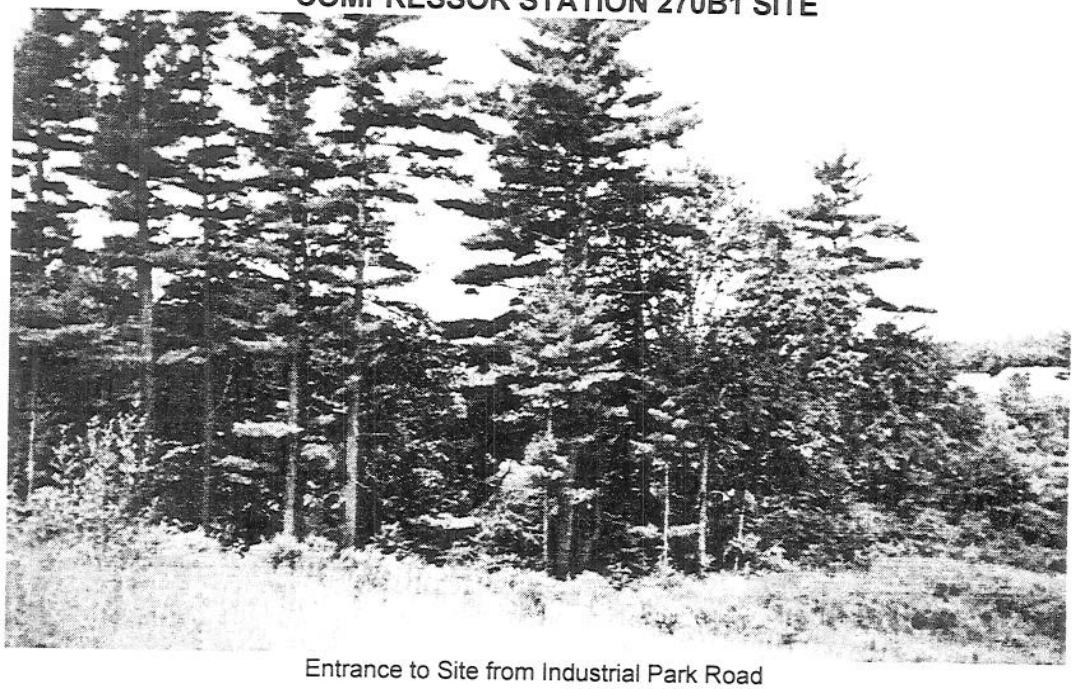
APPENDIX C

WETLAND SITE PHOTOGRAPHS

CONCORD EXPANSION PROJECT
SITE PHOTOGRAPHS

COMPRESSOR STATION 270B1 SITE

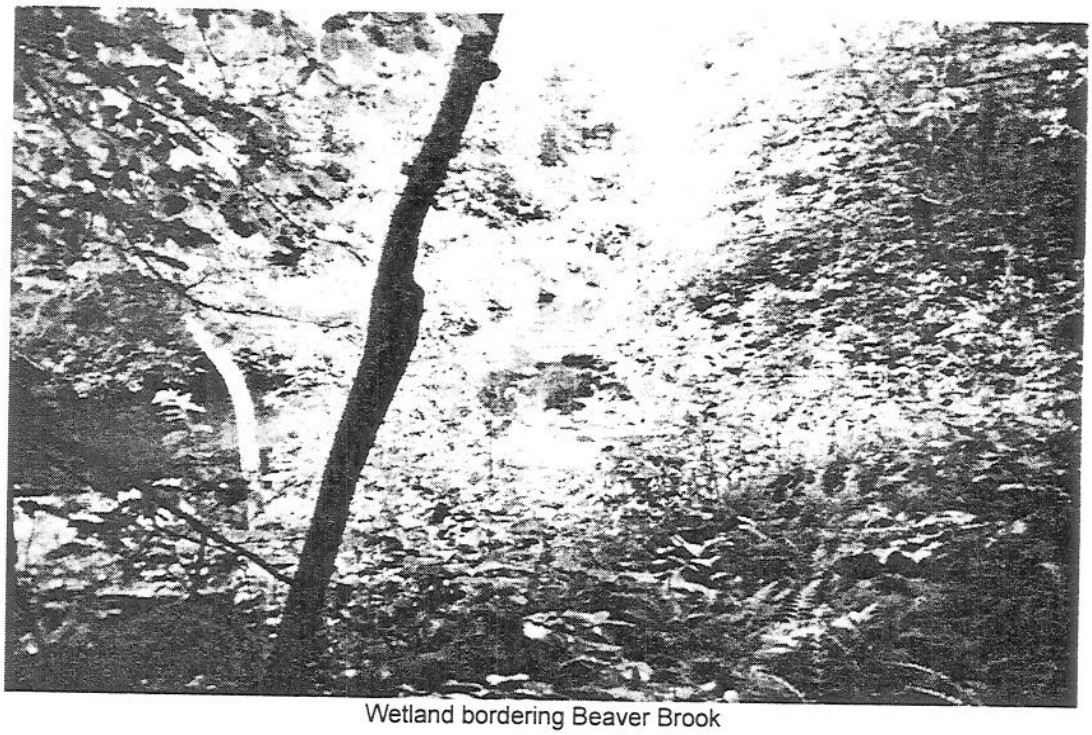


Entrance to Site from Industrial Park Road

Looking north toward ROW crossing of Beaver Brook. Beaver Brook in center of photo

COMPRESSOR STATION 270B1 SITE (CONTINUED)

Entrance of site looking south toward Industrial Park Road.



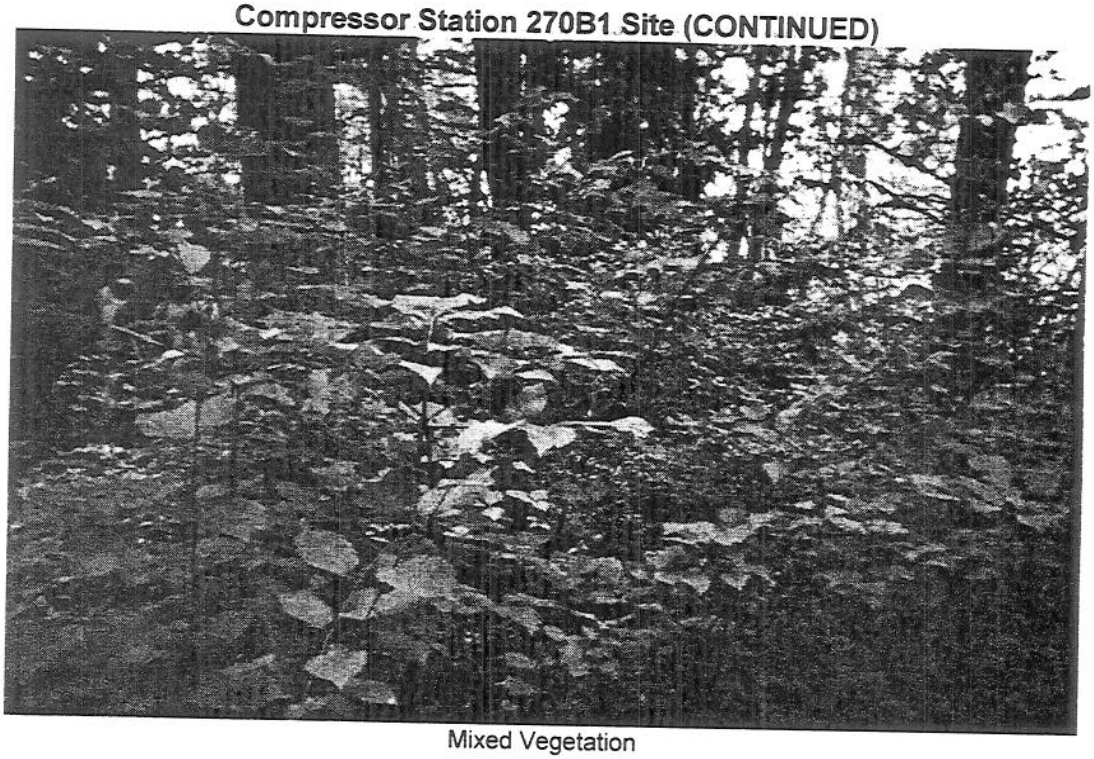
Wetland bordering Beaver Brook

Compressor Station 270B1 Site (CONTINUED)

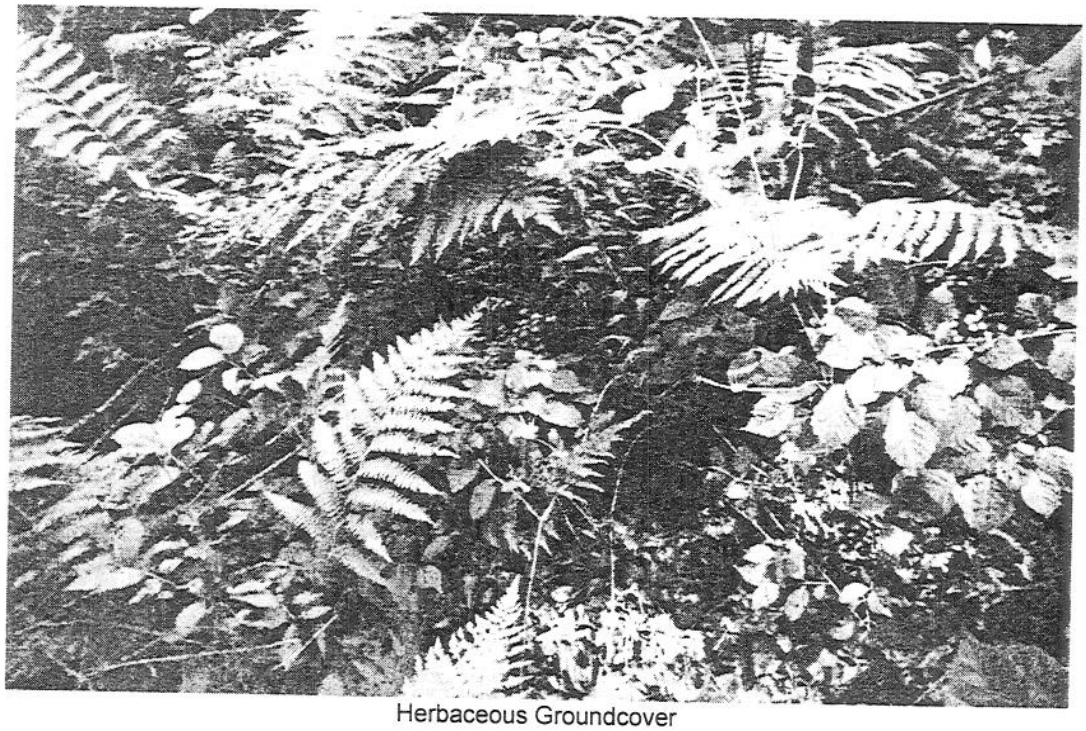
Wetland Bordering Beaver Brook

Eastern end of Wetland Bordering Beaver Brook

Compressor Station 270B1 Site (CONTINUED)

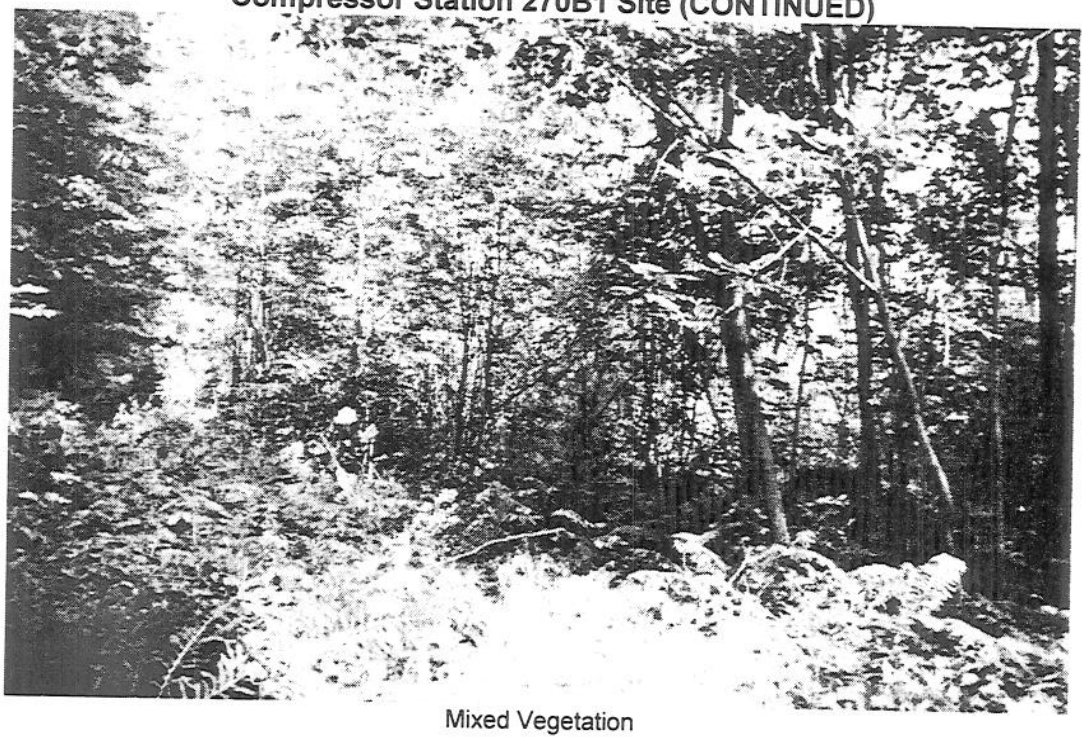


Mixed Vegetation



Herbaceous Groundcover

Compressor Station 270B1 Site (CONTINUED)



Mixed Vegetation

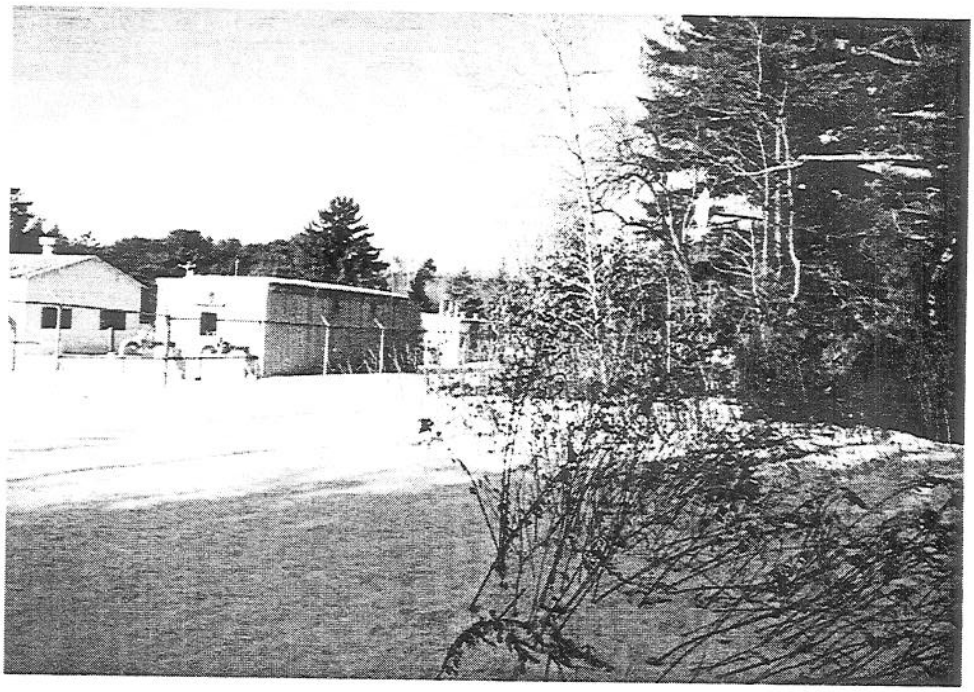
Laconia Meter Station Site

Laconia Meter Station from Broken Bridge Road Looking East

Laconia Meter Station - East of Broken Bridge Road Looking South

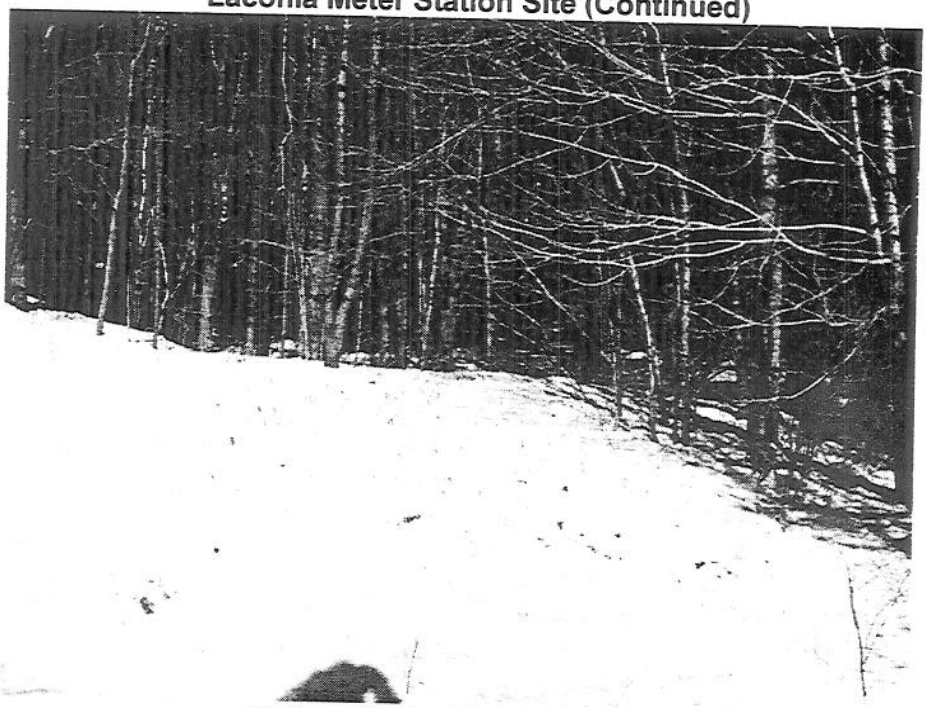
Laconia Meter Station Site (continued)

Laconia Meter Station Facing north



Wooded Fringe

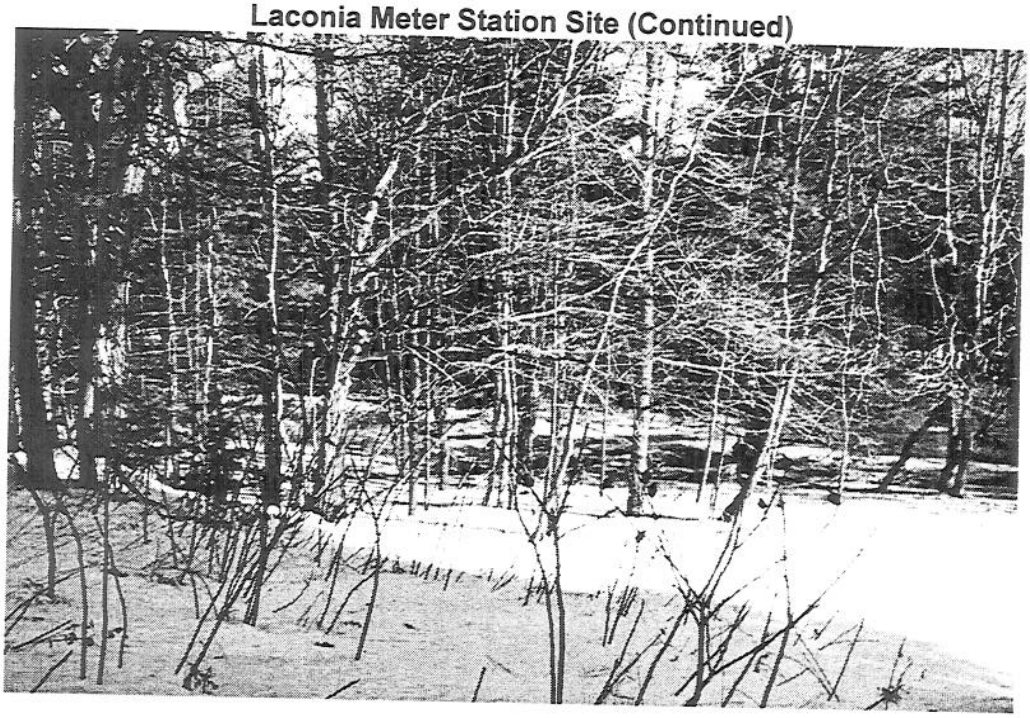
Laconia Meter Station Site (Continued)



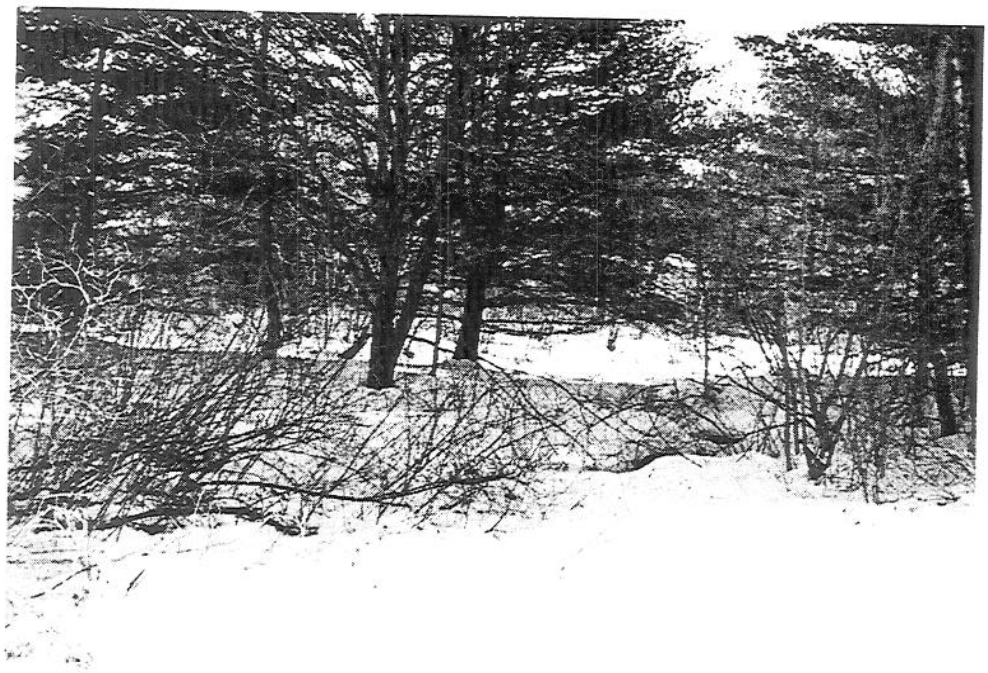
ROW and Wetland A – Looking North

Upland Slope Looking Southwest

Laconia Meter Station Site (Continued)

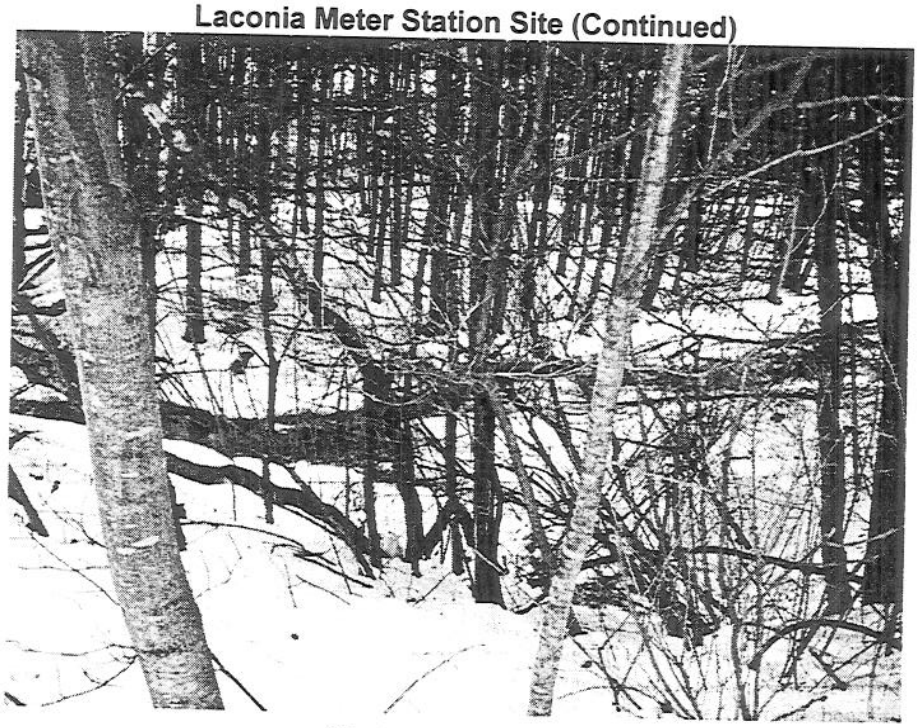


Wetland A Looking East



Wetland A – south of meter station looking east

Laconia Meter Station Site (Continued)



Wetland A facing East

Wetland B facing north

APPENDIX B

SITE PHOTOGRAPHS

CONCORD EXPANSION PROJECT
SITE PHOTOGRAPHS

COMPRESSOR STATION 270B1 SITE

Entrance to Site from Industrial Park Road

Looking north toward ROW crossing of Beaver Brook. Beaver Brook in center of photo

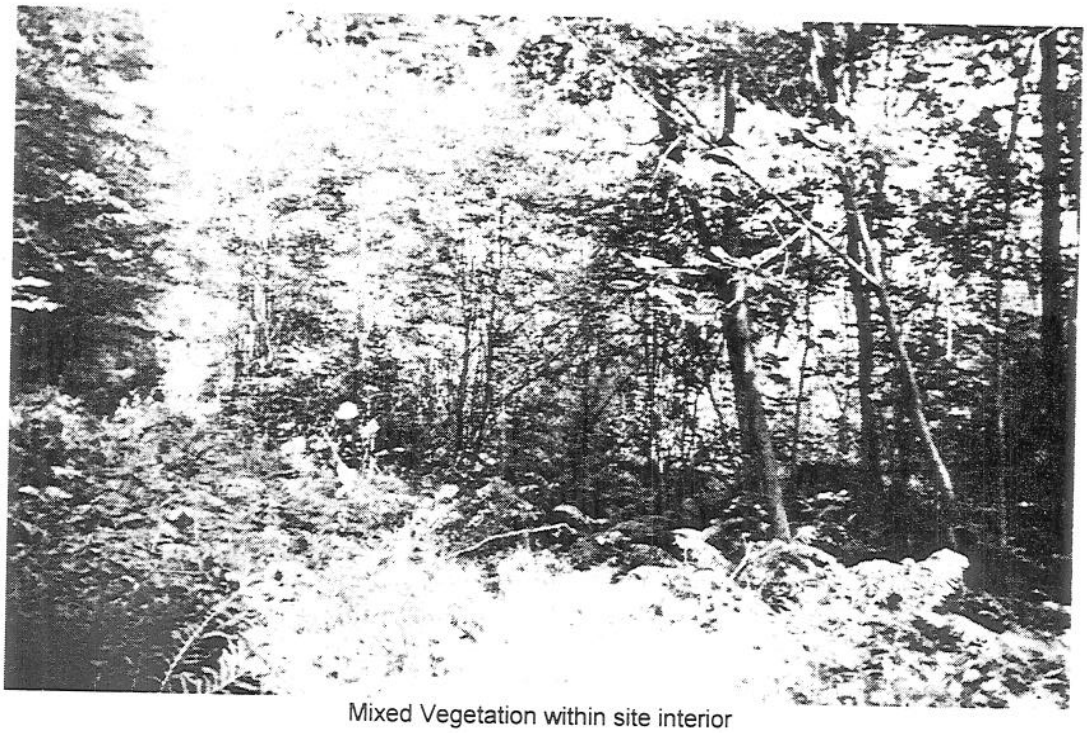
COMPRESSOR STATION 270B1 SITE (CONTINUED)

Entrance of site looking south toward Industrial Park Road.

Wetland bordering Beaver Brook

Compressor Station 270B1 Site (CONTINUED)

View of vegetation within interior of site.



Mixed Vegetation within site interior

APPENDIX C

CONSULTATION LETTERS

ENSR | AECOM

ENSR
[illegible] Road, Sandwich Beach, Massachusetts, 02562-2435
T 508.888.3900 F 508.888.6669 www.ensr.aecom.com

October 25, 2007

Mr. Bill Hoey- District Conservationist
Hillsborough County Conservation District
Chappell Professional Center
468 Route 13 South
Milford, NH 03055

Re: Soil Hazards & Seeding Recommendations Information Request
Tennessee Gas Pipeline Company
Concord Expansion Project
Pelham, NH

Dear Mr. Hoey:

Tennessee Gas Pipeline Company ("Tennessee"), a subsidiary of El Paso Corporation and a major supplier of natural gas to utilities and power generators in the northeast, plans to add a new compressor station in Pelham, New Hampshire, to increase the capacity of an existing Tennessee pipeline. The new compression would create an additional 30,000 dekatherms per day of capacity from Dracut, Massachusetts to Laconia, New Hampshire, to serve the growth needs of the KeySpan/Energy North distribution system. The project would benefit KeySpan's customers and New Hampshire citizens by providing incremental natural gas transportation in a safe and reliable manner.

Tennessee plans to construct the new, 6,130 horse-power compressor station on Tennessee's existing system. The facility will be located on a ten-acre tract of land in Pelham primarily within an existing industrial park located off Industrial Park Road (see attached locus map).

An Environmental Report, required as part of the Federal Energy Regulatory Commission ("FERC") Section 7C application and National Environmental Policy Act ("NEPA") review process, is currently being prepared for the project. As part of the FERC NEPA review, it is necessary to identify any concerns relative to soil compaction, severe erosion potential, poor revegetation potentia , etc., within the subject property. Additionally, TGP would appreciate information regarding any specific seed-mix recommendations for restoring work areas disturbed during construction of the compressor station.

ENSR requests that the HCCD review its records relative to any of the above-referenced areas and provide written comments pertaining to the identified resources. Enclosed is a USGS topographic locus map showing the project locus for your review. Should you have any questions regarding this request or require any further information to complete your review, please do not hesitate to contact me via phone at 508-888-3900 x 226 or email at jzimmer@ensr.aecom.com. Thank you for your consideration and assistance.

Sincerely,

ENSR Corporation

John Zimmer
Senior Project Manager

cc: Alicia Bishop – Tennessee
Shelley Jameson - Tennessee

Attachment - USGS topographic quadrangle locus map

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
The Concord Center
10 Ferry Street, Box 312, Suite 211
Concord, NH 03301-5081

(603) 223-6023 Fax: (603) 223-6030

www.nh.nrcs.usda.gov

November 8, 2007

John Zimmer, Senior Project Manager
ENSR
95 State Road
Sagamore Beach, MA 02562-2415

Mr. Zimmer,

Enclosed is a copy of NH NRCS Critical Area Planting Standard and Specification. It details seed mixtures for temporary and permanent vegetative cover along with fertilizer, mulch and lime recommendations. I have also enclosed a copy of the Hillsboro County Soil Survey. In it you will find detailed soils information and tables that provide information on erosion hazard, (table 6), revegetation potential (table 7 & 8), and other useful information that can be interpreted for the project you are working on. Please note that the information is not site specific and is intended for preliminary planning purposes. Onsite investigations are recommended as the site is located within an established industrial park where soil disturbance may have occurred. If NRCS can be of any further assistance, please contact our office at 223-6021 (Mike Lynch, District Conservationist, Merrimack, Belknap & Hillsborough Counties) or myself at 223-6022.

Sincerely,

William Hoey

William Hoey
Soil Conservationist

Cc; Mike Lynch, District Conservationist; Kerry Rickrode, HCCD Program Mgr.

Enclosure(s); Critical Area Planting Specification; Hillsboro County Soil Survey

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
Durham, New Hampshire

STANDARD AND SPECIFICATION
for
CRITICAL AREA PLANTING (ACRE)

(Code 342)

Definition

Planting vegetation, such as trees, shrubs, vines, grasses, or legumes on highly erodible or critically eroding areas (does not include tree planting mainly for wood products).

Purpose

To stabilize the soil, reduce damage from sediment and runoff to downstream areas, and improve wildlife habitat, visual resources, and water quality.

Conditions where practice applies

On highly erodible or critically eroding areas. These areas usually cannot be stabilized by ordinary conservation treatment and management and, if left untreated, can cause severe erosion or sediment damage. Examples of applicable areas are dams, dikes, mine spoil, levees, waterways, cuts, fills, surface-mined areas, and denuded or gullied areas where vegetation is difficult to establish by usual planting methods.

SPECIFICATIONS

Treatment specifications are included for the following critical area situations:

1. Temporary seedings on sediment producing areas which will be exposed for a period up to 12 months.
2. Permanent seeding of grass and/or legume species on sediment producing areas.
3. Sod establishment on sediment producing areas.
4. Woody vegetation ground cover establishment on sediment producing areas.

SECTION 1: Temporary Seeding of Critical Area Subject to Erosion Which Will Be Exposed Up to 12 Months.

Design Criteria and Specifications

1. Site Preparation

   (a) Install needed surface water control measures prior to planting as feasible.

   (b) Where practical, grade to permit use of conventional equipment for seedbed preparation.

   (c) Provide adequate drainage where internal water movement, especially at toe of slopes, may cause seeps or slippage before seeding or ground cover is well established.

2. Seedbed Preparation

   (a) As practical, perform all cultural operations at right angles to the slope.

   (b) Provide the best conditions possible for seeding. The best soil textures are sandy loam, loam, and silt loam. Where sands or clays are encountered, consider modifying them with hauled-in materials. Replace topsoil after grading.

   (c) The seedbed immediately before seeding should be firm, but not so compact as to prohibit covering seed or root penetration. Use implements that will provide a minimum 3 to 4 inch depth of firm, but friable soil free from clods or stones, if feasible.

3. Lime and Fertilizer

   (a) Have soils tested where time permits and follow lime and fertilizer recommendations.

   (b) In lieu of soil test:

      1. Apply agricultural limestone at a rate of 1 ton per acre (50 lb./1000 sq. ft.) where experience shows that lime is necessary to attain satisfactory plant growth.

      2. Apply 10-10-10 analysis fertilizer at a minimum rate of 1000 lbs. per acre (23 lb./1000 sq. ft.), or equivalent where practical and when feasible.

      3. Work lime and or fertilizer into the soil to a depth of 2 to 3 inches, either before or during, final seedbed preparation where possible.

4. Plant Selection and Seeding Rates.

(a) Select adapted species from the following table:

TABLE 1

Seeding for Temporary Cover

Seed	Seeding Rates Lbs./Ac.	Seeding Rates Lbs./1000 Sq. Ft.	Seeding Depth	Recommended Seeding Dates	Remarks
Winter Rye	112 (2 bu)	2.6	1-1 1/2"	8/15 - 9/5 for fall cover 8/15 - 10/1 for spring cover.	Good for fall seeding. Select a hardy variety.
Oats	80 (2 1/2 bu)	2.0	1-1 1/2"	4/1 - 7/1 8/15 - 9/15	Best for spring seeding. Early fall seedings will die when winter weather moves in, but the dead material will provide protection.
Annual Ryegrass	40	1.0	1/4"	4/1 - 6/1	Grows quickly but is of short duration. Use where appearance is important.
Sudangrass	40 (1.0 bu)	0.9	1/2-1"	5/15 - 8/15	Good growth during hot summer periods.
Perennial Ryegrass	30 (1.5 bu)	0.7	1/2"	4/1 - 6/1 8/15 - 9/15	Good cover, longer lasting than Annual Rye-Grass. Mulching will allow seeding throughout growing season.

(b) Apply seed uniformly at rates indicated in the aforementioned table by broadcasting, drilling, or hydroseeding.

5. Mulching
Mulch erosive and droughty areas immediately after or with seeding. See Mulching (484) Standard and Specifications for specific recommendations.

6. Conversion from Temporary to Permanent Vegetation
See Section 2 - Permanent seedings of grass and legume species on sediment producing areas, Section 3 - Sod establishment on sediment producing areas.

SECTION 2: Permanent Seedings of Grass and Legume Species on Sediment-Producing Areas

Design Criteria and Specifications

1. Site Preparation

(a) Install needed surface water control measures prior to planting permanent seeding.

(b) Where practical, grade to slopes that are 3:1 or flatter to permit use of conventional equipment.

(c) Provide adequate drainage where internal water movement, especially at toe of slopes, may cause seeps or slippage before seeding is well established.

2. Seedbed Preparation

(a) As practical, perform all cultural operations at right angles to the slope.

(b) Provide the best conditions possible for seeding. The best soil textures are sandy loam, loam, and silt loam. Where sands or clays are encountered, consider modifying them with hauled-in materials. Replace topsoil after grading.

(c) Where possible, the seedbed immediately before seeding, should be firm, but not so compact as to prohibit covering seed or root penetration. Tillage implements used shall provide a minimum 3-inch depth of firm, but friable soil free from clods or stones that are incompatible with seeding objectives.

3. Lime and Fertilizer

   (a) Where time permits, have soils tested and follow lime and fertilizer recommendations.

   (b) In lieu of soil tests:

      1. Apply ground limestone at a rate of 2 tons per acre. (100 lbs. per 1,000 sq. ft.).

      2. Apply 500 lbs. of 10-20-20 analysis fertilizer or equivalent per acre (11.5 lbs./1,000 sq. ft.).

      3. As practical, work lime and fertilizer into the soil to a depth of 2 to 3 inches, either before or during, final seedbed preparation.

4. Plant Selection and Seeding Rates

   (a) Select vegetative mixture from Table 2 for the purpose and management desired or use another mixture which experience has shown to be suitable.

   (b) Apply seed uniformly at rates indicated in Table 3 by broadcasting, drilling, or hydroseeding.

5. Mulching

   Mulching is an important step in establishing vegetation on critical areas. A mulch will help hold moisture, protect soil from erosion, hold seed in place, and keep soil temperatures relatively constant. See Mulching (484) Standard and Specifications for specific mulching recommendations.

6. Maintenance

   (a) Protect planted areas from damage by grazing, fire, traffic, and undesirable weed and woody growth as applicable.

   (b) Use visual inspections as a fertility needs assessment. If warranted, soil test every five years to determine lime and fertilizer needs.

TABLE 2
SEEDING FOR PERMANENT COVER*

Kind of Area	Seeding Mixture: Mowing	Seeding Mixture: No Mowing
Borrow Areas, Roadsides, Dikes, Levees, Pond Banks, and other Slopes and Banks		
A. Well to excessively drained	1,2,3,4,5, or 8	3,4,5,6,8,9,10, 11,12,13, or Table 4
4B. Somewhat poorly drained	2	5 or 6
C. Variable drainage	2	5 or 6
Drainage Ditch and Channel Banks		
A. Well to excessively drained	1,2,3, or 4	9,10,11
B. Somewhat poorly drained	2	
C. Variable drainage	2	
Diversions		
A. Well to excessively drained	2,3, or 4	9,10, or 11
B. Somewhat poorly drained	2	
C. Variable drainage	2	
Effluent Disposal		5 or 6
Gravel Pits	See NH Technical Note PM-NH-24	
Gullied and Eroded Areas		3,4,5,8,10,11
Mine spoil & Waste and Other Spoil Banks (If toxic substances and physical properties not limiting)		12,13,14
Shorelines (fluctuating water levels)		5 or 6
Sod Waterways and Spillways	1,2,3,4,6,7	1,2,3,4,6,7
General Recreation Seedings Picnic and Playgrounds or Driving and Archery Ranges	1,2,15,16, or 18	
Sand Dunes (blowing sand)		19

*For seeding woodland access road, skid trails, and landings, see Standard and Specifications (408) Forest Land Erosion Control System.

TABLE 3
SEED MIXTURES FOR PERMANENT SEEDINGS*

	Mixture	Lbs./Acre	Lbs./1000 Sq. Ft.
1.	Kentucky bluegrass	20	.45
	Creeping red fescue	20	.45
	Perennial ryegrass	5	.10
2.	Creeping red fescue	20	.45
	Redtop	2	.05
	Tall fescue	20	.45
3.	Creeping red fescue	20	.45
	Birdsfoot trefoil 1/	8	.20
	Tall fescue or smooth bromegrass	20	.45
4.	Tall fescue	20	.45
	Redtop	2	.05
	Birdsfoot trefoil 1/	8	.20
5.	Reed canarygrass	20	.45
	Redtop	5	.10
6.	Reed canarygrass	15	.35
	Redtop	5	.10
	Birdsfoot trefoil 1/	10	.25
7.	Smooth bromegrass	15	.35
	Perennial ryegrass	5	.10
	Birdsfoot trefoil 1/	10	.25
8.	Switchgrass (Broadcast)	10 (Pls) 2/	.25
9.	Creeping red fescue	10	.25
	Crownvetch or flatpea 1/	15 (30)	.35 (.70)
	Tall fescue or smooth bromegrass	15	.35
	Redtop	2	.05
10.	Creeping red fescue	20	.45
	Redtop	2	.05
	Crownvetch or flatpea	15 (30)	.35 (.70)
11.	Birdsfoot trefoil 1/	8	.20
	Crownvetch 1/	15	.35
	Creeping red fescue or tall fescue	20	.45

TABLE 3 (CONTINUED)

Mixture	Lbs./Acre	Lbs./1000 Sq. Ft.
12. Crownvetch or flatpea 1/	10 (30)	.25 (.70)
Perennial ryegrass	10	.25
13. Switchgrass	5 (PLS) 2/	.10
Bluestem (Big or Little)	5 (PLS) 2/	.10
Perennial ryegrass	5	.10
Birdsfoot trefoil 1/	5	.10
14. Tall fescue	20	.45
Flatpea	30	.70
SHADY OR SUNNY SITES		
15. Creeping red fescue	50	1.15
Canada bluegrass or Kentucky bluegrass	50	1.15
16. Creeping red fescue	50	1.15
Tall fescue	30	.70
17. Creeping red fescue	20	.45
Flatpea 1/	30	.70
18. Tall fescue	150	3.50
DUNES		
	Culms/Acre	Culms/1,000 sq. ft.
19. American beachgrass	20,000	460

1/ Inoculate legume seeds. Use four times recommended rate of inoculant when hydroseeding.

2/ (PLS) Pure Live Seed = $\frac{\text{\% germination x \% purity}}{100}$

*Relative amounts of individual species may vary within mixtures, somewhat, especially where species are available in commercial mixtures.

$\frac{\text{100 x lbs. of 100\% PLS required}}{\text{\% PLS of Commercial Seed Lot being used}}$ = Actual lbs. of commercial seed to be used

SECTION 3: Sod Establishment on Sediment-Producing Areas

Design Criteria and Specifications

1. Site Preparation

   (a) Install needed surface water control measures prior to laying sod.

   (b) Before laying sod, provide adequate subsurface drainage where internal water movement, especially at the toes of slopes, may cause seeps or soil slippage.

   (c) Grade slopes to 2:1 or flatter.

2. Seedbed Preparation

   (a) Provide good soil conditions for sodding. The desirable soil textures include sandy loam, loam, and silt loam. Where droughty or clayey soils are encountered, consider modifying them with additions of hauled-in materials. Replace topsoil after grading.

   (b) Fill areas must be compacted enough to prevent uneven settling. The entire surface to be sodded should be free from large clods, stones, or other debris. At this stage, incorporate lime and fertilizer uniformly into the surface soil as needed. Immediately before sodding, the soil should be loosened to a minimum depth of 4 inches and thoroughly dampened if not already moist. The last tillage operation should be performed across the slope whenever practical.

3. Lime and Fertilizer

   (a) If time permits, have soils tested and follow lime and fertilizer recommendations.

   (b) In lieu of a soil test:

      1. Apply 2 tons of ground limestone per acre. (100 lbs. per 1,000 sq. ft.).

      2. Apply 500 lbs. of 5-20-20 or equivalent fertilizer per acre. (11.5 lbs. per 1,000 sq. ft.).

      3. Lime and fertilizer should be worked into the top 3 to 4 inches of soil where feasible.

4. Sod Materials

(a) Sod quality: Sod should be good quality, free of weeds, disease and insects, and it should be of good color and density.

(b) Thickness of Cut: Sod should be machine cut at a uniform soil thickness necessary for plant viability during the Harvest-Transport-Installation cycle.

(c) Pad Size: Individual pieces of sod should be cut to the supplier's standard width and length. Maximum allowable deviation from standard widths and lengths shall be 5 percent.

(d) Strength of Sod Sections: Standard size sections of sod should be strong enough to support their own weight and retain their size and shape when suspended vertically from a firm grasp on the upper 10 percent of the section.

(e) Replacement: The policy for replacement of sod is dependent upon each individual sod farm. Most replacements extend only to the cost of the sod involved; not labor or transportation expenses. Notification of defective sod must be made within 24 hours of delivery. Failure to notify the sod farm within the specified time period can result in the farm's refusal to replace.

5. Installation

(a) Moistening the Soil: After all grading is completed, the soil should be irrigated within 12-24 hours prior to laying the sod. Sod should not be laid on soil that is dry and powdery.

(b) Starter Strip: The first row of sod should be laid in a straight line with subsequent rows placed parallel to and tightly against each other. Lateral joints should be staggered to promote more uniform growth and strength. Care should be exercised to ensure that the sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids which would cause air drying of the roots.

(c) Sloping Surfaces: On sloping areas where erosion may be a problem, sod should be laid with staggered joints and secured by pegging.

(d) Watering: The landscape contractor or agreed upon party should be responsible for watering sod immediately during and after installation to prevent drying. It should then be thoroughly irrigated to a depth sufficient that the underside of the new sod pad and soil immediately below the sod are thoroughly wet.

6. Acceptance: Acceptance of the installed sod should be on a daily basis within 14 hours of completion of an area or section unless otherwise specified.

7. Guarantee: The landscape contractor should guarantee work covered by this specification.

8. Maintenance:

(a) First week: In the absence of adequate rainfall, watering should be performed daily or as often as necessary and in sufficient quantities to maintain moist soil to a depth of at least 4 inches. Watering should be done during the heat of the day to help prevent wilting.

(b) Second and subsequent weeks: Water the sod as required to maintain adequate moisture in the upper 4 inches of soil. Avoid application of too much water. Sod should not be continually saturated; usually 20 to 30 minutes of sprinkler application is sufficient.

(c) Lime according to recommendations based on a soil test every five years.

(d) Fertilize with 60 pounds each of N, P205, and K20 annually.

(e) Mow once or twice a year to reduce undesirable growth. Mow to minimum height of 1.5 to 2 inches.

SECTION 4: Establishing Ground Covers, Vines, Shrubs, and Trees on Critical Areas Subject to Erosion.

Ground covers, vines, shrubs, and trees may be utilized on many critical areas subject to erosion where a permanent, long-lived vegetative cover other than turf is desired.

A partial listing has been made of some plants known to be suitable for erosion control and possessing aesthetic value. See Table 4. This list is neither inclusive nor exclusive. It includes plants which establish easily on difficult sites as well as plants which will require some site improvements and special attention before they will grow satisfactorily.

These plants cannot be expected to provide an erosion control cover and prevent soil slippage on sites that are not stable due to soil texture and structure, water movement, or excessive slope.

Ground covers are not necessarily low-maintenance plants, although some of them are. In general, they are more difficult to establish than turf. Plants included in this list respond favorably to careful treatment during the period of establishment.

Planting Time

Early spring. This allows for the maximum root and top development to check erosion and allow the plant to become established before winter.

Soil Preparation

For short slopes, small areas, and mass plantings of close spacing, apply a commercial granular fertilizer, such as 5-10-10, and organic supplement such as composted cow manure, peat, or well-rotted sawdust, and work into soil prior to planting. Fertilizer rate--3 to 5 lbs. per 100 sq. ft. The organic material needed will depend upon the soil and plant being used. Plants such as pachysandra require a high rate of organic material, about a 2-inch layer worked into the root zone. Depending on the soil type and steepness of slope, the depth of soil tilling will vary from 4 to 6 inches.

For steep slopes and large area plantings, working up the entire planting area is impractical and will probably induce erosion. Center hole planting, a hole dug for each plant, is more desirable. If the soil on the slope is poorly suited to the species being planted, incorporate organic material into the planting hole. Whether organic material is needed or not, fertilize each plant at the rate of one ounce per plant of some complete fertilizer, such as 10-10-10. Mix fertilizer with soil below the roots of the plants.

An alternative is to add to the planting hole a sandy loam soil mixed with peat, composted cow manure, or well-rotted sawdust at a rate of 1:1 or 2:1.

The entire planted slope should be covered with a protective mulch, such as woodchips, or wood pulp fiber to conserve moisture and control erosion. Weeds should be controlled by pulling or other acceptable means. Where fresh woodchips, wood shavings, or sawdust are used as mulches or to add organic material to planting bed, a slow release fertilizer, such as 7-40-6, 30-0-0, or organic forms should be used.

Where erosion hazard is very high, heavy jute matting stapled to the slope will provide excellent erosion control, as will landscape mats of fiberglass.

Where individual plants are planted, a temporary cover crop of annuals may be used to provide ground cover until planted material offers a protective cover.

PLANTING

1. Planting of Trees

   (a) Refer to Tree Planting (612) Standard and Specifications and planting guides for planting specification and specie selection.

   Additional guidance for specific purpose plantings may be found in standards and specifications for Farmstead and Feedlot Windbreaks (308), Field Windbreaks (392), Field Borders (386), Wildlife Wetland Habitat Management (644), Wildlife Upland Habitat Management (645), and in the New Hampshire TECHNICAL NOTES.

   (b) Some tree species suitable for critical area planting can be found in Table 4.

2. Planting of Shrubs, Vines, and Ground Covers

   (a) A partial listing of shrubs and vines to consider to meet a variety of conditions can be found in Table 4.

   (b) Additional guidance concerning selection and planting may be found in standards and specifications for Field Borders (386), Wildlife Wetland Habitat Management (644), Wildlife Upland Habitat Management (645), Field Windbreaks (392), Farmstead and Field Windbreaks (380), and in the New Hampshire TECHNICAL NOTES.

<u>Maintenance</u>

Some watering, weeding, remulching, and fertilizing may be required of a new planting during the period of establishment. Cultivation is not recommended. This will encourage erosion and cause root injury.

If a controlled release fertilizer was used at time of planting, additional fertilizing will not be necessary for several years. Otherwise, fertilize plantings the spring of the second growing season and thereafter as needed.

TABLE 4

GUIDE TO TREES, SHRUBS, VINES, AND GROUND COVER FOR CRITICAL AREAS*

KIND OF AREA	SPECIES TO CONSIDER (NOT ALL INCLUSIVE)
Borrow areas, roadsides, banks, gullied and eroding areas, and other slopes	Ground covers, bittersweet, Virginia creeper, creeping juniper, viburnums, privets
Sandy or gravelly areas, including pits	Bristly locust, sweetfern, sumac, red pine, scotch pine, white pine, black alder, Norway spruce, tamarack, jack pine
Dunes and shifting sands	Bayberry, Virginia creeper, beach plum, rugosa rose, seashore juniper, jack pine, red pine
Streambanks and shorelines	Red osier dogwood, purpleosier willow, silky dogwood, bristly locust
Windbreaks and screens	Russian olive, white pine, redpine, arbor-vitae,red cedar, tall hedge, Austrian pine, white spruce, hybrid poplar, dogwoods, viburnums, honeysuckle

* This is a very general guide and specific details for particular species and situations should be obtained from other detailed sources.

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ENSR
35 State Road, Sagamore Beach, Massachusetts 02562-2415
T 508 888 3900 F 508.888.6694 www.ensr.aecom.com

October 25, 2007

New Hampshire Natural Heritage Bureau Review
PO Box 1856
172 Pembroke Road
Concord, NH 03302-1856

Re: Rare Species Information Request
Tennessee Gas Pipeline Company
Concord Expansion Project
Pelham, NH

Natural Heritage Bureau Review:

On behalf of Tennessee Gas Pipeline Company ("Tennessee"), a subsidiary of El Paso Pipeline Group, ENSR is requesting information from the New Hampshire Natural Heritage Bureau ("NHB") regarding the potential presence of state-listed threatened and endangered species as well as any critical habitats known to occur along Tennessee's existing natural gas pipeline facilities in Pelham, New Hampshire. Please find attached a locus map depicting the area along the existing Tennessee system to be reviewed. In all cases ENSR will protect the confidential nature of any information received from NHB regarding the specific locations of threatened and endangered species.

If you have any questions or comments regarding the proposed project, please feel free to contact me via phone at 508-888-3900 x 226 or email at jzimmer@ensr.aecom.com. Thank you for your consideration.

Sincerely,

ENSR Corporation

John Zimmer
Senior Project Manager

cc: Alicia Bishop - Tennessee
Shelley Jameson - Tennessee

Attachments - USGS topographic quadrangle locus map
Rare Species Information Form

Memo

NH NATURAL HERITAGE BUREAU

To: John Zimmer, ENSR
95 State Road
Sagamore Beach, MA 02562

From: Melissa Coppola, NH Natural Heritage Bureau
Date: 11/1/2007 9:50:01 AM (valid for one year from this date)
Re: Review by NH Natural Heritage Bureau
NHB File ID: NHB07-1764 Town: Pelham
Project type: Other: natural gas compressor station Location: Tax Maps: Tax lot 5-111
cc: Kim Tuttle

As requested, I have searched our database for records of rare species and exemplary natural communities, with the following results.

Comments: This site is within an area flagged for possible impacts on the state-listed *Alasmidonta varicosa* (brook floater) in the Beaver Brook. The closest documented mussel population is ca. 1.5 miles away.

Invertebrate Species	State[1]	Federal	Notes
Brook Floater (*Alasmidonta varicosa*)	E	--	Contact the NH Fish & Game Dept (see below).

[1]Codes: "E" = Endangered, "T" = Threatened, "--" = an exemplary natural community, or a rare species tracked by NH Natural Heritage that has not yet been added to the official state list. An asterisk (*) indicates that the most recent report for that occurrence was more than 20 years ago.

Contact for all animal reviews: Kim Tuttle, NH F&G, (603) 271-6544.

A negative result (no record in our database) does not mean that a sensitive species is not present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. For some purposes, including legal requirements for state wetland permits, the fact that no species of concern are known to be present is sufficient. However, an on-site survey would provide better information on what species and communities are indeed present.

Department of Resources and Economic Development
Division of Forests and Lands
(603) 271-2214 fax: 271-6488

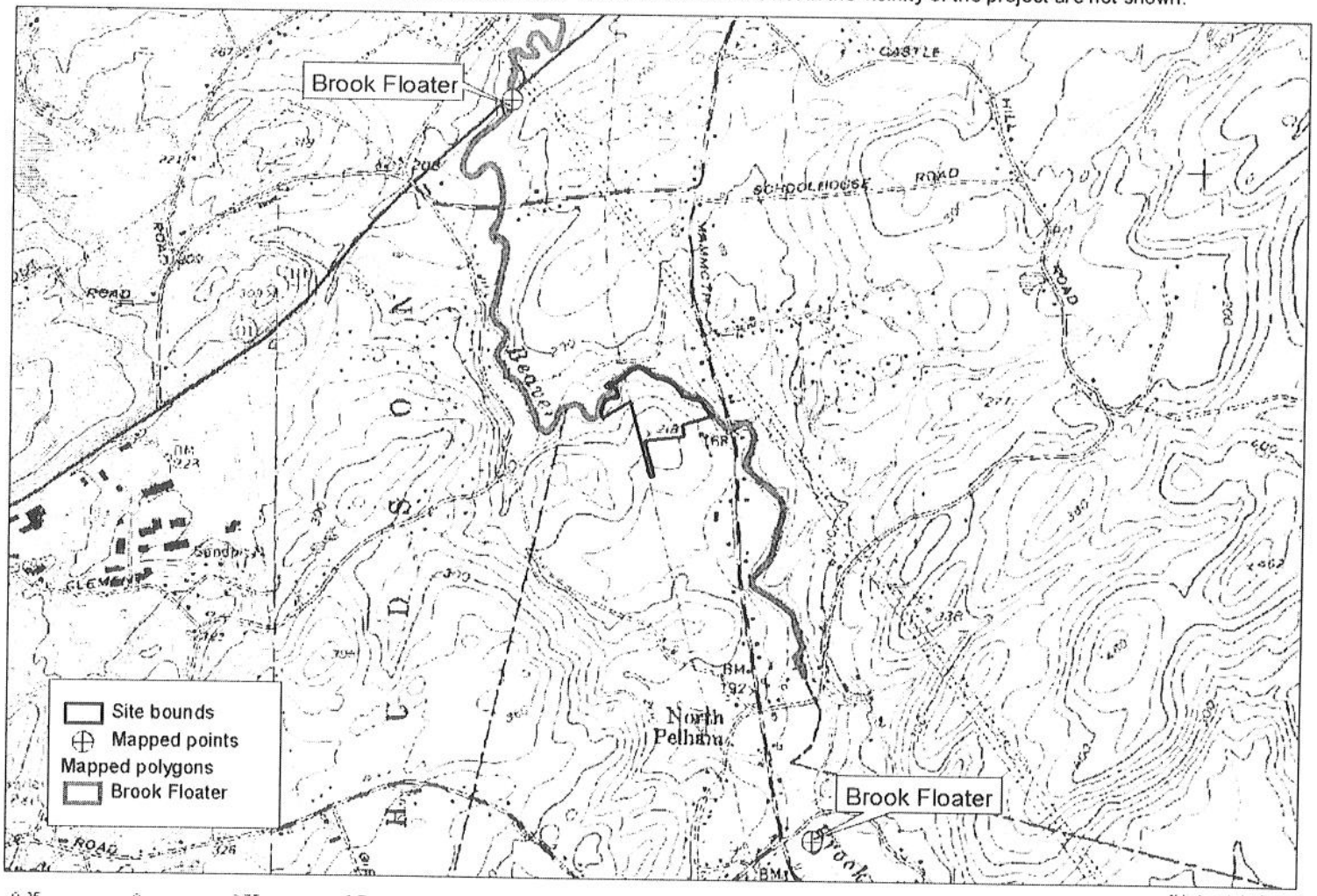
DRED/NHB
PO Box 1856
Concord NH 03302-1856

NHB07-1764

NH NATURAL HERITAGE BUREAU

Known locations of rare species and exemplary natural communities

Note: Mapped locations are not always exact. Occurrences that are not in the vicinity of the project are not shown.



*Historical record

Valid for one year from this date 01 Nov 2007

New Hampshire Natural Heritage Bureau - Animal Record

Brook Floater (*Alasmidonta varicosa*)

Legal Status

Federal: Not listed
State: Listed Endangered

Conservation Status

Global: Rare or uncommon
State: Critically imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Not ranked
Comments on Rank:

Detailed Description: 1994: Ca. 6 live and several dead located upstream of Route 111 in approximately 1.5 hour search by one observer at site located "2.0 miles north of Pelham". 1952: 10 individuals taken by H.D. Athearn.

General Area:
General Comments: Marea Gabriel's site number 623.
Management Comments:

Location

Survey Site Name: Beaver Brook
Managed By: Beaver Brook Floodplain

County: Rockingham
Town(s): Londonderry
Size: 19.4 acres

USGS quad(s): Windham (4207173)
Lat, Long: 424738N, 0712150W
Elevation: 140 feet

Precision: Within 1.5 miles of the area indicated on the map (location information is vague or uncertain).

Directions: Windham - Hudson town line. Access is at Route 111 crossing. Approximately 3.5 miles west of Cobbetts Pond.

Dates documented

First reported: 1952-07-14
Last reported: 1994

Gabriel, Marea. 1995. Freshwater mussel distribution in the rivers and streams of Cheshire, Hillsborough, Merrimack and Rockingham Counties, New Hampshire. Unpublished report to NH Department of Fish and Game. 61 pp. including maps and appendices.

New Hampshire Natural Heritage Bureau - Animal Record

Brook Floater (*Alasmidonta varicosa*)

Legal Status

Federal: Not listed
State: Listed Endangered

Conservation Status

Global: Rare or uncommon
State: Critically imperiled due to rarity or vulnerability

Description at this Location

Conservation Rank: Not ranked
Comments on Rank:

Detailed Description: 2003: 1 age and sex unknown (Obs_id 750).
General Area: 2003: Freshwater - Stream or river (Obs_id 750).
General Comments: 2003: From Freshwater Mussel Survey. Tallant Road Bridge/Beaver Brook Pelham, NH survey done for SEA consultants, Inc by Oak Hill Environmental Services. Coordinates for location taken off of ArcView by A. Pyzikiewicz (Obs_id 750).
Management Comments:

Location

Survey Site Name: Beaver Brook, Tallant Road bridge
Managed By:

County: Hillsborough
Town(s): Pelham
Size: .4 acres

USGS quad(s): Windham (4207173)
Lat, Long: 424610N, 0712100W
Elevation:

Precision: Within (but not necessarily restricted to) the area indicated on the map.

Directions: 2003: 225 ft downstream from Tallant Rd bridge crossing Beaver Brook (Obs_id 750).

Dates documented

First reported: 2003-10-17 Last reported: 2003-10-17

The New Hampshire Fish & Game Department has jurisdiction over rare wildlife in New Hampshire. Please contact them at 11 Hazen Drive, Concord, NH 03301 or at (603) 271-2461.

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ENSR
35 State Road, Sagamore Beach, Massachusetts 02562-2415
T 508.888.3990 F 508.888.6899 www.ensraecom.com

October 25, 2007

David Wunsch
New Hampshire State Geologist
New Hampshire Department of Environmental Services
29 Hazen Drive
PO Box 95
Concord, NH 03301

Re: Geologic Hazard Information Request
Tennessee Gas Pipeline Company
Concord Expansion Project
Pelham, NH

Dear Mr. Wunsch:

Tennessee Gas Pipeline Company ("Tennessee"), a subsidiary of El Paso Corporation and a major supplier of natural gas to utilities and power generators in the northeast, plans to add a new compressor station in Pelham, New Hampshire, to increase the capacity of an existing Tennessee pipeline. The new compression would create an additional 30,000 dekatherms per day of capacity from Dracut, Massachusetts to Laconia, New Hampshire, to serve the growth needs of the KeySpan/Energy North distribution system. The project would benefit KeySpan's customers and New Hampshire citizens by providing incremental natural gas transportation in a safe and reliable manner.

Tennessee plans to construct the new, 6,130 horse-power compressor tation on Tennessee's existing system. The facility will be located on a ten-acre tract of land in Pelham primarily within an existing industrial park located off Industrial Park Road (see attached locus map).

An Environmental Report, required as part of the Federal Energy Regulatory Commission ("FERC") Section 7C application and National Environmental Policy Act ("NEPA") review process, is currently being prepared for the project. As part of the FERC NEPA review, it is necessary to identify the presence or potential for geologic hazards or resources along or within 0.25 miles of TGP's new aboveground compressor station to be located in Pelham, New Hampshire, including:

- presence or potential for paleontological resources;
- potential earthquake hazards or active faults in the project vicinity;
- areas susceptible to soil liquefaction and/or landsliding;
- potential for slumping or ground subsidence due to karst terrain or underground mining;

- areas susceptible to flash flooding or volcanism; and
- any known existing or potential mineral mining resources.

ENSR is requesting a written response from the New Hampshire State Geologist regarding any of the above-mentioned geologic hazards or resources located within the general area. Please find enclosed a USGS topographic locus map showing the project locus for your review. Should you have any questions regarding this request or require any further information to complete your review, please do not hesitate to contact me via phone at 508-888-3900 x 226 or email at izimmer@ensr.aecom.com. Thank you for your consideration and assistance.

Sincerely,

ENSR Corporation

John Zimmer
Senior Project Manager

cc: Alicia Bishop - Tennessee
Shelley Jameson - Tennessee

Attachment - USGS topographic quadrangle locus map

January 9, 2008

John Zimmer
Senior Project Engineer
ENSR Corporation
95 State Road
Sagamore Beach, MA 02562-2415

Re: **Geologic Hazard Information Request**
Tennessee gas Pipeline Company
Concord Expansion Project
North Pelham, Hillsborough and Rockingham Counties, New Hampshire

Dear Mr. Zimmer:

Please find attached a response to your letter of October 25, 2007, regarding information on the presence or potential for geologic hazards at the proposed site in the northern part of the Town of Pelham, New Hampshire, approximately 0.75 mile north-northeast of North Pelham and about 1200 feet west of Route 128. NHGS staff reviewed our files, maps, publications, and databases to provide you with the accompanying information.

The New Hampshire Geological Survey is pleased to provide you this information, which is consistent with our mission of providing scientific and technical information for sound decision-making. We hope that this information is useful in your planning phase. Please let me know if we can be of further assistance.

Sincerely,

David R. Wunsch, Ph.D., P.G.
State Geologist and Director
NH Geological Survey

Ernst H. Kastning, Ph.D., P.G.
Surficial Mapping Program Manager

Re: **Geologic Hazard Information Request**
Tennessee gas Pipeline Company
Concord Expansion Project
North Pelham, Hillsborough and Rockingham Counties, New Hampshire

Presence or potential for paleontological resources.

The property is underlain by the Eliot Formation (Silurian in age), a granulite metamorphic unit within the garnet zone of the Merrimack Group (Sriramadas, 1966). The strike of the bedding (metamorphic foliation) is approximately N45W and the beds dip 70-80 degrees to the northwest. As is true for most of New Hampshire, this bedrock unit is crystalline and metamorphosed, it will not have paleontological content.

The only other potential source of paleontologic material in New Hampshire may exist in peat bogs. The 1:24,000-scale surficial geologic map of the area (Larson, 1984) does not indicate the presence of such deposits within one mile of the site.

Potential earthquake hazards or active faults in the project vicinity.

There are no mapped faults within several miles of the site (Sriramadas, 1996). Records of earthquakes available from the Weston Geophysical Observatory of Boston College indicate that two nearest low-magnitude earthquakes within the last 15 years occurred as follows. One centered about three miles north-northeast of the site in the Town of Londonderry, New Hampshire (magnitude 2.3 on February 6, 1996) and the other centered about 7.6 miles to the south-southwest in West Chelmsford, Massachusetts (magnitude 1.9 on July 28, 1993). Based on seismic-risk analysis, there is approximately a 12-percent probability that a magnitude 4.75 or greater earthquake would occur within 50 miles of the site over the next 100 years (Figure 1 attached).

Areas susceptible to soil liquefaction and/or landsliding

Ground motion during an earthquake and/or over-wetting of surficial materials through precipitation or snow melt may cause liquefaction of clay-rich units. Varved glacial-lake deposits are particularly susceptible to these conditions. There are glacial lake-bottom deposits consisting of silt and sand just to the north of the North Pelham site (Larson, 1984); however, excessively clay-rich deposits do not appear to be located on or near the site. Landslides of clay-rich units may occur, especially in areas of steep slopes. The steepest topographic slopes in the vicinity of the site are about 1500 feet due west of the property. These slopes are no greater than 17 feet per 100 feet or 9.7 degrees. The slope at the site leading north down Beaver brook is about the same (9.7 degrees). The site is almost entirely underlain by glacial till (Larson, 1984). Till contains a large fraction of clay and this may pose a slide problem if construction is too close to the top of the slope or on the slope.

Potential for slumping or ground subsidence due to karst terrane or underground mining

True karst (features developed principally through dissolution of rock) is extremely rare in New Hampshire. Thus slumping or subsidence of the ground as a result of karst is not an issue for this site.

Other openings such as mines (active or abandoned) can potentially affect on ground instability on the surface. This is rather uncommon in areas of mining, but it can occur locally. The data that we have on mines in New Hampshire (Meyers and Stewart, 1956) indicates that historically there has been little or no mining or rock quarrying in the area. The nearest known abandoned quarry is over seven miles to the west-southwest of the property, in Nashua (Sriramadas, 1966). There are several gravel pits in the southwestern part of the Windham Quadrangle. However, the closest ones are a mile or more from the North Pelham site (Larson, 1984) and would not pose a problem for site development.

Areas susceptible to flash flooding or volcanism

Flash flooding is always a concern along streams in New Hampshire. Alluvium (Holocene in age) occurs along Beaver Brook which flows through the northeastern part of the property (Larson, 1984). This indicates that this reach of the stream has experienced periodic flooding in the past and will continue to do so from time to time.

Most of the planned site lies about 40 to 60 feet above the alluvial deposits of Beaver Brook and thus this amount above the active floodplain. The northeasternmost area of the property is only 10 to 20 feet above the floodplain. The latter may be of concern should construction occur in that section of the property.

New Hampshire is volcanically inactive, so volcanic hazards are not an issue.

Any known existing or potential mineral mining resources

As mentioned above, we have no historical information on mining or quarrying of bedrock in the immediate vicinity of the North Pelham site. It is unlikely that the area will be of commercial mining interest in the foreseeable future. On the other hand, sand-and-gravel resources exist within the northeastern part of the site (Larson, 1984). Quaternary alluvium along Beaver Brook, which flows through the property, is a potential source of aggregate. As with many alluvial deposits in New Hampshire, this material may serve as a local ground water aquifer.

Extenuating circumstances

Specific information regarding the nature and position of the proposed structures or site-development plans were not included in the request for information. Some hazards, particularly those of land stability (liquefaction, landsliding) and flooding, may be of concern should the structures be installed too close to Beaver Brook.

References cited

Larson, Grahame J., 1984, Surficial geologic map of the Windham Quadrangle, Rockingham and Hillsborough Counties, New Hampshire: *New Hampshire Department of Resources and Economic Development, Map SGS 2*, 1 sheet, scale = 1:24,000. (map available as publication Geo-88 from NH Department of Environmental Services http://www.des.nh.gov/asp/Geology/links.asp?theLink=9)

Meyers, T.R. and Stewart, Glenn W., 1956 (fifth printing, 1977), The Geology of New Hampshire: Part III – Minerals and Mines: *New Hampshire Department of Resources*

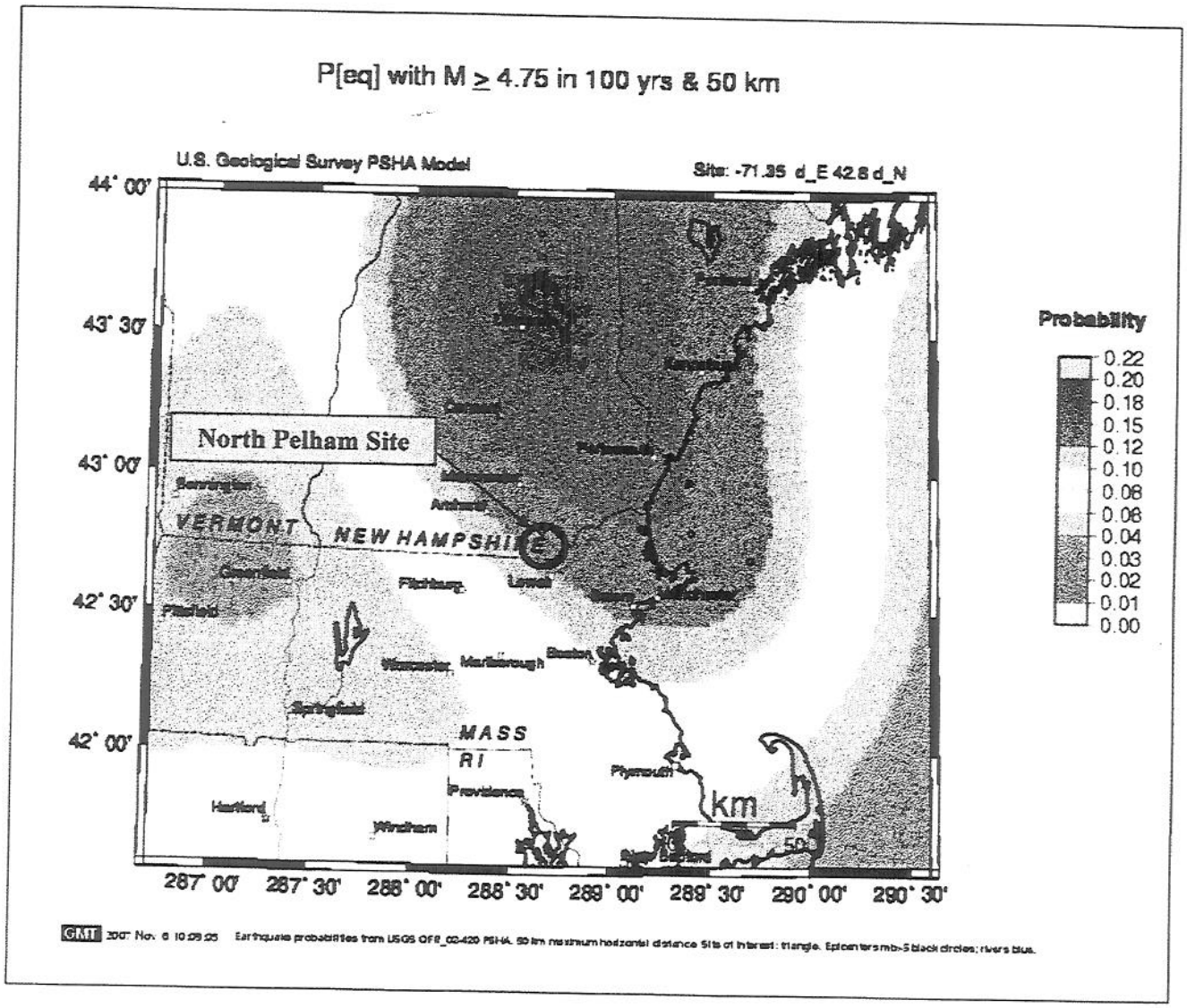
and Economic Development, Division of Forest and Lands, 105 p. plus map showing mines. (Text available on line: http://www.des.nh.bov/pdf/GeologyofNH.pdf)

Sriramadas, Aluru, 1966, Geologic map and structure sections of the Manchester Quadrangle, New Hampshire: *New Hampshire Department of Resources and Economic Development, Bulletin No. 2,* including map sheet, scale 1:62,500. (map available as publication Geo-61 from NH Department of Environmenal Services: http://www.des.nh.gov/asp/Geology/links.asp?theLink=9)

Figure 1

Seismic Risk in Western New England

Map showing probability of magnitude 4.75 or greater earthquake in 100 years



Compiled 6 November 2007 by Ernst H. Kastning
New Hampshire Geological Survey
Source: U.S. Geological Survey http://www.usgs.gov

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ENSR
96 State Road, Sagamore Beach, Massachusetts 02562-2415
T 508.888.3900 F 508.888.6889 www.ensraecom.com

October 25, 2007

Mr. Anthony Tur
Endangered Species Specialist
U.S. Fish and Wildlife Service
New England Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5087

Re: Rare Species Information Request
Tennessee Gas Pipeline Company
Concord Expansion Project
Pelham, NH

Dear Mr. Tur:

Tennessee Gas Pipeline Company ("Tennessee"), a subsidiary of El Paso Corporation and a major supplier of natural gas to utilities and power generators in the northeast, plans to add a new compressor station in Pelham, New Hampshire, to increase the capacity of an existing Tennessee pipeline. The new compression would create an additional 30,000 dekatherms per day of capacity from Dracut, Massachusetts to Laconia, New Hampshire, to serve the growth needs of the KeySpan/Energy North distribution system. The project would benefit KeySpan's customers and New Hampshire citizens by providing incremental natural gas transportation in a safe and reliable manner.

Tennessee plans to construct the new, 6,130 horse-power compressor station on Tennessee's existing system. The facility will be located on a ten-acre tract of land in Pelham primarily within an existing industrial park located off Industrial Park Road (see attached locus map).

An Environmental Report, required as part of the Federal Energy Regulatory Commission ("FERC") Section 7C application and National Environmental Policy Act ("NEPA") review process, is currently being prepared for the project. As part of the FERC NEPA review, it is necessary to identify the presence of any federally listed threatened or endangered species on or within 0.25-miles of the proposed aboveground compressor station to be located in Pelham, New Hampshire.

Based on examination of the county lists for Hillsborough County, it appears that only the small-whorled pogonia has the potential to be located within the review area. ENSR requests that the USFWS review its records relative to threatened and endangered species and provide written comments pertaining to the identified resources. Please find enclosed a USGS topographic locus map showing the project locus for your review. In all cases, ENSR will protect the confidential nature of any information received from the USFWS regarding the specific locations of threatened and endangered species. If you have any questions or comments regarding the proposed project, please feel free to contact me via phone at 508-888-3900 x 226 or email at jzimmer@ensr.aecom.com. Thank you for your consideration and assistance.

Sincerely,

ENSR Corporation

John Zimmer
Senior Project Manager

cc: Alicia Bishop - Tennessee
Shelley Jameson - Tennessee

Attachment – USGS topographic quadrangle locus map

United States Department of the Interior

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

November 30, 2007

Reference: Project: Natural gas facility compressor station; Location: Pelham, NH

John Zimmer
ENSR Corporation
95 State Road
Sagamore Beach, MA 02562-2415

Dear Mr. Zimmer:

This responds to your recent correspondence requesting information on the presence of federally-listed and/or proposed endangered or threatened species in relation to the proposed activity(ies) referenced above.

Based on information currently available to us, no federally-listed or proposed, threatened or endangered species or critical habitat under the jurisdiction of the U.S. Fish and Wildlife Service are known to occur in the project area(s). Preparation of a Biological Assessment or further consultation with us under Section 7 of the Endangered Species Act is not required.

This concludes our review of listed species and critical habitat in the project location(s) and environs referenced above. No further Endangered Species Act coordination of this type is necessary for a period of one year from the date of this letter, unless additional information on listed or proposed species becomes available.

In order to curtail the need to contact this office in the future for updated lists of federally-listed or proposed threatened or endangered species and critical habitats, please visit the Endangered Species Consultation page on the New England Field Office's website:

www.fws.gov/northeast/newenglandfieldoffice/EndangeredSpec-Consultation.htm

In addition, there is a link to procedures that may allow you to conclude if habitat for a listed species is present in the project area. If no habitat exists, then no federally-listed species are present in the project area and there is no need to contact us for further consultation. If the above conclusion cannot be reached, further consultation with this office is advised. Information describing the nature and location of the proposed activity that should be provided to us for further informal consultation can be found at the above-referenced site.

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

Sincerely yours,

Anthony P. Tur
Endangered Species Specialist
New England Field Office

Libby, Nicole

From: Libby, Nicole

Sent: Wednesday, January 09, 2008 11:15 AM

To: 'dlafrazia@dred.state.nh.us'

Subject: Concord Expansion Project Information Request

Attachments: Fig_1_2a_Site_Location_Comp_Station_270B.pdf; Fig_1_2b_Site_Location_Laconia_Meter_Station.pdf; 10-25-07 request.PDF

In regards to our phone conversation this morning, attached are Project location maps for the Tennessee Gas Pipeline Company, Concord Expansion Project. I have also attached the letter sent by ENSR on behalf of Tennessee Gas, requesting information in regards to state lands in the vicinity of the Project.

The Project includes construction of a compressor station in Pelham, NH and modifications to an existing meter station in Concord, NH.

Please let me know if you have any questions or if you have any difficulty opening the attachments. Any information you could provide would be appreciated.

Thank you for your time,

Nicole Libby
Project Specialist

ENSR
95 State Road
Sagamore Beach, MA 02562-2415
Office (508) 888-3900 ext. 228
Fax (508) 888-6689
Cell (508) 944-2102

Libby, Nicole

From: Linda Corriveau [lcorriveau@dred.state.nh.us]
Sent: Wednesday, January 09, 2008 12:11 PM
To: Bill Carpenter
Cc: Denise LaFrazia; Libby, Nicole
Subject: FW: Concord Expansion Project Information Request
Attachments: Fig_1_2a_Site_Location_Comp_Station_270B.pdf; Fig_1_2b_Site_Location_Laconia_Meter_Station.pdf; 10-25-07 request.PDF

Bill, please review the emails below with the following attachments.. This expansion project might involve some DRED properties. Unfortunately, this office in not familiar with this request that was sent in October, therefore, Tennessee Gas Pipeline is requesting a quick turn around. As Land Agent, have you seen the request and what can we do to assist?

-----Original Message-----
From: Denise LaFrazia
Sent: Wednesday, January 09, 2008 11:54 AM
To: Linda Corriveau
Subject: FW: Concord Expansion Project Information Request

Linda, I received a phone call and then this email from Nicole Libby (see attachments). She would like a reply to her request letter to Commissioner Bald dated 10-25-07.
If I can help, let me know.

Denise D. LaFrazia
Administrative Secretary
Planning and Development

State of New Hampshire
Department of Resources and Economic Development
Division of Parks and Recreation
P.O. Box 1856
Concord, NH 03302-1856
603-271-2606
603-271-2629-fax
dlafrazia@dred.state.nh.us
-----Original Message-----
From: Libby, Nicole [mailto:nlibby@ensr.aecom.com]
Sent: Wednesday, January 09, 2008 11:15 AM
To: Denise LaFrazia
Subject: Concord Expansion Project Information Request

In regards to our phone conversation this morning, attached are Project location maps for the Tennessee Gas Pipeline Company, Concord Expansion Project. I have also attached the letter sent by ENSR on behalf of Tennessee Gas, requesting information in regards to state lands in the vicinity of the Project.

The Project includes construction of a compressor station in Pelham, NH and modifications to an existing meter station in Concord, NH.

Please let me know if you have any questions or if you have any difficulty opening the attachments. Any information you could provide would be appreciated.