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Tennessee
Gas Pipeline
an El Paso company

2004 JAN 30 P 3:20

January 30, 2004

FEDERAL ENERGY
REGULATORY COMMISSION

Ms. Magalie R. Salas, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

ORIGINAL

Re: Tennessee Gas Pipeline Company
Tewksbury-Andover Project
Docket No. CP04-60-000

Dear Ms. Salas:

Tennessee Gas Pipeline Company ("Tennessee"), pursuant to the Natural Gas Act and Sections 157.205(b), 157.208(b)(2), and 157.211(a)(2) of the Federal Energy Regulatory Commission's ("Commission") Rules and Regulations thereunder, hereby submits an original and seven (7) copies of an application ("Application") requesting authorization under its blanket certificate granted by the Commission's order issued September 1, 1982 at Docket No. CP82-413 to construct a lateral and delivery point in Middlesex and Essex Counties, Massachusetts. An electronic copy of the submittal is also enclosed.

In light of heightened security concerns regarding the disclosure of detailed energy infrastructure information, Tennessee has segregated certain of its Exhibits, which include alignment sheets, flow diagrams, and other detailed maps showing the location of the facilities. The items being filed herein are organized pursuant to 18 C.F.R. §§ 375 and 388, and the Commission's Final Rule in Docket Nos. RM02-4-000, PL02-1-000, Order No. 630, Critical Energy Infrastructure Information ("CEII") as described below.

Volume 1: Public

Letter of Transmittal, Prior Notice Text, Federal Register Notice, Exhibit A, Exhibit B - Environmental Report (excluding Resource Report 4) with Selected Appendices, Exhibit C, and Diskette

Volume 2: Non-Internet Public

7.5 Minute Series USGS Maps, Aerial Alignment Sheets Showing the Location of the Project, and Other Oversized Appendices

Volume 3: Privileged and Confidential – Do Not Release
Cultural Resources (Resource Report 4)

Volume 4: CEII – Do Not Release
Exhibit D - Flow Diagrams for Proposed Facilities

Ms. Magalie R. Salas, Secretary

January 30, 2004

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Tennessee respectfully requests: (1) that the information herein submitted in Volume Two not be placed on the internet; and (2) that the information herein submitted in Volumes Three and Four be accorded privileged and confidential treatment pursuant to 18 C.F.R. § 388.112.

Any questions concerning the enclosed filing should be addressed to the undersigned or to Ms. Cynthia Hornstein Roney at (832) 676-3535.

Respectfully submitted,

TENNESSEE GAS PIPELINE COMPANY

By



Jacques A. Hodges

Attorney

(832) 676-5509

(832) 676-2251 (fax)

Enclosures

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2004 JAN 30 P 3 21

FEDERAL ENERGY
REGULATORY COMMISSION



**Tennessee
Gas Pipeline**
an El Paso company

Docket Number CP04 60-000

***FERC 45-DAY PRIOR NOTICE
APPLICATION AND
ENVIRONMENTAL REPORT***

**VOLUME I
(Internet Public)
Application and Exhibits
Resource Reports
Appendices A-I**

***Tewksbury – Andover Lateral Project
Tennessee Gas Pipeline***

***Tewksbury and Andover,
Massachusetts***

January 2004

**COLER &
COLANTONIO ^{LLC}**
ENGINEERS AND SCIENTISTS

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**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

2004 JAN 30 P 3:20

**FEDERAL ENERGY
REGULATORY COMMISSION**

In the Matter of)

Tennessee Gas Pipeline Company)

Docket No. CP04-42-000

**APPLICATION UNDER BLANKET AUTHORIZATION
PRIOR NOTICE PROCEDURES**

Pursuant to Sections 157.205(b) and 157.208(b)(2) of the Regulations of the Federal Energy Regulatory Commission ("Commission") and blanket authority granted in Docket No. CP82-413-000 on September 1, 1982¹, Tennessee Gas Pipeline Company ("Tennessee") hereby files this prior notice request to construct, own, and operate a lateral and pursuant to Section 157.211(a)(2) of the Commission's regulations and its blanket certificate, Tennessee seeks authority to construct, own, and operate a delivery meter station. The facilities will allow Tennessee to implement firm transportation service for Bay State Gas Company ("Bay State") and the Wyeth BioPharma business unit of Wyeth Pharmaceuticals, Inc. ("Wyeth"). The project is hereinafter referred to as the "Tewksbury-Andover Lateral" or "the Project." In support of this application, Tennessee states as follows:

¹ 20 FERC ¶ 62,409 (1982).

I.

IDENTITY OF APPLICANT

The exact legal name of Tennessee is Tennessee Gas Pipeline Company. Tennessee is a corporation organized and existing under the laws of the State of Delaware. Tennessee's principal place of business is located at 9 E. Greenway Plaza, Houston, Texas 77046. The names, titles, mailing addresses, and telephone and facsimile numbers of the persons designated to receive service and to whom communications concerning this application are to be addressed are as follows:

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(*Persons designated for service in accordance with Rule 203, 18 C.F.R. § 385.203, of the Commission's Rules of Practice and Procedure.) Tennessee requests that the Commission waive Rule 203(b)(3) to allow designated service to four persons.

II.

DESCRIPTION OF FACILITIES AND PURPOSE

Pursuant to Section 157 and its blanket certificate, Tennessee requests authority to construct, own, and operate a lateral and meter station in Middlesex and Essex Counties, Massachusetts. The Project facilities will allow Tennessee to implement firm transportation services for Bay State and Wyeth.

The lateral consists of approximately 5.31 miles of eight-inch pipeline commencing at a tap to be located at milepost 270B-102+1.53 on Tennessee's existing Concord Lateral in Middlesex County, Massachusetts. The lateral will be constructed in an easterly direction, predominantly within an existing easement corridor of the New England Power Company, and will terminate at Wyeth's manufacturing/research facility in the town of Andover in Essex County, Massachusetts. Tennessee will construct the new lateral using eight-inch pipe with 0.250, 0.322, and 0.500-inch wall thicknesses with an established maximum allowable operating pressure (MAOP) of 1440 psig. Appurtenant facilities for in-line inspection, electric current mitigation, and cathodic protection will be installed concurrent with construction of the lateral. The meter skid that will connect to Bay State's distribution system will be located at Wyeth's facility and will be designed to deliver up to 25,000 Dth per day. The meter facilities will include one six-inch ultrasonic and one two-inch turbine meter, chromatograph, electronic gas measurement equipment, communications equipment, and other minor appurtenances. The estimated cost of the Project is \$7,321,000, excluding allowance for funds used during construction. Bay State will reimburse Tennessee \$72,450 for the cost of the "tap

facilities” as defined in the general terms and conditions of Tennessee’s FERC Gas Tariff. Tennessee will finance the remaining cost of the Project with funds on hand.

A map of the Project location in relation to Tennessee’s existing facilities is included as Exhibit A.

III.

PUBLIC CONVENIENCE AND NECESSITY

The Project facilities are necessary for Tennessee to provide requested firm transportation service to Bay State and to Wyeth. Bay State is a local distribution company with existing facilities located in the vicinity of the Project. Bay State has executed a precedent agreement for 17,000 Dth/day of firm transportation service commencing as soon as the facilities described herein are constructed and ready for service and continuing thereafter for an initial term of ten years. The agreement provides for service on the lateral. In addition, Tennessee has executed a firm transportation agreement with Wyeth for 14,000 Dth/day of FT-IL service on the Tewksbury-Andover lateral for a twenty-year period commencing as soon as the facilities described herein are constructed and ready for service. Bay State will transport Wyeth’s gas from the Tennessee delivery point to Wyeth’s facility. Therefore, the Project will not result in a bypass of Bay State’s local distribution system.²

² Tennessee currently has an executed precedent agreement with Bay State, which memorializes a project that serves both Bay State and Wyeth. If the precedent agreement is not terminated, Tennessee and Wyeth will amend Wyeth’s FT-IL Agreement to reflect a volume of 8,000 Dth/d. If, however, the precedent agreement is terminated, then Tennessee will continue to construct the Project as contemplated herein and Wyeth will take 14,000 Dth/d of service from Tennessee.

IV.

ENVIRONMENTAL MATTERS

Tennessee encloses herewith as Exhibit B, the required concise analysis discussing the relevant issues outlined in Section 380.12 of the Commission's regulations pursuant to the requirements of Section 157.208(b)(9). Tennessee's analysis supports the conclusion that these actions do not comprise a major federal action significantly affecting the quality of the human environment.

Full-size USGS 7-1/2 minute series topographic maps are enclosed herewith in a separate Volume II in accordance with the requirements of Section 157.208(c)(3).

The information concerning cultural resources is included in a separate Volume III, marked as "Contains Privileged and Confidential Information – Do Not Release."

V.

IMPACT ON PEAK DAY DELIVERIES

The installation of these facilities will not impact Tennessee's annual deliveries or peak day operations. Tennessee includes, as Exhibit D in a separate Volume IV, marked as "Critical Energy Infrastructure Information – Do Not Release," a flow diagram for the proposed facilities, which reflects daily design capacity and daily operating pressures, as required by Sections 157.208(c)(5) and 157.211(b)(5) of the Commission's regulations.

VI.

MISCELLANEOUS

Tennessee herewith submits its verified statement that the Project complies with the requirements of 18 C.F.R., Part 157, Subpart F. Pursuant to Section 2.55(a)(2)(ii) of the Commission's regulations, which requires advance notice of the installation of auxiliary and appurtenant facilities that are installed "on or at the same time as" proposed facilities, Tennessee includes as Exhibit C a list of appurtenant facilities associated with the Project. All affected landowners have been previously notified of the Project by first class mail in accordance with Section 157.203(d) of the Commission's Regulations (18 C.F.R. §157.203) and will receive a supplemental notice within three business days following assignment of a docket number to the instant application.

VII.

FORM OF NOTICE

Included with this filing is a form of notice suitable for publication in the Federal Register as required by Section 157.7(b) of the Commission's Regulations, 18 C.F.R. § 157.7(b). In accordance with Section 2011 of the Commission's Regulations, 18 C.F.R. § 385.2011, included with this filing is a computer diskette containing the filing in electronic form. The undersigned submits that the paper copies contain the same information as the electronic media, that the undersigned has read and knows the content of the paper copies, and that the contents as set forth herein are true to the best knowledge, information, and belief of the undersigned based on representations made by Tennessee personnel.

VIII.

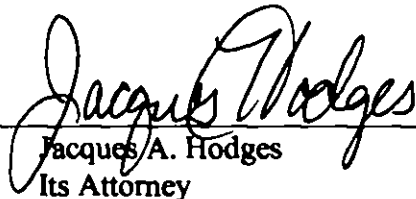
CONCLUSION

WHEREFORE, Tennessee requests that the Commission, after giving public notice of this filing, allow Tennessee to construct these facilities as proposed herein in order to facilitate natural gas service to Bay State and Wyeth.

Respectfully submitted,

TENNESSEE GAS PIPELINE COMPANY

By



Jacques A. Hodges
Its Attorney

9 E. Greenway Plaza
Houston, Texas 77046
(832) 676-5509

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

In the Matter of

§
§
§

Docket No. CP04-____-000

Tennessee Gas Pipeline Company

**NOTICE OF REQUEST UNDER
BLANKET CERTIFICATE PRIOR NOTICE PROCEDURE**

Take notice that on January __, 2004, Tennessee Gas Pipeline Company ("Tennessee"), a Delaware corporation, whose mailing address is 9 E. Greenway Plaza, Houston, Texas 77046, filed an application pursuant to Sections 157.205, 157.208 and 157.211 of the Federal Energy Regulatory Commission's ("Commission") Regulations (18 CFR §§ 157.205, 157.208, and 157.211) under the Natural Gas Act, for authority to construct a lateral pipeline and delivery point to facilitate gas transportation services to a new delivery point in Massachusetts. Tennessee proposes to perform this activity under its blanket certificate issued in Docket No. CP82-413-000.

Tennessee seeks authority to construct 5.31 miles of eight-inch lateral pipeline from its Concord Lateral in Middlesex County eastward to a new delivery point in Essex County. Tennessee estimates that the project will cost approximately \$7,321,000, excluding allowance for funds used during construction.

Tennessee's request states that the lateral pipeline and delivery point are required to provide firm service of 17,000 Dth/day requested by Bay State Gas Company and an additional 8,000 Dth/day requested by Wyeth Pharmaceuticals, Inc. Tennessee further states that all affected landowners have been previously notified of the Project by first class mail in accordance with Section 157.203(d) of the Commission's Regulations (18 C.F.R §157.203) and will receive a supplemental notice within three business days following assignment of a docket number to the instant application.

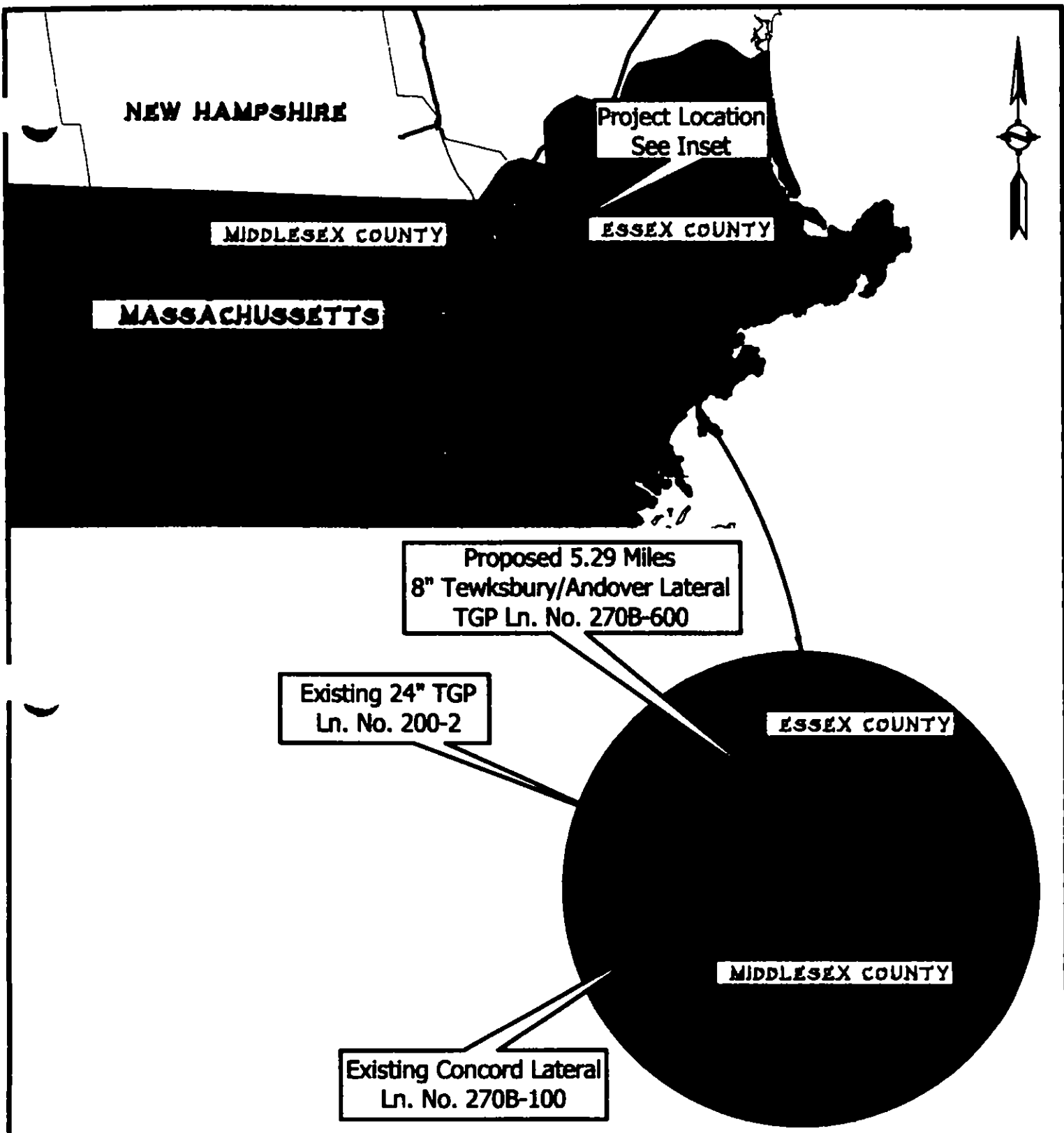
Tennessee asserts that, based upon its environmental review, the Project does not constitute a major federal action significantly affecting the quality of the human environment and subject to the requirements of the National Environmental Policy Act of 1969.

Any questions concerning this application may be directed to Mr. Jacques A. Hodges, Attorney, Tennessee Gas Pipeline Company, 9 East Greenway Plaza, Houston, Texas 77046, at (832) 676-5509 or fax (832) 676-2251 or Ms. Cynthia Hornstein Roney, Certificates & Regulatory Compliance, at (832) 676-3535 or fax (832) 676-2231.

This filing is available for review at the Commission or may be viewed on the Commission's Web site at <http://www.ferc.gov>, using the "eLibrary" link. Enter the docket number, excluding the last three digits, in the docket number field to access the document. For assistance, please contact FERC Online Support at OnlineSupport@ferc.gov or call toll-free at (866)206-3676, or, for TTY, contact (202)502-8659. Comments, protests, and interventions may be filed electronically via the Internet in lieu of paper. See 18 CFR 385.2001(a)(1)(iii) and the instructions on the Commission's Web site under the "e-Filing" link. The Commission strongly encourages intervenors to file electronically.

Any person or the Commission's staff may, within forty-five days after issuance of the instant notice by the Commission, file pursuant to Rule 214 of the Commission's Procedural Rules (18 CFR 385.214) a motion to intervene or notice of intervention and pursuant to Section 157.205 of the Regulations under the Natural Gas Act (18 CFR 157.205) a protest to the request. If no protest is filed within the time allowed therefor, the proposed activity shall be deemed to be authorized effective the day after the time allowed for filing a protest. If a protest is filed and not withdrawn within thirty days after the time allowed for filing a protest, the instant request shall be treated as an application for authorization pursuant to Section 7 of the Natural Gas Act.

Magalie Roman Salas
Secretary



**NON-INTERNET PUBLIC
FERC SUBMITTAL**

LEGEND

- Existing Pipe
- Existing Concord Lateral
- Proposed Tewksbury/Andover Pipeline

ENG. RECORD		DATE
DRAWN BY:	MFL	11/98
DRAWING APPROVAL		
PROJECT APPROVAL		
SURVEY DATE:		
SCALE: N.T.S.		
PROJECT ID: 002304		
FILE NAME: 0300-0000		



**PROPOSED NATURAL GAS PIPELINE
TEWKSBURY/ANDOVER LATERAL**

MIDDLESEX & ESSEX COUNTIES, MASSACHUSETTS

DWG. NO. **TA-E12-270B-600-MAP**

NO.	DATE	BY	REVISION	PROJ. ID	APPR.
REVISIONS					



Docket Number CP04_____

ENVIRONMENTAL REPORT
Accompanying
FERC 45-Day Prior Notice Application

VOLUME I
(Internet Public)
Resource Reports
Appendices A - I

Tewksbury – Andover Lateral Project
Tennessee Gas Pipeline

Tewksbury and Andover,
Massachusetts

January 2004

**COLER &
COLANTONIO[®]**
ENGINEERS AND SCIENTISTS

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LIST OF ACRONYMS

AC	Alternating Current
APE	Area of Potential Effect
ATWS	Additional Temporary Work Space
CFR	Code of Federal Regulations
CI	Chief Inspector
CMR	Code of Massachusetts Regulations
CO	Carbon Monoxide
CRP	Conservation Resource Protection
DBH	Diameter at Breast Height
DOT	Department of Transportation
Dth/d	Dekatherms Per Day
EGM	Electronic Gas Measurement
EI	Environmental Inspector
EPA	Environmental Protection Agency
ER	Environmental Report
FEIR	Final Environmental Impact Report
FERC	Federal Energy Regulatory Commission
GPD	Gallons Per Day
GPM	Gallons Per Minute
HDD	Horizontal Directional Drill
IWPA	Interim Wellhead Protection Area
LNG	Liquefied Natural Gas
MAOP	Maximum Allowable Operating Pressure
MA DEM	Massachusetts Department of Environmental Management
MA DEP	Massachusetts Department of Environmental Protection
MA DFW	Massachusetts Division of Fisheries and Wildlife
MGL	Massachusetts General Laws
MHC	Massachusetts Historical Commission
MMCF/D	Million Cubic Feet Per Day
MP	Milepost
MSL	Mean Sea Level
NHESP	Natural Heritage & Endangered Species Program
NHPA	National Historic Preservation Act
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRCS	National Resource Conservation Service
NSA	Noise Sensitive Area
NWI	National Wetland Inventory
OD	Outside Diameter
PCB	Polychlorinated Biphenyls



PEM	Palustrine Emergent
PFW	Palustrine Forested Wetlands
PSS	Palustrine Scrub-Shrub
PVC	Polyvinyl Chloride Pipe
RDA	Request for Determination of Applicability
ROW	Right-of-Way
SHPO	State Historic Preservation Officer
SPCP	Spill Prevention and Control Plan
Tennessee	Tennessee Gas Pipeline
THPO	Tribal Historic Preservation Officer
TSCA	Toxic Substances Control Act
TWS	Temporary Work Space
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
USNPS	United States National Park Service



1.0 General Project Description

**COLER &
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ENGINEERS AND SCIENTISTS



RESOURCE REPORT 1 – GENERAL PROJECT DESCRIPTION FERC ENVIRONMENTAL CHECKLIST

Part 380 – Minimum Filing Requirements for Environmental Reports	Company Compliance or Inapplicability of Requirement
Provide a detailed description and location map of the Project facilities (§ 380.12 (c)(1)).	Section 1.0, 1.1.2 Appendices A, B, J, K
Describe any non-jurisdictional facilities that would be built in association with the Project (§ 380.12 (c)(2)).	Section 1.7
Provide current original U.S. Geological Survey (USGS) 7.5-minute series topographic maps with mileposts showing the Project facilities (§ 380.12 (c)(3)).	Appendices B, J, K
Provide aerial images or photographs or alignment sheets based on these sources with mileposts showing the Project facilities (§ 380.12 (c)(3)).	Appendix L
Provide plot / site plans of compressor stations showing the location of the nearest noise-sensitive areas (NSA) within 1 mile (§ 380.12 (c)(3,4)).	No compressor station facilities proposed as part of Project. Requirement Not Applicable.
Describe construction and restoration methods (§ 380.12 (c)(6)).	Section 1.3
Identify the permits required for construction across surface waters (§ 380.12 (c)(9)).	Table 1.6-1
Provide the names and addresses of all affected landowners and certify that all affected landowners will be notified as required in §157.6(d) (§ 380.12 (a)(4) and (c)(10)).	Appendix C Section 1.8

1.0 GENERAL PROJECT DESCRIPTION

Tennessee Gas Pipeline Company ("Tennessee"), a subsidiary of El Paso Corporation, is filing a *45-Day Prior Notice Application* with the Federal Energy Regulatory Commission ("FERC") to construct, operate, own and modify facilities in Middlesex and Essex Counties, Massachusetts. Tennessee's proposed Tewksbury - Andover Lateral Project (the "Project") will provide natural gas to Bay State Gas Company ("Bay State") and Wyeth Biopharmaceutical Company ("Wyeth") in Andover, Massachusetts.

The Project will include the construction and installation of approximately 5.31 miles of new 8.625-inch outside diameter ("OD") natural gas pipeline through the Town of Tewksbury, Massachusetts (approximately 5.05 miles) and the Town of Andover, Massachusetts (approximately 0.23 miles). The proposed pipeline will tie into the existing Tennessee owned and operated Concord Lateral in Tewksbury and extend eastward to a terminus at the Wyeth property in Andover. The pipeline alignment has been designed to utilize an existing electric transmission right-of-way to the greatest extent practicable, thereby minimizing alteration of undisturbed areas and minimizing additional landowner impacts. Appendix A provides a graphical overview of the Tewksbury - Andover Lateral Project.

This resource report identifies the proposed facilities, the purpose and need for the proposed facilities and the land requirements for the proposed Project. The proposed facilities are described geographically in a west-to-east direction and by category, addressing pipeline facilities first and aboveground facilities second. The nomenclature used to identify resources and facilities along the proposed pipeline lateral route throughout this Environmental Report ("ER") and on the alignment sheets utilizes Mileposts ("MP") commencing at the point of interconnect with the existing Concord Lateral (MP 0.00) and extending east to the terminus at the Wyeth facility (MP 5.31). The U.S. Geological Service ("USGS") topographic quadrangle maps (Appendix B and Appendix J) and the National Wetland Inventory ("NWI") maps (Appendix K) also identify each major milepost along the proposed alignment.

In addition, this resource report discusses the proposed construction procedures, the operation and maintenance practices, up-to-date project permits and approvals and if any foreseeable plans for future expansion or abandonment of the proposed facilities has been determined. The various permits and approvals required to construct and operate the proposed Project are detailed in this resource report. The landowners whose properties will be crossed or affected by the proposed Project are identified in Appendix C of this document.

1.1 PROPOSED FACILITIES

The Project consists of the construction and operation of an 8.625-inch OD pipeline lateral, a delivery measurement station and associated appurtenances to provide natural gas to Bay State and Wyeth. Descriptions for the Project facilities are presented in Section 1.1.2. A project overview map and full-size USGS 7.5-minute series topographic maps showing the Project areas

are located in Appendices A, B and J, respectively. Appendix B also provides 8.5x11-inch USGS 7.5-minute series topographic excerpts showing the Project alignment.

1.1.1 Purpose and Need

The proposed facilities are necessary to provide firm transportation service for deliveries of natural gas to Bay State and Wyeth. The Project will include an interconnection to Tennessee's existing 16-inch OD Concord Lateral pipeline in Tewksbury, a natural gas pipeline lateral in Tewksbury and Andover and a new meter station at the terminus of the lateral in Andover. Tennessee's proposed facilities are fully integrated elements necessary for successful completion of the Project. Planned capacities are consistent with the binding precedent agreements for natural gas transportation between Tennessee, Bay State and Wyeth.

Bay State is a distribution company with existing service from Tennessee in New England delivery zone 6 including a delivery point to Bay State's Lawrence Division. Bay State's South Andover service area that currently includes Wyeth, is at the southern end of the Lawrence Division and is experiencing moderate growth. The Project will provide needed pressure support and reliable gas supply for Bay State in this part of its distribution system.

Wyeth is a research-based, global pharmaceutical company responsible for the discovery and development of innovative medicines including protein-based therapies for a wide range of conditions including hemophilia, cancer, bone and tissue repair, inflammatory diseases, and immune system disorders. The nature of the research conducted at Wyeth is both time and temperature sensitive, and the facility relies on natural gas to fuel its power generation turbines. Tennessee's proposal will provide a firm source of natural gas to Wyeth to allow it to continuously maintain current research and allow for potential future expansion.

1.1.2 Location and Description of Facilities

A summary of the proposed Project's pipeline facilities including pipe diameters, approximate length, mileposts and type of activity is provided in Table 1.1-1. A summary of the proposed aboveground facilities including type, type of activity and location is provided in Table 1.1-2. The proposed meter station will be located within the grounds of the Wyeth facility and will be connected to Bay State's distribution system. The proposed pipeline lateral will tap into the existing Concord Lateral. At the Concord Lateral interconnect valve in Tewksbury, a pig launcher facility is proposed to allow for internal inspection of the pipeline.

The capacity of the proposed Tewksbury Andover Lateral will be approximately 25,000 Dth/d. Maximum Allowable Operating Pressure ("MAOP") of the proposed pipeline will be 1440 psig.

The proposed pipeline lateral will commence at a point of interconnect with the existing Tennessee-owned Concord Lateral in the Town of Tewksbury, Massachusetts, and extend east adjacent to an existing railroad right-of-way before entering an existing electric transmission right-of-way and continuing east to the terminus. Major roadway crossings associated with the

Project include U. S. Interstate 93, Shawsheen Road, East Street, Pinnacle Road, Livingston Road and Lancaster Drive. The alignment also crosses an active railroad line in the vicinity of East and Carter Streets in Tewksbury.

**TABLE 1.1-1
PROPOSED PIPELINE FACILITIES FOR THE TEWKSBURY-ANDOVER LATERAL PROJECT**

Facility	Pipeline Diameter and Type	Approximate Length (miles)	Mileposts	Town	County and State
Tewksbury-Andover Lateral	8" Installation	5.05	0.00 to 5.05	Tewksbury	Middlesex, MA
Tewksbury-Andover Lateral	8" Installation	0.23	5.05 to 5.31	Andover	Essex, MA

**TABLE 1.1-2
PROPOSED ABOVEGROUND FACILITY MODIFICATIONS
FOR THE TEWKSBURY-ANDOVER LATERAL PROJECT**

Facility	New/Modified	Horsepower New/Added	Approximate Milepost	Town	County and State
Interconnect Valve and Pig Launcher	New	N/A	0.00	Tewksbury	Middlesex, MA
Meter Station and Pig Receiver	New	N/A	5.31	Andover	Essex, MA

1.1.3 Location Maps, Detailed Site Maps, and Plot/Site Maps

Volume II of this report contains all appendices referenced within this narrative. Appendix A provides an overview map that illustrates the location of all proposed underground pipeline and aboveground facilities. Appendix J includes 1:24,000 scale full-size USGS topographic maps showing all of the proposed facilities and Appendix B includes 8 ½ x 11-inch USGS quadrangle map excerpts of the proposed Project facilities. Appendix K provides 1:24,000-scale U.S. Fish and Wildlife Service ("USFWS") NWI Maps for the proposed Project area. Appendix L provides 1-inch = 200-foot scale aerial photo-based alignment sheets, and includes scaled plans for the construction workspaces and permanent/operational Right-of-Way ("ROW"). The aerial photography for the photo-based alignment sheets was taken in December 2001 for the proposed Tewksbury-Andover Lateral and all aboveground facilities. The photo-based alignment sheets in Appendix L have incorporated civil and environmental survey data and depict property boundaries, waterbodies (including streams and drainages) and wetland resource areas.

1.2 LAND REQUIREMENTS

1.2.1 Pipeline Facilities

The Project alignment sheets provided in Appendix L depict the size and location of land required for the proposed facilities, including the overall construction ROW (consisting of the permanent and operational ROW and temporary ROW) and additional temporary work space ("ATWS") areas consisting of pipe storage yards, staging areas, contractor yards and access roads. Contractor and pipe storage yard areas are identified on the USGS quadrangle maps (including the full-size and excerpts) included in Appendix J and Appendix B, respectively. In addition, figures included in Appendix D illustrate the typical ROW configurations for the Project.

Land requirements for the construction and operation of the pipeline facilities are identified in Table 1.2-1. The proposed Project consists of the installation of a lateral pipeline with the construction ROW width for the Project varying depending upon site-specific conditions such as road crossings, residential areas and large wetland crossings up to a maximum of 45 feet. The workspace through identified wetlands and waterbodies will be limited to a maximum width of 30 feet to reduce temporary impacts. The construction ROW will generally consist of 20 feet of permanent easement workspace and up to 25 feet of temporary workspace. In addition, the construction ROW will include 25 to 50 feet of ATWS at road and waterbody crossings. Temporary staging areas associated with the horizontal directional drill of the Shawsheen River and U. S. Interstate 93 will require ATWS for the staging of drilling equipment and fabrication of the pipeline string, and these areas are detailed within the project alignment sheets (Appendix L). Temporary staging areas associated with the horizontal directional drilling of Cater Street/East Street/B&M Railroad are also shown on the alignment sheets.

TABLE 1.2-1

**LAND REQUIREMENTS FOR TEWKSBURY – ANDOVER LATERAL PROJECT
PIPELINE FACILITIES**

Facility	ROW Cross-Section ^a		Length (Linear Feet)	Land Affected During Construction ^b (acres)	Land Affected During Operation ^c (acres)
	Figure Number	Mileposts			
Tewksbury – Andover Lateral	Tie-in	-(0.01) – 0.01	100	0.15	0.03
	Figure 1	0.01 – 0.02	58	0.03	0.03
	Figure 2	0.02 – 0.30	1,456	0.31	0.69
	Figure 1	0.30 – 0.35	299	0.17	0.14
	Figure 2	0.35 – 0.56	1,068	0.25	0.49
	Figure 1	0.56 – 0.62	334	0.20	0.15
	Figure 3	0.62 – 0.64	100	0.10	0.05
	Road Bore	0.64 – 0.64	30	-	-
	Figure 3	0.64 – 0.66	100	0.10	0.05
	Figure 1	0.66 – 0.68	100	0.05	0.05
	Figure 2	0.68 – 0.76	412	0.09	0.19
	Figure 1	0.76 – 0.94	924	0.53	0.42
	Figure 2	0.94 – 0.96	141	0.03	0.06
	Figure 1	0.96 – 1.01	257	0.15	0.12
	Figure 2	1.01 – 1.40	2,031	0.47	0.93
	Figure 1	1.40 – 1.44	226	0.13	0.10
	Figure 4	1.44 – 1.46	100	0.15	0.05
	Road Bore	1.46 – 1.46	25	-	-
	Figure 1	1.46 – 1.47	22	0.01	0.01
	Figure 2	1.47 – 1.48	63	0.01	0.03
	Figure 5	1.48 – 1.48	23	-	0.01
	Figure 2	1.48 – 1.60	602	0.14	0.28
	Figure 1	1.60 – 1.60	40	0.02	0.02
	Figure 6	1.60 – 1.61	26	0.01	0.01
	Figure 4	1.61 – 1.62	60	0.12	0.03
	Road Bore	1.62 – 1.63	53	-	-
	Figure 4	1.63 – 1.65	100	0.15	0.05
	Figure 1	1.65 – 1.69	212	0.12	0.10
	Figure 6	1.69 – 1.71	84	0.03	0.04
	Figure 2	1.71 – 1.84	726	0.17	0.33
	Figure 1	1.84 – 1.91	379	0.22	0.17
	Figure 2	1.91 – 1.97	285	0.07	0.13
	Figure 1	1.97 – 2.05	415	0.24	0.19
	Figure 2	2.05 – 2.06	87	0.02	0.04
	Figure 1	2.06 – 2.07	28	0.02	0.01
	Figure 4	2.07 – 2.09	100	0.15	0.05
	Road Bore	2.09 – 2.10	41	-	-

TABLE 1.2-1 (cont.)

**LAND REQUIREMENTS FOR TEWKSBURY - ANDOVER LATERAL PROJECT
PIPELINE FACILITIES**

Facility	ROW Cross-Section ^a		Length (Linear Feet)	Land Affected During Construction ^b (acres)	Land Affected During Operation ^c (acres)
	Figure Number	Mileposts			
Tewksbury - Andover Lateral	Figure 4	2.10 - 2.11	100	0.15	0.05
	Figure 1	2.11 - 2.18	320	0.19	0.15
	Figure 5	2.18 - 2.18	10	-	0.01
	Figure 7	2.18 - 2.26	419	0.24	0.19
	Figure 5	2.26 - 2.27	50	-	0.02
	Figure 7	2.27 - 2.35	434	0.25	0.2
	Figure 5	2.35 - 2.36	50	-	0.02
	Figure 7	2.36 - 2.47	579	0.33	0.27
	Figure 5	2.47 - 2.47	38	-	0.02
	Figure 8	2.47 - 2.49	55	0.06	0.03
	Road Bore	2.49 - 2.50	53	-	-
	Figure 8	2.50 - 2.52	122	0.16	0.06
	Figure 7	2.52 - 2.55	165	0.09	0.08
	Figure 9	2.55 - 2.57	115	0.03	0.05
	Figure 2	2.57 - 2.93	1,917	0.44	0.88
	Figure 5	2.93 - 2.96	116	-	0.05
	Figure 7	2.96 - 3.08	641	0.37	0.29
	Figure 9	3.08 - 3.22	750	0.17	0.34
	Figure 7	3.22 - 3.26	229	0.13	0.11
	Road Bore	3.26 - 3.27	51	-	-
	Figure 7	3.27 - 3.29	93	0.05	0.04
	Figure 10	3.29 - 3.32	180	0.31	0.08
	Figure 7	3.32 - 3.43	545	0.31	0.25
	Figure 9	3.43 - 3.44	50	0.01	0.02
	Figure 7	3.44 - 3.54	550	0.31	0.25
	Figure 9	3.54 - 3.87	1,717	0.39	0.79
	Figure 7	3.87 - 3.88	57	0.03	0.03
	Figure 11	3.88 - 3.91	177	0.26	0.08
	Figure 7	3.91 - 3.92	50	0.03	0.02
	Horiz. Dir. Drill	3.92 - 4.15	1,195	-	0.45
	Figure 12	4.15 - 4.19	233	0.27	0.11
	Figure 7	4.19 - 4.30	598	0.34	0.27
	Figure 13	4.30 - 4.32	100	0.16	0.05
	Figure 9	4.32 - 4.33	30	0.01	0.01
	Figure 7	4.33 - 4.34	38	0.02	0.02
	Road Bore	4.34 - 4.35	51	-	-
	Figure 13	4.35 - 4.36	100	0.15	0.05
	Figure 1	4.36 - 4.43	338	0.19	0.16
	Figure 2	4.43 - 4.44	50	0.01	0.02

TABLE 1.2-1 (cont.)

**LAND REQUIREMENTS FOR TEWKSBURY – ANDOVER LATERAL PROJECT
PIPELINE FACILITIES**

Facility	ROW Cross-Section ^a		Length (Linear Feet)	Land Affected During Construction ^b (acres)	Land Affected During Operation ^c (acres)
	Figure Number	Mileposts			
Tewksbury – Andover Lateral	Figure 1	4.44 – 4.45	82	0.02	0.04
	Figure 7	4.45 – 4.46	58	0.02	0.03
	Figure 9	4.46 – 4.54	390	0.09	0.18
	Figure 5	4.54 – 4.54	10	-	0.01
	Figure 2	4.54 – 4.60	319	0.07	0.15
	Figure 1	4.60 – 4.61	33	0.02	0.02
	Figure 13	4.61 – 4.63	100	0.15	0.05
	Road Bore	4.63 – 4.64	47	-	-
	Figure 13	4.64 – 4.65	100	0.15	0.05
	Figure 1	4.65 – 4.67	106	0.04	0.05
	Figure 7	4.67 – 4.72	218	0.13	0.10
	Figure 14	4.72 – 4.92	1,084	1.37	0.50
	Horiz. Dir. Drill	4.92 – 5.31	2,017	-	0.71
	Total		28,037	11.93	12.46

SUMMARY

Tewksbury – Andover Lateral	Total Tie-in	100	0.15	0.03
	Total Figure 1	4,173	2.35	1.93
	Total Figure 2	9,157	2.08	4.22
	Total Figure 3	200	0.20	0.10
	Total Figure 4	460	0.72	0.23
	Total Figure 5	297	-	0.14
	Total Figure 6	110	0.04	0.05
	Total Figure 7	4,674	2.65	2.15
	Total Figure 8	177	0.22	0.09
	Total Figure 9	3,052	0.70	1.39
	Total Figure 10	180	0.31	0.08
	Total Figure 11	177	0.26	0.08
	Total Figure 12	233	0.27	0.11
	Total Figure 13	400	0.61	0.2
	Total Figure 14	1,084	1.37	0.50
	Total HDD	3,212	-	1.16
	Total Road Bores	351	-	-
	Total	28,037	11.93	12.46

^a See Appendix D for Typical ROW Configurations.

^b Construction ROW is based on the extent of temporary and additional temporary workspace only (varies, 25-foot in uplands, 10-foot in wetlands) and does not include 20-foot permanent ROW.

^c Permanent ROW is based on the extent of the ROW that will be maintained post construction (20-foot in uplands, 10-foot in wetlands).

^d Extra Work Areas are required for construction in areas of steep slopes, at roadway, wetland and waterbody crossings.

1.2.2 Aboveground Facilities

Aboveground facilities associated with the Project will include pig launcher and receiver facilities to be located at the connection point to the existing Concord Lateral as well as a new proposed meter station at the Wyeth facility. Table 1.2-2 provides the land requirements for construction and operation of the aboveground facilities associated with the Project. Appendix M provides preliminary site-specific plans for aboveground facilities proposed by Tennessee.

**TABLE 1.2-2
LAND REQUIREMENTS FOR THE TEWKSBURY – ANDOVER LATERAL PROJECT
ABOVEGROUND FACILITIES**

Facility	Milepost	Property Size (acres)	Land Disturbed During Construction (acres)	Additional Land Required for Operation (acres)	Comments
Interconnect Valve and Pig Launcher	0.00	0.15	0.15	0	Facilities to be located at interconnect with Concord Lateral
Meter Station and Pig Receiver	5.31	0.25	0.25	0	Meter station facilities to be located within previously disturbed area at Wyeth facility
TOTAL	-	0.40	0.40	0	-

1.2.3 Summary of Construction and Operation Land Requirements

The construction workspace (including ATWS, permanent ROW, access roads and staging areas) for the proposed pipeline facilities will total approximately 24.39 acres of which 11.93 will be temporary impacts associated with installation of the pipeline (See Table 1.2-1). Operation of the pipeline will require approximately 12.46 acres that will be maintained as permanent ROW (See Table 1.2-1), and the meter station to be located at the Wyeth facility will occupy approximately 0.25 acres.

Table 8.1-5 in Resource Report 8 lists the access roads proposed for the project. Tennessee will utilize existing roadways to the greatest extent practicable to access the ROW. New access roads will be sited in previously disturbed areas and may be graded up to 25 feet in width with additional width at turns to ensure vehicle safety. Also, Resource Report 8 provides information on the proposed ATWS areas, pipeyards and staging areas. The photo-based alignment sheets in Appendix L depict the location and configuration of all temporary and permanent construction workspace and access roads required for the Project.

1.3 CONSTRUCTION PROCEDURES

1.3.1 Pipeline

Construction methods will be implemented on the Project in accordance with the conditions outlined in FERC's *Wetland and Waterbody Construction and Mitigation Procedures* ("Procedures") and *Erosion Control, Revegetation and Maintenance Plan* ("Plan") (January 2003 Versions). Proposed deviations from the FERC Plan and Procedures are identified in Appendix F. Tennessee has based these variations on the project-specific conditions and believes that they will provide an equal or greater level of protection to the environment than the standard FERC Plan and Procedures.

Tennessee estimates the construction staff to be significant on this Project, with approximately 50-75 contract personnel to be employed during construction. Construction constraints will require that the pipeline installation be performed utilizing numerous small crews that will vary in size on a daily basis depending on location and task. Construction will take place over a period of approximately 8 to 12 weeks from initial clearing through ROW restoration. However, landscaping within residential areas may take up to an additional 2 to 4 weeks to complete beyond the normal final ROW cleanup and restoration.

1.3.1.1 Rugged Topography

Rugged topography is limited along the proposed Project route. Permanent trench breakers consisting of sandbags, gravel, cement, or cement filled sacks will be installed in the ditch over and around the pipe in areas of slope with erosion potential. Trench plugs, usually composed of compacted earth or other suitable low-permeable material, will be used to isolate wet areas to minimize channeling of groundwater along the ditch line.

If side slopes are encountered requiring special construction, the following techniques will be used. During grading, the up-slope side of the pipeline ROW will be cut. The material removed from the cut will be used to fill the down-slope edge of the ROW in order to provide a safe and level surface from which to operate the heavy equipment. Side hills may require additional temporary workspace down-slope in order to accommodate the fill material. During grade restoration, the spoil is placed back in the cut and compacted. Any springs or seeps found in the cut will be carried down-slope through PVC pipe and/or gravel French drains installed as part of the cut restoration.

1.3.1.2 Residential Areas

Tennessee will make every effort to ensure that construction activities minimize impacts to residences and that cleanup is quick and thorough. Tennessee uses specialized construction techniques to minimize the impacts of construction in residential areas. The duration of an open trench will be minimized for a distance of 100 feet on either side of a nearby residence.

After clearing and grading are complete, a construction safety fence will be installed on the edge of the construction corridor for the entire length adjacent to the residence for 100 feet on either side of the residence, except for those areas where it is not practical due to an existing road or stream crossing that must remain unobstructed. Safety fence will also be erected to keep unauthorized individuals out of other construction areas where it may be deemed necessary or agreed upon by a landowner. Once the pipe has been lowered in the trench, the section adjacent to the nearby residence will be backfilled immediately.

Immediately after backfilling, residential areas will be restored and all construction debris will be removed. Topsoil in landscaped lawns will either be segregated or imported. Compaction testing will be performed and soil compaction mitigation will be performed in severely compacted areas. Lawns will be raked, topsoil added as necessary, and restored per landowner agreements. Ornamental shrubs will be replaced when possible. Fences, mailboxes, and other structures that have been removed will be restored. Sidewalks, driveways and roads will be restored as soon as practical. After cleanup, a Tennessee representative will contact landowners to ensure that conditions of all agreements have been met.

1.3.1.3 Road Crossings

Prior to construction, the Call Before You Dig system and the local Department of Public Works within each affected municipality will be contacted to verify and mark all utilities along the project workspace areas. Field instrumentation and test pits will be employed wherever there is a question as to the location of utilities such as, water, cable, gas, and sewer lines.

Tennessee will take measures to ensure that construction activities will allow continuous access to residential areas by fire and emergency vehicles. At least one lane of traffic will be kept open when constructing on or across residential streets. During the brief period when a road is completely cut, steel plates will be available on-site to cover the open area to permit travel by emergency vehicles. Traffic lanes and home access will remain available except for the temporary periods essential for laying pipeline.

Boring will be required under Lancaster Street. Boring entails drilling a hole below travel arteries through which the pipe will pass. First, a bore pit is dug on one side of the artery and a receiving pit dug on the other. The bore pit is excavated to a depth equal to the depth of the pipe ditch and is graded such that the bore will follow the grade of the pipe. A boring machine is lowered to the bottom of the bore pit and placed on supports. The machine cuts a shaft under the artery using a cutting head mounted on an auger. The auger rotates in a casing, both of which are pushed forward as the hole is cut. The pipeline is then pushed through the casing. The casing is removed and the area between the pipeline and the shaft is grouted, as required by permits. The pipeline will be installed under other major roadways, such as the intersection of Carter Street/East Street/B&M Railroad and U. S. Interstate 93 via horizontal directional drill. Please refer to Appendix O for detailed plans of proposed roadway crossings.

1.3.1.4 Rock Removal and Blasting

Rock encountered during trenching will be removed using one of the following techniques. The technique selected is dependent on relative hardness, fracture susceptibility, expected volume and location. Techniques include:

- Conventional excavation with a backhoe;
- Ripping with a bulldozer followed by backhoe excavation;
- Hammering with a pointed backhoe attachment or a Pneumatic rock hammer and followed by backhoe excavation;
- Blasting followed by backhoe excavation; or
- Blasting surface rock prior to excavation.

All blasting activity will be performed according to strict guidelines designed to control energy release. Proper safeguards will be taken to protect personnel and property in the area. Refer to Resource Report 6 – Geological Resources for details relative to blasting. Charges will be kept to the minimum required to break up the rock. Mats made of heavy steel mesh or other material effective in preventing scattering of rock and debris and will be used as necessary. These activities will strictly adhere to all local, state, and federal regulations applying to controlled blasting and blast vibration limits with regard to structures and underground utilities. Special care will be taken to monitor and assess blasting within 150 feet of dwellings and private or public water supply wells.

Large rock not suitable for use as backfill material will either be windrowed along the edge of the ROW with landowner permission, buried on the ROW with landowner permission, or hauled off the ROW and disposed at an approved landfill or recycling facility. The remaining rock will be mixed with the subsoil and used to backfill the trench to the original level of rock.

1.3.2 Aboveground Facilities

The proposed aboveground facilities will be constructed in accordance with industry standards. A preliminary plan is provided within Appendix M that details the proposed meter station and interconnect valve assembly. The duration of construction for the aboveground facilities is approximately one to two months. Approximately 10 to 20 workers will be required for construction of the meter station.

1.3.3 Timeframe for Construction

Tennessee plans to commence construction of the Project in the second quarter of 2004, and all construction is anticipated to be completed during the fourth quarter of 2004. Currently, it is anticipated that one contractor will be assigned to the pipeline lateral portion of the Project with a second contractor assigned to the aboveground facilities installation.

1.3.4 Environmental Training for Construction

As required by FERC, environmental training will be given to both company and contractor personnel involved with pipeline construction. The level of training will be commensurate with the type of duties of the personnel. All construction personnel from the chief inspector, environmental inspector, craft inspectors and contractor's superintendent to welders, loggers, equipment operators, and laborers will be given environmental training. The training will be given prior to the start of construction and throughout the construction process, as needed. The training program will cover the FERC Plan and Procedures, job-specific permit conditions, company policies, cultural resource procedures, threatened and endangered species restrictions, National Pollution Discharge and Elimination System ("NPDES") Stormwater Pollution Prevention Plan and any other pertinent information related to the job. In addition to the environmental inspector(s), all other construction personnel will serve an important role in maintaining strict compliance with all permit conditions to protect the environment during construction.

1.4 OPERATION AND MAINTENANCE PROCEDURES

The entire Tewksbury-Andover Lateral will be operated, owned and maintained by Tennessee. Tennessee will operate and maintain the newly constructed pipeline in the same manner as it currently operates and maintains its major interstate pipeline facilities in the Northeast and in accordance with the requirements of the United States Department of Transportation ("DOT"). The pipeline will be patrolled on a routine basis, and personnel well qualified to perform both emergency and routine maintenance on interstate pipeline facilities will handle maintenance.

The proposed facilities will be operated and maintained in a manner such that pipeline integrity is maintained in the interest of ensuring that a safe, continuous supply of natural gas reaches its ultimate destination. Maintenance activities will include regularly scheduled gas-leak surveys and measures necessary to repair any potential leaks. The latter may include repair or replacement of pipe segments. All fence posts, signs, marker posts, aerial markers and decals will be painted or replaced to ensure that the pipeline locations will be visible from the air and ground.

The pipeline will be patrolled from the air on a periodic basis. This will provide information on possible leaks, construction activities, erosion, exposed pipe, population density, possible encroachment and any other potential problems that may affect the safety and operation of the pipeline. In addition, Tennessee is a participant in the "Dig Safe" system for utility companies in Massachusetts. Under the "Dig Safe" system, anyone planning excavation activities may call a single number to alert all utility companies. Representatives of the utility companies that might be affected then visit the site and mark their facilities so that the excavation can proceed with relative certainty as to the location of all underground lines.

Other maintenance functions will include: (1) periodic seasonal mowing of the ROW in accordance with the timing restrictions outlined in FERC's *Plan and Procedures*; (2) terrace

repair, backfill replacement and drain tile repair as necessary; (3) periodic inspection of water crossings; and (4) maintenance of a supply of emergency pipe, leak repair clamps, sleeves and other equipment needed for repair activities. Tennessee will not use herbicides or pesticides within 100 feet of a wetland or waterbody unless approved by appropriate state and local agencies.

Cathodic protection of the pipeline will be conducted with impressed current systems that employ rectifier / groundbed systems. Units will be installed along the pipeline and aboveground test stations will be installed at various locations along the pipeline to gather accurate information for potential current adjustments. The cathodic protection system will be regularly monitored to maintain required pipe-to-soil potential and will be achieved in accordance with the specifications set forth by Tennessee that meet or exceed DOT regulations.

In areas where the proposed pipeline parallels high-voltage electric transmission lines, an alternating current mitigation system will be implemented to reduce stray current and prevent possible shock to personnel during post-construction activities and prevent interference with the cathodic protection system. This system will be primarily composed of zinc ribbon.

The Project will not require any additional permanent staff or new operations offices or district offices for operation.

1.4.1 Cleared Areas

A post-construction permanent ROW of 20-feet (10-feet through wetland resource areas) will be maintained in accordance with FERC's *Plan and Procedures*. Maintaining a cleared ROW is necessary for the following reasons:

- Access for routine pipeline patrols and corrosion surveys;
- Access in the event that emergency repairs of the pipeline are needed; and
- Visibility during aerial patrols.

1.4.2 Erosion Control

Erosion problems on the pipeline ROW will be reported to the local operations supervisor. These reports may originate from landowners or company personnel performing routine patrols. Corrective measures will be conducted as needed.

1.4.3 Periodic Pipeline and ROW Patrols

During these surveys, all permanent erosion control devices that are installed during construction will be inspected to ensure that they are functioning properly. In addition, attention will be given to:

- Erosion and washouts along the ROW;
- Water control devices such as diversions;

- Condition of banks at stream and river crossings;
- Fallen timber or other threats to the pipeline;
- Shrubs and other vegetation planted during construction; and
- Any other conditions that could endanger the pipeline.

The local operations supervisor will be notified of any conditions that need attention. Corrective measures will be performed as needed.

1.5 FUTURE PLANS AND ABANDONMENT

Tennessee has not identified any current or reasonably foreseeable plans for future expansion of the facilities proposed in this docket. To the extent that expansion of facilities may be required due to additional demand for natural gas service, this expansion could involve other pipeline segments not proposed in this docket. Any new facilities would be designed to be compatible with existing or proposed facilities. This application includes no facilities abandonment.

1.6 PERMITS AND APPROVALS

Construction contractors employed by Tennessee will be required to observe and comply with all federal, state and local laws, ordinances and regulations that apply to the conduct of the work. During the performance of work, contractors will comply with the Minimum Federal Safety Standards adopted by the DOT under the Natural Gas Pipeline Safety Act of 1968 as well as Tennessee standards.

Tennessee will obtain all necessary permits, licenses and clearances relating to the placement of the pipeline across or under roads, drainage facilities, waterbodies, wetlands and through any other sites or places that a governmental license or permit may be required (See Tables 1.6-1 and 1.6-2). Additionally, Tennessee will also acquire all applicable permits relative to the construction and operation of the proposed aboveground facilities. Tennessee will include copies of all relevant environmental permits and approvals in the construction bid packages and contracts. The contractor will be required to be familiar with all permits and licenses obtained by Tennessee. The contractor will be required to comply with all the requirements related to the construction of the pipeline and to the restoration of any areas disturbed by the construction of the pipeline.

**TABLE 1.6-1
INFORMATION ON FEDERAL, STATE AND LOCAL APPROVALS
FOR TEWKSBURY—ANDOVER LATERAL PROJECT**

Permit	Issuing Agency	Status
Federal Permits		
Section 404 permit	Army Corps of Engineers New England District	Received 1/2004
Clearance	U. S. Fish and Wildlife Service	Received 11/14/02
NPDES – Hydrostatic Testwater Discharge	U. S. Environmental Protection Agency	To be filed Spring 2004
NPDES - Construction	U. S. Environmental Protection Agency	To be filed Spring 2004
Massachusetts State Permits		
Environmental Notification Form / Environmental Impact Statement	Massachusetts Environmental Policy Act	Final Certificate issued 8/2003
401 Water Quality Certification	MA Dept. of Env. Protection Wetland and Waterways Division	Received 11/2003
Clearance	MA Historical Commission (SHPO)	8/21/03
Clearance	MA Natural Heritage & Endangered Species Program	8/8/03
Local Permits		
Order of Conditions MGL 131, Section 40 Local Wetland Bylaws	Tewksbury Conservation Commission	Order of Conditions issued 9/2003
	Andover Conservation Commission	Negative RDA issued 11/22/02
Road Crossing Permits	MA Highway Department and Local Departments of Public Works	To be filed in Spring 2004

TABLE 1.6-2

**AGENCY CORRESPONDENCES AND RESPONSES
FOR THE TEWKSBURY - ANDOVER LATERAL PROJECT**

AGENCY	DATE SENT	REQUEST	DATE RECEIVED	COMMENT
USFWS New England Field Office Attn: Phil Morrison 70 Commercial St. Ste. 300 Concord, NH 03301-5087 (603) 223-2541	10/07/02	<i>Threatened and Endangered Species Consultation Request</i>	11/14/03	No Impact
MA Historical Commission Attn: Brona Simon 220 Morrissey Blvd. Boston, MA 02125	10/29/02	<i>Cultural Resources and Archeological Review</i>	8/21/03	No Impact and no further archeological testing required
Commission on Indian Affairs Attn: Jim Peters One Congress Street, 10 th Floor Boston, MA 02114	10/07/02	<i>Cultural Resources Review</i>	11/19/02	Oral: No impact
MA DEM Div. of Resource Conservation Attn: Andy Backman Blackstone Heritage State Park 271 Oak Street Uxbridge, MA 01569 (617) 626-1350	10/07/02	<i>Natural, Recreational and Scenic Areas Consultation Request</i>	11/20/02	No Impact
MA DEM Attn: Jennifer Howard, 136 Damon Road Northampton, MA 01060 (508) 866-2580	10/07/02	<i>Natural, Recreational and Scenic Areas Consultation Request</i>	12/06/02	Oral: No Impact
U.S. EPA, Region 1 MA State Program Unit Attn.: Ms. Mary Jo Feuerbach CMA 1 Congress St. Ste. 1100 Boston, MA 02114 (617) 918-1578	10/07/02	<i>Sole Source Aquifer Consultation Request</i>	10/21/02	No Impact

TABLE 1.6-2

**AGENCY CORRESPONDENCES AND RESPONSES
FOR THE TEWKSBURY - ANDOVER LATERAL PROJECT**

AGENCY	DATE SENT	REQUEST	DATE RECEIVED	COMMENT
MA DFW Attn: Richard Hartley Route 135 Westborough, MA 01581 (508) 792-7270 ext. 132	10/07/02	<i>Fisheries of Concern Consultation Request</i>	11/14/02	Shawsheen River yields 18 fish species, including Bridle shiner (state SC) & stocked with trout
NHESP Attn: Ms. Christine Vaccaro Route 135 Westborough, MA 01581-3337 (508) 792-7270 ext. 200 (508) 792-7270 direct ext. 154	10/07/02 5/27/03 7/8/03	<i>State Threatened and Endangered Species Consultation Request</i>	10/17/02 2/27/03 3/7/03 6/25/03 8/8/03	Proposed project avoids adverse impact through implementation of Tennessee's Impact Avoidance/Mitigation Plan
U. S. NPS Attn: Mr. David Clark 15 State Street Boston, MA 02109 (617) 223-5131	10/07/02	<i>National Landmarks & Wild and Scenic Rivers Consultation Request</i>	11/19/02	Oral: No impact to federally designated wilderness areas.
Tewksbury Planning Board Dept. of Community Develop. Attn: Steven Sadwick, Director. 999 Whipple Road Tewksbury, MA 01876 (978) 640-4370	10/07/02	<i>Plans of Future Development in Project Area Consultation Request</i>	11/25/02	Three project proposals pending before the Planning Board within ¼ mile radius of proposed pipeline alignment.
Andover Planning Department Attn: Steve Colyer, Director Town Offices 36 Bartlet Street Andover, MA 01810 (978) 623-8310	10/07/02	<i>Plans of Future Development in Project Area Consultation Request</i>	11/12/02	Preliminary conceptual stage of development in area of Project

1.7 NONJURISDICTIONAL FACILITIES

There are no non-jurisdictional facilities associated with the Tewksbury—Andover Lateral project.



1.8 LANDOWNER INFORMATION

Appendix C contains a listing of all affected landowners including tract numbers and addresses. The project alignment sheets (Appendix L) depict the property boundaries of each affected parcel and identify the names of the property owners of record according to a specified line list. Tennessee certifies that all affected property owners, towns, communities and local, state and federal governmental agencies will be notified via first-class mail or hand-delivered within three business days of the issuance of the date FERC issues a notice of the application in accordance with 18 CFR 157.6(d).

Tennessee obtained landowner permission to conduct engineering and environmental surveys on all tracts within Andover and the majority of affected tracts in Tewksbury. There was one tract of land in Tewksbury where survey permission was not granted (MP 4.34 to 4.51) resulting in a geographic gap (survey skip) where field data was not collected. However, environmental information for these properties was obtained through other available sources of information such as Natural Resource Conservation Service Soil Surveys, National Wetland Inventory maps, USGS topographic maps, aerial photograph interpretation and consultation with applicable federal and state regulatory agencies.



2.0 Water Use and Quality

**COLER &
COLANTONIO^{LLC}**
ENGINEERS AND SCIENTISTS

RESOURCE REPORT 2 – WATER USE AND QUALITY FERC ENVIRONMENTAL CHECKLIST

Part 380 – Minimum Filing Requirements for Environmental Reports	Company Compliance or Inapplicability of Requirement
Identify all perennial surface waterbodies crossed by the Project and their water quality classification. (§ 380.12 (d)(1)).	Section 2.2 Table 2.2-1
Identify all waterbody crossings that may have contaminated sediments. (§ 380.12 (d)(1)).	Section 2.2.1
Identify watershed areas, designated surface water protection areas, and sensitive waterbodies crossed by the Project. (§ 380.12 (d)(1)).	Sections 2.2.2, 2.2.5
Provide a table (based on National Wetlands Inventory (NWI) maps if delineations have not been done) identifying all wetlands, by milepost and length, crossed by the Project (including abandoned pipeline), and the total acreage and acreage of each wetland type that would be affected by construction. (§ 380.12 (d)(1 and 4)).	Section 2.3.1 Table 2.3-1 Table 2.3-2 Table 2.3-3
Discuss construction and restoration methods proposed for crossing wetlands, and compare them to staff's Wetland and Waterbody Construction and Mitigation Procedures. (§ 380.12 (d)(2)).	Section 2.3.3 Appendix F
Describe the proposed waterbody construction, impact mitigation, and restoration methods used to cross surface waters and compare to staff's Wetland and Waterbody Construction and Mitigation Procedures. (§ 380.12 (d)(2)).	Section 2.2.7 Appendix F
Provide original NWI maps or the appropriate state wetland maps, if NWI maps are not available, that show all proposed facilities and include milepost locations for proposed pipeline routes (§ 380.12 (d)(4)).	Appendix K
Identify all U. S. Environmental Protection Agency (EPA) or state designated aquifers crossed (§ 380.12 (d)(9)).	Section 2.1

2.0 WATER USE AND QUALITY

This resource report provides information on groundwater and surface water resources in the vicinity of the Project including wetlands and waterbodies, and on construction-related water use. In addition, wetland construction and restoration methods proposed for wetland crossings are discussed with reference to FERC's *Plans and Procedures* (Appendix F). Section 2.1 describes groundwater availability, quality and current uses. Section 2.2 describes surface water availability, quantity, current uses, potential use during construction, and construction methodologies to be utilized in the vicinity of surface waters. Section 2.3 describes wetland resource areas crossed by the Project (including location by milepost, USFWS classification, and acres affected during construction and operation), anticipated construction and operation impacts, wetland construction procedures and proposed impact mitigation and minimization measures. Section 2.4 provides a list of references utilized during preparation of this resource report. Tennessee determined the nature and location of wetlands, surface waters, springs, wells, groundwater hazards and point and non-point pollution sources by consulting appropriate agencies and performing thorough field verification and delineation surveys during October-December 2002.

2.1 GROUND WATER RESOURCES

Massachusetts lies entirely in the Glaciated Appalachian Groundwater Resource Region (Todd 1980). The region is characterized by variations in thickness of glacial drift. While hilltops are overlaid with a thin mantle of till, slopes may contain less till with bedrock outcrops, and valleys are underlain by thicker drift and till. These aquifers range in depth from 20 to 200 feet. In most of the area within this region, aquifers are not productive. The majority of groundwater sources for the region are located within sand and gravel deposits formed as outwash plains or as channel fillings in the stratified drift.

Portions of the proposed Project lie within a potentially productive high yield aquifer and a potentially productive medium yield aquifer associated with Meadow Brook, a public surface water supply, located east of Tewksbury, Massachusetts (MA DEP 1999) (See Table 2.1-1).

No U.S. EPA designated or petitioned sole source aquifers are located along the proposed pipeline route (Feuerbach 2002), and there are no known springs that provide water to livestock or wildlife located along the proposed route.

TABLE 2.1-1

**D. E. P. ZONED AQUIFER PROTECTION AREAS
CROSSED BY THE TEWKSBURY - ANDOVER LATERAL**

Town/State	Approximate Milepost	Water Supply	Distance of Protection Area Crossed (feet) and Type
Tewksbury, MA	2.54 to 3.26	Meadow Brook	3,800 feet / Potentially productive medium yield aquifer
Andover, MA	5.29	Shawsheen River	1,267 feet / Potentially productive medium yield aquifer

Water Availability

The majority of the Project alignment lies within the Shawsheen River basin. The principal aquifers in the basin are composed of unconsolidated sand and gravel deposited by meltwater streams during the glacial period. The most productive of these aquifers sustain well yields of several hundred gallons per minute and lie primarily along the Shawsheen River and its major tributaries, Elm, Heath, Strong Water, and Vine Brooks. Aquifers that sustain well yields of less than 200 gal/min occur in many tributary-stream valleys and wetland areas. These aquifers are generally less than 50 ft thick and have small surface areas (USGS 2003). Bedrock in the basin is composed of a variety of igneous and metamorphic rocks. Wells in bedrock yield up to 100 gal/min, but generally yield much less. The median yield of 26 bedrock wells in this basin is 10 gal/min that is an amount an amount sufficient for domestic supplies.

Mean annual precipitation in the Project area is approximately 40 inches (Northeast Regional Climate Center 2002), and permeable soil conditions allow for relatively rapid recharge from precipitation.

Water Quality

The ambient ground water quality within the Project area varies considerably, but is generally considered suitable for drinking following disinfection treatment. Variations are mainly attributed to (1) differences in the composition of the rocks, (2) the pattern of ground water movement from recharge to discharge and (3) the length of time that the water is in contact with the various rock types (EPA 2003). No evidence of point source pollution was observed by environmental scientists from Coler & Colantonio, Inc., during field surveys conducted in 2002.

Groundwater Hazards

The Massachusetts Department of Environmental Protection ("MADEP") database was searched to determine the presence of potential groundwater hazards within the immediate Project area.

Three records of the release of contaminants to groundwater on or near the Project location were identified, however no currently active solid or hazardous waste facilities, or petroleum/chemical storage were identified. In addition, no evidence of such sites including abandoned drums, aboveground fuel pumps, un-vegetated/previously disturbed areas or dumpsites was observed during field surveys conducted in October 2002.

Three septic systems (leach fields) were identified within the vicinity of the Project alignment. The majority of the properties crossed by the proposed pipeline alignment have public water supply. Tennessee has conducted alignment modifications in response to meetings with the landowners and the Tewksbury Board of Health such that the proposed workspace will not affect any residential septic systems. Tennessee will continue to coordinate with affected landowners and the Tewksbury Board of Health to ensure that all private septic systems are protected. If an unidentified sewage/septic system is encountered during construction of the Project, effort will be made to avoid the system. Any sewage/septic system damaged during construction of the Project will be repaired to its former capacity or replaced in accordance with applicable regulations.

2.1.1 Public and Private Water Supply Wells

This section will identify all known public and private water supply wells, springs and wellhead protection areas located within 150 feet of construction work areas associated with the Project. This information was compiled through consultation with state and local agencies and private landowners. Any private water wells found in the vicinity of the proposed project alignment were avoided using modifications to the pipeline alignment.

2.1.1.1 Pipeline Facilities

A DEP Interim Wellhead Protection Area ("IWPA") associated with Meadow Brook in Tewksbury was identified in the vicinity of the Project (DEP Outstanding Resource Waters Map Northeast Region 1999). No springs or public or private water supply wells are located within 150 feet of the Project. Aside from incidental use of water supplies associated with contractor work facilities, the Project will not require use of public and/or private water supply wells. Tennessee will implement mitigation measures as described in Section 2.1.2 to ensure protection of identified groundwater resources.

2.1.1.2 Aboveground Facilities

There are no known public or private water supply wells, springs or wellhead protection areas located within 150 feet of the proposed location of the interconnect with the existing Concord Lateral in Tewksbury or the proposed meter station within the Wyeth property in Andover, Massachusetts.

2.1.2 Groundwater Impact Mitigation

The Project is not anticipated to impact groundwater quality and supply. Tennessee proposes to implement construction practices designed to reduce and/or mitigate potential impacts on groundwater during construction as detailed within FERC's *Plans and Procedures* (Appendix F). Tennessee and its contactors will adhere to these practices related to groundwater protection including specifications for trench breakers and dewatering as well as restrictions on refueling and storage of hazardous substances.

In the unlikely event that construction of the Project temporarily impacts private well quality or yield, Tennessee will provide alternative water sources or other compensation to the well owner. Should permanent well damage be sustained, Tennessee will either compensate the well owner or make arrangements for a new well to be drilled.

All equipment used in construction of the pipeline will be refueled and lubricated within the limits of the ROW at a minimum distance of 100 feet from all wetlands, waterbodies and identified wells. Auxiliary fuel tanks will be used to reduce the frequency of refueling operations, and refueling will not take place within 400 feet of identified municipal or community water supplies including groundwater and surface water as per state requirements. The impact minimization measures will prevent the discharge of hydraulic fluids or fuels from leaving the ROW and/or leaching into the groundwater.

2.2 SURFACE WATER RESOURCES

The Project area within Massachusetts is located within the Shawsheen River drainage. The Shawsheen River basin covers approximately 78 square miles of northeastern Massachusetts. The basin is characterized by low, rounded hills and many wetlands. Major tributaries associated with the Shawsheen River include Elm, Heath, Strong Water, and Vine Brooks. The river has a low gradient and flows through wetlands for nearly one-half of its length. Approximately 85 percent of the municipalities in the Shawsheen River basin obtained all or part of their water from sources outside of the basin (USGS 2003)

The pipeline facilities associated with the Project cross a total of five perennial and four intermittent streams as listed in Table 2.2-1. No waterbodies were identified within the vicinity of the proposed aboveground facilities. Table 2.2-1 identifies each waterbody crossing location by approximate milepost, waterbody identification number, perennial or intermittent flow, bank crossing width, state water and fishery classifications and crossing methodology. The information presented within the table was collected through field surveys conducted by Coler & Colantonio, Inc., during October 2002; examination of the USGS 7.5-minute topographic quadrangle maps of the Project area (Appendix B and Appendix J); and through consultation with the MADEP (Felix 2003).

TABLE 2.2-1

**SUMMARY INFORMATION OF WATERBODIES CROSSED BY THE
TEWKSBURY-ANDOVER LATERAL PROJECT**

Town	Channel #	Approximate Milepost	Waterbody	Stream Type	Crossing Width (feet)	Water Quality Classification	Fishery Classification	Crossing Method
Tewksbury / Andover	CH-1	4.85	Shawsheen River	P	0	B	CW	Horizontal Directional Drill
Tewksbury	CH-2	4.38	Tributary to Shawsheen River	I	2	B	WW	Open Cut
Tewksbury	CH-3*	3.94	Unnamed	I	4	B	WW	Open Cut
Tewksbury	CH-4	3.04	Pinnacle Brook	P	4	B	WW	Push – Pull
Tewksbury	CH-5	2.74	Pinnacle Brook	P	10	B	WW	Push – Pull
Tewksbury	CH-5A	2.53	Meadow Brook	P	8	B	WW	Push – Pull
Tewksbury	CH-6	2.35	Unnamed drainage	I	1	B	WW	Open Cut
Tewksbury	CH-7	1.30	Tributary to Strong Water Brook	I	6	B	WW	Open Cut
Tewksbury	CH-8	0.32	Tributary to Great Swamp	P	8	B	WW	Dry Ditch

Legend: Stream Type: P = Perennial
Water Quality Classification:

I = Intermittent **Fishery Classification:** WW = Warmwater Fishery
A – Waters designated as a source of public water supply.

CW = Coldwater Fishery

B – Waters are designated as a habitat for fish, other aquatic life, and wildlife, and for primary and secondary contact recreation.

* Channel 3 was identified from aerial photography due to lack of property access at the time of the field delineation.

2.2.1 Contaminated Sediments

Tennessee has contacted state environmental and water quality agencies in Massachusetts to determine the potential for waterbodies with known contaminated sediments to be crossed by the Project. A search of the DEP databases yielded no reported sediment contamination in any of the waterbody crossings (DataMap Technology Corporation 2002). In addition, no evidence of abandoned drums, aboveground fuel pumps, unvegetated areas or dumpsites was observed during field surveys conducted by Coler & Colantonio, Inc., in October 2002.

2.2.2 Public Watershed Areas

No public watershed or potable surface water supply areas are crossed by the Project, and no potable water supply intakes were identified within three miles downstream of any proposed waterbody crossing location (MADEP 2002). Based on this information, the Project will not affect any public watershed or potable surface water supply areas. Tennessee will utilize the erosion control and spill prevention measures as described within FERC's Plan and Procedures (Appendix F) to ensure that construction activities do not contaminate surface waters that contribute to groundwater sources.

2.2.3 Hydrostatic Test Water

In compliance with DOT specifications, Tennessee will conduct hydrostatic testing on all segments of pipeline prior to placement in service. Tennessee anticipates the use of water from the Town of Andover municipal system for hydrostatic pressure testing as identified in Table 2.2-2. Upon completion of the hydrostatic test, the wastewater will be discharged to the stormwater management system within the Wyeth property. No hydrostatic test water will be discharged directly to a wetland or waterbody.

Environmental impacts from withdrawal and discharge of test water will be minimized by utilizing the measures outlined in FERC's *Plan & Procedures* (Appendix F) and by complying with all appropriate permit requirements.

TABLE 2.2-2

**POTENTIAL SOURCE FOR HYDROSTATIC TEST WATER
FOR THE TEWKSBURY – ANDOVER LATERAL PROJECT**

Facility	Potential Source	Milepost	Quantity of Water Required (gallons)
8" diameter pipeline	Municipal water supply (Andover)	5.31	72,546

2.2.4 Construction Permits

As listed in Resource Report 1, Table 1.6-1, Tennessee will obtain all necessary permits and licenses related to installation of the pipeline across waterbodies and wetlands and before withdrawal or discharge of hydrostatic test water.

2.2.5 Sensitive Surface Waters

MADEP considers surface waters sensitive (designated as Class A) if they provide a source of water supply for drinking or food processing purposes and are suitable for bathing and primary contact recreational purposes (MADEP 2002). No waterbodies in the Project location are designated by MADEP as Class A waters and there are no waterbodies that are part of the Federal Wild and Scenic Rivers System (Backman 2002).

The Shawsheen River, as well as several named and unnamed tributaries to the Shawsheen River, will be crossed by the Project alignment. These waterbodies have been identified as Class B and are freshwater streams that either maintain trout or are upstream of a waterbody that produces trout. Tennessee does not anticipate any permanent adverse impacts on the identified sensitive waterbodies crossed by the Project. Temporary impacts associated with construction will be minimized to the greatest extent practicable, as Tennessee and its contractors will utilize the waterbody construction measures detailed within FERC's Plan and Procedures (Appendix F). Additionally, Tennessee will consult with MADEP and comply with regulatory approvals that provide conditions relative to timing of construction through these waterbodies to avoid fishery impacts.

2.2.6 Construction-Related Impacts

Temporary impacts that may result from construction activities in streams crossed by the Project include:

- increases in turbidity and silt loads due to mechanical disturbances;
- changes in the physical configuration of bottom surfaces; and
- removal of associated riparian vegetation

Minor, temporary increases in turbidity within waterbodies may result during construction and are dependent on such factors as stream flow velocities, existing sediment loads, particle size distributions and bottom substrate. While increased turbidity may have a temporary impact on invertebrate and fish species present within the waterbodies, the impacts are anticipated to be temporary in nature. Upon completion of construction, these areas will be restored to pre-construction conditions through bank restoration measures and natural biological processes.

2.2.7 Waterbody Construction and Mitigation Procedures

Tennessee will implement the waterbody construction procedures identified within FERC's *Plan and Procedures* (Appendix F), as well as installing the specified erosion controls at all waterbodies prior to the commencement of crossing activities.

Perennial waterbody crossings will typically be conducted as independent operations that are separate from the remainder of the pipeline construction to allow for the scheduling of crews and equipment during favorable weather conditions to expedite installation and restoration and minimize potential sedimentation impacts.

2.3 WETLANDS

2.3.1 Existing Resources

Tennessee located, classified and delineated wetland resources in the Project area through field surveys conducted in October 2002. All jurisdictional wetlands crossed by the Project were field delineated in accordance with the U. S. Army Corps of Engineers ("USACE") Wetlands Delineation Manual (Environmental Laboratory 1987) and the MA DEP Wetlands Protection Act Regulations (310 CMR 10.00).

The pipeline facilities associated with the Project will cross a total of 14 wetlands. No wetlands were identified within the vicinity of the proposed aboveground facilities. A total of approximately 11,403 linear feet of wetlands will be crossed over the entire Project area. Approximately 7.21 acres of wetland will be temporarily altered during construction. Of this amount, 2.40 acres will be permanently maintained in a scrub-shrub vegetation community during operation of the pipeline. Table 2.3-1 lists the wetlands to be crossed by the Project and also those wetlands delineated during the field surveys that are identified on the alignment sheets but not affected by construction or operation of the Project. The following provides a brief description of major wetland types crossed by the Project.

Palustrine Scrub-Shrub Wetlands

Several palustrine scrub-shrub ("PSS") wetlands were identified within and adjacent to the existing and proposed ROW during the field survey. Dominant species in this assemblage included multiflora rose (*Rosa multiflora*), purple loosestrife (*Lythrum salicaria*), meadow-sweet

(*Spiraea latifolia*), silky dogwood (*Cornus amomum*), northern arrowwood (*Viburnum dentatum*), highbush blueberry (*Vaccinium corymbosum*), elderberry (*Sambucus canadensis*) and several species of willow (*Salix* spp.). Also common are red maple (*Acer rubrum*), saplings and reed canary grass (*Phalaris arundinacea*).

Palustrine Emergent Wetlands

The palustrine emergent ("PEM") wetlands located within the project area were generally devoid of trees, however several did contain small stands of red maple. Herbaceous plant species adapted to hydric conditions dominated these wetlands and included reed canary grass, bluejoint grass (*Calamagrostis canadensis*), sedges (*Carex* spp.), bulrushes (*Scirpus* spp.), smartweeds (*Polygonum* spp.), soft rush (*Juncus effusus*) and sensitive fern (*Onoclea sensibilis*).

2.3.2 Construction and Operation Impacts

Construction of the Project will result in approximately 7.21 acres of temporary impacts to wetlands, including 4.67 acres of impact in PEM and 2.54 acres of impact to PSS wetlands (See Table 2.3-1 and 2.3-2). No permanent impacts to existing PEM and PSS wetlands are expected as a result of the Project, as these wetlands will be allowed to revert to the pre-construction vegetation cover type upon completion of pipeline installation.

Temporary wetland impacts may include soil disturbance, temporary alteration of hydrology and loss of vegetation during construction. Upon completion of construction, topsoil, contour elevations and hydrologic patterns will be restored to pre-construction conditions to promote the reestablishment of hydrophytic vegetation. Woody vegetation will be allowed to regenerate within the ROW except for a 10-foot wide area centered over the pipeline that will be maintained in an herbaceous/scrub-shrub state to allow for inspection and maintenance of the pipeline once it is in service.

2.3.3 Wetland Construction Procedures

Tennessee will protect and minimize potential adverse impacts on wetlands using construction procedures specified within FERC's *Plan and Procedures* (Appendix F).

Tennessee will utilize one of the following three methods for crossing wetlands during construction. The alignment sheets (Appendix L) indicate the proposed crossing technique for each wetland. The three methods are:

- Standard Pipeline Construction;
- Conventional Wetland Construction; and
- Push/Pull Wetland Construction

Standard pipeline construction will be utilized in wetlands where soils are non-saturated and able to support construction equipment at the time of crossing. This method requires segregation of topsoil from subsoil along the trenchline.

Conventional wetland construction will be used for crossing wetlands with saturated soils or soils unable to support construction equipment. Prior to crossing and movement of construction equipment through these wetlands, the ROW will be stabilized using timber mats or corduroy roads to allow for a stable, safe working condition.

Push/pull construction involves pushing or pulling a floating section of pre-assembled pipe into position within an inundated trench. Upon completion of the crossing, the floats are removed and the pipe, typically coated with concrete, is allowed to sink to the bottom of the trench. The crossing must be straight and level or nearly straight and level to float the pipeline across the wetland within the trench. Tennessee may utilize this method in large wetland areas with saturated soils and ground or surface water levels high enough at the time of construction to float the pipeline into the trench without the use of temporary dams.

When wetland soils are saturated, the pipeline trench will be excavated across the wetland by equipment supported on temporary wooden swamp mats to minimize the disturbance to wetland soils. Unless soils are saturated, the top 12 inches of wetland soil over the trenchline will be segregated. Trench spoil will be temporarily piled in a ridge along the pipeline trench. Gaps in the spoil pile will be left at appropriate intervals to provide for natural circulation or drainage of water. While the trench is dug, the pipeline will be assembled in a staging area located in an upland area. After the pipeline is lowered into the trench, wide track bulldozers or backhoes supported on swamp mats will be used for backfill, final cleanup, and grading. This method will minimize the amount of equipment and travel in wetland areas. If dry conditions exist within the wetland, the pipe fabrication will occur in the wetland and normal cross-country construction practices will be used.

Staging areas may be needed adjacent to specific wetlands to facilitate the pipeline crossing. The staging areas are in addition to the typical construction ROW and will be used for the assembly and fabrication of the pipe section that will cross the wetland area. This work area will be located at least 50 feet away from the wetland edge, topographic conditions permitting. If topographic conditions do not permit a 50-foot setback, these areas will be located at least 10 feet away from the wetland. Vegetation will not be cleared within the buffer zone between the staging areas and the wetland. Work areas will be limited in size to the minimum necessary to safely construct the wetland crossing, thus minimizing impacts to the wetland. Please refer to Table 8.1-4 for areas of potential temporary workspace and staging areas.

2.3.4 Minimization of Impacts

To minimize impacts to wetlands, Tennessee will implement the wetland construction procedures described within FERC's Plan and Procedures (Appendix F). Tennessee has reduced



the typical construction ROW through wetlands to 30 feet, and, during operation of the Project, 10 feet of the permanent ROW, centered over the pipeline, will be maintained within wetlands at an early successional stage in accordance with FERC requirements. In forested wetlands, Tennessee will minimize tree clearing to the extent practicable while maintaining safe construction conditions.

Tennessee will protect and minimize potential adverse impacts to wetlands by expediting construction in and around wetlands, restoring wetlands to their original configurations and contours, segregating topsoil during excavation, permanently stabilizing upland areas near wetlands as soon as possible after backfilling, inspecting the ROW periodically during and after construction and repairing any erosion control or restoration features until permanent revegetation is successful. Tennessee will comply with the applicable permit conditions issued by USACE under Section 404 of the Clean Water Act, MADEP under the 401 Water Quality Certificate program and the Tewksbury and Andover Conservation Commissions.

TABLE 2.3-1

WETLANDS CROSSED BY THE TEWKSBURY-ANDOVER LATERAL

Town	Approximate Milepost	Wetland #	Wetland Classification	Crossing Length (linear feet)	Acreage Affected		Crossing Method
					Temp. ^a	Perm. ^b	
Tewksbury / Andover	4.75	1	PEM/PSS	641	0	0	Horizontal Directional Drill
Tewksbury	4.34	2	PSS	607	0.42	0.14	Standard or Conventional
Tewksbury	3.87	3	PSS	300	0	0	Horizontal Directional Drill
Tewksbury	3.38	4	PEM/PSS	1277	0.88	0.29	Conventional or Push - Pull
Tewksbury	3.01	5	PSS	558	0.38	0.13	Conventional or Push - Pull
Tewksbury	2.98	6	PSS	0	0	0	Wetland avoided
Tewksbury	2.94	7	PSS	0	0	0	Wetland avoided
Tewksbury	2.76	8	PSS	453	0.31	0.10	Conventional or Push - Pull
Tewksbury	2.49	9	PEM	1492	1.03	0.34	Conventional or Push - Pull
Tewksbury	2.39	10	PSS	0	0	0	Wetland avoided
Tewksbury	2.34	11	PSS	0	0	0	Wetland avoided
Tewksbury	2.04	12	PSS	46	0.03	0.01	Standard or Conventional
Tewksbury	1.91	13	PSS	120	0.08	0.03	Standard or Conventional

TABLE 2.3-1

WETLANDS CROSSED BY THE TEWKSBURY-ANDOVER LATERAL

Town	Approximate Milepost	Wetland #	Wetland Classification	Crossing Length (linear feet)	Acreage Affected		Crossing Method
					Temp. ^a	Perm. ^b	
Tewksbury	1.78	14	PSS	125	0.09	0.03	Standard or Conventional
Tewksbury	1.71	15	PSS	409	0.28	0.09	Standard or Conventional
Tewksbury	1.45	16	PEM	483	0.33	0.11	Standard or Conventional
Tewksbury	0.85	17	PEM/PSS	2085	1.44	0.48	Conventional or Push - Pull
Tewksbury	0.67	18	PSS/PEM	372	0.26	0.09	Standard or Conventional
Tewksbury	0.67	19	PSS/PEM	0	0	0	Wetland avoided
Tewksbury	0.32	20	PSS	996	0.69	0.23	Conventional or Push - Pull
Tewksbury	0.03	21	PEM/PSS	1439	0.99	0.33	Conventional or Push - Pull
TOTAL		21	-	11,403	7.21	2.40	-

*Legend: PEM = Palustrine Emergent Wetland; PSS = Palustrine Scrub-Shrub Wetland; PFO = Palustrine Forested Wetland

^a Temporary Acreage = permanent ROW (20 feet) and temporary workspace (10 feet)

^b Permanent Acreage = 10' permanently maintained ROW through wetlands

TABLE 2.3-2

**WETLAND IMPACT SUMMARY BY WETLAND TYPE^a
FOR THE TEWKSBURY-ANDOVER LATERAL PROJECT**

Town	Palustrine Emergent (acres affected)		Palustrine Scrub/Shrub (acres affected)		Total Acres of Impact (acres affected)	
	Temp. ^b	Perm. ^c	Temp. ^b	Perm. ^c	Temp. ^b	Perm. ^c
Tewksbury, MA	4.67	1.55	2.54	0.85	7.21	2.40
Andover, MA	0	0	0	0	0	0
TOTAL	4.67	1.55	2.54	0.85	7.21	2.40

^a Impact calculations for areas with more than one wetland type were based on dominant type only.

^b Temporary Acreage = Permanent ROW (20 feet) and temporary workspace (10 feet)

^c Permanent Acreage = 10' permanently maintained area centered over pipeline within permanent ROW through wetlands.

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3.0 Vegetation and Wildlife

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ENGINEERS AND SCIENTISTS



RESOURCE REPORT 3 – VEGETATION AND WILDLIFE FERC ENVIRONMENTAL CHECKLIST

Part 380 – Minimum Filing Requirements for Environmental Reports	Company Compliance or Inapplicability of Requirement
Classify the fishery type of each surface waterbody that would be crossed, including fisheries of special concern. (§ 380.12 (e)(1)).	Sections 3.1.1 and 3.1.2
Describe terrestrial and wetland wildlife and habitats that would be affected by the Project. (§ 380.12 (e)(2)).	Section 3.2
Describe the major vegetative cover types that would be crossed and provide acreage of each cover type that would be affected by construction. (§ 380.12 (e)(3)).	Section 3.3
Describe the effects of construction and operation procedures on the fishery resources and proposed mitigation measures. (§ 380.12 (e)(4)).	Sections 3.1.3 and 3.1.4
Evaluate the potential for short-term, long-term, and permanent impact on wildlife resources and state-listed endangered or threatened species caused by construction and operation of the Project and proposed mitigation measures. (§ 380.12 (e)(4)).	Sections 3.2.2 and 3.4.2
Identify all federally listed or proposed endangered or threatened species that potentially occur in the vicinity of the Project and discuss the results of consultations with other agencies. (§ 380.12 (e)(5)).	Section 3.4
Identify all federally listed essential fish habitat (EFH) that potentially occurs in the vicinity of the Project and the results of abbreviated consultations with the NMFS, and any resulting EFH assessments. (§ 380.12 (e)(4 and 7)).	Section 3.1.2
Describe any significant biological resources that would be affected. Describe impact and any mitigation proposed to avoid or minimize that impact. (§ 380.12 (e) 4 and 7)).	Sections 3.1, 3.1.3, 3.2, 3.2.2, 3.3, 3.3.3, 3.4 and 3.4.2 Appendix F

3.0 VEGETATION AND WILDLIFE

Resource Report 3 describes the existing fish, wildlife and vegetation resources within the Project areas, the potential impacts of construction and operation on these resources, and measures to reduce and mitigate these impacts. Section 3.1 describes the fishery resources and fish habitat of special concern. Section 3.2 describes wildlife resources, focusing on the habitat types traversed by the Project. Section 3.3 describes the vegetation types, including wetlands, currently found in the vicinity of the Project. Section 3.4 describes the occurrence of state and federally listed threatened and endangered species that have been reported in the vicinity of the Project. Section 3.5 provides a list of references.

3.1 FISHERIES

This section discusses fishery resources, fish species of special concern, and construction and operation impacts on the fisheries present in the streams crossed by the proposed pipeline. Table 2.2-1 of Resource Report 2 identifies water quality classification and fisheries designation type for each stream crossed by the proposed Project as obtained from Massachusetts Surface Water Quality Standards, 314 CMR 4.00 (Massachusetts Department of Environmental Protection 2002).

Representative fish species known to occur within the project waterbodies include both warmwater and coldwater species and were identified through correspondence with the Massachusetts Division of Fisheries and Wildlife ("MADFW"). A list of representative game and commercial fish species known to occur in project area waterbodies is found in Table 3.1-1.

TABLE 3.1-1		
REPRESENTATIVE GAME AND COMMERCIAL FISH SPECIES KNOWN TO OCCUR IN PROJECT AREA WATERBODIES		
Coldwater - Anadromous	Coldwater - Resident	Warmwater
None	Brown Trout (<i>Salmo trutta</i>)	Largemouth Bass (<i>Micropterus salmoides</i>)
	Rainbow Trout (<i>Salmo gairdneri</i>)	White Sucker (<i>Catostomus commersoni</i>)
		Bluegill (<i>Lepomis macrochirus</i>)
		Pumpkinseed (<i>Lepomis</i> sp.)
		Brown Bullhead (<i>Ictalurus nebulosis</i>)
		Banded Sunfish (<i>Enneacanthus obesus</i>)
		White Perch (<i>Morone americana</i>)

3.1.1 Fishery Classification

During the field reconnaissance, observations were made at all waterbodies and water conveyance channels present within or adjacent to the proposed Project areas. Field determinations and examination of USGS 7.5-minute series topographic maps identified and classified the streams. Summary information on the individual waterbodies and streams crossed by the Project including fishery classifications is provided in Table 2.2-1 of Resource Report 2.

3.1.1.1 Pipeline Facilities

As detailed within Table 2.2-1 of Resource Report 2, the Project will cross a total of four intermittent streams and five perennial streams. Representative fish species (Table 3.1-1) were identified through consultation with MADFW. Tributaries to Shawsheen River, as well as other perennial streams crossed by the Project within Tewksbury, are classified as warmwater fisheries and have no special concerns. According to information from the MADFW and United States Fish and Wildlife Service ("USFWS"), the Shawsheen River is identified as a coldwater trout stream with no known federally threatened or endangered fish species present (Hartley 2002, Morrison 2002). Due to the proposed installation of the pipeline under the Shawsheen River via Horizontal Directional Drill, adverse impacts to fisheries associated with the Shawsheen River are not anticipated.

3.1.1.2 Aboveground Facilities

No waterbodies were observed within or adjacent to the locations of the proposed aboveground facilities associated with the Project during the field surveys.

3.1.2 Fisheries of Special Concern

MADFW reported that no Fisheries of Special Concern exist within the proposed Project alignment (Hartley 2002). The bridle shiner (*Notropis bifrenatus*), a state-listed species of special concern, is known to exist in the Shawsheen River. This species is not on the Rare Species Survey List for Tewksbury or Andover, and the Massachusetts Natural Heritage & Endangered Species Program ("NHESP") did not indicate that the project would have any adverse impact on this species (Huckery 2003). Additionally, USFWS did not identify any federally listed species of concern as being present within waterbodies crossed by the alignment (Morrison 2002).

3.1.3 Construction and Operation Impacts

Tennessee will implement all necessary protection techniques as detailed within the FERC *Procedures* (Appendix F). Once construction activities are completed, all areas will be restored to pre-construction contours. Please refer to Table 2.1-1 of Resource Report 2 for information about individual waterbody crossings.

Whenever construction occurs within a stream, there is potential for impacts upon fish habitat. A research study on the effects of pipeline crossings on stream characteristics conducted by the Gas Research Institute (Schubert et al. 1985) indicates that installation of a pipeline (or pipeline related activity) across a stream may cause temporary increases in suspended solid concentrations and streambed sedimentation. While uncommon, directional-drilling procedures under waterbodies may result in an increase in sedimentation by accidental release of drilling slurry into the waterbody. Sedimentation and a reduction in fish and benthic invertebrate populations were observed to a distance of approximately 575 feet (175 meters) downstream. These impacts were temporary as the sediments were washed away during subsequent storm events, and aquatic communities subsequently recolonized the area. Complete recovery of the benthic community occurred in two to seven months, and complete recovery of the fish community occurred within one year after construction completion. Downstream habitat alteration and increased suspended solids concentrations and sedimentation may eliminate or degrade fish spawning and nursery areas, resulting in a temporary reduction in reproductive potential.

Post-construction or operational impacts will be minimal. Restoration and maintenance of the vegetation within the right of way will minimize the erosion potential relative to the stream. Removal of streamside trees at the corridor crossing may temporarily reduce shading of the stream, eliminate escape cover and potentially result in a locally elevated water temperature. Elevated water temperature can lead to a reduction in levels of dissolved oxygen and influence fish survival and fitness. However, no impact is anticipated in relation to the timing of construction, because measures will be taken to avoid work within streams during the spawning period. Tennessee will adhere to FERC's Plan and Procedures to reduce sedimentation and erosion into all waterbodies encountered with the Project areas.

3.1.4 Minimization of Impacts

All waterbodies crossed by or within temporary workspace associated with the Project will be protected by adherence to FERC's Plan and Procedures (Appendix F) as well as any additional state and federal requirements. Open trenching will be employed at all stream crossings except for the Shawsheen River, which will be crossed via horizontal directional drill. Trenching and boring details and standard construction techniques employed at waterbody crossings are detailed within Appendix D. In general, Tennessee shall protect and minimize potential adverse impacts to streams by:

- Expediting construction and limiting the amount of equipment and activities in water bodies;
- Adhering to FERC's "Wetland and Waterbody Construction and Mitigation Procedures" to the greatest extent practicable;
- Coordinating construction activities to avoid high flow and spawning periods;
- Installing erosion controls to prevent sediment and siltation from entering streams;

- Constructing waterbody crossings as perpendicular to the axis of the waterbody channel as engineering and routing conditions allow;
- Providing additional temporary workspace associated with directional drilling, including pipe staging areas and storage areas for drilling mud and borehole cuttings, in upland areas outside of wetlands and riparian zones wherever practicable;
- Maintaining ambient downstream flow rates;
- Removing all construction material and structures from the waterbody after construction;
- Restoring stream channels and bottoms to their original configurations and contours;
- Permanently stabilizing stream banks and adjacent upland areas after construction;
- Inspecting ROWs periodically during and after construction and repairing any erosion controls and/or performing restoration, as needed, in a timely manner; and,
- Reducing clearing and leaving as many trees in place as possible on stream banks.

3.2 WILDLIFE

This section identifies and discusses the various wildlife species associated with the upland and wetland vegetation cover types identified in Section 3.3.1. It also identifies unique or significant habitats such as wildlife refuges, national forests and wildlife management areas occurring within the Project area. A discussion of the existing habitat types to be crossed by the Project is presented in Section 3.2.1 with additional information provided on mammal, bird and reptile and amphibian species that utilize these habitats. Tables 3.2-1, 3.2-2 and 3.2-3 provide lists of representative species for the types of habitats described. Section 3.2.2 describes the short-term, long-term and permanent impacts to wildlife habitat anticipated from construction and operation of the Project as well as mitigation measures to avoid and minimize these potential impacts.

3.2.1 Existing Resources

Existing terrestrial conditions were established through a combination of field reconnaissance and the use of a modified version of the USGS land cover classification system of Anderson et al. (1976). The general cover types include forested land, wetland, urban/roadway, old field/scrub/brushland, open water, and agricultural. The extent of each land cover type and the areas of transition between cover types were established during field reconnaissance. Land with at least 10 percent crown closure was classified as forest and further categorized into deciduous, coniferous, or mixed based on overstory species composition. Gradual transitions between land cover types ("soft edges") were included within the old field/scrub/brushland category, where applicable. Hard edges that contain abrupt transitions between land cover types were not incorporated as a separate classification. While the majority of the proposed pipeline traverses similar land classifications, species composition, topography and land use provide a variety of habitat conditions within each.

3.2.1.1 Mammals

Forty-three species have geographic ranges that include the eastern portion of Massachusetts (DeGraaf and Rudis 1983). These species include 24 species of rodents, seven species of bats, as well as larger species such as white-tailed deer (*Odocoileus virginianus*), eastern coyote (*Canis latrans*) and bobcat (*Felis rufus*). Species identified by visual sighting or sign (tracks, scat, forage areas) included white-tailed deer, raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), eastern gray squirrel (*Sciurus carolinensis*), eastern chipmunk (*Tamias striatus*), woodchuck (*Marmota monax*), and red fox (*Vulpes vulpes*) (Hamilton and Whitaker 1979).

The proposed project will occur within several different habitat types including forests, wetlands and urban/suburban areas. The impacts to habitat are expected to be temporary in nature and will not significantly affect mammal populations or habitats located within the project limits. A list of representative mammal species for each habitat type is presented in Table 3.2-1.

Mammal species with significant recreational and commercial value that inhabit areas to be crossed by the proposed pipeline sections include white-tailed deer, eastern cottontail, eastern gray squirrel, and eastern coyote. Based on the Massachusetts Division of Fisheries and Wildlife Environmental Law Enforcement, 2001 Preliminary Deer Harvest Summary numbers, 637 deer were harvested by shotgun in the northeast district that includes the towns that are located within the project corridor (MADFW 2002). The significance of furbearer trapping for recreational and commercial purposes has been eliminated with the passage of restrictive legislation governing the activity.

3.2.1.2 Birds

Massachusetts possesses a diversity of avian species that utilize the variety of landforms, habitats and vegetative communities within the state. At least 78 species of birds are known to use the eastern portion of the state as a breeding area, many of which are neotropical migrants (DeGraaf and Rudis 1983). Approximately 18 species utilize eastern Massachusetts as a wintering area and migrate to other portions of North America to breed in the spring. About 56 species complete their life cycles within the same area and are considered permanent residents.

The proposed project will occur within several different habitat types including forests, wetlands and urban/suburban areas. These habitats provide breeding, wintering and escape cover for birds as well as potential food sources in the form of berries and seeds. Any impacts associated with the proposed project are expected to be temporary in nature and will not significantly affect resident or migratory populations located within the project limits. A list of representative avian species for each habitat type is presented in Table 3.2-2.

Several species of upland game birds and waterfowl provide recreational hunting opportunities within the project area. Ring-necked pheasant (*Phasianus colchicus*), northern bobwhite

(*Colinus virginianus*) and wild turkey (*Meleagris gallopavo*) are hunted within upland areas, while a variety of waterfowl including mallard (*Anas platyrhynchos*), American black duck (*Anas rubripes*), Canada goose (*Branta canadensis*) and wood ducks (*Aix sponsa*) provide sporting opportunities within wetland areas.

3.2.1.3 Reptiles and Amphibians

A total of 36 species of reptiles and amphibians are found within the eastern half of Massachusetts. These include nine species of salamanders, seven species of turtles, 10 species of frogs, and 10 species of snakes (DeGraaf and Rudis 1983). During the field surveys, the presence of reptiles and amphibians was determined by a search along wetland and stream margins as well as beneath fallen logs, rocks, and debris within upland areas.

The Project will occur within several different habitat types including forests, wetlands and urban/suburban areas. These areas offer habitats that provide breeding, wintering, and escape cover for reptiles and amphibians as well as potential food sources for these species. Any impacts are expected to be temporary in nature and will not significantly affect resident or migratory populations located within the project limits. A list of representative reptile and amphibian species for each habitat type is presented in Table 3.2-3. Due to the habitat requirements of these animals, many of these species may be found in more than one habitat type.

**TABLE 3.2-1
REPRESENTATIVE MAMMAL SPECIES FOR HABITAT TYPES
CROSSED BY THE TEWKSBURY-ANDOVER LATERAL PROJECT**

Habitat Type	Common Name	Scientific Name
Coniferous Forest	Red Squirrel	<i>Tamiasciurus hudsonicus</i>
	Deer Mouse	<i>Peromyscus maniculatus</i>
	Long-tailed Shrew	<i>Sorex dispar</i>
Deciduous Forest	Virginia Opossum	<i>Didelphis virginiana</i>
	Northern Flying Squirrel	<i>Glaucomys sabrinus</i>
	White-footed Mouse	<i>Peromyscus leucopus</i>
	Woodland Jumping Mouse	<i>Napaeozapus insignis</i>
	Gray Fox	<i>Urocyon cinereoargenteus</i>
Mixed Forest	Gray Squirrel	<i>Sciurus carolinensis</i>
	Red Fox	<i>Vulpes vulpes</i>
	Striped Skunk	<i>Mephitis mephitis</i>
	White-tailed Deer	<i>Odocoileus virginianus</i>
	Eastern Coyote	<i>Canis Latrans</i>
Wetland	Beaver	<i>Castor canadensis</i>
	Muskrat	<i>Ondatra zibethicus</i>
	Mink	<i>Mustela vision</i>
	Water Shrew	<i>Sorex palustris</i>
Old Field/Scrub/Brushland	Eastern Cottontail	<i>Sylvilagus floridanus</i>
	Woodchuck	<i>Marmota monax</i>
	Meadow Vole	<i>Microtus pennsylvanicus</i>
	Meadow Jumping Mouse	<i>Zapus hudsonicus</i>
Urban / Agricultural	Raccoon	<i>Procyon lotor</i>
	Big Brown Bat	<i>Eptesicus fuscus</i>
	Eastern Chipmunk	<i>Tamias striatus</i>
	House Mouse	<i>Mus musculus</i>
	Gray Squirrel	<i>Sciurus carolinensis</i>

**TABLE 3.2-2
REPRESENTATIVE BIRD SPECIES FOR HABITAT TYPES
CROSSED BY THE TEWKSBURY-ANDOVER LATERAL PROJECT**

Habitat Type	Common Name	Scientific Name
Coniferous Forest	Great-horned Owl	<i>Bubo virginianus</i>
	Three-toed Woodpecker	<i>Picoides tridactylus</i>
	Red-breasted Nuthatch	<i>Sitta canadensis</i>
	Purple Finch	<i>Carpodacus purpureus</i>
	Pine Grosbeak	<i>Pinicola enucleator</i>
Deciduous Forest	Eastern Screech Owl	<i>Otus asio</i>
	Downy Woodpecker	<i>Picoides pubescens</i>
	Red-eyed Vireo	<i>Vireo olivaceus</i>
	Ovenbird	<i>Seiurus aurocapillus</i>
	Black-throated Blue Warbler	<i>Dendroica caerulescens</i>
Mixed Forest	Sharp-shinned Hawk	<i>Accipiter striatus</i>
	Wild Turkey	<i>Meleagris gallopavo</i>
	Blue Jay	<i>Cyanocitta cristata</i>
	Black-capped Chickadee	<i>Parus atricapillus</i>
	Wood Thrush	<i>Hylocichla mustelina</i>
Wetland	Great Blue Heron	<i>Ardea herodias</i>
	Mallard	<i>Anas platyrhynchos</i>
	Red-winged Blackbird	<i>Agelaius phoeniceus</i>
	Common Yellowthroat	<i>Geothlypis trichas</i>
	Virginia Rail	<i>Rallus limicola</i>
Old Field/Scrub/Brushland	Brown Thrasher	<i>Toxostoma rufum</i>
	White-throated Sparrow	<i>Zonotrichia albicollis</i>
	American Kestrel	<i>Falco sparverius</i>
	Ring-necked Pheasant	<i>Phasianus colchicus</i>
	Song Sparrow	<i>Melospiza melodia</i>
Urban/Agricultural	American Crow	<i>Corvus brachyrhynchos</i>
	House Sparrow	<i>Passer domesticus</i>
	European Starling	<i>Sturnus vulgaris</i>
	Rock Dove	<i>Columba livia</i>
	Common Grackle	<i>Quiscalus quiscula</i>

**TABLE 3.2-3
REPRESENTATIVE REPTILE AND AMPHIBIAN SPECIES
FOR HABITAT TYPES CROSSED
BY THE TEWKSBURY-ANDOVER LATERAL PROJECT**

Habitat Type	Common Name	Scientific Name
Coniferous Forest	Northern Red-bellied Snake	<i>Storeria o. occipitomaculata</i>
Deciduous Forest	Spotted Salamander	<i>Ambystoma maculatum</i>
	Red-backed Salamander	<i>Plethodon cinereus</i>
	Eastern Ribbon Snake	<i>Thamnophis sauritus</i>
Mixed Forest	Eastern Box Turtle	<i>Terrapene carolina</i>
	Eastern Garter Snake	<i>Thamnophis s. sirtalis</i>
	Northern Black Racer	<i>Coluber c. constrictor</i>
Wetland	Spotted Turtle	<i>Clemmys guttata</i>
	Red-spotted Newt	<i>Notophthalmus v. viridescens</i>
	Wood Frog	<i>Rana sylvatica</i>
	Eastern Painted Turtle	<i>Chrysemys p. picta</i>
Old Field/Scrub/Brushland	Black Rat Snake	<i>Elaphe o. obsoleta</i>
	Eastern Hognose Snake	<i>Heterodon platyrhines</i>
	Northern Leopard Frog	<i>Rana pipiens</i>
Urban	Red-backed Salamander	<i>Plethodon cinereus</i>
	Northern Brown Snake	<i>Storeria d. dekayi</i>
	Eastern Milk Snake	<i>Lampropeltus triangulum</i>
	Green Frog	<i>Rana clamitans</i>

3.2.1.4 Significant or Sensitive Species / Habitats

Consultation letters regarding significant or sensitive habitats were sent to USFWS and NHESP. USFWS indicates that there are no federally listed or proposed threatened or endangered species under federal jurisdiction known to occur in the Project areas located in Massachusetts (Morrison 2002). The NHESP indicated that several state-protected species may be located within the Project alignment and provided a Rare Species Survey List including the Eastern pond mussel (*Ligumia nasuta*), spotted turtle (*Clemmys guttata*), Eastern box turtle (*Terrapene carolina*), wood turtle (*Clemmys insculpta*), Blanding's turtle (*Emydoidea blandingii*), blue-spotted salamander (*Ambystoma laterale*) and sedge wren (*Cistothorus platensis*). NHESP also indicated that the Project alignment passed through Estimated Habitat 4014 that has been designated for spotted turtles (Huckery 2003).

3.2.2 Construction and Operations Impacts

The Project will require a total temporary disturbance (TWS, ATWS and pipe storage yards) of approximately 11.93 acres that consists of 0.34 acres of existing roadways, 0.39 acres of upland forest, 0.55 acres of residential land, 1.61 acres of commercial / industrial land, 4.81 acres of



wetland and 4.23 acres of land classified as open or "other" including conservation areas. The Project will require a total permanent impact of approximately 12.46 acres consisting of 0.67 acres of upland forest, 0.85 acres of residential land, 2.5 acres of commercial / industrial land, 6.04 acres of land classified as open or "other" including conservation areas and 2.4 acres of wetland. Table 8.1-1 provides a list of community types that will be impacted by the Project.

Long-term impacts to wildlife habitat due to construction and operation of the Project will be limited to minor clearing of upland forests required for temporary workspace. Any areas cleared for required temporary workspace and pipeline construction will quickly regenerate and provide additional scrub/shrub and old-field habitat. Areas of early successional habitat that are impacted by construction will be re-vegetated upon completion of construction.

The wildlife populations that utilize the Project areas will not be permanently adversely affected by the Project. While temporary impacts upon food, cover and water sources may occur, none of the species located within the Project area are specialized in such a way that construction of the pipeline will inhibit the overall fitness or reproductive output of the populations as a whole. Most species are not dependent on the right-of-way or transitional areas to provide all of their habitat requirements. Many of the mammal, bird, reptile and amphibian species are adaptive to changing habitat conditions and possess the capability to expand or shift their home ranges to find alternative sources of food, water and shelter until the right-of-way habitats become reestablished (DeGraaf et al. 1992).

Tennessee and its contractors will strive to minimize impacts to wildlife by expediting construction to the greatest extent possible. Conversion of forest and scrub-shrub habitats, particularly in wetlands, will be minimized through restriction of the right-of-way to the smallest width practical given the site-specific conditions. Re-vegetation will occur after construction has been completed, and the areas of impact will be monitored until final site stabilization is achieved.

TABLE 3.2-4**ESTIMATED CLEARING OF FOREST VEGETATION COVER TYPES**

Town	Upland Forest to be Cleared		Palustrine Forest to be Cleared	
	Temporary (acres) ^{a/}	Permanent (acres) ^{b/}	Temporary (acres) ^{a/}	Permanent (acres) ^{b/}
Tewksbury, MA	0.39	0.67	0.00	0.00
Andover, MA	0.00	0.00	0.00	0.00
Total	0.39	0.67	0.00	0.00

a/ Temporary cleared areas consist of that portion of the construction ROW and extra temporary work areas that would be allowed to naturally re-vegetate following construction.

b/ Permanently cleared areas consist of those portions of the construction ROW and aboveground facilities that would be maintained permanently free of woody vegetation during operation of the project.

3.3 VEGETATION

This section identifies and discusses the major vegetation cover types traversed by the Project. Existing terrestrial conditions were established using a modified version of the USGS land cover classification system of Anderson *et al.* (1976). The general cover types include forested land, barren land, urban/roadway land, old field/scrub/brushland and open water. The extent of each land cover type was identified during the field reconnaissance. Lands with at least 10 percent crown closure were classified as forest and include deciduous and mixed forest types. Mixed forests include areas where both deciduous and coniferous trees are growing within the same stand, but neither type predominates. The forest categories include both mature and immature stands. The ecotones that represent a gradual transition between forested lands and other land categories were included in the old field/scrub/brushland category where applicable.

Mixed forest and old field/scrub/brushland areas dominate the land use along the proposed route as the majority follows an existing, maintained overhead electric transmission line corridor. Forest types present in the region, as classified by Kuchler (1964) and Braun (1950), include northern hardwoods and transition hardwoods-white pine (*Pinus strobus*). Vegetative communities within the Project corridor are influenced by natural landscape features such as the Great Swamp and the Shawsheen River as well as urban, suburban and industrial development.

Routine vegetation maintenance clearing will occur within the permanent ROW in accordance with FERC's *Procedures*. To facilitate leak and corrosion surveys in several areas, a corridor, no more than 10 feet wide centered on the proposed pipeline, is maintained in an herbaceous state. The average width of the proposed permanent ROW is 20 feet. Please see Table 8.1-2 for acreage of each cover type to be affected during construction and operation of the Project.

3.3.1 Existing Resources

3.3.1.1 Cover Type Descriptions

Deciduous Forest: The Project route crosses stands of deciduous forest dominated by oak-maple and maple assemblages. Oak-maple forest areas were composed of white oak (*Quercus alba*), red oak (*Quercus rubra*), black oak (*Quercus velutina*) and red maple. Secondary tree species include sweet birch (*Betula lenta*), white birch (*Betula alba*), American beech (*Fagus grandifolia*), and quaking aspen (*Populus tremuloides*), with lesser concentrations of white pine and eastern hemlock (*Tsuga canadensis*). Understory species within this assemblage include staghorn sumac (*Rhus typhina*), Canada mayflower (*Maianthemum canadense*), American starflower (*Trientalis borealis*), lady fern (*Athyrium filix-femina*) and Indian pipes (*Monotropa uniflora*). Stands of maple forest were dominated by red maple with secondary tree species including black birch (*Betula nigra*) and white pine (*Pinus strobus*). Understory species were similar to that of the beech-maple assemblages but also include Canada goldenrod (*Solidago canadensis*), sensitive fern (*Onoclea sensibilis*), foxtail grass (*Setaria* sp.), cinquefoil (*Potentilla* sp.), and bird's foot trefoil (*Lotus corniculatus*).

Coniferous Forest: Stands of coniferous forest dominated by white pine are found in several locations along the Project corridor. These forests generally have a limited shrub layer due to dense canopy cover. Mature white pine trees of up to three feet diameter at breast height were noted at several locations along the pipeline corridor but outside of the designated workspace. Understory species generally consist of lowbush blueberry (*Vaccinium angustifolia*), striped pipsissewa (*Chimaphila maculata*), oaks and European buckthorn (*Rhamnus frangula*). The thick layer of partially decomposed pine needles and low light levels prevent lush herbaceous growth in this forest type.

Mixed Forest: Stands of mixed forest were the most abundant of the forest assemblages identified within the Project area, and two types of mixed communities, maple-pine and oak-pine, predominate. Maple-pine forests are dominated by white pine and red maple. Understory species found within maple-pine assemblages include American witch hazel (*Hamamelis virginiana*), cinnamon fern (*Osmunda cinnamomea*), bracken fern (*Pteridium aquilinum*) and wild sarsaparilla (*Aralia nudicaulis*).

Several forest stands were co-dominated by white pine and one or more different species of oak including white, red and black. Secondary tree species such as sweet birch and American beech were present in several stands in conjunction with regenerating growth of the dominant species. Understory shrub and herbaceous species were similar to those of maple-pine assemblages but also included tree club moss (*Lycopodium obscurum*), false Solomon's seal (*Smilacina trifolia*), winterberry (*Gaultheria procumbens*), bracken fern and lowbush blueberry.

Maintained Lawn: Maintained lawns surrounding residential communities and urban development are found along portions of the route. Typical lawn vegetation included: white clover (*Trifolium pratense*), plantain (*Plantago major*, *P. lanceolata*), dandelion (*Taraxicum officinalis*), fescue (*Festuca sp.*), yarrow (*Achillea millifolium*), timothy (*Phleum pratense*), wild strawberry (*Fragaria virginiana*), lance-leaved goldenrod (*Solidago graminifolia*), red raspberry (*Rubus strigosus*) and prickly dewberry (*Rubus flagellaris*)

Open Land: The majority of the Project area is within an existing overhead utility right-of-way that is maintained in an early successional stage. These areas and upland old growth fields outside of the proposed right-of-way contain an abundance of shrubs and herbaceous vegetation. Dominant species within these areas included: multiflora rose (*Rosa multiflora*), poison ivy (*Toxicodendron radicans*), lance-leaved goldenrod (*Solidago graminifolia*), lowbush blueberry, common mullein (*Verbascum thapsus*), bracken fern, red raspberry, prickly dewberry and Canada goldenrod. Other common species included foxtail grass, narrow-leaved meadowsweet (*Spiraea alba*) and white clover. Shrub species such as staghorn sumac and tree saplings including red maple, white oak, black cherry (*Prunus serotina*) and white pine have colonized edge areas along the right-of-way.

Palustrine Emergent Wetlands: The palustrine emergent wetlands located within the Project area were generally devoid of trees, however, several did contain small stands of red maple. Herbaceous plant species adapted to hydric conditions dominated these wetlands and included blue flag (*Iris versicolor*), Canada rush (*Juncus canadensis*), sensitive fern, sphagnum moss (*Sphagnum sp.*), swamp dewberry (*Rubus hispidus*), broad-leaf cattail (*Typha latifolia*), wool grass (*Scirpus cyperinus*), reed canarygrass (*Phalaris arundinacea*), button sedge (*Carex bullata*), purple loosestrife (*Lythrum salicaris*), common reed (*Phragmites australis*), spotted joe-pye-weed (*Eupatoriadelphus maculatus*), stiff arrow-head (*Sagittaria rigida*), tussock sedge (*Carex stricta*), soft rush (*Juncus effusus*) and fringed sedge (*Carex crinita*).

Palustrine Scrub-Shrub Wetland: Several palustrine scrub-shrub wetlands were identified within and adjacent to the proposed pipeline right-of-way during the field survey. Again, the majority of the wetlands crossed by the Project are within the existing overhead utility right-of-way and are maintained in a scrub-shrub state. Dominant species in this assemblage included silky dogwood, highbush blueberry, speckled alder (*Alnus rugosa*) black willow (*Salix nigra*) and steplebush (*Spiraea tomentosa*). Other species present within these wetlands were northern arrowwood (*Viburnum dentatum*) and red maple. Herbaceous understory species including sensitive fern, cinnamon fern, wool-grass, tussock sedge and jewelweed (*Impatiens capensis*) were present within these wetlands.

Open Water: The open water cover type includes natural ponds and other impoundments of standing water.



Urban/Roadway Land: The urban/roadway land cover types include residential areas, commercial areas and paved roadways. Residential areas may include large developments, single residential lots or other areas with homes in close proximity to the route alignment. Commercial/industrial areas are defined by the presence of electric power or natural gas utility facilities, manufacturing or industrial plants, landfills, mines, quarries, large working farms and commercial or retail facilities.

3.3.2 Communities of Special Concern

Communities of special concern include sensitive or protected vegetation types, natural areas and unique plant communities. Tennessee has requested and obtained information regarding unique communities from the Massachusetts NHESP indicating that a state species of Special Concern, Philadelphia panic grass (*Panicum philadelphicum*), may be located within the Project area (Huckery 2003). No other sensitive or protected vegetation types, natural areas or plant communities are located within the Project area. An initial field survey did not encounter Philadelphia panic grass along the Project route, however Tennessee is working with NHESP to develop a mitigation plan if the species is encountered during construction (refer to Appendix D).

3.3.3 Construction and Operation Impacts

Long-term impacts to successional habitats are limited to forest and scrub-shrub areas during operation of the Project. The siting of the alignment along a previously disturbed and maintained electric transmission corridor was the preferred alternative as it minimizes the clearing of forested areas and maintains existing vegetation buffers to adjacent residences. In areas where workspace within forested areas is unavoidable, they will be cleared and standard erosion control/cover species will be planted after construction is completed. Temporary workspace that was identified as forest during the field surveys will be allowed to revert to forest. Areas that are already vegetated with grasses or early successional species will be restored after construction has been completed.

3.3.4 Minimization of Impacts

Tennessee shall protect and minimize potential adverse impacts to wildlife through the use of the following procedures:

3.3.4.1 Clearing

No rubber tired equipment will be permitted to work in wetlands unless it will not damage the root systems and its use is approved by the Construction Inspector. Bulldozers will not be used for clearing in wetlands. Trees and brush will be cut at ground level by hydroaxes, tree shears, grinders or chain saws. Stumps will be left in place, except on the trenchline or unless the



removal is necessary to ensure worker safety. Stumps may be ground to a suitable height for safety reasons.

3.3.4.2 Grading

Grading will be limited to the areas directly over the trenchline, except where topography requires additional grading for safety reasons. Where grading is required, topsoil will be segregated and returned as an even layer to all graded areas.

3.3.4.3 Trenching

Following segregation of the topsoil, the remainder of the ditch will be excavated so that the pipe will have a minimum of 36 inches of cover unless otherwise specified.

3.3.4.4 Lowering-in\Backfilling

The trench will be backfilled with subsoil first. After the subsoil has been rough graded, topsoil will be replaced in an even layer. Spoil material imported from off the ROW must be approved by the Environmental Inspector. Where rock was part of the surface features prior to construction of the pipeline, rock will be placed back in the wetland in approximately the same configuration as pre-construction.

3.3.4.5 Cleanup/Restoration

All construction debris shall be removed following backfilling of the pipeline. Once backfilling is complete, Tennessee will restore the original contours and flow regimes to the extent practical, with the exceptions of unnatural features and unstable grades. The ROW will be seeded with an erosion control seed mixture to stabilize the area until indigenous species can become re-established. If an identified wetland is within an active agricultural parcel, reseedling will be performed according to appropriate land management or state agency permits and/or landowner agreements. If weather conditions limit the effectiveness of reseedling efforts, at the discretion of the Environmental Inspector and as allowed by all applicable permits, the ROW may be mulched to minimize erosion until conditions are suitable for reseedling. No fertilizer or lime shall be used in wetlands unless specified by the NRCS and approved by the applicable regulatory agencies.

3.4 ENDANGERED AND THREATENED SPECIES

This section identifies and discusses the presence of federal and state-listed plant and animal species potentially located within, or in the vicinity of the Project area. It also identifies significant habitats such as designated critical habitats and rare plant communities known to

occur within, or in the vicinity of the Project. Table 3.4-1 summarizes the species identified by the USFWS and MADFW as potentially occurring within the vicinity of the Project area and identifies the federal or state listing status of each species. Appendix E includes copies of the correspondence letters between Tennessee and the applicable regulatory agencies.

3.4.1 Existing Resources

3.4.1.1 Federal Species

A consultation letter regarding federally listed and proposed endangered or threatened species was sent to the U. S. Fish and Wildlife Service. The USFWS indicated that no federally listed or proposed threatened or endangered species under federal jurisdiction are known to occur in the Project areas (Morrison 2002).

3.4.1.2 State Species

The NHESP indicated that several state-protected species may be located within the Project alignment and provided a Rare Species Survey List including the Eastern pond mussel, spotted turtle, Eastern box turtle, wood turtle, Blanding's turtle, blue-spotted salamander, sedge wren and Philadelphia panic-grass. NHESP also indicated that the Project alignment passed through Estimated Habitat 4014, which has been designated for the spotted turtle (Huckery 2003).

TABLE 3.4-1
STATE-LISTED ENDANGERED AND
THREATENED SPECIES ALONG THE
TEWKSBURY-ANDOVER LATERAL PROJECT

Location	Species	State Status
Tewksbury, MA Middlesex County	Eastern Box Turtle (<i>Terrapene carolina</i>)	Special Concern
	Spotted Turtle (<i>Clemmys guttata</i>)	Special Concern
	Blanding's Turtle (<i>Emydoidea blandingii</i>)	Threatened
	Blue-spotted Salamander (<i>Ambystoma laterale</i>)	Special Concern
	Eastern Pond Mussel (<i>Ligumia nasuta</i>)	Special Concern
	Sedge Wren (<i>Cistothorus platensis</i>)	Endangered
	Philadelphia Panic Grass (<i>Panicum philadelphicum</i>)	Special Concern
	Wood Turtle (<i>Clemmys insculpta</i>)	Special Concern

3.4.2 Minimization of Impacts

At the request of the NHESP, Tennessee conducted field surveys for the identified wildlife and plant species of special concern to determine their presence and design impact minimization and mitigation measures to be incorporated into the Project design.

3.4.2.1 Eastern Pond Mussel

The Project alignment includes five perennial stream crossings: Pinnacle Brook (two crossings), Meadow Brook and the Shawsheen River. Field surveys for Eastern pond mussels were conducted at each of the perennial stream crossings, and it was determined that Pinnacle Brook and Meadow Brook do not provide suitable habitat at the proposed crossing locations (Nedeau 2003). Further, no mussels were observed within these streams. The Shawsheen River however, appears to provide suitable habitat for this species although no individuals were observed. Potential impacts to Eastern pond mussels will be avoided through installation of the pipeline under the river channel using the horizontal direction drill construction method.

3.4.2.2 Philadelphia Panic Grass

Several areas that could potentially support Philadelphia panic grass were identified along the Project alignment and will be surveyed prior to commencement of the Project. Should any populations of this species be located, Tennessee will protect them through avoidance where possible. Erosion and sedimentation controls will be installed around the populations located along the edges of the temporary workspace prior to the commencement of clearing activities, and the environmental inspector will monitor the populations daily to ensure that no adverse impacts occur as a result of construction activities. The protective fencing will remain in place until final restoration occurs.

Should populations be located within the permanent right of way or in areas where avoidance is not possible, Tennessee will consult with a certified plant biologist to determine the appropriate method for live removal of the plants. Photographs of the populations will be taken to document the position within the workspace and pre-construction condition. Once removed, the plants will be housed at a nursery or plant propagation facility approved by the NHESP. Upon final restoration of the workspace, the plants will be replaced in their original position and monitored on a bi-weekly basis through the remainder of the growing season to ensure successful reestablishment.

3.4.2.3 Blue-spotted Salamander

Wetland 7 has been identified as a vernal pool through the presence of spotted salamander egg masses and fairy shrimp. This vernal pool and surrounding uplands support breeding populations of spotted salamanders and may support blue-spotted salamanders. Tennessee has

incorporated a route deviation into the Project design to avoid any impact to this wetland and minimize disturbance of surrounding uplands. Erosion controls (silt fence and hay bales) will be installed prior to and maintained throughout construction to discourage blue-spotted salamanders from entering the workspace and prevent sedimentation of the wetland. An Environmental Inspector will conduct daily salamander surveys within the construction right-of-way during installation of the pipeline adjacent to Wetland 7. Any blue-spotted salamanders observed will be removed from the workspace and placed within the wetland.

3.4.2.4 Turtle Species

Portions of the Project will be located within or adjacent to potential Eastern box turtle habitat. The Project alignment is primarily limited to the previously disturbed, maintained overhead utility right-of-way, thus potential impacts to mixed forest will be minimal. Furthermore, portions of the Project alignment will be located within identified and potential wetland/riparian habitat for Blanding's turtles, spotted turtles and wood turtles. There will be some disturbance to potential nesting areas; however, construction of the Project is temporary in nature and all areas will be restored to pre-construction grades and revegetated following completion of the pipeline installation. The Project may actually improve potential nesting habitat by exposing portions of the right-of-way and maintaining early-successional vegetation.

Tennessee coordinated with NHESP to design and conduct field surveys and trapping activities to determine the presence of rare turtle species in the Project area. They will also be conducting a radio-telemetry monitoring study to document habitat use and movement patterns of captured individuals. This will allow Tennessee to determine more precisely where to focus precautionary construction methods and habitat restoration measures. Furthermore, the location of radio-tagged turtles will be monitored closely during construction through identified habitats such that they may be recaptured if located within the workspace and moved to an area outside of it. The radio-telemetry study will not only allow Tennessee to proceed with construction in an environmentally responsible manner, but will provide the NHESP with habitat use and movement data for these turtle species.

To minimize or avoid potential impacts to rare turtles, Tennessee incorporated the following mitigation methods into the Project design:

- *Pre-construction surveys* – Turtle surveys will be conducted within wetlands and areas identified as potential turtle habitat prior to construction. Should individuals be located, they will be identified, marked, moved outside of the designated workspace and a rare species identification form will be completed and submitted to NHESP.
- *Erosion Controls* (silt fence and hay-bales) will be installed prior to and maintained throughout construction to keep turtles from entering the workspace

- *Daily surveys of workspace* – Daily surveys will be conducted by the environmental inspector during installation of pipeline through identified and potential habitats. If turtles are found, they will be identified and marked and carefully removed from the construction site. The turtles will be placed into the same habitat in which they were found, but outside of the identified workspace.
- *Contractor training* – Contractors shall be trained by the environmental inspector on the identification of the four turtle species. Additionally, a detailed protocol shall be established to direct contractors as to the appropriate course of action to be taken if individual turtles are encountered within the workspace (i.e. contact environmental inspector, limitation of heavy equipment usage until individual is relocated, etc.).
- *Expedited construction* – Tennessee anticipates completion of stream and wetland crossings within 48 hours of commencement. Certain wetland crossings may take longer (within 48-96 hours of commencement) depending on wetland size and construction method utilized. This will minimize the length of time that the flume pipe(s) is in place in streams and/or disturbance occurs within wetlands, and will allow restoration measures to be instituted as soon as practicable. Erosion controls will remain in place within wetlands until restoration is complete; however, streams will be allowed to resume natural flow after the pipe is installed and the banks are stabilized.

Following completion of the rare species surveys and turtle trapping efforts, Tennessee provided results and proposed impact avoidance and mitigation measures to the NHESP for review and comments. NHESP indicated that they approved of the field surveys and proposed impact avoidance and mitigation methods for the state listed species of special concern and were satisfied that the Project had minimized potential impacts to these species.

3.4.2.5 Sedge Wren

The Project alignment will be located within or near potential sedge wren habitat in Wetland 1, which borders the Shawsheen River. No individual sedge wrens or nests were observed during field surveys. Potential impacts to sedge wrens will be avoided by utilizing horizontal direction drill construction method to install the pipeline beneath Wetland 1 and the Shawsheen River.

3.5 LITERATURE CITED

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4.0 Cultural Resources

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*Cultural Resources
Environmental Report
Tewksbury - Andover Lateral Project*

RESOURCE REPORT 4 – CULTURAL RESOURCES FERC ENVIRONMENTAL CHECKLIST

**This information is located in a separate Volume III marked
“Privileged and Confidential”**



5.0 Socio-Economics

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*Socio-Economics
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RESOURCE REPORT 5 – SOCIO-ECONOMICS FERC ENVIRONMENTAL CHECKLIST

Part 380 – Minimum Filing Requirements for Environmental Reports	Company Compliance or Inapplicability of Requirement
For major aboveground facilities and major pipeline Projects that require an EIS, describe existing socioeconomic conditions within the Project areas. (§ 380.12 (g)(1)).	Not applicable
For major aboveground facilities, quantify impact on employment, housing, local government services, local tax revenues, transportation, and other relevant factors within the Project area. (§ 380.12 (g)(2 – 6)).	Not applicable

5.0 SOCIO-ECONOMICS

The Project does not involve significant aboveground facilities such as conditioning or liquefied natural gas (LNG) plants. The Project scope is minor in nature and involves a small diameter lateral of minimal length and the installation of a meter station at the existing Wyeth facility. Based on the type and magnitude of potential environmental and residential impacts as well as the absence of significant or controversial issues identified to date, the requirement for an Environmental Impact Statement is not anticipated. Therefore, in accordance with Federal Energy Regulatory Commission (FERC) guidance provided in 18 Code of Federal regulations (CFR) Part 380.12(g), Resource Report 5 addressing socio-economic conditions and impacts in the Project area is not required.

Resource Report 1 (General Project Description) describes estimated workforce requirements in accordance with FERC guidance provided in 18 CFR Part 380.12(c). This information includes average workforce requirements, number of construction spreads, estimated duration of construction and number of personnel to be hired to operate the Project.



6.0 Geological Resources



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RESOURCE REPORT 6 – GEOLOGICAL RESOURCES FERC ENVIRONMENTAL CHECKLIST

Part 380 – Minimum Filing Requirements for Environmental Reports	Company Compliance or Inapplicability of Requirement
Identify the location (by milepost) of mineral resources and any planned or active surface mines crossed by the proposed facilities. (§ 380.12 (h)(1 and 2)).	Section 6.3 Table 6.3-1
Identify any geologic hazards to the proposed facilities. (§ 380.12 (h)(2)).	Section 6.4
Discuss the need for and locations where blasting may be necessary in order to construct the proposed facilities. (§ 380.12 (h)(3)).	Section 6.2 Table 6.1-1
For LNG Projects in seismic areas, the materials required by "Data Requirements for the Seismic Review of LNG Facilities," NBSIR84-2833. (§ 380.12 (h)(5)).	Not Applicable
For underground storage facilities, how drilling activity by others within or adjacent to the facilities would be monitored, and how old wells would be located and monitored within the facility boundaries. (§ 380.12 (h)(6)).	Not Applicable

6.0 GEOLOGICAL RESOURCES

This Resource Report describes the geologic resources traversed by the Project through Andover (Essex County) and Tewksbury (Middlesex County), Massachusetts. Additionally, this Resource Report identifies potential impacts of the Project on geological resources, geological hazards that may affect construction and operation of the facilities, and geological hazards that may place the facilities and/or public at risk. This report also describes measures to mitigate adverse impacts relating to geological resources and to minimize risks due to geological hazards.

6.1 GEOLOGIC SETTING

The Tewksbury-Andover Lateral Project is located within the Seaboard Lowland Province of the Eastern Plateau physiographic zone (Atwood 1940). The Seaboard Lowland is characterized by irregular topography with maximum summit altitudes less than 500 feet and a gentle slope toward the east. The present topography is the result of glacial erosion of and deposition on the bedrock surface that were deeply dissected with pre-glacial valleys. The surficial deposits mapped throughout the Seaboard Lowlands consist principally of till and a widespread layer of eolian sand (Oldale 1962). The till-layer, composed of gravel, sand, silt and clay, was deposited beneath moving ice. The sand layer consists of fine to medium-grained sand and is generally found to be less than three feet thick. Table 6.1-1 lists areas of shallow bedrock crossed by the Tewksbury-Andover Lateral.

**TABLE 6.1-1
GEOLOGIC CONDITIONS
WITHIN THE TEWKSBURY-ANDOVER LATERAL PROJECT**

Town and State	GEOLOGY		BEDROCK	GEOLOGIC HAZARDS
	Physiographic Province	Geological Formation/Stratigraphic Unit	Mileposts of Shallow Bedrock ^a	Mileposts of Severe Erosion Potential ^b
Andover, MA	Seaboard Lowlands	Irregular topography underlain by metamorphosed bedrock and covered with till and widespread eolian sand.	None	None
Tewksbury, MA			None	None

a: Areas of shallow bedrock are those with bedrock within five feet from the surface. See Table 7.1-1 for soil series information, including depth to bedrock, for the soils crossed by the Project

b: Area of soil that contain severe erosion potential. See Table 7.1-1 for soil series information, including erosion potential and erosion hazard, for the soils crossed by the Project

6.1.1 Pipeline Facilities and Aboveground Facilities

This section represents a total of approximately 5.31 miles of proposed pipeline construction located in Middlesex County and Essex County, Massachusetts. The USGS 7.5-minute quadrangle maps that contain this section are Reading, Billerica and Lawrence, Massachusetts. Elevations range from approximately 15-100 feet above Mean Sea Level ("MSL").

The proposed Tewksbury—Andover Lateral is located within the Nashoba Zone that is characterized by shale, marble and pale green volcanic bedrock. The Nashoba Zone was metamorphosed and synchronously intruded by Ordovician and Silurian plutons (Andover Granite). Additionally, the proposed lateral crosses two large plutons, known as the Sharpners Pond Pluton and the Andover Pluton. From southeast to northwest the Nashoba Zone bedrock includes: the Ayer Granite of Lower Silurian-Upper Ordovician age; the Shawsheen Gneiss, Fish Brook Gneiss, Boxford Member and Nashoba Formation of Ordovician to Proterozoic age; and the Tadmuck Brook Schist.

Based on review of the Middlesex and Essex County Soil Surveys, the Project alignment does not cross any areas identified as having shallow depth to bedrock (United States Department of Agriculture 1995). All soil series crossed by the Project have depth to bedrock greater than 60 inches.

6.2 BLASTING

The NRCS Soil Surveys do not identify any areas with shallow depth to bedrock. However, during field review of the alignment, areas of exposed ledge were identified in the vicinity of mileposts 1.60 and 1.68. A complete list of blasting locations can only be accurately determined in the field during the construction process. If blasting is to occur, Tennessee will obtain state and municipal approvals associated with proposed blasting prior to the commencement of construction. In accordance with the Code of Massachusetts Regulations 527 CMR 13, the entity conducting blasting must hold a valid and current MA Blasters License issued by the State Fire Marshall's Office (Harrington 2002).

In addition to detailed specification requirements, safety and impact minimization precautions include:

- installation of blasting mats in congested areas, in shallow waterbodies or near structures that could be damaged by fly-rock;
- posting warning signals, flags and barricades;
- following procedures for safe storage, handling, loading, firing and disposal of explosive materials;
- manning adjacent pipelines at valves for emergency response, and;
- excessive vibration will be controlled by limiting the size of charges and using charge delays that stagger each charge in a series of explosions.

The blasting specifications meet or exceed all applicable federal, state and local requirements governing the use of explosives.

6.3 MINERAL RESOURCES

Review of the USGS topographic map indicates that several geologic resources, including dimensioned granite, sand and gravel, and crushed stone, are mined in Middlesex and Essex Counties (See Appendix B and Appendix J). However, no major mining areas are crossed or within 0.25 miles of the Project.

There are, however, three inactive gravel and sand pits observed on the USGS Map within the vicinity of the Project alignment. One mine located on the Map at the terminus of the Project adjacent to the Wyeth facility was not observed during the Project reconnaissance. Based on the presence of numerous bedrock outcroppings in the area, it is believed that the sand and gravel yards were operational during blasting for development of the industrial park and Wyeth facility, and that they are no longer operational. A second gravel pit located south of Great Swamp is inactive and has been transitioned to a residential use. Table 6.3-1 summarizes the three inactive surface mines observed on the USGS Map to be within 0.25 miles of the Project.

TABLE 6.3-1

**SURFACE MINES CROSSED BY OR WITHIN 0.25 MILES
OF THE TEWKSBURY - ANDOVER LATERAL PROJECT**

Town	County	Operation	Approximate Milepost	Approximate Distance from ROW (feet)	Status	Operator(s)
Andover, MA	Essex	Gravel Pit	5.31	200	Inactive	---
Tewksbury, MA	Middlesex	Sand Pit	3.14	500	Inactive	---
Tewksbury, MA	Middlesex	Gravel Pit	1.02	300	Inactive	---

6.4 GEOLOGIC HAZARDS

This section provides information on potential geologic hazards in the vicinity of the Project. Potential geologic hazards considered for this section include earthquakes and active faults, areas susceptible to soil liquefaction, areas of potential ground failure such as landslides and slope movement, karst features (areas which possess a topography peculiar to and dependent upon

underground solution and the diversion of surface waters to underground routes), sinkhole formations and volcanism.

6.4.1 Earthquakes

Review of the *Earthquake Activity in New England and the Northeastern United States* (Ebel and Kafka 1991) map provided by the Weston Observatory indicates that three earthquakes were registered in the southern Greater Boston area of eastern Massachusetts between 1534 and 1992. According to the map, one of the earthquakes recorded registered a magnitude of 2.0 to 2.9; the other two earthquakes registered magnitudes of 3.0 to 3.9. Review of the *Seismicity of Massachusetts* map (USGS 2003) indicates that no earthquakes were registered in the area between 1977 and 2001.

A roughly semi-circular area surrounding Boston is included in Zone 3 as a consequence of the 1755 earthquake that was felt across the State. With the exception of the southwestern corner of the State, the remainder of Massachusetts is included in Zone 2. The proposed 5.31-mile pipeline as well as the aboveground facilities are located within Zone 2.

6.4.2 Active Faults

Review of the Bedrock Geologic Map of Massachusetts indicates that the Tewksbury-Andover Lateral Project alignment will cross one minor fault line in the town of Tewksbury. The fault line is not named and is shown on the Map as estimated, no direct observation of an earthquake has been made in the area of the fault line.

6.4.3 Subsidence

Subsidence is a significant geologic hazard in areas where the bedrock is predominantly limestone or dolomite. Since rock in this area is not carbonate, this will not be a concern with the Project. Based on the USGS topographic maps, no karst terrain is located in eastern Massachusetts or in the vicinity of the Project corridor. None of the soil types crossed by the pipeline are documented as having the potential to produce sinkholes.

6.4.4 Landslides

Review of the Preliminary Landslide Overview Map of the Conterminous United States (Radbruch-Hall et al. 1976) revealed that an area in the vicinity of the proposed Concord Lateral is "moderately susceptible" to landslides (see Table 6.1-1), and that landslides occur with "low incidence". The map indicates that, in Lower New England,

"The coastal area [of New England] is a rocky terrain with a highly irregular shoreline. Away from the coast, the land is rolling with extensive plains of ground moraine and Pleistocene

marine clay. The clays are unstable and on steep slopes adjacent to major streams there are numerous large areas that are susceptible to small slumps and earthflows."

Based on this information, the Project alignment is "moderately susceptible" to "low incidence" landslides.

6.4.5 Volcanism

No active volcanoes or igneous thermal activity are present in Essex, Middlesex or any neighboring counties.

6.5 PALEONTOLOGY

No paleontological resource areas have been mapped in Massachusetts (Foster 2002).

6.6 CONCLUSION

Impacts to geological resources will be insignificant. The potential for damage to the pipeline due to subsidence or other possible geological hazards will be minimized through routine inspection of the pipeline. The potential for slope failure due to earthflow along the proposed ROW will be minimized through specialized construction techniques and the use of erosion control procedures outlined in FERC's Plan and Procedures (Appendix F).

The Project is not expected to be affected by seismic activity due to the low probability of significant magnitude earthquakes within the Project area. Tennessee will comply with all applicable regulations regarding pipe wall thickness and strength. Therefore, Tennessee anticipates that the proposed facilities will be able to withstand all but the most extreme fault movements.

Excavation and trenching procedures, including blasting in areas with shallow bedrock, will be conducted in compliance with all federal, state and local laws, codes and regulations.

Topographic impacts will be limited to temporary alteration of terrain during construction of the Project. Based on specific site conditions, slopes may be re-contoured to ensure safe working conditions. Upon completion of pipe installation, disturbed areas and drainage patterns will be restored to pre-construction contours and elevations. Revegetation of the ROW in accordance with FERC's *Plan* will ensure that the disturbed areas are stabilized and prevent erosion. Construction and restoration activities will be monitored throughout the process to ensure compliance. Operation and maintenance activities will include routine revegetation monitoring as a standard operational procedure.

6.7 LITERATURE CITED

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7.0 Soils

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RESOURCE REPORT 7 – SOILS FERC ENVIRONMENTAL CHECKLIST

Part 380 – Minimum Filing Requirements for Environmental Reports	Company Compliance or Inapplicability of Requirement
Identify, describe, and group by milepost the soils affected by the proposed pipeline and aboveground facilities. (§ 380.12 (i)(1)).	Section 7.1.1 Table 7.1-1
For aboveground facilities that would occupy sites over 5.0 acres, determine the acreage of prime farmland soils that would be affected by construction and operation. (§ 380.12 (i)(2)).	Section 7.1.2
Describe, by milepost, potential impacts on soils. (§ 380.12 (i)(3 and 4)).	Section 7.2 Table 7.1-1
Identify proposed mitigation to minimize impact on soils, and compare with the staff's Upland Erosion Control, Revegetation and Maintenance Plan. (§ 380.12 (i)(5)).	Section 7.3

7.0 SOILS

Resource Report 7 identifies, describes, and lists by mileposts, the soils affected by the Project and its associated facilities. This report characterizes soils traversed by the Project based on US Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Soil Surveys Information for Middlesex and Essex Counties, Massachusetts. Soil information for Middlesex County was obtained by the Middlesex County Interim Soil Survey Report, 4th Edition, published by the Middlesex Conservation District in July 1995, as well as soil maps published by the Middlesex Conservation District. The Soil Survey of Essex County, Massachusetts, Northern Part published by the USDA Soil Conservation Service in cooperation with the MA Agricultural Experiment Station and issued February 1981 provided soil information and descriptions for Essex County.

Resource Report 7 is organized into four sections. Section 7.1 describes the soils traversed by the proposed pipeline and soils affected by proposed aboveground facilities. Section 7.2 provides a description of the potential impacts of the Project on soil resources. Section 7.3 presents mitigation measures proposed to minimize soil impacts and Section 7.4 lists references used in the preparation of this report.

7.1 EXISTING ENVIRONMENT

The Project crosses a total of 17 unique soil-mapping units. Soil map units presented in this report are phases of various soil series, associations and complexes. Soil series are groups of soils having similar parent material such as glacial till, loess or alluvium and are differentiated mainly on the basis of significant variations in morphological features of the soil profile. A soil association is comprised of a group of soil series that occur together in a characteristic pattern that allow for mapping as a cohesive unit.

Soils that may cause potential limitations during construction and / or operation of the proposed facilities are identified by soil map unit and milepost and presented within Table 7.1-1. Potential soil limitations identified in the Project vicinity include prime farmland, hydric soils, soils with potential for poor revegetation, soils prone to compaction and soils that occur on steep slopes and are susceptible to severe erosion.

Associations have not been determined for the soils identified in Middlesex County, MA; however preliminary soil maps were utilized to identify potential hazard prone and sensitive soils associated with shallow depth to bedrock, poor vegetation potential, farmland and hydric factor crossed by the Project and are provided in Table 7.1-1 (USDA 1981). No soils crossed by this Project were identified as having severe erosion potential.

7.1.1 Pipeline Facilities

7.1.1.1 Middlesex County, MA

A brief description of each soil series crossed by the proposed pipeline is provided by the Official Soil Series Descriptions prepared by the US Department of Agriculture Natural Resource Conservation Service (NRCS 2002).

Freetown muck

The Freetown series consists of nearly level, deep, very poorly drained organic soils formed in more than 51 inches of highly decomposed organic material. They are depressions or on level areas on uplands and outwash plains. Permeability is moderate or moderately rapid. These soils are found in bogs that range from small, enclosed depressions to bogs of several hundred acres in size. It is mostly found in forested areas and the water table is at or near the surface most of the year.

Windsor loamy sand, 0 to 8 percent slopes

This deep, nearly level to gently sloping, excessively drained soil is in irregularly shaped areas. Typically, the surface layer is friable, very dark grayish brown loamy sand about 10 inches thick. The subsoil is 18 inches thick. It is yellowish brown loamy sand in the upper part and very pale brown sand in the lower part. The substratum is pale yellow sand to a depth of 60 inches or more. The permeability of this soil is rapid or very rapid, and available water capacity is low. The soil is suitable for cultivated crops, hay, and pasture. The soil is poorly suited to most types of wildlife habitat.

Windsor loamy sand, 8 to 15 percent slopes

This deep, gently sloping, excessively drained soil is in irregularly shaped areas. Typically, the surface layer is friable, very dark grayish brown loamy sand about 5 inches thick. The subsoil is 23 inches thick. It is yellowish brown loamy sand in the upper part and yellowish brown and very pale brown sand in the lower part. The substratum is pale yellow sand to a depth of 60 inches or more. The permeability of this soil is rapid or very rapid, and available water capacity is low. The soil is poorly suited for cultivated crops, hay, and pasture. Erosion hazard is moderate. The soil is poorly suited to most types of wildlife habitat.

Udorthents—Urban Land Complex

This soil series consists of nearly level to moderately steep, somewhat excessively to moderately well drained areas of Urban land. This soil is usually present in areas where soil has been excavated and/or deposited due to construction operations. Udorthents areas have been disturbed

to an extent where the natural layers of the soil are no longer recognizable and area not longer a major factor in determining limitations or capability of the land. Although urban land development has altered the soils and landscapes in these areas, the soil can be identified at widely separated points and the general nature of the area can be determined.

Udorthents—Wet Substratum

This soil series generally consists of gently sloping areas that have previously been disturbed with the filling of soil. These areas are thought to have once be areas of swamps.

Deerfield loamy sand, 0 to 8 percent slopes

The Deerfield series consists of very deep, moderately well drained soils formed in glaciofluvial deposits. They are nearly level to strongly sloping soils on terraces, deltas, and outwash plains. Permeability is rapid in the solum and rapid or very rapid in the substratum. These areas are mainly cleared and used for truck crops, tobacco, potatoes, hay, pasture, and silage corn. Some other areas are forested or in urban uses.

Scarboro loamy sand, 0 to 3 percent slopes)

The Scarboro series consists of very deep, very poorly drained soils in sandy glaciofluvial deposits on outwash plains, deltas, and terraces. They are very poorly drained, nearly level soils in depressions. The soils formed in sandy outwash deposits derived mainly from gneiss and granite. Permeability is rapid or very rapid. Land is mostly idle or woodland.

Charlton-Hollis-Rock outcrop complex, 3-8 percent slopes

This unit consists of well-drained, deep Charlton soils, exposed bedrock, and somewhat excessively drained, shallow Hollis soils on ridges and hills. The Charlton soil has a very friable, dark brown fine sandy loam surface layer to about four inches. The subsoil is friable brown fine sandy loam to dark yellowish brown gravelly fine sandy loam to 17 inches. The substratum is olive brown gravelly fine sandy loam to 60 inches or more. The Hollis soils have surface layer of friable, very dark brown sandy loam about 5 inches. The subsoil is friable brown to dark yellowish brown sandy loam. Hard granite bedrock is at a depth of 16 inches. Permeability is moderate to moderately rapid. Most areas of these soils are in woodland. These soils are poorly suited to farming.

Woodbridge fine sandy loam, 3 to 8 percent slopes

This deep, gently sloping, moderately well drained soil is on or near the tops of drumloidal hills and is in irregular shaped areas at lower elevations. The surface layer is friable, very dark grayish brown fine sandy loam about 9 inches thick. The subsoil is fine sandy loam 17 inches

thick from yellowish brown to olive brown. The substratum is mottled very firm, light olive brown fine sandy loam to 60 inches or more. Permeability of this soil is moderate or moderately rapid in the subsoil and slow in the substratum. A seasonal high water table is at a depth of one and a half to three feet. The soil is well suited to cultivated crops, hay, and pasture. Erosion hazard is moderate. The soil is suitable for trees and openland wildlife habitat.

Ridgebury fine sandy loam, 2 to 8 percent slopes, extremely stony

The Ridgebury series consists of very deep, somewhat poorly drained soils formed in glacial till derived mainly from granite, gneiss and schist. They are nearly level to gently sloping soils in low areas in uplands. Permeability is moderate to moderately rapid in the solum and slow or very slow in the substratum. The soils are in slightly concave areas and shallow drainageways of till covered uplands. Cleared areas are used mainly for hay and pasture, while the majority of areas are largely forested.

Canton fine sandy loam, 3-8 percent slopes

This series consists of deep, gently to moderately sloping, well-drained soil found on the lower slopes of hills. The surface layer is friable, dark brown fine sandy loam about seven inches thick. The subsoil is very friable fine sandy loam 24-26 inches thick ranging in color from brown to light olive brown. The substratum is loose, light brownish gray gravelly loamy sand to 60 inches or more. The permeability of this soil is moderately rapid in the subsoil and rapid in the substratum. This soil is well suited to cultivated crops, hay, and pasture. The erosion hazard is moderate.

Canton fine sandy loam, 8-15 percent slopes, extremely stony

This series consists of deep, moderately sloping, well-drained soil found on the lower slopes of hills. The surface layer is friable, dark brown fine sandy loam about three inches thick. The subsoil is very friable fine sandy loam 30 inches thick ranging in color from brown to light olive brown. The substratum is loose, light brownish gray gravelly loamy sand to 60 inches or more. The permeability of this soil is moderately rapid in the subsoil and rapid in the substratum. Most areas of this soil are in woodland, but the stones on the surface make this soil poorly suited to most uses other than woodland wildlife habitat.

Swansea muck

The Swansea series consists of very poorly drained organic soils. They formed in 16 to 51 inches of highly decomposed organic material over sandy mineral. These soils are in depressions or on flat level areas on uplands and outwash plains. Permeability is moderate or moderately rapid in the organic material and very rapid in the substratum. These soils are in bogs that range from small, enclosed depressions to bogs of several hundred acres in size. It is

mostly found in forested areas.

Merrimac-Urban land complex, 0 to 8 percent slopes

The Merrimac series consists of very deep, somewhat excessively drained soils formed in glacial outwash. They are gently sloping soils on outwash terraces and plains and other glacio-fluvial landforms. Permeability is moderately rapid or rapid in the solum and rapid or very rapid in the substratum. This soil is somewhat excessively drained and mainly cultivated and used for growing hay, pasture, silage, corn, or truck crops where the soils have not been altered or obscured by urban work or structures such as buildings, industrial areas, paved areas, and railroad yards

Wareham loamy sand, 0 to 5 percent slopes

This deep, nearly level, poorly drained soil is in irregularly shaped areas in outwash on plains, deltas, and terraces. Typically, the surface layer is friable, very dark brown loamy sand about 8 inches thick. The subsurface layer is very friable, light gray loamy sand two inches thick. The subsoil is friable, yellowish brown, mottled loamy sand 6 inches thick. The substratum is and to a depth of 60 inches or more. Most areas are forested or idle. Cleared and drained areas are used for growing hay, pasture, and row crops. Red maple (*Acer rubrum*), American elm (*Ulmus americana*), Eastern hemlock (*Tsuga canadensis*), Eastern white pine (*Pinus strobus*), quaking aspen (*Populus tremuloides*), and tamarack (*Larix laricina*) are the most common trees.

7.1.1.2 Essex County, MA

Essex County is in the northeastern part of Massachusetts. The major topographic features are drumoidal hills, rolling moraines, and dissecting river valleys. The Merrimack River, Parker River, Rowling River, and Ipswich River provide most of the drainage in the survey area. Winters are cold and summers are warm. In winter the ground is frequently, but not continuously, covered with snow. Total annual precipitation is nearly always adequate for crops that are suited to local temperatures.

The following soil descriptions were obtained from the Essex County Soil Survey (USDA 1981):

Gravel Pits (Pg)

This unit consists of irregularly shaped areas from which gravel has been removed for construction purposes. These pits are generally devoid of vegetation, although some older ones have scattered bushes, grass, and annuals. Most pits are droughty, but some have been excavated to a depth below the seasonal high water table. Areas of this unit are generally poorly suited to farming, recreational and residential development, and wildlife habitat.



Medisaprists, deep (MC)

This unit consists of nearly level, very poorly drained deposits of organic material to depths of 60 inches or more. It generally is black to very dark grayish brown decomposed organic matter or reddish brown fibrous organic matter. The permeability is moderate to rapid, and available water capacity is high. Most areas of this unit are in woodland, but the soils are poorly suited to timber production. The content of organic matter limit these soils for most uses other than wetland wildlife habitat.

TABLE 7.1-1

SOILS TRANSVERSED BY THE TEWKSBURY - ANDOVER LATERAL PROJECT

Facility	Soil Association / Soil Name / Soil Type	Milepost (MP)	Erosion Hazard / K Factor	Poor Vegetation Potential	Severe Compaction Potential*	Depth to Bedrock (inches)	Hydric/Non- Hydric (NRCS)	Prime Farm-land
Middlesex County, Massachusetts								
Valve Interconnect	Hinkley loamy sand, 3 to 8 percent slopes	0 to 0.03	Slight / 0.17	Severe	---	>60	Non Hydric	Important
Lateral	Freetown Muck	0.03 to 0.55 1.0 to 1.39 2.46 to 2.83 2.93 to 3.23 3.55 to 3.80 4.94 to 5.05	Slight / ---	Severe	---	>60	Hydric	---
	Windsor loamy sand, 0 to 15 percent slopes	0.55 to 0.56 0.75 to 0.96 3.23 to 3.27 3.27 to 3.55 4.62 to 4.68 4.68 to 4.94	Slight / 0.17—0.10	Severe	---	>60	Non Hydric	Important
	Udorthents—Urban Land Complex , 0 to 25 percent slopes	0.56 to 0.72	---	---	---	>60	Non Hydric	---
	Udorthents sandy to wet substratum	0.72 to 0.75 1.48 to 1.57 3.80 to 3.98 4.15 to 4.33	---	---	---	>60	Non Hydric	---

TABLE 7.1-1

SOILS TRANSVERSED BY THE TEWKSBURY - ANDOVER LATERAL PROJECT

Facility	Soil Association / Soil Name / Soil Type	Milepost (MP)	Erosion Hazard / K Factor	Poor Vegetation Potential	Severe Compaction Potential*	Depth to Bedrock (inches)	Hydric/Non-Hydric (NRCS)	Prime Farm-land
	Deerfield loamy sand, 0 to 8 percent slopes	0.96 to 1.0 1.85 to 1.92 4.33 to 4.54	Slight / 0.17	Moderate	---	>60	Non Hydric	Important
	Scarboro loamy sand, 0 to 3 percent slopes	1.39 to 1.48 1.57 to 1.69 1.76 to 1.85	Slight / 0.17	Severe	---	>60	Hydric	---
	Charlton—Hollis—Rock outcrop complex, 3-8 percent slopes	1.69 to 1.73	Slight / 0.20	Slight	---	>60	Non Hydric	---
	Woodbridge fine sandy loam, 3 to 5 percent slopes	1.73 to 1.76 1.92 to 2.17	Slight / 0.24	Slight	---	>60	Non Hydric	Prime
Lateral	Ridgebury fine sandy loam, 2 to 8 percent slopes, extremely stony	2.17 to 2.21	Slight / 0.28	---	---	>60	Hydric	---
	Canton fine sandy loam, 3-15 percent slopes (extremely stony)	2.21 to 2.24 2.32 to 2.42 2.42 to 2.46	Slight / 0.20 to 0.24	Slight	---	>60	Non Hydric	Prime
	Swansea muck	2.24 to 2.32 4.07 to 4.15	Slight / ---	Severe	---	>60	Hydric	---

TABLE 7.1-1

SOILS TRANSVERSED BY THE TEWKSBURY - ANDOVER LATERAL PROJECT

Facility	Soil Association / Soil Name / Soil Type	Milepost (MP)	Erosion Hazard / K Factor	Poor Vegetation Potential	Severe Compaction Potential*	Depth to Bedrock (inches)	Hydric/Non-Hydric (NRCS)	Prime Farm-land
	Merrimac—Urban land complex, 0 to 8 percent slopes	3.98 to 4.07	Slight / 0.24	Moderate	---	>60	Non Hydric	---
	Wareham loamy sand, 0 to 5 percent slopes	4.54 to 4.62	Slight / 0.17	Severe	---	>60	Hydric	---
Essex County, Massachusetts								
Meter Station	Urban Land (Ur)**	5.21 to 5.31 terminus	---	---	---	---	Non Hydric	---
Lateral	Gravel Pits (Pg)**	5.09 to 5.21	---	---	---	---	Non Hydric	---
	Medisapristis, deep (MC)	5.05 to 5.09	---	Severe	---	>60	Hydric	---

* Not Applicable—no agricultural land crossed by the proposed Lateral or above ground facilities **Soil Unit not assigned to a capability subclass

References:

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Service. Guide for Soil Categories for Use with Farmland Valuation. <http://www.dls.state.ma.us/bia/pdfs/Soilguidefy2003.pdf>

USDA – Natural Resources Conservation Service. 2001. Massachusetts – Hydric Soils List. http://soils.usda.gov/soil_use/hydric/states/ma.htm

7.1.2 Aboveground Facilities

7.1.2.1 Middlesex County

The start of the proposed line is located at Tennessee's Concord Lateral in Tewksbury, Middlesex County, MA. An interconnect valve will be installed at the pipeline connection. This interconnect valve is located within the Hinkley soils series. The area of the pipeline interconnect is a disturbed area maintained by dirt paths and utility right-of-ways. The following soils description was obtained from the Middlesex County Soil Survey Interim (July 1995).

Hinkley loamy sand, 3 to 8 percent slopes

The Hinkley series consists of nearly level to very steep, deep (5+ ft.), excessively drained soils on glacial outwash plain, terraces, kames, and eskers. They formed in gravelly and cobbly coarse textured glacial outwash. Hinkley soils have friable or loose, gravelly sandy loam to loamy coarse sand which have very rapid permeability.

7.1.2.2 Essex County

The terminus of the Project is at the existing Wyeth Biopharmaceutical ("Wyeth") facility in Andover, MA, where the soil is mapped as Urban Land (Ur). Tennessee is proposing to construct a meter station site at the Wyeth facility. The Urban Land soils have been altered or obscured by urban work or structures. Buildings, industrial areas, paved areas, and railroad yards cover more than 75 percent of the land surface. Appendix M provides preliminary site-specific plans for aboveground facilities proposed by Tennessee. The following soil description was obtained from the Essex County Soil Survey (USDA 1981):

Urban Land (Ur)

Urban land consists of nearly level to moderately steep areas where the soils have been altered or obscured by urban work or structures. Buildings, industrial areas, paved areas, and railroad yards cover more than 75 percent of the land surface.

7.2 CONSTRUCTION AND OPERATION IMPACTS

The Project will involve short-term construction related impacts on soil resources. Impacts will result from soil disturbance due to clearing, grading, trench excavation, and by heavy machinery traveling along the right-of-way during pipeline construction, potential reduction of soil quality from the intermixing of topsoil and subsoil, and the potential for soil settling or slumping. The soil resource impacts will occur only during the construction period and/or post-construction monitoring period.

Important factors in determining the occurrence of soil hazards include the characteristics of the major soil types, vegetative cover, and slope. This section discusses soil impacts and mitigation along the Project route. Information regarding the soil-related limitations was compiled from the NRCS county soil surveys referenced previously.

In general, the Project does not traverse soils with a severe potential for soil compaction (agricultural land). An examination of the soil surveys information showed that depth to bedrock is greater than five feet through the majority of the Project area, therefore the probability of the introduction of rock into the topsoil is low (See Table 7.1-1). The following subsections describe the nature of the potential soils-related issues in the Project area.

7.2.1 Agricultural Land

Based on the preliminary field survey of the Project corridor, no portion of the Project is located within agricultural land.

7.2.2 Hydric Soils

Impacts associated with hydric soils coincide with impacts associated with construction in wetlands. Since field delineated resources are considerably more accurate than the soil surveys referenced previously, please refer to Resource Report 2 for information on potential impacts associated with hydric soils (wetland) and proposed mitigation for construction in these areas.

7.2.3 Severe Erosion

No soils crossed by this Project were identified as having moderate or severe erosion potential.

7.2.4 Compaction

During construction, some soils may become compacted under construction traffic. Factors that influence compaction include soil moisture, soil texture, grain size distribution and porosity. For instance, heavily graded soils with some silt content that are not overly wet or dry tend to compact more than uniform sands. Tennessee anticipates that soil decompaction measures will not be required since no Agricultural land is crossed by the Project.

7.2.5 Introduction of Rock in Topsoil

Introduction of rocks into topsoil results in reduction of soil quality, potential difficulty in tilling, and damage to farm equipment. Review of the soil surveys and surficial geology data determined that one of the soils crossed by the Project has bedrock at a depth of less than five feet and one of the soil series was classified as having an extremely stony soil phase.

7.2.6 Poor Revegetation Potential

Soils that have a severe revegetation potential (areas of seeding mortality) were determined from data contained within the county soil surveys (USDA 1995, 1981). The revegetation potential of the major soil types in each soil unit was rated according to its potential for producing domestic perennial grasses and herbaceous legumes. Soil properties that affect the growth of grasses and legumes include the topsoil thickness for the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, soil temperature, and slope. Approximately 3.03 miles of the Project is located within areas identified as having severe revegetation potential (See Table 7.1-1). If restoration and revegetation measures are not successful within two years after construction is completed, Tennessee will consult with NRCS to address the specific sites.

7.3 MITIGATION

This section contains information pertaining to specialized construction methods along pipeline right-of-ways. Temporary soil impacts will be limited to the pipeline right-of-way during the period of construction and implementation of the FERC Plan and Procedures (Appendix F). This plan emphasizes the use of standard erosion control techniques to reduce the potential for erosion and the use of temporary control measures such as interceptor dikes, rip-rap, or sediment barriers, followed by re-establishment of stabilizing vegetation to minimize erosive impacts.

The following sections briefly address soil impact mitigation measures that Tennessee will use during construction.

7.3.1 Erosion Control

Construction will temporarily alter surface drainage and temporarily increase the potential for compaction, erosion, sedimentation, mixing of soil horizons, and rutting. The pipeline will be constructed in a manner that will minimize environmental impacts and conditions specific to the construction area. Tennessee's objective is to minimize the potential for erosion and sedimentation during pipeline construction and to effectively restore the right-of-way and other disturbed areas. Tennessee will meet this objective by employing the erosion and sedimentation control measures contained in the Plan and Procedures.

The Environmental Inspectors are responsible for ensuring that contractors implement and maintain erosion and sediment control measures during construction.

Erosion control and sedimentation measures will be implemented through construction of water bars and terraces diagonally across the right-of-way on slopes to reduce runoff, except in cultivated areas and lawns. Water diverted by the water bars will be channeled to well vegetated areas. Erosion control barriers consisting of silt fences, hay/straw bales, and/or sandbags may be temporarily used in place of water bars.

As a general practice, erosion control barriers will be installed immediately after soil disturbances in the following areas:

- at water bar outlets if vegetation is incapable of filtering effectively;
- between graded right-of-way and waterbody after clearing (along banks);
- downslope of stockpiled soils near waterbodies and wetlands;
- at the base of slopes adjacent to road crossings, and at downslope boundaries of construction areas where runoff is not controlled with a water bar; and,
- in the right-of-way at boundaries between wetlands and adjacent disturbed uplands.

7.3.2 Proposed Topsoil Segregation Methods

Typically, right-of-way topsoil segregation and techniques are employed in agricultural land and hayfields. The Project does not cross any Agricultural land, therefore, topsoil segregation methods are not to be utilized.

7.3.3 Introduction of Rock Into Topsoil

As discussed previously, introduction of rock into the topsoil is not expected to be an issue on the Project. However, if stones larger than four inches are found they will be removed from the top 12 inches of the soil profiles.

7.3.4 Revegetation

In wetlands, the right-of-way will be seeded with New England WetMix at 40 lbs/acre (unless standing water is present) to stabilize the area until indigenous wetland species are re-established. Amendments such as fertilizer and lime will not be permitted in wetlands unless otherwise stated. If there are adverse weather conditions, the right-of-way will be mulched in accordance with local NRCS or other local soil conservation authority recommendations until reseeding can resume. The right-of-way will generally be seeded within six working days of final grading. Slopes steeper than 3:1 will be seeded immediately after final grading.

Stabilizing of the soil will be necessary until vegetation is established. Temporary measures include mulching, matting, or netting. If construction is completed 30 days or more before the seeding season for perennial vegetation, areas adjacent to waterbodies will be mulched with three tons/acre of straw at a minimum of 100 feet on either side.

7.4 LITERATURE CITED

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8.0 Land Use, Recreation and Aesthetics

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ENGINEERS AND SCIENTISTS



RESOURCE REPORT 8 – LAND USE, RECREATION AND AESTHETICS FERC ENVIRONMENTAL CHECKLIST

Part 380 – Minimum Filing Requirements for Environmental Reports	Company Compliance or Inapplicability of Requirement
Classify and quantify land use affected by (§ 380.12 (j)(1)). <ul style="list-style-type: none"> • Pipeline construction and permanent rights of way (§ 380.12 (j)(1)); • Extra work / staging areas (§ 380.12 (j)(1)); • Access Roads (§ 380.12 (j)(1)); • Pipe and contractor yards (§ 380.12 (j)(1)); and • Aboveground facilities (§ 380.12 (j)(1)). 	Section 8.1 and Table 8.1-1 Section 8.1.1 and Table 8.1-1 Section 8.1.1 and Table 8.1-4 Section 8.1.1 and Table 8.1-5 Section 8.1.1 and Table 8.1-6 Section 8.1.1 and Table 8.1-7
Identify by milepost all locations where the pipeline right-of-way would at least partially coincide with existing right-of-way, where it would be adjacent to existing rights-of-way, and where it would be outside of existing right-of-way. (§ 380.12 (j)(1)).	Section 8.1.1 Table 8.1-3
Provide detailed typical construction right-of-way cross-section diagrams showing information such as widths and relative locations of existing rights-of-way, new permanent right-of-way, and temporary construction right-of-way. (§ 380.12 (j)(1)).	Appendix D
Summarize the total acreage of land affected by construction and operation of the Project (§ 380.12 (j)(1)).	Table 8.1-2
Identify by milepost all planned residential or commercial/business development and the time frame for construction (§ 380.12 (j)(3)).	Section 8.2.2
Identify by milepost special land uses (e.g. sugar maple stands, specialty crops, natural areas, national and state forests, conservation land, etc.). (§ 380.12 (j)(4)).	Section 8.3.1
Identify by beginning milepost and length of crossing all land administered by Federal, state or local agencies, or private conservation organizations. (§ 380.12 (j)(4)).	Section 8.3.1
Identify by milepost all natural, recreational or scenic areas and all registered natural landmarks crossed by the Project. (§ 380.12 (j)(4 and 6)).	Section 8.3.1
Identify all facilities that would be within designated coastal zone management areas. (§ 380.12 (j)(4 and 7)).	Not Applicable Section 8.3.1



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RESOURCE REPORT 8 – LAND USE, RECREATION AND AESTHETICS FERC ENVIRONMENTAL CHECKLIST (continued)

Part 380 – Minimum Filing Requirements for Environmental Reports	Company Compliance or Inapplicability of Requirement
Identify by milepost all buildings that would be within 50 feet of the construction right-of-way or extra work area. (§ 380.12 (j)(5)).	Section 8.2.1 Table 8.2-1
Identify all designated or proposed candidate National or State Wild and Scenic Rivers crossed by the Project. (§ 380.12 (j)(6)).	Section 8.3.1
Describe any measures to visually screen aboveground facilities, such as compressor stations. (§ 380.12 (j)(11)).	Not Applicable
Demonstrate that applications for rights-of-way or other proposed land use have been or soon will be filed with federal land-managing agencies with jurisdiction over land that would be affected by the Project. (§ 380.12 (j)(12)).	Table 8.5

8.0 LAND USE, RECREATION AND AESTHETICS

Resource Report 8 characterizes the land use in areas affected by the Project, identifies potential construction and operation impacts on these uses and addresses mitigation measures that will be utilized to minimize or avoid impacts. Section 8.1 describes the existing land uses crossed by the Project and quantifies impacts according to land use type. Section 8.2 provides information on existing and planned residential areas. Section 8.3 identifies special land use areas, including public lands, recreational lands and designated conservation areas, and summarizes consultations with federal, state and local agencies. Visual resources are described in Section 8.4, Section 8.5 reviews ROW applications and other land use, and a list of references used in preparation of this resource report is provided in Section 8.5.

8.1 LAND USE

Characterization of land use was completed using information gathered from field surveys conducted in October of 2002 and through interpretation of aerial photographs of the Project area (taken in December 2001). Land use types along the proposed pipeline route were divided into six broad classifications: roadways, forested uplands, wetlands, open land (existing right-of-way) residential and commercial/industrial as defined in FERC's *Guidance Manual for Environmental Report Preparation* (2002). Resource Report 3 provides a detailed description of the cover types affected by the Project (Section 3.3.1). Table 8.1-1 identifies the total linear distance the Project will traverse through each land use category, and Table 8.1-2 details the construction and operation impacts associated with the Project on identified land uses.

8.1.1 Pipeline Facilities

8.1.1.1 Construction and Permanent Rights-of-Way

The typical construction ROW width for the Project will be 45 feet and will generally consist of 20 feet of permanently maintained ROW centered over the pipeline and up to 25 feet of temporary construction workspace. As detailed in Resource Report 2, temporary workspace within wetlands will be limited to 30 feet to minimize adverse impacts. The 20-foot permanent ROW will be consistent within wetlands as well, but only a 10-foot wide area centered over the pipeline will be maintained in an herbaceous or scrub-shrub vegetative state. Appendix D provides typical ROW configurations detailing the temporary workspace and permanent ROW associated with the Project. Table 8.1-2 summarizes land uses and acreages associated with construction and operation of the Project.

8.1.1.2 Existing Right of Way

Approximately 4.30 miles (80.9%) of the 5.31-mile pipeline lateral will be located directly within an existing 250-foot wide electric transmission corridor currently operated and maintained by New England Power Company. By siting the Project within an existing, maintained ROW,

Tennessee will minimize the amount of new disturbance associated installation of the pipeline. Table 8.1-3 summarizes the types and widths of the existing ROWs paralleled and crossed by the Project and indicate the width of overlap with each existing ROW during construction. The proposed facilities do not cross or lie adjacent to any areas of special land use such as specialty crops, grazing allotments or Conservation Resource Protection (CRP) lands.

8.1.1.3 Extra Work / Staging Areas

In addition to the typical 45-foot wide construction ROW, ATWS areas will be required to facilitate construction through portions of the route containing wetlands, waterbodies, agricultural land, steep side slopes, bedrock outcrops and road, railroad and utility crossings. The typical ATWS width and length are 20 and 100 feet, respectively, and a list of ATWS areas required to construct the Project is presented within Table 8.1-4. ATWS areas are also depicted on the photo-based alignment sheets in Appendix L.

At several of the roadway and existing utility crossings along the proposed alignment, wetlands and/or waterbodies are located directly adjacent to the road or utility. To facilitate these crossings and allow for safe construction conditions, Tennessee is requesting a variance to utilize additional temporary workspace within 50 feet of identified wetland resources. All areas of proposed additional temporary workspace within 50 feet of a wetland or waterbody have been identified within Table 8.1-4.

8.1.1.4 Access Roads

Public roads and the construction ROW will be used for primary access to the pipeline during construction. One new, permanent access road will be constructed for this Project to provide access to the interconnect point with the existing Concord Lateral. All other roads designated for temporary use during construction are existing roads and are listed in Table 8.1-5 according to milepost. The Project will not require any modification of existing land use associated with the use of the identified access roads during construction, and the access road locations are depicted both on the full-size USGS topographic quadrangle maps (Appendix J) and on the Project alignment sheets (Appendix L).

8.1.1.5 Pipe and Contractor Yards

As detailed in Table 8.1-6, Tennessee and its contractors will utilize two areas totaling approximately 2.85 acres in size for pipe storage and contractor staging areas during construction. These pipeyard and staging areas are located along the existing electric transmission corridor and are previously disturbed. The pipe storage and staging areas are depicted on the full size USGS topographic quadrangle map excerpt included in Appendix J.

8.1.2 Aboveground Facilities

The aboveground facilities associated with the Project will be constructed within previously disturbed areas and will not require alteration of existing land uses. Tables 1.1-2 and 1.2-2 detail the aboveground facilities and the land required for construction and operation of the facilities. Appendix M provides preliminary site-specific plans for aboveground facilities proposed by Tennessee.

8.1.3 Facility Abandonment / Replacement

No facilities will be abandoned or replaced as part of this Project.

8.1.4 Impact and Mitigation

8.1.4.1 Pipeline Facilities

The primary impacts to land uses will be associated with clearing new and widening existing ROW through forested areas; temporary impacts to existing land uses, including displacement, inconveniences and encumbrances; and restrictions of future land uses within the new permanent ROW. As detailed in Table 8.1-2, a combined total of approximately 24.39 acres will be utilized for workspace, staging area or access during construction of the Project. Upon completion of construction, a total of 12.46 acres will be maintained as new permanent ROW, and approximately 0.67 acres of lands that were forested prior to construction will be permanently maintained in an herbaceous / scrub-shrub state. No trees or structures will be allowed within the permanent ROW to ensure operational safety and allow for routine maintenance of the facilities. Land used as temporary ROW and ATWS will revert to pre-construction condition. The following provides a brief discussion of the impacts and mitigation measures associated with the various land use types crossed by the Project:

Roadways

The Project will cross a total of 0.15 miles (2.8%) of existing roadways that will result in a temporary impact of 0.34 acres during construction. The potential temporary impacts associated with roadway crossing include disruption of traffic flows, identification and construction around existing underground utilities such as water and sewer lines and maintenance of emergency vehicle access; there will be no permanent effects on existing use. Tennessee will incorporate measures to ensure that construction activities will not prevent the passage of fire and emergency vehicles. At least one lane of traffic will be kept open, and when a road is completely cut, steel plates will be available on-site to cover the open area to permit travel by emergency vehicles. Traffic lanes and residential access will be maintained except for the temporary periods essential for laying pipeline. Tennessee will further reduce potential impacts associated with road crossings by utilizing boring techniques to install the pipeline under major arterial roadways along the Project route.

TABLE 8.1-1

LAND CROSSED BY THE TEWKSBURY - ANDOVER LATERAL PROJECT

Town	Roadways ^{a/}		Forest ^{b/}		Wetlands ^{c/}		Open Land		Residential		Com./Ind.		Other		Total
	Miles	%	Miles	%	Miles	%	Miles	%	Miles	%	Miles	%	Miles	%	
Tewksbury	0.08	1.5	0.41	7.8	2.14	40.5	1.69	31.5	0.23	4.3	0.63	12.0	0.03	0.5	5.21
Andover	0.07	1.3	0	0	0.02	0.4	0	0	0	0	0.01	0.2	0	0	0.10
Total	0.15	2.8	0.41	7.7	2.16	40.7	1.69	31.8	0.23	4.3	0.64	12.1	0.03	0.6	5.31

^{a/} Includes both Federal, State and local roadways

^{b/} Upland forest only

^{c/} Includes forested wetlands, palustrine scrub-shrub wetlands, and palustrine emergent wetlands. Includes only those wetlands directly crossed by pipeline.

Note: Total indicates the percentage of land crossed by each use type over the entire Tewksbury-Andover Lateral. Other percentages indicate degree of land crossed per use type within each individual town.

TABLE 8.1-2

ACREAGE AFFECTED BY CONSTRUCTION AND OPERATION OF THE TEWKSBURY - ANDOVER LATERAL PROJECT

Town	Roadways <i>g/</i>		Forest <i>h/</i>		Wetlands <i>d/</i>		Open Land		Residential		Com./Ind.		Other		Total	
	Temp	Perm	Temp <i>c/</i>	Perm	Temp	Perm	Temp	Perm	Temp <i>c/</i>	Perm	Temp	Perm	Temp	Perm	Temp	Perm
Tewksbury	0.34	0	0.39	0.67	7.21	2.40	4.13	5.96	0.55	0.85	1.22	2.11	0.10	0.08	11.54	12.07
Andover	0	0	0	0	0	0	0	0	0	0	0.39	0.39	0	0	0.39	0.39
Total	0.34	0	0.39	0.67	7.21	2.40	4.13	5.96	0.55	0.85	1.61	2.5	0.10	0.08	11.93	12.46

g/ Includes both State and local roadways

h/ Upland forest only

c/ Standard temporary workspace is 25 feet. Temporary workspace does not include permanent ROW of 20 feet.

d/ Total workspace within wetlands is 30 feet (10 feet of temporary workspace and 20 feet of permanent easement). Temporary acreage affected includes both the 20-foot permanent easement and the 10-foot temporary workspace. Permanent acreage affected was calculated based on a 10-foot maintained corridor through wetlands centered over the pipeline.

**TABLE 8.1-3
EXISTING RIGHTS-OF-WAY CROSSED OR PARALLELED
BY THE TEWKSBURY - ANDOVER LATERAL PROJECT**

Town	Milepost	ROW Type	Width of Existing ROW (ft)	Width Used for Temp. ROW (ft)	Width Used for New Permanent ROW (ft)
Tewksbury	0.00	Powerline	90	60	20
Tewksbury	0.03 – 0.64	Railroad ^a	85	0	0
Tewksbury	0.64 – 4.91	Powerline ^b	250	30 – 45	20
Tewksbury	0.34	Oil Distribution Line	30	30	20
Tewksbury	0.73	Sewer	20	45	20
Tewksbury	1.61	Sewer	50	55	10
Tewksbury	1.78	Drainage	20	30	20
Tewksbury	1.80	Sewer	20	30	20
Tewksbury	2.45	Drainage	30	45	20
Tewksbury	4.45	Drainage	30	45	20
Tewksbury	4.51	Drainage	30	30	20

a – Proposed project parallels existing active railroad right-of-way

b – Proposed pipeline, temporary workspace and permanent easement are located within an existing, maintained electric transmission right-of-way.

**TABLE 8.1-4
AREAS OF PROPOSED ADDITIONAL TEMPORARY WORKSPACE
TO BE UTILIZED DURING CONSTRUCTION
OF THE TEWKSBURY - ANDOVER LATERAL PROJECT**

Town	Milepost	Width (Feet)	Length (Feet)	Total Area (Acreage)	Location
Tewksbury	0.00*	80	100	0.13	Concord Lateral Interconnect
Tewksbury	0.59	20	100	0.05	West of Powerline Drive
Tewksbury	0.59*	20	100	0.05	East of Powerline Drive
Tewksbury	1.44*	40	100	0.09	West of Juniper Lane
Tewksbury	1.60*	40	60	0.06	West of North Street
Tewksbury	1.61	40	100	0.09	East of North Street
Tewksbury	2.07*	40	100	0.09	West of Livingston Street
Tewksbury	2.09	40	100	0.09	East of Livingston Street
Tewksbury	2.51	40	24	0.02	West of Lancaster Road
Tewksbury	2.52	40	90	0.08	East of Lancaster Road
Tewksbury	3.29	50	180	0.21	East of Pinnacle Street
Tewksbury	3.88*	15	65	0.02	West of Carter Street
Tewksbury	4.15*	25	234	0.13	West of Wetland 3 Associated with HDD
Tewksbury	4.30	45	100	0.10	West of Shawsheen Street
Tewksbury	4.35	20	100	0.05	East of Shawsheen Street South of perm. Easement

**TABLE 8.1-4 (continued)
AREAS OF PROPOSED ADDITIONAL TEMPORARY WORKSPACE
TO BE UTILIZED DURING CONSTRUCTION
OF THE TEWKSBURY - ANDOVER LATERAL PROJECT**

Town	Milepost	Width (Feet)	Length (Feet)	Total Area (Acreage)	Location
Tewksbury	4.35	20	100	0.05	East of Shawsheen Street North of temp. workspace
Tewksbury	4.60*	20	100	0.05	West of Redgate Road North of temp. workspace
Tewksbury	4.61*	20	100	0.05	West of Redgate Road South of workspace
Tewksbury	4.63	20	100	0.05	East of Redgate Road North of temp. workspace
Tewksbury	4.63	20	100	0.05	East of Redgate Road South of workspace
Tewksbury	4.71	30	721	0.50	North of Whitegate Road Stringing area for HDD
Tewksbury	4.86*	205	176	0.41	South of Bradford Road Staging area for HDD
Andover	5.31	120	142	0.39	Meter station at Wyeth

* Indicates areas of proposed additional temporary workspace located within 50 feet of a wetland or waterbody.



TABLE 8.1-5

**ACCESS ROADS TO BE USED DURING CONSTRUCTION AND OPERATION
OF THE TEWKSBURY - ANDOVER LATERAL PROJECT**

Access Road #	Town	Milepost	Description	Total Area of Modification (Acres)	Existing Land Use
1	Tewksbury	0.00	Access to interconnect site	0.12	Forest
2	Tewksbury	0.64	Powerline Drive	0	Roadway
3	Tewksbury	1.63	North Street	0	Roadway
4	Tewksbury	2.09	Livingston Street	0	Roadway
5	Tewksbury	2.49	Lancaster Drive	0	Roadway
6	Tewksbury	3.27	Pinnacle Street	0	Roadway
7	Tewksbury	3.92	Carter Street	0	Roadway
8	Tewksbury	3.97	East Street	0	Roadway
9	Tewksbury	4.34	Shawsheen Road	0	Roadway
10	Tewksbury	4.63	Redgate Road	0	Roadway
11	Andover	5.27	Biotechnology Drive	0	Roadway

TABLE 8.1-6

**PIPE AND CONTRACTOR YARDS
TO BE USED DURING CONSTRUCTION AND OPERATION
OF THE TEWKSBURY - ANDOVER LATERAL PROJECT**

Town	Milepost	Description	Total Acres	Existing Land Use
Tewksbury	0.84	Storage area within substation property	1.0	Open land / utility
Tewksbury	4.17	Parking lot	1.85	Industrial

Forested Land

A total of 0.41 miles (7.7%) of the Project crosses forested land, and a total of 1.06 acres of forest will be impacted during construction. Of this area, approximately 0.67 acres will be utilized as permanent ROW. The primary impact minimization measure to reduce the impact of the Project on forestland consists of routing the proposed pipeline along and within existing cleared ROWs to limit the extent of forest clearing required for construction and operation of the facilities. Additionally, Tennessee has located ATWS areas outside of forested land where possible to further reduce adverse impacts. No old growth forests, sugar maple (*Acer saccharum*) stands or Christmas tree farms were identified within the Project area.

Agricultural Land

The Project does not cross any land currently in active agricultural use.

Wetlands

A total of 2.16 miles (40.7%) of wetlands are crossed by the Project. Approximately 7.21 acres of wetlands will be temporarily altered during construction including 4.72 acres of impact to palustrine emergent wetlands (PEM), and 2.63 acres of impact to palustrine scrub / shrub wetlands (PSS) (See Table 2.3-1 and 2.3-2 of Resource Report 2). In accordance with FERC guidelines, a 10-foot wide area centered on the pipeline will be maintained in an herbaceous vegetative state within the permanent ROW that will limit the permanent alteration of wetlands to 2.40 acres. Please refer to Section 2.3 of Resource Report 2 and FERC's Procedures (Appendix F), for a detailed description of potential wetland impacts associated with construction and operation of the Project as well as impact minimization and wetland restoration techniques to be implemented. The larger wetland systems (Wetland #20 and Wetland #21), although not classified and forested, include forested sections of bordering wetland vegetation. Within the permanent easement only, these forested sections will be permanently converted to scrub/shrub wetlands.

Residential Land

A total of 0.23 miles (4.3%) of residential land will be crossed by the Project that will result in approximately 1.40 acres of impact during construction. Although Tennessee will restore residential areas to pre-construction conditions, the permanent ROW associated with the Project will use approximately 0.85 acres of residential land.

Primary impacts associated with construction within residential land include temporary inconveniences associated with landscape disturbance, presence of workers and construction equipment and construction noise. In addition, operation of the Project will limit potential future uses such as placement of buildings, swimming pools and large trees within the permanent ROW. Section 8.2.1 provides additional detail relative to existing and planned residences within the Project area as well as measures implemented by Tennessee to minimize impacts to residential lands.

Commercial / Industrial Land

A total of 0.64 miles (12.1%) of the Project crosses commercial/industrial land. Approximately 4.11 acres of commercial/industrial land will be impacted during construction, and approximately 2.50 acres of this will be used for permanent ROW. Typical commercial/industrial uses in the Project area include parking lots, railroads and local businesses. Impact minimization measures utilized in commercial/industrial areas include timing of construction to avoid peak use periods, maintaining access to businesses at all times and expediting construction through these areas. Tennessee will coordinate directly with affected commercial/industrial landowners on an individual basis to further reduce potential adverse impacts.

8.1.4.1 Aboveground Facilities

Aboveground facilities associated with the Project will include a meter station to be constructed by Tennessee at the Wyeth facility in Andover, MA and a hot-tap valve at the point of interconnection with the existing Concord Lateral in Tewksbury, MA. The meter station was sited directly within the existing Wyeth facility property to avoid adverse environmental impacts, and the proposed aboveground facilities will not result in the permanent alteration of any existing land uses. Tennessee will utilize standard techniques to construct the aboveground facilities, and no special impact minimization or mitigation measures will be required due to previously disturbed nature of the sites.

8.2 RESIDENTIAL AREAS

8.2.1 Planned Residential and Commercial Areas

The Planning Boards of each town were contacted to determine whether any proposed

residences, subdivisions or commercial developments have been approved within 0.25 miles of the construction workspace. According to the Town of Andover Planning Board, there are no proposed developments within 0.25 miles of the proposed Project. Consultation with the Town of Tewksbury Department of Community Development indicated that three proposed projects were located within 0.25 miles of the Project (Sadwick 2002). A warehouse expansion along East Street has been approved, and construction will be completed prior to the commencement of construction activities associated with the Project. An affordable housing project located off Livingston Street is within the permitting phase and will not likely begin construction until after the proposed pipeline is installed. A senior living community is currently under construction within 0.25 miles of the electric transmission corridor, but is not located in the direct vicinity of the proposed pipeline and therefore, no coordination of construction activities will be required.

8.2.2 Existing Residences and Buildings

A total of 27 residences and / or buildings are located within 50 feet of the edge of the Project ROW. Table 8.2-1 lists residences and other structures located within 50 feet of the designated workspace. Tennessee does not currently anticipate the displacement of homes or businesses as a result of construction of the proposed facilities.

In residential areas, Tennessee has initiated discussions with affected homeowners and will continue to work on an individual basis throughout construction and restoration. Homeowners will be contacted directly by Tennessee's land agents to provide information and notification relative to the timing of construction within their property and any special construction techniques that may be utilized.

During construction, trees, shrubs, ornamental plants and obstructions may be cleared or removed from the ROW, and Tennessee will coordinate these activities with the affected landowners and implement FERC's recommended residential mitigation measures described under Section 8.2.2 of the *Guidance for Environmental Report Preparation* (2002). These measures include:

- preserving mature landscaping where practicable;
- restoring lawn and landscaping immediately after backfilling;
- fencing the edge of the workspace for a 100-foot distance along the pipeline on either side of the residence and maintaining the fence throughout the open trench phase of construction;
- controlling fugitive dust by spraying water on disturbed ROW soils as necessary

For instances where a 25-foot offset between a residence and the construction ROW cannot be maintained, Tennessee will develop a site-specific residential construction plan in accordance with FERC's requirements. In the event that any damages result from Project construction across residential properties, Tennessee will either coordinate repair of the damages or provide alternative compensation in agreement with the property owner.



TABLE 8.2-1

**RESIDENCES AND STRUCTURES WITHIN 50 FEET OF THE WORK AREAS
ASSOCIATED WITH THE TEWKSBURY - ANDOVER LATERAL PROJECT**

Town	Milepost	Type of Building	Distance from Edge of Workspace (feet)	Proposed Mitigation*
Tewksbury	1.40	Residence	30	Residential Construction Techniques
Tewksbury	1.41	Residence	35	
Tewksbury	1.42	Residence	35	
Tewksbury	1.43	Residence	30	
Tewksbury	1.44	Residence	30	
Tewksbury	1.45	Residence	25	
Tewksbury	1.47	Residence	30	
Tewksbury	1.48	Residence	30	
Tewksbury	1.49	Residence	35	
Tewksbury	1.50	Residence	30	
Tewksbury	1.51	Residence	25	
Tewksbury	1.52	Residence	45	
Tewksbury	1.59	Residence	35	
Tewksbury	1.60	Residence	25	
Tewksbury	1.65	Condominium	50	
Tewksbury	1.66	Condominium	45	
Tewksbury	1.72	Condominium	45	
Tewksbury	1.74	Condominium	30	

TABLE 8.2-1

**RESIDENCES AND STRUCTURES WITHIN 50 FEET OF THE WORK AREAS
ASSOCIATED WITH THE TEWKSBURY - ANDOVER LATERAL PROJECT**

Town	Milepost	Type of Building	Distance from Edge of Workspace (feet)	Proposed Mitigation^a
Tewksbury	2.18	Residence	25	Residential Construction Techniques
Tewksbury	2.32	Garage	40	
Tewksbury	2.46	Residence	25	
Tewksbury	3.90	Commercial / Industrial	20	
Tewksbury	4.01	Commercial / Industrial	5	Horizontal Directional Drill (avoidance)
Tewksbury	4.04	Commercial / Industrial	5	
Tewksbury	4.21	Commercial / Industrial	40	
Tewksbury	4.85	Residence	50	Residential Construction Techniques
Tewksbury	4.89	Residence	50	

^a See Resource Report 1 for a description of residential construction techniques and horizontal directional drill methodology.

8.3 PUBLIC LAND, RECREATION AND OTHER DESIGNATED AREAS

Public lands, recreation areas and other special land uses located within the Project area are identified in Table 8.3-1, which also details location, distance crossed and acreage affected during construction and operation. The conservation land identified within Table 8.3-1 is state owned land as designated by Article 97.

8.3.1 Public or Conservation Land

The Project will not cross any National forests, state forests or land administered by federal, state or local agencies such as Indian reservations, designated wilderness areas, nature preserves or registered natural landmarks (Clark 2002).

8.3.2 Natural, Recreational or Scenic Areas

The National Park Service has indicated that no protected resources are located within one mile of the Project (Clark 2002). Tennessee's review of property records ascertained that the majority of the Project area is privately owned. Tennessee has had verbal contact with all landowners and

has not identified any conflicts with landfills, golf courses, racetracks, airfields, special agricultural products or privately owned nature preserves. Please refer to Resource Report 4 for information regarding the presence of land of local historical or cultural significance (i.e., Native American religious sites, historic districts, etc.).

TABLE 8.3-1

**PUBLIC LAND AND DESIGNATED RECREATION,
SCENIC OR OTHER AREAS CROSSED BY THE TEWKSBUURY - ANDOVER LATERAL PROJECT**

Town	Name of Area	Milepost	Crossing Length (feet)	Acreage Affected by Construction
Tewksbury	Conservation Land under Article 97	4.79	550	1.30
		4.91	70	0 (HDD)

8.3.3 Coastal Zone Management Areas

The Project is not located in the designated Coastal Zone (MADEP 2002).

8.3.4 Agency and Landowner Consultation

Tennessee is in the process of acquiring all necessary easements/permits to install the pipeline facilities associated with the Project across affected private and land management agency properties. Additionally, Tennessee will acquire all necessary permits and approvals, as detailed in Table 1.6-1 of Resource Report 1, prior to commencement of construction. Table 1.6-2 provides a list of agencies contacted for information, consultation or technical assistance during preparation of this Environmental Report. Copies of all correspondences received to date are provided in Appendix E. Any further responses received from these agencies will be subsequently forwarded to FERC.

A review of available information and consultation with various departments of the MA DEP has identified one hazardous, potential hazardous and / or solid waste sites within 250 feet of the proposed pipeline (DataMap Technology Corporation 2002), and Table 8.3-2 provides a summary of this data. Construction will not occur in the direct vicinity of this site and no special mitigation measures are planned. Tennessee will dispose of/or mitigate for any hazardous materials uncovered in accordance with applicable federal and state regulations.

TABLE 8.3-2

**POTENTIAL HAZARDOUS AND SOLID WASTE SITES
WITHIN 250 FEET OF THE TEWKSBURY – ANDOVER LATERAL**

Name	Town	Approximate Milepost	Distance (feet)	Description
939 East Street	Tewksbury	4.01	250	120-Day reportable condition on 4/16/99. Class B-1 Response Action Outcome received on 6/29/99. Remedial actions not conducted as level of no significant risk exists.

8.4 VISUAL RESOURCES

The Project crosses no areas designated by the USNPS as a National Scenic Trail (Clark 2002). No waterbodies under the authority of the USNPS Wild and Scenic Rivers Act or related state programs have been identified within the Project area (Clark 2002).

Permanent visual impacts associated with installation of the pipeline will not occur within non-forested areas; however tree clearing for construction and maintenance of the permanent ROW in forested areas may result in visual impacts. To minimize this potential, Tennessee has routed the Project along existing utility corridors to limit the amount of tree clearing. Temporary impacts of limited duration will be mitigated through the intensive restoration practices to revegetate the ROW in a timely manner.

The proposed aboveground facilities associated with the Project have been located within previously disturbed sites, and Tennessee does not anticipate any temporary or permanent impacts to visual resources as a result construction and operation of these facilities.

Siting of the Project along existing utility corridors minimizes the amount of forest and other habitats that will be impacted during construction and operation of the Project facilities. This also concentrates utilities in existing areas and reduces the degree of disturbance within previously undisturbed areas. Potential impact mitigation measures include scalloping the edge of the permanent ROW to create a non-linear line of sight that blends with the adjacent land. In areas where permanent impacts are unavoidable, Tennessee will assess a planting program and coordinate with the USNPS and the affected municipalities to develop site-specific visual impact mitigation plans if necessary.



8.5 APPLICATIONS FOR RIGHT-OF-WAY AND OTHER LAND USE

The Project does not affect any land under the jurisdiction of Federal land-managing agencies, therefore no applications for right-of-way or other land use are required.

8.6 LITERATURE CITED

Clark, D. 2002. United States National Park Service. Personal Communication. (617) 223-5051.

DataMap Technology Corporation Environmental First Search™ Report. August 2, 2002.
<http://www.efsn.com>

Federal Energy Regulatory Commission. 2002. FERC Guidance Manual for Environmental Report Preparation. September 2003. Washington, D.C.

Massachusetts Department of Environmental Protection (MA DEP). 2002.
<http://www.state.ma.us/dep/>

Sadwick, S. 2002. Director of Planning and Community Development. Town of Tewksbury, MA. Personal Communication. (978)-640-4378.



9.0 Air Quality and Noise



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RESOURCE REPORT 9 – AIR AND NOISE FERC ENVIRONMENTAL CHECKLIST

Part 380 – Minimum Filing Requirements for Environmental Reports	Company Compliance or Inapplicability of Requirement
Describe existing air quality in the vicinity of the Project. (§ 380.12 (k)(1)).	Not applicable
Quantify the existing noise levels (day-night sound level (Ldn) and other applicable noise parameters) at noise-sensitive areas and at other areas covered by relevant state and local noise ordinances (§ 380.12 (k)(2)).	Not applicable
Quantify existing and proposed emissions of compressor equipment, plus construction emissions, including nitrogen oxides (NO _x) and carbon monoxide (CO), and the basis for these calculations. Summarize anticipated air quality impacts for the Project. (§ 380.12 (k)(3)).	Not applicable
Describe the existing and proposed compressor units at each station where new, additional, or modified compression units are proposed, including the manufacturer, model number, and horsepower of the compressor units. (§ 380.12 (k)(4)).	Not applicable
Identify any nearby noise-sensitive area by distance and direction from the proposed compressor unit building / enclosure. (§ 380.12 (k)(4)).	Not applicable
Identify any applicable state or local noise regulations. (§ 380.12 (k)(4)).	Not applicable
Calculate the noise impact at noise-sensitive areas of the proposed compressor unit modifications or additions, specifying how the impact was calculated, including manufacturer's data and proposed noise control equipment. (§ 380.12 (k)(4)).	Not applicable

9.0 AIR AND NOISE

This resource report is required for applications involving compressor facilities at new or existing stations, or for all new liquefied natural gas (LNG) facilities. The Project does not involve a compressor station or LNG facilities. Therefore, in accordance with FERC guidance provided in 18 Code of Federal Regulations (CFR) Part 380.12(k), Resource Report 9 addressing information related to Air and Noise Resources is not required.



10.0 Alternatives

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RESOURCE REPORT 10 – ALTERNATIVES FERC ENVIRONMENTAL CHECKLIST

Part 380 – Minimum Filing Requirements for Environmental Reports	Company Compliance or Inapplicability of Requirement
Address the “no action” alternative (§ 380.12 (l)(1)).	Section 10.1
For large Projects, address the effect of energy conservation or energy alternatives to the Project (§ 380.12 (l)(1)).	Section 10.1.1 Section 10.1.2
Identify system alternatives considered during the identification of the Project and provide the rationale for rejecting each alternative (§ 380.12 (l)(1)).	Section 10.2
Identify major and minor route alternatives considered to avoid impact on sensitive environmental areas (e.g. wetlands, parks, or residences) and provide sufficient comparative data to justify the selection of the proposed route (§ 380.12 (l)(3)).	Section 10.3
Identify alternative sites considered for the location of major new aboveground facilities and provide sufficient comparative data to justify the selection of the proposed site (§ 380.12 (l)(3)).	Section 10.4

10.0 ALTERNATIVES

This Project has undergone an extensive need and alternative routing analysis. The primary goal of the alternatives analysis was to provide natural gas service to the customers in a manner that avoids and minimizes potential adverse environmental effects to the greatest extent practicable. Tennessee has evaluated routing options based on regional topography, potential adverse environmental impacts, existing land usage and construction safety and feasibility considerations. Tennessee considered route alternatives in support of the FERC routing guidelines as set forth in 18 CFR Part 380.15. Described below are the alternatives that have been considered. Section 10.1 details the no-action alternative. Section 10.2 discusses system alternatives, and Section 10.3 evaluates route alternatives. Section 10.4 provides additional information relative to siting considerations.

10.1 NO ACTION ALTERNATIVE

The “no action” alternative in relation to this Project would avoid the temporary environmental impacts associated with pipeline installation. Current service for the Bay State Lawrence Division is received from Tennessee in Lawrence, MA that is approximately 20 miles from the Wyeth facility and Bay State’s Andover service area. The research conducted at the Wyeth facility is both time and temperature dependant, requiring constant and dependable fuel supply. Bay State’s service to Wyeth is interruptible and the level of insufficient to fuel proposed additional turbines at Wyeth’s facility. Since the facility is already in operation and the infrastructure is designed to utilize natural gas, alternative fuels are not economically feasible. Additionally, the natural gas load for Bay State’s system, independent of Wyeth’s needs, is growing moderately and requires additional natural gas from Tennessee.

10.1.1 Energy Conservation

Reduction in the need for additional energy usage is the preferred alternative wherever possible. The use of energy conservation alone will not allow Wyeth to maintain its existing operations and does not provide for any ability for future expansion of its research facility. This alternative was determined to be not feasible, as it does not meet the Project purpose and need and would adversely affect the existing operation of the Wyeth facility.

10.1.2 Energy Alternatives

Alternative energy sources for Tennessee customers include oil, coal, biomass and nuclear fuels. All of these fuels are being used throughout areas within the proximity of the existing pipeline network. Current regulations in Massachusetts do not allow for the use of fossil fuels by a major source that would result in anything other than the lowest achievable emission rates in a severe non-attainment area (MGL c. 111 § 142A-142M; 310 CMR 6.00-8.00). The regulations were instituted to improve both air quality and the quality of life. Use of these alternative energy sources would directly conflict with state regulations and long-term energy and environmental

policies and plans. Additionally, the Wyeth facility is not designed with the applicable infrastructure to operate its current systems under a fuel other than natural gas. Therefore, supplying adequate volumes of natural gas through the construction of the Tewksbury-Andover Lateral is preferred.

10.2 SYSTEM ALTERNATIVES

10.2.1 Existing Capacity

Tennessee currently has sufficient mainline capacity, via the Concord Lateral, to meet new market demand, however Tennessee must install the lateral line to deliver natural gas from the mainline to Bay State's South Andover service area and the Wyeth facility. The addition of this proposed facility will allow Tennessee to continue to meet the need of its existing customers while supplying Bay State and Wyeth with the firm capacity requested. There will be no incremental forward haul capacity created on the mainline, as Bay State will utilize firm capacity from the existing Concord Lateral. No major system alternatives were considered for the Project, as there are no other pipelines that are owned and operated by Tennessee in the vicinity that could provide the required volumes of natural gas. The proposed alignment optimizes Project economics and minimizes potential adverse environmental effects to the greatest extent practicable.

10.3 ROUTE ALTERNATIVES

Several route alternatives to the proposed alignment were evaluated as part of the planning and design process for this Project. The alternatives were evaluated based on environmental and residential impacts as well as permanent easement acquisitions and costs. Impacts to residential areas were evaluated in terms of traffic congestion during construction, maintenance impacts to public transportation and impacts to local businesses and residences.

10.3.1 Methodology and Rationale for Alternative Route Selection

The objective of route selection was the identification of a Project alignment that minimizes potential environmental impacts and achieves the Project purpose. To achieve this, Tennessee utilized the following route selection criteria:

- Identification of technical requirements
- Development of routing criteria
- Identification of potential routing alternatives
- Collection of data relative to each alternative
- Evaluation of potential environmental impacts
- Evaluation of routing alternatives against routing criteria

Sources of existing information such as field reconnaissance, aerial photography, U.S.G.S topographic maps and National Wetland Inventory maps were also employed during Project routing. The intent of this process was to identify the alignment, initiating from the existing Concord Lateral to the Wyeth facility that minimized environmental impacts to the greatest extent, was technically feasible from a construction perspective and was cost-effective.

The use of existing corridors was given primary consideration during the alternatives analysis process. Existing corridors allow for the further minimization of environmental impacts as well as construction costs. Siting pipeline facilities along existing corridors reduces the establishment of new corridors in previously undisturbed areas while limiting the number of affected landowners. In addition, operation and maintenance of the facilities once in service is reduced.

10.3.2 Major Route Alternatives

The majority of the proposed alignment is located within an existing electric transmission corridor. The operation and maintenance of the proposed Tewksbury-Andover Lateral will not require an increase in the width of the existing permanent easement. The siting of the Project outside an existing, previously disturbed and maintained ROW would result in significantly greater environmental impact in the form of forest clearing, additional roadway crossings and disturbance to residential and commercial properties. The proposed route represents a minimization of the environmental impacts both during construction and maintenance.

10.3.2.1 Railroad Alignment

The major route alternative was considered in the planning and design of the Project that would site the proposed pipeline adjacent to an existing active Boston and Maine Railroad ROW. This alternate route would commence at the Concord Lateral interconnect at approximately the same point as the proposed route and commence approximately eastwardly to the Wyeth facility. Based on the requirements of the railroad, the pipeline would not be able to be located within the existing easement and would necessitate the clearing and associated permanent impact associated with the creation of a new corridor to be located adjacent to the railroad ROW. This would result in new impacts to scrub-shrub and forested wetlands as well as clearing of upland forest well in excess of the preferred alignment.

10.3.2.2 Roadway Alignment

A second major route alternative examined was the installation of the proposed pipeline within existing roadways. This alternative is not viable due to the proposed pressure of the pipeline that significantly exceeds that of local distribution systems. This would result in a significant maintenance and safety concern due to potential third-party damage. Although the environmental impacts would be significantly reduced, the inability to obtain a permanent easement within the roadways, potential conflicts with existing utilities and the public safety concern eliminate this alternative from further consideration.

10.3.3 Route Variations

The preferred alignment was selected along pre-existing ROWs based on the ability to minimize potential impacts to environmental, cultural resources and residential areas. Inclusion of these variations allows the pipeline to be constructed within existing ROWs wherever possible. Once the primary route was determined, several route variations were identified based on concerns regarding sensitive environmental resources such as wetland and waterbody crossings, cultural resources, landowner concerns and land acquisition and construction issues. These minor variations were incorporated to avoid or minimize impacts to these areas while providing the necessary workspace to allow for the safe construction of the proposed pipeline.

Tennessee examined a route deviation to the south of the existing electric transmission corridor through property currently owned by the Tewksbury State Hospital to avoid two perennial stream crossings and associated temporary wetland impacts. However, this route would result in the creation of new permanent easement and a significant amount of permanent clearing of both upland forest and forested wetlands. Tennessee presented this alternative to the Tewksbury Conservation Commission at a public hearing held in November 2002, and the Commission requested that Tennessee align the pipeline within the existing electric transmission corridor due to the existing disturbed nature of the wetlands within the corridor and temporary impacts associated with construction of the new pipeline. Table 10.3-1 provides additional details on route variations.

10.4 ALTERNATIVE SITES

The only aboveground facilities proposed for this Project have been sited on a previously disturbed areas of Tennessee's permanent ROW and within the existing Wyeth facility. No alternative site evaluation was conducted, as the preferred site is located within an existing parking lot and avoids any adverse environmental impacts.

TABLE 10.3-1

**LIST OF PIPELINE ROUTE VARIATIONS ASSOCIATED WITH TEWKSBURY –
ANDOVER LATERAL PROJECT**

Approximate Milepost	Description of Variation (Direction, location...etc.)	Reason
0.54	Slight realignment to north	Avoidance of electric guy wires and overhead utilities
1.39	20 feet to north within electric transmission corridor	Avoidance of residences and septic systems
2.17	Crossover from south to north limit of electric transmission corridor	Avoidance of septic systems
2.53	Crossover from north to south limit of electric transmission corridor	Existing electric distribution line limits workspace
2.94	Crossover from south to north limit of electric transmission corridor	Avoid wetland and existing electric distribution line
3.08	20 feet to south within existing electric transmission corridor	Avoidance of a vernal pool (Wetland 7)
3.15	Crossover from north to south limit of electric transmission corridor	Avoidance of private well and residential impacts
3.28	Crossover from south to north limit of electric transmission corridor	Avoid tree clearing and existing electric distribution line
4.54 to 4.68	Move south approximately 30 feet into electric transmission corridor	Avoid tree clearing



11.0 Reliability and Safety

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Tewksbury-Andover Lateral Project*
11-1

RESOURCE REPORT 11 – RELIABILITY AND SAFETY FERC ENVIRONMENTAL CHECKLIST

Part 380 – Minimum Filing Requirements for Environmental Reports	Company Compliance or Inapplicability of Requirement
Describe how the Project facilities would be designed, constructed, operated and maintained to minimize potential hazard to the public from the failure of Project components as a result of accidents or natural catastrophes. (§ 380.12 (m)).	Not applicable

11.0 RELIABILITY AND SAFETY

The Project does not involve new or re-commissioned LNG facilities. Therefore, in accordance with the FERC guidance provided in 18 CFR Part 380.12(m), Resource Report 11 addressing reliability and safety of new or recommissioned LNG facilities is not required.



12.0 PCB Contamination

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*PCB Contamination
Environmental Report
Tewksbury - Andover Lateral Project
12-1*

RESOURCE REPORT 12 – PCB CONTAMINATION FERC ENVIRONMENTAL CHECKLIST

Part 380 – Minimum Filing Requirements for Environmental Reports	Company Compliance or Inapplicability of Requirement
For Projects involving the replacement or abandonment of facilities determined to have PCB's, provide a statement that activities would comply with an approved EPA disposal permit or with the requirements of the TSCA. (§ 380.12 (n)(1)).	Not applicable
For compressor station modifications on sites that have been determined to have soils contaminated with PCB's, describe the status of remediation efforts completed to date. (§ 380.12 (n)(2)).	Not applicable

12.0 PCB CONTAMINATION

Resource Report 12 is required for applications involving the replacement, abandonment by removal or abandonment in-place of pipeline facilities determined to have polychlorinated biphenyls (PCBs) in excess of 50 parts per million (ppm) in pipeline liquids (18 CFR 380.12(n)). Based upon the final PCB Mega-Rule (63 FR 35384), which went into effect on August 28, 1998, the EPA authorized use of PCBs in natural gas pipeline systems at concentrations of less than 50 ppm. Use of PCBs greater than 50 ppm is also authorized provided that pipeline companies continue annual sampling until results indicate that the levels have been reduced below 50 ppm for at least two consecutive samples at a minimum interval of 180 days.

Additionally, pipeline companies may reuse PCB contaminated natural gas pipe and appurtenances (valves, regulators, drips, filter separators, etc.) in a natural gas pipeline system provided that all free flowing liquids have been removed. Wipe sampling is no longer required when pipe is removed from service. Pipe and appurtenances are not regulated by the Toxic Substances Control Act (TSCA) for disposal and pipeline condensate is not required to be sampled other than by the waste disposal/energy recovery vendor for acceptance.

Tennessee has been involved in an extensive program to identify areas where releases of PCBs have occurred, if contamination is present, and what remedial actions have been completed. Effective September 9, 1999, testing performed upon Tennessee's entire pipeline system (including compressor station facilities), indicates that all operating areas of Tennessee's pipeline system have been confirmed to have concentrations less than 50 ppm PCBs and are not regulated by TSCA for disposal. Therefore, there are no TSCA regulated PCB pipeline or soil/water contamination issues associated with Tennessee's system.

Based on this data and in accordance with FERC guidance provided in 18 CFR 380.12(n), Resource Report 12 is not required for the Project.



13.0 Additional Information Related to LNG Plants




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*Additional Information Related to LNG Plants
Environmental Report
Tewksbury - Andover Lateral Project
13-1*

**RESOURCE REPORT 13 – ADDITIONAL INFORMATION
RELATED TO LNG PLANTS
FERC ENVIRONMENTAL CHECKLIST**

Part 380 – Minimum Filing Requirements for Environmental Reports	Company Compliance or Inapplicability of Requirement
Provide all the listed detailed engineering materials. (§ 380.12 (o)).	Not applicable



13.0 ADDITIONAL INFORMATION RELATED TO LNG PLANTS

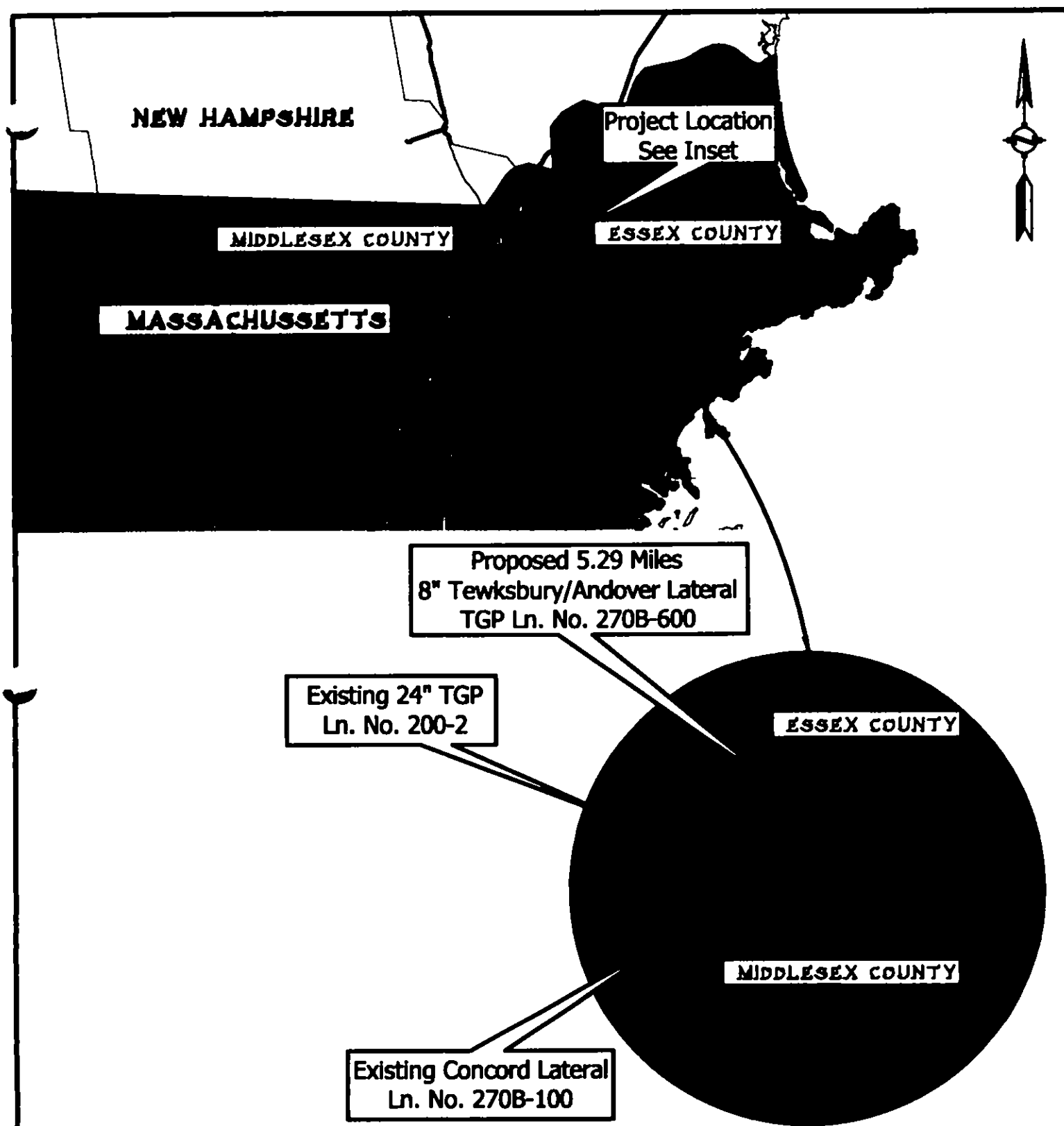
This resource report is required for construction of new LNG facilities. The Project does not involve the construction or recommissioning of any LNG facility. Therefore, in accordance with FERC guidance provided in 18 CFR Part 380.12(o), Resource Report 13 addressing additional information related to LNG facilities is not required.



Appendix A
Graphical Overview of Project

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**NON-INTERNET PUBLIC
FERC SUBMITTAL**

LEGEND

- Existing Pipe
- Existing Concord Lateral
- Proposed Tewksbury/Andover Pipeline

ENG. RECORD		DATE
DRAWN BY:	MTL	11/08
DRAWING APPROVAL		
PROJECT APPROVAL		
SURVEY DATE:		
SCALE: N.T.S.		
PROJECT ID: 082304		
FILE NAME: 03004006		



**PROPOSED NATURAL GAS PIPELINE
TEWKSBURY/ANDOVER LATERAL**

MIDDLESEX & ESSEX COUNTIES, MASSACHUSETTS

DWG. NO. TA-E12-270B-600-MAP

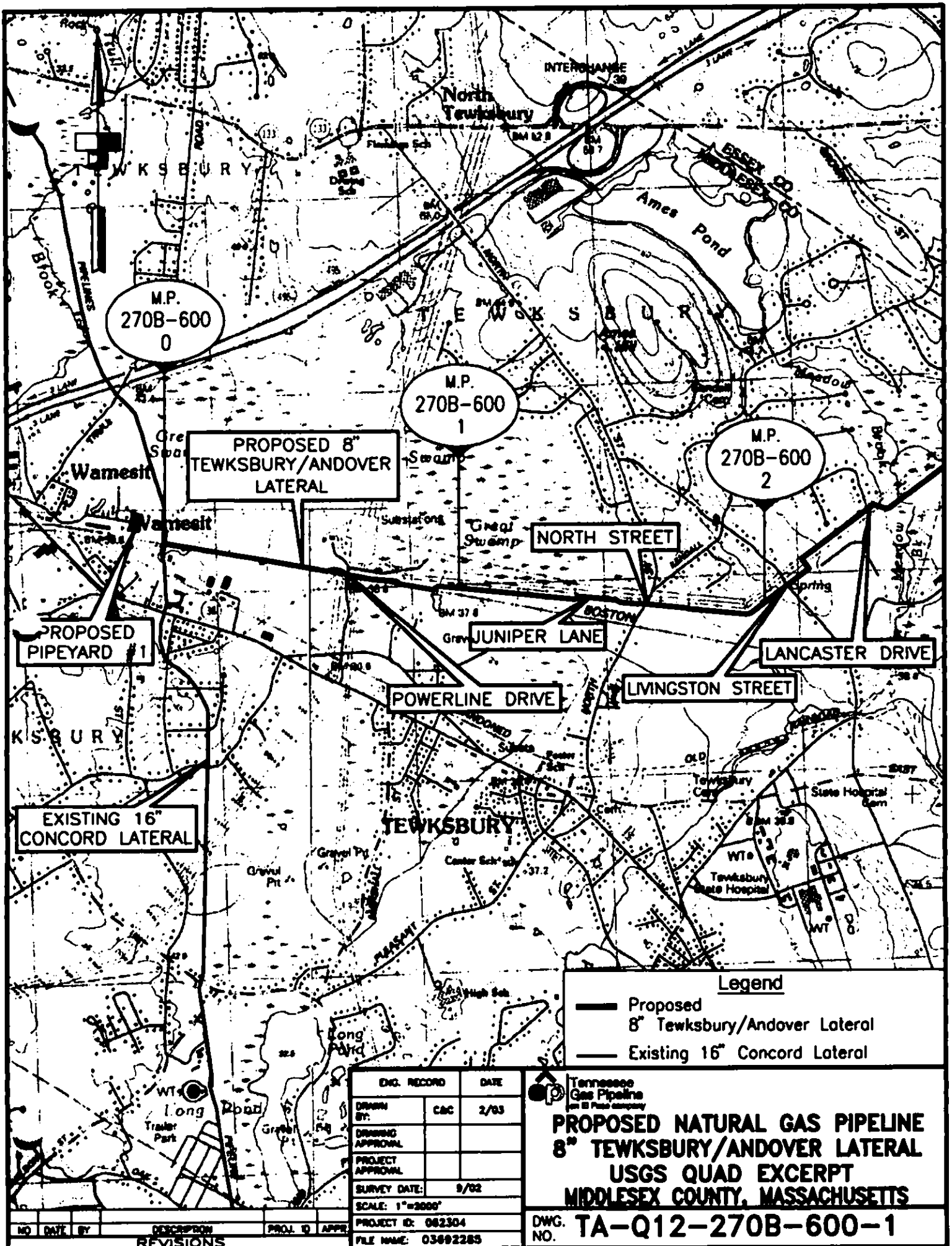
NO.	DATE	BY	DESCRIPTION	APPROVAL
REVISIONS				



Appendix B
USGS Quadrangle Exceptrs

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Appendix C
List of Property Owners

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TEWKSBURY ANDOVER LATERAL
LIST OF AFFECTED PROPERTY OWNERS

LINE LIST NO.	LANDOWNER	STREET	CITY	STATE	ZIP CODE
MA-Wyeth 1.00	Charles Parisi & Charles Salvo	50 Beach Road, Apt. 21	Tequesta	FL	33469
MA-Wyeth 2.00	New England Power Company	25 Research Drive	Westborough	MA	01283
MA-Wyeth 3.00	New England Power Company	25 Research Drive	Westborough	MA	01283
MA-Wyeth 4.00	L.J. DiPalma, Inc.	62 Juniper Lane	Tewksbury	MA	01876
MA-Wyeth 5.00	L.J. DiPalma, Inc.	62 Juniper Lane	Tewksbury	MA	01876
MA-Wyeth 6.00	L.J. DiPalma, Inc.	62 Juniper Lane	Tewksbury	MA	01876
MA-Wyeth 7.00	Germano, Frances A.	10 Germano Lane	Tewksbury	MA	01876
MA-Wyeth 8.00	Germano, Frances A.	10 Germano Lane	Tewksbury	MA	01876
MA-Wyeth 9.00	Pheasant Hunt Condominiums	P.O.Box 893	Acton	MA	01720
MA-Wyeth 10.00	Cooney, James F and Catherine T	920 Livingston Street	Tewksbury	MA	01876
MA-Wyeth 11.00	Cooney, Peter D. and June C.	2877 Anderson Drive	Dighton	MA	02715
MA-Wyeth 12.00	Cooney, Peter D. and June C.	2877 Anderson Drive	Dighton	MA	02715
MA-Wyeth 13.00	Fearn, William C. and Martha A.	975 Livingston Street	Tewksbury	MA	01876
MA-Wyeth 14.00	Higginbotham, John C. , et al	71 Sheffield Street	Tewksbury	MA	01876
MA-Wyeth 15.00	Power, Donald C. and Donna J.	61 Sheffield Street	Tewksbury	MA	01876
MA-Wyeth 16.00	Kachoris, Thomas J. and Elizabeth	51 Sheffield Street	Tewksbury	MA	01876
MA-Wyeth 17.00	Rodgers, Maxwell G. and Maureen	41 Sheffield Street	Tewksbury	MA	01876
MA-Wyeth 18.00	Durney, Christopher and Gayle	31 Sheffield Street	Tewksbury	MA	01876
MA-Wyeth 19.00	Machey, Paula J., et al	21 Sheffield Street	Tewksbury	MA	01876
MA-Wyeth 20.00	Simeone, Eustachio P.	245 Lancaster Drive	Tewksbury	MA	01876
MA-Wyeth 21.00	Ferro, John A. and Madeleine	235 Lancaster Drive	Tewksbury	MA	01876
MA-Wyeth 22.00	Long, David J. and Ann Marie	231 Lancaster Drive	Tewksbury	MA	01876
MA-Wyeth 23.00	Doherty, John F and Laurie	225 Lancaster Drive	Tewksbury	MA	01876
MA-Wyeth 24.00	James A. Elliott and Anne L. Collins	246 Lancaster Drive	Tewksbury	MA	01876
MA-Wyeth 25.00	James A. Elliott and Anne L. Collins	246 Lancaster Drive	Tewksbury	MA	01876
MA-Wyeth 26.00	New England Power Company	25 Research Drive	Tewksbury	MA	01876
MA-Wyeth 27.00	Pinnacle Realty Trust	13 Woodcrest Drive	Tewksbury	MA	01876
MA-Wyeth 28.00	New England Power Company	25 Research Drive	Tewksbury	MA	01876
MA-Wyeth 29.00	Pinnacle Realty Trust	13 Woodcrest Drive	Tewksbury	MA	01876
MA-Wyeth 30.00	Massachusetts Electric Company c/o NEPCO	25 Research Drive	Tewksbury	MA	01876
MA-Wyeth 31.00	Town of Tewksbury	1009 Main Street	Tewksbury	MA	01876
MA-Wyeth 32.00	Dias, Armindo G.	380 Pinnacle Street	Tewksbury	MA	01876
MA-Wyeth 33.00	New England Power Company	25 Research Drive	Tewksbury	MA	01876
MA-Wyeth 34.00	New England Power Company	25 Research Drive	Tewksbury	MA	01876
MA-Wyeth 35.00	New England Power Company	25 Research Drive	Tewksbury	MA	01876
MA-Wyeth 36.00	Two S Realty Trust	1 Vail Court	Cambridge	MA	01876
MA-Wyeth 37.00	New England Power Company	25 Research Drive	Tewksbury	MA	01876
MA-Wyeth 38.00	New England Power Company	25 Research Drive	Tewksbury	MA	01876
MA-Wyeth 39.00	McDevit, John J. Jr., et al	P.O. Box 4757	Manchester	NH	03108
MA-Wyeth 40.00	McDevit, John J. Jr., et al	P.O. Box 4757	Manchester	NH	03108
MA-Wyeth 41.00	Boston and Maine RR	Iron Horse Park	N. Billerica	MA	
MA-Wyeth 42.00	Holt and Bugbee Company	1600 Shawsheen St.	Tewksbury	MA	01876
MA-Wyeth 43.00	Barnacott, Virgilio, et ux	1500 Shawsheen St.	Tewksbury	MA	01876

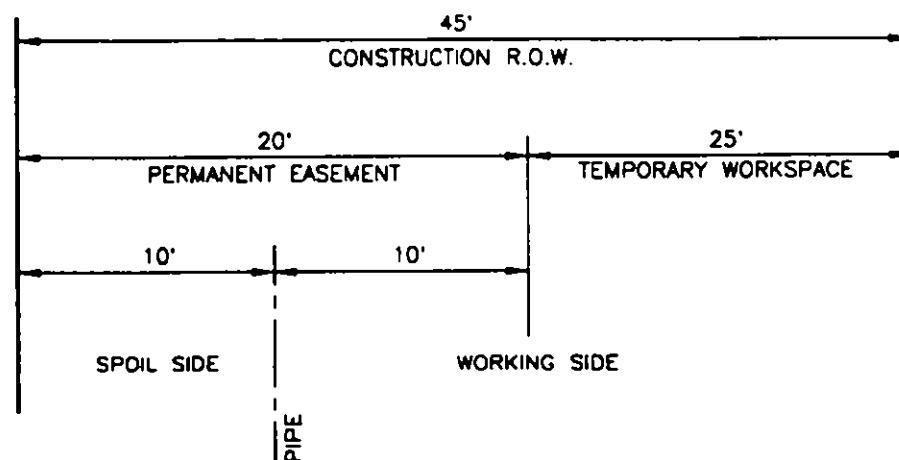
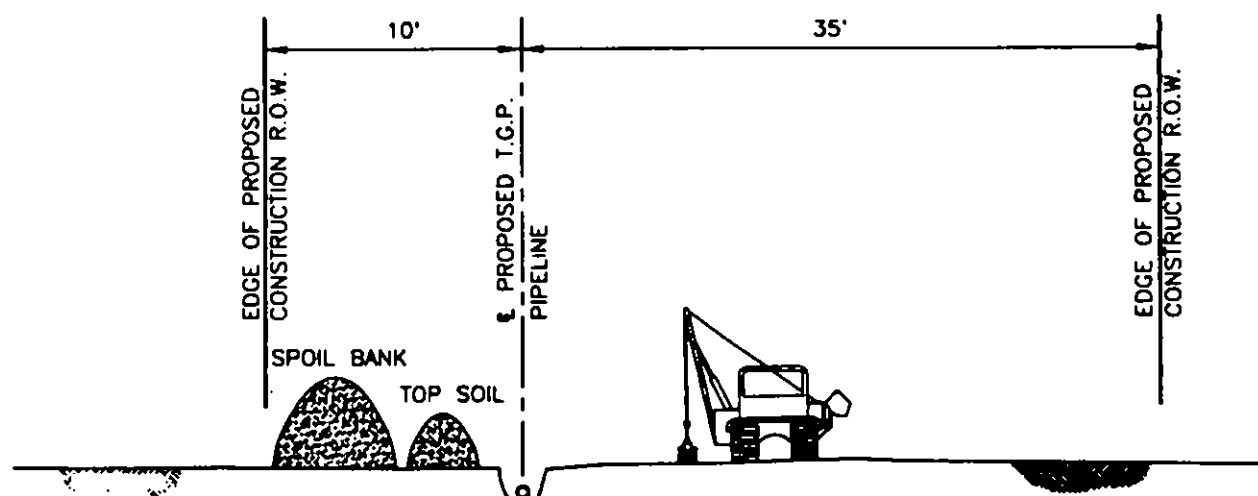
TEWKSBURY ANDOVER LATERAL
LIST OF AFFECTED PROPERTY OWNERS

LINE LIST NO.	LANDOWNER	STREET	CITY	STATE	ZIP CODE
MA-Wyeth 45.00	Lavalle, Lawrence M. and Diane E.	1465 Shawsheen Street	Tewksbury	MA	01876
MA-Wyeth 46.00	DeVito, Louis and MaryAnn	1455 Shawsheen Street	Tewksbury	MA	01876
MA-Wyeth 47.00	J.D.B. Realy Trust	1501 Main Street	Tewksbury	MA	01876
MA-Wyeth 48.00	Brigman Lee Circle				
MA-Wyeth 48.01	Makooi, Ramak B. and Wendy J.	70 Briana Lee Circle	Tewksbury	MA	01876
MA-Wyeth 48.02	Itzkowitz, Howard E. and Marilyn J.	29 Bradford Road	Tewksbury	MA	01876
MA-Wyeth 49.00	J.D.B. Realy Trust	1501 Main Street	Tewksbury	MA	01876
MA-Wyeth 50.00	Sarma, Sitangsu and Aparna	39 Bradford Road	Tewksbury	MA	01876
MA-Wyeth 51.00	Wagner, Thomas and Jean	49 Bradford Road	Tewksbury	MA	01876
MA-Wyeth 52.00	Bland, Albert & Christina	9 Redgate Road	Tewksbury	MA	01876
MA-Wyeth 53.00	Piantone, Robert C. Trust	P.O. Box 604	Andover	MA	01810
MA-Wyeth 53.01	Dooley, William J. III and Roberta	25 Redgate Road	Tewksbury	MA	01876
MA-Wyeth 54.00	Redgate Road				
MA-Wyeth 55.00	Clapp, Denise	20 Redgate Road	Tewksbury	MA	01876
MA-Wyeth 56.00	Digiampaolo, Marianne R.	40 Redgate Road	Tewksbury	MA	01876
MA-Wyeth 57.00	Dinapoli, Robert J. and Marie	50 Redgate Road	Tewksbury	MA	01876
MA-Wyeth 58.00	Bacigalupo, Martha J.	60 Redgate Road	Tewksbury	MA	01876
MA-Wyeth 59.00	Merritt, Brian R. and Nancy M.	70 Redgate Road	Tewksbury	MA	01876
MA-Wyeth 60.00	Patterson, Carl G. and Nancy M.	20 Whitegate Road	Tewksbury	MA	01876
MA-Wyeth 61.00	Bramante, Richard D. and Barbara	30 Whitegate Road	Tewksbury	MA	01876
MA-Wyeth 62.00	Neary, Joseph and Maureen	40 Whitegate Road	Tewksbury	MA	01876
MA-Wyeth 63.00	Davies-Conway, Lisa M.	50 Whitegate Road	Tewksbury	MA	01876
MA-Wyeth 64.00	Town of Tewksbury	1009 Main Street	Tewksbury	MA	01876
MA-Wyeth 65.00	Zidinak, Peter M. and Maureen	187 Bradford Road	Tewksbury	MA	01876
MA-Wyeth 66.00	Florino, Ronald and MaryBeth	196 Bradford Road	Tewksbury	MA	01876
MA-Wyeth 67.00	Town of Tewksbury	1009 Main Street	Tewksbury	MA	01876
MA-Wyeth 68.00	Sughrue, Holly C. and Richard J.	24 Belvair Road	Tewksbury	MA	01876
MA-Wyeth 69.00	Sughrue, Holly C. and Richard J.	24 Belvair Road	Tewksbury	MA	01876
MA-Wyeth 70.00					
MA-Wyeth 71.00	JW South Street RT	5 Drud Hill Road	Wakefield	MA	01880
MA-Wyeth 72.00	JW South Street RT	5 Drud Hill Road	Wakefield	MA	01880
MA-Wyeth 73.00					
MA-Wyeth 74.00					
MA-Wyeth 75.00	Wyeth Biopharma				
MA-Wyeth 76.00	Wyeth Biopharma				



Appendix D
Typical Right-of-Way Configurations

**COLER &
COLANTONIO**
ENGINEERS AND SCIENTISTS



LOOKING DOWNSTATION

ENG. RECORD		DATE
DRAWN BY:	MTL	10/03
DRAWING APPROVAL		
PROJECT APPROVAL		
SURVEY DATE:		
SCALE: NTS		
PROJECT ID: 062304		
FILE NAME: 03694879		

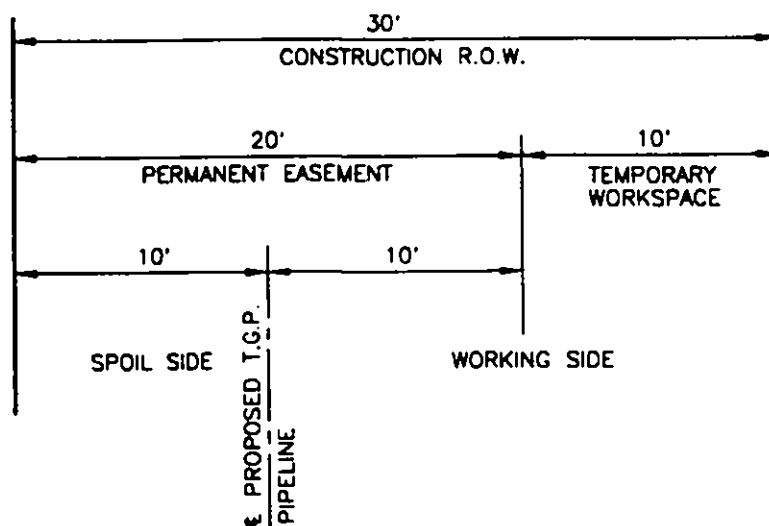
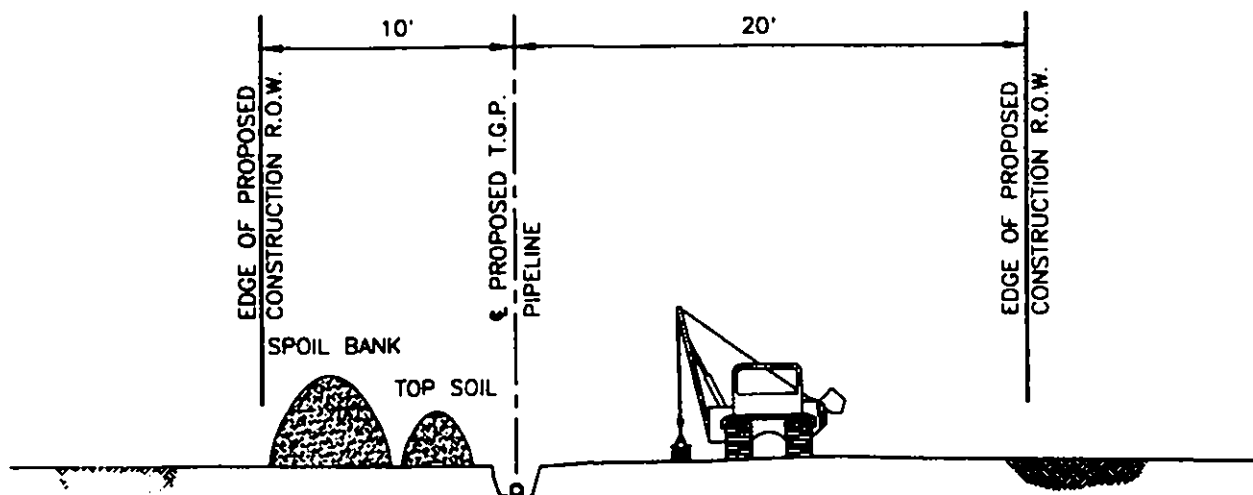


**PROPOSED 8" TEWKSBURY/ANDOVER LATERAL
TYPICAL ROW CONFIGURATION
MIDDLESEX COUNTY, MASSACHUSETTS**

DWG.
NO.

FIGURE-1

NO.	DATE	BY	DESCRIPTION	PROJ. ID	APPR.



LOOKING DOWNSTATION

ENG. RECORD		DATE
DRAWN BY:	MTL	10/03
DRAWING APPROVAL		
PROJECT APPROVAL		
SURVEY DATE:		
SCALE:	MTS	
PROJECT ID:	082304	
FILE NAME:	03684880	

PROPOSED 8" TEWKSBURY/ANDOVER LATERAL

TYPICAL ROW CONFIGURATION

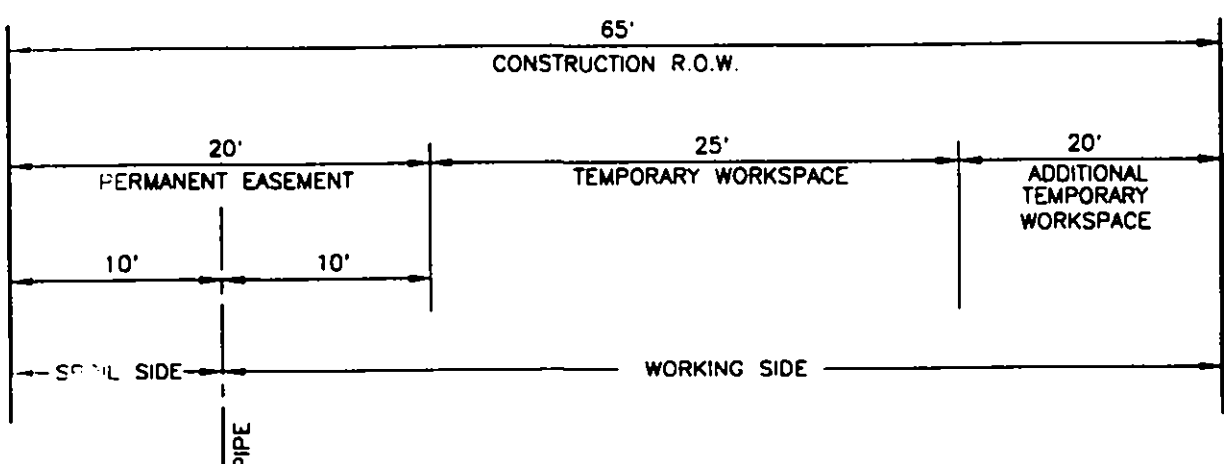
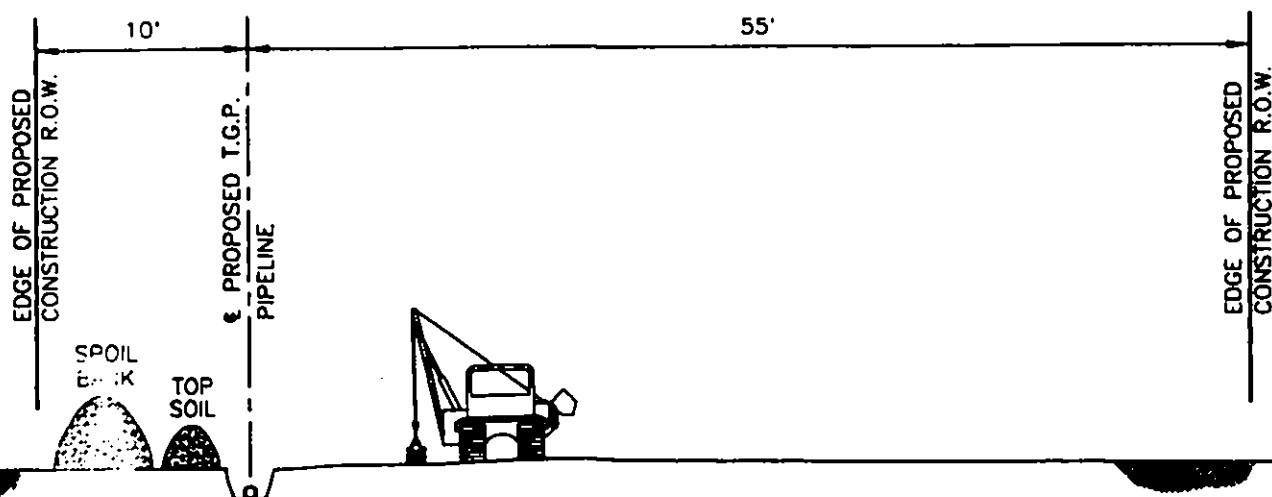
ESSEX COUNTY, MASSACHUSETTS

DWG. NO.


FIGURE-2

NO	DATE	BY

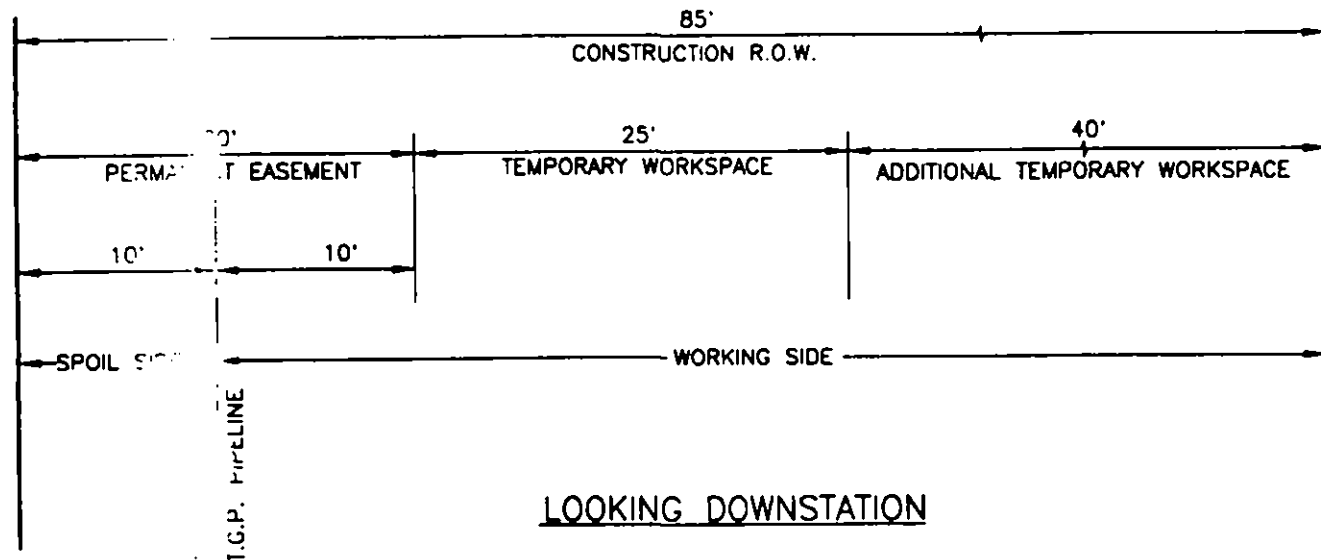
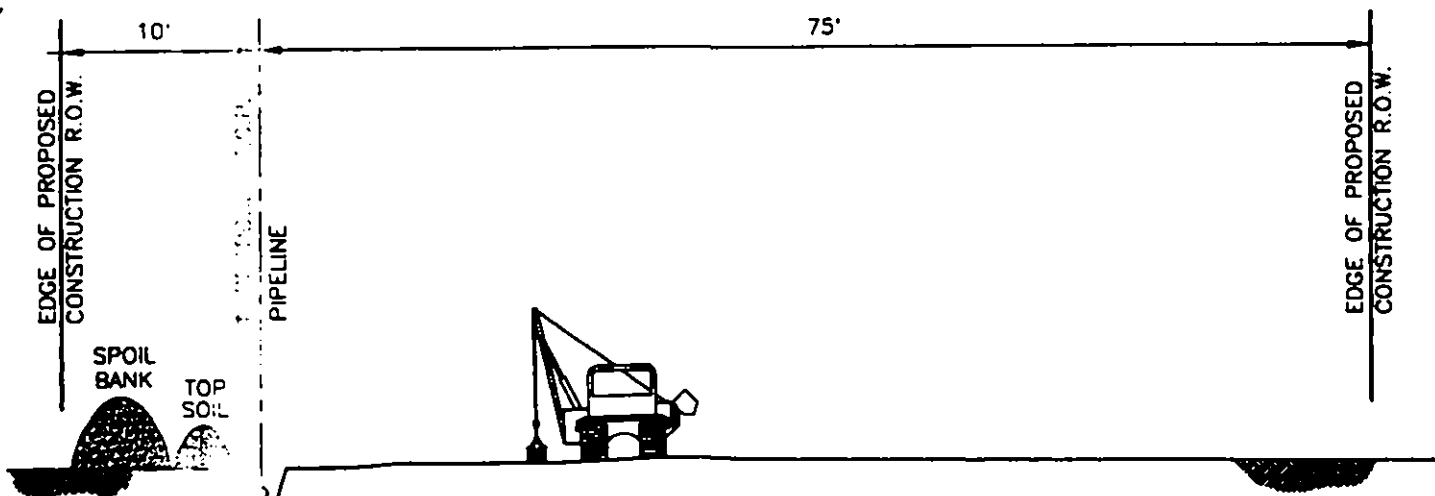
NO	DATE	BY



LOOKING DOWNSTATION

ENG. RECORD		DATE	 PROPOSED 8" TEWKSBURY/ANDOVER LATERAL TYPICAL ROW CONFIGURATION MIDDLESEX COUNTY, MASSACHUSETTS
DRAWN BY:	MTL	10/03	
DRAWING APPROVAL			
PROJECT APPROVAL			
SURVEY DATE:			
SCALE: NTS			DWG. NO. FIGURE-3
PROJECT ID: 062304			
FILE NAME: 03684881			

NO.	DATE	BY	REVISION	PROJ. ID	APPR.



LOOKING DOWNSTATION

ENG. RECORD		DATE
DRAWN BY:	MTL	10/03
DRAWING APPROVAL		
PROJECT APPROVAL		
SURVEY DATE:		
SCALE:	NTS	
PROJECT ID:	062304	
FILE NAME:	03684882	

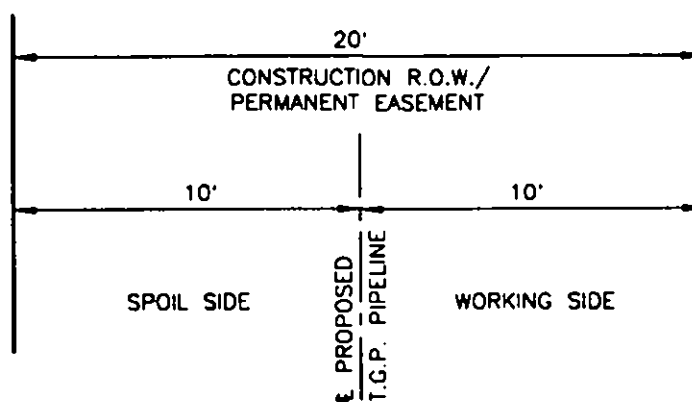
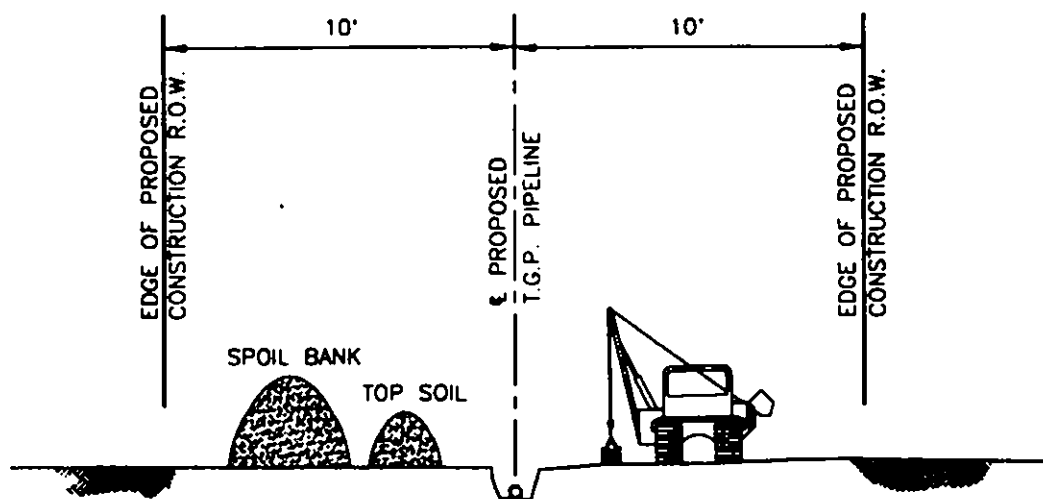


**PROPOSED 8" TEWKSBURY/ANDOVER LATERAL
TYPICAL ROW CONFIGURATION
MIDDLESEX COUNTY, MASSACHUSETTS**

DWG. NO.

FIGURE-4

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LOOKING DOWNSTATION

ENG. RECORD		DATE
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DRAWING APPROVAL		
PROJECT APPROVAL		
SURVEY DATE:		
SCALE: NTS		
PROJECT ID: 062304		
FILE NAME: 03894883		

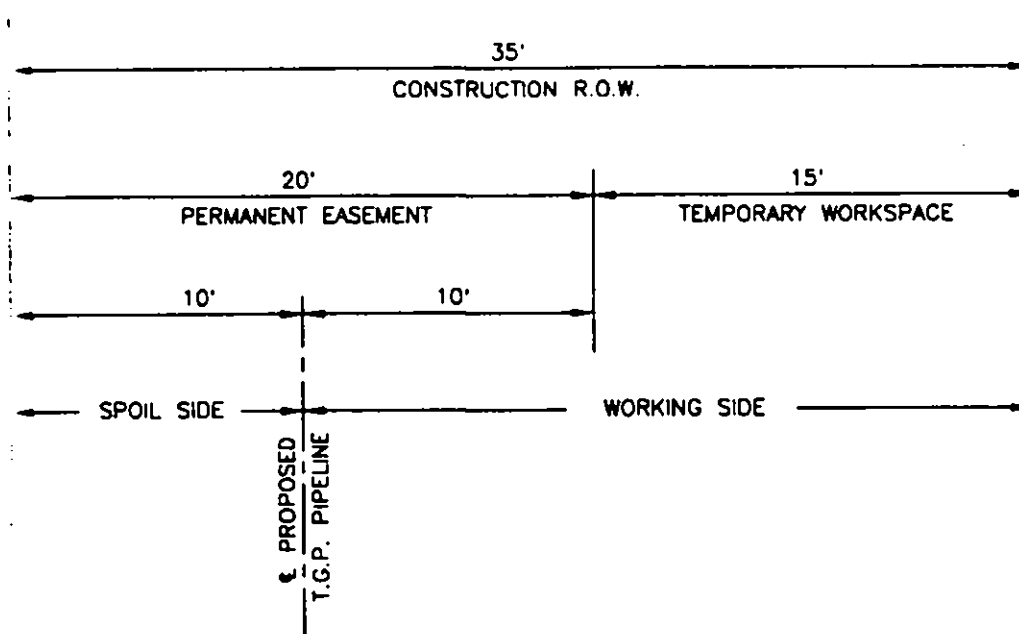
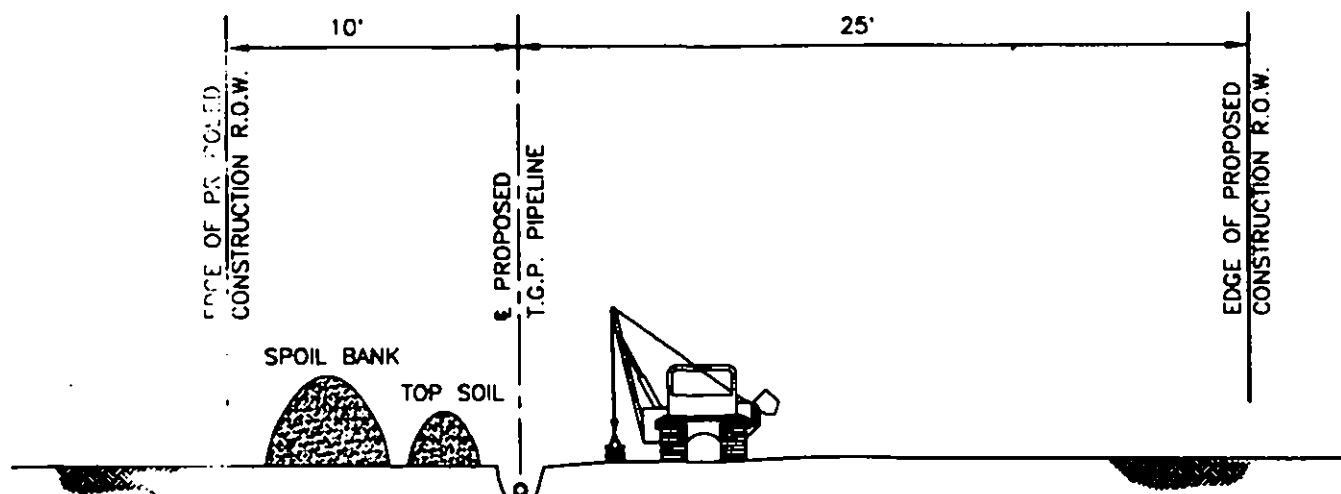


**PROPOSED 8" TEWKSBURY/ANDOVER LATERAL
TYPICAL ROW CONFIGURATION
MIDDLESEX COUNTY, MASSACHUSETTS**

DWG.
NO.

FIGURE-5

NO.	DATE	BY	REVISION	PROJ. ID	APPR.
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LOOKING DOWNSTATION

ENG. RECORD		DATE
DRAWN BY:	MTL	10/03
DRAWING APPROVAL		
PROJECT APPROVAL		
SURVEY DATE:		
SCALE: NTS		
PROJECT ID: 062304		
FILE NAME: 03694884		

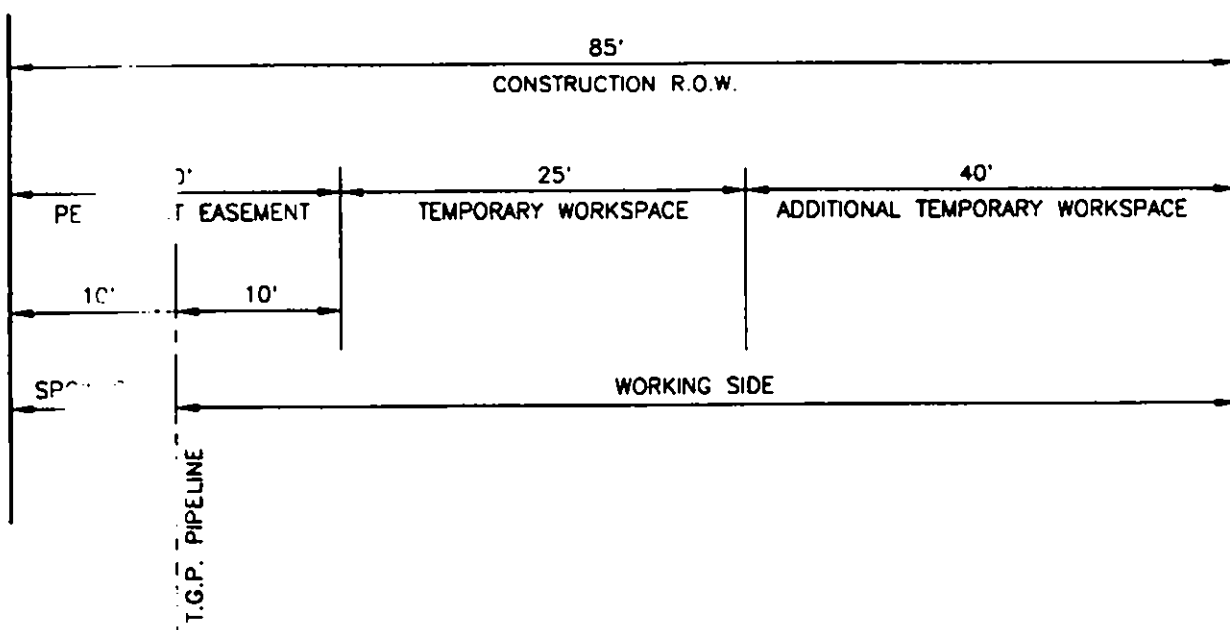
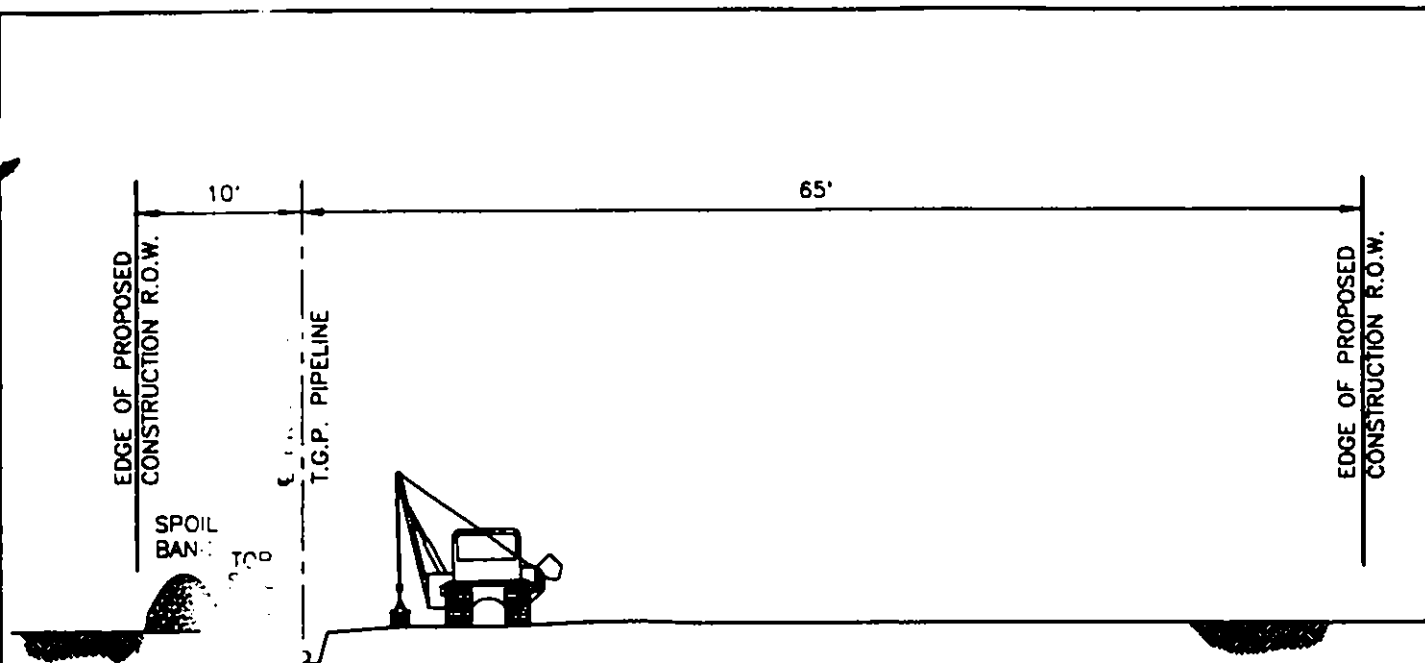


**PROPOSED 8" TEWKSBURY/ANDOVER LATERAL
TYPICAL ROW CONFIGURATION
MIDDLESEX COUNTY, MASSACHUSETTS**

DWG.
NO.

FIGURE-6

NO	DATE	BY	ON	PROJ. ID	APPR.
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LOOKING DOWNSTATION

NO.	DATE	BY

PROJ. ID	APPR.

DWG. RECORD		DATE
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DRAWING APPROVAL		
PROJECT APPROVAL		
SURVEY DATE:		
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PROJECT ID: 062304		
FILE NAME: 03084885		

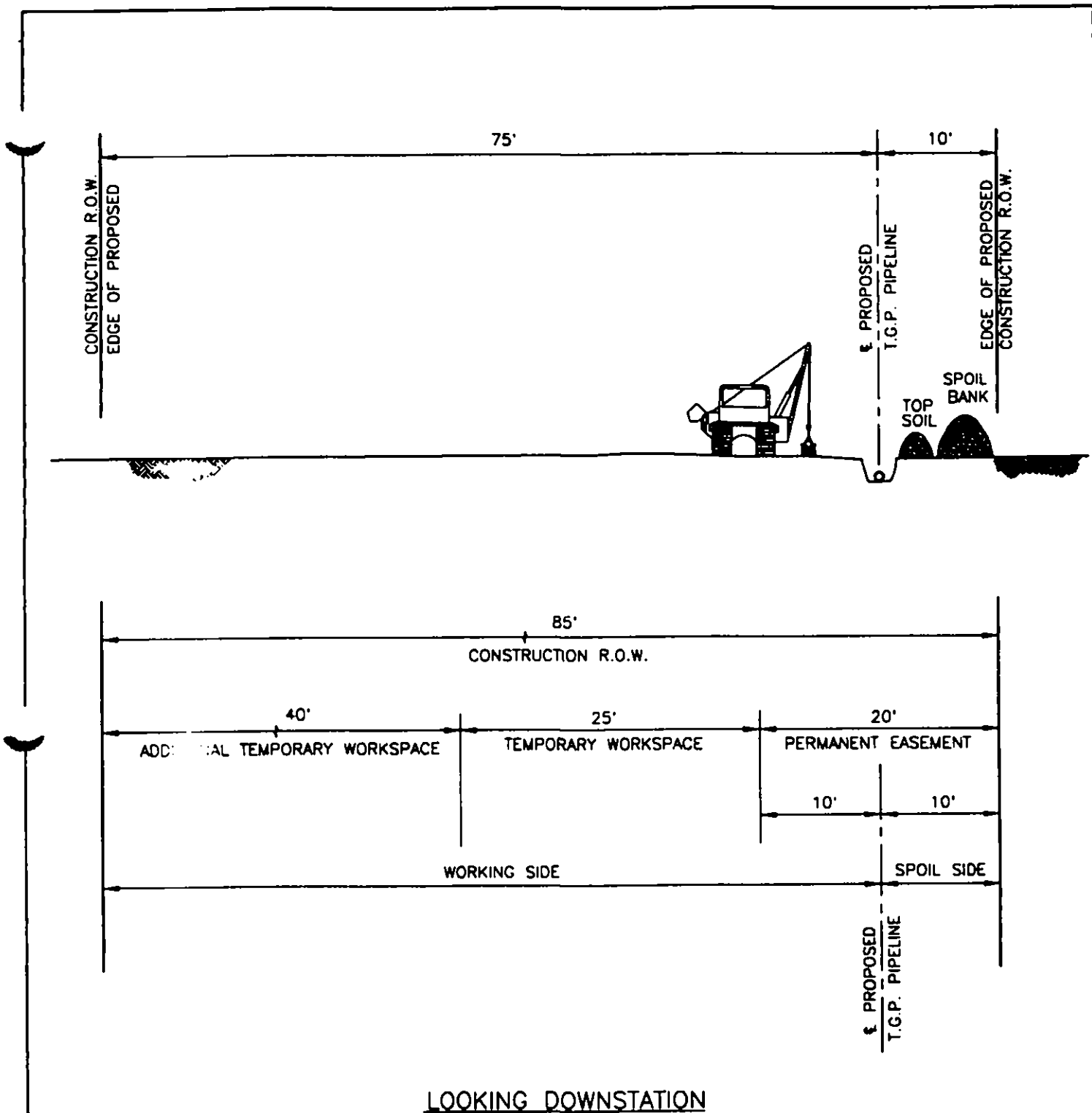
PROPOSED 8" TEWKSBURY/ANDOVER LATERAL

TYPICAL ROW CONFIGURATION

MIDDLESEX COUNTY, MASSACHUSETTS

DWG. NO.

FIGURE-7



ENG. RECORD		DATE
DRAWN BY:	MTL	10/03
DRAWING APPROVAL		
PROJECT APPROVAL		
SURVEY DATE:		
SCALE: NTS		
PROJECT ID: 062304		
FILE NAME: 03694888		

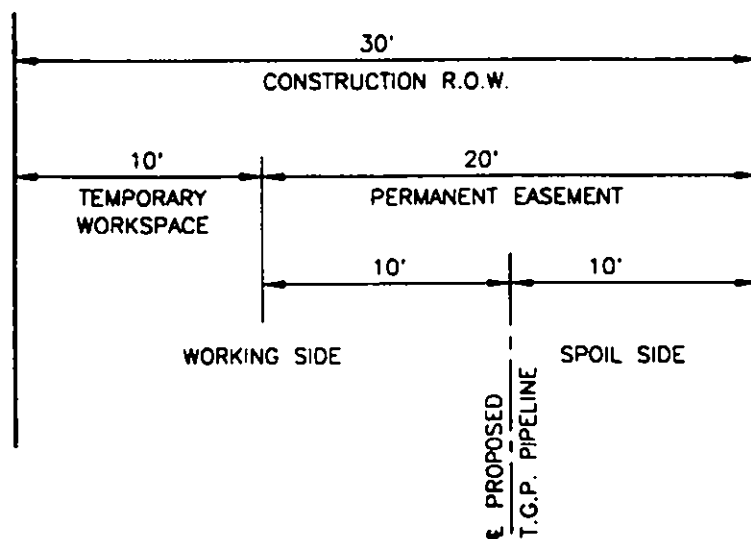
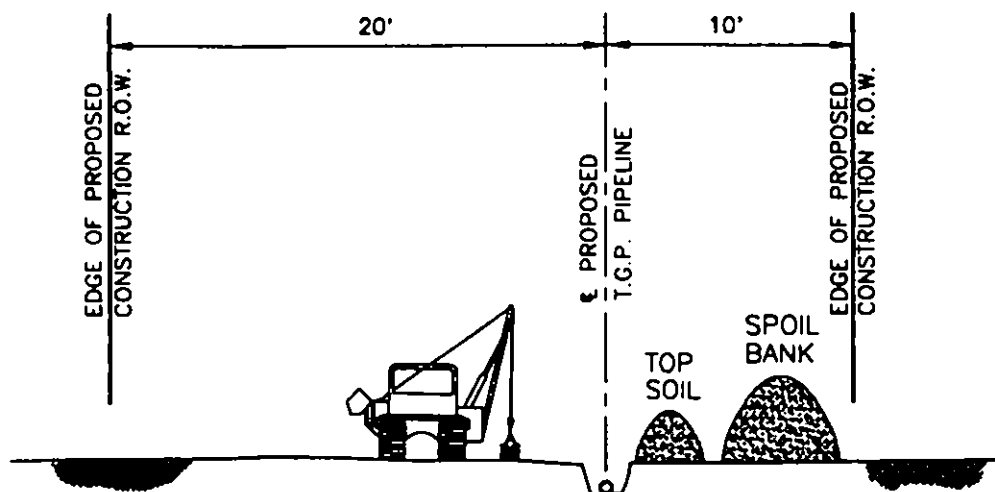


**PROPOSED 8" TEWKSBURY/ANDOVER LATERAL
TYPICAL ROW CONFIGURATION
MIDDLESEX COUNTY, MASSACHUSETTS**

DWG.
NO.


FIGURE-8

NO	DATE	BY	DESCRIPTION	PROJ. ID	APPR.



LOOKING DOWNSTATION

ENG. RECORD		DATE
DRAWN BY:	MTL	10/03
DRAWING APPROVAL		
PROJECT APPROVAL		
SURVEY DATE:		
SCALE: NTS		
PROJECT ID: 062304		
FILE NAME: 03694869		



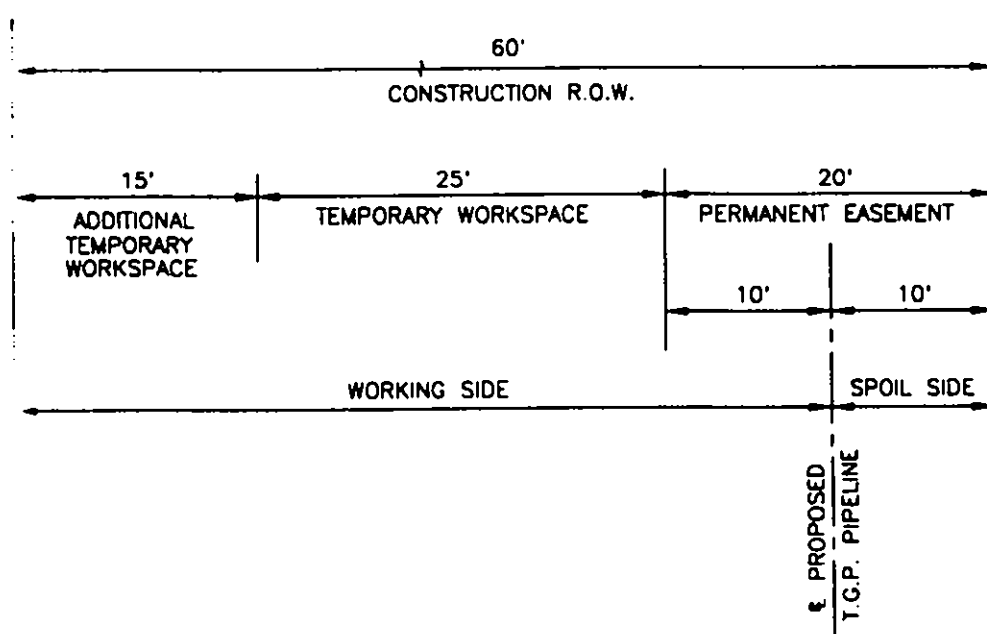
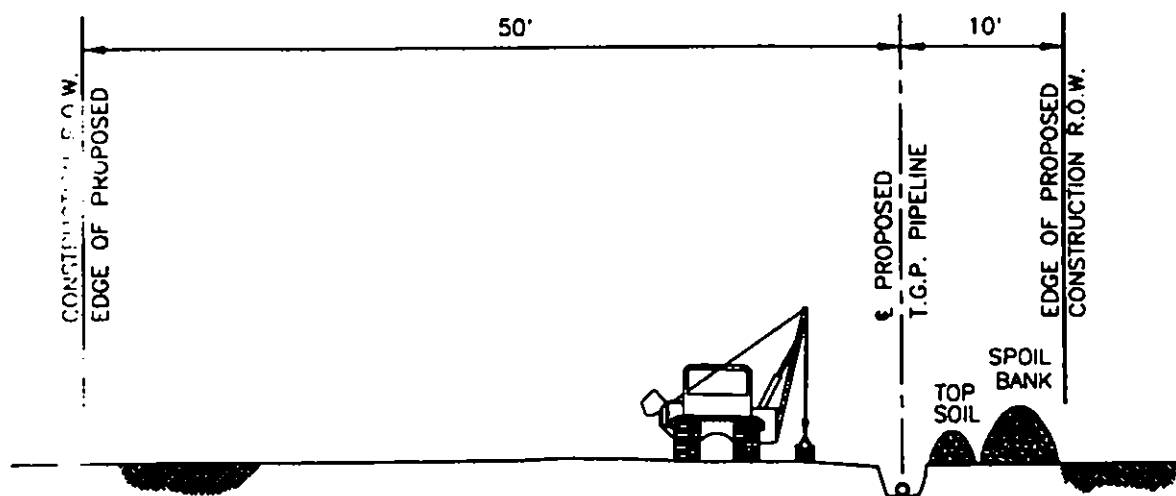
Tennessee Gas Pipeline
an El Paso company

PROPOSED 8" TEWKSBURY/ANDOVER LATERAL
TYPICAL ROW CONFIGURATION
MIDDLESEX COUNTY, MASSACHUSETTS

DWG. NO.

FIGURE-9

NO.	DATE	BY	REVISION	PROJ. ID	APPR

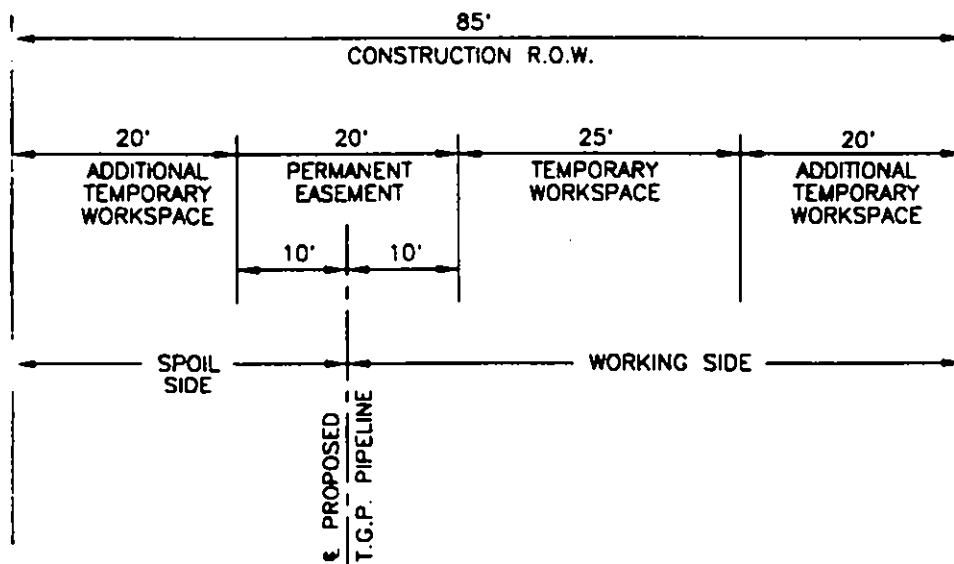
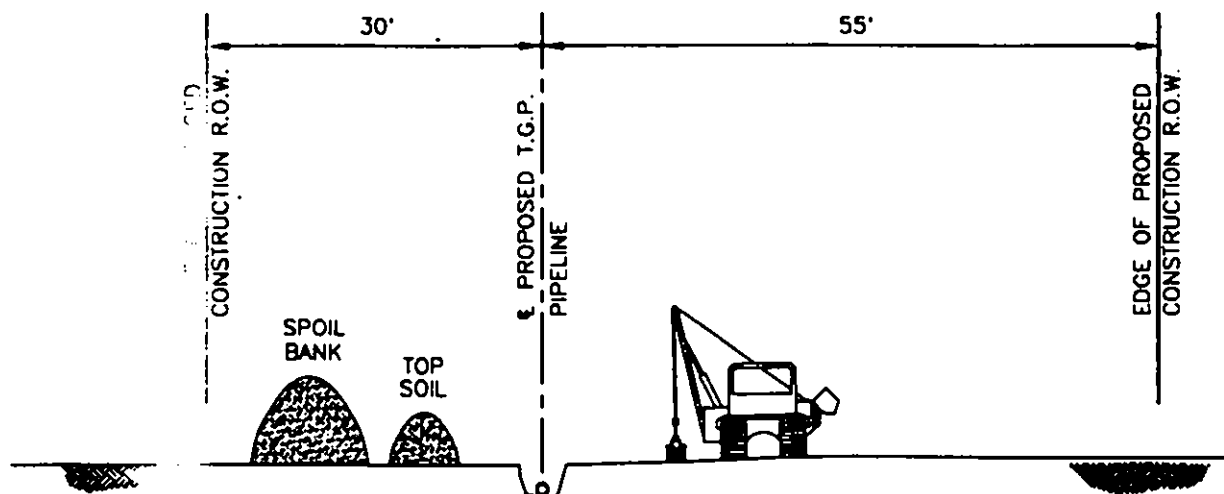


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DRAWING APPROVAL			
PROJECT APPROVAL			
SURVEY DATE:			
SCALE: NTS			
PROJECT ID: 062504		PROPOSED 8" TEWKSBURY/ANDOVER LATERAL TYPICAL ROW CONFIGURATION MIDDLESEX COUNTY, MASSACHUSETTS	
FILE NAME: 03694891			
DWG. NO.		FIGURE-10	


NO.	DATE	BY

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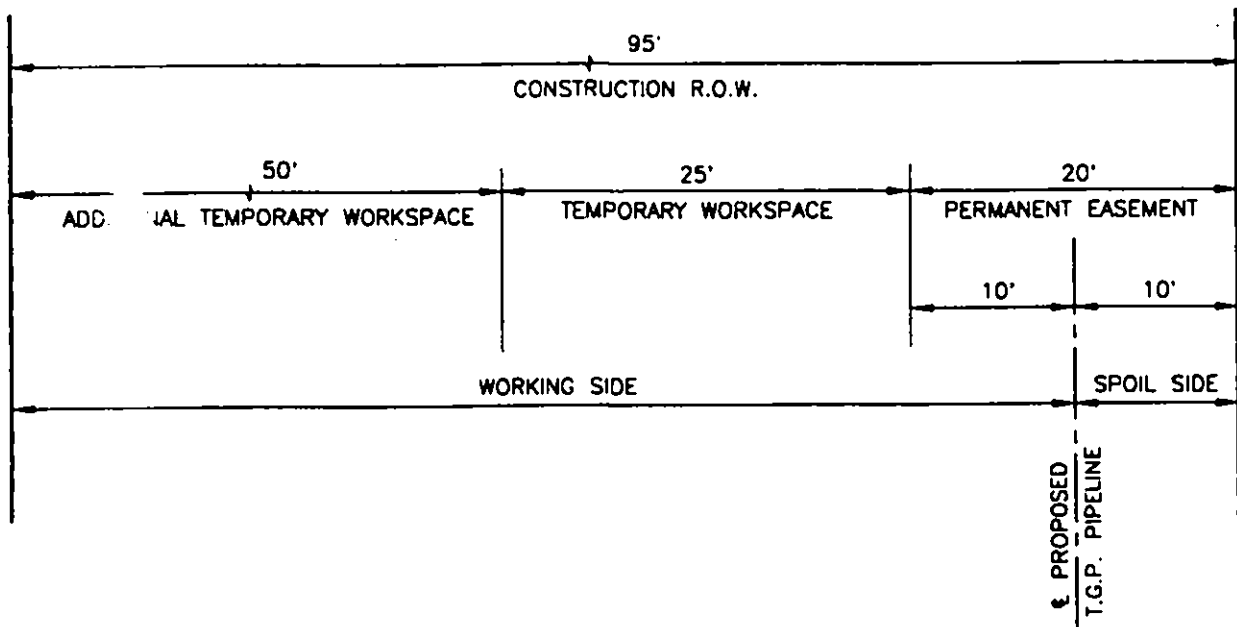
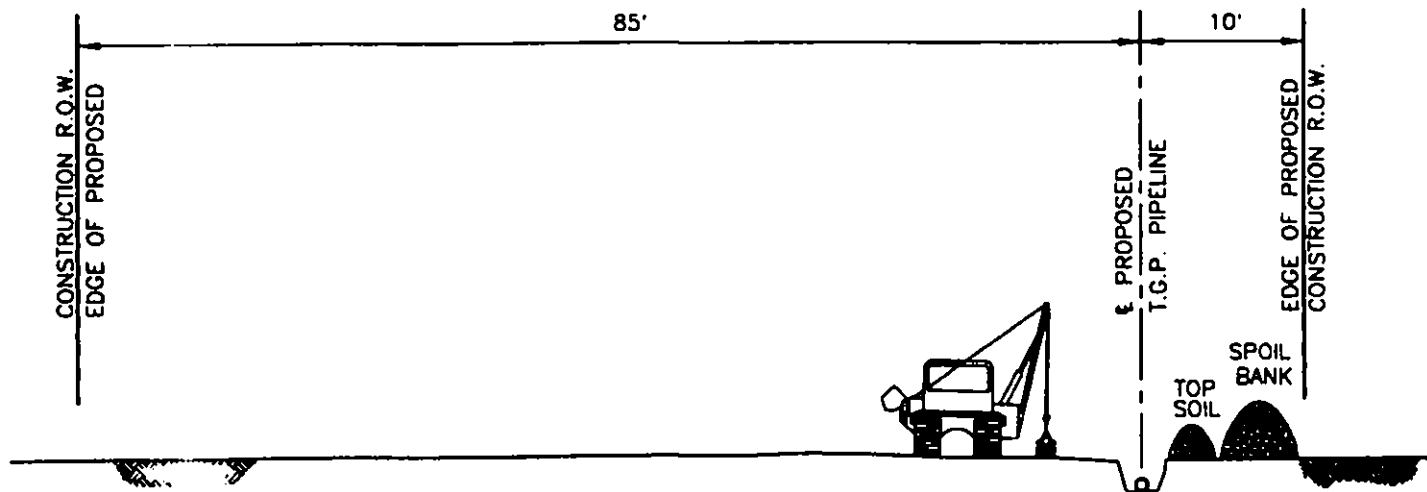
LOOKING DOWNSTATION

ENG. RECORD		DATE
DRAWN BY:	MTL	10/03
DRAWING APPROVAL		
PROJECT APPROVAL		
SURVEY DATE:		
SCALE:	NTS	
PROJECT ID:	062304	
FILE NAME:	03604892	

 Tennessee Gas Pipeline <small>an E.P. Energy company</small>	PROPOSED 8" TEWKSBURY/ANDOVER LATERAL	
	TYPICAL ROW CONFIGURATION	
	ESSEX COUNTY, MASSACHUSETTS	
	DWG. NO.	FIGURE-11


NO.	DATE	BY

REVISION	PROJ. ID	APPR
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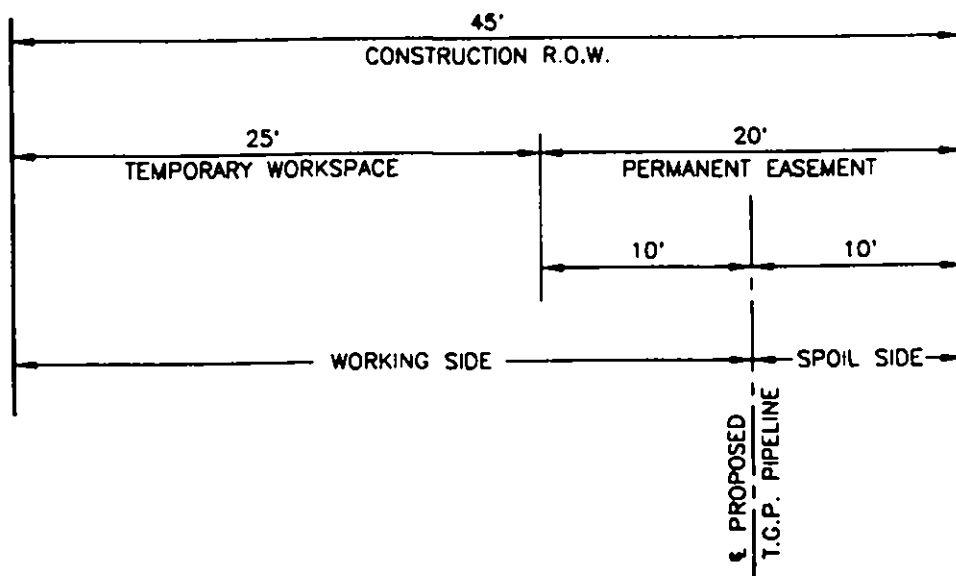
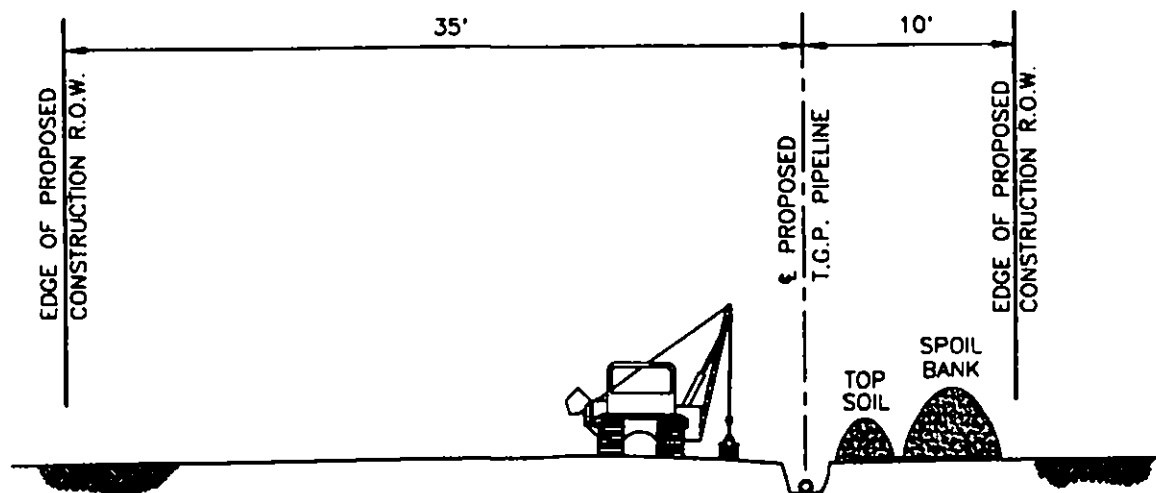


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ENG. RECORD		DATE
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DRAWING APPROVAL		
PROJECT APPROVAL		
SURVEY DATE:		
SCALE: NTS		
PROJECT NO: 002304		
FILE NAME: 03004895		


 Tennessee Gas Pipeline an El Paso company	
PROPOSED 8" TEWKSBURY/ANDOVER LATERAL	
TYPICAL ROW CONFIGURATION	
ESSEX COUNTY, MASSACHUSETTS	
DWG. NO.	FIGURE-12

NO	DATE	BY	DESCRIPTION	PROJ. ID	APPR.
			VISIONS		



LOOKING DOWNSTATION

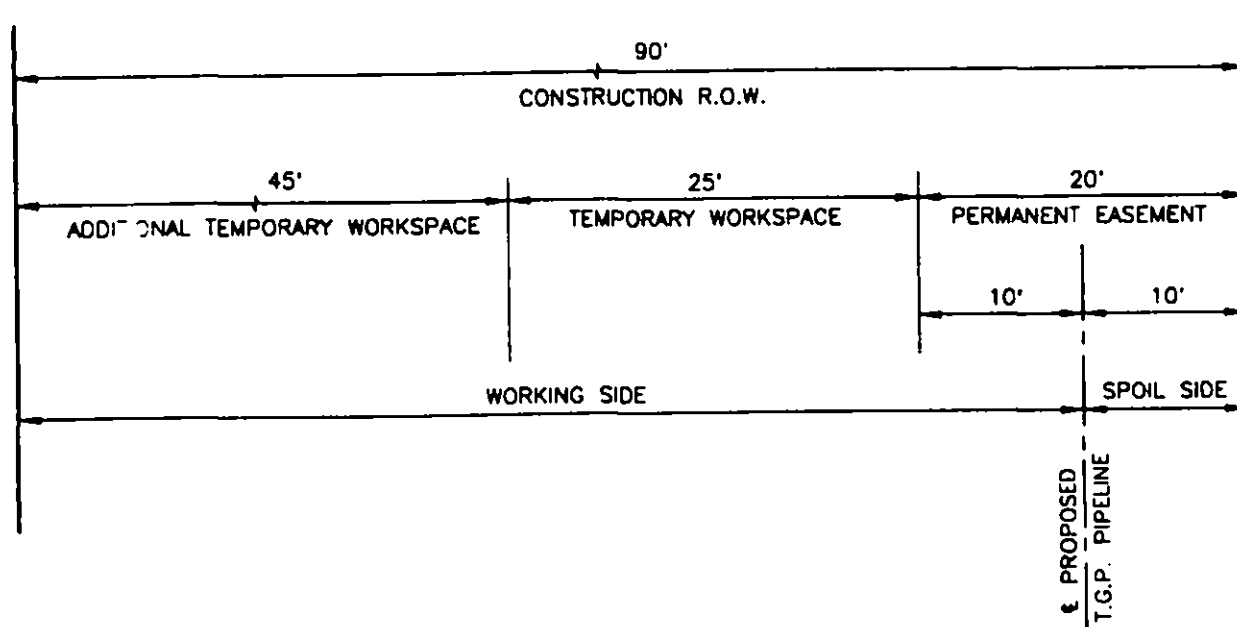
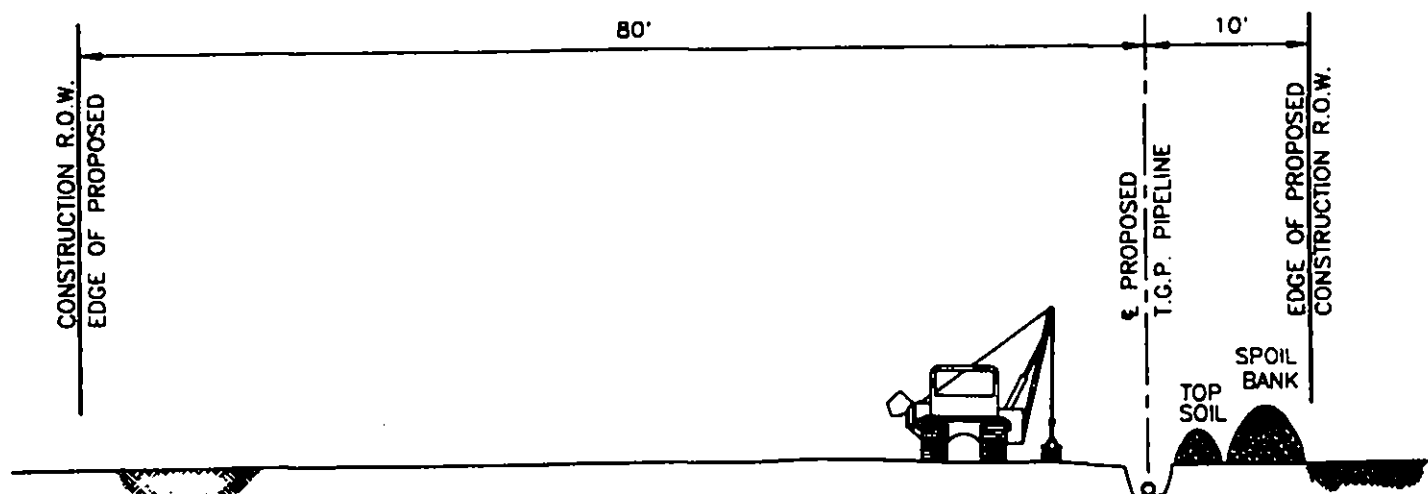
ENG. RECORD		DATE
DRAWN BY:	MTL	10/03
DRAWING APPROVAL		
PROJECT APPROVAL		
SURVEY DATE:		
SCALE: NTS		
PROJECT ID: 062304		
FILE NAME: 03684896		

 Tennessee Gas Pipeline
an E.P.S. company

**PROPOSED 8" TEWKSBURY/ANDOVER LATERAL
TYPICAL ROW CONFIGURATION
ESSEX COUNTY, MASSACHUSETTS**

DWG. NO.	FIGURE-13
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NO	DATE	BY	DESCRIPTION	PROJ. ID	APPR.
			VISIONS		



LOOKING DOWNSTATION

ENG. RECORD		DATE
DRAWN BY:	MTL	10/03
DRAWING APPROVAL		
PROJECT APPROVAL		
SURVEY DATE:		
SCALE: NTS		
PROJECT ID: 082304		
FILE NAME: 03694898		



PROPOSED 8" TEWKSBURY/ANDOVER LATERAL
TYPICAL ROW CONFIGURATION
ESSEX COUNTY, MASSACHUSETTS

DWG.
NO.

FIGURE-14

NO	DATE	BY	DESCRIPTION	PROJ. ID	APPR.
			VISIONS		



Appendix E
Agency Correspondence

**COLER &
COLANTONIO^{LLP}**
ENGINEERS AND SCIENTISTS



UNIVERSITY of MASSACHUSETTS

Environmental Institute
Blaisdell House
310 Hicks Way
Amherst, MA 01003-9280

Archaeological Services

voice: 413.545.1552
fax: 413.577.1458

October 29, 2002

John Zimmer
Coler & Colantonio, Inc.
101 Accord Park Drive, Suite One
Norwell, MA 02061

**RE: Phase 1 Testing of the Tewksbury/Andover Lateral, Tewksbury, Massachusetts.
Preliminary Management Summary – MHC Permit 2213**

Dear John,

Enclosed please find a copy of our management summary, concerning the Phase 1 site intensive (locational) survey for the proposed Tewksbury/Andover Natural Gas Pipeline Lateral, Massachusetts.

The project resulted in the excavation of 134 STPs in ten survey units, which is 58 less than the 192 recommended in the project proposal for 16 survey units. Thus far, nine survey units are considered complete and are not recommended for any additional testing. Four survey units still require testing, but are not yet accessible. The remaining three survey units have yielded Native American artifacts, and may require additional testing, depending upon the exact placement of the pipeline, and the limits of the construction impacts.

It is recommended that any additional testing wait until the exact route of the line has been defined and staked in the field, the size of the temporary and permanent easements determined, and permission obtained to access all necessary properties. If any deviations are required from the line already tested, an additional budget can be quickly arrived at, based on the field information gathered to date.

If you have any questions or comments please contact me at our offices. Thank you for your assistance on this project.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Chris Donta', is written over a horizontal line.

Christopher Donta, Ph.D.
Senior Project Archaeologist

COLER & COLANTONIO INC.

ENGINEERS AND SCIENTISTS

October 7, 2002

Ms. Christine Vaccaro
Natural Heritage and Endangered Species Program
Massachusetts Division of Fisheries and Wildlife
Route 135
Westborough, MA 01581-3337

Re: Threatened & Endangered Species Consultation
Tewksbury - Andover Lateral Project
Tewksbury and Andover, MA

Dear Ms. Vaccaro:

Tennessee Gas Pipeline Company ("Tennessee") is proposing the installation of approximately five miles of small-diameter (six-inch or eight-inch-diameter) natural gas pipeline to service the Wyeth Genetics facility in Andover, MA. The preliminary pipeline route will commence in Tewksbury at a tie-in point with the existing Concord Lateral to the north of Colab Road and extend east along an existing utility right-of-way to minimize alteration of previously undisturbed areas. The alignment extends off the utility easement in the vicinity of Whitegate Road where a horizontal directional drill will be used to install the pipeline under the Shawsheen River and US Route 93. No work is proposed within either the Shawsheen River or the highway right-of-way.

An Environmental Report, required as part of the Federal Energy Regulatory Commission (FERC) 45-Day Prior Notice process, is being prepared for the project. As part of the FERC review, it is necessary to determine whether the project will have an impact on threatened or endangered species or designated critical habitats, jeopardize the continued existence of any proposed endangered or threatened species or will result in destruction or adverse modification of proposed critical habitats. To accomplish this, Coler & Colantonio, Inc. has reviewed the *MA Natural Heritage Atlas* (2000-2001) Wilmington Quadrangle and found that a portion of the proposed alignment is located within designated habitat WH 4014.

On behalf of Tennessee, Coler & Colantonio, Inc. requests that the NHESP review its records and confirm this finding and provide comments and concerns relative to the identified habitat. Enclosed are copies of the completed rare species information form and a USGS topographic quadrangle map with the proposed location of the work labeled. If you have any questions, please do not hesitate to contact me at (281) 675-4541. Thank you for your consideration and assistance.

Sincerely,
Coler & Colantonio, Inc.



Ernest Ladiani, REM
Group Manager
Environmental Sciences & Permitting Division

cc: Brant Johnson, TGP
Matt Griswold, TGP
Patricia Huckery, NHESP

Enclosures

16350 Park Ten Place #151
Houston, Texas 77084

281-398-4400
Fax: 281-398-4405

Rare Species Information Form

Please complete this form to request site-specific information from the Natural Heritage and Endangered Species Program database (Please submit only one project per request).

Requestor Information

Name: Ernest Ladkani

Affiliation: Coler & Colantonio, Inc.

Address: 16350 Park Ten Place # 151

City: Houston

State: TX

Zip Code: 77084

Daytime Phone: 281-675-4541

Project Information

Project or Site Name: Tewksbury - Andover Lateral Project

Town: Tewksbury & Andover

USGS Quad Map: Wilmington

Name of Landowner or Project Proponent: Tennessee Gas Pipeline Company

Description of Proposed Project: (If necessary, attach additional sheet):

See Attached Letter

- ☒ Will this project be reviewed as a Notice of Intent by the local Conservation Commission?
- ☒ Will this project be undergoing review through MEPA?
- ☒ Have you enclosed the required copy of a USGS topographic map in the scale 1:24,000 or 1:25,000 (not copy reduced) with the site location clearly marked and centered on the copy page?

Please mail this completed form and topographic map to:

Environmental Review
Natural Heritage and Endangered Species Program
MA Division of Fisheries and Wildlife
Rte. 135
Westborough, MA 01581

Or fax to: (508) 792-7275
Natural Heritage Program
Attn: Environmental Review

*Questions regarding this form should be directed to (508) 792-7270 ext. 154

Persons requesting information should expect a 4 week turnaround (time varies on amount of requests received per week).
Please do not ask for an expedited review. Requests are processed in the order that they are received.



Division of Fisheries & Wildlife

Wayne F. MacCallum, *Director*

October 17, 2002

Ernest Ladkani
Coler & Colantonio, Inc.
16350 Park Ten Place #151
Houston, TX 77084

RECEIVED OCT 23 2002

Re: Tewksbury-Andover Lateral Project
Tewksbury/Andover, MA
NHESP File: 02-11107

Dear Mr. Ladkani,

Thank you for contacting the Natural Heritage and Endangered Species Program for information regarding state-protected rare species in the vicinity of the site identified above.

At this time we are not aware of any rare plants or animals or exemplary natural communities in the area of this site.

This review concerns only rare species of plants and animals and ecologically significant natural communities for which the Program maintains site-specific records. This review does not rule out the possibility that more common wildlife or vegetation might be adversely affected if this site is developed, especially if it will modify currently undeveloped areas. Should site plans change, or new rare species information become available, this evaluation may be reconsidered.

Please call me at (508)792-7270 x.154 if you have any questions.

Sincerely,

Christine Vaccaro
Environmental Review Assistant



Natural Heritage & Endangered Species Program

Field Headquarters, Westborough, MA 01581 Tel: (508) 792-7270, ext 200 Fax: (508) 792-7821
An Agency of the Department of Fisheries, Wildlife & Environmental Law Enforcement
<http://www.masswildlife.org>

Commonwealth of Massachusetts



Division of Fisheries & Wildlife

Wayne F. MacCallum, *Director*

27 February 2003

Ellen Roy Herzfelder, Secretary
Executive Office of Environmental Affairs
Attention: MEPA Office, Nicholas Zavalas, EOEA No. 12956
251 Causeway St., Suite 900
Boston, Massachusetts 02114

Project Name: Tewksbury-Andover Lateral
Proponent: Tennessee Gas Pipeline Company
Location: Pipeline crosses Interstate 93 in Andover and East Street, Pinnacle Street, and North Street in Tewksbury
Document Reviewed: Environmental Notification Form
NHESP File Number: 02-11107

Dear Secretary Roy Herzfelder,

The Natural Heritage & Endangered Species Program (NHESP) of the MA Division of Fisheries & Wildlife has reviewed the Environmental Notification Form for the proposed Tewksbury-Andover Lateral and would like to offer the following late comments regarding impacts to state-protected rare species.

We wish to correct our written comments of 17 October 2002 to the proponent in which we overlooked the presence of rare wildlife species within Estimated Habitat on the proposed alignment. Based on the information submitted with the ENF, the proposed 5.1 Tewksbury-Andover Lateral natural gas pipeline may "take" state-protected species, particularly rare turtles, under the MA Endangered Species Act (MESA)(G.L. c.131A) and its implementing regulations (321 CMR 10.00). Take, in reference to animals, means to "harass, harm, pursue, hunt, shoot, hound, kill, trap, capture, collect, process, disrupt the nesting, breeding, feeding or migratory activity or attempt to engage in any such conduct, or to assist such conduct, and in reference to plants, means to collect, pick, transplant, cut or process or attempt to engage or to assist in any such conduct." In addition, under the Wetlands Protection Act Regulation (WPA), the proposed project may not meet the performance standard for work within the wetland habitat of rare wildlife (310 CMR 10.59).

Spotted Turtles (*Clemmys guttata*) are documented to occur within Estimated Habitat 4014 (Wetlands 5, 6, 7, 8 and 9). Besides Meadow and Pinnacle Brook, other wetlands of interest are Great Swamp (Wetland 17), Wetland 4 and 21. We recommend that the proponent utilize the attached town list in identifying suitable habitat for rare species within the alignment. Once suitable habitat is identified we recommend field surveys (including radio-telemetry for turtles) based on survey protocols produced by qualified individuals and approved by the NHESP.

The NHESP requests that the rare species survey results and attendant impact analysis are presented in a Draft Environmental Impact Report. Exact locations of rare species should not be presented. The proponent should clearly show how they have avoided, minimized, and mitigated impacts to rare plants and animals to the greatest extent practicable by submitting a Conservation Permit application package according to the guidelines we have provided to them. They should also show how construction would meet the WPA rare species performance standard.

We appreciate the opportunity to comment on this project.

Sincerely,


Patricia Muckery
NHESP Endangered Species Project Analyst



Natural Heritage & Endangered Species Program

Field Headquarters, Westborough, MA 01581 Tel: (508) 792-7270, ext 200 Fax: (508) 792-7821
An Agency of the Department of Fisheries, Wildlife & Environmental Law Enforcement

Copies to:

Tennessee Gas Pipeline Company
Environmental Compliance
Nine Greenway Plaza
Houston, TX 77046

Derrick Standish
DEP Northeast Regional Office
205A Lowell Street
Wilmington, MA 01887

Tewksbury Conservation Commission
DPW Building
999 Whipple Road
Tewksbury, MA 01876

John Zimmer
Coler & Colantonio, Inc.
101 Accord Park Drive
Norwell, MA 02061

Richard Hartley, MDFW

RARE SPECIES SURVEY LIST

<u>Scientific Name</u>	<u>Common Name</u>	<u>Status</u>	<u>Last Observed</u>
Invertebrates			
CRANGONYX ABERRANS	MYSTIC VALLEY AMPHIPOD	SC	1996
LIGUMIA NASUTA	EASTERN PONDMUSSEL	SC	1989
Plants			
PANICUM PHILADELPHICUM	PHILADELPHIA PANIC-GRASS	SC	1990
Vertebrates			
CLEMMYS GUTTATA	SPOTTED TURTLE	SC	1998
TERRAPENE CAROLINA	EASTERN BOX TURTLE	SC	1996
AMBYSTOMA LATERALE	BLUE-SPOTTED SALAMANDER	SC	1994
CLEMMYS INSCULPTA	WOOD TURTLE	SC	1992
EMYDOIDEA BLANDINGII	BLANDING'S TURTLE	T	1993
CISTOTHORUS PLATENSIS	SEDGE WREN	E	1978

E=Endangered

T=Threatened

SC=Special Concern

**COLER &
COLANTONIO ^{LLC}**
ENGINEERS AND SCIENTISTS

October 7, 2002

Mr. Phil Morrison
U.S. Fish and Wildlife Service - New England Field Office
70 Commercial Street Ste. 300
Concord, NH 03301-5087

RE: Threatened & Endangered Species Consultation
Tewksbury - Andover Lateral Project
Tewksbury and Andover, MA

Dear Mr. Morrison:

Tennessee Gas Pipeline Company ("Tennessee") is proposing the installation of approximately five miles of small-diameter (six-inch or eight-inch-diameter) natural gas pipeline to service the Wyeth Genetics facility in Andover, MA. The preliminary pipeline route will commence in Tewksbury at a tie-in point with the existing Concord Lateral to the north of Colab Road and extend east along an existing utility right-of-way to minimize alteration of previously undisturbed areas. The alignment extends off the utility easement in the vicinity of Whitegate Road where a horizontal directional drill will be used to install the pipeline under the Shawshoon River and US Route 93. No work is proposed within either the Shawshoon River or the highway right-of-way.

A 45-day Prior Notice application, required as part of the Federal Energy Regulatory Commission ("FERC") Certificate process, is being prepared for the project. As part of the FERC NEPA review, it is necessary to identify whether the proposed facility will have potentially adverse effects to any sensitive areas as listed below:

- Officially designated wilderness area
- Officially designated wildlife preserve
- Species designated as threatened or endangered or designated critical habitats
- Species proposed for designation as endangered or threatened or proposed designated critical habitats

On behalf of Tennessee, Coler & Colantonio, Inc. requests that the U.S. Fish and Wildlife Service review its records to identify whether the proposed pipeline construction will be located within any of the above referenced areas and provide comments relative to the identified resources. Please find enclosed a USGS topographic quadrangle map with the proposed alignment highlighted. If you have any questions, please do not hesitate to contact me at (281) 675-4541. Thank you for your consideration and assistance.

Sincerely,
Coler & Colantonio, Inc.


Ernest Ladomi, REM
Group Manager
Environmental Sciences & Permitting Division

cc: Brant Johnson, Tennessee
Matt Griswold, Tennessee

Enclosure



RECEIVED NOV 1 8 2002

United States Department of the Interior



FISH AND WILDLIFE SERVICE
New England Field Office
70 Commercial Street, Suite 300
Concord, New Hampshire 03301-5087

RE: Tewksbury-Andover Lateral Project
Tewksbury and Andover, Massachusetts

November 14, 2002

Ernest Ladkani
Coler & Colantonio, Inc.
16350 Park Ten Place #151
Houston, TX 77084

Dear Mr. Ladkani:

This responds to your October 7, 2002 letter requesting information on the presence of federally-listed and proposed endangered or threatened species in relation to the proposed construction of approximately five miles of small-diameter natural gas pipeline originating in Tewksbury and ending in Andover, Massachusetts. Our comments are provided in accordance with Section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531-1543).

Based on information currently available to us, no federally-listed or proposed, threatened or endangered species under the jurisdiction of the U.S. Fish and Wildlife Service are known to occur in the project areas. Preparation of a Biological Assessment or further consultation with us under Section 7 of the Endangered Species Act is not required. Should additional information on listed or proposed species become available, this determination may be reconsidered.

Thank you for your cooperation. Please contact me at 603-223-2541 if we can be of further assistance.

Sincerely yours,

Philip A. Morrison
Fish and Wildlife Biologist
New England Field Office

COLER & COLANTONIO

ENGINEERS AND SCIENTISTS

October 7, 2002

Mr. Richard Hartley
Massachusetts Department of Fisheries and Wildlife and Environmental Law Enforcement
Route 135
Westborough, MA 01581

RE: Fisheries of Concern Consultation
Tewksbury - Andover Lateral Project
Tewksbury and Andover, MA

Dear Mr. Hartley:

Tennessee Gas Pipeline Company ("Tennessee") is proposing the installation of approximately five miles of small-diameter (six-inch or eight-inch-diameter) natural gas pipelines to service the Wych Genetics facility in Andover, MA. The preliminary pipeline route will commence in Tewksbury at a tie-in point with the existing Concord Lateral to the north of Colab Road and extend east along an existing utility right-of-way to minimize utilization of previously undisturbed areas. The alignment extends off the utility easement in the vicinity of Whitgate Road where a horizontal directional drill will be used to install the pipeline under the Shawsheen River and US Route 93. No work is proposed within either the Shawsheen River or the highway right-of-way.

As part of pipeline development, Tennessee will be filing a 45-Day Prior Notice application with the Federal Energy Regulatory Commission ("FERC"). As part of the Environmental report accompanying this application, it is necessary to identify the fishery type of each surface water body that is crossed by the pipeline, including fisheries of special concern.

On behalf of Tennessee, Coler & Colantonio, Inc., requests that the Massachusetts Department of Fisheries and Wildlife conduct a preliminary review of the proposed project. The review will identify the fishery types (coldwater vs. warmwater) of each surface water body crossed and whether there are fisheries of special concern within the project location. Enclosed is a copy of the USGS topographic quadrangle map with the proposed location of the alignment highlighted. If you have any questions or require additional information to complete the review, please do not hesitate to contact me at (281) 675-4541. Thank you for your consideration and assistance.

Sincerely,
Coler & Colantonio, Inc.



Ernest Ladzani, REM
Group Manager
Environmental Sciences & Permitting Division

cc: Brant Johnson, Tennessee
Matt Griswold, Tennessee

Enclosure

16350 Park Ten Place #151
Houston, Texas 77084

281-398-4400
Fax: 281-398-4405



Commonwealth of Massachusetts

Division of Fisheries & Wildlife

MassWildlife

RECEIVED NOV 25 2002

Wayne F. MacCallum, Director

Ernest Ladkani, REM
Coler & Colantonio, Inc.
16350 Park Ten Place #151
Houston, TX 77084

November 14, 2002

Re: Tewksbury - Andover Lateral Project Tewksbury and Andover, MA

Dear Mr. Ladkani:

Thank you for contacting the Fisheries Section of the Division of Fisheries & Wildlife for information on fisheries resources in the above referenced project area. The proposed pipeline appears to cross surface water bodies at 8 locations: The Shawsheen River, Pinnacle Brook, Meadow Brook, two unnamed tributaries to Strong Water Brook, and three unnamed tributaries to Great Swamp. Fisheries surveys of the Shawsheen River have yielded 18 species: white sucker (*Catostomus commersoni*), creek chubsucker (*Erimyzon oblongus*), American eel (*Anguilla rostrata*), brown bullhead (*Ameiurus nebulosus*), fallfish (*Semotilus corporalis*), redbfin pickerel (*Esox americanus americanus*), pumpkinseed (*Lepomis gibbosus*), golden shiner (*Notemigonus crysoleucas*), chain pickerel (*Esox niger*), bluegill (*Lepomis macrochirus*), bridge shiner (*Notropis bifrenatus*), banded sunfish (*Enneacanthus obesus*), largemouth bass (*Micropterus salmoides*), redbreast sunfish (*Lepomis auritus*), swamp darter (*Etheostoma fusiforme*), tessellated darter (*Etheostoma olmstedti*), sea lamprey (*Petromyzon marinus*) and yellow bullhead (*Ameiurus natalis*). Additionally, the Shawsheen River is stocked annually with trout. Due to the status of the bridge shiner in Massachusetts (listed as Special Concern), you will have to contact the Natural Heritage and Endangered Species Program at this same address before proceeding with the proposed project. We have no fisheries information for the remainder of the waters proposed for crossings.

Because the Shawsheen River supports trout, and the status of the remaining waters is unknown, we request that any work, which may impact the bank, bordering vegetated wetlands or in-stream resource, take place during low flow periods (June 1st through September 30th). For all phases of construction, best management practices for erosion and sedimentation control should also be adhered to, thereby minimizing potential impacts to the resource. Additionally, at no time should cement laden water be allowed to enter the river nor should refueling of equipment take place where a spill could reach surface waters as either scenario could result in a fish kill. If the project results in the alteration of a streambed, we request that the existing grade be maintained so as not to impede upstream fish movement.

www.masswildlife.org

Division of Fisheries and Wildlife

Field Headquarters, One Rabbit Hill Road, Westborough, MA 01581 (508) 792-7270 Fax (508) 792-7275

An Agency of the Department of Fisheries, Wildlife & Environmental Law Enforcement

Should you have any questions or require further information, please do not hesitate to contact me directly at (508) 792-7270 ext. 132.

Sincerely,

A handwritten signature in dark ink, appearing to read 'R. A. Hartley', written over the printed name.

Richard A. Hartley
Aquatic Biologist

Cc. Charles Bell, MDFW Northeast District Supervisor
Patricia Huckery, MDFW NHESP

**COLER &
COLANTONIO** U
ENGINEERS AND SCIENTISTS

October 7, 2002

Massachusetts Dept. of Environmental Management
Blackstone Heritage State Park
Attention: Andy Backman
271 Oak Street
Uxbridge, MA 01569

RE: Environmental Resource Consultation
Tewksbury - Andover Lateral Project
Tewksbury and Andover, MA

Dear Mr. Backman:

Tennessee Gas Pipeline Company ("Tennessee") is proposing the installation of approximately five miles of small-diameter (six-inch or eight-inch-diameter) natural gas pipeline to service the Wyeth Genetics facility in Andover, MA. The preliminary pipeline route will commence in Tewksbury at a tie-in point with the existing Concord Lateral to the north of Colab Road and extend east along an existing utility right-of-way to minimize alteration of previously undisturbed areas. The alignment extends off the utility easement in the vicinity of Whitgate Road where a horizontal directional drill will be used to install the pipeline under the Shawsheen River and US Route 93. No work is proposed within either the Shawsheen River or the highway right-of-way.

A 45-day Prior Notice application, required as part of the Federal Energy Regulatory Commission ("FERC") Certification process, is being prepared for the project. To complete the Environmental Report accompanying this application, it is necessary to identify any state designated wild and scenic rivers and/or state forests that will potentially be impacted by the project. All natural, recreational, or scenic areas, natural landmarks visually sensitive areas and land administered by state, local and private conservation organizations must be identified to be crossed or within 0.25 miles of the project must also be identified.

On behalf of Tennessee, Coler & Colantonio, Inc. requests that the Massachusetts Dept. of Environmental Management review its records to identify whether the proposed pipeline construction will be located within or adjacent to any of the above referenced areas and provide written comments relative to the identified resources. Please review the enclosed USGS topographic quadrangle map with the proposed location of the alignment highlighted labeled. If you have any questions or require additional information to complete your review, please do not hesitate to contact me at (281) 675-4541. Thank you for your consideration and assistance.

Sincerely,
Coler & Colantonio, Inc.


Ernest Ladkani, REM
Group Manager
Environmental Sciences & Permitting Division

cc: Bram Johnson, Tennessee
Matt Griswold, Tennessee

Enclosures

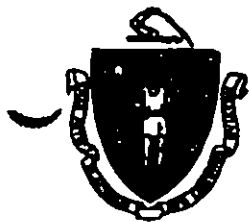
16350 Park Ten Place #151
Houston, Texas 77084

281-398-4400
Fax: 281-398-4405

11/19/2002 12:26

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PAGE 82



COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

251 CAUSEWAY STREET, SUITE 600-700
BOSTON, MA 02114-2104
PHONE: 617-626-1250 FAX: 617-626-1449
www.state.ma.us/dem/



November 20, 2002

Jane Swift
GOVERNOR

Bob Durand
SECRETARY

Peter C. Webber
COMMISSIONER

Ernest Ladkani
Coker & Colantonio, Inc.
16358 Park Ten Place #151
Houston, Texas 77084

Dear Mr. Ladkani:

The Department of Environmental Management has reviewed the materials we received regarding the Tennessee Gas Pipeline Tewksbury - Andover Lateral Project. The project will not adversely impact any state forests nor any designated wild and scenic rivers. Your company may want to contact the Massachusetts Watershed Initiative team leader for the Shawsheen River (William.J.Dunn@state.ma.us) for comments related to the lateral drilling.

Sincerely,

Andy Backman
Regional Planner

COLER & COLANTONIO ^{LLC}

ENGINEERS AND SCIENTISTS

October 7, 2002

Ms. Mary Jo Fencrbach
U.S. Environmental Protection Agency
Region 1, Massachusetts State Program Unit
CMA 1 Congress Street Ste. 1100
Boston, MA 02114

RE: Designated Sole-Source Aquifer Consultation
Tewksbury - Andover Lateral Project
Tewksbury and Andover, MA

Dear Ms. Fencrbach:

Tennessee Gas Pipeline Company ("Tennessee") is proposing the installation of approximately five miles of small-diameter (six-inch or eight-inch-diameter) natural gas pipeline to service the Wyeth Genetics facility in Andover, MA. The preliminary pipeline route will commence in Tewksbury at a tie-in point with the existing Concord Lateral to the north of Colab Road and extend east along an existing utility right-of-way to minimize alteration of previously undisturbed areas. The alignment extends off the utility easement in the vicinity of Whitegate Road where a horizontal directional drill will be used to install the pipeline under the Shawsheen River and US Route 93. No work is proposed within either the Shawsheen River or the highway right-of-way.

Tennessee will be filing a 45-Day Prior Notice application with the Federal Energy Regulatory Commission ("FERC"). As required by the FERC review guidelines, it is necessary to identify all U. S. Environmental Protection Agency ("EPA") designated aquifers that will be affected by the proposed work.

On behalf of Tennessee, Coler & Colantonio, Inc. requests that the EPA New England Water Management Division conduct a review of the proposed project to determine if the project will affect any EPA designated aquifers. Please find enclosed a USGS topographic quadrangle map with the proposed location of the alignment highlighted. If you have any questions or require additional information to complete the review, please do not hesitate to contact me at (281) 675-4541. Thank you for your consideration and assistance.

Sincerely,
Coler & Colantonio, Inc.


Ernest Ladkani, REM
Group Manager
Environmental Sciences & Permitting Division

cc: Brant Johnson, Tennessee
Matt Griswold, Tennessee

Enclosure

16350 Park Ten Place #151
Houston, Texas 77084

281-398-4400
Fax: 281-398-4406



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
1 CONGRESS STREET, SUITE 1100
BOSTON, MASSACHUSETTS 02114-2023

RECEIVED OCT 25 2002

October 21, 2002

Mr. Ernest Ladkani
Coler and Colantonio, Inc.
16350 Park Ten Place
Suite 151
Houston, TX 77084

Dear Mr. Ladkani:

I received your October 7, 2002 letter requesting U.S. Environmental Protection Agency (EPA) to determine whether the proposed Tennessee Gas Pipeline Company installation of approximately five miles of pipeline to serve the Wyeth Genetics facility in Andover, MA will occur within the boundaries of an EPA designated Sole Source Aquifer. I reviewed the project location and determined that the project would not occur within the boundaries of any EPA designated Sole Source Aquifer. Additional information about Sole Source Aquifers in New England is available at EPA's New England Office website:
http://www.epa.gov/region01/eco/drinkwater/pc/solcsource_aquifer.html.

I hope that this information is helpful. Please contact me at (617)918-1578 if you have further questions.

Sincerely,

A handwritten signature in cursive script, reading "MaryJo M. Fenebach", is written over the typed name.

MaryJo M. Fenebach
EPA Drinking Water Source Protection Program

COLER & COLANTONIO ⁰²

ENGINEERS AND SCIENTISTS

October 7, 2002

Mr. David Clark
U. S. National Park Service
15 State Street
Boston, MA 02109

RE: Environmental Consultation
Tewksbury - Andover Lateral Project
Tewksbury and Andover, MA

Dear Mr. Clark:

Tennessee Gas Pipeline Company ("Tennessee") is proposing the installation of approximately five miles of small-diameter (six-inch or eight-inch-diameter) natural gas pipeline to service the Wyeth Genetics facility in Andover, MA. The preliminary pipeline route will commence in Tewksbury at a tie-in point with the existing Concord Lateral to the north of Colab Road and extend east along an existing utility right-of-way to minimize alteration of previously undisturbed areas. The alignment extends off the utility easement in the vicinity of Whitgate Road where a horizontal directional drill will be used to install the pipeline under the Shawshoan River and US Route 93. No work is proposed within either the Shawshoan River or the highway right-of-way.

A 45-day Prior Notice application is being prepared for the project as part of the Federal Energy Regulatory Commission ("FERC") Certificate process. One component of the FERC review process, as required by the National Environmental Policy Act ("NEPA"), is to identify any federally designated wild and scenic rivers that will potentially be affected by the project. In addition, all land administered by federal agencies, natural, recreational, or scenic areas, natural landmarks and visually sensitive areas to be crossed by the project must be identified.

On behalf of Tennessee, Coler & Colantonio, Inc. requests that the U. S. National Park Service review its records to identify whether the proposed pipeline construction will directly cross or be located within 0.25 miles any of the above referenced areas and provide written comments relative to the identified resources. Please find enclosed a USGS topographic quadrangle map with the proposed location of the work labeled to assist in this review. If you have any questions or need additional information, please do not hesitate to contact me at (81) 675-4541. Thank you for your consideration and assistance.

Sincerely,
Coler & Colantonio, Inc.



Ernest Ladkani, REM
Project Manager
Environmental Sciences & Permitting Division

cc: Bram Johnson, TGP
Matt Griswold, TGP

Enclosure

COLER & COLANTONIO & ENGINEERS AND SCIENTISTS

PHONE LOG

I called	<input checked="" type="checkbox"/>	Date:	11/19/02						
I returned call	<input type="checkbox"/>		S	M	<input checked="" type="checkbox"/>	W	T	F	S
Client called	<input type="checkbox"/>	Time:	AM <input type="checkbox"/>						
Client returned call	<input type="checkbox"/>		1:55 PM <input checked="" type="checkbox"/>						

Phone conversation between

<u>Lena Chadwick</u> of Coler & Colantonio, Inc.	and <u>Dave Clark</u> Title:
Regarding:	Company: <u>US National Park Service</u>
<u>Andover/Townshury Federal</u>	Address <u>15 State St</u>
<u>Follow-up phone call.</u>	City/State/Zip <u>Boston MA 02109</u>
	Office Phone: <u>617-223-5131</u>
	Office Fax:
	Home Phone:

The proposed project is not within a designated wilderness area & will not affect a designated wilderness area under the jurisdiction of NPS.

Additionally, he questioned this is a FERC + SHPO matter.

Copies to:

file

Signed:

Lena Chadwick

COLER & COLANTONIO ^{INC.}

ENGINEERS AND SCIENTISTS

October 7, 2002

Massachusetts Dept. of Environmental Management
Attention: Jennifer Howard
136 Damon Road
Northampton, MA 01060

RE: Environmental Resource Consultation
Tewksbury - Andover Lateral Project
Tewksbury and Andover, MA

Dear Ms. Howard:

Tennessee Gas Pipeline Company ("Tennessee") is proposing the installation of approximately five miles of small-diameter (six-inch or eight-inch-diameter) natural gas pipeline to service the Wyeth Genetics facility in Andover, MA. The preliminary pipeline route will commence in Tewksbury at a tie-in point with the existing Concord Lateral to the north of Colab Road and extend east along an existing utility right-of-way to minimize alteration of previously undisturbed areas. The alignment extends off the utility easement in the vicinity of Whitegate Road where a horizontal directional drill will be used to install the pipeline under the Shawsheen River and US Route 93. No work is proposed within either the Shawsheen River or the highway right-of-way.

A 45-day Prior Notice application, required as part of the Federal Energy Regulatory Commission ("FERC") Certification process, is being prepared for the project. To complete the Environmental Report accompanying this application, it is necessary to identify any state designated wild and scenic rivers and/or state forests that will potentially be impacted by the project. All natural, recreational, or scenic areas, natural landmarks visually sensitive areas and land administered by state, local and private conservation organizations must be identified to be crossed or within 0.25 miles of the project must also be identified.

On behalf of Tennessee, Coler & Colantonio, Inc. requests that the Massachusetts Dept. of Environmental Management review its records to identify whether the proposed pipeline construction will be located within or adjacent to any of the above referenced areas and provide written comments relative to the identified resources. Please review the enclosed USGS topographic quadrangle map with the proposed location of the alignment highlighted labeled. If you have any questions or require additional information to complete your review, please do not hesitate to contact me at (281) 675-4541. Thank you for your consideration and assistance.

Sincerely,
Coler & Colantonio, Inc.



Ernest Ladkani, REM
Group Manager
Environmental Sciences & Permitting Division

cc: Brant Johnson, Tennessee
Matt Griswold, Tennessee

Enclosures

COLER & COLANTONIO & ENGINEERS AND SCIENTISTS

PHONE LOG

I called		Date:	12/06/02						
I returned call			S	M	T	W	T	X	S
Client called	X	Time:	10:30 AM						
Client returned call			PM						

Phone conversation between:

Melissa Dettling of Coler & Colantonio, Inc.	And Title:	Jennifer Howard
Regarding:	Company:	MA DEM
Tewksbury-Andover Lateral Project	Address:	136 Damon Road
Consultation Response	City/State/Zip:	Northampton, MA 01060
	Office Phone:	(413)586-8706 ext. 18
	Office Fax:	
	Home Phone:	

Ms. Howard is in agreement with the "No Impact" letter received from Andy Bacman, MA DEM
She will make no further comment.

Copies to: file

Signed: Melissa Dettling

COLER & COLANTONIO INC.

ENGINEERS AND SCIENTISTS

October 7, 2002

Commission on Indian Affairs
Attn: Jim Peters
One Congress Street, 10th Floor
Boston, MA 02114

RE: Native American Resource Consultation
Tennessee Gas Pipeline Lateral Project
Tewksbury and Andover, MA

Dear Mr. Peters:

Tennessee Gas Pipeline Company ("Tennessee") is proposing the installation of approximately five miles of small-diameter (six-inch or eight-inch-diameter) natural gas pipeline to service the Wyeth Genetics facility in Andover, MA. The preliminary pipeline route will commence in Tewksbury at a tie-in point with the existing Concord Lateral to the north of Coleb Road and extend east along an existing utility right-of-way to minimize alteration of previously undisturbed areas. The alignment extends off the utility easement in the vicinity of Whitegate Road where a horizontal directional drill will be used to install the pipeline under the Shawshcen River and US Route 9. No work is proposed within either the Shawshcen River or the highway right-of-way.

As part of project development, Tennessee will be filing a 45-Day Prior Notice with the Federal Energy Regulatory Commission ("FERC"). As part of the cultural resources review, a determination on whether the project will have an impact on traditional Native American properties is necessary.

On behalf of Tennessee, Coler & Colantonio, Inc. requests that the Commission on Indian Affairs review its records to identify any of the above referenced areas that will be affected by the additional facilities. Enclosed are copies of the USGS topographic quadrangle maps with the proposed location of the work highlighted. If you have any questions, please do not hesitate to contact me at (281) 675-4541. Thank you for your consideration and assistance.

Sincerely,
Coler & Colantonio, Inc.


Ernest Lachani, REM
Group Manager
Environmental Sciences & Permitting Division

cc: Brent Johnson, Tennessee
Matt Griswold, Tennessee

Enclosure

COLER & COLANTONIO

ENGINEERS AND SCIENTISTS

PHONE LOG

I called	<input checked="" type="checkbox"/>	Date:	11/19/02						
I returned call	<input type="checkbox"/>		S	M	T	W	T	F	S
Client called	<input type="checkbox"/>	Time:	AM <input type="checkbox"/>						
Client returned call	<input type="checkbox"/>		1:50 PM <input checked="" type="checkbox"/>						

Phone conversation between

<u>Rena Chadwick</u>	and <u>Jim Peters</u>
of Coler & Colantonio, Inc.	Title:
Regarding:	Company: <u>Commission on Indian Affairs</u>
<u>Tauksburg - Andrew Lateral</u>	Address: <u>Congress St 10th Floor</u>
	City/State/Zip: <u>Boston, MA 02114</u>
	Office Phone: <u>617-727-6394</u>
	Office Fax:
	Home Phone:

I spoke with Jim Peters. He indicated that the project was unlikely to impact areas under their jurisdiction. He also indicated a letter had already been sent to that effect.

Copies to:

Signed:

Rena Chadwick

COLER & COLANTONIO ^{LLC}

ENGINEERS AND SCIENTISTS

October 7, 2002

Steve Colyer, Director
Andover Planning Division
Town Offices
36 Bartlet Street
Andover, MA 01810

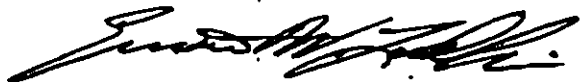
RE: Andover, MA Proposed Developments Consultation
Tewksbury - Andover Lateral Project
Tewksbury and Andover, MA

Dear Mr. Colyer:

Tennessee Gas Pipeline Company ("Tennessee") is proposing the installation of approximately five miles of small-diameter (six-inch or eight-inch-diameter) natural gas pipeline to service the Wyeth Genetics facility in Andover, MA. The preliminary pipeline route will commence in Tewksbury at a tie-in point with the existing Concord Lateral to the north of Colab Road and extend east along an existing utility right-of-way to minimize alteration of previously undisturbed areas. The alignment extends off the utility easement in the vicinity of Whitegate Road where a horizontal directional drill will be used to install the pipeline under the Shawsheen River and US Route 93. No work is proposed within either the Shawsheen River or the highway right-of-way.

On behalf of Tennessee, Coler & Colantonio, Inc. requests that the Andover Planning Division review the proposed pipeline alignment and identify all planned residential or commercial/business developments and subdivisions crossed or within 0.25 miles of the route. Any additional information such as permit status and planned construction start dates for these developments would be appreciated to allow for coordination and avoidance of potential impacts. Enclosed is a USGS topographic quadrangle map with the proposed pipeline alignment highlighted. If you have any questions or require any additional information, please do not hesitate to contact me at (281) 675-4541. Thank you for your consideration and assistance.

Sincerely,
Coler & Colantonio, Inc.



Ernest Ladicari, REM
Group Manager
Environmental Sciences & Permitting Division

cc: Brant Johnson, TGP
Matt Griswold, Tennessee

Enclosures



TOWN OF ANDOVER MASSACHUSETTS

Town Offices
36 Bartlet Street
Andover, MA 01810
(978) 623-8200
www.town.andover.ma.us

November 4, 2002

Ernest Ladkani, REM, Group Manager
Environmental Sciences & Permitting Division
Coler & Colantonio, Inc.
16350 Park Ten Place #151
Houston, TX 77084

Re: Andover, MA, Proposed Developments
Tewksbury-Andover Lateral Project

Dear Mr. Ladkani:

I am in receipt of your letter dated October 7, 2002 in which you request information on any proposed developments along the route of a proposed natural gas pipeline to serve the Wyeth Biopharma facility on Burt Road in Andover. Please forgive my late response.

According to the map that accompanied your letter it appears that the pipeline route would traverse a tract of land lying between the Shawsheen River and Interstate Highway I-93, west of the Wyeth facility. That particular tract of land is owned by an entity called "JW South Street RT." It is my understanding that the land is under agreement with a development firm, and that some type of commercial development in the form of buildings and parking areas may be proposed in the future. At this point the scope of development is in a very preliminary conceptual stage, and has not evolved to the point of determining where actual building locations and paved areas would be located. The JT South Street land is the only Andover property affected by the route.

Please feel free to contact me at (978) 623-8310 if you need additional information.

Very truly yours,

A handwritten signature in dark ink, appearing to read "Stephen Colyer", followed by a horizontal line.

Stephen Colyer, AICP
Director of Planning

SC:TENNECO1

COLER & COLANTONIO ^U/₂

ENGINEERS AND SCIENTISTS

October 7, 2002

Steven Sadwick, Director
Tewksbury Planning Board
Department of Community Development
999 Whipple Road
Tewksbury, MA 01876

RE:

Tewksbury - Andover Lateral Project
Tewksbury and Andover, MA

Dear Mr. Sadwick:

Tennessee Gas Pipeline Company ("Tennessee") is proposing the installation of approximately five miles of small-diameter (six-inch or eight-inch-diameter) natural gas pipeline to service the Wyeth Genetics facility in Andover, MA. The preliminary pipeline route will commence in Tewksbury at a tie-in point with the existing Concord Lateral to the north of Colab Road and extend east along an existing utility right-of-way to minimize alteration of previously undisturbed areas. The alignment extends off the utility easement in the vicinity of Whitegate Road where a horizontal directional drill will be used to install the pipeline under the Shawsheen River and US Route 93. No work is proposed within either the Shawsheen River or the highway right-of-way.

On behalf of Tennessee, Coler & Colantonio, Inc. requests that the Tewksbury Planning Board review the proposed pipeline alignment and identify all planned residential or commercial/business developments and subdivisions crossed or within 0.25 miles of the route. Any additional information such as permit status and planned construction start dates for these developments would be appreciated to allow for coordination and avoidance of potential impacts. Enclosed is a USGS topographic quadrangle map with the proposed pipeline alignment highlighted. If you have any questions or require any additional information, please do not hesitate to contact me at (281) 675-4541. Thank you for your consideration and assistance.

Sincerely,
Coler & Colantonio, Inc.



Ernest Laskani, REM
Group Manager
Environmental Sciences & Permitting Division

cc: Brant Johnson, TGP
Matt Griswold, TGP

Enclosure

33 FAX
59 FAX 781 982 5490

COLER & COLANTONIO

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ING AND CONSERVATION

FAX NO. : 919786484365

Nov. 25 2002 01:49PM P2



TOWN OF TEWKSBURY

999 WHIFFLE RD
TEWKSBURY, MASSACHUSETTS 01876

DEPARTMENT OF COMMUNITY DEVELOPMENT

STEVEN J. SADWICK, AICP
DIRECTOR

RECEIVED NOV 25 2002

(978) 644-4370
FAX (978) 644-4363

November 25, 2002

Mr. Ernest Ladkani, REM
Coler & Colantonio, Inc.
16350 Park Ten Place #151
Houston, Texas 77084

Dear Mr. Ladkani,

This correspondence is a follow-up to your request for information dated October 7, 2002 regarding the Tewksbury- Andover Line.

Please note that the line as currently proposed is in the vicinity of a number of utility/ railroad easements as well as wetland areas and publicly owned open space. Projects that fall within the 1/4 mile radius include a proposed warehouse expansion on East Street totaling approximately 280,000 square feet. This expansion proposal has been before the Planning Board since July 2002 and should reach its conclusion within the next month or two. There is also a proposed affordable housing project totaling 20 units on Livingston Street. This project's permitting process will begin in December 2002.

Finally, there is a senior living community that will begin construction shortly. This project will consist of 180 independent living units and 96 assisted living units. This project is located on Assessor's Map 48/ Lot 79.

Should you have any questions, please do not hesitate to contact me at 978-640-4370.

Sincerely,


Steven J. Sadwick
Director



Appendix F
FERC Plan and Procedures

**COLER &
COLANTONIO[®]**
ENGINEERS AND SCIENTISTS

**UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION**

**NOTICE OF AVAILABILITY
OF THE REVISED
UPLAND EROSION CONTROL, REVEGETATION AND MAINTENANCE PLAN
AND THE WETLAND AND WATERBODY CONSTRUCTION
AND MITIGATION PROCEDURES**

(January 17 , 2003)

The Office of Energy Projects (OEP) staff has revised the Upland Erosion Control, Revegetation and Maintenance Plan (Plan) and the Wetland and Waterbody Construction and Mitigation Procedures (Procedures) referred to at 18 CFR 157.206(b)(3)(iv) of the Commission's regulations. The effective date of the revised Plan and Procedures is January 17, 2003.

The staff's Plan and Procedures were last updated December 2, 1994. The latest revisions incorporate comments gathered over the past 12 months from the natural gas pipeline industry, public, and other agencies. Many of the changes better address regional issues by making some measures clearer or more specific and by converting others into performance-based measures. Other modifications provide necessary updates to reflect current laws and regulations. These 2003 versions replace the 1994 versions of the Plan and Procedures.

The revised Plan and Procedures are available on our website at <http://www.ferc.gov/gas/environment/guidelines.htm>.

**Magalie R. Salas
Secretary**

**UPLAND EROSION CONTROL, REVEGETATION, AND
MAINTENANCE PLAN**

01/17/2003 VERSION

**UPLAND EROSION CONTROL, REVEGETATION, AND
MAINTENANCE PLAN**

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**UPLAND EROSION CONTROL, REVEGETATION,
AND MAINTENANCE PLAN (PLAN)**

I. APPLICABILITY

- A. The intent of this Plan is to assist applicants by identifying baseline mitigation measures for minimizing erosion and enhancing revegetation. The project sponsors should specify in their applications for a FERC Certificate (Certificate) any individual measures in this Plan they consider unnecessary, technically infeasible, or unsuitable due to local conditions and to fully describe any alternative measures they would use. Applicants should also explain how those alternative measures would achieve a comparable level of mitigation.

Once a project is certificated, further changes can be approved. Any such changes from the measures in this Plan (or the applicant's approved plan) will be approved by the Director of the Office of Energy Projects (Director), upon the applicant's written request, if the Director agrees that an alternative measure:

1. provides equal or better environmental protection;
2. is necessary because a portion of this Plan is infeasible or unworkable based on project-specific conditions; or
3. is specifically required in writing by another Federal, state, or Native American land management agency for the portion of the project on its land or under its jurisdiction.

Any requirements in this Plan to file material with the Secretary of the FERC (Secretary) do not apply to projects undertaken under the provisions of the blanket certificate program. This exemption does not apply to a request for alternative measures.

Project-related impacts on wetland and waterbody systems are addressed in the staff's Wetland and Waterbody Construction and Mitigation Procedures (Procedures).

II. SUPERVISION AND INSPECTION

A. ENVIRONMENTAL INSPECTION

1. At least one Environmental Inspector is required for each construction spread during construction and restoration (as defined by section V). The number and experience of Environmental Inspectors assigned to each construction spread should be appropriate for the length of the construction spread and the number/significance of resources affected.
2. Environmental Inspectors shall have peer status with all other activity inspectors.
3. Environmental Inspectors shall have the authority to stop activities that violate the environmental conditions of the Certificate, state and Federal environmental permit conditions, or landowner requirements; and to order appropriate corrective action.

B. RESPONSIBILITIES OF ENVIRONMENTAL INSPECTORS

At a minimum, the Environmental Inspector(s) shall be responsible for:

1. Ensuring compliance with the requirements of this Plan, the Procedures, the environmental conditions of the Certificate authorization, the mitigation measures proposed by the applicant (as approved and/or modified by the Certificate), other 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 soil stabilization needs in all areas;
6. Ensuring that the location of dewatering structures and slope breakers will not direct water into known cultural resources sites or locations of sensitive species;
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 and the design of the discharge shall be changed to prevent reoccurrence;
8. Ensuring that subsoil and topsoil are tested in agricultural and residential areas to measure compaction and determine the need for corrective action;
9. Advising the Chief Construction 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, as necessary to prevent sediment flow into wetlands, waterbodies, sensitive areas, and onto roads;
13. Inspecting and ensuring the maintenance of 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. Keeping records of compliance with the environmental conditions of the FERC certificate, and the mitigation measures proposed by the project sponsor in the application submitted to the FERC, and other Federal or state environmental permits during active construction and restoration; and
16. Identifying areas that should be given special attention to ensure stabilization and restoration after the construction phase.

III. PRECONSTRUCTION PLANNING

The project sponsor shall do the following before construction:

A. CONSTRUCTION WORK AREAS

1. Identify all construction work areas (e.g., construction right-of-way, extra work space areas, pipe storage and contractor yards, borrow and disposal areas, access roads, etc.) that would be needed for safe construction. The project sponsor must ensure that appropriate cultural resources and biological surveys have been conducted.
2. Project sponsors are encouraged to consider expanding any required cultural resources and endangered species surveys in anticipation of the need for activities outside of certificated work areas.

B. DRAIN TILE AND IRRIGATION SYSTEMS

1. Attempt to locate existing drain tiles and irrigation systems.
2. Contact landowners and local soil conservation authorities to determine the locations of future drain tiles that are likely to be installed within 3 years of the authorized construction.
3. Develop procedures for constructing through drain-tiled areas, maintaining irrigation systems during construction, and repairing drain tiles and irrigation systems after construction.

4. Engage qualified drain tile specialists, as needed to conduct or monitor repairs to drain tile systems affected by construction. Use drain tile specialists from the project area, if available.

C. GRAZING DEFERMENT

Develop grazing deferment plans with willing landowners, grazing permittees, and land management agencies to minimize grazing disturbance of revegetation efforts.

D. ROAD CROSSINGS AND ACCESS POINTS

Plan for safe and accessible conditions at all roadway crossings and access points during construction and restoration.

E. DISPOSAL PLANNING

Determine methods and locations for the disposal of construction debris (e.g., timber, slash, mats, garbage, drilling fluids, excess rock, etc). Off-site disposal in other than commercially operated disposal locations is subject to compliance with all applicable survey, landowner permission, and mitigation requirements.

F. AGENCY COORDINATION

The project sponsor must coordinate with the appropriate local, state, and Federal agencies as outlined in this Plan and in the Certificate.

1. Obtain written recommendations from the local soil conservation authorities or land management agencies regarding permanent erosion control and revegetation specifications.
2. Develop specific procedures in coordination with the appropriate agency to prevent the introduction or spread of noxious weeds and soil pests resulting from construction and restoration activities.

G. STORMWATER POLLUTION PREVENTION PLAN

Make available on each construction spread the Stormwater Pollution Prevention Plan prepared for compliance with the U.S. Environmental Protection Agency's National Stormwater Program General Permit requirements.

IV. INSTALLATION

A. APPROVED AREAS OF DISTURBANCE

1. Project-related ground disturbance shall be limited to the construction right-of-way, extra work space areas, pipe storage yards, borrow and disposal areas, access roads, and other areas approved in the Certificate. Any project-related ground disturbing activities outside these Certificated areas, except those needed to comply with the Plan and Procedures (e.g., slope breakers, energy-dissipating devices, dewatering structures, drain tile system repairs) will require prior Director approval. All construction or restoration activities outside of the Certificated areas are subject to all applicable survey and mitigation requirements.
2. The construction right-of-way width for a project shall not exceed 75 feet or that described in the FERC application unless otherwise modified by a Certificate condition. However, in limited, non-wetland areas, this construction right-of-way width may be expanded by up to 25 feet without Director approval to accommodate full construction right-of-way topsoil segregation and to ensure safe construction where topographic conditions (such as side-slopes) or soil limitations require it. Twenty-five feet of extra construction right-of-way width may also be used in limited, non-wetland or non-forested areas for truck turn-arounds where no reasonable alternative access exists.

Project use of these additional limited areas is subject to landowner approval and compliance with all applicable survey and mitigation requirements. When such additional areas are used, each one should be identified and the need explained in the weekly or biweekly construction reports to the FERC, if required. The following material should be included in the reports:

- a. the location of each additional area by station number and reference to a previously filed alignment sheet, or updated alignment sheets showing the additional areas;
- b. identification of where the Commission's records contain evidence that the additional areas were previously surveyed; and

- c. a statement that landowner approval has been obtained and is available in project files.

Prior written approval of the Director is required when the Certificated construction right-of-way width would be expanded by more than 25 feet.

B. TOPSOIL SEGREGATION

1. Unless the landowner or land management agency specifically approves otherwise, prevent the mixing of topsoil with subsoil by stripping topsoil from either the full work area or from the trench and subsoil storage area (ditch plus spoil side method) in:
 - a. actively cultivated or rotated croplands and pastures;
 - b. residential areas;
 - c. hayfields; and
 - d. other areas at the landowner's or land managing agency's request.
2. In residential areas importation of topsoil is an acceptable alternative to topsoil segregation.
3. In deep soils (more than 12 inches of topsoil), segregate at least 12 inches of topsoil. In soils with less than 12 inches of topsoil make every effort to segregate the entire topsoil layer.
4. Where topsoil segregation is required, maintain separation of salvaged topsoil and subsoil throughout all construction activities.
5. Segregated topsoil may not be used for padding the pipe.

C. DRAIN TILES

1. Mark locations of drain tiles damaged during construction.
2. Probe all drainage tile systems within the area of disturbance to check for damage.

3. Repair damaged drain tiles to their original or better condition. Do not use filter-covered drain tiles unless the local soil conservation authorities and the landowner agree. Use qualified specialists for testing and repairs.
4. For new pipelines in areas where drain tiles exist or are planned, ensure that the depth of cover over the pipeline is sufficient to avoid interference with drain tile systems. For adjacent pipeline loops in agricultural areas, install the new pipeline with at least the same depth of cover as the existing pipeline(s).

D. IRRIGATION

Maintain water flow in crop irrigation systems, unless shutoff is coordinated with affected parties.

E. ROAD CROSSINGS AND ACCESS POINTS

1. Maintain safe and accessible conditions at all road crossings and access points during construction.
2. If crushed stone access pads are used in residential or active agricultural areas, place the stone on synthetic fabric to facilitate removal.

F. TEMPORARY EROSION CONTROL

Install temporary erosion controls immediately after initial disturbance of the soil. Temporary erosion controls must be properly maintained throughout construction (on a daily basis) and reinstalled as necessary (such as after backfilling of the trench) until replaced by permanent erosion controls or restoration is complete.

1. Temporary Slope Breakers

- a. Temporary slope breakers are intended to reduce runoff velocity and divert water off the construction right-of-way. Temporary slope breakers may be constructed of materials such as soil, silt fence, staked hay or straw bales, or sand bags.

- b. Install temporary slope breakers on all disturbed areas, as necessary to avoid excessive erosion. 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, and road crossings at the following spacing (closer spacing should be used if necessary):

<u>Slope (%)</u>	<u>Spacing (feet)</u>
5 - 15	300
>15 - 30	200
>30	100

- c. Direct the outfall of each temporary slope breaker to a stable, well vegetated area or construct an energy-dissipating device at the end of the slope breaker and off the construction right-of-way.
- d. Position the outfall of each temporary slope breaker to prevent sediment discharge into wetlands, waterbodies, or other sensitive resources.

2. Sediment Barriers

- a. Sediment barriers are intended to stop the flow of sediments and to prevent the deposition of sediments into sensitive resources. They may be constructed of materials such as silt fence, staked hay or straw bales, compacted earth (e.g., driveable berms across travelways), sand bags, or other appropriate materials.
- b. At a minimum, install and maintain temporary sediment barriers across the entire construction right-of-way at the base of slopes greater than 5 percent where the base of the slope is less than 50 feet from a waterbody, wetland, or road crossing until revegetation is successful as defined in this Plan. Leave adequate room between the base of the slope and the sediment barrier to accommodate ponding of water and sediment deposition.

- c. Where wetlands or waterbodies are adjacent to and downslope of construction work areas, install sediment barriers along the edge of these areas, as necessary to prevent sediment flow into the wetland or waterbody.

3. Mulch

- a. 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 area to cover at least 75 percent of the ground surface at a rate of 2 tons/acre of straw or its equivalent, unless the local soil conservation authority, landowner, or land managing agency approves otherwise in writing.
- b. Mulch can consist of weed-free straw or hay, wood fiber hydromulch, erosion control fabric, or some functional equivalent.
- c. Mulch before seeding if:
 - (1) final grading and installation of permanent erosion control measures will not be completed in an area within 20 days after the trench in that area is backfilled (10 days in residential areas), as required in section V.A.1; or
 - (2) construction or restoration activity is interrupted for extended periods, such as when seeding cannot be completed due to seeding period restrictions.
- d. If 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.
- e. If wood chips are used as mulch, do not use more than 1 ton/acre and add the equivalent of 11 lbs/acre available nitrogen (at least 50 percent of which is slow release).

- f. Ensure that mulch is adequately anchored to minimize loss due to wind and water.
- g. When anchoring with liquid mulch binders, use rates recommended by the manufacturer. Do not use liquid mulch binders within 100 feet of wetlands or waterbodies.
- h. Install erosion control fabric on waterbody banks at the time of final bank recontouring. Anchor the erosion control fabric with staples or other appropriate devices.

V. RESTORATION

A. CLEANUP

1. Commence cleanup operations immediately following backfill operations. Complete final grading, topsoil replacement, and installation of permanent erosion control structures within 20 days after backfilling the trench (10 days in residential areas). If seasonal or other weather conditions prevent compliance with these time frames, maintain temporary erosion controls (temporary slope breakers and sediment barriers) until conditions allow completion of cleanup.

The project sponsor should file with the Secretary for the review and written approval of the Director, a winterization plan if construction will continue into the winter season when conditions could delay successful decompaction, topsoil replacement, or seeding until the following spring.

2. A travel lane may be left open temporarily to allow access by construction traffic if the temporary erosion control structures are installed (as specified in section IV.F.) and inspected and maintained (as specified in sections II.B.12 through 14). When access is no longer required, the travel lane must be removed and the right-of-way restored.
3. Rock excavated from the trench may be used to backfill the trench only to the top of the existing bedrock profile. Rock that is not returned to the trench should be considered construction debris, unless approved for use as mulch or for some other use on the construction work areas by the landowner or land managing agency.

4. Remove excess rock from at least the top 12 inches of soil in all actively cultivated or rotated cropland and pastures, hayfields, and residential areas, as well as other areas at the landowner's request. The size, density, and distribution of rock on the construction work area should be similar to adjacent areas not disturbed by construction. The landowner may approve other provisions in writing.
5. Grade the construction right-of-way to restore pre-construction contours and leave the soil in the proper condition for planting.
6. Remove construction debris from all construction work areas unless the landowner or land managing agency approves otherwise.
7. Remove temporary sediment barriers when replaced by permanent erosion control measures or when revegetation is successful.

B. PERMANENT EROSION CONTROL DEVICES

1. Trench Breakers

- a. Trench breakers are intended to slow the flow of subsurface water along the trench. Trench breakers may be constructed of materials such as sand bags or polyurethane foam. Do not use topsoil in trench breakers.
- b. An engineer or similarly qualified professional shall determine the need for and spacing of trench breakers. Otherwise, trench breakers shall be installed at the same spacing as and upslope of permanent slope breakers.
- c. In agricultural fields and residential areas where slope breakers are not typically required, install trench breakers at the same spacing as if permanent slope breakers were required.
- d. At a minimum, install a trench breaker at the base of slopes greater than 5 percent where the base of the slope is less than 50 feet from a waterbody or wetland and where needed to avoid draining a waterbody or wetland.

2. Permanent Slope Breakers

- a. Permanent slope breakers are intended to reduce runoff velocity, divert water off the construction right-of-way, and prevent sediment deposition into sensitive resources. Permanent slope breakers may be constructed of materials such as soil, sand bags, or some functional equivalent.
- b. Construct and maintain permanent slope breakers in all areas, except cultivated areas and lawns, using spacing recommendations obtained from the local soil conservation authority or land managing agency.

In the absence of written recommendations, use the following spacing unless closer spacing is necessary to avoid excessive erosion on the construction right-of-way:

<u>Slope (%)</u>	<u>Spacing (feet)</u>
5 - 15	300
>15 - 30	200
>30	100

- c. Construct slope breakers to divert surface flow to a stable area without causing water to pool or erode behind the breaker. In the absence of a stable area, construct appropriate energy-dissipating devices at the end of the breaker.
- d. Slope breakers may extend slightly (about 4 feet) beyond the edge of the construction right-of-way to effectively drain water off the disturbed area. Where slope breakers extend beyond the edge of the construction right-of-way, they are subject to compliance with all applicable survey requirements.

C. SOIL COMPACTION MITIGATION

1. Test topsoil and subsoil for compaction at regular intervals in agricultural and residential areas disturbed by construction activities. Conduct tests on the same soil type under similar moisture conditions in undisturbed areas to 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.

3. Perform appropriate soil compaction mitigation in severely compacted residential areas.

D. REVEGETATION

1. General

- a. The project sponsor is responsible for ensuring successful revegetation of soils disturbed by project-related activities, except as noted in section V.D.1.b.
- b. Restore all turf, ornamental shrubs, and specialized landscaping in accordance with the landowner's request, or compensate the landowner. Restoration work must be performed by personnel familiar with local horticultural and turf establishment practices.

2. Soil Additives

Fertilize and add soil pH modifiers in accordance with written recommendations obtained from the local soil conservation authority, land management agencies, or landowner. Incorporate recommended soil pH modifier and fertilizer into the top 2 inches of soil as soon as possible after application.

3. Seeding Requirements

- a. Prepare a seedbed in disturbed areas to a depth of 3 to 4 inches using appropriate equipment to provide a firm seedbed. When hydroseeding, scarify the seedbed to facilitate lodging and germination of seed.

- b. Seed disturbed areas in accordance with written recommendations for seed mixes, rates, and dates obtained from the local soil conservation authority or as requested by the landowner or land management agency. Seeding is not required in actively cultivated croplands unless requested by the landowner.
- c. Perform seeding of permanent vegetation within the recommended seeding dates. If seeding cannot be done within those dates, use appropriate temporary erosion control measures discussed in section IV.F. and perform seeding of permanent vegetation at the beginning of the next recommended seeding season. Lawns may be seeded on a schedule established with the landowner.
- d. In the absence of written recommendations from the local soil conservation authorities, seed all disturbed soils within 6 working days of final grading, weather and soil conditions permitting, subject to the specifications in section V.D.3.a-c.
- e. Base seeding rates on Pure Live Seed. Use seed within 12 months of seed testing.
- f. 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 hydro).
- g. In the absence of written 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 seed application.

Broadcast or hydroseeding can be used in lieu of drilling at double the recommended seeding rates. Where seed is broadcast, firm the seedbed with a cultipacker or imprinter 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 Environmental Inspector.

VI. OFF-ROAD VEHICLE CONTROL

To each owner or manager of forested lands offer to install and maintain measures to control unauthorized vehicle access to the right-of-way. These measures may include:

- A. Signs;
- B. Fences with locking gates;
- C. Slash and timber barriers, pipe barriers, or a line of boulders across the right-of-way; and
- D. Conifers or other appropriate trees or shrubs across the right-of-way.

VII. POST-CONSTRUCTION ACTIVITIES

A. MONITORING AND MAINTENANCE

- 1. Conduct follow-up inspections of all disturbed areas after the first and second growing seasons to determine the success of revegetation.
- 2. Revegetation in non-agricultural areas shall be considered successful if upon visual survey the density and cover of non-nuisance vegetation are similar in density and cover to adjacent undisturbed lands. In agricultural areas, revegetation shall be considered successful if crop yields are similar to adjacent undisturbed portions of the same field.

Continue revegetation efforts until revegetation is successful.

- 3. Monitor and correct problems with drainage and irrigation systems resulting from pipeline construction in active agricultural areas until restoration is successful.
- 4. Restoration shall be considered successful if the right-of-way 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. Routine vegetation maintenance clearing shall not be done more frequently than every 3 years. However, to facilitate periodic corrosion and leak surveys, a corridor not exceeding 10 feet in width centered on the pipeline may be maintained annually in a herbaceous state. In no case shall routine vegetation maintenance clearing occur between April 15 and August 1 of any year.
6. Efforts to control unauthorized off-road vehicle use, in cooperation with the landowner, shall continue throughout the life of the project. Maintain signs, gates, and vehicle trails as necessary.

B. REPORTING

1. The project sponsor shall maintain records that identify by milepost:
 - a. method of application, application rate, and type of fertilizer, pH modifying agent, seed, and mulch used;
 - b. acreage treated;
 - c. dates of backfilling and seeding;
 - d. names of landowners requesting special seeding treatment and a description of the follow-up actions; and
 - e. any problem areas and how they were addressed.
2. The project sponsor shall file with the Secretary quarterly activity reports documenting problems, including those identified by the landowner, and corrective actions taken for at least 2 years following construction.

**WETLAND AND WATERBODY CONSTRUCTION AND
MITIGATION PROCEDURES**

01/17/2003 VERSION

WETLAND AND WATERBODY CONSTRUCTION AND MITIGATION PROCEDURES

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**WETLAND AND WATERBODY CONSTRUCTION AND MITIGATION PROCEDURES
(PROCEDURES)**

I. APPLICABILITY

- A. The intent of these Procedures is to assist applicants by identifying baseline mitigation measures for minimizing the extent and duration of project-related disturbance on wetlands and waterbodies. The project sponsors should specify in their applications for a FERC Certificate (Certificate) any individual measures in these Procedures they consider unnecessary, technically infeasible, or unsuitable due to local conditions and to fully describe any alternative measures they would use. Applicants should also explain how those alternative measures would achieve a comparable level of mitigation.

Once a project is certificated, further changes can be approved. Any such changes from the measures in these Procedures (or the applicant's approved procedures) will be approved by the Director of the Office of Energy Projects (Director), upon the applicant's written request, if the Director agrees that an alternative measure:

1. provides equal or better environmental protection;
2. is necessary because a portion of these Procedures is infeasible or unworkable based on project-specific conditions; or
3. is specifically required in writing by another Federal, state, or Native American land management agency for the portion of the project on its land or under its jurisdiction.

Any requirements in these Procedures to file material with the Secretary of the FERC (Secretary) do not apply to projects undertaken under the provisions of the blanket certificate program. This exemption does not apply to a request for alternative measures.

Project-related impacts on non-wetland areas are addressed in the staff's Upland Erosion Control, Revegetation, and Maintenance Plan (Plan).

01/17/2003 VERSION

B. DEFINITIONS

1. "Waterbody" 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:
 - a. "minor waterbody" includes all waterbodies less than or equal to 10 feet wide at the water's edge at the time of crossing;
 - b. "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 crossing; and
 - c. "major waterbody" includes all waterbodies greater than 100 feet wide at the water's edge at the time of crossing.
2. "Wetland" includes any area that is not in actively cultivated or rotated cropland and that satisfies the requirements of the current Federal methodology for identifying and delineating wetlands.

II. PRECONSTRUCTION FILING

- A. The following information shall be filed with the Secretary prior to the beginning of construction:
 1. the hydrostatic testing information specified in section VII.B.3. and a wetland delineation report as described in section VI.A.1., if applicable; and
 2. a schedule identifying when trenching or blasting would occur within each waterbody greater than 10 feet wide, or within any designated coldwater fishery. The project sponsor shall revise the schedule as necessary to provide FERC staff at least 14 days advance notice. Changes within this last 14-day period must provide for at least 48 hours advance notice.
- B. The following site-specific construction plans required by these Procedures must be filed with the Secretary for the review and written approval by the Director:
 1. plans for extra work areas that would be closer than 50 feet from a waterbody or wetland;

2. plans for major waterbody crossings;
3. plans for the use of a construction right-of-way greater than 75 feet wide in wetlands; and
4. plans for horizontal directional drill (HDD) "crossings" of wetlands or waterbodies.

III. ENVIRONMENTAL INSPECTORS

- A. At least one Environmental Inspector having knowledge of the wetland and waterbody conditions in the project area is required for each construction spread. The number and experience of Environmental Inspectors assigned to each construction spread should be appropriate for the length of the construction spread and the number/significance of resources affected.
- B. The Environmental Inspector's responsibilities are outlined in the Upland Erosion Control, Revegetation, and Maintenance Plan (Plan).

IV. PRECONSTRUCTION PLANNING

- A. A copy of the Stormwater Pollution Prevention Plan (SWPPP) prepared for compliance with the U.S. Environmental Protection Agency's (EPA) National Stormwater Program General Permit requirements must be available in the field on each construction spread. The SWPPP shall contain Spill Prevention and Response Procedures that meet the requirements of state and Federal agencies.
 1. It shall be the responsibility of the project sponsor and its contractors to structure their operations in a manner that reduces the risk of spills or the accidental exposure of fuels or hazardous materials to waterbodies or wetlands. The project sponsor and its contractors must, at a minimum, ensure that:
 - a. all employees handling fuels and other hazardous materials are properly trained;
 - b. all equipment is in good operating order and inspected on a regular basis;

- c. fuel trucks transporting fuel to on-site equipment travel only on approved access roads;
 - d. all equipment is parked overnight and/or fueled at least 100 feet from a waterbody or in an upland area at least 100 feet from a wetland boundary. These activities can occur closer only if the Environmental Inspector finds, in advance, no reasonable alternative and the project sponsor and its contractors have taken appropriate steps (including secondary containment structures) to prevent spills and provide for prompt cleanup in the event of a spill;
 - e. hazardous materials, including chemicals, fuels, and lubricating oils, are not stored within 100 feet of a wetland, waterbody, or designated municipal watershed area, unless the location is designated for such use by an appropriate governmental authority. This applies to storage of these materials and does not apply to normal operation or use of equipment in these areas; and
 - f. concrete coating activities are not performed within 100 feet of a wetland or waterbody boundary, unless the location is an existing industrial site designated for such use.
2. The project sponsor and its contractors must structure their operations in a manner that provides for the prompt and effective cleanup of spills of fuel and other hazardous materials. At a minimum, the project sponsor and its contractors must:
- a. ensure that each construction crew (including cleanup crews) has on hand sufficient supplies of absorbent and barrier materials to allow the rapid containment and recovery of spilled materials and knows the procedure for reporting spills;
 - b. ensure that each construction crew has on hand sufficient tools and material to stop leaks;

- c. know the contact names and telephone numbers for all local, state, and Federal agencies (including, if necessary, the U. S. Coast Guard and the National Response Center) that must be notified of a spill; and
- d. follow the requirements of those agencies in cleaning up the spill, in excavating and disposing of soils or other materials contaminated by a spill, and in collecting and disposing of waste generated during spill cleanup.

B. AGENCY COORDINATION

The project sponsor must coordinate with the appropriate local, state, and Federal agencies as outlined in these Procedures and in the Certificate.

V. WATERBODY CROSSINGS

A. NOTIFICATION PROCEDURES AND PERMITS

1. Apply to the U.S. Army Corps of Engineers (COE), or its delegated agency, for the appropriate wetland and waterbody crossing permits.
2. Provide written notification to authorities responsible for potable surface water supply intakes located within 3 miles downstream of the crossing at least 1 week before beginning work in the waterbody, or as otherwise specified by that authority.
3. Apply for state-issued waterbody crossing permits and obtain individual or generic section 401 water quality certification or waiver.
4. Notify appropriate state authorities at least 48 hours before beginning trenching or blasting within the waterbody, or as specified in state permits.

B. INSTALLATION

1. Time Window for Construction

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.

2. Extra Work Areas

- a. Locate all extra work areas (such as staging areas and additional spoil storage areas) at least 50 feet away from water's edge, except where the adjacent upland consists of actively cultivated or rotated cropland or other disturbed land.
- b. The project sponsor shall file with the Secretary for review and written approval by the Director, a site-specific construction plan for each extra work area with a less than 50-foot setback from the water's edge, (except where the adjacent upland consists of actively cultivated or rotated cropland or other disturbed land) and a site-specific explanation of the conditions that will not permit a 50-foot setback.
- c. Limit clearing of vegetation between extra work areas and the edge of the waterbody to the certificated construction right-of-way.
- d. Limit the size of extra work areas to the minimum needed to construct the waterbody crossing.

3. General Crossing Procedures

- a. Comply with the COE, or its delegated agency, permit terms and conditions.

- b. Construct crossings as close to perpendicular to the axis of the waterbody channel as engineering and routing conditions permit.
- c. 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 construction right-of-way.
- d. Where waterbodies meander or have multiple channels, route the pipeline to minimize the number of waterbody crossings.
- e. Maintain adequate flow rates to protect aquatic life, and prevent the interruption of existing downstream uses.
- f. Waterbody buffers (extra work area setbacks, refueling restrictions, etc.) must be clearly marked in the field with signs and/or highly visible flagging until construction-related ground disturbing activities are complete.

4. Spoil Pile Placement and Control

- a. All spoil from minor and intermediate waterbody crossings, and upland spoil from major waterbody crossings, must be placed in the construction right-of-way at least 10 feet from the water's edge or in additional extra work areas as described in section V.B.2.
- b. Use sediment barriers to prevent the flow of spoil or heavily silt-laden water into any waterbody.

5. Equipment Bridges

- a. Only clearing equipment and equipment necessary for installation of equipment bridges may cross waterbodies prior to bridge installation. Limit the number of such crossings of each waterbody to one per piece of clearing equipment.

- b. Construct equipment bridges to maintain unrestricted flow and to prevent soil from entering the waterbody. Examples of such bridges include:

- (1) equipment pads and culvert(s);
- (2) equipment pads or railroad car bridges without culverts;
- (3) clean rock fill and culvert(s); and
- (4) flexi-float or portable bridges.

Additional options for equipment bridges may be utilized that achieve the performance objectives noted above. Do not use soil to construct or stabilize equipment bridges.

- c. Design and maintain each equipment bridge to withstand and pass the highest flow expected to occur while the bridge is in place. Align culverts to prevent bank erosion or streambed scour. If necessary, install energy dissipating devices downstream of the culverts.
- d. Design and maintain equipment bridges to prevent soil from entering the waterbody.
- e. Remove equipment bridges as soon as possible after permanent seeding unless the COE, or its delegated agency, authorizes it as a permanent bridge.
- f. If there will be more than 1 month between final cleanup and the beginning of permanent seeding and reasonable alternative access to the right-of-way is available, remove equipment bridges as soon as possible after final cleanup.

6. Dry-Ditch Crossing Methods

- a. Unless approved otherwise by the appropriate state agency, install the pipeline using one of the dry-ditch methods outlined below for crossings of waterbodies up to 30 feet wide (at the water's edge at the time of construction) that are state-designated as either coldwater or significant coolwater or warmwater fisheries.

b. Dam and Pump

- (1) The dam-and-pump method may be used without prior approval for crossings of waterbodies where pumps can adequately transfer streamflow volumes around the work area, and there are no concerns about sensitive species passage.
- (2) Implementation of the dam-and-pump crossing method must meet the following performance criteria:
 - (i) use sufficient pumps, including on-site backup pumps, to maintain downstream flows;
 - (ii) construct dams with materials that prevent sediment and other pollutants from entering the waterbody (e.g., sandbags or clean gravel with plastic liner);
 - (iii) screen pump intakes;
 - (iv) prevent streambed scour at pump discharge; and
 - (v) monitor the dam and pumps to ensure proper operation throughout the waterbody crossing.

c. Flume Crossing

The flume crossing method requires implementation of the following steps:

- (1) install flume pipe after blasting (if necessary), but before any trenching;
- (2) use sand bag or sand bag and plastic sheeting diversion structure or equivalent to develop an effective seal and to divert stream flow through the flume pipe (some modifications to the stream bottom may be required in to achieve an effective seal);
- (3) properly align flume pipe(s) to prevent bank erosion and streambed scour;
- (4) do not remove flume pipe during trenching, pipelaying, or backfilling activities, or initial streambed restoration efforts; and

- (5) 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.

d. Horizontal Directional Drill (HDD)

To the extent they were not provided as part of the pre-certification process, for each waterbody or wetland that would be crossed using the HDD method, provide a plan that includes:

- (1) site-specific construction diagrams that show the location of mud pits, pipe assembly areas, and all areas to be disturbed or cleared for construction;
- (2) a description of how an inadvertent release of drilling mud would be contained and cleaned up; and
- (3) a contingency plan for crossing the waterbody or wetland in the event the directional drill is unsuccessful and how the abandoned drill hole would be sealed, if necessary.

7. Crossings of Minor Waterbodies

Where a dry-ditch crossing is not required, minor waterbodies may be crossed using the open-cut crossing method, with the following restrictions:

- a. except for blasting and other rock breaking measures, complete instream construction activities (including trenching, pipe installation, backfill, and restoration of the streambed contours) within 24 hours. Streambanks and unconsolidated streambeds may require additional restoration after this period;
- b. limit use of equipment operating in the waterbody to that needed to construct the crossing; and

- c. equipment bridges are not required at minor waterbodies that do not have a state-designated fishery classification (e.g., agricultural or intermittent drainage ditches). However, if an equipment bridge is used it must be constructed as described in section V.B.5.

8. Crossings of Intermediate Waterbodies

Where a dry-ditch crossing is not required, intermediate waterbodies may be crossed using the open-cut crossing method, with the following restrictions:

- a. complete instream construction activities (not including blasting and other rock breaking measures) within 48 hours, unless site-specific conditions make completion within 48 hours infeasible;
- b. limit use of equipment operating in the waterbody to that needed to construct the crossing; and
- c. all other construction equipment must cross on an equipment bridge as specified in section V.B.5.

9. Crossings of Major Waterbodies

Before construction, the project sponsor shall file with the Secretary for the review and written approval by the Director a detailed, site-specific construction plan and scaled drawings identifying all areas to be disturbed by construction for each major waterbody crossing (the scaled drawings are not required for any offshore portions of pipeline projects). This plan should be developed in consultation with the appropriate state and Federal agencies and should include extra work areas, spoil storage areas, sediment control structures, etc., as well as mitigation for navigational issues.

The Environmental Inspector may adjust the final placement of the erosion and sediment control structures in the field to maximize effectiveness.

10. Temporary Erosion and Sediment Control

Install sediment barriers (as defined in section IV.F.2.a. of the Plan) 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 replaced by permanent erosion controls or restoration of adjacent upland areas is complete. Temporary erosion and sediment control measures are addressed in more detail in the Plan; however, the following specific measures must be implemented at stream crossings:

- a. install sediment barriers across the entire construction right-of-way at all waterbody crossings, where necessary to prevent the flow of sediments into the waterbody. In the travel lane, these may consist of removable sediment barriers or driveable berms. Removable sediment barriers can be removed during the construction day, but must be re-installed after construction has stopped for the day and/or when heavy precipitation is imminent;
- b. where waterbodies are adjacent to the construction right-of-way, install sediment barriers along the edge of the construction right-of-way as necessary to contain spoil and sediment within the construction right-of-way; and
- c. use trench plugs at all waterbody crossings, as necessary, to prevent diversion of water into upland portions of the pipeline trench and to keep any accumulated trench water out of the waterbody.

11. Trench Dewatering

Dewater the trench (either on or off the construction right-of-way) in a manner that does not cause erosion and does not result in heavily silt-laden water flowing into any waterbody. Remove the dewatering structures as soon as possible after the completion of dewatering activities.

C. RESTORATION

1. Use clean gravel or native cobbles for the upper 1 foot of trench backfill in all waterbodies that contain coldwater fisheries.
2. For open-cut crossings, stabilize waterbody banks and install temporary sediment barriers within 24 hours of completing instream construction activities. For dry-ditch crossings, complete streambed and bank stabilization before returning flow to the waterbody channel.
3. Return all waterbody banks to preconstruction contours or to a stable angle of repose as approved by the Environmental Inspector.
4. Application of riprap for bank stabilization must comply with COE, or its delegated agency, permit terms and conditions.
5. Unless otherwise specified by state permit, limit the use of riprap to areas where flow conditions preclude effective vegetative stabilization techniques such as seeding and erosion control fabric.
6. Revegetate disturbed riparian areas with conservation grasses and legumes or native plant species, preferably woody species.
7. Install a permanent slope breaker across the construction right-of-way at the base of slopes greater than 5 percent that are less than 50 feet from the waterbody, or as needed to prevent sediment transport into the waterbody. In addition, install sediment barriers as outlined in the Plan. In some areas, with the approval of the Environmental Inspector, an earthen berm may be suitable as a sediment barrier adjacent to the waterbody.
8. Sections V.C.3. through V.C.6. above also apply to those perennial or intermittent streams not flowing at the time of construction.

D. POST-CONSTRUCTION MAINTENANCE

1. Limit vegetation maintenance adjacent to waterbodies to allow a riparian strip at least 25 feet wide, as measured from the waterbody's mean high water mark, to permanently revegetate with native plant species across the entire construction right-of-way. However, to facilitate periodic pipeline corrosion/leak surveys, a corridor centered on the pipeline and up to 10 feet wide may be maintained in a herbaceous state. In addition, trees that are located within 15 feet of the pipeline that are greater than 15 feet in height may be cut and removed from the permanent right-of-way.
2. Do not use herbicides or pesticides in or within 100 feet of a waterbody except as allowed by the appropriate land management or state agency.

VI. WETLAND CROSSINGS

A. GENERAL

1. The project sponsor shall conduct a wetland delineation using the current Federal methodology and file a wetland delineation report with the Secretary before construction. This report shall identify:
 - a. by milepost all wetlands that would be affected;
 - b. the National Wetlands Inventory (NWI) classification for each wetland;
 - c. the crossing length of each wetland in feet; and
 - d. the area of permanent and temporary disturbance that would occur in each wetland by NWI classification type.

The requirements outlined in this section do not apply to wetlands in actively cultivated or rotated cropland. Standard upland protective measures, including workspace and topsoiling requirements, apply to these agricultural wetlands.

2. Route the pipeline to avoid wetland areas to the maximum extent possible. If a wetland cannot be avoided or crossed by following an existing right-of-way, route the new pipeline in a manner that minimizes disturbance to wetlands. Where looping an existing pipeline, overlap the existing pipeline right-of-way with the new construction right-of-way. In addition, locate the loop line no more than 25 feet away from the existing pipeline unless site-specific constraints would adversely affect the stability of the existing pipeline.
3. Limit the width of the construction right-of-way to 75 feet or less. Prior written approval of the Director is required where topographic conditions or soil limitations require that the construction right-of-way width within the boundaries of a federally delineated wetland be expanded beyond 75 feet. Early in the planning process the project sponsor is encouraged to identify site-specific areas where existing soils lack adequate unconfined compressive strength that would result in excessively wide ditches and/or difficult to contain spoil piles.
4. 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.
5. Implement the measures of sections V. and VI. in the event a waterbody crossing is located within or adjacent to a wetland crossing. If all measures of sections V. and VI. cannot be met, the project sponsor must file with the Secretary a site-specific crossing plan for review and written approval by the Director before construction. This crossing plan shall address at a minimum:
 - a. spoil control;
 - b. equipment bridges;
 - c. restoration of waterbody banks and wetland hydrology;
 - d. timing of the waterbody crossing;

- e. method of crossing; and
 - f. size and location of all extra work areas.
6. Do not locate aboveground facilities in any wetland, except where the location of such facilities outside of wetlands would prohibit compliance with U.S. Department of Transportation regulations.

B. INSTALLATION

1. Extra Work Areas and Access Roads

- a. Locate all extra work areas (such as staging areas and additional spoil storage areas) at least 50 feet away from wetland boundaries, except where the adjacent upland consists of actively cultivated or rotated cropland or other disturbed land.
- b. The project sponsor shall file with the Secretary for review and written approval by the Director, a site-specific construction plan for each extra work area with a less than 50-foot setback from wetland boundaries (except where adjacent upland consists of actively cultivated or rotated cropland or other disturbed land) and a site-specific explanation of the conditions that will not permit a 50-foot setback.
- c. Limit clearing of vegetation between extra work areas and the edge of the wetland to the certificated construction right-of-way.
- d. The construction right-of-way may be used for access when the wetland soil is firm enough to avoid rutting or the construction right-of-way has been appropriately stabilized to avoid rutting (e.g., with timber riprap, prefabricated equipment mats, or terra mats).

In wetlands that cannot be appropriately stabilized, all construction equipment other than that needed to install the wetland crossing shall use access roads located in upland areas. Where access roads in upland areas do not provide reasonable access, limit all other construction equipment to one pass through the wetland using the construction right-of-way.

- e. The only access roads, other than the construction right-of-way, that can be used in wetlands without Director approval, are those existing roads that can be used with no modification and no impact on the wetland.

2. Crossing Procedures

- a. Comply with COE, or its delegated agency, permit terms and conditions
- b. Assemble the pipeline in an upland area unless the wetland is dry enough to adequately support skids and pipe.
- c. Use "push-pull" or "float" techniques to place the pipe in the trench where water and other site conditions allow.
- d. Minimize the length of time that topsoil is segregated and the trench is open.
- e. Limit construction equipment operating in wetland areas to that needed to clear the construction right-of-way, dig the trench, fabricate and install the pipeline, backfill the trench, and restore the construction right-of-way.
- f. Cut vegetation just aboveground level, leaving existing root systems in place, and remove it from the wetland for disposal.

- g. 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 construction right-of-way in wetlands unless the Chief Inspector and Environmental Inspector determine that safety-related construction constraints require grading or the removal of tree stumps from under the working side of the construction right-of-way.
- h. Segregate the top 1 foot of topsoil from the area disturbed by trenching, except in areas where standing water is present or soils are saturated or frozen. Immediately after backfilling is complete, restore the segregated topsoil to its original location.
- i. Do not use rock, soil imported from outside the wetland, tree stumps, or brush riprap to support equipment on the construction right-of-way.
- j. 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.
- k. Do not cut trees outside of the approved construction work area to obtain timber for riprap or equipment mats.
- l. Attempt to use no more than two layers of timber riprap to support equipment on the construction right-of-way.
- m. Remove all project-related material used to support equipment on the construction right-of-way upon completion of construction.

3. Temporary Sediment Control

Install sediment barriers (as defined in section IV.F.2.a. of the Plan) immediately after initial disturbance of the wetland or adjacent upland. Sediment barriers must be properly maintained throughout construction and reinstalled as necessary (such as after backfilling of the trench). Except as noted below in section VI.B.3.c., maintain sediment barriers until replaced by permanent erosion controls or restoration of adjacent upland areas is complete. Temporary erosion and sediment control measures are addressed in more detail in the Plan.

- a. Install sediment barriers across the entire construction right-of-way at all wetland crossings where necessary to prevent sediment flow into the wetland. In the travel lane, these may consist of removable sediment barriers or driveable berms. Removable sediment barriers can be removed during the construction day, but must be re-installed after construction has stopped for the day and/or when heavy precipitation is imminent
- b. Where wetlands are adjacent to the construction right-of-way and the right-of-way slopes toward the wetland, install sediment barriers along the edge of the construction right-of-way as necessary to prevent sediment flow into the wetland.
- c. Install sediment barriers along the edge of the construction right-of-way as necessary to contain spoil and sediment within the construction right-of-way through wetlands. Remove these sediment barriers during right-of-way cleanup.

4. Trench Dewatering

Dewater the trench (either on or off the construction right-of-way) in a manner that does not cause erosion and does not result in heavily silt-laden water flowing into any wetland. Remove the dewatering structures as soon as possible after the completion of dewatering activities.

C. RESTORATION

1. Where the pipeline trench may drain a wetland, construct trench breakers and/or seal the trench bottom as necessary to maintain the original wetland hydrology.
2. For each wetland crossed, install a trench breaker at the base of slopes near the boundary between the wetland and adjacent upland areas. Install a permanent slope breaker across the construction right-of-way at the base of a slopes greater than 5 percent where the base of the slope is less than 50 feet from the wetland, or as needed to prevent sediment transport into the wetland. In addition, install sediment barriers as outlined in the Plan. In some areas, with the approval of the Environmental Inspector, an earthen berm may be suitable as a sediment barrier adjacent to the wetland.
3. Do not use fertilizer, lime, or mulch unless required in writing by the appropriate land management or state agency.
4. Consult with the appropriate land management or state agency to develop a project-specific wetland restoration plan. The restoration plan should include measures for re-establishing herbaceous and/or woody species, controlling the invasion and spread of undesirable exotic species (e.g., purple loosestrife and phragmites), and monitoring the success of the revegetation and weed control efforts. Provide this plan to the FERC staff upon request.
5. Until a project-specific wetland restoration plan is developed and/or implemented, temporarily revegetate the construction right-of-way with annual ryegrass at a rate of 40 pounds/acre (unless standing water is present).
6. Ensure that all disturbed areas successfully revegetate with wetland herbaceous and/or woody plant species.

7. Remove temporary sediment barriers located at the boundary between wetland and adjacent upland areas after upland revegetation and stabilization of adjacent upland areas are judged to be successful as specified in section VII.A.5. of the Plan.

D. POST-CONSTRUCTION MAINTENANCE

1. Do not conduct vegetation maintenance over the full width of the permanent right-of-way in wetlands. However, to facilitate periodic pipeline corrosion/leak surveys, a corridor centered on the pipeline and up to 10 feet wide may be maintained in a herbaceous state. In addition, trees within 15 feet of the pipeline that are greater than 15 feet in height may be selectively cut and removed from the permanent right-of-way.
2. Do not use herbicides or pesticides in or within 100 feet of a wetland, except as allowed by the appropriate land management agency or state agency.
3. Monitor and record the success of wetland revegetation annually for the first 3 years after construction or until wetland revegetation is successful. At the end of 3 years after construction, file a report with the Secretary identifying the status of the wetland revegetation efforts. Include the percent cover achieved and problem areas (weed invasion issues, poor revegetation, etc.). Continue to file a report annually until wetland revegetation is successful.
4. Wetland revegetation shall be considered successful if 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, develop and implement (in consultation with a professional wetland ecologist) a remedial revegetation plan to actively revegetate the wetland. Continue revegetation efforts until wetland revegetation is successful.

VII. HYDROSTATIC TESTING

A. NOTIFICATION PROCEDURES AND PERMITS

1. Apply for state-issued water withdrawal permits, as required.
2. Apply for National Pollutant Discharge Elimination System (NPDES) or state-issued discharge permits, as required.
3. Notify appropriate state agencies of intent to use specific sources at least 48 hours before testing activities unless they waive this requirement in writing.

B. GENERAL

1. Perform non-destructive testing of all pipeline section welds or hydrotest the pipeline sections, before installation under waterbodies or wetlands.
2. If pumps used for hydrostatic testing are within 100 feet of any waterbody or wetland, address the operation and refueling of these pumps in the project's Spill Prevention and Response Procedures.
3. The project sponsor shall file with the Secretary before construction a list identifying the location of all waterbodies proposed for use as a hydrostatic test water source or discharge location.

C. INTAKE SOURCE AND RATE

1. Screen the intake hose to prevent entrainment of fish.
2. Do not use 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/or local permitting agencies grant written permission.
3. Maintain adequate flow rates to protect aquatic life, provide for all waterbody uses, and provide for downstream withdrawals of water by existing users.

4. Locate hydrostatic test manifolds outside wetlands and riparian areas to the maximum extent practicable.

D. DISCHARGE LOCATION, METHOD, AND RATE

1. Regulate discharge rate, use energy dissipation device(s), and install sediment barriers, as necessary, to prevent erosion, streambed scour, suspension of sediments, or excessive streamflow.
2. 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.



Appendix G
List of Preparers

**COLER &
COLANTONIO[®]**

ENGINEERS AND SCIENTISTS

LIST OF PREPARERS

1.0 Introduction

Preparation of the Environmental Report was a collaborative effort on the part of two companies working with Tennessee. The two companies and their tasks were as follows:

Coler & Colantonio, Inc., 101 Accord Park Drive, Norwell, MA 02061

Coler & Colantonio, Inc. was the lead company for the preparation of the Environmental Report and also conducted the engineering survey and pipeline alignment and design.

University of Massachusetts Archeological Services, Blaisdell House, 310 Hicks Way, Amherst, MA 01003-9280

UMASS supported the project with archaeological fieldwork and documentation found in Resource Report 4 and Volume III.

2.0 Principal Staff Support

The project field work and permit documentation was conducted by many professionals from a wide variety of environmental and archaeological disciplines. Following are the people who were principally involved with the management and coordination of the preparation of Environmental Report.

Coler & Colantonio, Inc. Staff

Matthew W. Long, PWS, Environmental Division Manager

Education

B.S., Watershed Management, Colorado State University

M.A., Religious Education, Gordon Conwell Theological Seminary

Graduate Studies, Wetland Science, University of Massachusetts

Mr. Long is the Manager of the Environmental Sciences and Permitting Division at Coler & Colantonio, Inc. and has eleven years experience with project management in the ecological sciences discipline. Mr. Long has managed field work, project design, permitting and construction supervision for facilities such as pipelines and other utilities, roadways and industrial, commercial and residential developments. As part of his responsibilities, he has managed and coordinated cultural resources and hazardous materials reviews, site design and document

preparation and acquisition of environmental permits on the local, State and Federal levels.

John Zimmer, PWS, Project Manager

Education

M.S., Wildlife Management, Louisiana State University

B.S., Wildlife Management, University of New Hampshire

Mr. Zimmer has an extensive background in wildlife biology and has managed the design, fieldwork, data analysis and report writing for several scientific studies. His responsibilities include performing wetland delineations; wildlife habitat evaluations and analysis, document preparation, and preparing environmental permit applications. Mr. Zimmer has an in-depth understanding of wildlife biology and habitat management, and his field experience and education make him a valuable member of the Environmental Sciences and Permitting Division.

Kelly Doyle, Senior Project Scientist

Education

B.A., Biology, Regis College

Graduate Studies, Wetland Science, University of Massachusetts

Ms. Doyle has extensive field experience and permit documentation for existing and proposed natural gas pipeline projects. She has conducted the majority of the fieldwork for natural gas pipelines in Massachusetts, New York, New Jersey, Rhode Island and Connecticut. Ms. Doyle provided field work, research and technical writing support in association with preparation of the Environmental Report.

Jason Zimmer, Wildlife Biologist

Education -

B.S., Wildlife Management, University of New Hampshire

M.S., Zoology and Physiology, University of Wyoming

Mr. Zimmer has an extensive background in ecology with an emphasis on applied wildlife management, wildlife-habitat relationships, population dynamics, wetland biology and ecosystem processes. Mr. Zimmer has been involved with several major pipeline and other linear projects, participating in environmental field work such as wetland delineation wildlife habitat assessment and endangered

species surveys. Mr. Zimmer recently completed wildlife habitat evaluations, rare species surveys and rare turtle trapping along the Project alignment.

Richard Lee Fuller, II, Project Geologist

Education

B.S. Environmental Geoscience, Boston College

Mr. Fuller has worked in the geology field for six years and has prepared and managed preparation of geological and soils resource reports for natural gas pipeline projects. Mr. Fuller is also well versed in environmental site investigations and assessment projects, including: directing monitoring well installation projects; soil and groundwater sampling; preparing Health and Safety Plans; Toxics Use Reduction (TUR) reporting; conducting Limited Removal Actions (soil excavation and disposal operations); and writing reports and compiling project documentation for environmental site assessments, Phase I investigations, Tier Classifications, Immediate Response Actions and Response Action Outcome Statements completed in accordance with the Massachusetts Contingency Plan.

UMASS Archeological Services

Mitchell T. Mulholland, Ph.D, Principal Investigator/ Project Coordinator

Education

Ph.D Anthropology, UMASS

M.A. Anthropology, UMASS

B.A. Anthropology, Connecticut College

Dr. Mulholland is a specialist in the prehistory of New England and presently serves as Director of UMASS Archeological Services. Since 1975, he has served as consultant, project archeologist and project director in the Northeast on all aspects of Cultural Resource Management projects. He has conducted projects in Massachusetts, Vermont, New Hampshire, Connecticut, Rhode Island and New York. In 1995 and 1996 he served as Project Director for Phase 0, 1 and 2 archaeological studies for the Portland Natural Gas Pipeline, from Gilead to Westbrook, Maine. For our years he worked as a Project Archeologist for the Institute for Conservation Archeological, Peabody Museum, Harvard University. He has served in an archeological and management capacity reconnaissance surveys, Archeological Overviews, Archeological Identification Studies, Evaluation Studies, Data Recovery projects, National Register nominations, Cultural Resource Management (CRM) field schools, large scale computer

archeology projects related to CRM, and several projects involving National Register determinations of eligibility, nominations and cultural landscape studies. During his time at UMASS he has served as Principal Investigator on more than 230 archeological projects in New England.

Christopher Donta, Ph.D, Project Archeologist

Education

Ph.D Anthropology, Bryn Mawr
M.A. Anthropology, Bryn Mawr
B.A. History, Holy Cross

Dr. Donta has conducted prehistoric and historic archeological research projects in Massachusetts, Alaska, Arizona, New Mexico and Pennsylvania. For the past five years he has conducted numerous archeological surveys in Massachusetts and Maine for UMASS. Over the past four years, Dr. Donta has served as Project Archeologist on prehistoric and historic archeological surveys for UMASS Archeological Services.



***Appendix H
Unanticipated Discovery Plan***

**COLER &
COLANTONIO^{LLP}**
ENGINEERS AND SCIENTISTS

UNANTICIPATED DISCOVERY PLAN

Tennessee conducted a detailed archaeological reconnaissance of the Project area to minimize the potential for the unanticipated discovery of cultural resources. To ensure that Tennessee maintains full and complete compliance with all federal and state regulations concerning the protection of cultural resources, an Unanticipated Discovery Plan has been prepared for the Project.

All inspectors have the responsibility to monitor the construction sites for potential archaeological remains throughout construction. If, during the course of construction, potential cultural resource remains are identified, the Environmental Inspector (EI) will immediately stop tasks in the vicinity of the potential find and make stop work recommendations to the Chief Inspector (CI), as appropriate. Should stop-work authorization be deemed necessary, Tennessee will notify the appropriate state preservation office and the FERC, and will retain a state-approved archaeological consultant who will assess the potential find and provide an immediate verbal report to Tennessee and the state preservation office. Tennessee will notify the Commission of the report and continue to consult with the state preservation office as per Section 106 of the National Historic Preservation Act (NHPA). The MHC and THPO contact(s) are listed below:

Massachusetts Historical Commission
220 Morrissey Boulevard
Boston, MA 02125-3314
(617) 727-8470

Wampanoag Tribal Historic Preservation Office
20 Black Brook Road
Aquinnah, MA 02535
(508) 645-9265

If the accidental discovery is determined to be ineligible for inclusion in the National Register of Historic Places, Tennessee will proceed with the project following written concurrence from MHC and approval from FERC. If the site is determined to be potentially eligible for inclusion in the Register, additional work such as a Determination of Eligibility or Data Recovery will be performed as required/approved by the appropriate state preservation office and the Commission. Further work at the site will be suspended until all criteria of Section 106 of the NHPA and other related Federal and state regulations have been successfully completed.

In the event that human remains are discovered during construction, the CI will immediately halt work and notify the local law enforcement agency and medical

examiner. If remains are found not to be of recent origin, Tennessee will contact MHC and THPO and begin consultation to ensure that all provisions of the Native American Graves Protection and Repatriation Act are followed. Provision for security to protect suspected burials from vandalism will be taken. Tennessee will notify FERC of the situation and will continue to keep FERC informed as to the progress of further consultation.

If the accidental discovery of human remains is determined by MHC, THPO and FERC to be ineligible for inclusion in the Register, Tennessee will proceed with coordinating the proper removal of the remains through cooperation with the local police, medical examiner, MHC and FERC. Only after the human remains have been properly removed from the site should construction of the pipeline facilities in the site areas be resumed.

Under no circumstances should human remains be removed from the site without completing all coordination processes with the local police, medical examiner, MHC, FERC and Native American representatives, as appropriate. Further work at the site will be suspended until all criteria of Section 106 of the NHPA and other related state and Federal regulations have been successfully completed.



Appendix I
State and Federal Environmental Approvals



**COLER &
COLANTONIO^U**
ENGINEERS AND SCIENTISTS



***Local Order of Conditions
Tewksbury Conservation Commission***

**COLER &
COLANTONIO²**

ENGINEERS AND SCIENTISTS

TOWN OF TEWKSBURY
CONSERVATION COMMISSION
LOCAL PERMIT
ORDER OF CONDITIONS

DEP #305 - 738

SEPTEMBER 18, 2003

Said Conservation Commission Permit is hereby issued in accordance with the Tewksbury Town Bylaws Chapter 18.04 entitled Conservation Commission Wetlands Protection:

TO: TENNESSEE GAS PIPELINE COMPANY
Owner or Petitioner

ADDRESS: 9 GREENWAY PLAZA

CITY OR TOWN: HOUSTON, TX 77046

By the Town of Tewksbury Conservation Commission affecting the rights of the owner with respect to use of the premises located at:

UTILITY EASEMENT REFERENCE ABUTTER LIST
Street Map(s) Lot(s)

TEWKSBURY
City or Town

The decision of said Board is on file with the Office of Planning and Conservation located in the DPW Building, 999 Whipple Road, Tewksbury, MA 01876. This document shall be recorded at the North Middlesex Registry of Deeds by the landowner.

Certified this EIGHTEENTH Day of SEPTEMBER 2003

Walter J. Pollock
Chairman, Director or Conservation Administrator



Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands

DEP File Number

305 738

for DEP use only

WPA Form 5 - Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

A Applicant Information

From:

TELENSBURY
Conservation Commission

The Notice of Intent for this project was filed on:

FEBRUARY 4, 2003
Date

For:

305 738
Project File Number

The public hearing was closed on:

SEPTEMBER 3, 2003
Date

To:

TELENSBURY CASPIAN CO.
Applicant Name
77 BARNARD PLAZA
Mailing Address
MILFORD
City/Town
MA 01860
State Zip Code

Title and Date of final Plans and Other Documents:

PROPOSED MAINTENANCE PROJECT
TELENSBURY/ANDOVER LAKE
Barnard Plaza 5/2003
Assessment Sheets 1-6
TELENSBURY CASPIAN CO.

The project site is located at:

TELENSBURY
City/Town
77 BARNARD PLAZA
Assessors Map/Plat # Parcel # of #

and the property is recorded at the Registry of Deeds for:

Barnard
County Book Page
Certificate (if registered land)

B Findings

Findings pursuant to the Massachusetts Wetlands Protection Act:

Following the review of the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this commission finds that the area in which work is proposed is significant to the following interests of the Wetlands Protection Act (check all that apply):

- ☐ Public Water Supply
- ☐ Private Water Supply
- ☐ Groundwater Supply
- ☒ Flood Control
- ☐ Land Containing Shellfish
- ☐ Fisheries
- ☒ Storm Damage Prevention
- ☒ Prevention of Pollution
- ☒ Protection of Wildlife Habitat

Furthermore, this Commission hereby finds that the project, as proposed, is:
(check one of the following boxes)

Approved subject to:

- ☒ The following conditions which are necessary, in accordance with the performance standards set forth in the wetlands regulations, to protect those interests checked above. This Commission orders that all the work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 - Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

B Findings (cont.)

Denied because:

the proposed work cannot be conditioned to meet the performance standards set forth in the wetlands regulations to protect those interests checked above. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect these interests, and a final Order of Conditions is issued.

the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(b)(c).

General Conditions

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order.
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
 - (a) the work is a maintenance dredging project as provided for in the Act; or
 - (b) the time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order.
6. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or

debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.

7. This Order does not become final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.
8. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to this Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of the work.

9. A sign shall be displayed at the site not less than two square feet or more than three square feet in size bearing the words,

"Massachusetts Department of Environmental Protection"
[or, "MA DEP"] "File Number

Project File Number

10. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before the Department.

11. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.

12. The work shall conform to the following attached plans and special conditions:

Final Approved Plans (attach additional plan references as needed)

Two sets of plans attached as indicated

Date: *1/28/04*

Signature: *[Signature]*

Signed and Stamped by: *[Signature]*

On file with: *[Signature]*



Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands

WPA Form 5 - Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

B Findings (cont.)

13. Any changes to the plans identified in Condition # 12 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.

14. The Agent or members of the Conservation Commission and Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.

15. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.

16. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall serve as the limit of work (unless another limit of work line has been noted in the plans of record) and be maintained until a Certificate of Compliance has been issued by the Conservation Commission.

17. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary.

Special Conditions (Use additional paper if necessary)

SEE ATTACHED SHEET

STANDARD ORDER OF

CONDITIONS

Findings as to municipal law, bylaw, or ordinance

Furthermore, the

TEWKSBURY
Conservation Commission

hereby finds (check one that applies):

☒ that the proposed work cannot be conditioned to meet the standards set forth in a municipal law, ordinance, or bylaw, specifically TEWKSBURY WETLANDS

PROTECTION BYLAW

Name and citation of municipal law, bylaw, or ordinance

Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order of Conditions is issued.

☐ that the following additional conditions are necessary to comply with a municipal law, bylaw, or ordinance, specifically

Name and citation of municipal law, bylaw, or ordinance

The Commission orders that all the work shall be performed in accordance with the said additional conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.

Additional conditions relating to municipal law, bylaw, or ordinance:



Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands

WPA Form 5 - Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

B Findings (cont.)

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

SEPTEMBER 18, 2003
Date

This Order must be signed by a majority of the conservation commission. The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate regional office of the Department of Environmental Protection.

Signatures:

[Signature]
[Signature]
[Signature]
[Signature]
[Signature]

On this

SEVENTEENTH

day of

SEPTEMBER

Month

2003

Year

before me personally appeared

Steve F. [Signature]

to me known to be the person described in and who executed the foregoing instrument and acknowledged that he/she executed the same as his/her free act and deed.

[Signature]

Notary Public

4-12-07

My commission expires

This Order is issued to the applicant as follows:

☐ by hand delivery on

Date

☒ by certified mail, return receipt requested, on

Date

C Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate Department of Environmental Protection Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Appendix E: Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the conservation commission and to the applicant, if he/she is not the appellant.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act (M.G.L. c. 131, §40 and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department of Environmental Protection has no appellate jurisdiction.



Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands

WPA Form 5 - Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

D Recording Information

This Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information shall be submitted to the

TEWKSBURY
Conservation Commission

on the form below, which must be stamped by the Registry of Deeds.

Detach on dotted line and submit to the Conservation Commission.

To:

Conservation Commission

Please be advised that the Order of Conditions for the project at

Project Location

DEP File Number

has been recorded at the Registry of Deeds of

County

and has been noted in the chain of title of the affected property in

Book

Page

in accordance with the Order of Conditions issued on

Date

If recorded land, the instrument number which identifies this transaction is

Instrument Number

If registered land, the document number which identifies this transaction is

Document Number

Signature of Applicant

ADDITIONAL CONDITIONS
DEP #305-738

- 1) The Dracut Expansion Line Administrative/Legal Conditions shall be adhered to as applicable.
- 2) A \$60,000.00 cash bond shall be posted with the Town of Tewksbury.
- 3) The Tewksbury Conservation Commission has stipulated that Bill Manuell shall be their designated consultant to monitor the project.

STANDARD ORDER OF CONDITIONS

TEWKSBURY CONSERVATION COMMISSION

1. The Commission hereby designates the Tewksbury Conservation Commission Administrator as its administration agent, with full powers to administer and enforce this Order of Conditions.
2. No work shall commence on-site until all appeal periods have elapsed and this Order of Conditions has been recorded with the Registry of Deeds.
3. Any change(s) in the above-described plan, which will or may, cause an area subject to protection under the Wetlands Protection Act and/or Tewksbury Conservation Commission Wetland By-Law, to be altered, or any change(s) in activity subject to regulation under M.G.L. Chapter 131, Section 40, shall require the applicant to inquire of the Commission, in writing, whether the change(s) is significant enough to require the filing of a new Notice of Intent.
4. Prior to the start of work, the contractor shall meet at the site with representatives of the project proponent and the commission in order to develop a mutual understanding of the environmental protection requirements described in the Notice of Intent and Order of Conditions. At this time, the project proponent shall provide proof that the Order of Conditions was recorded at the Registry of Deeds. The Commission shall also view and approve all erosion and sedimentation control measures as proposed in the Notice of Intent or specified in the Order of Condition. Existing residential dwellings are exempt from this condition.
5. A Limits of Work – Conservation Area – sign approved by the Tewksbury Conservation Commission shall be installed so as to be visible every 75 feet along the Conservation Area as defined by the Conservation Commission on all approved projects. This installation includes commercial, industrial, multi-family, condominiums or single family residential subdivisions of two or more lots prior to any clearing and/or excavation except for natural resource evaluations such as, soil sampling, exploratory borings, surveying that are temporary, have negligible impacts and are necessary for planning and design purposes. Single family residential lots that are not part of a subdivision are exempt from this special condition.

The Conservation area is defined by the Tewksbury Conservation Commission as a no Disturbance Zone which includes the approved delineated wetland area, the buffer zone, and other areas determined by the Commission.

Sign Requirements: The sign shall be 12 by 24 inches with the wording "Limits of Work" in the upper part of the sign and "Conservation Area" in the lower part of the

STANDARD ORDER OF CONDITIONS

Sign Requirements: The sign shall be 12 by 24 inches with the wording "Limits of Work" in the upper part of the sign and "Conservation Area" in the lower part of the sign in 3 inch letters. A sign prototype is available for view at the office of the Tewksbury Department of Planning and Conservation located at 999 Whipple Road, Tewksbury, Mass.

6. Prior to any earth moving activity, a row of staked hay bales backed by filter fabric fencing or 2 rows of staked hay bale filter (end to end) or two rows of filter fabric fencing (minimum 24" apart), shall be placed upgradient of the resource area along the limit of activity between all disturbed areas and the wetland. this shall also define the limit of activity down gradient of which no work shall take place. These erosion and siltation controls shall be maintained to insure their complete effectiveness for the duration of the project. Erosion controls shall remain in place until issuance of Certificate of Compliance or the Commission deems that prior removal of controls is appropriate.
7. The stormwater detention basin(s) shall be completely constructed and functional prior to the start of earthmoving on other portions of the project which generate runoff to the basin(s). A temporary outlet riser pipe or other similar structure shall be installed to allow the basin to function as a sedimentation basin and shall remain in place through construction until the area draining to the basin(s) has been fully stabilized.
8. Prior to removal of the outlet riser pipe or other similar structure from the detention basin(s), accumulated sediments shall be removed form the basin(s).
9. All disturbed or exposed soil surfaces shall be temporarily stabilized with hay, straw, mulch or any other protective covering and/or method approved by the U.S. Department of Agriculture Natural Resource Conservation Service.
10. Members and agents of the Tewksbury Conservation Commission shall have the right to enter and inspect the premises to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by this Commission for that evaluation.
11. The developer or contractor responsible for the project's completion shall be notified of, and understand, the requirement of this order. A copy of this order shall be on-site while activities regulated by this Order are being performed.
12. Upon completion of the project, the applicant shall submit with their request for a Certificate of Compliance an as-built site plan and an affidavit prepared by a professional engineer or any surveyor registered in the Commonwealth of Massachusetts stating that the site has been developed in accordance with the requirements of this Order of Conditions, based upon an on-site inspection and the referenced site plan.

STANDARD ORDER OF CONDITIONS

13. This Order shall apply to any successor in control or successor in interest of the property described in the Notice of Intent and accompanying plans.
14. All final earth gradings shall be permanently stabilized by the application of loamy textured topsoil and seed or sod unless otherwise approved by the commission.
15. The applicant or its successors shall notify the Conservation Commission 48 hours before any activity commences on the project in writing of the identity of the on-site construction supervisor hired to coordinate construction of the work on the site and to ensure compliance with this Order.
16. Commencing with the issuance of the Order, and continuing through the existence of same, the applicant shall submit to the Conservation Commission a written progress report every three months detailing what work has been completed in or near resource areas and what work is anticipated to be completed over the next period.
17. Field flags indicating the delineation of the bordering vegetated wetlands must be maintained for the duration of the project.
18. Prior to issuance of a Certificate of Compliance, the proponent shall submit the first annual stormwater report documenting actions undertaken to show compliance with the stormwater operation and maintenance plan. This condition applies to all projects required to maintain a written stormwater operation and maintenance plan. Annual reports shall be due 365 days from receipt of the previous submission.
19. Failure to obtain a Certificate of Compliance from the Tewksbury Conservation Commission upon completion of work and prior to expiration of the Order of Conditions shall result in a monetary fine of \$100.00 unless waived by the Commission.

TOWN OF TEWKSBURY
CONSERVATION COMMISSION

LOCAL PERMIT

ORDER OF CONDITIONS

DEP # 305- 708

MARCH 22, 2002

Said Conservation Commission Permit is hereby issued in accordance with the Tewksbury Town Bylaws Chapter 18.04 entitled Conservation Commission Wetlands Protection:

TO: TENNESSEE GAS PIPELINE COMPANY
Owner or Petitioner

ADDRESS: 9 GREEWAY PLAZA

CITY OR TOWN: HOUSTON, TX 77046

By the Town of Tewksbury Conservation Commission affecting the rights of the owner with respect to use of the premises located at:

<u>UTILITY EASEMENT</u>	<u>- REFERENCE</u>	<u>ABUTTER LIST</u>
Street	Map(s)	Lot(s)

TEWKSBURY
City Or Town

The decision of said Board is on file with the Office of Planning and Conservation located in the DPW Building, 999 Whipple Road, Tewksbury, MA 01876 This document shall be recorded at the North Middlesex Registry of Deeds by the landowner.

Certified this 22nd Day of MARCH 2002

Walter S. Polchlopek
Chairman, Director or Conservation Administrator



305-708

for DEP use only

WPA Form 5 - Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

A Applicant Information

From:

TEWKSBURY
Conservation Commission

The Notice of Intent for this project was filed on:

DECEMBER 20, 2001
Date

For:

305-708
Project File Number

The public hearing was closed on:

MARCH 6, 2002
Date

To:

TENNESSEE GAS PIPELINE CO
Applicant Name
9 GREENWAY PLAZA
Mailing Address
HOUSTON
City/Town
TX 77046
State Zip Code

Title and Date of final Plans and Other Documents:

DRACUT EXPANSION PROJECT
WETLAND SITE SPECIFIC DRAULIC
SCALE 1"=40' 11/14/01
PHILIP E BURROWS, PLS 357

The project site is located at:

TEWKSBURY
City/Town
UTILITY EASEMENT
Assessor's Map/Plot # Parcel #

and the property is recorded at the Registry of Deeds for:

MIDDLESEX
County Book Page

Certificate (if registered land)

B Findings

Findings pursuant to the Massachusetts Wetlands Protection Act:

Following the review of the above-referenced Notice of Intent and based on the information provided in this application and presented at the public hearing, this commission finds that the area in which work is proposed is significant to the following interests of the Wetlands Protection Act (check all that apply):

- ☐ Public Water Supply
- ☐ Private Water Supply
- ☐ Groundwater Supply
- ☒ Flood Control
- ☐ Land Containing Shellfish
- ☐ Fisheries
- ☐ Storm Damage Prevention
- ☒ Prevention of Pollution
- ☒ Protection of Wildlife Habitat

Furthermore, this Commission hereby finds that the project, as proposed, is:
(check one of the following boxes)

Approved subject to:

☒ The following conditions which are necessary, in accordance with the performance standards set forth in the wetlands regulations, to protect those interests checked above. This Commission orders that all the work shall be performed in accordance with the Notice of Intent referenced above, the following General Conditions, and any other special conditions attached to this Order. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, these conditions shall control.



Bureau of Resource Protection - Wetlands

WPA Form 5 - Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

B Findings (cont.)

Denied because:

the proposed work cannot be conditioned to meet the performance standards set forth in the wetlands regulations to protect those interests checked above. Therefore, work on this project may not go forward unless and until a new Notice of Intent is submitted which provides measures which are adequate to protect these interests, and a final Order of Conditions is issued.

the information submitted by the applicant is not sufficient to describe the site, the work, or the effect of the work on the interests identified in the Wetlands Protection Act. Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides sufficient information and includes measures which are adequate to protect the Act's interests, and a final Order of Conditions is issued. A description of the specific information which is lacking and why it is necessary is attached to this Order as per 310 CMR 10.05(b)(c)

General Conditions

1. Failure to comply with all conditions stated herein, and with all related statutes and other regulatory measures, shall be deemed cause to revoke or modify this Order
2. The Order does not grant any property rights or any exclusive privileges; it does not authorize any injury to private property or invasion of private rights.
3. This Order does not relieve the permittee or any other person of the necessity of complying with all other applicable federal, state, or local statutes, ordinances, bylaws, or regulations.
4. The work authorized hereunder shall be completed within three years from the date of this Order unless either of the following apply:
 - (a) the work is a maintenance dredging project as provided for in the Act; or
 - (b) the time for completion has been extended to a specified date more than three years, but less than five years, from the date of issuance. If this Order is intended to be valid for more than three years, the extension date and the special circumstances warranting the extended time period are set forth as a special condition in this Order.
5. This Order may be extended by the issuing authority for one or more periods of up to three years each upon application to the issuing authority at least 30 days prior to the expiration date of the Order.
6. Any fill used in connection with this project shall be clean fill. Any fill shall contain no trash, refuse, rubbish, or

debris, including but not limited to lumber, bricks, plaster, wire, lath, paper, cardboard, pipe, tires, ashes, refrigerators, motor vehicles, or parts of any of the foregoing.

7. This Order does not become final until all administrative appeal periods from this Order have elapsed, or if such an appeal has been taken, until all proceedings before the Department have been completed.
8. No work shall be undertaken until the Order has become final and then has been recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land upon which the proposed work is to be done. In the case of registered land, the Final Order shall also be noted on the Land Court Certificate of Title of the owner of the land upon which the proposed work is done. The recording information shall be submitted to this Conservation Commission on the form at the end of this Order, which form must be stamped by the Registry of Deeds, prior to the commencement of the work.
9. A sign shall be displayed at the site not less than two square feet or more than three square feet in size bearing the words:
 "Massachusetts Department of Environmental Protection"
 [or, "MA DEP"] "File Number"
305-708
Project File Number
10. Where the Department of Environmental Protection is requested to issue a Superseding Order, the Conservation Commission shall be a party to all agency proceedings and hearings before the Department.
11. Upon completion of the work described herein, the applicant shall submit a Request for Certificate of Compliance (WPA Form 8A) to the Conservation Commission.
12. The work shall conform to the following attached plans and special conditions:

Final Approved Plans (attach additional plan references as needed) DRACUT EXPANSION PROJECT

WETLAND SITE SPECIFIC DRAWING

NOVEMBER 14, 2001

PHILIP E BURROWS, PLS 35778
Signed and Stamped by

On file with



Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Wetlands

WPA Form 5 - Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

B Findings (cont.)

13. Any changes to the plans identified in Condition # 12 above shall require the applicant to inquire of the Conservation Commission in writing whether the change is significant enough to require the filing of a new Notice of Intent.

14. The Agent or members of the Conservation Commission and Department of Environmental Protection shall have the right to enter and inspect the area subject to this Order at reasonable hours to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by the Conservation Commission or Department for that evaluation.

15. This Order of Conditions shall apply to any successor in interest or successor in control of the property subject to this Order and to any contractor or other person performing work conditioned by this Order.

16. Prior to the start of work, and if the project involves work adjacent to a Bordering Vegetated Wetland, the boundary of the wetland in the vicinity of the proposed work area shall be marked by wooden stakes or flagging. Once in place, the wetland boundary markers shall serve as the limit of work (unless another limit of work line has been noted in the plans of record) and be maintained until a Certificate of Compliance has been issued by the Conservation Commission.

17. All sedimentation barriers shall be maintained in good repair until all disturbed areas have been fully stabilized with vegetation or other means. At no time shall sediments be deposited in a wetland or water body. During construction, the applicant or his/her designee shall inspect the erosion controls on a daily basis and shall remove accumulated sediments as needed. The applicant shall immediately control any erosion problems that occur at the site and shall also immediately notify the Conservation Commission, which reserves the right to require additional erosion and/or damage prevention controls it may deem necessary.

Special Conditions (Use additional paper if necessary)

Findings as to municipal law, bylaw, or ordinance

Furthermore, the

TEWKSBURY
Conservation Commission

hereby finds (check one that applies):

☐ that the proposed work cannot be conditioned to meet the standards set forth in a municipal law, ordinance, or bylaw, specifically

Name and citation of municipal law, bylaw, or ordinance

Therefore, work on this project may not go forward unless and until a revised Notice of Intent is submitted which provides measures which are adequate to meet these standards, and a final Order of Conditions is issued.

☒ that the following additional conditions are necessary to comply with a municipal law, bylaw, or ordinance, specifically TEWKSBURY

WETLAND PROTECTION BYLAW
Name and citation of municipal law, bylaw, or ordinance.

The Commission orders that all the work shall be performed in accordance with the said additional conditions and with the Notice of Intent referenced above. To the extent that the following conditions modify or differ from the plans, specifications, or other proposals submitted with the Notice of Intent, the conditions shall control.

Additional conditions relating to municipal law, bylaw, or ordinance:

STANDARD ORDER OF CONDITIONS
SEE ATTACHMENT



WPA Form 5 - Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

B Findings (cont.)

This Order is valid for three years, unless otherwise specified as a special condition pursuant to General Conditions #4, from the date of issuance.

Date MARCH 22, 2002

This Order must be signed by a majority of the conservation commission. The Order must be mailed by certified mail (return receipt requested) or hand delivered to the applicant. A copy also must be mailed or hand delivered at the same time to the appropriate regional office of the Department of Environmental Protection.

Signatures:

[Handwritten signatures of conservation commission members]

On this 22nd

day of MARCH

Month

2002

Year

before me personally appeared

LUCIO S. BARINELLI

to me known to be the person described in and who executed the foregoing instrument and acknowledged that he/she executed the same as his/her free act and deed.

[Handwritten signature of Notary Public]

Notary Public

4-12-07

My commission expires

This Order is issued to the applicant as follows:

☐ by hand delivery on

Date

☒ by certified mail, return receipt requested, on

Date

C Appeals

The applicant, the owner, any person aggrieved by this Order, any owner of land abutting the land subject to this Order, or any ten residents of the city or town in which such land is located, are hereby notified of their right to request the appropriate Department of Environmental Protection Regional Office to issue a Superseding Order of Conditions. The request must be made by certified mail or hand delivery to the Department, with the appropriate filing fee and a completed Appendix E, Request for Departmental Action Fee Transmittal Form, as provided in 310 CMR 10.03(7) within ten business days from the date of issuance of this Order. A copy of the request shall at the same time be sent by certified mail or hand delivery to the conservation commission and to the applicant, if he/she is not the appellant.

The request shall state clearly and concisely the objections to the Order which is being appealed and how the Order does not contribute to the protection of the interests identified in the Massachusetts Wetlands Protection Act (M.G.L. c. 131, §40 and is inconsistent with the wetlands regulations (310 CMR 10.00). To the extent that the Order is based on a municipal bylaw, and not on the Massachusetts Wetlands Protection Act or regulations, the Department of Environmental Protection has no appellate jurisdiction.



Department of Environmental Protection
Bureau of Resource Protection - Wetlands

WPA Form 5 - Order of Conditions

Massachusetts Wetlands Protection Act M.G.L. c. 131, §40

D Recording Information

This Order of Conditions must be recorded in the Registry of Deeds or the Land Court for the district in which the land is located, within the chain of title of the affected property. In the case of recorded land, the Final Order shall also be noted in the Registry's Grantor Index under the name of the owner of the land subject to the Order. In the case of registered land, this Order shall also be noted on the Land Court Certificate of Title of the owner of the land subject to the Order of Conditions. The recording information shall be submitted to the

TEWKSBURY
Conservation Commission

on the form below, which must be stamped by the Registry of Deeds

Detach on dotted line and submit to the Conservation Commission

To

Conservation Commission

Please be advised that the Order of Conditions for the project at

Project Location

DEP File Number

has been recorded at the Registry of Deeds of

County

and has been noted in the chain of title of the affected property in

Book

Page

in accordance with the Order of Conditions issued on

Date

If recorded land, the instrument number which identifies this transaction is

Instrument Number

If registered land, the document number which identifies this transaction is

Document Number

Signature of Applicant

STANDARD ORDER OF CONDITIONS

TEWKSBURY CONSERVATION COMMISSION

1. The Commission hereby designates the Tewksbury Conservation Commission Administrator as its administration agent, with full powers to administer and enforce this Order of Conditions.
2. No work shall commence on-site until all appeal periods have elapsed and this Order of Conditions has been recorded with the Registry of Deeds.
3. Any change(s) in the above-described plan, which will or may, cause an area subject to protection under the Wetlands Protection Act and/or Tewksbury Conservation Commission Wetland By-Law, to be altered, or any change(s) in activity subject to regulation under M.G.L. Chapter 131, Section 40, shall require the applicant to inquire of the Commission, in writing, whether the change(s) is significant enough to require the filing of a new Notice of Intent.
4. Prior to the start of work, the contractor shall meet at the site with representatives of the project proponent and the commission in order to develop a mutual understanding of the environmental protection requirements described in the Notice of Intent and Order of Conditions. At this time, the project proponent shall provide proof that the Order of Conditions was recorded at the Registry of Deeds. The Commission shall also view and approve all erosion and sedimentation control measures as proposed in the Notice of Intent or specified in the Order of Condition. Existing residential dwellings are exempt from this condition.
5. A Limits of Work – Conservation Area – sign approved by the Tewksbury Conservation Commission shall be installed so as to be visible every 75 feet along the Conservation Area as defined by the Conservation Commission on all approved projects. This installation includes commercial, industrial, multi-family, condominiums or single family residential subdivisions of two or more lots prior to any clearing and/or excavation except for natural resource evaluations such as, soil sampling, exploratory borings, surveying that are temporary, have negligible impacts and are necessary for planning and design purposes. Single family residential lots that are not part of a subdivision are exempt from this special condition.

The Conservation area is defined by the Tewksbury Conservation Commission as a no Disturbance Zone which includes the approved delineated wetland area, the buffer zone, and other areas determined by the Commission.

Sign Requirements: The sign shall be 12 by 24 inches with the wording "Limits of Work" in the upper part of the sign and "Conservation Area" in the lower part of the

STANDARD ORDER OF CONDITIONS

- Sign Requirements: The sign shall be 12 by 24 inches with the wording "Limits of Work" in the upper part of the sign and "Conservation Area" in the lower part of the sign in 3 inch letters. A sign prototype is available for view at the office of the Tewksbury Department of Planning and Conservation located at 999 Whipple Road, Tewksbury, Mass.
6. Prior to any earth moving activity, a row of staked hay bales backed by filter fabric fencing or 2 rows of staked hay bale filter (end to end) or two rows of filter fabric fencing (minimum 24" apart), shall be placed upgradient of the resource area along the limit of activity between all disturbed areas and the wetland, this shall also define the limit of activity down gradient of which no work shall take place. These erosion and siltation controls shall be maintained to insure their complete effectiveness for the duration of the project. Erosion controls shall remain in place until issuance of Certificate of Compliance or the Commission deems that prior removal of controls is appropriate.
 7. The stormwater detention basin(s) shall be completely constructed and functional prior to the start of earthmoving or other portions of the project which generate runoff to the basin(s). A temporary outlet riser pipe or other similar structure shall be installed to allow the basin to function as a sedimentation basin and shall remain in place through construction until the area draining to the basin(s) has been fully stabilized.
 8. Prior to removal of the outlet riser pipe or other similar structure from the detention basin(s), accumulated sediments shall be removed from the basin(s).
 9. All disturbed or exposed soil surfaces shall be temporarily stabilized with hay, straw, mulch or any other protective covering and or method approved by the U.S. Department of Agriculture Natural Resource Conservation Service.
 10. Members and agents of the Tewksbury Conservation Commission shall have the right to enter and inspect the premises to evaluate compliance with the conditions stated in this Order, and may require the submittal of any data deemed necessary by this Commission for that evaluation.
 11. The developer or contractor responsible for the project's completion shall be notified of, and understand, the requirement of this order. A copy of this order shall be on-site while activities regulated by this Order are being performed.
 12. Upon completion of the project, the applicant shall submit with their request for a Certificate of Compliance an as-built site plan and an affidavit prepared by a professional engineer or any surveyor registered in the Commonwealth of Massachusetts stating that the site has been developed in accordance with the requirements of this Order of Conditions, based upon an on-site inspection and the referenced site plan.

STANDARD ORDER OF CONDITIONS

13. This Order shall apply to any successor in control or successor in interest of the property described in the Notice of Intent and accompanying plans.
14. All final earth gradings shall be permanently stabilized by the application of loamy textured topsoil and seed or sod unless otherwise approved by the commission.
15. The applicant or its successors shall notify the Conservation Commission 48 hours before any activity commences on the project in writing of the identity of the on-site construction supervisor hired to coordinate construction of the work on the site and to ensure compliance with this Order.
16. Commencing with the issuance of the Order, and continuing through the existence of same, the applicant shall submit to the Conservation Commission a written progress report every three months detailing what work has been completed in or near resource areas and what work is anticipated to be completed over the next period.
17. Field flags indicating the delineation of the bordering vegetated wetlands must be maintained for the duration of the project.
18. Prior to issuance of a Certificate of Compliance, the proponent shall submit the first annual stormwater report documenting actions undertaken to show compliance with the stormwater operation and maintenance plan. This condition applies to all projects required to maintain a written stormwater operation and maintenance plan. Annual reports shall be due 365 days from receipt of the previous submission.
19. Failure to obtain a Certificate of Compliance from the Tewksbury Conservation Commission upon completion of work and prior to expiration of the Order of Conditions shall result in a monetary fine of \$100.00 unless waived by the Commission.

Tennessee Gas Pipeline

ADMINISTRATIVE/LEGAL CONDITIONS:

- 1 Plan Reference: Plan Reference: Sheet 1 "Dracut Expansion Project, Line No. 270B-100, 24" Replacement", Middlesex County, Massachusetts, prepared by Tennessee Gas Pipeline Engineering Department, dated February, 2000, revised February, 2001 (FERC Filing), unstamped; Sheet 2 "Dracut Expansion Project, Wetland Site Specific Drawing, Wetlands BU-1 & BU-2", Middlesex County, Massachusetts, prepared by Killam Associates New England, dated 11/12/01, stamped by Philip E. Burrows, P.L.S. 11/12/01; Sheet 3 "Dracut Expansion Project, Wetland Site specific Drawing, Wetland BU-3", Middlesex County, Massachusetts, prepared by Killam Associates new England, dated 11/9/01, stamped by Philip E. Burrows, P.L.S. 11/9/01; Sheet 4 "Dracut Expansion Project, Wetland Site Specific Drawing, Wetland BU-4", Middlesex County, Massachusetts, , prepared by Killam Associates new England, dated 11/9/01, stamped by Philip E. Burrows, P.L.S. 11/9/01; "Environmental Construction Plan – Dracut Expansion Project" dated February 2, 2001, revised January 18, 2002; "Upland Erosion Control, Revegetation, and Maintenance Plan" FERC Office of Pipeline Regulation, dated 12/2/94; "Wetland and Waterbody Construction and Mitigation Procedures" FERC Office of Pipeline Regulation, dated 12/2/94.
2. The proposed activity shall comply with the above referenced plan(s) and record documents except as conditioned herein. No change shall be made without formal action by the Conservation Commission allowing the change. The Commission shall make no ruling on any proposed changes until the applicant has submitted a written request for the Commission to make a formal determination on whether the change will require filing a new Notice of Intent. A copy of this request shall be sent to the Department of Environmental Protection's Northeast Regional Office. A new Public Hearing, at the expense of the applicant, shall then be required to amend this Order or if necessary to issue a new Order. No work involving the change(s) shall be done until a new or amended Order has been issued and all appeal periods have expired. It is the responsibility of the Applicant to make sure that any changes accepted by or required by the Conservation Commission are reflected in plans held by other Town departments. Any errors in the plans or information submitted by the applicant shall be considered changes and the above procedures shall be followed.
3. This document shall be included in all construction contracts and subcontracts dealing with the construction and shall supersede any conflicting contract requirements. A copy of this Order shall be provided to any person doing work on the site and shall be available on the site at all times during construction. Site inspections conducted by Commissioners or the Conservation Administrator shall check for the availability of this Order at the site.

4. This Order permits work within bordering vegetated wetlands, inland bank, streams, riverfront area and within the 100-foot buffer zone. No other work has been permitted by this decision.
5. This Order shall be deemed invalid if any of the information provided to the Commission at the time of the hearing is found to be incorrect.
6. The applicant and successors in title, and project engineers shall be responsible for any damage to other properties as a result of this construction. The project designer shall be responsible for any damage to the property of others as a result of construction done in conformance with the project design.
7. By acceptance of this Order of Conditions and commencement of work authorized herein, the applicant, owner, and their respective agents, assign, and successors in title agree to indemnify, defend and hold harmless the town for any damages that might occur on or off the subject property, or any legal claims which may be attributable to any alterations undertaken or construction performed on the subject property pursuant to this Order of Conditions. Issuance of this Order does not in any way imply or certify that the subject property or downstream or adjacent properties will not be subject to flooding, storm damage, or any other form of water damage that might result from alterations undertaken or construction performed on the subject property pursuant to this Order of Conditions.
8. The applicant shall post a cash instrument for \$90,000.00 to be held in an interest bearing account to guarantee successful restoration of impacted wetland areas. The bond shall be held in the full amount without periodic partial release until the Commission grants a Certificate of Compliance for the project.
9. The applicant will provide funding for a third party environmental monitor to work on behalf of the Conservation Commission until all construction related activities, including restoration, are complete. Prior to construction, the applicant will post a retainer of \$7800.00 for the services of the inspector. This retainer amount assumes one inspection and documentation per week, 10 hours per week, for a 12-week construction duration. The applicant shall replenish the retainer fund as necessary through the project. This retainer is not an upset limit or fixed fee. The balance of money on account will be returned to the applicant at the conclusion of the construction phase, including restoration.
10. The environmental monitor shall check in with the project environmental inspector or project safety inspector before entering the project site.
11. The applicant will provide funding for a third party environmental monitor to monitor the restoration until the Certificate of Compliance is issued by the Commission. The amount of time for this activity is estimated to be 20 hours per season.

12. Timesheets documenting inspection time and dates shall be submitted to the Department of Community Development by the third party environmental monitor. Payment by the applicant shall occur prior to issuing a Certificate of Compliance.
13. The applicant will provide the names and contact numbers of the person responsible for day-to-day oversight and stop work authority on the project.
14. The Tennessee Environmental Inspector shall notify the Conservation Commission immediately upon discovering any deviations from the construction methodology described in the application, or any unauthorized activity or discharge of fill in wetlands, buffer zone or riverfront area.
15. The Environmental Inspector has the authority to stop work in the event of a non-compliance event.
16. The Conservation Commission or its agents have the right to enter the properties or work areas to inspect the site to evaluate compliance with this permit.

PRE-CONSTRUCTION CONDITIONS:

17. Wildlife Habitat Evaluation - Before any construction activity on the project site, an evaluation of whether the project will have an adverse effect on wildlife habitat or habitat of rare species shall be performed by the applicant pursuant to 310 CMR 10.60; the wildlife habitat evaluation will be reviewed at the applicants expense by an independent third party chosen by the Commission; if it is determined that the project will have an adverse effect on wildlife habitat or the habitat of rare species beyond permissible thresholds, then this Order of Conditions is revoked and the Commission will require the filing of a new Notice of Intent.
18. The Conservation Commission shall receive written notice, by the applicant, or a duly authorized representative, not less than two nor more than five business days prior to the commencement of any activity on the site.
19. In the event that work ceases on the site for a period of time greater than five business days and inspections required by this Order are stopped, this condition shall again apply prior to recommencing work on the site. All conditions requiring additional information prior to commencing construction shall be met prior to submitting this notice.
20. Prior to commencing any construction activities, the applicant shall have the limit of the 100-foot buffer zone and the 200-foot riverfront area (where applicable)

marked in the field. In the event that the boundaries of these areas extend off-site, marking of such areas will not be required.

21. Prior to commencing any activities within jurisdictional areas (with the exception of installing sediment and erosion controls), the applicant and environmental inspector(s) shall meet with Conservation Staff to review this Order of Conditions. At or before this meeting, the applicant shall provide the Conservation Department with the following;

- evidence that the Order has been filed at the Registry of Deeds;
- list containing the names, addresses, business and home telephone numbers of the project supervisors who will be responsible for ensuring on-site compliance with this Order;
- set of photographs depicting the project site in pre-construction condition
- dewatering plan.

In addition, the Conservation Staff will check for the presence of the following items at the time of this site visit:

- sign displaying the project's DEP File number posted in a visible location (not on a live tree);
- oil spill containment kit;
- extra erosion controls (haybales, stakes, sediment fence) stored in an unexposed location or covered;
- portable toilet or other bathroom facilities accessible to work crews;
- field marking of buffer zone/riverfront area;
- dumpster (if required).

No work shall be permitted in areas subject to the Commission's jurisdiction until each of the above (10) items has been provided to the satisfaction of the Conservation Staff. Failure to comply with this condition shall result in the issuance of an enforcement order and/or the imposition of non-criminal penalties as allowed by Town of Tewksbury Wetland Bylaws

22. Tennessee shall provide the Commission with a contact list, including an environmental hotline, prior to the start of construction.

23. Well Yield and Quality (FERC Condition 11) Prior to construction, Tennessee shall file with the Commission the location, by milepost, of all private wells within 150 feet of the construction activities. Tennessee shall conduct, with the well owner's permission, pre- and post-construction monitoring of well yield and water quality for these wells. Within 30 days of placing the facilities in service, Tennessee shall file a report with the Commission discussing whether any complaints were received concerning well yield or water quality and how each was resolved.

24. Hazardous and Solid Waste Sites (FERC Condition 20) Tennessee shall submit copies of the evaluations of the 21 identified potential hazardous and solid waste sites. Tennessee shall forward to the Commission the Secretary's written approval before any construction activities in these areas.

25. The two isolated wetlands identified as TE-6 and TE-7 will be surveyed in the Spring of 2002 by the applicant's wildlife biologist to determine the presence or absence of breeding vernal pool species. The results of this survey shall be presented to the Commission for review and comment prior to the commencement of construction activities. The Environmental Inspector shall monitor these areas each morning prior to the start of construction to determine the presence of any individuals of obligate vernal pool species. All individuals located shall be removed from the workspace and placed into appropriate habitat adjacent to the area where found. Post-construction restoration and monitoring of these wetlands shall be performed to ensure that the vernal pool habitat continues to provide this important habitat.

EROSION/SEDIMENT CONTROL CONDITIONS:

26. Additional erosion controls shall be installed along the east and west side of right of way between Chapman Road and Keyspan facility. Identified on the site-specific plan as WL TE-2A and WL TE-2B.
27. The two additional wetlands identified on the site-specific plans as WL TE-8A and WL TE-8b shall have appropriate erosion controls installed. These wetlands shall be restored in accordance with the specifications provided with the Notice of Intent.
28. Erosion controls shall be extended along the east side of the right of way from WL TE-15 north to connect with those associated with WL TE-16 near Sunnyslope Avenue.
29. Erosion controls shall be extended along the east side of the right of way from WL TE-7 south to connect with those associated with WL TE-5.
30. Prior to commencing any construction activities within jurisdictional areas, erosion controls shall be installed in the location noted on the reference plans. Sediment barriers shall be installed by hand (unless otherwise approved by the Conservation Commission and/or Administrator) and shall thereafter be inspected and approved by the Conservation Commission or Conservation Administrator. Sediment barriers shall include, but not be limited to, haybales and sediment filter fabric fence. Each haybale shall be bound with organic twine (rope), staked with at least two 1" x 1" wooden (oak) stakes, and properly backfilled at least 3". The sediment filter fabric fence shall be staked and properly backfilled at least 3". If grading within the buffer zone and/or a resource area will be done on slopes steeper than 2:1 or within 5' of the sediment barriers, the sediment barriers shall be protected by installing a snow fence on the uphill side of slopes. The sediment barriers shall be maintained in good condition at all times until the Conservation

Commission has issued a Certificate of Compliance or has formally found the area to be permanently stabilized and the barriers no longer necessary.

31. The applicant shall adhere to the specifications outlined in (1) "Environmental Construction Plan – Dracut Expansion Project" originally dated February 2, 2001 and updated January 18, 2002; (2) "Upland Erosion Control, Revegetation, and Maintenance Plan" FERC Office of Pipeline Regulation, dated 12/2/94; and (3) "Wetland and Waterbody Construction and Mitigation Procedures" FERC Office of Pipeline Regulation, dated 12/2/94; except as modified by conditions herein. Each of the above plans are included with the Notice of Intent submitted by the Tennessee Gas Pipeline Company in November, 2001.
32. Monitoring by a trained environmental inspector shall be conducted in accordance with FERC requirements, and the weekly reports for work within jurisdictional areas – required under FERC approval – shall be submitted (in a timely manner) to the Conservation Commission for review. In the event that the reports do not provide adequate information to determine if resource areas are being adversely impacted, the Conservation Commission reserves the right to require additional reports/information.
33. Trees removed from the wetlands and/or the buffer zone shall be disposed of off-site in a legal manner. Records shall be kept documenting compliance with this condition.
34. Chipping of vegetation within wetland resource areas is prohibited.
35. At the end of each workday, the applicant shall mechanically sweep or manually sweep sediments from the adjacent streets, unless tracking and sediment is not evident on the streets.
36. The Tewksbury Conservation Commission reserves the right to require additional erosion and/or damage prevention controls if deemed necessary. These may be required by the Conservation Administrator, Conservation Assistant, or the Conservation Commission at any time when deemed appropriate.

POLLUTION CONTROL (including REFUELING OPERATIONS):

37. Any sediment, debris, or other materials that fall into or enter resource areas during construction activities shall be immediately removed by hand. This condition shall be noted on the Certificate of Compliance relative to the permanent easement. (Note: Temporary workspace reverts to landowner upon completion of construction).

38. Refueling and/or maintenance of machinery shall not be permitted within jurisdictional areas. The applicant shall post "No Refueling" signs to prevent such activity from occurring within resource areas or the buffer zone.
39. Trench breakers shall be installed at the entrance and exit points within vegetated wetlands as well as every 100' along the pipeline trench within wetlands greater than 100 feet in length.
40. A manifest or bill, as applicable, shall be kept by the applicant documenting the legal disposal of excavated materials, building debris, concrete, asphalt, and/or other materials removed from the work area including that material removed in dumpsters.

OTHER:

41. Weekly Report (FERC Condition 8) Tennessee shall submit a copy of the weekly status reports referred to in FERC License CP01-360-000 Appendix A Condition 8, to the Commission on a weekly basis until all construction related activities, including restoration, are complete.
42. In addition, Tennessee shall supply to the Commission on a weekly basis documentation on the destination and amount of any material removed from the project site.
43. If the Environmental Inspector encounters (1) an unforeseen problem which affects or may affect any of the interests identified in MGL Ch. 131 S. 40 or the Tewksbury Wetlands By-law (including, but not limited to unforeseen soil conditions, blasting, etc.) and/or (2) a significant violation of any wetlands related conditions, (s)he shall notify the Conservation Department within 24-hours of such an event. Following notification, the Commission may require an immediate meeting between the Commission, applicant, environmental inspector and contractor to determine whether any measures should be taken to resolve the problem or to protect the interests of the Act. If so, the precise measures should be identified and the applicant shall undertake such measures that may be required by the Conservation Commission.
44. No invasive plant species shall be used as part of any plantings proposed as part of this project within the Commission's jurisdiction. A list of invasive plant species may be obtained from the Conservation Commission office.
45. Following construction through wetlands, all disturbed wetland areas shall be restored to original contours and flow regimes and seeded with a wetland seed mix (not an erosion control mix or "conservation mix") containing species that are

indigenous to the area and suitable for the hydroregime anticipated at each wetland site. Seeded areas shall be lightly mulched with straw.

46. The applicant shall be responsible for the control of invasive species in the restored wetland areas.
47. Following restoration, the applicant shall monitor the progress of the wetland restoration areas annually and report on the progress to the Commission by October 1 of each year the permit is in effect or until the issuance of a Certificate of Compliance. In accordance with the Environmental Construction Plan monitoring requirements, if a wetland area is not showing signs of re-establishment during the first growing season following construction, the applicant shall develop and implement a plan to revegetate the wetlands with native species. This plan is subject to approval of the Conservation Commission prior to implementation.
48. At the conclusion of the project, the applicant shall submit a Request for Certificate of Compliance with as-built plans showing the original limit of wetlands, the as-built limit of wetlands as located in the field, limit of disturbance through the wetlands, denote the permanent right of way clearing versus the temporary work space areas to be allowed to revegetate naturally. The Request shall document extent of vegetation coverage through each wetland area, provide an estimate of species diversity within the restored wetlands and documentation of the presence of invasive species including purple loosestrife, glossy buckthorn, and common reed in or adjacent to the restoration area.
49. Tennessee shall expedite the pipeline installation in the vicinity of the active beaver dam and lodge near wetland TE15 and TE16.
50. The Conservation Commission will not consider issuing a Certificate of Compliance until the following items are submitted to, and accepted by, the Commission:
 - A written narrative prepared by the applicant or their representative certifying – under the pains and penalties of perjury and based on input from environmental inspectors – that the proposed work was conducted in compliance with the conditions contained in this Order and approved plans referenced above. The narrative shall discuss any deviations that exist, and their potential and/or realized impacts on resource areas. No deviation from the Order is permitted without formal action being taken by the Conservation Commission approving the change. The narrative shall list each condition and what evidence constitutes the certification of compliance with the condition.
 - Post-construction photographs demonstrating compliance with this Order including established vegetation where required.

To: Tewksbury
Conservation Commission

Please be advised that the Order of Conditions for the project
at _____
Project Location DEP File Number 305-208

has been recorded at the Registry of Deeds of
Middlesex
County

and has been noted in the chain of title of the affected property
in 1448
Book
414
Page

in accordance with the Order of Conditions issued on
March 22, 2002
Date

If recorded land, the instrument number which identifies this
transaction is

25853
Instrument Number

If registered land, the document number which identifies this
transaction is

Document Number

Signature of Applicant

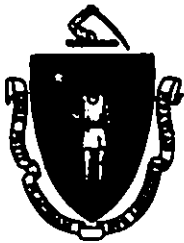
RECEIVED PAYMENT
WITH DEEDS
Richard P. Howe, Jr., Register
Nadine



***State MEPA Certificate
MA Executive Office of Environmental Affairs***

**COLER &
COLANTONIO[®]**

ENGINEERS AND SCIENTISTS



The Commonwealth of Massachusetts

Executive Office of Environmental Affairs

251 Causeway Street, Suite 900

Boston, MA 02114-2119

MITT ROMNEY
GOVERNOR

KERRY HEALEY
LIEUTENANT GOVERNOR

ELLEN ROY HERZFELDER
SECRETARY

Tel. (617) 626-1000
Fax (617) 626-1181
<http://www.mass.gov/envir>

October 16, 2003

CERTIFICATE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS ON THE FINAL ENVIRONMENTAL IMPACT REPORT

PROJECT NAME:	Tewksbury & Andover Lateral Pipeline Project
PROJECT MUNICIPALITY:	Tewksbury & Andover
PROJECT WATERSHED:	Shawsheen River
EOEA NUMBER:	12956
PROJECT PROPONENT:	Tennessee Gas Pipeline Company
DATE NOTICED IN MONITOR:	September 9, 2003

As Secretary of Environmental Affairs, I hereby determine that the Final Environmental Impact Report (FEIR) submitted on this project **adequately and properly complies** with the Massachusetts Environmental Policy Act (M.G.L. c. 30, ss. 61-62H) and with its implementing regulations (301 CMR 11.00).

Project Description

The project involves the construction of approximately 5 miles of 6" or 8" high-pressure natural gas pipeline in Tewksbury and Andover, and a new meter station, to provide a new and uninterrupted supply of natural gas to the Wyeth-Genetic facility located in Andover. Using open cut construction, the proposed new pipeline will begin at the Tennessee Concord Lateral located in the western portion of the project site, and extend in an easterly direction, parallel to the Boston & Maine Railroad line, for approximately .7 miles through undeveloped private property. Most of the proposed pipeline (approximately 4 miles) will be located within an existing 250-foot wide utility easement, owned and maintained by the New England Power Company (NEPCO), which crosses a number of local roads and residential properties.

EOEA #12956

FEIR Certificate

10/16/03

As described in the Expanded ENF (EENF), the proponent proposes to bore under two local roads (Carter Street, East Street) that are located in a predominantly industrial area in Tewksbury. The proponent proposes to employ Horizontal Direction Drilling (HDD) to install approximately ½ mile of new pipeline beneath the Shawsheen River and Interstate Highway 93 in Andover. The new pipeline will terminate at the proposed regulator station to be located at the Wyeth-Genetic facility in Andover.

The FEIR has generally responded adequately and resolved many of the remaining issues outlined in the Certificate in the DEIR. The Certificate on the Draft EIR required the proponent to structure the Final EIR as a response to comments document provided that the proponent include additional narrative or technical analysis as necessary to respond to the remaining issues pertaining to the project's impacts to wetlands, impacts to rare species, historical and archeological resources impacts, and mitigation commitments.

Wetlands Resources

The proposed project has been designed to comply with the Federal Regulatory Commission's (FERC) Upland Erosion Control, Revegetation and Maintenance Plan, and Wetland and Waterbody Construction and Mitigation Procedures (FERC Plan and Procedures) for the installation of natural gas pipeline projects. As described in the FEIR, the proponent has committed to restore topsoil and contour elevations to promote the reestablishment of hydrophytic vegetation within construction corridor.

Rare Species

The proponent has completed rare wildlife and plant surveys. All rare turtles will be tracked using radio-telemetry. According to the information contained in the FEIR, the Natural Heritage and Endangered Species Program (NHESP) has determined that the proponent's proposed impact avoidance/minimization procedures are sufficient to avoid adverse impacts to rare species and rare species habitat located within the project corridor.

EOEA #12956

FEIR Certificate

10/16/03

Historical / Archeological Resources

According to comments received by the Massachusetts Historical Commission (MHC) on the FEIR, no significant historic or archaeological resources were identified in the project area, and the Great Swamp Native American Site and the Meadow Brook Marsh Native American Site do not meet the eligibility criteria for listing in the National and State registers of Historic Places.

Article 97 Lands

As described in the FEIR, the proponent has received approval from the Town of Tewksbury for locating portions of the proposed pipeline within 3 parcels of undeveloped Article 97 land (Lot #35 - off Whitegate Road, Lot #42 - Bligh Street, Lot #34 - Bradford Road). As part of the proponent's easement agreement with the Town of Tewksbury, the proponent has committed to restoring the temporary impacts to Lots 34, 35 and 42 to pre-construction conditions. These temporarily impacted areas will continue to remain as protected open space.

Construction Period Impacts/Coordination

The construction period will be the major source of impacts from the project, including impacts from earth moving, impacts to vegetation, potential impacts from erosion and sedimentation, impacts to private property and adjacent land uses, and traffic impacts on adjacent roadways. As described in the FEIR, the proponent has committed to reseeding and replanting those portions of the construction corridor located adjacent to residential properties, Article 97 lands, and endangered species habitat, with appropriate native species of grasses, woody shrubs and trees. The proponent should continue to consult with the Tewksbury Conservation Commission during project construction.

All construction-related refueling and equipment maintenance activities should be conducted under cover on impervious surface areas with containment, and outside of any wetlands resource areas, endangered species habitat areas, residential areas and wellhead protection areas. The proponent should require its contractors to retrofit diesel-powered equipment with emissions controls, such as particulate filters or traps, and use low-sulfur diesel fuel pursuant to DEP's Clean Construction Equipment Initiative.

EOEA #12956

FEIR Certificate

10/16/03

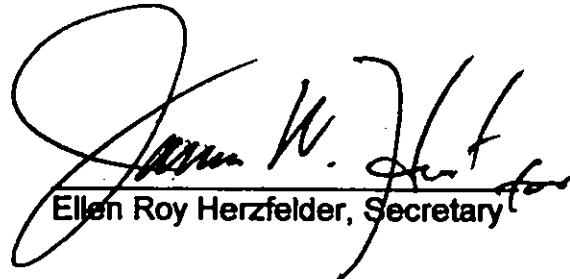
Mitigation

The proponent and state agencies should forward copies of the final Section 61 Findings to the MEPA Office for completion of the file.

I am satisfied that the project has avoided and mitigated environmental impacts to the extent feasible, and that the state permitting agencies have adequate information to base their permit decisions, and sufficient permitting authority to ensure that any remaining issues are adequately addressed.

October 16, 2003

DATE



Ellen Roy Herzfelder, Secretary

Comments received:

10/10/03 Northern Middlesex County of Governments (NMCOG)

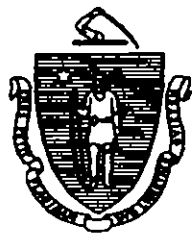
FEIR #12956
ERH/NCZ/ncz



***State 401 Water Quality Certificate
MA Department of Environmental Protection***

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ENGINEERS AND SCIENTISTS



COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Metropolitan Boston – Northeast Regional Office
ONE WINTER STREET, BOSTON, MA 02108 617-654-6500

MITT ROMNEY
Governor

KERRY HEALEY
Lieutenant Governor

ELLEN ROY HERZFELDER
Secretary

ROBERT W. GOLLEDGE, Jr.
Commissioner

November 19, 2003

Brant Johnson
Tennessee Gas Pipeline Company
9 Greenway Plaza
Houston, TX 77046

Transmittal # W034128
DEP File # 305-738
EOEA # 12956
DEP Project Code - ASPTA

RE: WATER QUALITY CERTIFICATION
Application for: BRPWW10
MAJOR FILL AND EXCAVATION PROJECTS

AT: Tewksbury-Andover Lateral Project
Natural Gas Pipeline Project
Various locations in Tewksbury and Andover, MA

Dear Mr. Johnson:

The Department of Environmental Protection (the "Department") has reviewed your application for Water Quality Certification, as referenced above. In accordance with the provisions of MGL c.21, §§26-53 and Section 401 of the Federal Clean Water Act as amended (33 U.S.C. §1251 et seq), it has been determined there is reasonable assurance the proposed project will be conducted in a manner which will not violate applicable water quality standards (314 CMR 4.00) and other applicable requirements of state law.

The Tewksbury-Andover Lateral Project (the "project") being proposed by the Tennessee Gas Pipeline Company ("Tennessee") involves the construction of approximately 5.1 miles of 8 inch diameter natural gas pipeline in Tewksbury and Andover to provide a new and uninterrupted supply of natural gas to the Wyeth-Genetic facility located in Andover. The project will begin at an interconnect with the existing Concord Lateral in Tewksbury and terminate at Wyeth's facility. The majority of the pipeline (approximately 4 miles) will be located within an existing 250-foot wide right-of-way ("ROW") owned and maintained by the New England Power Company ("NEPCO"). Alteration to waters of the Commonwealth (including wetlands) will total approximately 7.21 acres (see Table 1 attached).

A Notice of Intent has been filed and an Order of Conditions issued pursuant to the Massachusetts Wetland Protection Act (Ch. 131, § 40) for the proposed wetland impacts in Tewksbury (the project will not alter any wetlands in Andover). Additionally, the project has undergone extensive review and alternatives analysis through the Federal Energy Regulatory Commission ("FERC") and Massachusetts Environmental Policy Act ("MEPA") processes. The Massachusetts Secretary of Environmental Affairs issued a Certificate on the Final Environmental Impact Report (EOEA #12956) on October 16, 2003, indicating that the permitting agencies had adequate information on which to base their decisions and sufficient permitting authority to address any remaining issues.

Based on the extensive information currently in the record and on observations made during a site inspection conducted on August 7, 2003, the Department determines that the project meets the criteria of 314 CMR 9.06 and grants a Water Quality Certification subject to the following conditions to maintain water quality, to minimize impact on waters and wetlands, and to ensure compliance with appropriate state law:

1. This project could result in a violation of the water quality standards adopted by the Massachusetts Division of Water Pollution Control. Therefore, reasonable care and diligence shall be taken by the contractor to assure that the proposed activity will not violate Class B standards [314 CMR 4.05(3)(b) and 4.05(5)].
2. All work shall be in accordance with the following documents and plans:
 - Application for Water Quality Certificate received January 21, 2003, Transmittal Form # W034128 with attachments.
 - Tennessee Gas Pipeline, Tewksbury-Andover Lateral Project, List of Plan References:

Alignment Sheets

<u>Date</u>	<u>Title</u>	<u>Reference</u>
05/03	Proposed Natural Gas Pipeline – 8" Tewksbury/Andover Lateral Town of Tewksbury – Middlesex County, Massachusetts	TE-E12-270B-600-1
05/03	Proposed Natural Gas Pipeline – 8" Tewksbury/Andover Lateral Town of Tewksbury – Middlesex County, Massachusetts	TE-E12-270B-600-2
05/03	Proposed Natural Gas Pipeline – 8" Tewksbury/Andover Lateral Town of Tewksbury – Middlesex County, Massachusetts	TE-E12-270B-600-3
05/03	Proposed Natural Gas Pipeline – 8" Tewksbury/Andover Lateral Town of Tewksbury – Middlesex County, Massachusetts	TE-E12-270B-600-4
05/03	Proposed Natural Gas Pipeline – 8" Tewksbury/Andover Lateral Town of Tewksbury – Middlesex County, Massachusetts	TE-E12-270B-600-5
05/03	Proposed Natural Gas Pipeline – 8" Tewksbury/Andover Lateral Town of Tewksbury – Middlesex County, Massachusetts	TE-E12-270B-600-6

Wetland Site-Specific Drawings

<u>Date</u>	<u>Title</u>	<u>Reference</u>
01/03	Proposed Natural Gas Pipeline – 6" or 8" Tewksbury/Andover Lateral Wetland Site Specific	DWG. WETLAND_1
01/03	Proposed Natural Gas Pipeline – 6" or 8" Tewksbury/Andover Lateral Wetland Site Specific	DWG. WETLAND_2
01/03	Proposed Natural Gas Pipeline – 6" or 8" Tewksbury/Andover Lateral Wetland Site Specific	DWG. WETLAND_3
01/03	Proposed Natural Gas Pipeline – 6" or 8" Tewksbury/Andover Lateral Wetland Site Specific	DWG. WETLAND_4A
01/03	Proposed Natural Gas Pipeline – 6" or 8" Tewksbury/Andover Lateral Wetland Site Specific	DWG. WETLAND_4B
01/03	Proposed Natural Gas Pipeline – 6" or 8" Tewksbury/Andover Lateral Wetland Site Specific	DWG. WETLAND_5-6-7
01/03	Proposed Natural Gas Pipeline – 6" or 8" Tewksbury/Andover Lateral Wetland Site Specific	DWG. WETLAND_8-9A
01/03	Proposed Natural Gas Pipeline – 6" or 8" Tewksbury/Andover Lateral Wetland Site Specific	DWG. WETLAND_9B
01/03	Proposed Natural Gas Pipeline – 6" or 8" Tewksbury/Andover Lateral Wetland Site Specific	DWG. WETLAND_9C-10-11
01/03	Proposed Natural Gas Pipeline – 6" or 8" Tewksbury/Andover Lateral Wetland Site Specific	DWG. WETLAND_12-13
01/03	Proposed Natural Gas Pipeline – 6" or 8" Tewksbury/Andover Lateral Wetland Site Specific	DWG. WETLAND_14-15
01/03	Proposed Natural Gas Pipeline – 6" or 8" Tewksbury/Andover Lateral Wetland Site Specific	DWG. WETLAND_16
01/03	Proposed Natural Gas Pipeline – 6" or 8" Tewksbury/Andover Lateral Wetland Site Specific	DWG. WETLAND_17A
01/03	Proposed Natural Gas Pipeline – 6" or 8" Tewksbury/Andover Lateral Wetland Site Specific	DWG. WETLAND_17B
01/03	Proposed Natural Gas Pipeline – 6" or 8" Tewksbury/Andover Lateral Wetland Site Specific	DWG. WETLAND_18-19
01/03	Proposed Natural Gas Pipeline – 6" or 8" Tewksbury/Andover Lateral Wetland Site Specific	DWG. WETLAND_20

Wetland Site-Specific Drawings (Continued)

<u>Date</u>	<u>Title</u>	<u>Reference</u>
01/03	Proposed Natural Gas Pipeline – 6" or 8" Tewksbury/Andover Lateral Wetland Site Specific	DWG. WETLAND_21A
01/03	Proposed Natural Gas Pipeline – 6" or 8" Tewksbury/Andover Lateral Wetland Site Specific	DWG. WETLAND_21B

3. All work within Tewksbury shall conform to the following listed Order of Conditions issued pursuant to the Massachusetts Wetlands Protection Act (M.G.L. Chapter 131, § 40) unless otherwise conditioned herein or specified in writing by the Department:

- Order for DEP File # 305-738 issued by the Tewksbury Conservation Commission, dated September 18, 2003.

4. Wetland restoration areas shall be monitored annually for 5 years. A wetland scientist shall supervise all wetland restoration activity and shall perform monitoring and reporting. Copies of all reports shall be sent to both the Department and the Tewksbury Conservation Commission. Photographic stations shall be selected in the restoration areas where photographs shall be taken of pre-existing baseline conditions and then during each subsequent monitoring inspection and submitted with the reports. Transects or plots shall be established for monitoring the vegetative cover of the adjacent areas (control stations) and the restoration areas. The monitoring report shall specifically and comprehensively describe functions and conditions in the restoration areas and provide conclusions about the success of revegetation, substrate replacement, and wildlife habitat. For five full growing seasons, the monitoring schedule shall provide reports that shall be submitted twice each growing season with the first report covering the beginning of the growing season submitted no later than July 30th and the second report covering the end of the growing season submitted no later than November 30th. Wetland restoration will be considered successful if:

- The wetland supports at least 80 percent total cover with native wetland species,
- At least half of the indigenous species occurring in each wetland prior to construction will occur in each wetland following restoration, and
- If non-nuisance vegetation is similar in density and cover to adjacent undisturbed lands, based on representative random sampling in the field.

If any of these parameters are not met by the end of three years of monitoring, a remedial revegetation plan will be developed, submitted to the Department for approval, and implemented as finally approved.

5. The Department shall be notified of any changes in plans affecting waters or wetlands. The Department will determine whether the change(s) requires a revision to this Certification.

6. Prior to the start of work, the applicant shall provide the Department with the name, address and phone number(s) of the person responsible for ensuring that all work complies with the conditions of this Water Quality Certification.

Section 61 Findings: Pursuant to M.G.L. Chapter 30, Sections 61 to 62H inclusive (M.E.P.A.) the project, as referenced in Water Quality Certification Application, DEP Transmittal # W034128, was required to file a Draft Environmental Impact Report ("DEIR") pursuant to the implementation of the Massachusetts Environmental Policy Act adopted by the Secretary of Environmental Affairs (the "Secretary"). Tennessee filed the DEIR for the construction of the project under EOEPA # 12956 and noticed in the Environmental Monitor on June 10, 2003. The Certificate issued on July 17, 2003 for the DEIR stated that the project adequately and properly complied with MEPA and its implementing regulations and that it could advance to the Final Environmental Impact Report ("FEIR") stage. The Secretary allowed Tennessee to structure the FEIR as a "response to comments document, provided that the proponent [Tennessee] includes additional narrative or technical analysis as necessary to respond to remaining issues identified in this Certificate and the comments received." Tennessee filed the FEIR and noticed in the Environmental Monitor on September 9, 2003. In the Certificate issued on October 16, 2003, the Secretary determined that "the FEIR has generally responded adequately and resolved many of the remaining issues outlined in the Certificate in the DEIR" and that Tennessee "has avoided and mitigated environmental impacts to the extent feasible, and that the state permitting agencies have adequate information to base their permit decisions, and sufficient permitting authority to ensure that any remaining issues are adequately addressed." Based on the avoidance measures, minimization measures, and mitigation measures, and the efforts as described in Tennessee's filings, the Department adopts certain Section 61 Findings proposed by Tennessee, as modified by the Department, **which are herein made conditions of the Certificate** [see Attachment A].

Failure to comply with this Certification is grounds for enforcement, including civil and criminal penalties, under MGL c.21 §42, MGL c.21A §16, or other possible actions/penalties as authorized by the General Laws of the Commonwealth.

This Certification does not relieve the applicant of the obligation to comply with other appropriate state or federal statutes or regulations. This includes, but is not limited to, the conditions numbered 1 through 32 of the U.S. Department of the Army Programmatic General Permit, Commonwealth of Massachusetts.

NOTICE OF APPEAL RIGHTS

A) Appeal Rights and Time Limits

Certain persons shall have a right to request an adjudicatory hearing concerning certifications by the Department when an application is required: (a) the applicant or property owner; (b) any person aggrieved by the decision who has submitted written comments during the public comment period; any ten (10) persons of the Commonwealth pursuant to M.G.L. c.30A where a group member has submitted written comments during the public comment period; or (d) any governmental body or private organization with a mandate to protect the environment which has submitted written comments during the public comment period. Any person aggrieved, any ten (10) persons of the Commonwealth, or a governmental body or private organization with a mandate to protect the environment may appeal without having submitted written comments during the public comment period only when the claim is based on new substantive issues arising from material changes to the scope or impact of the activity and not apparent at the time of public notice. To request an adjudicatory hearing pursuant to M.G.L. c.30A, § 10, a Notice of Claim must be

made in writing, provided that the request is made by certified mail or hand delivery to the Department, with the appropriate filing fee specified within 310 CMR 4.10 along with a DEP Fee Transmittal Form within twenty-one (21) days from the date of issuance of this Certificate, and addressed to:

Docket Clerk
Office of Administrative Appeals
Department of Environmental Protection
One Winter Street, 3rd Floor
Boston, MA 02108

A copy of the request shall at the same time be sent by certified mail or hand delivery to the issuing office of the Wetlands and Waterways Program at:

Department of Environmental Protection, Northeast Regional Office
One Winter Street, 5th Floor
Boston, MA 02108

B) Contents of Hearing Request

A Notice of Claim for Adjudicatory Hearing shall comply with the Department's Rules for Adjudicatory Proceedings, 310 CMR 1.01(6), and shall contain the following information pursuant to 310 CMR 9.10(3):

- (a) the 401 Certification Transmittal Number and DEP Wetlands Protection Act File Number;
- (b) the complete name of the applicant and address of the project;
- (c) the complete name, address, and fax and telephone numbers of the party filing the request, and, if represented by counsel or other representative, the name, fax and telephone numbers, and address of the attorney;
- (d) if claiming to be a party aggrieved, the specific facts that demonstrate that the party satisfies the definition of "aggrieved person" found at 314 CMR 9.02;
- (e) a clear and concise statement that an adjudicatory hearing is being requested;
- (f) a clear and concise statement of (1) the facts which are grounds for the proceedings, (2) the objections to this Certificate, including specifically the manner in which it is alleged to be inconsistent with the Department's Water Quality Regulations, 314 CMR 9.00, and (3) the relief sought through the adjudicatory hearing, including specifically the changes desired in the final written Certification; and
- (g) a statement that a copy of the request has been sent by certified mail or hand delivery to the applicant, the owner (if different from the applicant), the conservation commission of the city or town where the activity will occur, the Department of Environmental Management (when the certificate concerns projects in Areas of Critical Environmental Concern), the public or private water supplier where the project is located (when the certificate concerns projects in Outstanding Resource Waters), and any other entity with responsibility for the resource where the project is located.

C) Filing Fee and Address

The hearing request along with a DEP Fee Transmittal Form and a valid check or money order payable to the Commonwealth of Massachusetts in the amount of one hundred dollars (\$100) must be mailed to:

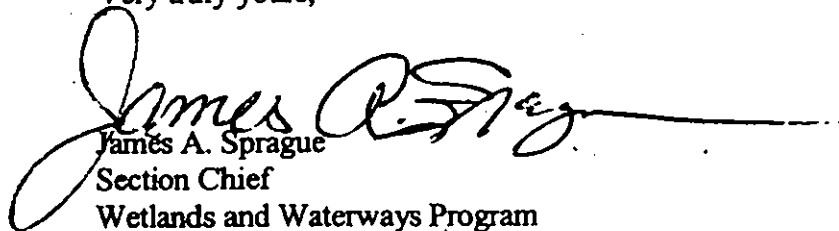
Commonwealth of Massachusetts
Department of Environmental Protection
Commonwealth Master Lockbox
PO Box 4062
Boston, MA 02211

The request will be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver. The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority. The Department may waive the adjudicatory hearing filing fee pursuant to 310 CMR 4.06(2) for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file an affidavit setting forth the facts believed to support the claim of undue financial hardship together with the hearing request as provided above.

401 WQC - Transmittal # W034128

Should you have any questions relative to this permit, please contact Derek Standish at (617) 654-6611.

Very truly yours,


James A. Sprague
Section Chief
Wetlands and Waterways Program

cc: John Zimmer, Coler & Colantonio, Inc., 101 Accord Park Drive, Norwell, MA 02061
Nicholas Zavolas, MEPA Unit, EOE, 251 Causeway Street, Suite 900, Boston, MA 02114
Tewksbury Conservation Commission, 999 Whipple Road, Tewksbury, MA 01876
Crystal I. Gardner, Department of the Army, New England District, Corps of Engineers, 696 Virginia Road,
Concord, MA 01742-2751

TABLE 1

WETLANDS CROSSED BY THE PROPOSED TEWKSBURY-ANDOVER LATERAL

Town	Approximate Milepost	Wetland #	Wetland Classification	Crossing Length (linear feet)	Acreage Affected		Crossing Method
					Temp. ^a	Perm. ^b	
Tewksbury / Andover	4.75	1	PEM/PSS	641	0	0	Horizontal Directional Drill
Tewksbury	4.34	2	PSS	607	0.42	0.14	Standard or Conventional
Tewksbury	3.87	3	PSS	300	0	0	Horizontal Directional Drill
Tewksbury	3.38	4	PEM/PSS	1277	0.88	0.29	Conventional or Push - Pull
Tewksbury	3.01	5	PSS	558	0.38	0.13	Conventional or Push - Pull
Tewksbury	2.98	6	PSS	0	0	0	Wetland avoided
Tewksbury	2.94	7	PSS	0	0	0	Wetland avoided
Tewksbury	2.76	8	PSS	453	0.31	0.10	Conventional or Push - Pull
Tewksbury	2.49	9	PEM	1492	1.03	0.34	Conventional or Push - Pull
Tewksbury	2.39	10	PSS	0	0	0	Wetland avoided
Tewksbury	2.34	11	PSS	0	0	0	Wetland avoided
Tewksbury	2.04	12	PSS	46	0.03	0.01	Standard or Conventional
Tewksbury	1.91	13	PSS	120	0.08	0.03	Standard or Conventional
Tewksbury	1.78	14	PSS	125	0.09	0.03	Standard or Conventional
Tewksbury	1.71	15	PSS	409	0.28	0.09	Standard or Conventional
Tewksbury	1.45	16	PEM	483	0.33	0.11	Standard or Conventional

TABLE 1

WETLANDS CROSSED BY THE PROPOSED TEWKSBURY-ANDOVER LATERAL

Town	Approximate Milepost	Wetland #	Wetland Classification	Crossing Length (linear feet)	Acreage Affected		Crossing Method
					Temp. ^a	Perm. ^b	
Tewksbury	0.85	17	PEM/PSS	2085	1.44	0.48	Conventional or Push - Pull
Tewksbury	0.67	18	PSS/PEM	372	0.26	0.09	Standard or Conventional
Tewksbury	0.67	19	PSS/PEM	0	0	0	Wetland avoided
Tewksbury	0.32	20	PSS	996	0.69	0.23	Conventional or Push - Pull
Tewksbury	0.03	21	PEM/PSS	1439	0.99	0.33	Conventional or Push - Pull
TOTAL		21	-	11,403	7.21	2.40	-

***Legend:** PEM = Palustrine Emergent Wetland; PSS = Palustrine Scrub-Shrub Wetland; PFO = Palustrine Forested Wetland

^a **Temporary Acreage** = permanent ROW (20 feet) and temporary workspace (10 feet)

^b **Permanent Acreage** = 10 feet permanently maintained ROW through wetlands

ATTACHMENT A

SECTION 61 FINDINGS

1. Groundwater

The Tennessee Gas Pipeline Company ("Tennessee") will minimize impacts to groundwater resources by using the construction techniques detailed in the Tennessee Erosion Control Plan (ECP) concerning blasting, trench breakers or plugs, trench de-watering, equipment refueling and hazardous material storage. In the unlikely event that groundwater resources are impacted, the ECP contains detailed information regarding mitigation measures. A Spill Prevention, Control and Countermeasure Plan (SPCC) is included within the Tennessee ECP.

2. Surface Water

Standard construction techniques employed at waterbody crossings are described fully in the Expanded ENF as well as Tennessee's ECP. In general, Tennessee shall protect and minimize potential adverse impacts to streams by:

- Cutting vegetation off at ground level leaving existing roots systems in place;
- No grading within 10 feet of high water bank, leaving a vegetative buffer strip;
- Placement of spoil a minimum of 10 feet from stream bank as described in ECP;
- Expediting construction and limiting the amount of equipment and activities in water bodies;
- Reducing clearing, leaving in place as many trees as possible on stream banks;
- Constructing waterbody crossings perpendicular to the axis of the waterbody channel as engineering and routing conditions allow;
- Maintaining ambient downstream flow rates;
- Removing all construction material and structures from the waterbody after construction;
- Restoring stream channels and bottoms to their original configurations and contours;
- Permanently stabilizing stream banks and adjacent upland areas after construction; and
- Inspecting right-of-way (ROW) periodically during and after construction and repairing any erosion controls and/or performing restoration, as needed, in a timely manner.

3. Hydrostatic Testing

Hydrostatic testing verifies the integrity of pipeline sections. Once the proposed pipeline is installed, hydrostatic testing of the pipe will be performed. Environmental impacts from withdrawal and discharge of test water will be minimized by utilizing the measures outlined in the ECP that include:

- Locating hydrostatic test manifolds outside of wetlands and riparian areas as practical;
- Withdrawing from and discharging to water sources that will comply with appropriate agency requirements and consider the protection of fisheries resources on a case-by-case basis;
- Complying with all appropriate permit requirements;
- Screening the intake to avoid entrapment of fish;

- Adding no chemicals to the test waters;
- Maintaining adequate flow rates to protect aquatic life, provide for all waterbody uses and downstream withdrawals of water by existing users;
- Anchoring the discharge pipe for safety;
- Discharging test water to a suitable receiving body of water, across a well-vegetated area or filtered through a filter bag or erosion control barriers;
- Discharging test water against a splash plate or other energy-dissipating device; and,
- Controlling the rate of discharge to prevent flooding or erosion.

4. Wetland Resource Areas

At all feasible locations, the proposed corridor through each of the wetlands lying parallel to existing ROW will be reduced to a 10-foot temporary work space construction ROW. The total ROW for the majority of the length of the project within uplands will consist of 20 feet of existing permanent ROW and 25 feet of temporary workspace. The post-construction ROW will consist of the maintenance of the existing 20-foot permanent easement of which 10 feet will be permanently maintained within wetlands in accordance with FERC requirements. By reducing the construction ROW through wetland areas, the extent of temporary and permanent impacts to these areas will be significantly decreased. Wetland construction techniques are fully described in the ECP. In general, Tennessee will protect and minimize potential adverse impacts to wetlands by:

- expediting construction in and around wetlands
- restoring wetlands to their original configurations and contours;
- permanently stabilizing upland areas near wetlands as soon as possible after backfilling;
- inspecting the ROW periodically during and after construction and repairing any erosion control or restoration features until permanent revegetation is successful.

5. Fisheries

Open trenching will be employed at all minor stream crossings. Trenching and boring details and standard construction techniques employed at waterbody crossings are described fully in the ECP. The crossing of the Shawsheen River will not utilize the open trench construction technique. The pipeline will be installed via Horizontal Directional Drill (HDD) beneath the Shawsheen River, avoiding impacts to all fisheries in the River.

6. Wildlife

Tennessee and its contractors will strive to minimize impacts to wildlife by expediting construction to the greatest extent possible. Construction will be scheduled to occur outside of breeding seasons to the extent practicable and will work with the Natural Heritage and Endangered Species Program (NHESP), the Tewksbury Conservation Commission and MA Division of Fisheries and Wildlife to minimize any potential adverse impacts to wildlife habitat associated with the project. Conversion of forest and scrub-shrub habitats, particularly in wetlands, will be minimized through restriction of the ROW to the smallest width practical given the local conditions. Revegetation will occur immediately after construction has been completed, and the areas of impact will be monitored until final site stabilization is achieved.

Additionally, Tennessee has ongoing consultations with the NHESP and will implement significant impact avoidance and mitigation measures to ensure that there are no adverse impacts on identified rare species habitats.

7. General Construction

Tennessee shall protect and minimize potential adverse environmental impacts during construction through the use of the following procedures:

7.1 Clearing

No rubber tired equipment will be allowed to work in wetlands unless it will not damage the root systems and its use is approved by the Environmental Inspector. Bulldozers will not be used for clearing. Trees and brush will be cut at ground level by hydroaxes, tree shears, grinders or chain saws. Stumps will be left in place, except on the trenchline or unless the removal is necessary to ensure worker safety. Stumps may be ground to a suitable height for safety reasons.

7.2 Grading

Grading will be limited to the areas directly over the trenchline, except where topography requires additional grading for safety reasons. Where grading is required, topsoil will be segregated and returned as an even layer to all graded areas. In wetlands, topsoil will be segregated unless standing water exists within the wetland or if the soils are saturated at the time of construction.

7.3 Trenching

Following segregation of the topsoil, the remainder of the ditch will be excavated so that the pipe will have a minimum of 36 inches of cover unless otherwise specified. In the event that rock is encountered, the ditch is prepared with the use of a hoe ram for minor situations and with the use of drill blasting should significant rock be encountered within the trench line.

7.4 Lowering-in/Backfilling

The trench will be backfilled with subsoil first. After the subsoil has been rough graded, topsoil will be replaced in an even layer, if applicable. Spoil material imported from off the ROW must be approved by the Environmental Inspector. Where rock was part of the surface features prior to construction of the pipeline, rock will be placed back in the wetland in approximately the same configuration as pre-construction.

7.5 Cleanup/Restoration

All construction debris shall be removed following backfilling of the pipeline. Once backfilling is complete, Tennessee will restore the original contours and flow regimes to the extent practical, with the exceptions of unnatural features and unstable grades. The ROW will be seeded with annual rye grass (40 pounds/acre, unless standing water is present) to stabilize the area until indigenous wetland species can re-establish themselves. If inclement weather limits the effectiveness of reseeding efforts, at the discretion of the Environmental Inspector and as allowed by all applicable permits, the ROW may be mulched to minimize erosion until

conditions are suitable for reseeded. No fertilizer or lime shall be used in wetlands unless specified by the National Resource Conservation Service (NRCS).

7.6 Monitoring

Tennessee will monitor wetland revegetation efforts for the first and second growing season after construction. Revegetation will be considered successful if (1) at least 80 percent of the total cover is native species and (2) the level of diversity of the native species present after construction is at least 50 percent of the level originally found in the wetland. If the area is not showing signs of re-establishing native wetland vegetation during the first growing season following construction, Tennessee will develop and implement (in consultation with a professional wetland ecologist) a plan to re-vegetate the wetland with native wetland species. **See Special Condition 4 in the 401 Water Quality Certificate for the Department's actual wetland restoration and monitoring requirements.**

8. Soils

This section contains excerpts from the ECP pertaining to construction methods and specialized construction methods along pipeline ROWs. Temporary soil impacts will be limited to the pipeline ROW during the period of construction. Through the implementation of Tennessee's ECP, Tennessee anticipates no adverse impact upon soils. This plan emphasizes the use of standard erosion control techniques to reduce the potential for erosion, and the use of temporary control measures such as interceptor dikes, rip rap, or sediment barriers, followed by re-establishment of stabilizing vegetation, to minimize erosive impacts. The following are brief descriptions of some of the methods Tennessee will utilize to minimize impact upon soils:

- Minimize the quantity and duration of soil exposure;
- Protect critical areas during construction by reducing the velocity of and redirecting runoff;
- Install and maintain erosion and sediment control measures during construction;
- Reestablish vegetation as soon as possible following final grading; and,
- Inspect the ROW and maintain erosion and sediment controls as necessary until final stabilization is achieved.

Tennessee conducts pre-construction surveys and tailors its ECP to the specific needs of the project. Information on soils is obtained from NRCS soil surveys and soil cores taken during wetland surveys. Tennessee will work with appropriate agencies and landowners to prevent the spread of noxious weeds and pests.

9. Land Use

The existing 20-foot permanent ROW will be maintained for the new 8-inch line and will not be expanded. Mitigation measures that may be utilized to minimize the effect of the proposed project on the various land use classifications include:

- The proposed pipeline will be installed via HDD beneath the Shawsheen River.
- Limitation of construction hours in vicinity of business, commercial and industrial buildings.
- Timing of construction during low use or low impact periods.
- Replanting of vegetation within temporary construction ROW.

Tennessee will provide and maintain, in a safe condition, private roads, and entrances that will be used or affected by construction of the Tewksbury-Andover Lateral Project. Also after construction, or before leaving a work area, the contractor will be required to cleanup all surplus materials that remain on the site. Potential mitigation measures to be utilized within Public Lands include selective tree removal, revegetation of temporary and permanent ROWs and timing construction to coincide with low use/activity periods.



NMCOG

Northern Middlesex Council of Governments

October 8, 2003

Ellen Roy Herzfelder, Secretary
Executive Office of Environmental Affairs
251 Causeway Street
Suite 900
Boston, MA 02114

RECEIVED

OCT 10 2003

MEPA

A Multi-Purpose
Regional Planning
District Serving:

Billerica
Chelmsford
Dracut
Dunstable
Lowell
Pepperell
Tewksbury
Tyngsborough
Andover

ATTN: Nicholas Zavolas, MEPA Unit

RE: Tewksbury-Andover Lateral Project, EOE A FEIR #12956, NMCOG #570

Dear Secretary Herzfelder:

The staff of the Northern Middlesex Council of Governments has reviewed the final environmental impact report for the Tewksbury-Andover Lateral Pipeline project. The proposed project consists of the construction of approximately 5 miles of 8-inch high-pressure natural gas pipeline to provide non-interruptible service to Wyeth BioPharma located in the Town of Andover.

Since the filing of the DEIR the Natural Heritage and Endangered Species Program has concluded that avoidance procedures outlined by the proponent will protect the habitat of the species likely to be impacted by construction. The proponent has pledged to continue to work with the NHESP, the Tewksbury Conservation Commission and the Massachusetts Division of Fish and Wildlife throughout the construction process.

The Massachusetts Historical Commission has reviewed the results of the proponents archaeological survey and concluded that the Shawsheen River Native American site, the Great Swamp Native American site and the Meadow Brook Marsh Native American site are not significant archaeological resources and are ineligible for listing in the National Register of Historic Places. Therefore, MHC concluded that no further archaeological testing of these sites is needed.

The proponent has pledged to continue to work with the Bureau of Waste Site Cleanup and the local Board of Health to resolve any hazardous materials issues that may come to light prior to or during construction.

All of the outstanding issues brought forth during the DEIR process appear to have been addressed in the FEIR document. The NMCOG staff does

Robert W. Flynn
Executive Director

Gallagher Terminal
Floor 3B
115 Thorndike Street
Lowell, MA
01852-3308

TEL. # (978) 454-8021

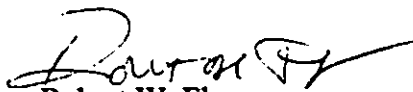
FAX # (978) 454-8023

www.nmcog.org

not feel that additional environmental review through the MEPA process is needed.

Should you have any questions relative to the NMCOG staff comments please contact myself or Beverly Woods.

Very truly yours,



Robert W. Flynn
Executive Director

Cc: Tewksbury
Town Manager
Town Planner
Public Works
Engineer
Board of Selectmen
Planning Board
Conservation Commission
Board of Health
NMCOG Councillors

Tennessee Gas Pipeline Company



Agency Clearance

**COLER &
COLANTONIO^U**
ENGINEERS AND SCIENTISTS



Commonwealth of Massachusetts

Division of Fisheries & Wildlife

Wayne F. MacCallum, *Director*

8 August 2003

Tewksbury Conservation Commission
DPW Building, 999 Whipple Road
Tewksbury, MA 01876

RE: Applicant: Tennessee Gas Pipeline Company
 Project Location: Utility easement in Tewksbury and Andover
 Project Description: 5.1 miles of new high pressure natural gas pipeline
 NHESP File No. 02-11107

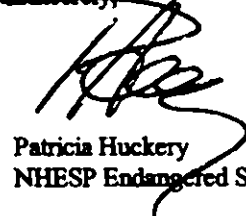
Dear Commissioners:

The applicant listed above has submitted a rare species survey and impact avoidance/minimization report dated 8 July 2003 to the Natural Heritage & Endangered Species Program (NHESP) of the MA Division of Fisheries & Wildlife. This report is sent in response to our comments to the Commission dated 7 March 2003 and as a result of a meeting we had on 19 June 2003 with Tennessee Gas Pipeline representatives. Our rare wildlife concerns will be addressed through the NOI process, while any rare plant issues that may arise from survey work this year will be addressed directly by us under the MA Endangered Species Act (G.L. c.131A)(MESA).

This year's rare turtle survey work, supplemented with that of spring 2004, should adequately cover the time period when rare turtles are most active and likely to be trapped and then protected. At this point, the proposed impact avoidance/minimization proposed seems sufficient to avoid adverse impacts to the habitat and species. Although the avoidance/minimization package may change based on new rare species findings. A rare species report should be submitted that includes rare species morphometric data for rare turtles, maps showing movement patterns of turtles, aerial photograph maps delineating rare species habitats, rare species points, post construction analysis of the impact avoidance/minimization plan, and results of rare species habitat restoration plan. In upland portions of the R.O.W. near rare turtle sites, there should be large areas of suitable nesting substrate that is not seeded, but rather left open to enhance its use as nesting habitat.

If a significant portion of the local population of Philadelphia Panic Grass (*Panicum philadelphicum*) is impacted by the proposed project a Conservation & Management Permit will be required under the MESA. This permit may be issued by the MA Division of Fisheries & Wildlife if there is no viable alternative with fewer impacts to the rare plants. The person completing the plant survey is James B. Hall, who is qualified to perform the work.

Sincerely,



Patricia Huckery
NHESP Endangered Species Project Analyst

cc: Brant Johnson, TGP
 John Zimmer, Coler & Colantonio
 Derek Standish, DEP Northeast Regional Office, Wetlands Section
 file

www.masswildlife.org

Division of Fisheries and Wildlife

Field Headquarters, One Rabbit Hill Road, Westborough, MA 01581 (508) 792-7270 Fax (508) 792-7275

An Agency of the Department of Fisheries, Wildlife & Environmental Law Enforcement



The Commonwealth of Massachusetts
William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

August 21, 2003

John Zimmer
Coler & Colantonio, Inc.
101 Accord Park Drive, Suite 1
Norwell, MA 02061

RE: Tewksbury-Andover Lateral, Tewksbury and Andover, MHC #RC.20864, EOE A #12956

Dear Mr. Zimmer:

Staff of the Massachusetts Historical Commission have reviewed the preliminary management summary for the complete intensive archaeological survey of the proposed Tewksbury-Andover Lateral natural gas pipeline in Tewksbury and Andover as well as the archaeological site examinations of the Great Swamp and Meadow Brook Marsh Native American Sites in Tewksbury, prepared by University of Massachusetts Archaeological Services and received at this office August 8, 2003. Previously, MHC staff reviewed a preliminary management summary for part of the intensive archaeological survey and commented on the results in a letter to Secretary Ellen Roy Herzfelder dated February 19, 2003, a copy of which was sent to you.

The following comments address the findings of the intensive survey and site examinations and the recommendations in the preliminary management summaries.

The complete intensive survey identified three archaeological sites associated with the Native American settlement of the Tewksbury area. These were designated the Great Swamp Native American Site, the Meadow Brook Marsh Site, and the Shawsheen River Native American Site. In our letter of February 19, 2003, MHC requested that archaeological site examinations be conducted for the Great Swamp Native American Site and the Meadow Brook Marsh Site in order to gather sufficient information to determine whether the sites meet the criteria of eligibility for listing in the National Register of Historic Places, as well as to determine the exact horizontal and vertical boundaries of the sites. Because of its small size, low density, and limited range of materials, the Shawsheen River Native American Site was not likely to produce additional information if it were subject to additional archaeological testing. Therefore, MHC found that the Shawsheen River Native American Site is not a significant archaeological resource, and is not eligible for listing in the National Register of Historic Places (36 CFR 60). MHC concurred with the recommendation in the preliminary management summary that no further archaeological testing is warranted for this site.

Results of the site examination testing at the Great Swamp Native American Site indicate that the site covers a small area, approximately 24 meters by 12 meters within which there is a low density of stone flakes, which are the by-product of stone tool manufacture and maintenance. Most of the flakes were

220 Morrissey Boulevard, Boston, Massachusetts 02125
(617) 727-8470 • Fax: (617) 727-5128
www.state.ma.us/sec/mhc

recovered from plowed soil contexts within a 5-meter by 5-meter area. No diagnostic artifacts, features or datable organic materials in clear association with archaeological deposits were recovered.

Results of the site examination testing at the Meadow Brook Marsh Native American Site indicated that the site covers a small area, approximately 17 meters by 20 meters within which there is a low density of stone flakes, which are the by-product of stone tool manufacture and maintenance. Most of the flakes were recovered from plowed soil contexts. A projectile point of the variety known as Levanna, dates the site to the Late Woodland or Contact period (approximately 1,000-350 years ago). No features or datable organic materials in clear association with archaeological deposits were recovered.

Given the absence of features, limited range of materials, and disturbed context of much of the material, additional archaeological excavation at the Great Swamp Native American Site and Meadow Brook Marsh Native American Site is unlikely to add significant new information beyond what has already been recovered from the site examinations. Therefore, MHC finds that the Great Swamp Native American Site and Meadow Brook Marsh Native American Site do not meet the criteria of eligibility for listing in the National Register of Historic Places (36 CFR 60). MHC concurs with the recommendation in the preliminary management summary that no further archaeological investigation is warranted for the Great Swamp Native American Site or Meadow Brook Marsh Native American Site.

Since no significant historic or archaeological resources were identified in the project area, MHC concurs with the recommendation in the preliminary management summary that no further archaeological testing is warranted for the Tewksbury-Andover Lateral project.

These comments are offered to assist in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800), Massachusetts General Laws, Chapter 9, Sections 26-27C (950 CMR 71), and MEPA. If you have any questions concerning this review, please feel free to contact Eric Johnson at this office.

Sincerely,



Brona Simon
State Archaeologist
Deputy State Historic Preservation Officer
Massachusetts Historical Commission

xc: Kevin Madden, FERC
Brant Johnson, Tennessee Gas Pipeline
Secretary Ellen Roy Herzfelder, EOE, Attention Nicholas Zavolas, MEPA Office
Crystal Gardner, USACOE-NED-Regulatory
Mitchell T. Mulholland, University of Massachusetts Archaeological Services



***USACOE Individual Permit
Under Section 10 of Rivers & Harbors Act
and Section 404 of the Clean Water Act***

**COLER &
COLANTONIO^{LLC}**
ENGINEERS AND SCIENTISTS

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REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT, CORPS OF ENGINEERS
898 VIRGINIA ROAD
CONCORD, MASSACHUSETTS 01742-2751

January 16, 2004

Regulatory Division
CENAE-R-200302378

Harold McCracken
Tennessee Gas Pipeline Company
8 Greenway Plaza
Houston, Texas 77048

Dear Mr. McCracken:

Enclosed are two copies of a Department of the Army permit authorizing the work described therein. Your signature is necessary to execute this permit. The authorized work cannot start until we receive a complete, signed copy of the permit. If the conditions are acceptable, please sign both copies and return one signed copy of the entire permit to "Regulatory Division" at the address above.

Please post the enclosed ENG form 4336 (i.e., Notice of Authorization) in a conspicuous location at the job site whenever work is ongoing. This permit requires you to notify us before beginning work so that we may inspect the project. Therefore, please complete and return the attached Work Start Notification Form to this office no later than two weeks before the anticipated starting date.

If the plans or construction methods (i.e., for work in our jurisdiction) need to be changed, please contact us immediately to discuss modification of your permit prior to undertaking these changes.

This permit is a limited authorization containing a specific set of conditions. Please read the permit thoroughly to familiarize yourself with those conditions, including any conditions contained on the attached state water quality certification. If a contractor does the work for you, both you and the contractor are responsible for ensuring that the work is done in compliance with the permit's terms and conditions, as any violations could result in civil or criminal penalties.

Our verification of this project's wetland delineation under the 1987 Manual is valid for a period of five years from the date of this letter unless new information warrants revision of the determination before the expiration date.

Please note that the Department of the Army permit process does not supersede any other agency's jurisdiction. Hence, if other federal, state, and/or local agencies have jurisdiction over your project, you must receive all applicable permits before you may begin work.

The Corps of Engineers has implemented an administrative appeals process for permit

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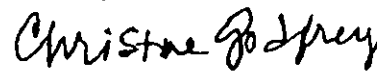
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2003

denials, proffered permits that you object to the terms and conditions of and jurisdictional determinations. A Notification of Administrative Appeal Options form and flow charts are enclosed with this letter, which explains the appeals process and your options. However, in order to retain your right to appeal, you must submit the attached NAAO form within 60 days of this letter's date. For this Initial Proffered Permit, please send the completed form to me, Regulatory Division Chief, at 696 Virginia Road, Concord, Massachusetts 01742. Direct questions regarding the Corps of Engineers appeals process to Ms. Joanne M. Barry, Chief, Policy and Technical Analysis Branch at (978) 318-8156 or at the above address.

If you have any questions regarding this correspondence, please contact Ted Lento at (978) 318-8863 or use (800) 363-4367 within Massachusetts.

Sincerely,



Christine Godfrey
Chief, Regulatory Division

Enclosures:

01/28/2004 15:32 FAX 781 982 5490

COLER & COLANTON¹⁰

0004

WORK START NOTIFICATION FORM
(Minimum Advance Notice: Two Weeks)

MAIL TO: U.S. Army Corps of Engineers, New England District
Regulatory Division
Policy Analysis/Technical Support Branch
696 Virginia Road
Concord, Massachusetts 01742-2751

A Corps of Engineers Permit (No. 200302378) was issued to Tennessee Gas Pipeline Company. The permit authorized placement of fill material within 7.21 acres of wetlands in Andover and Tewksbury, Massachusetts in conjunction with the installation of approximately 5.1 miles of an 8 inch diameter natural gas pipeline referred to as the Tewksbury - Andover Lateral Project. After the pipeline is installed, the wetlands will be restored to pre-construction ground contours. The people (e.g., contractor) listed below will do the work, and they understand the permit's conditions and limitations.

PLEASE PRINT OR TYPE

Name of Person/Firm: _____

Business Address: _____

Telephone: () _____ () _____

Proposed Work Dates: Start: _____

Finish: _____

PERMITTEE'S SIGNATURE: _____ DATE: _____

PRINTED NAME: _____ TITLE: _____

FOR USE BY THE CORPS OF ENGINEERS

PM: Lento Submittals Required: _____

Inspection Recommendation: _____

01/28/2004 15:34 FAX 781 982 5490

DEPARTMENT OF THE ARMY PERMIT

Permittee Tennessee Gas Pipeline CompanyPermit No. 200302378Issuing Office New England District

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description:

Place fill material within 7.21 acres of wetlands in Andover and Tewksbury, Massachusetts in conjunction with the installation of approximately 5.1 miles of an 8-inch diameter natural gas pipeline referred to as the Tewksbury - Andover Lateral Project. After the pipeline is installed, the wetlands will be restored to pre-construction ground contours. The attached Tables entitled "TABLE 1 WETLANDS CROSSED BY THE PROPOSED TEWKSBURY-ANDOVER LATERAL" and "TABLE 2 SUMMARY INFORMATION OF WATERBODIES CROSSED BY THE PROPOSED TEWKSBURY-ANDOVER LATERAL PROJECT" present information on the location and size of wetland and waterways that will be impacted. Further details are depicted on the attached plans entitled, "PROPOSED NATURAL GAS PIPELINE 6" OR 8" TEWKSBURY / ANDOVER LATERAL" on 25 sheets dated 3/03.

Project Location:

Wetlands and streams located predominately within the New England Power Company right of way in the Towns of Andover and Tewksbury, Massachusetts

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on, January 16, 2009. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.
2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

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4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

Special Conditions:

(1) The permittee shall ensure that a complete copy of this permit is at the work site whenever work is being performed and that all personnel performing work at the site of the work authorized by this permit are fully aware of the terms and conditions of the permit. This permit, including its drawings and any appendices and other attachments, shall be made part of any and all contracts and sub-contracts for work which affects areas of Corps of Engineers' jurisdiction at the site of the work authorized by this permit. This shall be done by including the entire permit in the specifications for the work.

SPECIAL CONDITIONS CONTINUED ON PAGE 4

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

() Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

☒ Section 404 of the Clean Water Act (33 U.S.C. 1344).

() Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1414).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

01/28/2004 15:36 FAX 781 982 5490

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. **Reliance on Applicant's Data:** The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. **Reevaluation of Permit Decision.** This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 328.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 328.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 309.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. **Extensions.** General condition 1 establishes a time limit for the completion of the activity authorized by this permit. Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

(PERMITTEE)

(DATE)

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

Christine Godfrey
(DISTRICT ENGINEER)

1-16-04
(DATE)

for Thomas L. Koning, Colonel
Corps of Engineers

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEREE)

(DATE)

SPECIAL CONDITIONS CONTINUED FROM PAGE 2

(1 continued) If the permit is issued after the construction specifications but before receipt of bids or quotes, the entire permit shall be included as an addendum to the specifications. If the permit is issued after receipt of bids or quotes, the entire permit shall be included in the contract or sub-contract as a change order. The term "entire permit" includes permit amendments. Although the permittee may assign various aspects of the work to different contractors or sub-contractors, all contractors and sub-contractors shall be obligated by contract to comply with all environmental protection provisions of the entire permit, and no contract or sub-contract shall require or allow unauthorized work in areas of Corps of Engineers' jurisdiction.

2) All areas of wetlands and/or waters, which are disturbed during construction, except those authorized herein for permanent impact, shall be restored to their approximate original elevation (but not higher) and condition by careful protection, and/or removal and replacement, of existing soil and vegetation. In addition, if upland clearing, grubbing, or other construction activity results in, or may result in, soil erosion with transport and deposition into a wetland or waterway, devices such as geotextile silt fences, sediment trenches, etc., shall be installed and properly maintained to minimize such impacts during construction. These devices must be removed upon completion of work and stabilization of disturbed areas. The sediment collected by these devices must also be removed and placed upland, in a manner that will prevent its later erosion and transport to a waterway or wetland.

3) Adequate sedimentation and erosion control devices, such as geotextile silt fences or other devices capable of filtering the fines involved, shall be installed and properly maintained to minimize adverse impacts on waters and wetlands during construction. These devices must be removed upon completion of work and stabilization of disturbed areas. The sediment collected by these devices must also be removed and placed upland, in a manner that will prevent its later erosion and transport to a waterway or wetland.

4) No temporary fill (e.g., access roads, cofferdams) may be placed in waters or wetlands unless specifically authorized by this permit. If temporary fill is used, it shall be disposed of at an upland site and suitably contained to prevent its subsequent erosion into a water of the U.S., and the area shall be restored to its original contours (but not higher). During use, such temporary fill must be stabilized to prevent erosion or, in the case of flowing water (rivers or streams), clean washed stone should be used.

5) Trench plugs shall be installed within the pipeline trench where it intersects with wetland boundaries and within wetlands with pipe crossing lengths in excess of 300 feet to prevent the flow of water from the wetlands both during and after construction.

6) Condition four of the attached Water Quality Certificate (WQC) requires annual monitoring of the restored wetlands for five years and has re-vegetation and invasive species control requirements to ensure successful restoration of the wetlands. Reports summarizing the results of this monitoring and restoration are also required by the WQC to be sent to both the DEP and Tewksbury Conservation Commission. A copy of these reports shall also be submitted to Ed Reiner, Senior Wetland Scientist, USEPA, 1 Congress St., Suite 1100 (CMA), Boston, MA 02114-2023.

Tewksbury-Andover Lateral Project
Exhibit C, Section 2.55(a) Appurtenant Facilities

Tewksbury-Andover Lateral:

- Pig Launcher facilities with associated valving
- Cathodic Protection System
- A/C Mitigation System

Meter Station:

- Pig Receiver facilities with associated valving
- Flow Control Skid
- Gas Chromatograph equipment and building
- Electronic Gas Measurement equipment (EGM) and meter building
- Communication Equipment
- Cathodic Protection System