy and would like to be added to our mailing list, you can do so tonight by signing up at the sign-in table.

It's important to note that the FERCs EIS is not a decisional document. It is prepared to advise the FERC's Commissioners and to disclose to the public the environmental impact of constructing and operating the proposed project. Once our final EIS is complete, the document is published, mailed to those on our mailing list and forwarded to our Commissioners. The Commissioners independently consider the environmental information in the EIS, along with other non-environmental issues, in determining whether to authorize the project.

If approved, the Commission will provide Algonquin a certificate of public convenience and necessity, which is essentially a permit authorizing the project. The certificate will require that Algonquin meet certain conditions to limit adverse environmental impacts. Algonquin will also have to obtain various other permits before it can construct this project, including those under the Corps of Engineers' jurisdiction that you'll hear about in a moment. If approved, FERC environmental inspectors would monitor the project through construction and restoration, performing regular inspections to ensure environmental compliance with the conditions of the FERC certificate.

At this time, I'll turn the floor over to Lieutenant Colonel Lefebvre.

LT COL LEFEBVRE: Good evening. I'd like to welcome you to this joint public hearing on a request from Algonquin Gas Transmission for a U.S. Army Corps of Engineers permit to place fill material and impact wetlands in conjunction with the expansion of its existing 1100-mile-long gas transmission pipeline system in Massachusetts, Conneticut, Rhode Island and New Jersey. The proposed project is the subject of an Environmental Impact Statement being prepared by FERC with the U.S. Army Corps of Engineers as a cooperating agency.

We are here because an Army Corps of Engineers permit will be required to fill and/or impact an undetermined amount of wetlands in conjunction with the proposed project. Wetland impacts for the proposed alternative are about 59.6 acres of temporary wetland impacts, with permanent fill of approximately 0.16 acre, and conversion from forested wetland to scrub shrub and emergent wetland of approximately 4.4 acres. The joint hearing will serve two purposes: to gather comments about the Corps of Engineer permit review and to receive comments about the draft EIS being prepared by FERC.

Before we begin, I would like to thank you for involving yourself in this environmental review process. Please feel free to bring up any and all topics that you feel need to be discussed on the Corps of Engineers record. I assure you that all your comments will be addressed during this permit decision process.

I am Lieutenant Colonel Stephen Lefebvre, the Deputy District Commander of the U.S. Army Corps of Engineers in New England. Our headquarters office is located in Concord, Massachusetts. Other Corps of Engineers New England District representatives with me tonight are Rick Christoph from our regulatory division and Tim Dugan from our public affairs office.

The work related to this project is proposed in

waterways and wetlands within Bristol and Norfolk Counties in Massachusetts and New London County in Connecticut. This hearing is being conducted as part of the Corps of Engineers regulatory program to listen to your comments, to understand your concerns and to provide you the opportunity to put your thoughts on the record should you care to do so.

I'd like to point out that no decision has been made by the Army Corps of Engineers with regard to the core permit decision. My job tonight is simply to listen to your comments, to make sure the Corps of Engineers is fully informed of all the issues as we begin our deliberations on the permit application. I would like to briefly review the Corps of Engineers' responsibilities in this process.

The core jurisdictions in this case are Section 10 of the Rivers and Harbors Act, which authorizes the Corps of Engineers to regulate structures and work in navigable waters of the United States, and Section 404 of the Clean Water Act, which regulates the discharge of dredged or fill material in waters of the United States, to include wetlands. The detailed regulation that explains the procedures for evaluating permit applications and unauthorized work is Title 33 of the Code of Federal Regulations, Parts 320 through 330.

The core decision rests upon several important factors. First, the Corps must make a public interest

determination. That is, we must determine whether or not the project is in the overall public interest based on the probable impacts of the proposed project on a wide variety of public interest factors. All factors which may be relevant to the proposal will be considered prior to our making a decision. Those factors include, but are not limited to, conservation, economics, aesthetics, the environment, fish and wildlife values, navigation, recreation, water supply, food production, and, in general, the needs and welfare of the American people.

The public interest determination is done by weighing the benefits that may reasonably accrue from the proposal against the reasonably foreseen detriments. Only project deemed not contrary to the public interest may receive a permit.

Second, our decision will reflect the national concern for both the protection and utilization of important resources.

And third, in accordance with the National Environmental Policy Act or NEPA, any project that significantly affects the environment must have an Environmental Impact Statement. In this case, the Federal Energy Regulatory Commission is the lead federal agency for preparing the EIS.

All factors affecting the public will be included

in our evaluation. Your comments will help us in reaching a decision. The record of this draft EIS hearing will remain open and written comments may be submitted tonight or by mail to the FERC by December 29th, 2008. Comments on the Corps of Engineers permit review of this proposal should be sent to the Corps of Engineers by January 11th, 2009. All comments will receive equal consideration.

Lastly, to date no decision has been made by the Army Corps of Engineers with regard to this permit. It is our responsibility to evaluate both the environmental and socioeconomic impacts prior to our permit decision. And in order to accomplish that decision we need your input. Your testimony and comments from this hearing will be posted on the FERC website after this hearing. Again, it is indeed crucial to this public process that your voice is heard, and I thank you for your involvement in this environmental review.

Thank you. I'll turn it back over to Shannon.

MS. JONES: Thank you.

We're now at the point where we're ready to take comments. Do we have any speakers signed up?

Thank you. So far we only have one person, Douglas Lee. If you could come up and please state and spell your name for the transcriber.

And just a note about the transcriptions, we're

having the meeting transcribed so that we have an accurate record of all the comments that are made, since we do need to respond to them all. Ace-Federal Reporters is providing that service. The transcripts will be placed on our website -- on our public website. You can also make arrangements directly with the court reporter if you need an immediate hard copy of the transcripts.

MR. LEE: Good evening. My name is Doug Lee. I own property, along with my wife, Mary Beth, is at 62 Bog Meadow Road in Norwich, Connecticut. The wetland E3W2 exists entirely on our property and we'd like to provide comments on the proposed activities this evening.

But just a little bit of background before I launch into the short material that I provided to the panelists, I do have a Bachelors and Masters Degree in Fishery Science from Oregon State University, Ph.D. in Zoology from Michigan State University with an emphasis in Aquatic Community Ecology and Population Dynamics. I was an adjunct assistant professor with the University of Connecticut for seven years, running research programs with the National Oceanic and Atmospheric Administration, so that's just a little bit of background.

PM1-1 Flipping to the first page, on the easement looking west from the east side of the property, this is just a quick picture that gives you a shot of the easement

PM1-1 To address these concerns, Algonquin Gas Transmission, LLC (Algonquin) adjusted the construction work area to maintain the forested buffer between the permanent pipeline right-of-way and the pond on the Lee property. Section 4.8.3.1 has been revised to include this information.

PM1-1 (cont'd)

looking west and you can see a stand of phragmites in the center of the picture. And to the right, which is to the north of the easement, is a heavily wooded buffer, and that happens to be immediately adjacent to a two-acre pond.

Going to the next page, this is a photograph of the black-and-white portion of E3W2 that's on file with the City of Norwich planning office. The thick black line running from the top to the bottom denotes the position of the pipeline. The narrow black lines give you the property boundaries and the white solid lines represent the proposed areas of activity for the trenching and replacement of the pipe.

The dashed lines represent the 100-foot upland review boundaries but in certainly the black-and white renditions you can't tell that those lines, and especially the one particularly to the right as you look at the page -- that's to the north -- runs through the pond.

So if you flip to the next page, you can see the satellite photograph where I've gone ahead and overlaid the position of the pipeline, the position of the north boundary of the upland review area as depicted in the applicant's DEIS. And the solid yellow line represents the width of the proposed area of activity, that would be 25 feet to the north of the pipeline. And 50 feet to the south, and the solid white line moving to the north from the red line, the

PM1-1 (cont'd)

pipeline, represents the distance between the pipeline and the edge of the pond. So you can't quite tell from the picture because it was taken in the late spring/early summer, but the pond edge is actually well inside of the canopy and, at its closest point, the pond edge is 23 feet away from the pipeline.

So this is a view of the pond from the north looking south, and so it would be looking towards the easement; obviously you can't see it. But I included this shot just to give you a sense of the overall size. It's about 500 feet of distance between the north edge of the pond and the far edge of the pond.

And the pond itself is actually quite high functioning. It has an extensive population of odenates, tipulids, stoneflies, a very high population of -- and a diverse population of amphibians. No fish in this particular pond. We keep it that way because it keeps the mosquitoes down. And the population of amphibians has been healthy enough in some years to actually support the occasional visiting river otter.

The applicant's proposed construction activities would result in clearing of all trees along the southern edge of the pond right up to the edge of the pond in order to give them the 25 feet to the north of the pipeline to work, and the applicant's proposed construction activities

PM1-1 (cont'd)

would result in dredged soils being stored immediately adjacent to that pond.

And at this point I want you to think back to the phragmites stand, because that means that the topsoils that are currently contaminated with phragmites would be stockpiled to the north of where they currently exist and, in fact, in that -- what is currently that wooded buffer between the easement and the pond edge.

So installation of the pipeline as planned will result in clearing to the edge of the pond and placement of phragmites-contamined topsoil in areas where heavy tree growth and shading currently prevent expansion of phragmites. Clearing of all trees along the southern edge of the pond leaves no undisturbed buffer between the pond and the work area as proposed. Both clearing of the edge of the pond and introducing wetland topsoils contamined with phragmites to previously undisturbed areas represent poor practice and are not in keeping with the ENS or invasive species control plans that are in the applicant's draft Environmental Impact Statement.

Property owners suggest that there are two prudent and feasible alternatives to the current proposal. These alternatives are in compliance with the intent of the applicant's erosion and sediment control, as well as the invasive species control plans in the draft EIS.

PM1-1 (cont'd)

The first alternative is to restrict the limit of clearing north of the pipeline in E3W2 to 15 feet -- that's the current limit of clearing for the easement -- and that leaves a fully wooded and undisturbed wetland with a minimum eight-foot buffer between the work area and the pond edge.

If you stockpile the phragmites-contamined topsoil on the south side of the pipeline to prevent further expansion into undisturbed wetland north of the easement and adjacent to the pond, and the applicant could work with the owners to temporarily use up to 65 feet as opposed to the 50 feet that's proposed of work space south of the pipeline to compensate for restriction on clearing north of the pipeline.

This may not necessarily be the most attractive alternative depending on the contractor that the applicant utilizes, so we've offered a second alternative as well, and that is to in fact re-route the position of the new pipeline to be installed in E3W2 15 feet or more to the south of its current position and then install a new pipeline using the proposed construction approach. The current pipeline would be left in place and the new pipeline easement would be shift accordingly.

And if you look at the aerial photograph with the applicant's construction overlays and you look closely at the property boundaries, you see that in fact on our

PM1-1 (cont'd)

property we have plenty of room to facilitate moving the pipeline and the easement further south and farther away from the pond.

Thank you very much for the opportunity to speak tonight.

LT COL LEFEBVRE: Okay. We appreciate your input. Thank you.

MS. JONES: Thank you.

Is there anybody else who would like to provide comments here tonight?

(No response.)

MS. JONES: Okay. Without any more speakers, the formal part of this meeting will conclude. We will remain afterwards if there are additional questions or if anyone wants to review the maps.

On behalf of the FERC and the Corps of Engineers, I'd like to thank you all for coming tonight. This meeting is concluded.

(Whereupon, at 7:25 p.m., the scoping meeting was concluded.)

Comments on the Draft EIS and Responses

FEDERAL AGENCIES

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
408 Atlantic Avenue – Room 142
Boston, Massachusetts 02210-3334

December 22, 2008

9043.1
ER 08/1144

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

RE: Comments
Draft Environmental Impact Statement
Hubline East to West Project, FERC CP08-420-000
Massachusetts, Connecticut, Rhode Island, New Jersey

Dear Secretary Bose:

FA1-1 The U.S. Department of the Interior has reviewed the Draft Environmental Impact Statement (DEIS) for the proposed Hubline East to West Project. We have no comment on the DEIS.

Thank you for the opportunity to review and comment on this statement. Please contact me at (617) 223-8565 if I can be of assistance.

Sincerely,

Andrew L. Raddant
Regional Environmental Officer

FA1-1 Comment noted.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
1 CONGRESS STREET, SUITE 1100
BOSTON, MASSACHUSETTS 02114-2023

OFFICE OF THE
REGIONAL ADMINISTRATOR

December 29, 2008

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E., Room 1A
Washington, D.C. 20426

RE: Hubline East to West Project, Docket Nos. PF07-15-000 and CP08-420-000 FERC/EIS - 0227D (CEQ # 20080461)

Dear Ms. Bose:

In accordance with our responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act we have reviewed the Draft Environmental Impact Statement (DEIS) for the proposed Hubline East to West Project in Massachusetts, Connecticut, Rhode Island and New Jersey.

FA2-1 EPA has no objections to the project as proposed and has rated the DEIS "LO-1-Lack of Objections-Adequate" in accordance with EPA's national rating system, a description of which is attached to this letter. Please feel free to contact me at 617/918-1025 if you have any questions.

Sincerely,

Timothy Timmermann
Environmental Scientist
Office of Environmental Review

Attachment

Internet Address (URL) • http://www.epa.gov/region1
Recycled/Recyclable • Printed with Vegetable Oil Based Inks on Recycled Paper (Minimum 30% Postconsumer)

FA2-1 Comment noted.

Summary of Rating Definitions and Follow-up Action

Environmental Impact of the Action

LO--Lack of Objections
The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC--Environmental Concerns
The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

EO--Environmental Objections
The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU--Environmentally Unsatisfactory
The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

Adequacy of the Impact Statement

Category 1--Adequate
EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2--Insufficient Information
The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category 3--Inadequate
EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

Comments on the Draft EIS and Responses

STATE AGENCIES

PETITION NO. 871 - Algonquin Gas Transmission Company Federal Energy Regulatory Commission (FERC) application (Docket No. 08-426) for the construction and operation of the HubLine/East to West Project located in Massachusetts, Connecticut, Rhode Island and New Jersey. Connecticut segment includes replacement of 11 miles of existing pipeline, appurtenant infrastructure, and installation of access roads in the Towns of Norwich, Preston, Ledyard, and North Stonington as well as upgrades to an existing compressor station in Cromwell.	Connecticut Siting Council December 18, 2008

Council's Decision on the Petition

On October 10, 2008, Algonquin Gas Transmission Company notified the Council of an application before the Federal Energy Regulatory Commission (FERC) for a Certificate of Public Convenience and Necessity for the construction and operation of the HubLine/East to West Project (Project) located in Massachusetts, Connecticut, Rhode Island and New Jersey. The Connecticut portion of the Project consists of an upgrade of Algonquin's existing E-3 pipeline system in the Towns of Norwich, Preston, Ledyard and North Stonington. In addition to the pipeline work, the Project also includes modifications to the existing Cromwell Compressor Station.

At a public meeting held on December 18, 2008, the Council ruled that the FERC has exclusive jurisdiction over the proposed project under the Natural Gas Act, 15 U.S.C. § 717 *et. seq.* The Council further stated its intention to make recommendations to the FERC and Algonquin regarding siting, environmental mitigation measures and construction procedures. The Council also does not have jurisdiction over the safety standards of the proposed project, which is regulated by the United States Department of Transportation.

The Project is designed to respond to increasing interest from customers needing transportation capacity to high growth markets in the Northeast. The Project would be designed to deliver natural gas from emerging liquefied natural gas terminals at the east end of the Algonquin system.

Algonquin began the Certificate process with FERC in 2007. On June 9, 2008, Algonquin submitted its Application and final Resource Reports to the FERC. The Resource Reports contain descriptions of the proposed facilities, construction techniques, and related potential environmental impacts.

Proposed Project

The Project consists of the replacement of 31.4 miles of multi-diameter pipeline and associated pipeline support facilities in Massachusetts, Connecticut, Rhode Island and New Jersey. The Project would increase the capacity of the Algonquin system from 2.1 billion cubic feet per day to 2.8 billion cubic feet per day. The additional capacity would enable LNG suppliers to market new gas supplies from the Northeast Gateway and Neptune Deepwater Ports in Massachusetts Bay and the Canaport LNG Terminal in New Brunswick to meet increasing demand throughout the northeast region. The project would allow Algonquin to operate a multidirectional system to provide flexibility in obtaining and delivering natural gas instead of the current one dimensional system of delivering natural gas from the Gulf Coast region.

The Connecticut portion of the Project consist of the replacement of 11.0 miles of 6-inch and 4-inch diameter pipe with 12-inch diameter pipe on Algonquin's existing E-3 System, as follows; 3.7 miles in Norwich, 6.1 miles in Preston, 0.9 mile in Ledyard, and 0.3 mile in North Stonington. The upgrade would extend from Algonquin's existing E31-1 valve in Norwich (MP 0.0) to the Ledyard Meter Station at MP 11.0.

Modifications to the Cromwell Compressor Station would occur entirely within the fenced-in area of the station. The work consists of valve modifications and the installation of a gas-cooling equipment to allow for bi-directional flow.

Algonquin presently maintains a 30-foot right-of-way (ROW) along this portion of the E-3 System. Although the replacement project would not require the permanent expansion of the ROW, the Project would require a temporary 75-foot ROW for construction and spoil storage. Generally, the construction side of the ROW would extend 50 feet from the center of the pipeline to accommodate excavation, trench bank sloping, topsoil segregation, and safe equipment mobility. The spoil side of the ROW would extend 25 feet from the pipeline for storage of spill and rock excavated from the trench. Actual widths would vary slightly depending on the presence of wetlands, structures or other local features.

The construction ROW would also include areas for additional temporary workspace to accommodate conditions such as wetland, stream crossings, power line crossings, road crossings, soil/rock storage and other construction needs. These areas are typically limited extensions of the construction ROW.

Work areas in close proximity to residences would be delineated by the use of temporary construction fencing that will be maintained during all excavation work. Algonquin would attempt to retain mature trees and landscaping within the work space to the greatest extent possible. Work adjacent to residences would be conducted expeditiously as possible.

The existing pipe within the ROW would be removed using the take-up and relay method. First, the ROW would be cleared to accommodate the 75-foot construction ROW and rough graded as necessary to allow construction vehicles to traverse the ROW. The old pipe would be excavated and removed, followed by further excavation to attain a depth of five to six feet to accommodate the new pipeline. Roadways would be crossed using conventional open cut or bore methods. Pipe would be transported to the work areas from a pipe storage yard located in Preston. Water that accumulates in the trench would be pumped to an upland area and/or filtered through a filter bag or siltation barrier.

A 1.2 mile section of the new pipeline would deviate from the existing ROW to accommodate a crossing of the Shetucket River and concerns of a local landowner. The construction and permanent ROWs for the new segment would be consistent with the existing E-3 segment (75 feet and 30 feet, respectively). A 0.7 mile segment of the old pipeline located beneath the Shetucket River between the existing Greenville Meter Station and MP 4.11 would be abandoned in place.

Algonquin proposes to use horizontal directional drilling (HDD) to cross underneath the Shetucket River, approximately 800 feet wide at the crossing point. The length of the drill would be approximately 2,034 feet and would reach a depth of 40 feet below the riverbed. The drilling station on the east side of the river would occupy a golf driving range. The drilling station on the west side of the river would occupy a level and cleared portion of a residential property.

Clearing would be conducted by mechanical and hand cutting, as appropriate, with upland trees stumps and root stock left in the temporary workspace as much as possible to encourage natural re-vegetation. Timber would be removed to appropriate locations, given to the landowner upon request, or chipped onto the ROW. Stumps would be removed as necessary to an appropriate disposal area. The limits of clearing would be identified by flagging. In wetlands, trees and brush would be either hand cut, or mechanically cut with rubber tired and/or tracked equipment, to ground level, leaving the root structure intact. In agricultural and residential areas, topsoil would be stripped and stockpiled separately from the subsoil during grading. Within 10-20 days after the trench is backfilled, depending on the location, Algonquin would complete final grading, site cleanup, and the installation of permanent ROW erosion control measures. The temporary workspace areas and construction ROW would be seeded and allowed to re-vegetate.

Community Outreach

Algonquin began outreach efforts in early 2007. Notice was provided to local and state government officials and all landowners affected by the project. Algonquin conducted eight publically noticed open houses in Connecticut. FERC held a draft EIS open house in Norwich on December 11, 2008.

Environmental Impact

The pipeline would cross watercourses in 16 locations including nine perennial crossings and seven intermittent crossings. Thirteen locations would be directly affected through the use of open cut, flume or dam installation procedures. The remaining three locations would not be affected due to the use of HDD or horizontal bore installation. The CT DEP recommended additional stream bank restoration techniques at the crossing of Main Brook (MP 9.3), to include gravels and cobbles in order to stabilize the stream channel and banks. Algonquin agreed to implement the CT DEP's protective stream restoration measures at this location.

One of the watercourse crossings, Hunter Brook at MP 3.3, would affect a cold water fishery. Algonquin would use a dry crossing method during the period of June 1 through September 30 to avoid spawning and fry development periods.

The Shetucket River and Hunter Brook, located immediately east of the river, would both be crossed using HDD. Algonquin has performed a geotechnical investigation and determined HDD is suitable for the crossing. FERC is requesting 1) that Algonquin submit final site-specific HDD crossing plans that depict detailed construction work areas for review and written approval; 2) that Algonquin revise its HDD Contingency Plan to specify the water source that would be used for the drilling mud; and 3) that Algonquin submit an alternate site-specific plan for crossing the river in the event the HDD fails.

FERC procedures stipulate that all temporary workspace should be at least 50 feet from watercourses except as approved by the FERC. Algonquin requested an exception of this rule in five locations with FERC granting approval of four of them. Algonquin has to submit additional justification for the fifth crossing which consists of the HDD staging area on the east side of the Shetucket River.

The project would affect 12.8-acres of forested wetlands and 8.3-acres of non-forested wetlands. None of the wetlands would be filled. About 0.3 acre of forested wetland would be permanently converted to a non-forested wetland in the area of Wheeler Farms Road to accommodate a new ROW. Algonquin routed the ROW to the north of an existing residence at the request of the landowner rather than continue on the existing ROW located south of the residence. This relocation around the residence would result in 15,750 square feet of additional disturbance to Wetland E-3-W19 subject to FERC review and approval.

The project would cross an Atlantic white cedar swamp, a significant natural wetland community, between MPs 6.6 and 7.3. The CT DEP conducted a field review of the crossing and determined the project would not affect any Atlantic white cedar trees or other state protected plant species. The CT DEP recommends the control of isolated stands of *Phragmites* through the use of pre- and post-construction herbicide applications.

FERC procedures stipulate that all temporary workspace should be at least 50 feet from wetlands except as approved by the FERC. Algonquin requested an exception of this rule in 14 locations with FERC approving 13 of these locations. FERC requested additional information regarding the remaining area which consists of the HDD staging area on the east side of the Shetucket River. FERC also requests that Algonquin submit justification for an additional five workspaces that were not previously identified in Algonquin's filing.

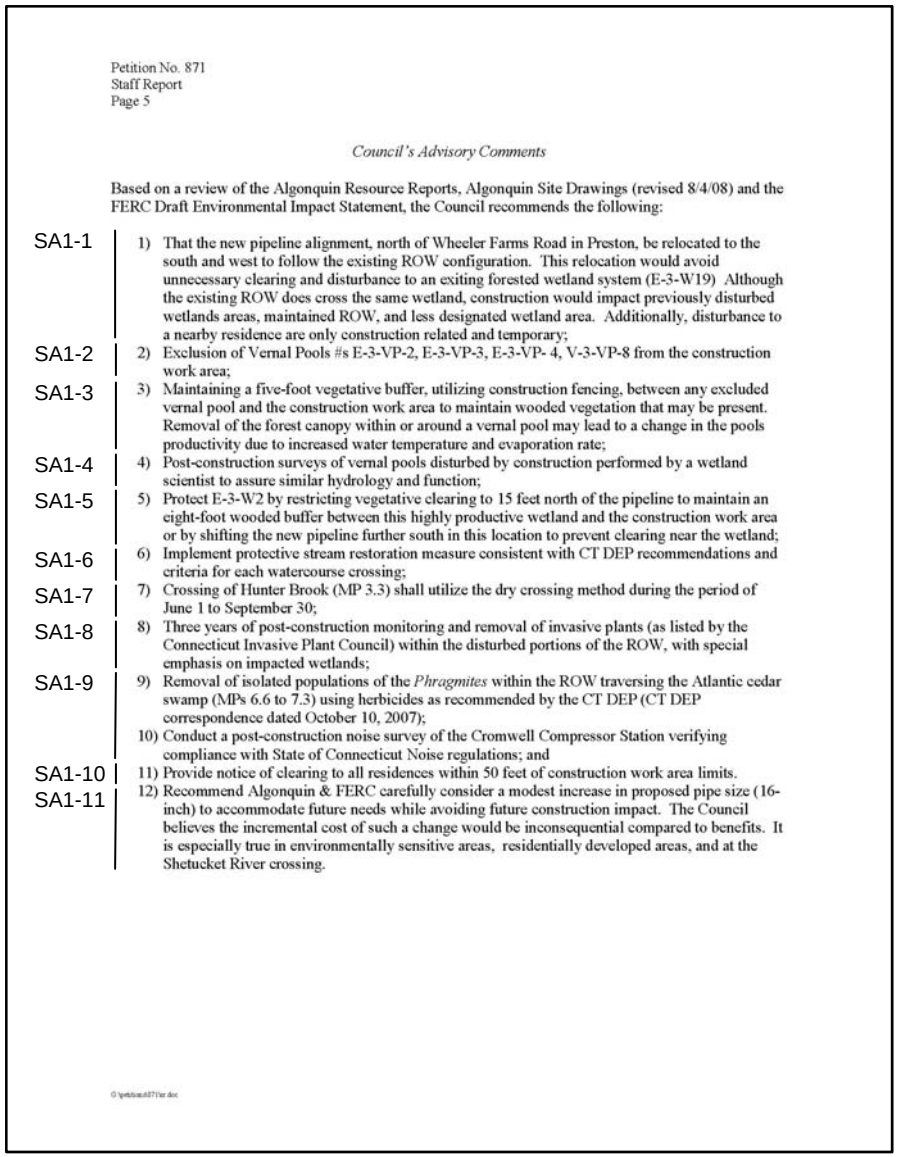
Algonquin would conduct post-construction monitoring of the right-of-way in affected wetlands. These efforts include the monitoring of re-vegetation annually for at least three-years or as long as necessary to document successful wetland re-vegetation. Monitoring would also include documentation and control of invasive species in accordance with Algonquin's Invasive Species Plan.

The construction work area would directly affect six vernal pools, three of which are classified as having high to very high productivity. Four of the vernal pools would extend into the construction work area with the remaining two located entirely within the construction work area. FERC requested that Algonquin assess the potential to reduce the width of the construction ROW where the four vernal pools extend into the ROW. Furthermore, FERC requests that Algonquin consult with the CT DEP to further develop vernal pool mitigation and restoration procedures.

The project would temporarily affect approximately 52.6-acres of forest, 41.0-acres of open land, 7.8-acres of agricultural land, 0.8-acre of commercial land, and 20-acres of residential land. New ROW associated with the Shetucket River crossing would affect 2.0-acres of forest land, 0.7-acres of open land, 0.2-acre of commercial land and 0.2-acre of residential land.

Algonquin consulted with the CT DEP to determine if records of State listed endangered, threatened, or special concerns species were within the project work area. No records were identified.

The Cromwell Compressor Station currently contains six engine-driven and two-turbine driven compressor units. Noise from these units is considered significant but not a dominate noise source when compared to noise generated from traffic on Interstate 91, adjacent to the site. When the station is operating at full load, the noise level would exceed FERC's noise standard at the nearest sensitive area (NSA), two residences approximately 850 feet west of the site. The addition of the new gas cooler is not expected to increase noise levels at the NSA if proposed mitigation measures are implemented (low noise fans and acoustical pipe installation). FERC requested Algonquin file a post-construction noise survey within 60-days of the in-service date to verify the mitigation measures are working. If noise levels exceed existing levels, Algonquin would have to implement additional controls within one year of the in-service date.



Petition No. 871
Staff Report
Page 5

Council's Advisory Comments

Based on a review of the Algonquin Resource Reports, Algonquin Site Drawings (revised 8/4/08) and the FERC Draft Environmental Impact Statement, the Council recommends the following:

SA1-1 1) That the new pipeline alignment, north of Wheeler Farms Road in Preston, be relocated to the south and west to follow the existing ROW configuration. This relocation would avoid unnecessary clearing and disturbance to an exiting forested wetland system (E-3-W19) Although the existing ROW does cross the same wetland, construction would impact previously disturbed wetlands areas, maintained ROW, and less designated wetland area. Additionally, disturbance to a nearby residence are only construction related and temporary;

SA1-2 2) Exclusion of Vernal Pools #s E-3-VP-2, E-3-VP-3, E-3-VP- 4, V-3-VP-8 from the construction work area;

SA1-3 3) Maintaining a five-foot vegetative buffer, utilizing construction fencing, between any excluded vernal pool and the construction work area to maintain wooded vegetation that may be present. Removal of the forest canopy within or around a vernal pool may lead to a change in the pools productivity due to increased water temperature and evaporation rate;

SA1-4 4) Post-construction surveys of vernal pools disturbed by construction performed by a wetland scientist to assure similar hydrology and function;

SA1-5 5) Protect E-3-W2 by restricting vegetative clearing to 15 feet north of the pipeline to maintain an eight-foot wooded buffer between this highly productive wetland and the construction work area or by shifting the new pipeline further south in this location to prevent clearing near the wetland;

SA1-6 6) Implement protective stream restoration measure consistent with CT DEP recommendations and criteria for each watercourse crossing;

SA1-7 7) Crossing of Hunter Brook (MP 3.3) shall utilize the dry crossing method during the period of June 1 to September 30;

SA1-8 8) Three years of post-construction monitoring and removal of invasive plants (as listed by the Connecticut Invasive Plant Council) within the disturbed portions of the ROW, with special emphasis on impacted wetlands;

SA1-9 9) Removal of isolated populations of the *Phragmites* within the ROW traversing the Atlantic cedar swamp (MPs 6.6 to 7.3) using herbicides as recommended by the CT DEP (CT DEP correspondence dated October 10, 2007);

10) Conduct a post-construction noise survey of the Cromwell Compressor Station verifying compliance with State of Connecticut Noise regulations; and

SA1-10 11) Provide notice of clearing to all residences within 50 feet of construction work area limits.

SA1-11 12) Recommend Algonquin & FERC carefully consider a modest increase in proposed pipe size (16-inch) to accommodate future needs while avoiding future construction impact. The Council believes the incremental cost of such a change would be inconsequential compared to benefits. It is especially true in environmentally sensitive areas, residentially developed areas, and at the Shetucket River crossing.

State Agencies 1

SA1-1 This comment is no longer applicable to the amended HubLine/East to West Project (E2W Project or Project).

SA1-2 Vernal pool numbers E-3-VP-3, E-3-VP-4, and V-3-VP-8 are no longer affected by the amended E2W Project.

Vernal pool number E-3-VP-2 at milepost (MP) 1.4 is considered low quality due to the small number of wood frog and spotted salamander egg masses that are present and the low percentage of forest present. In addition, only the extreme northern fringe of the pool basin would be temporarily affected during construction. The deeper portion of the pool, which is the better quality habitat, would be avoided. Alonquin has stated that it would remove and salvage the detritus layer of the basin within the construction right-of-way to be used for restoration. In addition, sediment barriers would be installed along the south edge of the right-of-way to control sediment and act as a wildlife barrier during construction. This portion of the vernal pool basin is located along the travel lane of the right-of-way and, therefore, would not be excavated. Equipment mats would be placed along the affected portion of the basin to prevent rutting and soil mixing and compaction. After construction activities are complete, the equipment mats would be removed and the pool basin would be restored to preconstruction condition. The salvaged detritus layer would be returned and spread within the pool basin.

Algonquin provided these vernal pool construction and restoration mitigation measures to the Connecticut Department of Environmental Protection (CTDEP) on October 7, 2008. Algonquin reviewed and discussed these measures with the CTDEP during a meeting held on June 24, 2009. At that meeting, the CTDEP indicated that these were acceptable measures to protect and restore vernal pool number E-3-VP-2.

Section 4.6.1.4 has been revised to include this information.

SA1-3 See the response to comment SA1-2.

SA1-4 In accordance with its Erosion and Sedimentation Control Plan (E&SCP) (see Appendix B), Invasive Plant Species Control Plan (see Appendix G), and Wetland Restoration Procedures for Temporary Wetland Impacts (see Appendix H), Algonquin would conduct post-construction monitoring of the right-of-way in affected wetlands for a period of at least 3 years. As part of this monitoring program, Algonquin would also assess the condition of vernal pool number E-3-VP-2 to ensure that the hydrology and function have been maintained. Algonquin's monitoring program would be performed by a qualified wetland scientist.

SA1-5 See the response to comment PM1-1.

SA1-6 Algonquin would implement mitigation measures to restore all waterbodies crossed during construction in accordance with its E&SCP (see Appendix B) and any other applicable agency requirements.

SA1-7 This comment is no longer applicable to the amended E2W Project.

SA1-8 In accordance with its E&SCP (see Appendix B) and Wetland Restoration Procedures for Temporary Wetland Impacts (see Appendix H), Algonquin would conduct post-construction monitoring of wetlands for a period of at least 3 years. The revegetation monitoring would also assess the establishment of undesirable exotic plant species. Algonquin conducted surveys for the presence of invasive species during its wetland delineations and developed an Invasive Plant Species Control Plan (see Appendix G) that would be implemented during construction and operation of the proposed Project. This plan contains a list of wetlands where invasive wetland plant species were observed during wetland surveys and describes construction-phase mitigation, post-construction monitoring, and remediation that would be implemented to control the spread of invasive wetland plant species.

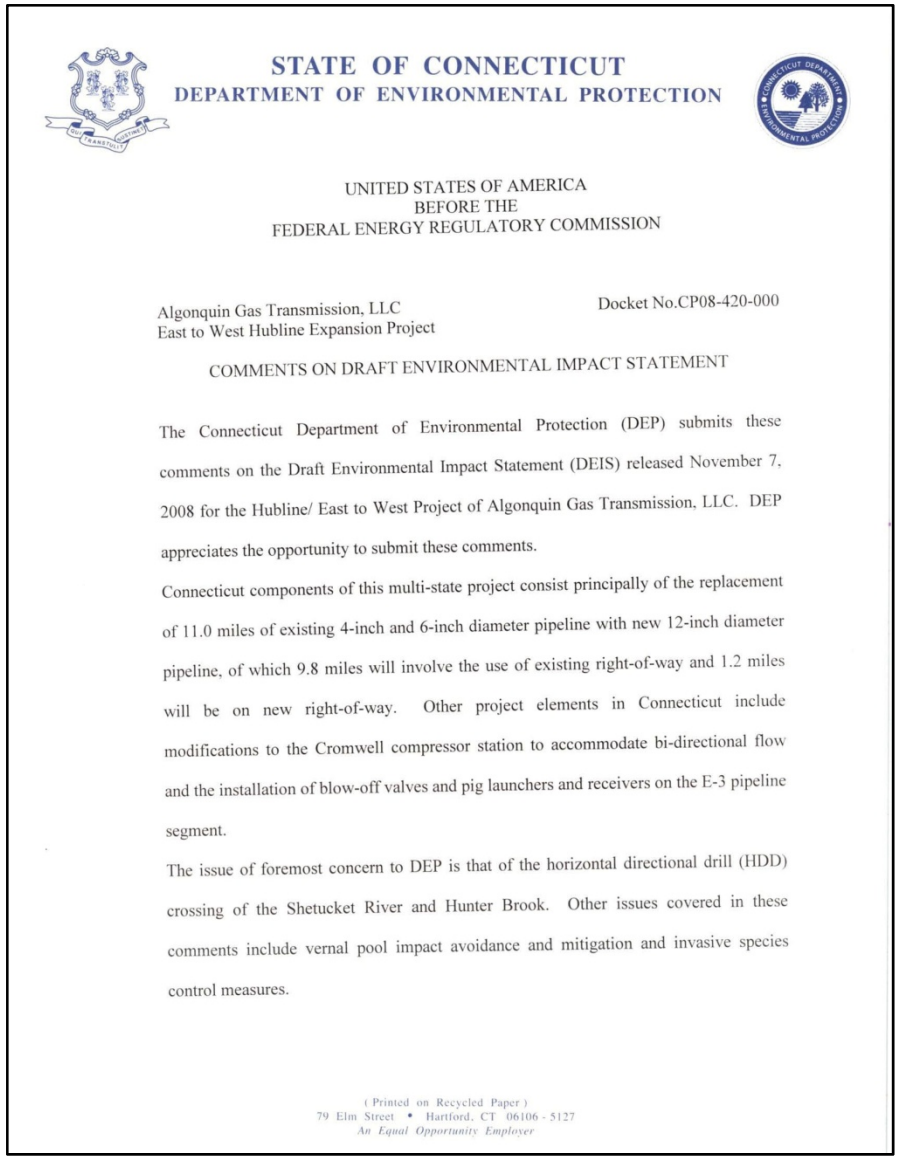
Algonquin discussed the Invasive Plant Species Control Plan with the CTDEP during a meeting held on June 24, 2009. During that meeting, the CTDEP indicated that the plan is acceptable. We have reviewed the Invasive Plant Species Control Plan and also find it acceptable.

Section 4.5.4 has been revised to include this information.

SA1-9 These comments are no longer applicable to the amended E2W Project.

SA1-10 As discussed in section 4.8.3.1, affected landowners would be notified at least 3 to 5 days before construction commences, unless more advance notice is requested by the landowner during easement negotiations.

SA1-11 An increased pipeline diameter would not be justified by the purpose and need for the E2W Project and the contracted volumes (see section 1.1).



STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Algonquin Gas Transmission, LLC
East to West Hubline Expansion Project

Docket No.CP08-420-000

COMMENTS ON DRAFT ENVIRONMENTAL IMPACT STATEMENT

The Connecticut Department of Environmental Protection (DEP) submits these comments on the Draft Environmental Impact Statement (DEIS) released November 7, 2008 for the Hubline/ East to West Project of Algonquin Gas Transmission, LLC. DEP appreciates the opportunity to submit these comments.

Connecticut components of this multi-state project consist principally of the replacement of 11.0 miles of existing 4-inch and 6-inch diameter pipeline with new 12-inch diameter pipeline, of which 9.8 miles will involve the use of existing right-of-way and 1.2 miles will be on new right-of-way. Other project elements in Connecticut include modifications to the Cromwell compressor station to accommodate bi-directional flow and the installation of blow-off valves and pig launchers and receivers on the E-3 pipeline segment.

The issue of foremost concern to DEP is that of the horizontal directional drill (HDD) crossing of the Shetucket River and Hunter Brook. Other issues covered in these comments include vernal pool impact avoidance and mitigation and invasive species control measures.

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SA2-1

HORIZONTAL DIRECTIONAL DRILL CROSSING OF SHETUCKET RIVER

DEP endorses the use of horizontal directional drilling (HDD) for the Shetucket River and Hunter Brook crossing as the preferred crossing methodology. However, DEP disagrees with the approach contained on page 4-34 and in Section II of Appendix I, The Horizontal Directional Drill Contingency Plan, of the DEIS that, in the event of a drilling mud frac-out, drilling activity will continue under reduced drilling mud pressure and volume until the crossing is completed, with clean-up activity to occur subsequently. In DEP's experience, frac-outs have been encountered in virtually every HDD project we have regulated. Therefore, DEP has developed a specified methodology for dealing with frac-outs, and had included this procedure within Monitoring and Operations Plans for recent HDD projects. A copy of the most recent Monitoring and Operations Plan, developed for an HDD crossing of the Goodwives River in Darien, Connecticut, is attached. Conditions 2 and 3 of the Plan deal, respectively, with loss of circulation and drilling fluid release contingencies. This plan specifies a cessation of drilling activity upon loss of circulation or identification of a fluid release (frac-out). Conditions similar to those contained in the attached plan will be specified in the Section 401 Water Quality Certification issued for this project.

In addition, and consistent with concerns expressed by FERC staff on page ES-5 of the DEIS, DEP will require that Algonquin specify the preferred contingency plan should it be unable to complete the HDD crossing of the Shetucket River as proposed. This requirement must be satisfied in advance of the HDD commencement and would apply to any redrilling attempts off of the existing right-of-way or any crossings plans which

State Agencies

SA2-1 These comments are no longer applicable to the amended E2W Project.

SA2-1 (cont'd)

employ an alternate crossing methodology. The use of open trench crossing methods for the Shetucket River should not be considered as a potential contingency plan.

Relative to the drilling fluid mixture, DEP notes the recommendation at the top of page 4-35 that the source of water used for the drilling mud be identified for each HDD crossing, a request repeated in condition #16 of Section 5.2 of the DEIS. DEP requests that the estimated volume of water required, in addition to the proposed water source, be given in the FEIS, to the degree of precision possible in light of unpredictable variables, to assist in the assessment of the impacts occasioned by the withdrawal of the water for drilling fluid from whatever source in proposed.

DEP concurs with the use of significant setbacks from the riverbanks for the HDD staging areas as a measure to protect the river from run-off and sedimentation impacts and as an approach to minimize frac-out occurrence within the river channel.

VERNAL POOLS

Six vernal pools are crossed or partially crossed by the proposed pipeline alignment in Connecticut, three of which are rated as high quality or very high quality. DEP appreciates the FERC staff efforts to modify the pipeline alignment to avoid impacts to vernal pools #s 2, 3 and 8 of Segment E-3 and to reduce impacts to vernal pool #9, as discussed on page 4-91 of the DEIS.

SA2-2 DEP encourages Algonquin to include potential opportunities for vernal pool creation or enhancement as a potentially valuable component of the wetland mitigation plan which Algonquin will submit as part of the Section 401 Water Quality Certification application.

SA2-3 Algonquin should also commit to regrading all disturbed vernal pools to their original contours as quickly as possible after pipeline replacement activities are completed.

SA2-2 See the response to comment SA1-2.

SA2-3 See the response to comment SA1-2.

SHETUCKET RIVER COMPLIANCE IN SUPPORTING DESIGNATED USES

SA2-4 Sixteen stream crossings are associated with the E-3 system replacement. These crossings include nine perennial and seven intermittent streams. According to the *2008 State of Connecticut Integrated Water Quality Report*, Segment 2 of the Shetucket River is listed as Fully Supporting for the designated use of Fish Consumption, but this segment has not yet been assessed for the designated uses of Aquatic Life or Recreation. Segment 1 of the Shetucket River (from Route 2 to just below the pipeline project) is listed as having a Recreational Use Impairment. Other waterbodies crossed by the project (Norwichtown Brook and unnamed tributaries, Bobbin Mill Brook, Hunter Brook, unnamed streams, and Main Brook) have not yet been assessed by DEP. The FEIS should reflect the latest assessment information and consider anticipated impacts to the listed watercourses and management measures proposed to minimize further impacts.

SPECIES OF SPECIAL CONCERN

In the scooping comments filed by DEP on November 21, 2007, three state species of special concern were listed as potentially impacted by this project. These were *Stellaria borealis* (northern stitchwort), *Terrapene carolina* (eastern box turtle), and *Glyptemis insculpta* (wood turtle). Subsequently, on November 6, 2008, Algonquin submitted a table listing 194 common wildlife species along the E-3 system. By listing all of these species, Algonquin is raising more questions with regard to what species are actually

SA2-5 present versus what species are potentially present. Also, Algonquin should keep in mind that if there is suitable habitat of listed species in the corridor, even if there is no hit on the Connecticut Natural Diversity Data Base, they may be required to perform biological surveys if the DEP Wildlife Division deems such surveys to be necessary. Conversations

State Agencies 2

SA2-4 The amended E2W Project no longer includes a crossing of the Shetucket River. As discussed in Algonquin's E&SCP (see Appendix B), mitigation measures would be implemented at all waterbody crossings to minimize impacts during construction and ensure successful restoration.

SA2-5 Based on agency consultations and field surveys, no state-listed species were found to occur along the amended Project. In addition, based on consultations with the U.S. Fish and Wildlife Service, it has been determined that the Project would have no effect on federally listed species or their critical habitats.

SA2-5 (cont'd)

between DEP and Algonquin's consultants are continuing in order to identify and assess impacts to listed species along and in the pipeline right-of-way and to develop appropriate mitigation measures.

ADDITIONAL COMMENTS

In DEP's November 21, 2007 scoping comments, DEP identified a concern relative to the very soft substrate of the streambank at Main Brook at the pipeline crossing location and recommended that the stream channel should be armored with a heterogeneous mixture of gravels and cobbles to facilitate streambed restoration after construction, and that the streambanks should also be armored with small rock to protect the streambanks from erosion after pipeline disturbance. DEP notes that, according to page 4-32 of the DEIS, Algonquin will perform this protective mitigation measure. DEP expresses its appreciation for this commitment.

The Invasive Plant Species Control Plan (Appendix L) sets out the efforts Algonquin will take to protect against the spread of invasive species along the pipeline. This Plan

SA2-6

specifies post-construction control and removal measures for invasive species. DEP recommends that spraying and removal be employed prior to construction disturbance in order to minimize the available rootstock and seed supply potentially transmitted to disturbed areas not presently supporting these species. DEP will be discussing the employment of such pre-construction measures with Algonquin as we proceed with review of the Water Quality Certification application.

DEP notes that, according to Table 2.2.4-1 on page 2-13, no new access roads will be required in Connecticut to access the Algonquin right-of-way. This will reduce the

SA2-6 See the response to comment SA1-8.

potential for the spread of invasive species as well as minimizing other construction and habitat impacts.

The Department hopes that these comments are helpful in the preparation of the Final Environmental Impact Statement. In order to facilitate the Department's review of that document, please forward three copies to the DEP Office of Environmental Review. If there are any questions regarding these comments, please contact me at (860) 424-4110 or at frederick.riese@ct.gov.

Sincerely,

Frederick L. Riese
Senior Environ. Analyst
Office of Environ. Review

Attachment: (1)

cc: Robert Kaliszewski, DEP/OPPD
Peter Francis, DEP/OLISP
Brian Murphy, DEP/IFD
Michael Salter, DEP/IWRD
Sara Radacsi, DEP/IWRD
Jessica Morgan, DEP/WPSD

MONITORING AND OPERATIONS PLAN
DIRECTIONAL DRILLING
GOODWIVES RIVER ROAD
TOWN OF DARIEN, CONNECTICUT

The Monitoring and Operations Plan consists of the following conditions and corresponding operational and monitoring protocols for the Directional Bore under a small portion of the Goodwives River.

CONDITION 1 – NORMAL DIRECTIONAL DRILLING CONDITIONS

Normal directional drilling – no release
Routine directional drilling data collection
Routine monitoring via visual observation – low tide

CONDITION 2 – LOSS OF CIRCULATION

Loss of circulation during drilling
Shut down of drilling and add "Loss of Circulation Material"
Visual observation
Stop drilling if leak detected
Restart drilling if circulation is regained and no release is detected

CONDITION 3 – DRILLING FLUID RELEASE and REMEDIATION

Drilling fluid release confirmed
Notify regulatory agencies
Implement operational procedures to attempt to stop release
Perform bentonite sampling and notify DEP of testing and results
Monitoring to define release area
Install bentonite containment system
Mobilize remediation crew with vacuum system from shore
Remove bentonite
Furnish manifests of material disposal to the CTDEP

1

The following description provides specific details of action for the Contractor regarding the various monitoring and operations conditions outlined above.

CONDITION 1 – NORMAL DRILLING CONDITIONS

Drilling Operations

The Drilling Supervisor shall provide the Environmental Monitor with the following information on an hourly basis.

- Position of drill head
- Volume of drilling fluid mixed and in use, accounting for bentonite swelling (15 to 20 times dry volume)
- Calculation of drilling fluid volume based on drilling length and drill diameter
- Variation of estimated volume used and calculated volume
- Equipment breakdown and repairs
- Drilling pressure, changes and time
- Drilling fluid, bentonite, additions, volume, and time

Monitoring Plan

Continuous visual observation for duration of directional bore. A log will be kept of all monitoring, by the Environmental Monitor, and will be available for inspection by the Town of Darien Department of Public Works (DPW), or Connecticut Department of Environmental Protection (CTDEP).

If a release is detected and confirmed during routine monitoring, Condition 3 will be implemented.

CONDITION 2 – LOSS OF CIRCULATION

Drilling Requirements

Loss of circulation can indicate blockage of return path, release of drilling fluid into a void space around the direction drill, or a breakout to the surface of land or into the Goodwives River or its adjacent area. The following shall be conducted if loss of circulation occurs, unless the Town of Darien DPW and CTDEP mutually agree to an alternative.

- Drilling Supervisor shall immediately notify the Environmental Monitor of Condition 2.
- Drill head can be retracted a short distance (20 feet) prior to shutdown.
- Shut down drilling to investigate loss of circulation.
- Pump "loss of circulation material" into borehole for approximately 15 minutes without advancing the drill head to seal voids/fissures and reestablish circulation.

- The drilling operation will be restarted if circulation is regained. The Drilling Supervisor will notify the Environmental Monitor and Condition 2 will continue until a complete survey of the drill alignment is performed, as specified under Condition 2, Monitoring Plan. If releases are not identified, the drilling and monitoring will change to Condition 1.
- If circulation is not reestablished, the Drilling Contractor and Environmental Monitor will continue to monitor the drill path for two hours to try to locate the potential release. If a release is not detected during the two hours, drilling will stop and the area of investigation to go beyond the drill path alignment will be widened. IF a release is not detected, drilling will be continued and Condition 2, Monitoring Plan, will continue.

Monitoring Plan

- Mark the location of the drill head with a surface marker as per the Drilling Contractor.
- Continue visual environmental monitoring as per Condition 1.
- If a drilling fluid release is detected, drilling will be stopped ad Condition 3 will be immediately implemented.
- If a release is not detected, drilling will be reactivated and monitoring will continue under Condition 1 or 2 as applicable.

CONDITION 3 – DRILLING FLUID RELEASE and REMEDIATION

Drilling Operations

Should the monitoring team detect a drilling fluid release when loss of circulation has occurred and cannot be reestablished, the following steps apply:

- Shutdown of drilling operations for eight hours to seal the fissure after loss of circulation material has been fed into the borehole under Condition 2. The drill head will be pulled back from its furthest advancement point prior to shutdown.
- Begin circulation of drilling fluid for a 15-minute period following the eight-hour shutdown. The drill head may be advanced to its previous furthest point of penetration.
- If circulation returns, then drilling will continue as long as monitoring has determined that the release has stopped or has been slowed to the point where a significant impact will not result. The Environmental Monitor and the Town of Darien DPW will consult with the CTDEP prior to starting drilling operations. Discussion on what constitutes a significant impact is presented later in this section.
- During any drilling shutdown period, the driller will be permitted to circulate drilling fluid on a four hour cycle for a period of approximately 15 minutes to prevent complete blockage and loss of drilling equipment.

- If circulation does not return or significant release continues, then a determination shall be made by the town of Darien DPW, the Environmental Monitor, the driller, and CTDEP as to whether to continue drilling, repeat a four hour waiting period, seal the fissure by routing, or reroute the 10" HDPE pipe. A decision to proceed will be based upon the significance of impacts resulting from a continuing release.
- Repeated attempts to shut down and seal the fissure may be conducted by the driller. Up to six attempts will be permitted prior to making a decision to continue drilling, seal the fissure by grouting, or reroute the 10" HDPE pipe.
- If repeated attempts to seal the fissure by waiting have failed to stop or reduce the release to acceptable levels, then the driller shall be permitted to grout the fissure with cement-bentonite-water slurry or reroute the drill head. Sealing the fracture with grout will occur at the River bottom at the location of release, if practical. Grout will be injected into the fracture under pressure and be permitted to cure (harden).
- Following the grouting and curing period, drilling will recommence and will continue if the release is stopped or reduced to a point where no significant impact will occur. The Environmental Monitor will consult with the CTDEP prior to resuming drilling operations.
- If the decision is made to reroute the drill path because an acceptable solution cannot be achieved, then the plans and procedures shall be discussed with CTDEP, the Town of Darien DPW, the driller, and the Environmental Monitor. Rerouting may involve both vertical and horizontal adjustments in the drill path. The abandoned borehole may be grouted to seal a potential fissure pathway for the rerouted 10" HDPE pipe. Approvals for rerouting shall be obtained from the CTDEP, and the Town Environmental Protection Commission.
- Grout to be used during the project will consist of a mixture of cement, bentonite, and water. When the cement is fully hydrated, the grout will form a solid hardened mass. The volume of grout required will depend on the size of fracture or upon the distance the drill head is withdrawn from the furthest point of advancement of the borehole. Fractures shall be monitored to ensure that grout pumping ceases if grout is observed at the surface.

If a release has been detected, but circulation has not been lost, then the following sequence of operations shall apply:

- If the release does not pose a significant impact, as defined later in this section, then drilling may continue with the approval of CTDEP. The driller will add loss of circulation material to the drilling fluid, and monitoring of the release point as defined in this section shall apply.
- If the release is significant, then drilling operations will immediately be shut down for a period of approximately 30minutes while loss of circulation material is mixed with drilling fluid. Loss of circulation material (LCM) shall be pumped into the borehole without advancing the drill head for a period of approximately 15 minutes or until the LCM is noted by the monitoring team at the point of release. As long as circulation of returns continues and LCM is closing the

fissure by direct observation of the release then the driller will continue to circulate drilling fluid containing LCM. Drilling will advance forward when the release has been sealed or slowed to a point where no significant impact will result. CTDEP will be consulted prior to continuance of drilling and advancement.

- If the significant release is not slowed after 15 minutes or observation of LCM at the release point, then drilling operations shall be modified as directed by CTDEP.
- The stepwise procedure described previously in this section when a release and loss of circulation occurs shall be implemented from this point forward.

Monitoring Plan

- **In the event of a detected drilling fluid release, the Environmental Monitor will immediately contact the:**

  CTDEP Oil and Chemical Spills Section of the Waste Management Bureau on their 24-hour hot line at (860) 424-3338.

  CTDEP Office of Long Island Sound Programs at (860) 424-3034. The telephone notification will be followed by written notification to be sent by facsimile by the next business morning to the CTDEP Long Island Sound Programs at (860) 424-4054. The original written notice will be mailed to the CTDEP Office of Long Island Sound Programs at 79 Elm Street, Hartford, Connecticut 06106-5127.

  Bentonite Remediation Contractor (Fleet Environmental Services, LLLC) at (203) 281-2867.

  National Marine Fisheries at (978) 281-9300.

- The Environmental Monitor will monitor the release area and continue to monitor the remaining drill path; the boundaries of the impacted area will be determined.
- The origin of the breakout will be located and surface marked.
- A sample of the released material shall be obtained and tested to determine its contents. Results of the sampling shall be made available to the Town of Darien and the CTDEP immediately once available.
- Visual observation data will be collected to allow the Town of Darien DPW, the Environmental Monitor, drilling supervisor, and CTDEP to determine the significance of the release.
- The Contractor shall maintain on site, and have ready at all times, at least 400 feet of bentonite containment fencing. This fence will be assembled and ready for immediate deployment when a release, failure, or breach is detected. This shall be installed within the first eight hours of a detection of a release.

- Following detection of a release, a remediation crew with a vacuum system shall be mobilized and moved to the site, if required by the CTDEP; otherwise, CTDEP can suspend drilling operations.
- The vacuum system shall be near the site and shall have all of the necessary staff, equipment, tools, supplies, and fuel to be fully operational upon arrival.
- Mobilize two high-volume vacuum trucks to the site within four to six hours of notification. The vacuum trucks shall have a minimum storage capacity of 3,000 gallons and a minimum vacuum capacity of 2,100 cubic feet per minute (CFM). For a liquid material the pumping capacity should be nominally 200 to 300 gallons per minute (GPM). Each truck shall be equipped with 200 feet of 4 to 6 inch diameter suction hose and be capable of recovering bentonite from within the Goodwives River. A small barge will also arrive at the site as early as practicable (depending on the tide) to operate the suction hose at the point of release within the river. They will have two way radio communication capability with the vacuum truck operator. The Drilling Contractor will operate the suction end of the vacuum hose and will control the removal to the drilling fluid deposits. Initially, removal shall be primarily focused over the release point and areas of thickest deposition. The Drilling Contractor shall also monitor the input of new drilling fluid into the release zone and notify the Environmental Monitor of conditions and progress hourly. Any changes that may result in significant impacts shall be reported immediately and a decision to halt drilling operations shall be reviewed with CTDEP.
- Three 20,000 gallon frac tanks will be brought to the site within four to six hours to accept the bentonite/water mixture from the vacuum trucks. The frac tanks will provide for gravity settling. Tanks will be plumbed to decant water from the upper portion of ht tank, and effluent will pass through a system of 25 micron bag filters (and sand filters as required) prior to discharge back into the Goodwives River. The discharge will be visually checked to insure that it is not resulting in turbidity within the river. Accumulated solids shall be either dumped into roll-off containers for subsequent drying and disposal, or directly pumped into a bulk tanker. The bentonite will be disposed in accordance with applicable HDPE pipe laws and regulations. The Environmental Monitor will be in communication with the CTDEP Bureau of Water management during this process to insure that the emergency treatment and discharge procedures are acceptable.
- If the Environmental Monitor, Town of Darien DPW, and CTDEP determine that two vacuum trucks are not adequate to remediate the release in a timely manner, additional vacuum trucks of similar specifications will be mobilized to the site within eight hours of that determination. Additional frac tanks will also be mobilized as required.
- In the event a bentonite release occurs outside the water, the release will immediately be contained with silt fencing or hay bales. The drilling fluid will be transferred manually or by pump into a storage tank and removed from the site. Condition 3 operations will commence. The contractor shall store 100 feet of additional silt fencing or hay bales on site to contain a release on land. The Environmental Monitor shall maintain records of the quantity of drilling fluid removed by vacuum equipment, transferral of the material to other containment,

and daily status of cleanup operations. The Contractor shall be responsible for disposing of the vacuumed material and waste drilling fluids in an approved manner and furnished to the CTDEP upon completion of the work. The survey will continue to monitor any known areas of fluid release throughout the entire drilling program.

Significant Impacts

The identification of the conditions which constitute a significant impact will be based upon several factors, as follows:

- Containment of the release by bentonite containment system
- Drilling fluid depositional depths that do not exceed 24 inches at the interface with the containment fence.
- The presence and operation of the vacuum system equipment. Removal of drilling fluid deposits must exceed the rate of deposition from a continuing source.

In any event, the decision as to conditions, which constitute a significant impact, will be based upon discussions between CTDEP, the Town of Darien DPW, the Environmental Monitor, and the driller. The CTDEP shall make the final determination or ruling concerning impact decisions and further course of action.

Post Drilling Monitoring and Sampling Plan

In the event of a drilling fluid release, a site specific post-remediaton sampling protocol tailored to the actual impact areas will be submitted to the CTDEP and implemented by the Town of Darien DPW. The protocol will be based upon the location, volume, and spatial extent of the release, with the goal of establishing whether adverse effects on benthic communities had occurred in the impact zone. Every effort will be made to follow a random sampling design in each impacted habitat, with comparisons made to unimpacted zones of the same habitat. Additionally, pre-drilling benthic data gathered in support of this permit application will be used for comparative purposes. Core samples will be collected where possible, both to monitor depositional thickness and to evaluate benthic macroinvertebrate communities.

At a minimum, in the event of a drilling fluid release, an inspection of the entire drill path will be conducted approximately 48 hours following the completion of all drilling activities, if requested by CTDEP. A brief report summarizing the status of drilling fluid deposits shall be presented. The occurrence of fresh releases following the end of drilling shall also be recorded. The post-drill monitoring, in the event of no drilling fluid release, will consist of an underwater investigation to be conducted 30 days following the end of all drilling activities, if requested by CTDEP. All releases which persist beyond the completion of drilling activities will be removed within 30 days following the completion of drilling activities or 30 days following post-drilling detection, if requested by CTDEP, in accordance with the methods previously described.

7

RIGINAL

State of New Jersey

JON S. CORZINE
Governor

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Environmental Regulation
Office of Permit Coordination and Environmental Review
401 East State Street
P.O. Box 423
Trenton, New Jersey 08625-0423
Phone: (609) 292-3600 Fax: (609) 777-1330

MARK N. MAURIELLO
Acting Commissioner

CP08-420-000

2009 MAR -2 P 3:36

February 3, 2009

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First St. NE: Room 1A
Washington DC, 20426

RE: **Algonquin Gas Transmission**
East to West Hubline Expansion Project
Docket No. CP08-420-000
Draft Environmental Impact Statement (DEIS)

Dear Secretary Bose:

The Office of Permit Coordination and Environmental Review of the New Jersey Department of Environmental Protection (NJDEP) has completed its review of the Draft Environmental Impact Statement (DEIS) for the proposed Algonquin Gas Transmission East to West Hubline Expansion Project. The Office of Permit Coordination and Environmental Review is responsible for the coordinating the Departmental reviews of environmental documents prepared pursuant to the requirements of the National Environmental Policy Act (NEPA).

SA3-1 The Department has no comment on this proposal. Thank you for offering the opportunity to comment on the DEIS.

Sincerely,

Kenneth C. Koschek
Supervising Environmental Specialist
Office of Permit Coordination
and Environmental Review

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SA3-1 Comment noted.

Comments on the Draft EIS and Responses

INDIVIDUALS

Comments on Proposed Activities for E3-W2

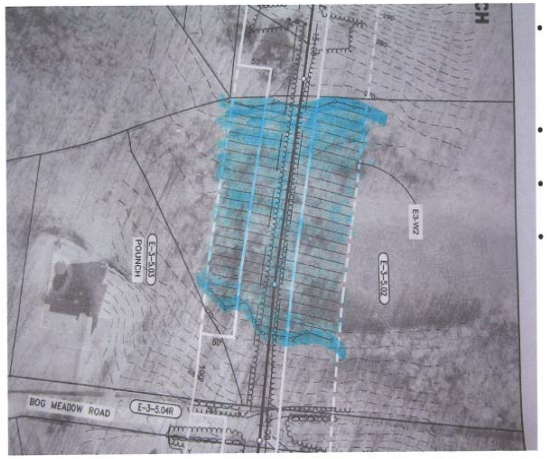
Prepared for Public Hearing, 11 Dec. 2008
Norwich City Hall

Douglas & Mary Beth Lee
62 Bog Meadow Road
Norwich, CT 06360
860-887-1494

E3-W2, east looking west

- Note extensive stand of *Phragmites* spp. introduced from past pipeline easement mowing/maintenance.
- Note heavily wooded and undisturbed wetlands just north (to the right) of the easement. This strip of undisturbed wetland sits between the easement and a 2+ acre pond.

E3-W2 as depicted in DEIS

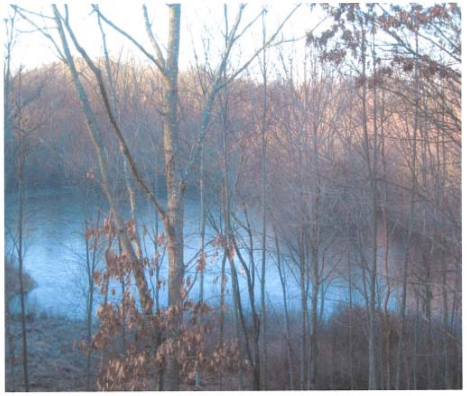


- Thick black line running from top to bottom denotes the position of the pipeline.
- Thin black lines denote property boundaries.
- Solid white lines denote proposed area of activity.
- Note white dashed lines allegedly depicting the edge of the 100' upland review area. The alleged upland review boundary on the right runs through the pond.

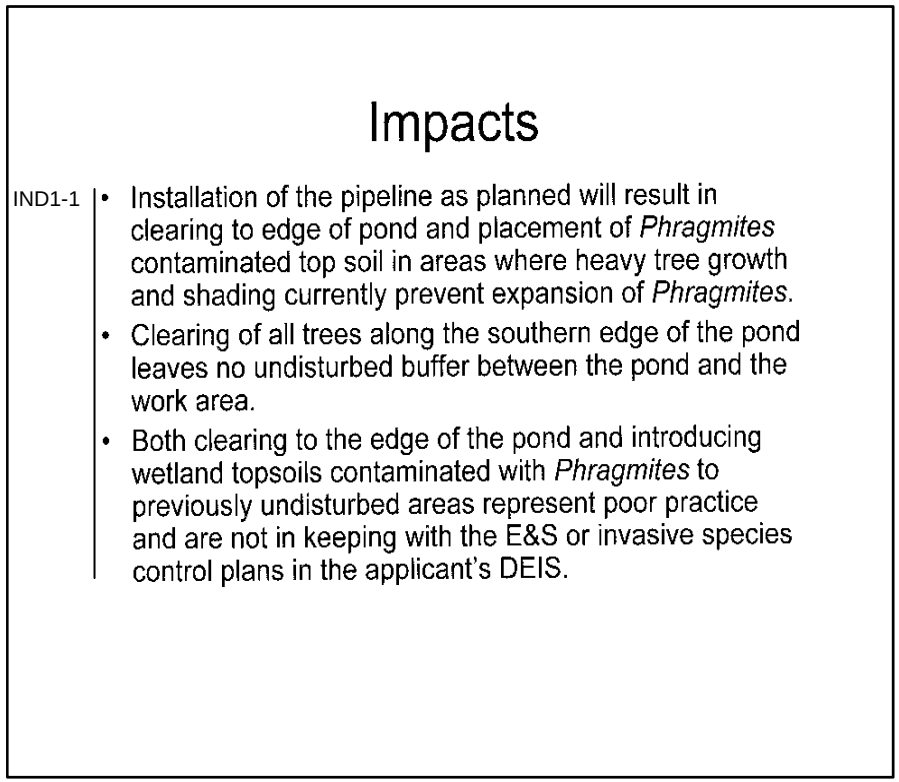
E3-W2 satellite photo

- Note existence of a 2+ acre pond immediately adjacent to the easement.
- The solid red line denotes the position of the gas line.
- The dashed white line denotes the boundary of the 100' upland review area as depicted in the DEIS.
- The solid yellow line denotes 25' to north of pipeline and 50' to south, corresponding to the proposed area of activity.
- Difficult to discern due to canopy cover but denoted by short white line perpendicular to the pipeline is the pond edge 23' north of the pipeline.

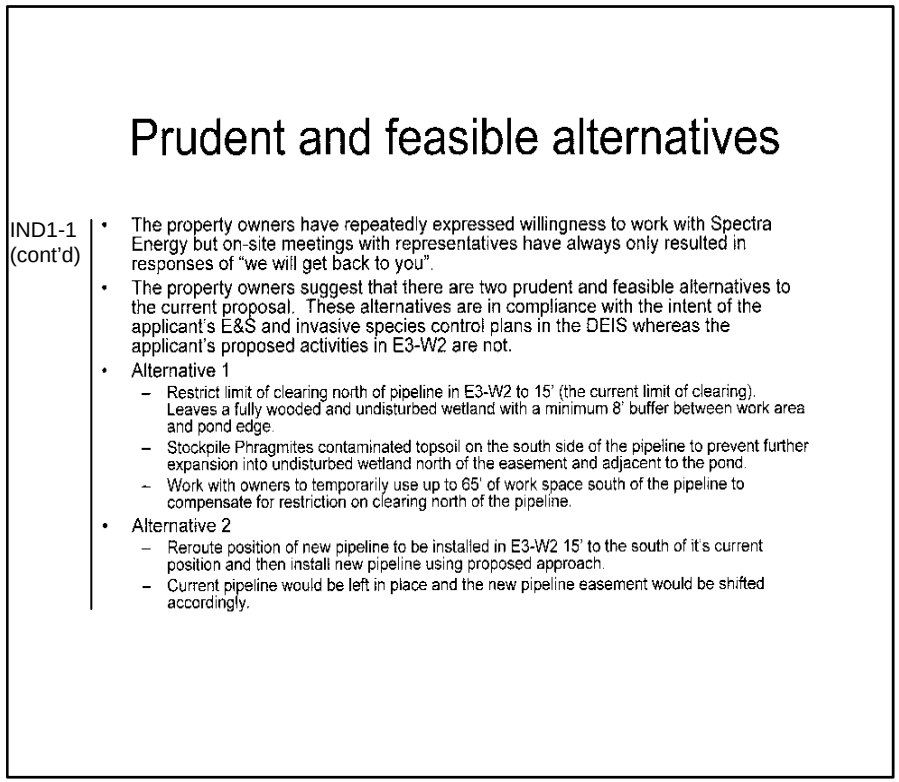
Pond and associated wetlands are high functioning.



- View of pond from north looking south.
- The Algonquin easement is adjacent to the south edge of the pond (far side of this picture) and the pipeline is within 23' of the pond edge at its closest point.
- The applicant's proposed construction activities would result in clearing all trees along the southern edge of the pond.
- The applicant's proposed construction activities would result in dredged soils being stored immediately adjacent to the pond prior to trench refilling.



IND1-1 See the response to comment PM1-1.


Prudent and feasible alternatives
IND1-1 (cont'd)
• The property owners have repeatedly expressed willingness to work with Spectra Energy but on-site meetings with representatives have always only resulted in responses of "we will get back to you".
• The property owners suggest that there are two prudent and feasible alternatives to the current proposal. These alternatives are in compliance with the intent of the applicant's E&S and invasive species control plans in the DEIS whereas the applicant's proposed activities in E3-W2 are not.
• Alternative 1
– Restrict limit of clearing north of pipeline in E3-W2 to 15' (the current limit of clearing). Leaves a fully wooded and undisturbed wetland with a minimum 8' buffer between work area and pond edge.
– Stockpile Phragmites contaminated topsoil on the south side of the pipeline to prevent further expansion into undisturbed wetland north of the easement and adjacent to the pond.
– Work with owners to temporarily use up to 65' of work space south of the pipeline to compensate for restriction on clearing north of the pipeline.
• Alternative 2
– Reroute position of new pipeline to be installed in E3-W2 15' to the south of it's current position and then install new pipeline using proposed approach.
– Current pipeline would be left in place and the new pipeline easement would be shifted accordingly.

December 21, 2008
40 Reservoir Road
Norwich, CT 06360

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE, Room 1A
Washington, DC 20426

Concerns about the HubLine/East to West Project
Docket number CP08-420-000:

At the request of a representative at the Norwich City Hall Meeting of FERC on December 11, 2008, I am writing to express my concerns about the Algonquin Gas Transmission, LLC's HubLine/East to West Project's effects on my family, my home and my property. We are a four person household consisting of two adults and two young children in Norwich, Connecticut. Currently, Algonquin Gas has requested the use of a temporary work space of 0.19 acres which encompasses an area double the size of their permanent easement located on my property. This requested area is in a prominent and much used place on our property.

IND2-1 Our short term concerns deal with everyday issues during the construction period, such as the proximity of the work space to the main building of our house. As explained to us, the work will be done as close as 4 feet from the front of our home. This proposed work area may contain our well, septic, and various electrical wiring. The proposed boundary will destroy a large portion of our yard including a custom built deck, a full two car garage, our only level yard area that is enjoyed by our children, and a meticulously hand built BMX track. This project has been explained as lasting a few months.

IND2-2 Which leads me to some of our long term concerns; it has been explained to us that everything "north" of the temporary work space boundary should be considered cleared and graded. This area, besides the features that could be "rebuilt" (mentioned above), contains 30 plus mature trees, established shrubbery, a half dozen rock walls and other geographical features. One very large tree in jeopardy is the focal point of the entire property with the house built positioned in its shade and a custom deck built around it. This rustic and natural environment makes up a majority of the front of our property. The home itself was built situated to take advantage of the current landscape. The entire home is wrapped in waist to ceiling windows, on which we have never had a blind or curtain. The style of the home has been described as a "tree house" and is formally called a Deck House, where the outside atmosphere surrounding the house essentially is the interior décor of the home. The permanent changes that will be a result of this project will change the character of this house forever. All of these concerns lead us to believe that any damages done during this project will ultimately result in a house that we would not have purchased. We strongly

IND2-1 To address the Perry's concerns, Algonquin adjusted the construction work area to maintain at least 34 feet between the workspace and the main building of the house and minimize tree clearing on their property. The revised site-specific residential construction plan for the Perry property is included as page D-5 in Appendix D of this final EIS. Section 4.8.3.1 has been revised to include this information.

IND2-2 See the response to comment IND2-1.

IND2-2 (cont'd)

feel that any work performed outside of the current permanent easement will greatly affect the value of our home in a negative way.

As previously mentioned to Marty of Algonquin Gas (the only representative of this project that has been in contact with us), considering we are the only house on the gas line that will see this level of destruction, the simplest and most logical decision for all parties would be for Algonquin gas to purchase our property and home outright. This investment would allow them to use the property as needed for the duration of the project, and at its conclusion, repair and resell at their discretion.

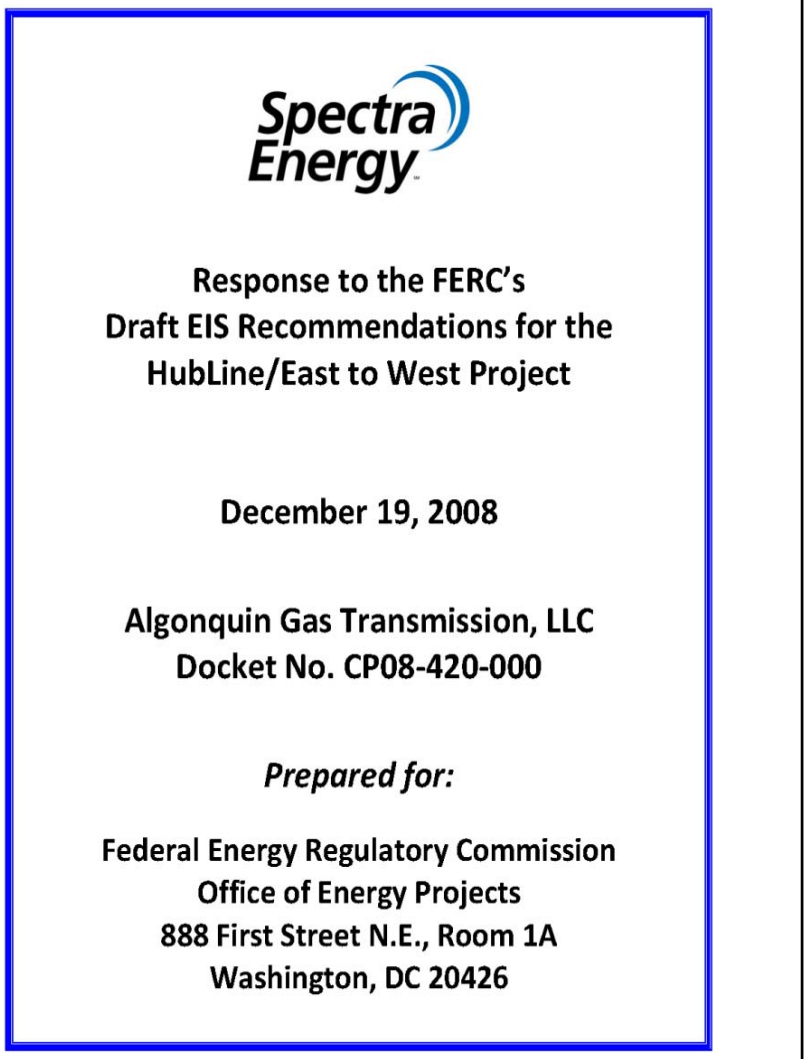
I will limit this letter to these concerns which hopefully give a proper range of our issues. Please contact me for additional and more specific details, property maps, project projection sheets, photos, videos, and otherwise.

Sincerely,
Joshua and Lynn Perry
Norwich, Connecticut
06360

860.887.1202 home

Comments on the Draft EIS and Responses

APPLICANT


Spectra Energy
Response to the FERC's
Draft EIS Recommendations for the
HubLine/East to West Project
December 19, 2008
Algonquin Gas Transmission, LLC
Docket No. CP08-420-000
Prepared for:
Federal Energy Regulatory Commission
Office of Energy Projects
888 First Street N.E., Room 1A
Washington, DC 20426

Algonquin Gas Transmission, LLC (Algonquin)
Docket No. CP08-420-000

Response to the FERC's Draft EIS Recommendations

RECOMMENDATION 11

Algonquin shall prepare an alternatives analysis for the proposed blow-off valve near MP 1.3 of the I-10 Extension. The analysis shall evaluate modifications to the proposed valve site to minimize potential visual, vegetation, and wetland impacts, and evaluate a site adjacent to the southeast side of Roosevelt Road that is approximately 350 feet south of the currently proposed location from an environmental and engineering perspective, including access to the site. Algonquin may discuss any other factors that are relevant to the site selection. Algonquin shall file this alternatives analysis with the Secretary **during the draft EIS comment period**. *(section 3.6.2)*

RESPONSE 11

A1-1

Please note that the location of the remote blow-off valve shown on the alignment sheets that were filed with the FERC in June 2008 is incorrect. The remote blow-off valve has since been sited nearer the pipeline leaving a 50 foot buffer of woods between the workspace and the residences on Harding Avenue, as depicted on the revised DWG. BB-A-1052 (Rev. 6) filed under separate cover. This location provides additional buffer between the homes and the valve location.

Relocating the blow-off valve near milepost ("MP") 1.3 on the I-10 Extension, 350 feet to the south, would place the valve in Wetland I10-W2. Moving the blow-off valve approximately 700 feet to the south, on the southeasterly side of Roosevelt Road, would place the valve in the buffer zones of Wetlands I10-W2 and I10-W3. These wetlands are located about 175 feet apart from each other along the proposed pipeline centerline. Since these sites would place the valve in wetlands and/or wetland buffer zones, Algonquin eliminated them from further consideration.

Respondent(s): Terrance Doyle, Spectra Energy (617) 560-1417

A1-1 This comment is no longer applicable to the amended E2W Project.

Algonquin Gas Transmission, LLC (Algonquin)
Docket No. CP08-420-000

Response to the FERC's Draft EIS Recommendations

RECOMMENDATION 18

Algonquin shall revise its alignment sheets and E&SCP to be consistent with section VI.A.3 of the FERC Procedures, or prepare a site-specific analysis of each wetland area, including soils characteristics and other factors, that would justify use of a greater than 75-foot-wide right-of-way. Algonquin shall file the revised alignment sheets and E&SCP or site-specific analysis of each wetland area with the Secretary **during the draft EIS comment period**. *(section 4.4.3)*

RESPONSE 18

A1-2 Algonquin's revised alignment sheets are provided under separate cover.

Workspace through wetland areas typically includes a total construction work area width of 75 feet with 50 feet on the working side and 25 feet on the spoil side of the proposed pipeline. The following analysis describes project specific conditions resulting in the need for an additional minimum 10 feet wide linear spoil storage area to support the installation of a 36-inch-diameter pipeline.

As a general rule, a 85-foot-wide construction work area is required to support the installation of a 36-inch-diameter pipeline. This is because 35 feet of linear spoil storage (instead of the standard 25 feet) is required to temporarily store approximately 311 cubic yards per 100 feet of trench length, considering a trench excavation generally 8 feet deep and a 40 percent expansion rate (Pipeline Rules of Thumb Handbook, 6th edition).

Specific features of the E2W Project terrain and the associated requirement for blasting in some locations underscore the need for this increased spoil storage area. The terrain consists of mild to moderate rocky slopes with flat low rocky areas that generally contain wetlands. This mild terrain prevents rapid water runoff which increases the potential for saturated trench spoil. Further, in those locations requiring blasting, the additional 10 feet of proposed workspace will provide an area to store the excavated rock along the edge of the spoil site while the remaining 25 feet would then provide adequate area to store subsequent trench spoil.

In addition to the above, there are other E2W Project features that contribute to the need for the additional work area. These features are itemized by specific location in Attachment 1, Table R18-1 (*Wetland Workspace Requirements Along the I-10 Extension and Q-1 System*) and include:

Unstable or Organic Soils/Trench Spoil Management - Trench spoil is loose organic material that is difficult to stockpile. The post excavation windrowed material sloughs to the sides and cannot support its own overburden weight resulting in the need for additional width to maintain material storage within the approved construction right-of-way ("ROW")

Wetland Workspace is Adjacent to Road or Railroad Crossing - Additional area required to pre-fabricate the pipe section to be installed through the road or railroad and to temporarily stockpile excavated material from the road crossing excavation.

Applicant

A1-2 This comment is no longer applicable to the amended E2W Project because the E-3 System Replacement would be constructed using a nominal 75-foot-wide right-of-way.

Algonquin Gas Transmission, LLC (Algonquin)
Docket No. CP08-420-000

Response to the FERC's Draft EIS Recommendations

A1-2 (cont'd)

Waterbody Crossing Associated with Wetland - Stream crossings within a wetland system will generate additional spoil generated from bell-hole excavations and work area to place pumps and filtering mechanisms to support tie-in welds on each side of the stream channel. Additional cover is typically required through the stream channel resulting in additional trench spoil that will be stored adjacent to the stream banks.

Wetland Crossing Length is Large - The extended length of the wetland crossing will require prefabrication of multiple four to six pipe joint sections that will be assembled in staging areas and transported to the wetland. The sections will then be welded together, resulting in additional spoil generated from bell-hole excavations and work area to place pumps and filtering mechanisms to support each tie-in weld location.

Potential For Shallow Bedrock - Observation of adjacent terrain and/or historic research indicates potential for shallow bedrock and/or surface rock ledge outcroppings which will require blasting and temporary storage of resultant material. Additional construction work area width will be required to store blast rock segregated from other ditch spoil.

Close Proximity to Utility Towers or Beneath Power Lines - Pipeline routing is adjacent to or under existing powerline facilities which will require "lower height" windrowed stockpiles of excavated material and the use of "lower height" construction equipment to maintain safe separation from high voltage wires and tower structures necessitating additional construction workspace width.

Rocky or Bouldery Surface or Soils - Field observation of the wetland areas indicates substantial amounts of surface boulders and surface rock mixed with existing soils which will require blasting and temporary storage of resultant material. Additional construction work area width will be required to store blast rock segregated from other ditch spoil.

Seasonally or Permanently Flooded/Ponded - Wetland area may be flooded during pipeline construction resulting in saturated material that will be difficult to maintain within the approved construction right-of-way in a windrowed stockpile technique. The post excavation windrowed material sloughs and cannot support its own overburden weight resulting in the need for additional width to maintain material storage.

Work Area Located on Sideslope - Terrain adjacent to the wetland area consists of steep slopes. The terrain limits the amount of usable area to store spoil segregated from upland trench and grading spoils.

Vernal Pool Located at or Near Wetland Crossing - Additional construction work area may be required through wetland areas adjacent to the vernal pool to allow for a narrow work area to avoid impacts to the vernal pool.

Wetland Only Partially Enters Workspace - Construction work area adjacent to wetlands supports standard upland techniques. Wetlands partially inside the workspace will be protected by placement of timber mats, maintaining disturbance up to the edge of the wetland, or other suitable protection of the wetland area, dependent on field conditions at the time of construction.

Algonquin Gas Transmission, LLC (Algonquin)
Docket No. CP08-420-000

Response to the FERC's Draft EIS Recommendations

A1-2 (cont'd)

Additional HDD Entry/Exit Workspace Required - Additional work area required for the placement of a noise attenuation tent to contain the drill rig and support equipment and personnel, storage of the drill stem section, associated mud pits and drilling fluid cleaning and containment, parking, and suitable site grading due to existing site terrain.

Extra Workspace Needed for Hydrostatic Testing Work Area - Workspace adjacent to hydrostatic test water sources is required to place intake pumps, intake hoses, and victaulic pipe lengths to transport the test water to the pipeline segment.

Maintain Travel Lane Around Wetland or Other Site Feature - There are several areas where Algonquin will maintain a travel lane in uplands along the ROW adjacent to wetland resources. In these instances, Algonquin proposes to utilize a ROW width wider than 85 feet to provide room to allow travel outside of the wetland. This configuration will allow final restoration of the adjacent wetland resource while maintaining travel lane access to other portions of the route.

Respondent(s): Terrance Doyle, Spectra Energy (617) 560-1417

Algonquin Gas Transmission, LLC (Algonquin)
Docket No. CP08-420-000

Response to the FERC's Draft EIS Recommendations

RECOMMENDATION 19

Algonquin shall file information regarding its compensatory wetland mitigation plan that includes:

a) a description of any additional sites under consideration to fulfill the 1:15 wetland preservation ratio required by the COE;
b) the acreage of wetlands that would be preserved on each site;
c) details of any conservation restrictions that would be placed on each site; and
d) the comments of the COE on the compensatory wetland mitigation plan.

Algonquin shall file this information with the Secretary **during the draft EIS comment period.** *(section 4.4.4)*

RESPONSE 19

A1-3

On November 19, 2008 Algonquin held a teleconference with Ted Lento and Paul Minkin of the New England District of the United States Army Corps of Engineers ("COE"). The purpose of the teleconference was to discuss the suitability of the "Agreement on Conveyancing, Permitting, and Mitigation" ("Agreement") between Algonquin and the Town of Stoughton ("Town") for compensatory wetland mitigation related to Algonquin's HubLine/East to West Project.

The Agreement proposes that of an approximately 96 acre property located in Stoughton and Canton, Massachusetts, approximately 46 acres will be placed under conservation easement, and approximately 50 additional acres will be conveyed to the Town for passive recreation and open space. During the teleconference, the COE explained that in order to receive wetland compensatory mitigation credit for the 46 acres to be placed under conservation easement, COE standard specifications for conservation easements must be added to the Agreement. These easement specifications may be incorporated as an Attachment to the Agreement. The COE has provided their standard conservation easement specifications to Algonquin, which Algonquin is currently reviewing and working to incorporate into the Agreement.

In order to receive wetland compensatory mitigation credit for the 46 acres to be preserved under conservation easement, the COE also noted that allowed and prohibited land uses on the adjacent 50 acres that will be conveyed to the Town must be specified within the Agreement. Allowed land uses must not detract from wetland functions and values protected within the 46 acre conservation easement area. Acceptable land uses that were discussed included walking trails, fishing, and canoe launches, although other comparable land uses may be deemed acceptable by the COE. The proposed location of any site improvements to accommodate such land uses within the 50 acre recreation and open space area must also be specified in the Agreement. The COE stated that expressly maintaining an undisturbed buffer to the 46 acres may also be an acceptable solution. The objective is to ensure that the 46 acres remain unencumbered as a result of uses on the passive recreation acreage.

If Algonquin incorporates the COE conservation easement specifications and a list of appropriate allowed land uses for the 50 acre passive recreation and open space area into the Agreement, Algonquin will receive compensatory wetland mitigation credit provided the COE approves of the allowed land uses. Under these provisions, the Agreement would equate to

Applicant

A1-3 Due to the reduction in Project scope, no forested wetlands would be permanently affected by the E2W Project. The U.S. Army Corps of Engineers and the CTDEP have agreed that natural regeneration of wetlands would be sufficient mitigation for the Project and a compensatory wetland mitigation plan is no longer required. Section 4.4.4 has been revised to include this information.

A1-3 (cont'd)

approximately ten acres of compensation for every one acre of wetland impact under the current Project design. The COE explained that preservation at this 10:1 ratio would be sufficient to compensate for Project impacts to wetland functions and values, and that additional compensatory mitigation would not be necessary. The COE also noted that all future correspondence with the COE regarding the Project's wetland compensatory mitigation and related draft conservation easement ("CE") should be completed directly through Ted Lento who will coordinate with the COE Office of Counsel and other staff prior to final approval of the CE. Changes in the draft CE may be required after review by the COE staff and prior to final approval.

In addition to the approximately 96 acre compensatory mitigation property, Algonquin is investigating additional land at other sites to address environmental compensatory mitigation with state and municipal agencies. This additional compensation would not be required by the COE for Section 404/10 permitting, provided the CE specifications and allowed land uses on the 96 acre property are approved by the COE. Algonquin will provide the COE with the CE and allowed land use specifications pertinent to the Agreement as these documents are completed by Algonquin and available for circulation. Algonquin will also provide FERC the finalized Agreement and the corresponding CE and allowed land use specifications once it has been approved by the COE.

Respondent(s): Terrance Doyle, Spectra Energy (617) 560-1417

Algonquin Gas Transmission, LLC (Algonquin)
Docket No. CP08-420-000

Response to the FERC's Draft EIS Recommendations

RECOMMENDATION 21

Algonquin shall assess the potential to reduce the construction right-of-way width at MPs 10.8 of the I-10 Extension; MPs 14.5 and 16.0 of the Q-1 System Replacement; and MPs 1.4, 4.4, 9.8, and 10.0 of the E-3 System Replacement to avoid or reduce impacts on vernal pools at these locations. Algonquin shall file revised alignment sheets that depict the reduced construction right-of-way width for all locations where Algonquin determines that a reduction is feasible. If Algonquin determines that reducing the construction right-of-way width is not feasible at any of these locations, it shall provide a site-specific explanation of the conditions that would not permit a workspace reduction. Algonquin shall file its assessment and the applicable revised alignment sheets with the Secretary **during the draft EIS comment period**. *(section 4.6.1.4)*

RESPONSE 21

A1-4

Algonquin evaluated the potential to reduce the ROW width at seven locations along the proposed I-10 Extension and Q-1 System in Massachusetts and the E-3 System in Connecticut to avoid or reduce impacts to vernal pools identified in Recommendation 21. The construction workspace modification assessments are provided in the following sections. Prior to construction, Algonquin will provide revised alignment sheets showing the construction workspace modifications as part of its Implementation Plan.

I-10 Extension

At the landowner's request, Algonquin incorporated a minor reroute of the I-10 Extension pipeline across Tract I10-194CC located on the east side of Turnpike Street. This reroute will improve the pipeline crossing of the roadway and avoid Vernal Pool B-VP-10 (MP 10.8) which is located on the west side of Turnpike Street.

Q-1 System

Vernal Pool A-VP-04 (MP 14.5) is located adjacent to State Route 27 (Norwood Street) and extends beyond the full width of the 85-foot wide construction ROW and the 200-foot-wide study corridor. At this location, State Route 27 is a busy roadway situated in a valley with steep slopes of up to 40 degrees on both sides of the roadway. The proposed construction method to install the new 36-inch-diameter pipeline across State Route 27 is the open cut method. Due to the extreme topography and existing utilities within the roadway, the excavation needed to install the new pipeline is expected to be very deep and use of the entire 85-foot-wide construction ROW will be required to assemble and install the pipeline section and to manage trench spoil. Therefore, reducing the construction ROW width at Vernal Pool A-VP-04 is not possible.

At Vernal Pool A-VP-09 (MP 16.0), Algonquin will reduced the construction ROW width from 85 feet to 75 feet to minimize vegetation clearing within the pool basin.

A1-4 See the response to comment SA1-2.

The remaining portions of this comment are no longer applicable to the amended E2W Project.

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E-3 System

A1-4 (cont'd)

At Vernal Pool E3-VP-2 (MP 1.4), Algonquin will modify the construction workspace to avoid impacts to this vernal pool.

Algonquin will make every attempt to reduce the construction workspace to avoid impacts to Vernal Pools E3-VP-3 (MP 4.4) and E3-VP-8 (MP 9.8). The edge of each pool basin is located within 10 feet of the centerline of the existing and new pipelines and may be difficult to completely avoid during trenching activities. During construction, erosion and sediment controls will be installed around the edge of the pool basin within the construction ROW in an attempt to avoid impacts to the pool basins.

Vernal Pool E3-VP-9 (MP 10.0) is located on the centerline of the existing and new pipelines. Construction activities at this location will consist of removing the existing pipeline, widening and deepening the trench, and installing the new 12-inch-diameter pipeline. Impacts to this vernal pool are unavoidable and reducing or modifying the construction workspace to minimize impacts is not possible.

Respondent(s): Terrance Doyle, Spectra Energy (617) 560-1417

Algonquin Gas Transmission, LLC (Algonquin)
Docket No. CP08-420-000

Response to the FERC's Draft EIS Recommendations

RECOMMENDATION 22

Algonquin shall continue to consult with the COE, the MassNHESP, the MassDEP, and the CTDEP to determine additional recommended mitigation measures to minimize impacts on vernal pools. Algonquin shall file a description of the agency recommendations and specifically identify the additional mitigation measures it would implement with the Secretary **during the draft EIS comment period**. *(section 4.6.1.4)*

RESPONSE 22

A1-5 Algonquin has continued to work with the Massachusetts Department of Environmental Protection ("MassDEP"), the Massachusetts Natural Heritage & Endangered Species Program ("MassNHESP"), and the Connecticut Department of Environmental Protection ("CTDEP") regarding appropriate mitigation for vernal pools during construction of the I-10 Extension and Q-1 System in Massachusetts and the E-3 System in Connecticut. As described in Response 21 above, Algonquin has assessed the possibility of modifying its construction workspace to avoid or further minimize impacts to vernal pools at seven locations in Massachusetts and Connecticut. Presently, construction workspace modifications avoid or minimize impacts to five of these seven pools. The following sections summarize the additional agency consultation and mitigation measures that will be implemented to minimize adverse impacts to other vernal pools along the pipeline routes.

Massachusetts

The MassNHESP requested that Algonquin evaluate the feasibility of using the horizontal bore method to install the pipeline beneath the Certified Vernal Pool ("CVP") CVP B-VP-5 located at MP 6.5 along the I-10 Extension. Following an engineering evaluation, Algonquin concluded that to accomplish the bore, additional temporary workspace ("ATWS") would be required immediately west of the vernal pool to accommodate the bore pit work area thereby increasing impacts to the terrestrial forested habitat around the pool basin. Secondly, large surface boulders are present in the vicinity of the vernal pool which increases the risk of failure for the bore and increases the overall construction duration. In addition, although a bore would eliminate the need to trench across the vernal pool, Algonquin would still need to install an equipment travel lane to allow construction to continue along the pipeline alignment. For these reasons, the horizontal bore method option, while technically possible, is not suitable at this location as an impact avoidance measure.

Recognizing the goal of reducing forested impacts at CVP B-VP-04 and the site constraints described above, Algonquin proposes to use an alternative construction technique such as the "stove-pipe" or "drag-section" construction method between MP 6.50 to MP 6.60 to minimize the amount of workspace and associated impact to the CVP B-VP-04 basin and adjacent forested habitats. This is in contrast to the standard cross country construction method which generally requires a wider nominal ROW for adequate workspace needed for safe construction. Use of the stove pipe method would allow Algonquin to eliminate approximately 35 feet of temporary workspace width along this section of pipeline ROW and limit the construction work area to the 50-foot-wide permanent ROW easement. Although this method generally takes longer to install

Applicant

A1-5 See the response to comment SA1-2.

The remaining portions of this comment are no longer applicable to the amended E2W Project.

A1-5 (cont'd)

pipeline, this conservation measure would result in an overall decrease of approximately 0.44 acre of disturbance to CVP B-VP-04 and adjacent upland habitat compared to the Project's initial plan. Of this reduction, approximately 0.2 acre consists of reduced forested impact. The new total impact to forest land within 300 feet of CVP B-VP-04 will be approximately 0.42 acre.

The MassNHESP indicated any excavation within CVP B-VP-04 coupled with the loss of surrounding forested habitat due to clearing around the pool constitutes a "take" of the blue-spotted salamander (Massachusetts special concern species) and would require the filing of a Conservation and Management Permit in accordance with the Massachusetts Endangered Species Act ("MESA") (321 CMR 10.23). MassNHESP has indicated that with the reduced workspace associated with the alternative construction technique, Algonquin would qualify for a permit assuming the implementation of appropriate avoidance, minimization, and mitigation measures. As a result, Algonquin has prepared a Conservation and Management Permit Application for the blue-spotted salamander that was submitted to MassNHESP in December 2008.

Conservation Measures

In response to recommendations from MassNHESP, Algonquin has prepared the following additional conservation measures to minimize short-term and long-term impacts to CVP B-VP-04.

Pre-construction Measures

1. Vegetation Sampling – conduct relevé sampling to quantify the species composition and locations of plant species found within the habitat.
2. Micro-Topography Assessment – conduct an additional pre-construction civil survey to document micro-topography within the vernal pool and develop a detailed restoration plan for use during construction.
3. Biological Surveys – conduct funnel trap sampling for salamanders and invertebrates and egg mass counts for vernal pool indicator species.
4. Invasive Species – conduct surveys to quantify and document the species composition and locations of invasive plant species found within and in close proximity to the vernal pool.

Construction Measures

1. Time of Year Restrictions – no trenching between MP 6.5 and MP 6.6 until after September 1. A travel lane constructed from timber mats can be installed and used for equipment travel through this area outside of the construction timing window.
2. Habitat Impact Minimization Measures:
   a. *Signing/Fencing*: protected areas will be flagged or fenced to prevent pipeline installation before September 1.
   b. *Equipment Mats*: will be used to minimize disturbance to areas not within the pipeline trench line.
   c. *No Refueling Zones*: within 100 feet of resource.

A1-5 (cont'd)

d. *Erosion Control and Critter Gap Installation*: install erosion control devices to prevent sediment from leaving the workspace. Install 3-4 foot wide "critter" gaps in the erosion control fence.
e. *Wetland Topsoil Segregation*: topsoil in vernal pool habitats will be segregated and placed back after construction.
f. *Restoration*: habitats will be restored in the same geographic and pre-construction configuration and composition, based on pre-construction micro-topography survey efforts to the extent possible. Where feasible, Algonquin will remove native shrubs from the pool prior to construction and store them in temporary nurseries with the goal of replanting the shrubs back in the pool and surrounding wetland habitat following construction. If transplanting and replacing the shrubs from the pool is not feasible, the shrubs will be replaced from an outside source (nursery). If shrub replacement is necessary, they will be of the same species or other native species with similar characteristics.

Post-Construction Measures

CVP B-VP-04 will be monitored at one year, three years, and five years post-construction as follows:

1. Vegetation Sampling – the vegetation survey sampling plots will be revisited post-construction to document the restoration of vegetation.
2. Biological Surveys – conduct funnel trap sampling for salamanders and invertebrates and egg mass counts for vernal pool indicator species.
3. Invasive Species – surveys will be conducted to quantify the species composition, amounts, and locations of invasive plant species found within the habitat.

Long-Term Net Benefit

To receive a conservation and management permit, Algonquin must demonstrate that it will implement a conservation and management plan that provides a long-term net benefit to the conservation of the blue-spotted salamander. According to the MassNHESP, typical net benefit options for the Project include land protection of adjacent parcels or off-site benefits.

Algonquin is actively negotiating the purchase of an approximately 32-acre parcel in the Town of Holbrook within the Cranberry Brook Area of Critical Environmental Concern ("ACEC") to satisfy the long-term net benefit standard of the conservation and management permit and mitigate other Project-related wetland and wildlife impacts. The currently undeveloped parcel is located adjacent to the Holbrook Town Forest and is surrounded by a mixture of upland forest and forested wetlands to the east, west and south, and is bordered to the north by an existing NSTAR powerline. This parcel contains two CVPs, and an additional six CVPs are located within approximately 800 feet of its boundaries. The existing combination of vernal pool habitat surrounded by mature forested habitat is ideal potential foraging, sheltering, over-wintering and migratory habitat for blue-spotted salamanders. Although actual presence or absence of the species within the parcel has not been ascertained, even if not present the acquisition of the land will permanently protect the breeding habitat for numerous other vernal pool-breeding

A1-5 (cont'd)

amphibians including spotted salamanders, four-toed salamanders, wood frogs, spring peepers, gray treefrogs and American toads.

Although an agreement has been reached in principle with the landowner, Algonquin does not expect the formal agreement to be finalized until the first quarter of 2009. At that time, the Project will also receive survey permission from the property owner in order to obtain additional information that will then be used to supplement this filing.

Algonquin has assessed construction workspace modifications in an attempt to avoid or reduce impacts to three other vernal pools including B-VP-10 (MP 10.8) along the I-10 Extension and A-VP-04 (MP 14.5) and A-VP-09 (MP 16.0) along the Q-1 System. The result of the assessment is a reroute that will avoid vernal pool B-VP-10 and a reduction in construction ROW width to 75 feet for vernal pool A-VP-09 (MP 16.0) to minimize vegetation clearing. There will be no change in impacts at vernal pool A-VP-04 (MP 14.5) due to existing site conditions. Following construction, Algonquin will monitor all vernal pools affected by the E2W Project in Massachusetts for a period of five years to ensure that these resource areas were properly restored. Please refer to Response 21 above for a further description.

Connecticut

On September 8, 2008, the CTDEP issued a "Notice of Insufficiency" regarding Algonquin's state permit filing. The Notice contained 19 items that required clarification or additional information. One of these items pertained to vernal pools along the E-3 System, and the CTDEP requested additional information on the nature and quality of the pools as well as proposed construction mitigation to minimize impacts to these pools.

In Algonquin's response to the CTDEP, it committed to implementing several construction mitigation measures as well as conducting post-construction monitoring. In general, construction is expected to occur during the summer of 2009 (dry conditions) outside of the breeding window for vernal pool species. For those pools located outside of the construction ROW, sediment barriers will be installed along the edge of the ROW to prevent erosion or sedimentation of the pool during construction. In addition, the sediment barriers will also act an exclusion barrier that will minimize the opportunity for vernal pool species to enter the construction area.

For vernal pools that will be directly affected by construction, the detritus layer including leaves, duff, and branches will be collected and salvaged for restoration purposes. Once construction is completed, the original topography and contours will be restored to pre-construction condition. The FERC requires that all wetland areas be monitored for a period of three years following construction to ensure proper wetland restoration and revegetation. During this monitoring period, the affected vernal pools will also be evaluated to make certain that the pool hydrology is intact. The following sections describe the specific measures that will be implemented for each vernal pool along the E-3 System pipeline.

A1-5 (cont'd)

E3-VP-1 (MP 1.4)
Vernal Pool E3-VP-1 is a moderate quality vernal pool located outside of the construction workspace and will not be affected by construction. Sediment barriers will be installed along the north side of the construction ROW to prevent possible erosion and sedimentation of the pool basin and to deter vernal pool wildlife from entering the construction workspace.

E3-VP-2 (MP 1.4)
Vernal Pool E-3-VP-2 is a low quality vernal pool located on the south side of the construction ROW and would be partially affected by construction. Only the extreme northern fringe of the pool basin will be temporarily affected by construction and the deeper portion of the basin and the better quality habitat will remain untouched. For the basin within the ROW, the detritus layer will be removed and salvaged for restoration. Sediment barriers will be installed along the south edge of the ROW for erosion and sediment control and to act as a barrier to wildlife. This portion of the pool basin is located along the travel lane of the ROW and will not be excavated. Equipment mats will be placed along the affected portion of the pool basin to avoid rutting and soil mixing and compaction. Once construction is completed, the equipment mats will be removed and the pool basin will be restored to preconstruction condition. The salvaged detritus layer will be returned and spread within the pool basin.

E3-VP-3 (MP 4.4)
Vernal Pool E3-VP-3 is ranked as a very high quality habitat and consists of a manmade basin created in the 1950's that has since has become naturalized. A small portion of the south edge of the pool basin is located within the construction ROW; however, impacts to the pool basin will be avoided. Sediment barriers will be installed along the north side of the construction ROW and along the edge of the pool basin to prevent possible erosion and sedimentation of the pool basin and to deter vernal pool wildlife from entering the construction workspace.

E3-VP-4 (MP 7.1)
Vernal Pool E3-VP-4 is a moderate quality and small vernal pool located within a very large wetland complex (Wetland E3-W29). The pool basin was likely created during the installation of the original E-3 System pipeline during the 1950s. The pool basin is located within the travel lane of the construction ROW and will not be excavated. The detritus layer will be removed and salvaged from the pool basin. Equipment mats will be placed along the travel lane and over the pool basin to avoid rutting and soil mixing and compaction. Once construction is completed, the equipment mats will be removed and the pool basin will be restored to preconstruction condition. The salvaged detritus layer will be returned and spread within the pool basin.

E3-VP-5 (MP 7.4)
Vernal Pool E3-VP-5 is ranked as a high quality vernal pool based on the numbers of amphibian egg masses documented during 2007 and 2008. This pool is located entirely within the existing E-3 System construction ROW and was likely created during construction of the original pipeline. There is a temporary outlet that flows southward during high water conditions in the spring to a manmade pond. During construction, the detritus layer within the entire pool basin will be removed and salvaged. Wetland topsoil will also be excavated and segregated. The portion of the pool and wetland along the travel lane will be matted to avoid rutting and soil mixing and compaction. Once construction is completed, the pool basin will be restored to

A1-5 (cont'd)

preconstruction contours. The segregated wetland topsoil will be replaced to the trench line and the salvaged detritus layer will be spread throughout the pool basin.

E3-VP-6 (MP 8.2)
Vernal Pool E3-VP-6 is a high quality vernal pool located well outside of the construction workspace and will not be affected by construction. Sediment barriers will be installed along the north side of the construction ROW to prevent possible erosion and sedimentation of the pool basin and to deter vernal pool wildlife from entering the construction workspace.

E3-VP-7 (MP 9.4)
Vernal Pool E3-VP-7 is a very high quality vernal pool located well outside of the construction workspace and will not be affected by construction. Sediment barriers will be installed along the south side of the construction ROW to prevent possible erosion and sedimentation of the pool basin and to deter vernal pool wildlife from entering the construction workspace.

E3-VP-8 (MP 9.8)
Vernal Pool E3-VP-8 is ranked as a very high quality habitat. A small portion of the south edge of the pool basin is located within the construction ROW; however, the impacts to the pool basin will be avoided. Sediment barriers will be installed along the north side of the construction ROW and along the edge of the pool basin to prevent possible erosion and sedimentation of the pool basin and to deter vernal pool wildlife from entering the construction workspace.

E3-VP-9 (MP 10.0)
Vernal Pool E3-VP-9 is ranked as a moderate quality vernal pool located partially within the existing E-3 ROW. During construction, the detritus layer within the pool basin within the ROW will be removed and salvaged. Wetland topsoil will also be excavated and segregated within the pool basin. Sediment barriers will be installed along the north side of the construction ROW to prevent possible erosion and sedimentation of the remaining pool basin and to deter vernal pool wildlife from entering the construction workspace. Once construction is completed, the pool basin will be restored to preconstruction contours. The segregated wetland topsoil will be replaced to the trench line and the salvaged detritus layer will be spread throughout the pool basin.

As described in Response 21 above, Algonquin has assessed additional construction workspace modifications along the E-3 System in an attempt to avoid or reduce impacts to four vernal pools including E3-VP-2 (MP 1.4), E3-VP-3 (MP 4.4), E3-VP-8 (MP 9.8) and E3-VP-9 (MP 10.0). The construction workspace will be modified to avoid vernal pool E3-VP-2 and every attempt will be made to reduce the construction workspace during construction to avoid impacts to vernal pools E3-VP-3 and E3-VP-8. Vernal pool E3-VP-9 (MP 10.0) is located on the centerline of the existing pipeline and avoiding or minimizing project impacts is not possible. Please refer to Response 21 above for additional details.

Respondent(s): Terrance Doyle, Spectra Energy (617) 560-1417

Algonquin Gas Transmission, LLC (Algonquin)
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Response to the FERC's Draft EIS Recommendations

RECOMMENDATION 23

Algonquin shall file its final MESA application, the comments of the MassNHESP on the final MESA application, and any additional consultation and clearance letters with the Secretary **during the draft EIS comment period**. *(section 4.7.4)*

RESPONSE 23

A1-6 Algonquin will file its MESA application with the MassNHESP during the first quarter of 2009. This application will be prepared in accordance with the requirements of the MESA, M.G.L. c. 131A, and its implementing regulations, 321 CMR 10.00. The scope, content, and format of the application package will be developed based on the MESA Project Review Checklist and the extensive consultation that has taken place between Algonquin and the staff at the MassNHESP.

Respondent(s): Terrance Doyle, Spectra Energy (617) 560-1417

A1-6 This comment is no longer applicable to the amended E2W Project.

Algonquin Gas Transmission, LLC (Algonquin)
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Response to the FERC's Draft EIS Recommendations

RECOMMENDATION 24

Algonquin shall file a site-specific request and justification for each unapproved extra workspace listed in table E-1 in Appendix E of the EIS with the Secretary **during the draft EIS *comment period.*** *(section 4.8.1)*

RESPONSE 24

A1-7 Table R24-1 (*Temporary Extra Workspaces Associated with the HubLine/East to West Project*) in Attachment 2 provides justification for each unapproved extra workspace listed in Table E-1 in Appendix E of the FERC DEIS.

Respondent(s): Terrance Doyle, Spectra Energy (617) 560-1417

Applicant

A1-7 Table E-1 of the draft EIS has been moved to table 4.8.1-3 of the final EIS and has been revised to include Algonquin's justifications for each previously unapproved workspace. Based on our review, we have determined that all of the workspaces listed in table 4.8.1-3 are justified and, therefore, we recommend approval of Algonquin's requests.

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Response to the FERC's Draft EIS Recommendations

RECOMMENDATION 31

Algonquin shall prepare a Dust Control Plan that specifies:

a) the sources of water that would be used for dust control;
b) the anticipated quantities of water that would be required;
c) measures to minimize fish and fish egg entrainment during dust control water withdrawals if a surface water source would be used;
d) the mitigation measures to be used for dust abatement;
e) the performance requirements, if applicable (e.g., visible opacity standards);
f) the individuals with authority to determine when additional dust control measures are necessary; and
g) the individuals with authority to stop work if the contractor does not comply with dust control measures.

The Dust Control Plan shall be filed with the Secretary **during the draft EIS comment period**. *(sections 4.3.2.10 and 4.11.1.3)*

RESPONSE 31

A1-8 | Algonquin's Dust Control Plan for the E2W Project is provided in Attachment 3.

Respondent(s): Terrance Doyle, Spectra Energy (617) 560-1417

Applicant

A1-8 Section 4.11.1.2 has been revised to include a discussion of Algonquin's Dust Control Plan (see Appendix F) and the specific dust abatement measures included in the plan. Section 4.11.1.2 also states that the need to implement dust control measures during construction would be assessed daily by the contractor and the Environmental Inspector (EI). The contractor would be responsible for implementing the appropriate measure(s). The EI would monitor the contractor's compliance with the plan and would have the authority to order corrective action.

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Response to the FERC's Draft EIS Recommendations

RECOMMENDATION 32

Algonquin shall file the specific measures it would implement during construction to minimize diesel combustion emissions and comply with the applicable state diesel emissions standards with the Secretary **during the draft EIS comment period**. *(section 4.11.1.3)*

RESPONSE 32

A1-9

Algonquin will employ best practices when operating construction equipment and will comply with all applicable state regulations regarding equipment operation with a goal to minimize diesel emissions to the extent feasible. A summary of the applicable regulations for each state is provided below:

Massachusetts

Massachusetts Department of Environmental Protection (MassDEP) 310 CMR 7.00: Air Pollution Control - 7.11: U Transportation Media:

(1) *Motor Vehicles*
- (a) *All motor vehicles registered in the Commonwealth shall comply with pertinent regulations of the Registry of Motor Vehicles relative to exhaust and sound emissions.*
- (b) *No person shall cause, suffer, allow, or permit the unnecessary operation of the engine of a motor vehicle while said vehicle is stopped for a foreseeable period of time in excess of five minutes. 310 CMR 17.11 shall not apply to:*
  1. *vehicles being serviced, provided that operation of the engine is essential to the proper repair thereof, or*
  2. *vehicle engaged in the delivery or acceptance of goods, wares, or merchandise for which engine assisted power is necessary and substitute alternate means cannot be made available, or*
  3. *vehicles engaged in an operation for which the engine power is necessary for an associated power need other than movement and substitute alternate power means cannot be made available provided that such operation does not cause or contribute to a condition of air pollution.*

Connecticut

Regulation of Connecticut State Agencies Title 22a section 22a-174-18(b)(3)(c):

Mobile sources. Except as provided in subsection (j) of this section, no person shall cause or allow:
- *(A). Any visible emissions from a gasoline powered mobile source for longer than five (5) consecutive seconds;*
- *(B). Visible emissions from a diesel powered mobile source of a shade or density equal to or darker than twenty percent (20%) opacity for more than ten (10) consecutive seconds,*

A1-9 Section 4.11.1.2 has been revised to include Algonquin's commitment to employ best practices when operating construction equipment and to comply with all applicable Connecticut and New Jersey regulations regarding equipment operation with a goal to minimize diesel emissions to the extent feasible.

The remaining portions of this comment are no longer applicable to the amended E2W Project.

A1-9 (cont'd)

during which time the maximum shade or density shall be no darker than forty percent (40%) opacity; or

(C). A mobile source to operate for more than three (3) consecutive minutes when such mobile source is not in motion, except as follows:

(i). When a mobile source is forced to remain motionless because of traffic conditions or mechanical difficulties over which the operator has no control,

(ii). When it is necessary to operate defrosting, heating or cooling equipment to ensure the safety or health of the driver or passengers,

(iii). When it is necessary to operate auxiliary equipment that is located in or on the mobile source to accomplish the intended use of the mobile source,

(iv). To bring the mobile source to the manufacturer's recommended operating temperature,

(v). When the outdoor temperature is below twenty degrees Fahrenheit (20 degrees F),

(vi). When the mobile source is undergoing maintenance that requires such mobile source be operated for more than three (3) consecutive minutes, or

(vii). When a mobile source is in queue to be inspected by U.S. military personnel prior to gaining access to a U.S. military installation.

Rhode Island

Rhode Island Department of Environment Management, Office of Air Resources, Air Pollution Control Regulation No. 45:

45. RHODE ISLAND DIESEL ENGINE ANTI-IDLING PROGRAM

45.2. Applicability

These regulations apply to any person, entity, owner or operator with control over the operations of diesel engines.

45.3. Diesel motor vehicle engine idling.

No person, entity, owner or operator shall cause, allow or permit the unnecessary idling of the engine of a diesel motor vehicle while said vehicle is stopped for a period of time in excess of five (5) consecutive minutes in any sixty (60) minute period, except as provided in the exemptions listed in section 45.5.

45.4. Non-road diesel engine idling

No person, entity, owner or operator shall cause, suffer, allow or permit the unnecessary idling of non-road diesel engines under its control or on its property.

45.5. Exemptions

Vehicles, diesel engines and non-road diesel engines are exempt from the requirement of this regulation in the following circumstances:

A1-9 (cont'd)

45.5.1. Vehicles that remain motionless due to traffic conditions or at the direction of a law enforcement official.

45.5.2. Vehicles idling when it is necessary to operate defrosting, heating, or cooling equipment to ensure the health or safety of the driver or passengers. In the case of providing heat, the exemption allows idling for up to 15 minutes per hour when temperatures are between 0 degrees and 32 degrees Fahrenheit. Idling for the purpose of providing heat will be allowed as needed when temperatures are below 0 degrees Fahrenheit. A passenger bus may idle a maximum of 15 minutes per hour to maintain passenger comfort while non-driver passengers are onboard whenever temperatures are below 50 degrees Fahrenheit.

45.5.3. Vehicles necessarily idling when the primary propulsion engine is needed to power work-related mechanical or electrical operations other than propulsion (e.g., mixing or processing cargo or straight truck refrigeration). This exemption does not apply when idling for cabin comfort or to operate non-essential on-board equipment.

45.5.4. Non-road diesel engines may idle when the engine idles for maintenance, servicing, repairing, or diagnostic purposes, if idling is required for such activity. In addition, a non-road diesel engine may idle as part of a state or federal inspection to verify that all equipment is in good working order, if idling is required as part of the inspection.

45.5.5. An occupied vehicle with a sleeper berth compartment may idle for purposes of air conditioning or heating during federally mandated rest or sleep period. This exemption shall expire on July 1, 2010.

45.5.6. Vehicles may idle when the primary propulsion engine idles for maintenance, servicing, repairing, or diagnostic purposes, if idling is required for such activity. In addition, a vehicle may idle as part of a state or federal inspection to verify that all equipment is in good working order, provided idling is required as part of the inspection.

45.5.7. Police, fire, rescue, ambulance and other public safety vehicles, military vehicles, armored vehicles, other emergency or law enforcement vehicle, or any vehicle being used in an emergency capacity, may idle while in an emergency or training mode and not for the convenience of the vehicle operator. Also, an armored vehicle may idle when a person remains inside the vehicle to guard the contents, or while the vehicle is being loaded or unloaded.

45.5.8. Airfield maintenance vehicles while actively being used to achieve their intended purpose on a state-owned or operated airport.

45.5.9. Diesel powered engines or vehicles that must continuously operate while stationary in order to perform their intended function, in accordance with all

A1-9 (cont'd)

applicable regulations (e.g., an electricity generator which is actively being used to power equipment on-site).

45.5.10. Operating a vehicle mounted auxiliary power unit or generator set as a means to heat, air condition or provide electrical power as an alternative to idling the vehicle's main engine is not considered idling.

New Jersey

New Jersey Administrative Code Title 7, Chapter 27, subchapter 14:
CONTROL AND PROHIBITION OF AIR POLLUTION FROM DIESEL-POWERED MOTOR VEHICLES

7:27-14.3 General prohibitions

(a) No person shall cause, suffer, allow, or permit the engine of a diesel-powered motor vehicle to idle for more than three consecutive minutes if the vehicle is not in motion, except:

1. *A motor vehicle that has been stopped for three or more hours may idle for up to 15 consecutive minutes when the ambient temperature is below 25 degrees Fahrenheit; and*
2. *A diesel bus while it is actively discharging or picking up passengers may idle for 15 consecutive minutes in a 60-minute period.*

(b) The provisions of (a) above shall not apply to:

1. *Any motor vehicle idling in traffic, or a motor vehicle other than a school bus idling in a queue of motor vehicles, that are intermittently motionless and moving because the progress of the motor vehicles in traffic or the queue has been stopped or slowed by the congestion of traffic on the roadway or by other conditions over which the driver of the idling motor vehicle has no control;*
2. *A motor vehicle whose primary power source is utilized in whole or in part for necessary and definitively prescribed mechanical operation other than propulsion. This use includes, but is not limited to, operating lift gate pumps and controlling cargo temperature. This exemption does not apply to passenger compartment heating or passenger compartment air conditioning;*
3. *A motor vehicle being or waiting to be examined by a State or Federal motor vehicle inspector;*
4. *Vehicles that are actively performing emergency services. Examples include fire vehicles, police vehicles, public utility vehicles, military tactical vehicles and snow removal vehicles, during the time that such vehicles are actively performing emergency services;*
5. *A motor vehicle while it is being repaired or serviced, provided that operation of the engine is essential to the proper repair or service;*
6. *Subject to (b)7i below, on or before April 30, 2010, a motor vehicle, manufactured with a sleeper berth, while it is being used, in a non-residentially zoned area, by the vehicle's operator for sleeping or resting, unless the vehicle is equipped with a functional auxiliary power system designed in whole or in part to*

A1-9 (cont'd)

maintain cabin or sleeper berth comfort or to mitigate cold weather start-up difficulties;

7. *Beginning May 1, 2010, a vehicle equipped with a sleeper berth, which vehicle is equipped with a model year 2007 or newer engine, or has been retrofitted with a diesel particulate* filter that is connected and properly functioning.
   i. *If the Commissioner, after consulting with the New Jersey Department of Transportation and the State Police, determines that public safety would be adversely affected if the exemption in (b)7 above were to take effect on May 1, 2010, the Commissioner may, by notice published in the New Jersey Register on or before May 1, 2010, delay the operative date of the exemption in (b)7 above, and extend the exemption in (b)6 above, for up to one year, but in no case may the exemption of (b)6 above be extended beyond April 30, 2011; or*
8. *The operation of technology designed to reduce engine idling, such as auxiliary or alternate power units ("APUs"), generator sets, and bunk heaters, provided the vehicle's main engine is not operating.*

(c) Beginning May 1, 2008, no person shall cause, suffer, allow, or permit the engine of a diesel-powered motor vehicle to idle for more than three consecutive minutes when that vehicle is parked in a parking space with available electrification technology.

(d) In no case shall the provisions of (a) and (b) above relieve any person from compliance with N.J.A.C. 7:27-5, Prohibition of Air Pollution, or any other applicable local, State, or Federal law.

(e) No person shall cause, suffer, allow or permit any emission control apparatus or element of design installed on any diesel-powered motor vehicle or diesel engine to de disconnected, detached, deactivated, or in any other way rendered inoperable or less effective, in respect to limiting or controlling emissions than it was designed to be by the original equipment or vehicle manufacturer, except for the purposes of diagnostics, maintenance, repair or replacement and only for the duration of such operations.

(f) No person shall cause, suffer, allow or permit any retrofit device or any part thereof, or any closed crankcase ventilation system or any part thereof, installed on any diesel-powered motor vehicle pursuant to N.J.S.A. 26:2C-8.26 et seq. and N.J.A.C. 7:27-32 to be disconnected, detached, deactivated, or in any other way rendered inoperable or less effective, in respect to limiting or controlling emissions, than it was designed to be by the original retrofit device or closed crankcase ventilation system manufacturer, except for the purposes of diagnostics, maintenance, repair or replacement and only for the duration of such operations.

New York

Subpart 217-3: Idling Prohibition For Heavy Duty Vehicles:

§217-3.1 Applicability

A1-9 (cont'd)

This Part shall apply to all on-road heavy duty vehicles propelled by diesel fueled and non-diesel fueled engines excluding marine vessels. Heavy duty vehicle means a vehicle that has a gross vehicle weight rating ("GVWR") exceeding 8,500 pounds and is designed primarily for transporting persons or properties.

§217-3.2 Prohibitions

No person who owns, operates or leases a heavy duty vehicle including a bus or truck, the motive power for which is provided by a diesel or non-diesel fueled engine or who owns, leases or occupies land and has the actual or apparent dominion or control over the operation of a heavy duty vehicle including a bus or truck present on such land, the motive power for which said heavy duty vehicle is provided by a diesel or non-diesel fueled engine, shall allow or permit the engine of such heavy duty vehicle to idle for more than five consecutive minutes when the heavy duty vehicle is not in motion, except as otherwise permitted by section 217-3.3 of this Subpart.

§217-3.3 Exceptions

The prohibitions of section 217-3.2 of this Subpart shall not apply when:

(a) A diesel or non-diesel fueled heavy duty vehicle including a bus or truck is forced to remain motionless because of the traffic conditions over which the operator thereof has no control.

(b) Regulations adopted by Federal, State or local agencies having jurisdiction require the maintenance of a specific temperature for passenger comfort. The idling time specified in section 217-3.2 of this Subpart may be increased, but only to the extent necessary to comply with such regulations.

(c) A diesel or non-diesel fueled engine is being used to provide power for an auxiliary purpose, such as loading, discharging, mixing or processing cargo; controlling cargo temperature; construction; lumbering; oil or gas well servicing; farming; or when operation of the engine is required for the purpose of maintenance.

(d) Fire, police and public utility trucks or other vehicles are performing emergency services.

(e) Trucks owned or operated by persons engaged in mining and quarrying are used within the confines of such person's property.

(f) A diesel fueled truck is to remain motionless for a period exceeding two hours, and during which period the ambient temperature is continuously below 25°F.

A1-9 (cont'd)

(g) A heavy duty diesel vehicle, as defined in subdivision 217-5.1(o) of this Part, that is queued for or is undergoing a state authorized periodic or roadside diesel emissions inspection pursuant to Subpart 217-5 of this Part.

(h) A hybrid electric vehicle, as defined in subdivision 217-5.1(r) of this Part, idling for the purpose of providing energy for battery or other form of energy storage recharging.

(i) Heavy duty vehicles used for agricultural purposes on a farm.

(j) Electric powered vehicles.

Respondent(s): Terrance Doyle, Spectra Energy (617) 560-1417

Algonquin Gas Transmission, LLC (Algonquin)
Docket No. CP08-420-000

Response to the FERC's Draft EIS Recommendations

RECOMMENDATION 35

Algonquin shall provide information related to the proposed remote blow-off valve sites that includes:

a) the specific location of all proposed remote blow-off valve sites and their proximity to nearby NSAs;
b) an estimate of the potential GHG emissions from these facilities;
c) if needed, a description of proposed mitigation measures to ensure that these emissions would comply with the MEEA's Greenhouse Gas Emissions Policy and Protocol;
d) an estimate of the potential noise impact of the remote blow-off valves on nearby NSAs, including estimated blowdown frequency and duration and estimated noise levels at NSAs during blowdown events; and
e) a comparison of the estimated noise levels to applicable noise ordinances, and, if needed, a description of proposed mitigation measures to ensure that noise resulting from remote blowdown activities would comply with federal and local noise ordinances, including the FERC's 55 dBA Ldn.

Algonquin shall file this information with the Secretary during the draft EIS comment period. *(sections 4.11.1.5 and 4.11.2.3)*

RESPONSE 35

A1-10

Noise

The use of a pipeline blow-off, remote or otherwise, to evacuate natural gas from a pipeline is very infrequent and is only utilized during maintenance if the pipeline has to be cut or during emergency situations. The gas release and associated noise is very temporary usually only lasting for approximately one hour. For each remote blow-off event, Algonquin will ensure that the resulting noise level during the blow-off will comply with federal and local noise ordinances, including the FERC's 55 dBA (Ldn). If necessary, a silencer will be employed in addition to the filter/separator to achieve the required noise level at nearby noise sensitive areas.

Greenhouse Gas ("GHG")

In most instances, natural gas releases from the remote blow-off valve sites would be a rare, non-routine maintenance activity that requires replacement of a section of the pipeline. This type of maintenance is expected to be required only every 7 to 10 years. Prior to replacement, the section of the pipeline is isolated (sections between valve sites) and the pressure in the pipe is reduced to the maximum extent practical prior to evacuating the natural gas through a blow-off valve. To provide a worst-case estimate of GHG emissions associated with this activity, it was assumed that the largest pipeline segments for the I-10 Extension, Q-1 System, and E-3 System would be blown-off in a single year (i.e., the segments with the greatest volume of natural gas; MP 1.3 to MP 7.17 for the I-10, MP 12.2 to MP 19.7 for the Q-1, and MP 2.96 to MP 7.37 for the E-3). Given the rarity of this type of maintenance activity, this represents a very conservative scenario for estimating GHG emissions for any given year. Table R35-1 below summarizes the amount of natural gas released and the GHG emissions expressed as CO_2e

Applicant

A1-10 Section 4.11.1.2 has been revised to include the exact location of the one proposed remote blow-off valve (i.e., MP 0.0 of the E-3 System Replacement), as well as an estimate of the potential greenhouse gas emissions from the remote blow-off valve.

Section 4.11.2.1 has been revised to include the exact location of the one proposed remote blow-off valve, as well as to identify the applicable Connecticut noise regulation based upon nearby noise receptor class.

Section 4.11.2.2 has been revised to state Algonquin's commitment to comply with federal, state, and local noise ordinances, and, if necessary, to employ a silencer in addition to the proposed filter/separator to ensure the noise level at nearby noise-sensitive areas associated with blowdown events does not exceed the 51 decibels on the A-weighted scale limit set by the State of Connecticut.

The remaining portions of this comment are no longer applicable to the amended E2W Project.

A1-10 (cont'd)

calculated using the Intergovernmental Panel on Climate Change Fourth Assessment Report Global Warming Potentials.

Table R35-1
Summary of the Amount of Natural Gas Released and the GHG Emissions

Facility/State	Blow-off (MCF (1))	CH_4 Released (tons)	CO_2e (2) (tons)
I-10 Extension, MA	4,280	83	2,090
Q-1 System, MA	5,100	99	2,490
E-3 System, CT	395	8	193
Total	**9,775**	**190**	**4,773**
Project (tons/yr)	**1,396**	**27**	**682**

(1) MCF is 1000 ft³.
(2) CO_2e calculated using the Intergovernmental Panel on Climate Change Fourth Assessment Report Global Warming Potentials.

As a worst-case estimate of the GHGs that would be released in a single year, Algonquin has estimated the GHG emissions for all three pipeline facilities to total 4,773 tons. This is very conservative as it would be highly unlikely for this maintenance activity to occur in all three pipeline facilities in a 12-month period. To estimate a projected annual average, the total annual value was divided by 7 years as it is expected that this activity would occur approximately every 7 to 10 years. The projected annual average GHG emissions are 682 tons/year. This is very low, for example, compared to the Rehoboth Compressor Station operations (see Table 4.11.1-9 of the FERC DEIS) or to the GHG emissions projected for construction activities (see Table 4.11.1-8 of the FERC DEIS).

The potential GHG emissions associated with the remote blow-offs are not subject to MEEA's Greenhouse Gas Emissions Policy and Protocol as implemented by MEEA's MEPA ENF Certificate, which applied that policy only to the compressor station emissions requiring an air plan approval from the MassDEP.

Respondent(s): ***Terrance Doyle, Spectra Energy (617) 560-1417***

Algonquin Gas Transmission, LLC (Algonquin)
Docket No. CP08-420-000

Response to the FERC's Draft EIS Recommendations

RECOMMENDATION 36

Algonquin shall file the following information related to the collocation of its facilities with the NSTAR facilities:

a) revised alignment sheets depicting a buffer of at least 5 feet between construction work areas and all NSTAR towers;
b) the results of its future geotechnical investigation of the NSTAR right-of-way and any revisions to its estimated locations where blasting would likely be necessary in or adjacent to NSTAR's right-of-way;
c) site-specific blasting plans for those areas where the pipelines would be 50 feet or less from an existing tower foundation, including the subsurface extent of the foundations;
d) site-specific construction plans for those areas where the pipelines would be 50 feet or less from an existing tower foundation, including the subsurface extent of the foundations, and where special construction procedures would be used to protect the integrity of NSTAR's facilities; and
e) an update of its ongoing communications with NSTAR regarding safety and reliability issues, including any modifications to proposed construction methods, right-of-way access issues, and electrical risk mitigation measures that result from these discussions.

Algonquin shall file this information with the Secretary during the draft EIS comment period. *(section 4.12.2)*

RESPONSE 36

A1-11

a) The requested information has been reflected on the latest set of alignment sheets filed under separate cover (see Response 18).

b) Table R36-1 in Attachment 4, is a summary of E2W Project geotechnical coring data that was accomplished in November and December of 2008. The cores were taken to 12 feet below grade, which is greater than the assumed depth required to construct the 36-inch-diameter pipeline. The cores confirmed the bedrock data that was supplied in Resource Report 6. However, based on the coring data, Algonquin expects to encounter bedrock at MP 2.76 and MP 7.87 on the I-10 Extension, which were not included as areas of bedrock in Resource Report 6. Algonquin's geotechnical consultant performed seismic testing for rock at selected locations along the I-10 Extension. The results of this testing will be filed with the Secretary once they are available.

c) Algonquin has received proposals from two blasting consultants to review Algonquin's Blasting Plan as provided to FERC and to make recommendations should any blasting be required within 50 feet of any tower. These proposals are currently under review and a consultant will be engaged prior to the start of the work. Therefore, Algonquin has not yet prepared any site specific blasting plans. Once prepared, the Project Blasting Plan will be provided to NSTAR and the Commission.

d) Algonquin would apply the same site-specific construction plans as provided in its September 8, 2008 Supplemental Responses to the Staff's August 20, 2008 Environmental Information Request. However, a revised table of Tower Locations within

A1-11 This comment is no longer applicable to the amended E2W Project.

A1-11 (cont'd)

50' of Pipeline on the I-10 Extension and the Q-1 System (Table R36-2) is included in Attachment 5. Please note that due to modifications made to date, there has been a reduction in the number of locations where this occurs.

e) NSTAR and Algonquin have continued communications and NSTAR has completed its review of the proposed alignment changes on the I-10 Extension. Based on these alignment changes, NSTAR has agreed that it appears technically feasible to locate a future electric transmission line in the center of the ROW, notwithstanding the presence of the Algonquin pipeline. Copies of NSTAR correspondence are included in Attachment 5. There were initially six (6) locations that NSTAR identified as an impediment to possible future expansion of their system. The following MP's for these areas of concern include:

- MP 1.6 to MP 1.9;
- MP 2.8 to MP 3.0;
- MP 7.6 to MP 7.8;
- MP 8.1 to MP 8.2;
- MP 8.4 to MP 8.5; and
- MP 8.8 to MP 9.4.

There are no NSTAR routing issues on the Q-1 or the E-3 Systems. Working with NSTAR, Algonquin was able to make adjustments to the I-10 Extension pipeline route to allow NSTAR to place future towers between existing towers. These modifications can be seen on the following alignment sheets:

- Sheet 1053, MP 1.7;
- Sheet 1056, MP 2.8;
- Sheet 1066, MP 7.8;
- Sheet 1067, MP 8.2;
- Sheet 1067, MP 8.4;
- Sheet 1069, MP 9.0;
- Sheet 1069, MP 9.2;
- Sheet 1069, MP 9.3; and
- Sheet 1069, MP 9.4.

Algonquin is currently negotiating with NSTAR over the remaining non-technical issues associated with sharing the I-10 Extension ROW and will notify the Commission when these negotiations are complete.

Algonquin has engaged an experienced consultant to design the AC Mitigation and the Cathodic Protection for the I-10 Extension and Q-1 System pipelines. The consultant is currently reviewing the data supplied by NSTAR and continuing the collection of field data (i.e., soil resistivity) to perform their analysis. Once this study is complete, the results will be shared with NSTAR.

Respondent(s): ***Terrance Doyle, Spectra Energy (617) 560-1417***

Algonquin Gas Transmission, LLC (Algonquin)
Docket No. CP08-420-000

Response to the FERC's Draft EIS Recommendations

CLARIFICATION 1

On Page 4-131 of the DEIS, FERC states that: "Algonquin has stated that it would abandon pipelines according to the terms of the existing easement agreements. If an existing easement agreement does not address abandonment, Algonquin would negotiate with landowners regarding appropriate terms for abandonment. Algonquin has also stated that it would retain or amend its existing easement rights in areas where the pipeline is abandoned. In situations where Algonquin determines to abandon the pipeline by removal, it would determine whether to release the existing easement or modify the easement. We do not believe Algonquin has been clear as to the final disposition of easements along the sections of pipeline that would be abandoned. It is the Commission's practice that all landowners are provided the opportunity to request that abandoned pipelines be removed and that pipeline companies relinquish all surface rights back to the landowners for easements in which there are no longer in-service pipelines in the right-of-way. We will seek clarification on this issue during the draft EIS comment period."

RESPONSE TO CLARIFICATION 1

A1-12 It is Algonquin's practice to work closely with landowners regarding the abandonment of its pipelines. Typically, a section of pipeline is abandoned in place due to a reroute of the existing pipeline. Reroutes on lift and relay projects occur for a variety of reasons. Typically, the abandoned section of pipeline is left in place to reduce overall project related impacts. This is particularly true when the abandonment involves wetland, waterbody or road crossings. In accordance with Algonquin's procedures, the abandoned pipe is grouted and capped on both ends. Upon abandonment of a portion of its pipeline, Algonquin will negotiate with each individual landowner to ensure that their concerns are met and relinquish its easement where appropriate.

Respondent(s): ***Terrance Doyle, Spectra Energy (617) 560-1417***

Applicant

A1-12 Section 4.8.1 has been revised to include additional discussion of the abandonment locations and information regarding Algonquin's interactions with landowners regarding abandonment of the pipeline. A discussion of the abandonment procedures is provided in section 2.3.1.

The attachments to this comment letter are too voluminous to include in this EIS. They are available for public inspection from the FERC's Office of External Affairs at 1-866-208-FERC or on the FERC's Internet website (www.ferc.gov) using the eLibrary link. Click on the eLibrary link, click on "General Search," and enter the docket number excluding the last three digits in the Docket Number field (i.e., CP08-420). Select a date range of December 19, 2008. For assistance, please contact FERC Online Support at FERCOnlineSupport@ferc.gov or toll free at 1-866-208-3676, or for TTY, contact (202) 502-8659. **The Category/Accession number for this submittal is 20081219-4015.**

APPENDIX L

SUBJECT INDEX

APPENDIX L

SUBJECT INDEX