Docket No. _____
Exh. TDI-GGM-5a

Gilman & Briggs Environmental
1 Conti Circle, Suite 5, Barre, VT 05641
Ph: (802) 479-7480; FAX: (802) 476-7018
gbenvironmental@earthlink.net

MEMORANDUM

To: Galen Guerrero-Murphy
From: Art Gilman
Date: 22 October 2014
Re: NECPL Project Surveys (Shrewsbury – Wallingford Railroad & Ludlow Converter Site)

This memorandum recaps surveys for rare, threatened or endangered species undertaken in two areas:

1) Along a section of proposed conduit corridor within the right-of-way of the Green Mountain Railroad (VTrans) in the towns of Shrewsbury and Wallingford, east of Vt. Rte. 103 and generally bypassing the village of Cuttingsville, a distance of approximately 3.5 miles, and
2) At the site of the proposed converter station on Nelson Road in Ludlow, a parcel of land of some 30 acres.

Shrewsbury-Wallingford Railroad Option

Searches were undertaken on foot within the railroad right-of-way on 3-4-5 September 2014, with a follow-up visit to one location on 9 October 2014. The railroad is located from Mileposts 134.1 to 137.6. Both sides of the railbed were inspected to the limits of the right-of-way for the presence of significant natural communities, necessary wildlife habitat, rare, threatened or endangered plants, and for the presence of any rare fauna or habitat for rare fauna, as listed under federal and Vermont statute (threatened or endangered), or as listed by the Vermont Department of Fish and Wildlife, Wildlife Diversity Program (rare). A complete list of plants observed was taken (Table 1).

No rare, threatened, or endangered plant species was observed. Rare species are those ranked by the Vermont Natural Heritage Inventory as S1 (very rare, generally 1–5 sites in Vermont) or S2 (rare, generally 5–20 sites in Vermont). Threatened or endangered species are those listed as such in Vermont's endangered species statute. In my opinion, the presence of any such species in the disturbed lands of the railroad right of way, especially in this location in the Green Mountains, would be unlikely.

For the most part, no natural communities were observed. Most of the corridor is bordered by sloping northern hardwood deciduous forests, common to the region. A small patch of a "sugar maple–ostrich fern riverine floodplain forest" or a variant thereof, was observed at one location where the Mill River is near the bottom of the railroad embankment. This community is ranked S1 (very rare) in Vermont; however, its size and quality were not fully assessed as it primarily lies outside the railroad right of way. It appears to be quite small.

Additional to searches for rare plants in this area, non-native invasive species (NNIS) of plants were also mapped. These species are quarantined by the Vermont Agency of Agriculture, Food, and Markets and are listed as Class A or Class B noxious weeds. NNIS observed included: Morrow's Asian honeysuckle, Asian round-leaved bittersweet, winged euonymous, and garlic mustard. In general, most populations were confined to the northern portion of this corridor segment, between Vt. Rte.103 and Town Hill Road. South of that segment, only a couple minor infestations were noted.

Additionally, no rare fauna, nor habitat sufficient to support any such species was observed. This section of Vermont is outside the breeding range of Indiana bat, a species of concern elsewhere on the project. It would be unlikely to find this species or other species of bat along the railway corridor.

Much of the forest on the eastern (uphill) side of the corridor from near Rte. 103 south for approximately one mile is mapped as deer wintering area by the Vermont Fish and Wildlife Department (Vermont Natural Resources Atlas). This area does not have dense coniferous cover along the railroad itself and is not topographically sheltered, being generally west-sloping and likely exposed to prevailing winds (funneled up the Mill River Valley). Here as elsewhere the forest community near the railroad consists primarily of second or third growth deciduous hardwood forests, with admixtures of conifers. The lack of cover and food resources adjacent to the railroad (i.e. the ballasted side-slopes) make the corridor itself unsuitable for deer wintering.

Ludlow Converter Station Site

Searches for rare, threatened, or endangered species and significant natural communities were undertaken at the proposed Ludlow converter site just east of Nelson Road on 11 August 2014. A wander search was undertaken around the perimeter and through the center of the parcel. A complete list of plant species was taken (Table 2).

This site is a typical forest lot, on old farmland, dominated by a mixture of conifers, mostly white pine, and upland hardwood deciduous trees, primarily birch, beech, and maple. It has apparently developed on old field and has been partially harvested at some point in the recent past. This type of community is very common throughout Vermont, and, here being located in the central part of the Green Mountains at mid-elevation (ca. 1400'), is not one likely to support any rare, threatened, or endangered species of plant or animal, except as transient individuals, and none were observed. Additionally, no significant natural communities are present.

The current level of conifer canopy approaches 50% in parts of the site. It is not mapped as a deer wintering area by the Vermont Department of Fish and Wildlife, and evidence of use by overwintering deer was not apparent (e.g., no extensive pellet groups or browse was observed).

Additional to searches for rare plants in this area, non-native invasive species (NNIS) of plants were also mapped. These species are quarantined by the Vermont Agency of Agriculture, Food, and Markets and are listed as Class A or Class B noxious weeds. NNIS observed included: Oriental Bittersweet. Two large clumps were observed adjacent to North Hill Road and southeast of the driveway to the house located on the TDI-NE owned parcel.

TABLE 1. Plants of the NECPL, Shrewsbury/Wallingford Railroad, September 2014

Trees, shrubs, and woody vines: Total 24

Scientific Name	Common Name
Abies balsamifera	Balsam fir
Alnus incana ssp. rugosa	Speckled alder
Berberis thunbergii	Japanese barberry (NNIS)
Berberis vulgaris	Common barberry (NNIS)
Betula populifolia	Gray birch
Cornus alterniflora	Alternate-leaved dogwood
Cornus sericea	Red-osier dogwood
Corylus cornuta	Beaked hazel
Crataegus punctata	Dotted haw
Diervilla lonicera	Bush-honeysuckle
Euonymus alatus	Winged euonymus (NNIS)
Fallopia japonica	Japanese knotweed
Fraxinus americana	White ash
Larix laricina	Tamarack
Lonicera morrowii	Morrow's honeysuckle (NNIS)
Malus pumila	Apple
Pinus strobus	White pine
Populus balsamifera	Balsam poplar
Populus tremuloides	Quaking aspen
Rhamnus cathartica	European buckthorn (NNIS)
Rosa multiflora	Multiflora rose
Rubus idaeus	Red raspberry
Sambucus pubens	Red elder
Spiraea alba var. *latifolia*	Meadowsweet

Fern and Fern Allies: Total: 12

Scientific Name	Common Name
Athyrium filix-femina	Lady fern
Dryopteris carthusiana	Spinulose woodfern
Dryopteris cristata	Crested fern
Dryopteris intermedia	Evergreen woodfern
Lycopodium clavatum	Running clubmoss
Lycopodium lagopus	One-cone clubmoss
Onoclea sensibilis	Sensitive fern
Osmunda claytoniana	Interrupted fern
Parathelypteris noveboracensis	New York fern
Pteridium aquilinum	Bracken fern
Spinulum annotiunum	Northern interrupted clubmoss
Thelypteris palustris	Marsh fern

Grasses, sedges, and rushes ("Graminoids"): Total 31

Scientific Name	Common Name
Agrostis gigantea	Redtop
Agrostis stolonifera	Creeping bentgrass
Agrostis tenuis	Rough bentgrass
Anthoxanthum odoratum	Sweet vernal grass
Bromus ciliatus	Fringed brome
Calamagrosits canadensis	Bluejoint
Carex arctata	Drooping woodland sedge
Carex communis	Common sedge
Carex flava	Yellow-green sedge
Carex intumescens	Bladder sedge
Carex tenera	Delicate quill sedge
Danthonia spicata	Oat grass
Dichanthelium boreale	Boreal panic grass
Eleocharis sp.	Spikerush
Juncus effusus	Common rush
Glyceria striata	Manna grass
Juncus tenuis	Path rush
Muhlenbergia glomerata	Spike muhly
Muhlenbergia mexicana	Mexican muhly
Panicum capillare	Witch panic grass
Poa palustris	Fowl bluegrass
Poa pratensis	Kentucky bluegrass
Scirpus atrovirens	Dark-green bulrush
Scirpus cyperinus	Common woolgrass
Scirpus microcarpus	Barber pole bulrush
Typha latifolia	Broad-leaved cattail

Herbs and forbs: Total 53

Scientific Name	Common Name
Achillea millefolium	Common yarrow
Anaphalis margaritacea	Pearly everlasting
Arctium lappa	Great burdock
Cirsium vulgare	Common thistle
Doellingeria umbellata	Tall white aster
Epilobium sp.	Willow-herb
Epipactis helleborine	Helleborine
Erechtites hieraciifolia	Fireweed
Erigeron strigosus	Daisy fleabane
Fragaria virginiana	Common strawberry
Galium triflorum	Fragrant bedstraw
Geum aleppicum	Yellow avens
Geum rivale	Water avens
Hypericum perfoliatum	Common St. John's-wort
Lactuca canadensis	Tall lettuce
Leontodon autumnalis	Fall-dandelion
Leucanthemum vulgare	Ox-eye daisy

Linnaea borealis	Twinflower
Lobelia inflate	Indian-tobacco
Lysimachia quadrifolia	Four-leaved loosestrife
Mitchella repens	Partridge-berry
Oclemena acumanata	Whorled wood aster
Oenothera biennis	Evening primrose
Packeria schweinitziana	Robbin's ragwort
Pilosella officinarum	Mouse-ear hawkweed
Plantago rugelii	Plantain
Potentilla norvegica	Rough cinquefoil
Potentilla simplex	Old field cinquefoil
Prunella vulgaris	Common selfheal
Pyrola eliptica	Shinleaf
Ranunculus acris	Tall buttercup
Rudbeckia hirta	Black-eyed Susan
Rumex acetosa	Common dock
Solidago canadensis	Canada goldenrod
Solidago nemoralis	Gray goldenrod
Solidago puberula	Downy goldenrod
Solidago rugosa	Rough-leaved goldenrod
Solidago uliginosa	Bog goldenrod
Symphyotrichum lanceolatum	Lance-leaved aster
Symphyotrichum lateriflorum	Calico aster
Taraxacum officinale	Dandelion
Tussilago farfara	Colt's-foot
Valeriana officinalis	Common valerian
Verbascum thapsus	Common mullein
Veronica officinalis	Common speedwell

Table 2: Plants observed on the proposed NECLP Converter Station site, Ludlow

Scientific Names	**Common Names**	
Trees and Shrubs		
Acer pensylvanicum	Striped maple	
Acer rubrum	Red maple	
Acer saccharum	Sugar maple	Common
Betula alleghaniensis	Yellow birch	
Betula papyrifera	Paper birch	
Fagus americana	Beech	Common
Fraxinus americana	White ash	Common
Juglans cinerea	Butternut	Sapling
Malus pumila	Apple	Lawn area
Picea rubens	Red spruce	
Pinus resinosa	Red pine	1 tree, among white pine
Pinus strobus	White pine	Common
Populus tremuloides	Quaking aspen	Lawn
Prunus virginiana	Choke cherry	
Prunus serotina	Black cherry	
Quercus rubra	Red oak	
Rubus allaeghaniensis	Blackberry	
Rubus canadensis	Canada blackberry	
Rubus hispidus	Dewberry	
Rubus idaeus	Red raspberry	
Rubus occidentalis	Black raspberry	
Salix bebbiana	Bebb's willow	
Salix sericea	Silky willow	
Spiraea alba var. latifolia	Hardhack	
Spiraea tomentosa	Steeplebush	
Tsuga canadensis	Hemlock	1 small tree
Ulmus americana	American elm	
Vaccinium angustifolium	Blueberry	Few

Ferns & Fern Allies		
Athyrium filix-femina	Lady fern	
Dendrolycopodium dendroideum	Pincess pine	
Dennstaedtia punctilobula	Hay-scented fern	
Dryopteris campyloptera	Mountain woodfern	
Dryopteris carthusiana	Spinulose woodfern	
Dyopteris intermedia	Intermediate woodfern	
Onoclea sensibilis	Sensitive fern	
Osmunda claytoniana	Interrupted fern	
Osmundastrum cinnamomeum	Cinnamon fern	
Pteridium aquilinum	Bracken	
Parathelypteris noveboracensis	New York fern	

Grasses, sedges, and rushes		
Agrostis gigantea	Red-top	Co-dominant in field
Agrostis perennans	Perennial bent grass	Trails in forest
Anthoxanthum odoratum	Sweet vernal grass	Co-dominant in field
Carex gynandra	Fringed sedge	Logging roads
Carex lurida	Lurid sedge	Few, logging road
Cinna latifolia	Wood reed	Occasional in forest
Danthonia compressa	Poverty grass	Dominant along logging roads
Danthonia spicata	Poverty grass	Common, field and along edges
Juncus tenuis	Path rush	
Poa palustris	Swamp bluegrass	Few
Schizachne purpurascens	Purple false oat	Few, forest
Scirpus hattorianus	Blackish bulrush	

Herbs & Forbs		
Achillea millefolium	Yarrow	Field
Anemone quinquefolia	Wild anemone	
Apocynum androsaemifolium	Spreading dogbane	
Aralia nudicaulis	Wild sarsarparilla	
Asclepias syriaca	Milkweed	Field
Bidens frondosa	Beggar's-ticks	
Coptis trifolia	Goldthread	
Daucus carota	Queen Anne's lace	
Doellingeria umbellata	Tall white aster	
Epilobium coloratum	Willow-herb	
Erigeron strigosus	Daisy fleabane	Field
Fragaria virginiana	Wild strawberry	
Galium mollugo	Bedstraw	Field
Galium triflorum	Bedstraw	Forest
Hieracium scabrum	Hawkweed	
Hydrocotyle americana	Pennywort	
Hypericum maculatum	Dotted St. John's-wort	
Impatiens capensis	Jewelweed	
Lactuca canadensis	Canada wild lettuce	
Leucanthemum vulgare	Ox-eye daisy	
Lobelia inflata	Indian tobacco	
Lycopus uniflorus	Water horehound	
Medeola virginiana	Indian cucumber	
Monotropa uniflora	Indian pipes	Few
Oclemena acuminata	Whorled wood aster	Forest
Oxalis stricta	Wood-sorrel	
Persicaria hydropiper	Water-pepper	
Persicaria sagittata	Tearthumb	
Pilosella officinalis	Mouse-ear chickweed	
Plantago lanceolata	English plantain	Field
Plantago major	Plantain	
Potentilla norvegica	Rough cinquefoil	
Potentilla recta	Sulphur cinquefoil	Field
Prunella vulgaris	Self-heal	

Solidago canadensis	Canada goldenrod	
Solidago juncea	Early goldenrod	Field
Solidago nemoralis	Ashy goldenrod	Field
Solidago rugosa	Roughl-leaved goldenrod	
Symphyotrichum lanceolatum	Lance-leaved aster	
Symphyotrichum lateriflorum	Calico aster	Field margin
Trifolium aureum	Yellow hop-clover	
Trifolium pratense	Red clover	Field
Tussilago farfara	Colt's-foot	
Uvularia sessilifolia	Wild-oats	
Veronica officinalis	Speedwell	
Viola cucullata	Blue violet	

VERMONT SITE SUMMARY FORM
Natural Heritage Inventory (NHI)

rev. Nov. 2013

Survey Site (or project name): _____ **Town**(s)**:** Shrewsbury

Surveyor(s): Arthur V. Gilman Reason for visit: _____

Survey Date(s): 3 September 2014 Report Date: 20 November 2014

Unusual data sensitivity issues? ☐ If so, explain: None

General directions to site:

On E side of Mill River, ca. 1200' S of the Rte. 103 bridge across the MIll River, slightly N of the village of the village of Cuttingsville. Note, only the portion lying within lands of the Vermont Railway System's (Green Mountain Railroad) property was inspected and the site was accessed from the railroad bed.

Ownership:

Owners/Contacts	**Phone, Address, Email. Indicate local address if different**	Owner Comments	Permission obtained?
1)Vermont Railway System			☒
2)			☐
3)			☐
4)			☐

List rare & uncommon species and significant natural communities found during the survey date

Species or Natural Community Name	EO# (office)	Separate survey form?	Found ?	Biological Data, Comments, Collection #s, Owners (can denote as 1, 2, 3, 4 from above)	EO Rank
Sugar maple – ostrich fern floodplain forest			Y	See next page	C

Describe site and its range and variability (give a word picture of natural and man-made features including topography, elevation, exposure, community types, geologic substrata, woody debris abundance, disturbance evidence, exotics, etc.):

This occurs on a somewhat level terrace (steep sided upslope) along the Mill River - some damage evident - woody debris from Tropical Storm Irene. Trees are sugar maple and white ash. Ground layer has abundant ostrich fern. Other woody species noted were: Malus pumila, Crataegus punctata, Carpinus caroliniana, with herbs Tiarella cordifolia, Ranunculus recurvatus, Zizia aurea, Onoclea sensibilis, Lysimachia nummularia, Arisaema triphyllum and Elymus wiegandii. There were also some patches of the non-native invasive species (NNIS) Fallopia japonica

Threats to site and elements:

Biggest threat is likely increase of NNIS Fallopia japonica

Management/Protection recommendations:

Additional comments:

Rank is provisional until the entire site can be inspected - it appears to be a small example along a relatively high-gradient river;

Attached Files:

☐ **Map(s)* (required—all others are optional)**
☐ Species list
☐ Plot Form (identify location with GPS or on map)
☐ Rapid Community Assessment Form
☐ Associated GIS shapefile. Must be in *NAD83 State Plane*: ☐ File name: _____
☐ Printout of GPS coordinates
☐ Sketch of local topography cross-section around EO locations, including scale and direction

* Show site with element locations. Consider mapping route taken and observation points.

In Word 2007/2010, to unlock the form to draw a diagram or insert pictures or maps, click on the padlock in the "Review" or "Developer" tab/ribbon, select "Restrict Formatting and Editing," then click the "Stop Protection" button. When finished, click, "Yes, Start Enforcing Protection," then click "OK."

Please send with natural community or rare species forms to the appropriate person, or send completed forms to Eric Sorenson: Everett.Marshall [at] state.vt.us / Natural Heritage Inventory, Vermont Fish & Wildlife Department, 1 National Life Dr., Davis 2, Montpelier, VT 05641 / 802-371-7333