59. Wetlands along the southern edge of lake Took-A- While.

60. Many wetlands within the Riverlands section of the study area are bounded by existing trails and roads.

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Stowe, PA 19464

61.

62.

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Stowe, PA 19464

63. Boundary points PP12 (extreme left) and PP13 (center-left).

64. Boundary point 006 (center-right).

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Stowe, PA 19464

65a. Old field to scrub/shrub wetlands transition in the vicinity of MM3 and MM4.

65b.

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66a. Wetland forest to upland forest transition at boundary point CC8.

66b.

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Stowe, PA 19464

67.

68. North Branch Canal.

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69. A large tract of palustrine emergent wetlands is located to the south of the existing intake access road. Boundary points FF40 and FF41 are visible at the lower left.

70. Old field habitat vegetates a large area of historic fill.

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71. North Branch Canal.

72.

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Stowe, PA 19464

73. The wetland boundary occurs along the edge of the historic fill at right. Boundary point KK31 at center.

74. Boundary point KK41 (center) marks the transition from palustrine emergent wetlands to upland old field habitat. Historic fill area to the right.

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APPENDIX B

Data Sheets

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 7/24/07 Plot No.: DPA1 A Section: woodland upland S side

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Prunus serotina	Facu	7. Podophyllum peltatum	Facu
2. Fraxinus americana	Facu	8.	
3. Acer rubrum	Fac	9.	
Saplings/shrubs		**Woody vines**	
4. Lindera benzoin	Facw	10. Parthenocissus quinquef.	Facu
5. Carya ovata	Facu	11. Toxicodendron radic.	Fac
6.		12.	

% of species that are OBL, FACW, and/or FAC: 25. Other indicators: _____.

Hydrophytic vegetation: Yes ____ No X. Basis: _____.

Soil

Series and phase: Weikert & Klinesville channery silt loam On hydric soils list? Yes ____; No X.

Mottled: Yes ____; No X. Mottle color: —; Matrix color: 10YR4/3.

Gleyed: Yes ____ No X Other indicators: none.

Hydric soils: Yes ____ No X; Basis: no indicators.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: —.

Saturated soils: Yes ____; No X. Depth to saturated soil: >18"

Other indicators: none.

Wetland hydrology: Yes ____; No X. Basis: no indicators.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland _____; Nonwetland X.

Comments:

Determined by: J. Montgomery

K. Maurice

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 7/24/07 Plot No.: DPA2 A Section: forested wetland 1 (cont)

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Acer rubrum	Fac	7. Symplocarpus foetidus	OBL
2. Carya ovata	Facu	8. Osmunda cinnamomea	Facw
3.		9.	
Saplings/shrubs		**Woody vines**	
4. Lindera benzoin	Facw	10. —	
5.		11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC: 80. Other indicators: _____.

Hydrophytic vegetation: Yes X No ____. Basis: >50% Fac or greater

Soil

Series and phase: Atherton silt loam On hydric soils list? Yes X; No ____.

Mottled: Yes X; No ____. Mottle color: 10YR 6/8; Matrix color: 10YR 6/1.

Gleyed: Yes ____ No X Other indicators: _____.

Hydric soils: Yes ____ No X; Basis: mottled low chroma soil.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: _____.

Saturated soils: Yes ____; No X. Depth to saturated soil: >18"

Other indicators: _____.

Wetland hydrology: Yes X; No ____. Basis: soil type; dry conditions.

Atypical situation: Yes X; No ____.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland X; Nonwetland ____.

Comments: dry conditions

Determined by: J. Montgomery
K. Maurice

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: Nest AA30 Application Number: _____ Project Name: Susque. #21159.002

State: _____ County: Luzern Legal Description: Township: _____

Date: 24 Oct 2007 Plot No.: 1 DPAA1 Section: _____

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		Herbs	
1. Red Oak	FACU	7. Princesspine club moss	FAC
2. Virginia pine	upl	8. Red Oak seedlings	FACU
3. Red maple	FAC	9. Partridgeberry	FACU
Saplings/shrubs		Woody vines	
4. Spicebush	FACW	10. —	
5. Red Oak	FACU	11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC: 25. Other indicators: _____.

Hydrophytic vegetation: Yes ____ No X. Basis: _____.

Soil

Series and phase: Chenango gravelly loam On hydric soils list? Yes ____; No ✓.

Mottled: Yes ____; No ✓. Mottle color: —; Matrix color: 10YR 5/4.

Gleyed: Yes ____ No ✓ Other indicators: _____.

Hydric soils: Yes ____ No ✓; Basis: color _____.

Hydrology

Inundated: Yes ____; No ✓. Depth of standing water: _____.

Saturated soils: Yes ____; No ✓. Depth to saturated soil: _____.

Other indicators: _____.

Wetland hydrology: Yes ____; No ✓ Basis: upland side of break in slope

Atypical situation: Yes ____; No ✓.

Normal Circumstances? Yes ✓ No ____.

Wetland Determination: Wetland _____; Nonwetland ✓.

Comments:

Determined by: E. Gallo JB Schaeffer

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: Near AA 30 Application Number: Project Name: Susquehanna Sta 21159.002

State: County: Luzerne Legal Description: Township:

Date: 24 Oct 2007 Plot No: DPAA2 Section:

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		Herbs	
1. Pin Oak	FACW	7. Arrowwood	FAC
2. Red Maple	FAC	8. spicebush	FACW-
3. Red Oak	FACU-	9.	
Saplings/shrubs		Woody vines	
4. Spicebush	FACW	10.	
5. Highbush Blueberry		11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC: 6/7 Other indicators:

Hydrophytic vegetation: Yes ✓ No . Basis:

Soil

Series and phase: Rexford loam On hydric soils list? Yes X ; No .

Mottled: Yes ✓ ; No . Mottle color: 10YR 5/6 ; Matrix color: 10YR 5/2

Gleyed: Yes No ✓ Other indicators: oxidized rizospheres.

Hydric soils: Yes ✓ No ; Basis: chroma and/or mottles

Hydrology

Inundated: Yes ; No ✓. Depth of standing water: > 18"

Saturated soils: Yes ; No ✓. Depth to saturated soil: > 19"

Other indicators: soil color

Wetland hydrology: Yes ✓ ; No . Basis: break in slope

Atypical situation: Yes ; No ✓.

Normal Circumstances? Yes No ✓. very dry conditions until recently

Wetland Determination: Wetland yes ; Nonwetland .

Comments:

Determined by: E. Gark JB Schaeffer

PA25003 of 4

Photos ~~2 of 3~~ 3/4 wet down 2' break in slope spice bush dense, arrow wood, each pin oak

PA25000 ~~2 of 5~~ up tied on red oak sapling + black (oak) platy bark, princess pine, oak seedlings

Not relevant - K. Maurice 4/30/08

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 7/20/07 Plot No.: DPB1 B Section: upland woods N side

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Prunus serotina	Facu	7. Dennstaedtia punctil	U/1
2. Quercus alba	Facu	8. Prunus serotina	Facu
3. Acer rubrum	Fac	9.	
Saplings/shrubs		**Woody vines**	
4. Lindera benzoin	Facw	10. Smilax rotundifolia	Fac
5. Prunus		11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC: 42. Other indicators: _____.

Hydrophytic vegetation: Yes ____ No X. Basis: <50% Fac or greater species.

Soil

Series and phase: Rexford loam On hydric soils list? Yes X; No ____.

Mottled: Yes ____; No X. Mottle color: —; Matrix color: 10YR 5/6.

Gleyed: Yes ____ No X Other indicators: none.

Hydric soils: Yes ____ No X; Basis: no indicators.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: —.

Saturated soils: Yes ____; No X. Depth to saturated soil: >18".

Other indicators: none.

Wetland hydrology: Yes ____; No X. Basis: no indicators.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland ____; Nonwetland X.

Comments:

Determined by: J. Montgomery

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 7/25/07 Plot No.: DPB2 B Section: for Wetland N side (2)

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Fraxinus americana	Facw	7. Symplocarpus foetidus	OBL
2. Acer rubrum	Fac	8. Impatiens capensis	Facw
3.		9. Pilea pumila	Facw
Saplings/shrubs		**Woody vines**	
4. Lindera benzoin	Facw	10. —	
5. Viburnum dentatum	Fac	11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC: 86. Other indicators: _____.

Hydrophytic vegetation: Yes X No ____. Basis: >50% Fac or greater spp.

Soil

Series and phase: Atherton silt loam On hydric soils list? Yes X; No ____.

Mottled: Yes X; No ____. Mottle color: 10YR 4/6; Matrix color: 10YR 5/2.

Gleyed: Yes ____ No X Other indicators: tree hummocks.

Hydric soils: Yes X No ____; Basis: mottled low chroma soil.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: —.

Saturated soils: Yes ____; No X. Depth to saturated soil: ?.

Other indicators: dry conditions.

Wetland hydrology: Yes X; No ____. Basis: soil hydric, dry conditions.

Atypical situation: Yes X; No ____.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland X; Nonwetland ____.

Comments: dry conditions

Determined by: J Montgomery

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 7/25/07 Plot No.: DPB3 B Section: for Wetland Name

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Nyssa sylvatica	Fac	7. Symplocarpus foetidus	OBL
2. Acer rubrum	Fac	8. Rubus hispidus	Facw
3.		9.	
Saplings/shrubs		**Woody vines**	
4. Lindera benzoin	Facw	10.	
5.		11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC: 100. Other indicators: _____.

Hydrophytic vegetation: Yes X No ____. Basis: 100 % Fac or greater rec.

Soil

Series and phase: Atherton Silt loam On hydric soils list? Yes X; No ____.

Mottled: Yes X; No ____. Mottle color: 10YR4/6; Matrix color: 10YR4/1.

Gleyed: Yes ____ No X Other indicators: tree bases.

Hydric soils: Yes X No ____; Basis: mottled low chroma soil.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: —.

Saturated soils: Yes ____; No X. Depth to saturated soil: ?.

Other indicators: dry conditions.

Wetland hydrology: Yes X; No ____. Basis: assumed from soil.

Atypical situation: Yes X; No ____.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland X; Nonwetland ____.

Comments: dry conditions

Determined by: J. Montgomery

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 24 July 2007
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Upland old field
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPC1

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Erigeron annuus* *	Herb	FACU	9	*Taraxacum offinale*	Herb	FACU-
2	*Cirsium arvense* *	Herb	FACU	10	*Plantago lanceolata*	Herb	UPL
3	*Cirsium vulgare* *	Herb	FACU-	11	*Phleum pretense*	Herb	FACU
4	*Solidago canadensis* *	Herb	FACU	12	*Oxalis spp.*	Herb	FACU-UPL
5	*Solidago rugosa* *	Herb	FAC	13			
6	*Trifolium pretense* *	Herb	FACU-	14			
7	*Ambrosia artemisiifolia*	Herb	FACU	15			
8	*Conyza canadensis*	Herb	UPL	16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 17

Remarks

Dominant species = *

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	None Present	(in)
Depth to Free Water in Pit	None Present	(in)
Depth to Saturated Soil	> 18	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Chenango gravelly loam				Drainage Class: Well Drained
Taxonomy (Subgroup): Typic Dystrudepts			Field Observations Confirm Mapped Type?	**YES** NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-12	Ap	10 YR 3/3		moist friable, stony
12-18	B	10 YR 4/4		moist friable, stony

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	YES	**NO**			
Wetland Hydrology Present?	YES	**NO**	Is this Sampling Point Within a Wetland?	YES	**NO**
Hydric Soils Present?	YES	**NO**			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 24 July 2007
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Palustrine Emergent Wetland
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPC2

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Juncus effuses* *	Herb	FACW+	9	*Vernonia noveboracensis*	Herb	FACW+
2	*Carex spp.* *	Herb	FAC-OBL	10	*Eupatoriadelphus spp.*	Herb	FAC-FACW
3	*Juncus tenuis* *	Herb	FAC-	11	*Rudbeckia laciniata*	Herb	FACW
4	*Solidago gigantea* *	Herb	FACW	12	*Aster puniceus*	Herb	OBL
5	*Solidago canadensis* *	Herb	FACU	13	*Scirpus spp.*	Herb	FACU-OBL
6	*Solidago rugosa* *	Herb	FAC	14			
7	*Euthamia graminifolia* *	Herb	FAC	15			
8	*Eupatorium perfoliatum*	Herb	FACW+	16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 86

Remarks

Dominant species = *

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	None Present	(in)
Depth to Free Water in Pit	None Present	(in)
Depth to Saturated Soil Dry period	> 24	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Rexford loam			Drainage Class: Poorly Drained		
Taxonomy (Subgroup): Aeric Fragiaquepts			Field Observations Confirm Mapped Type?	**YES**	NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-15	Ap	10 YR 4/1	7.5 YR 2.5/3	
15-24	B	2.5 Y 6/2	10 YR 5/8	

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**YES**	NO			
Wetland Hydrology Present?	**YES**	NO	Is this Sampling Point Within a Wetland?	**YES**	NO
Hydric Soils Present?	**YES**	NO			

Remarks

Delineation was conducted during a dry period. Wetland hydrology would be present in a normal year early in the growing season.

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 10/8/07 Plot No.: DRC3 Section: (C28)

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. —		7. Solidago rugosa	Fac
2.		8. Solidago canadensis	Facu
3.		9. Lolium perenne	Facu
Saplings/shrubs		**Woody vines**	
4. Rosa multiflora	Facu	10. —	
5. Rubus allegheniensis	Facu	11.	
6. Rubus occidentalis	Fac	12.	

% of species that are OBL, FACW, and/or FAC: 33. Other indicators: none.

Hydrophytic vegetation: Yes ____ No X. Basis: <33% Fac or greater spp.

Soil

Series and phase: Chenango gravelly loam On hydric soils list? Yes ____; No X.

Mottled: Yes ____; No X. Mottle color: —; Matrix color: 10YR 4/4.

Gleyed: Yes ____ No X Other indicators: none.

Hydric soils: Yes ____ No X; Basis: no indicators.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: _____.

Saturated soils: Yes ____; No X. Depth to saturated soil: > 16".

Other indicators: none.

Wetland hydrology: Yes ____; No X. Basis: No Indicators.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland _____; Nonwetland X.

Comments:

Determined by: J. Montgomery, L. Gaeb

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 10/8/07 Plot No.: DPC4 Section: (C28)

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Quercus palustris	Facw	7. Impatiens capensis	Facw
2. Acer rubrum	Fac	8. Cinna arundinacea	Facw
3.		9. Symplocarpus foetidus	OBL
Saplings/shrubs		**Woody vines**	
4. Viburnum dentatum	Fac	10.	
5. Lindera benzoin	Facw	11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC: 100. Other indicators: _____.

Hydrophytic vegetation: Yes X No ____. Basis: 100% Fac or greater veg.

Soil

Series and phase: Atherton silt loam On hydric soils list? Yes X ; No ____.

Mottled: Yes X ; No ____. Mottle color: 7.5YR 4/6 ; Matrix color: 10YR 4/2.

Gleyed: Yes ____ No X Other indicators: _____.

Hydric soils: Yes X No ____; Basis: mottled low chroma soil.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: -.

Saturated soils: Yes ____; No X. Depth to saturated soil: ?.

Other indicators: matted vegetation, dry conditions.

Wetland hydrology: Yes X ; No ____. Basis: assume from soil & vegetation.

Atypical situation: Yes X ; No ____.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland X ; Nonwetland ____.

Comments: dry conditions

Determined by: J. Montgomery, L. Carlo

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 10/8/07 Plot No.: DPC 5 Section: (C44)

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Acer rubrum	Fac	7. Osmunda cinnamomea	Facw
2. Quercus palustris	Facw	8. Impatiens capensis	Facw
3.		9. Symplocarpus foetidus	OBL
Saplings/shrubs		**Woody vines**	
4. Lindera benzoin	Facw	10. –	
5. Vaccinium corymbosum	Facw	11.	
6. Ilex verticillata	Facw	12.	

% of species that are OBL, FACW, and/or FAC: 100. Other indicators: _____.

Hydrophytic vegetation: Yes X No ____. Basis: 100% Fac or greater or.

Soil

Series and phase: Atherton silt loam On hydric soils list? Yes X; No ____.

Mottled: Yes ____; No X. Mottle color: –; Matrix color: 10YR 3/1.

Gleyed: Yes ____ No X Other indicators: _____.

Hydric soils: Yes X No ____; Basis: low chroma soil.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: –.

Saturated soils: Yes ____; No X. Depth to saturated soil: ?.

Other indicators: shallow-rooted trees, water-stained lvs.

Wetland hydrology: Yes X; No ____. Basis: assumed from soil & veget.

Atypical situation: Yes X; No ____.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland X; Nonwetland ____.

Comments: dry conditions

Determined by: J. Montgomery, L. Gault

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 26 March 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Upland floodplain forest
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPCC1

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Acer rubrum* *	Tree	FAC	9	*Fraxinus americana*	Sapling	FACU
2	*Prunus serotina*	Tree	FACU	10	*Allium vineale*	Herb	FACU-
3	*Robinia pseudoacacia*	Tree	FACU-	11			
4	*Fraxinus americana*	Tree	FACU	12			
5	*Quercus alba*	Tree	FACU-	13			
6	*Lindera benzoin* *	Shrub	FACW-	14			
7	*Acer rubrum*	Sapling	FAC	15			
8	*Prunus serotina*	Sapling	FACU	16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100

Remarks

* = Dominant species

Ground cover sparse due to time of year

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	None present	(in)
Depth to Free Water in Pit	None present	(in)
Depth to Saturated Soil	>24	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Pope soils			Drainage Class: Well Drained	
Taxonomy (Subgroup): Fluventic Dystrudepts		Field Observations Confirm Mapped Type?	**YES**	NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-8	A	10 YR 4/3	-	
8-20	B	10 YR 5/4	-	
20-24	B	10 YR 5/4	10 YR 5/2	

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**YES**	NO			
Wetland Hydrology Present?	YES	**NO**	Is this Sampling Point Within a Wetland?	YES	**NO**
Hydric Soils Present?	YES	**NO**			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 27 March 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Palustrine Forested Wetland
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPCC2

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Acer rubrum* *	Tree	FAC	9	*Allium vineale*	Herb	FACU-
2	*Nyssa sylvatica*	Tree	FAC	10			
3	*Viburnum dentatum*	Shrub	FAC	11			
4	*Lindera benzoin* *	Shrub	FACW-	12			
5	*Onoclea sensibilis* *	Herb	FACW	13			
6	*Symplocarpus foetidus* *	Herb	OBL	14			
7	*Boehmeria cylindrica*	Herb	FACW+	15			
8	*Cinna arundinacea*	Herb	FACW+	16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100

Remarks

* = Dominant species

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	0	(in)
Depth to Free Water in Pit	surface	(in)
Depth to Saturated Soil	surface	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☒ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Holly silt loam				Drainage Class: Poorly Drained			
Taxonomy (Subgroup): Fluvaquentic Endoaquepts				Field Observations Confirm Mapped Type?		**YES**	NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-12	A	7.5 YR 3/1	7.5 YR 3/3	
12-18	B	10 YR 4/1	7.5 YR 3/3	
18-24	B	7.5 YR 3/1	7.5 YR 4/6	

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**YES**	NO			
Wetland Hydrology Present?	**YES**	NO	Is this Sampling Point Within a Wetland?	**YES**	NO
Hydric Soils Present?	**YES**	NO			

Remarks

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 7/24/04 Plot No.: DPD1 D Section: field W end

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

	Species	Indicator Status		Species	Indicator Status
Trees			Herbs		
1.	—		7.	Setaria Faberii	Upl
2.			8.	Ambrosia artemisiifolia	Facu
3.			9.	Trifolium hybridum	Facu
Saplings/shrubs			~~Woody vines~~		
4.	—		10.	Euthamia graminifolia	Fac
5.			11.	Chenopodium album	Facu
6.			12.		

% of species that are OBL, FACW, and/or FAC: 20. Other indicators: _____.

Hydrophytic vegetation: Yes ____ No X. Basis: no > Fac spp.

Soil

Series and phase: RdA Rexford loam On hydric soils list? Yes X; No ____.

Mottled: Yes ____; No X. Mottle color: —; Matrix color: 10YR 6/4.

Gleyed: Yes ____ No X Other indicators: none.

Hydric soils: Yes ____ No X; Basis: no indicators.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: —.

Saturated soils: Yes ____; No X. Depth to saturated soil: > 18".

Other indicators: none.

Wetland hydrology: Yes ____; No X. Basis: no indicators.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland _____; Nonwetland X.

Comments:

Determined by: J. Montgomery

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 7/24/07 Plot No.: DPD2 D Section: wetl west field

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

	Species	Indicator Status		Species	Indicator Status
Trees			Herbs		
1.	—		7.	Euthamia graminif.	Fac
2.			8.	Verbena hastata	Facw
3.			9.	Carex annectens	Facw
Saplings/shrubs			~~Woody vines~~		
4.	—		10.	Juncus effusus	Facw
5.			11.	Polygonum sagittatum	Obl
6.			12.		

% of species that are OBL, FACW, and/or FAC: 100. Other indicators: _____.

Hydrophytic vegetation: Yes X No ____. Basis: 100% Fac or greater sp.

Soil

Series and phase: Atherton silt loam On hydric soils list? Yes X; No ____.

Mottled: Yes X; No ____. Mottle color: 10YR 5/6; Matrix color: 10YR 5/2.

Gleyed: Yes ____ No X Other indicators: _____.

Hydric soils: Yes X No ____; Basis: mottled low chroma soil.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: —.

Saturated soils: Yes ____; No X. Depth to saturated soil: >18".

Other indicators: _____.

Wetland hydrology: Yes X; No ____. Basis: dry conditions; soil hydric.

Atypical situation: Yes X; No ____.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland X; Nonwetland ____.

Comments: dry conditions

Determined by: J. Montgomery

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 10/12/07 Plot No.: DP#1 Section: E2 (E24)

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Acer rubrum	Fac	7. Dennstaedtia punctil	UPL
2. Carya sp.	Facu	8. Thelypteris noveboracensis	Fac
3.		9. Solidago rugosa	Fac
Saplings/shrubs		**Woody vines**	
4. Rosa multiflora	Facw	10. Smilax rotundifolia	Fac
5. Lindera benzoin	Facw	11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC: 62. Other indicators: 25% Facu.

Hydrophytic vegetation: Yes ____ No X. Basis: Fac neutral test.

Soil

Series and phase: Oquaga + Lordstown channery silt loam On hydric soils list? Yes ____; No X.

Mottled: Yes ____; No X. Mottle color: —; Matrix color: 10YR5/6.

Gleyed: Yes ____ No X Other indicators: none.

Hydric soils: Yes ____ No X; Basis: no indicators.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: _____.

Saturated soils: Yes ____; No X. Depth to saturated soil: >16".

Other indicators: none.

Wetland hydrology: Yes ____; No X. Basis: no indicators.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland _____; Nonwetland X.

Comments:

Determined by: J. Montgomery, L. Gamble

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 10/12/07 Plot No.: DPE2 Section: E2 (E24)

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Acer rubrum	Fac	7. Impatiens capensis	Facw
2.		8. Scirpus viridis	OBL
3.		9. Symplocarpus foetidus	OBL
Saplings/shrubs		**Woody vines**	
4. Lindera benzoin	Facw	10. Smilax rotundifolia	Fac
5.		11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC: 100. Other indicators: _____.

Hydrophytic vegetation: Yes X No ____. Basis: 100% Fac or greater spp.

Soil

Series and phase: Wyoming gravelly loam On hydric soils list? Yes ____; No X.

Mottled: Yes X; No ____. Mottle color: 10YR4/4; Matrix color: 10YR4/1.

Gleyed: Yes ____ No X Other indicators: manganese nodules.

Hydric soils: Yes X No ____; Basis: low chroma.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: _____.

Saturated soils: Yes X; No ____. Depth to saturated soil: 2"

Other indicators: _____.

Wetland hydrology: Yes X; No ____. Basis: saturated soil.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland X; Nonwetland _____.

Comments:

Determined by: J. Montgomery, L. Card.

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 25 March 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Palustrine Emergent Wetland
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPFF1

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 *Phalaris arundinacea* *	Herb	FACW+	9		
2 *Dipsacus sylvestris*	Herb	FACU-	10		
3			11		
4			12		
5			13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100

Remarks

* = Dominant species

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	None present	(in)
Depth to Free Water in Pit	None present	(in)
Depth to Saturated Soil Driest part	>12	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Pope soils			Drainage Class: Well Drained	
Taxonomy (Subgroup): Fluventic Dystrudepts		Field Observations Confirm Mapped Type?	YES	**NO**

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-6	A	7.5 YR 3/1		Wet slightly sticky
6-12	B	7.5 YR 2.5/1	10 YR 4/4	Wet slightly sticky

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

Impenetrable beyond 12 " due to high concentration.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**YES**	NO			
Wetland Hydrology Present?	YES	NO	Is this Sampling Point Within a Wetland?	**YES**	NO
Hydric Soils Present?	**YES**	NO			

Remarks

Wetland /upland mosaic

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 26 March 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Palustrine Emergent Wetland
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPFF2

VEGETATION

	Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1	*Phalaris arundinacea* *	Herb	FACW+	9		
2	*Dipsacus sylvestris* *	Herb	FACU-	10		
3	*Juncus effusus*	Herb	FACW+	11		
4	*Solidago spp.*	Herb	UPL-OBL	12		
5	*Lythrum salicaria*	Herb	FACW+	13		
6				14		
7				15		
8				16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 50

Remarks

* = Dominant species

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	2	(in)
Depth to Free Water in Pit	surface	(in)
Depth to Saturated Soil	surface	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Pope soils				Drainage Class: Well Drained		
Taxonomy (Subgroup): Fluventic Dystrudepts			Field Observations Confirm Mapped Type?		YES	**NO**

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-14	A	10 YR 4/1	10 YR 3/6	Wet sticky

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**YES**	NO			
Wetland Hydrology Present?	**YES**	NO	Is this Sampling Point Within a Wetland?	**YES**	NO
Hydric Soils Present?	**YES**	NO			

Remarks

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 10/8/07 Plot No.: DPG1 Section: (G4)

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Acer rubrum	Fac	7. Dennstaedtia punctil.	U,1
2. Quercus rubra	Fac	8. Lycopodium obscurum	Facu
3.		9.	
Saplings/shrubs		**Woody vines**	
4. Carya tomentosa	Facu	10. —	
5. Amelanchier arborea	Fac	11.	
6. Lindera benzoin	Facw	12.	

% of species that are OBL, FACW, and/or FAC: 57. Other indicators: _____.

Hydrophytic vegetation: Yes ___ No X. Basis: Fac neutral test.

Soil

Series and phase: Chenango grvl. loam On hydric soils list? Yes ___; No X.

Mottled: Yes ___; No X. Mottle color: —; Matrix color: 10YR5/4.

Gleyed: Yes ___ No X Other indicators: none.

Hydric soils: Yes ___ No X; Basis: no indicators.

Hydrology

Inundated: Yes ___; No X. Depth of standing water: _____.

Saturated soils: Yes ___; No X. Depth to saturated soil: > 16".

Other indicators: none.

Wetland hydrology: Yes ___; No X. Basis: no indicators.

Atypical situation: Yes ___; No X.

Normal Circumstances? Yes ___ No ___.

Wetland Determination: Wetland _____; Nonwetland X.

Comments:

Determined by: J. Montgomery, L. Gould

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 10/6/07 Plot No.: DPG2 Section: (G4)

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Acer rubrum	Fac	7. Onoclea sensibilis	Facw
2. Carya ovata	Facu	8. Symplocarpus foetidus	OBL
3.		9. Impatiens capensis	Facw
Saplings/shrubs		**Woody vines**	
4. Lindera benzoin	Facw	10. —	
5. Ilex verticillata	Facw	11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC: 86. Other indicators: _____.

Hydrophytic vegetation: Yes X No ____. Basis: >50% Fac or greater rep.

Soil

Series and phase: Atherton silt loam On hydric soils list? Yes X; No ____.

Mottled: Yes X; No ____. Mottle color: 10YR5/2; Matrix color: 7.5YR 4/4 or 10Y 4/1.

Gleyed: Yes X No X Other indicators: _____.

Hydric soils: Yes X No ____; Basis: mottled low chroma soil.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: —.

Saturated soils: Yes ____; No X. Depth to saturated soil: ?.

Other indicators: tree hummocks.

Wetland hydrology: Yes X; No ____. Basis: soil & vegetation.

Atypical situation: Yes X; No ____.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland X; Nonwetland ____.

Comments: dry conditions

Determined by: J. Montgomery, L. Conko

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 10/9/08 Plot No.: DP63 Section: (G30)

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Quercus alba	Facu	7. Dennstaedtia punct.	Upl
2. Quercus rubra	Facu	8. Lycopodium obscurum	Facu
3. Carya tomentosa	Facu	9.	
Saplings/shrubs		**Woody vines**	
4. Lindera benzoin	Facw	10. —	
5. Cornus racemosa	Fac	11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC: 28. Other indicators: _____.

Hydrophytic vegetation: Yes ____ No X. Basis: <50% Fac or greater or.

Soil

Series and phase: Chenango gravl loam On hydric soils list? Yes ____; No X.

Mottled: Yes ____; No X. Mottle color: —; Matrix color: 10YR4/4.

Gleyed: Yes ____ No X Other indicators: none.

Hydric soils: Yes ____ No X; Basis: no indicators.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: _____.

Saturated soils: Yes ____; No X. Depth to saturated soil: _____.

Other indicators: none.

Wetland hydrology: Yes ____; No X. Basis: no indicators.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland _____; Nonwetland X.

Comments:

Determined by: J. Montgomery, L. Cash

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 10/7/07 Plot No.: DPG4 Section: (G3a)

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Acer rubrum	Fac	7. Dennstaedtia punct.	Facw
2. Pinus strobus	Facw	8. Lycopodium obscurum	Facw
3. Quercus alba	Facu	9. Rubus hispidus	Facw
Saplings/shrubs		**Woody vines**	
4. Vaccinium corymbosum	Facw	10.	
5. Lindera benzoin	Facw	11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC: 50. Other indicators: _____.

Hydrophytic vegetation: Yes X No ____. Basis: 50% Fac or greater rule.

Soil

Series and phase: Atherton silt loam On hydric soils list? Yes X; No ____.

Mottled: Yes ____; No X. Mottle color: 10YR4/4; Matrix color: 10YR3/2.

Gleyed: Yes ____ No X Other indicators: _____.

Hydric soils: Yes X No ____; Basis: mottled low chroma soil.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: ~.

Saturated soils: Yes ____; No X. Depth to saturated soil: ?.

Other indicators: dry conditions, assumed from soil + veg.

Wetland hydrology: Yes X; No ____. Basis: see above.

Atypical situation: Yes X; No ____.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland X; Nonwetland ____.

Comments:

Determined by: J. Montgomery, L. Gaudo

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: _____ County: _____ Legal Description: Township: _____

Date: 10/9/07 Plot No.: DPH1 Section: (H4)

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Betula lenta	FACU	7. Dennstaedtia punct.	UPL
2. Tsuga canadensis	FACU	8.	
3. Acer rubrum	FAC	9.	
Saplings/shrubs		**Woody vines**	
4. Rubus allegheniensis	FACU	10. —	
5. Quercus rubra seedl	FACU	11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC: 16. Other indicators: _____.

Hydrophytic vegetation: Yes ____ No X. Basis: <50% FAC or greater rpr.

Soil

Series and phase: Braceville grav. loam On hydric soils list? Yes ____; No X.

Mottled: Yes ____; No X. Mottle color: ~; Matrix color: 10YR4/4.

Gleyed: Yes ____ No X Other indicators: none.

Hydric soils: Yes ____ No X; Basis: no indicators.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: _____.

Saturated soils: Yes ____; No X. Depth to saturated soil: >16".

Other indicators: none.

Wetland hydrology: Yes ____; No X. Basis: no indicators.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland _____; Nonwetland X.

Comments:

Determined by: J. Montgomery, L. Gorla

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 10/7/07 Plot No.: DPH2 Section: (H4)

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Acer rubrum	Fac	7. Osmunda cinnamomea	Facw
2.		8. Rubus hispidus	Facw
3.		9.	
Saplings/shrubs		**Woody vines**	
4. Lindera benzoin	Facw	10. –	
5. Vaccinium corymbosum	Facw	11.	
6. Carpinus caroliniana	Fac	12.	

% of species that are OBL, FACW, and/or FAC: 100. Other indicators: _____.

Hydrophytic vegetation: Yes X No ____. Basis: 100% Fac or greater rr.

Soil

Series and phase: Rexford loam On hydric soils list? Yes X; No ____.

Mottled: Yes X; No ____. Mottle color: 10YR 5/6; Matrix color: 10YR 6/1.

Gleyed: Yes ____ No X Other indicators: _____.

Hydric soils: Yes X No ____; Basis: mottled low chroma soil.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: –.

Saturated soils: Yes ____; No X. Depth to saturated soil: ?.

Other indicators: tree hummocks, water-stained leaves.

Wetland hydrology: Yes X; No ____. Basis: _____.

Atypical situation: Yes X; No ____.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland X; Nonwetland ____.

Comments: dry conditions

Determined by: J. Montgomery, L. Gumbo

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 10/10/07 Plot No.: DPI 1 Section: _____

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. —		7. Solidago rugosa	Fac
2.		8. Glechoma hederacea	Facu
3.		9. Solidago canadensis	Facu
Saplings/shrubs		**Woody vines**	
4.		10. Cirsium arvense	Facu
5.		11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC: 20. Other indicators: _____.

Hydrophytic vegetation: Yes ____ No X. Basis: <100% Fac or greater >.

Soil

Series and phase: Chenango gravelly lo On hydric soils list? Yes ____; No X.

Mottled: Yes ____; No X. Mottle color: — ; Matrix color: 10YR4/3.

Gleyed: Yes ____ No X Other indicators: none.

Hydric soils: Yes ____ No X; Basis: no indicators.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: _____.

Saturated soils: Yes ____; No X. Depth to saturated soil: >18" .

Other indicators: none.

Wetland hydrology: Yes ____; No X. Basis: no indicators.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland _____; Nonwetland X.

Comments:

Determined by: J. Montgomery, L. Gould

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 10/10/07 Plot No.: DP12 Section: I 1

(167)

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Acer rubrum	Fac	7. Impatiens capensis	Facw
2. Quercus palustris	Facw	8. Onoclea sensibilis	Facw
3.		9. Cinna arundinacea	Facw
Saplings/shrubs		**Woody vines**	
4. Lindera benzoin	Facw	10. –	
5. Vaccinium corymbosum	Facw	11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC: 100. Other indicators: _____.

Hydrophytic vegetation: Yes X No ____. Basis: 100% fac or greater spp.

Soil

Series and phase: Rexford Loam On hydric soils list? Yes X; No ____.

Mottled: Yes X; No ____. Mottle color: 10YR 4/6; Matrix color: 10YR 4/1.

Gleyed: Yes ____ No X Other indicators: _____.

Hydric soils: Yes X No ____; Basis: mottled low chroma soil.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: _____.

Saturated soils: Yes X; No ____. Depth to saturated soil: 6"

Other indicators: water-stained leaves.

Wetland hydrology: Yes X; No ____. Basis: saturated soil.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland X; Nonwetland ____.

Comments:

Determined by: J. Montgomery, L. Gould

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 10/10/07 Plot No.: DPS 1 Section: _____

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

	Species	Indicator Status		Species	Indicator Status
Trees			Herbs		
1.	—		7.	Solidago canadensis	Facu
2.			8.	Aster pilosus	Upl
3.			9.	grass (unident)	
Saplings/shrubs			~~Woody vines~~		
4.	—		10.	Solidago rugosa	Fac
5.			11.		
6.			12.		

% of species that are OBL, FACW, and/or FAC: 33. Other indicators: _____.

Hydrophytic vegetation: Yes ____ No X. Basis: <50% Fac or greater spp.

Soil

Series and phase: Braceville gravelly loam On hydric soils list? Yes ____; No X.

Mottled: Yes ____; No X. Mottle color: —; Matrix color: 10YR 5/3.

Gleyed: Yes ____ No X Other indicators: none.

Hydric soils: Yes ____ No X; Basis: no indicators.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: —.

Saturated soils: Yes ____; No X. Depth to saturated soil: >18".

Other indicators: none.

Wetland hydrology: Yes ____; No X. Basis: no indicators.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland _____; Nonwetland X.

Comments:

Determined by: J. Montgomery, L. Cable

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 10/10/07 Plot No.: DP32 Section: _____

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Acer rubrum	Fac	7.	
2. Quercus palustris	Facw	8.	
3.		9.	
Saplings/shrubs		**Woody vines**	
4. Ilex verticillata	Facw	10.	
5. Vaccinium corymbosum	Facw	11.	
6. Acer rubrum	Fac	12.	

% of species that are OBL, FACW, and/or FAC: ____. Other indicators: _____.

Hydrophytic vegetation: Yes ____ No ____. Basis: _____.

Soil

Series and phase: Braceville gravelly loam On hydric soils list? Yes ____; No X.

Mottled: Yes X; No ____. Mottle color: 10YR 6/4; Matrix color: 10YR 4/2.

Gleyed: Yes ____ No X Other indicators: _____.

Hydric soils: Yes X No ____; Basis: mottled low chroma soil.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: —.

Saturated soils: Yes ____; No X. Depth to saturated soil: ?.

Other indicators: dry conditions.

Wetland hydrology: Yes X; No ____. Basis: assumed from soil + veg.

Atypical situation: Yes X; No ____.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland X; Nonwetland ____.

Comments: dry conditions

Determined by: J. Montgomery, L. Gould

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 10/16/07 Plot No.: DPK1 Section: _____

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

	Species	Indicator Status		Species	Indicator Status
Trees			Herbs		
1.	—		7.	Solidago canadensis	Facu
2.			8.	Agrostis perennans	Facu
3.			9.	grass (undent)	
Saplings/shrubs			Woody vines		
4.	Acer rubrum	Fac	10.	Toxicodendron radicans	Fac
5.	Rosa multiflora	Facu	11.		
6.			12.		

% of species that are OBL, FACW, and/or FAC: 40. Other indicators: _____.

Hydrophytic vegetation: Yes ____ No X. Basis: <50% Fac or greater spp.

Soil

Series and phase: Rexford Loam On hydric soils list? Yes X; No ____.

Mottled: Yes ____; No X. Mottle color: —; Matrix color: 10YR 5/4.

Gleyed: Yes ____ No X Other indicators: none.

Hydric soils: Yes ____ No X; Basis: no indicators.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: —.

Saturated soils: Yes ____; No X. Depth to saturated soil: >18".

Other indicators: none.

Wetland hydrology: Yes ____; No X. Basis: no indicators.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland _____; Nonwetland X.

Comments:

Determined by: J. Montgomery

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 10/16/07 Plot No.: DPK2 Section: _____

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. —		7. Vernonia noveboracensis	Facw
2.		8. Solidago gigantea	Facw
3.		9. Juncus effusus	Facw
Saplings/shrubs		**~~Woody vines~~**	
4. Acer rubrum	Fac	10. Eutbamia graminifolia	Fac
5.		11. Solidago rugosa	Fac
6.		12.	

% of species that are OBL, FACW, and/or FAC: 100. Other indicators: _____.

Hydrophytic vegetation: Yes X No ____. Basis: 100% Fac or greater spp.

Soil

Series and phase: Rexford Loam On hydric soils list? Yes X; No ____.

Mottled: Yes X; No ____. Mottle color: 7.5YR4/6; Matrix color: 10YR4/2.

Gleyed: Yes ____ No X Other indicators: _____.

Hydric soils: Yes X No ____; Basis: mottled low chroma soil.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: _____.

Saturated soils: Yes X; No ____. Depth to saturated soil: 10"

Other indicators: adjacent to pond.

Wetland hydrology: Yes X; No ____. Basis: saturated soil.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland X; Nonwetland _____.

Comments:

Determined by: J. Montgomery

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 10/16/07 Plot No.: DPK3 Section: near K45

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Acer rubrum	Fac	7. Mitchella repens	Facu
2. Betula lenta	Facu	8.	
3. Fraxinus americana	Facu	9.	
Saplings/shrubs		**Woody vines**	
4. Lindera benzoin	Facw	10. —	
5.		11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC: 40. Other indicators: _____.

Hydrophytic vegetation: Yes ____ No X. Basis: <50% fac or greater wr.

Soil

Series and phase: Oquaga + Lordstown ext stony silt loam On hydric soils list? Yes ____; No X.

Mottled: Yes ____; No X. Mottle color: — ; Matrix color: 10YR5/6.

Gleyed: Yes ____ No X Other indicators: _____.

Hydric soils: Yes ____ No X; Basis: no indicators.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: _____.

Saturated soils: Yes ____; No X. Depth to saturated soil: >18"

Other indicators: none.

Wetland hydrology: Yes ____; No X. Basis: no indicators.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland _____; Nonwetland X.

Comments:

Determined by: J. Montgomery

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 10/16/07 Plot No.: DPK4 Section: near K44

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Acer rubrum	Fac	7. Onoclea sensibilis	Facw
2.		8. Osmunda cinnamomea	Facw
3.		9. Dryopteris carthusiana	Fac
Saplings/shrubs		**Woody vines**	
4. Lindera benzoin	Facw	10. —	
5.		11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC: 100. Other indicators: _____.

Hydrophytic vegetation: Yes X No ____. Basis: 100% Fac or greater veg.

Soil

Series and phase: Rexford Loam On hydric soils list? Yes X; No ____.

Mottled: Yes X; No ____. Mottle color: 10YR4/6; Matrix color: 10YR 5/2.

Gleyed: Yes ____ No X Other indicators: streamside.

Hydric soils: Yes X No ____; Basis: modified low chroma soil.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: _____.

Saturated soils: Yes X; No ____. Depth to saturated soil: 10-16".

Other indicators: streamside.

Wetland hydrology: Yes X; No ____. Basis: soil & veget.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland X; Nonwetland _____.

Comments:

Determined by: J Montgomery

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 10/25/07 Plot No.: DPK5 Section: _____

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Juglans nigra	Facu	7. Solidago rugosa	Fac
2. Fraxinus americana	Facu	8. grass (unident)	
3. Prunus serotina	Facu	9.	
Saplings/shrubs		**Woody vines**	
4. Cornus florida	Facu	10. Vitis riparia	Facw
5. Elaeagnus umbellata	Upl	11.	
6. Prunus serotina	Facu	12.	

% of species that are OBL, FACW, and/or FAC: 12. Other indicators: _____.

Hydrophytic vegetation: Yes ____ No X. Basis: <50% Fac or greater spp.

Soil

Series and phase: Rexford loam On hydric soils list? Yes X; No ____.

Mottled: Yes ____; No X. Mottle color: —; Matrix color: 10YR4/4.

Gleyed: Yes ____ No X Other indicators: none.

Hydric soils: Yes ____ No X; Basis: no indicators.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: _____.

Saturated soils: Yes ____; No X. Depth to saturated soil: > 16".

Other indicators: none.

Wetland hydrology: Yes ____; No X. Basis: no indicators.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland _____; Nonwetland X.

Comments:

Determined by: J. Montgomery, L. Gould

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 10/20/07 Plot No.: DPK6 Section: (K11&)

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Acer rubrum	Fac	7. Onoclea sensibilis	Facw
2.		8. Solidago rugosa	Fac
3.		9.	
Saplings/shrubs		**Woody vines**	
4. Viburnum dentatum	Fac	10.	
5. Lindera benzoin	Facw	11.	
6. Cornus amomum	Facw	12.	

% of species that are OBL, FACW, and/or FAC: 100. Other indicators: _____.

Hydrophytic vegetation: Yes X No ____. Basis: 100% Fac or greater or .

Soil

Series and phase: Rexford loam On hydric soils list? Yes X; No ____.

Mottled: Yes X; No ____. Mottle color: 10YR 4/6; Matrix color: 10YR 6/2.

Gleyed: Yes ____ No X Other indicators: _____.

Hydric soils: Yes X No ____; Basis: mottled low chroma soil.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: _____.

Saturated soils: Yes X; No ____. Depth to saturated soil: 10"

Other indicators: streamside.

Wetland hydrology: Yes X; No ____. Basis: saturated soil.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland X; Nonwetland _____.

Comments:

Determined by: J. Montgomery, L Gould

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 25 March 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Successional Old Field
Is the site significantly disturbed (Atypical Situation)?	**YES** NO	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPKK1

VEGETATION

	Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1	*Rubus allegheniensis* *	Shrub	FACU-	9		
2	*Rosa multiflora* *	Shrub	FACU	10		
3	*Hesperis matronalis* *	Herb	FACU-	11		
4	*Alliaria petiolata*	Herb	FACU-	12		
5	*Cicuta bulbifera*	Herb	OBL	13		
6	*Solidago spp.*	Herb	UPL-OBL	14		
7				15		
8				16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 0

Remarks

* = Dominant species

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	None present	(in)
Depth to Free Water in Pit	None present	(in)
Depth to Saturated Soil	>24	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Fill				Drainage Class:	
Taxonomy (Subgroup):			Field Observations Confirm Mapped Type?	YES	NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-24	Fill	10 YR 4/2	2.5 YR 4/4	Wet slightly sticky

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

Data point located on a soil stockpile created during construction of SSES facilities. Soil chromas reflect historic rather than current conditions.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	YES	**NO**			
Wetland Hydrology Present?	YES	**NO**	Is this Sampling Point Within a Wetland?	YES	**NO**
Hydric Soils Present?	YES	**NO**			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 25 March 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Palustrine Emergent Wetland
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPKK2

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Typha latifolia* *	Herb	OBL	9			
2	*Phragmites australis* *	Herb	FACW	10			
3	*Microstegium vimineum* *	Herb	FAC	11			
4	*Onoclea sensibilis*	Herb	FACW	12			
5				13			
6				14			
7				15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100

Remarks

* = Dominant species

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	6	(in)
Depth to Free Water in Pit	1	(in)
Depth to Saturated Soil	surface	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☒ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Holly silt loam				Drainage Class: Poorly Drained			
Taxonomy (Subgroup): Fluvaquentic Endoaquepts				Field Observations Confirm Mapped Type?		**YES**	NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-24	A-B	10 YR 4/1	2.5 YR 4/6	Wet sticky

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**YES**	NO			
Wetland Hydrology Present?	**YES**	NO	Is this Sampling Point Within a Wetland?	**YES**	NO
Hydric Soils Present?	**YES**	NO			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 27 March 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Palustrine Forested Wetland
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPKK3

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Acer saccharinum* *	Tree	FACW	9	*Acer saccharinum*	Sapling	FACW
2	*Fraxinus americana*	Tree	FACU	10	*Onoclea sensibilis*	Herb	FACW
3	*Ulmus rubra* *	Tree	FAC	11	*Carex spp.*	Herb	FAC-OBL
4	*Betula nigra*	Tree	FACW	12	*Cinna arundinacea*	Herb	FACW+
5	*Lindera benzoin* *	Shrub	FACW-	13			
6	*Toxicodenron radicans*	Vine	FAC	14			
7	*Ulmus rubra*	Sapling	FAC	15			
8	*Fraxinus americana*	Sapling	FACU	16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 83

Remarks

* = Dominant species

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	None present	(in)
Depth to Free Water in Pit	11	(in)
Depth to Saturated Soil	surface	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Holly silt loam			Drainage Class: Poorly Drained	
Taxonomy (Subgroup): Fluvaquentic Endoaquepts	Field Observations Confirm Mapped Type?		**YES**	NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-10	A	10 YR 4/1	10 YR 3/6	
10-24	B	2.5 Y 6/1	10 YR 4/6	

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**YES**	NO			
Wetland Hydrology Present?	**YES**	NO	Is this Sampling Point Within a Wetland?	**YES**	NO
Hydric Soils Present?	**YES**	NO			

Remarks

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 10/18/07 Plot No.: DPL1 Section: _____

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Juglans nigra	Facu	7. Solidago rugosa	Fac
2. Robinia pseudoacacia	Facu	8. Polygonum perfoliatum	Fac
3.		9. Bromus inermis	Upl
Saplings/shrubs		**Woody vines**	
4. Rosa multiflora	Facu	10.	
5.		11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC: 33. Other indicators: _____.

Hydrophytic vegetation: Yes ____ No X. Basis: <50% Fac or greater

Soil

Series and phase: Rexford Silt loam On hydric soils list? Yes X; No ____.

Mottled: Yes ____; No X. Mottle color: —; Matrix color: 10YR 5/4.

Gleyed: Yes ____ No X Other indicators: none.

Hydric soils: Yes ____ No X; Basis: no indicators.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: _____.

Saturated soils: Yes ____; No X. Depth to saturated soil: > 18"

Other indicators: none.

Wetland hydrology: Yes ____; No X. Basis: no indicators.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland _____; Nonwetland X.

Comments:

Determined by: J. Montgomery

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: _____ Application Number: _____ Project Name: _____

State: PA County: Luzerne Legal Description: Township: Salem

Date: 10/14/07 Plot No.: DPL2 Section: _____

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1. Juglans nigra	FACU	7. Onoclea sensibilis	FACW
2.		8. Polygonum sagittatum	OBL
3.		9. Solidago gigantea	FACW
Saplings/shrubs		**Woody vines**	
4. Cornus racemosa	FAC	10. —	
5. Lindera benzoin	FACW	11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC: 83. Other indicators: _____.

Hydrophytic vegetation: Yes X No ____. Basis: >50% FAC or greater UPL.

Soil

Series and phase: Rexford si H loam On hydric soils list? Yes X; No ____.

Mottled: Yes X; No ____. Mottle color: 10YR4/6; Matrix color: 10YR4/2.

Gleyed: Yes ____ No X Other indicators: _____.

Hydric soils: Yes X No ____; Basis: mottled low chroma soil.

Hydrology

Inundated: Yes ____; No X. Depth of standing water: _____.

Saturated soils: Yes X; No ____. Depth to saturated soil: 6"

Other indicators: _____.

Wetland hydrology: Yes X; No ____. Basis: saturated soil

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland X; Nonwetland _____.

Comments:

Determined by: J. Montgomery

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 27 March 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Palustrine Emergent Wetland
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPLL1

VEGETATION

	Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1	*Cornus amomum*	Shrub	FACW	9		
2	*Phalaris arundinacea* *	Herb	FACW+	10		
3	*Lythrum salicaria* *	Herb	FACW+	11		
4	*Typha latifolia*	Herb	OBL	12		
5				13		
6				14		
7				15		
8				16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100

Remarks

* = Dominant species

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	10 over part of site	(in)
Depth to Free Water in Pit	surface	(in)
Depth to Saturated Soil	surface	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Holly silt loam			Drainage Class: Poorly Drained	
Taxonomy (Subgroup): Fluvaquentic Endoaquepts	Field Observations Confirm Mapped Type?		**YES**	NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-6	A	10 YR 3/1	10 YR 4/4	
6-15	B	6/N	10 YR 4/6	

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**YES**	NO			
Wetland Hydrology Present?	**YES**	NO	Is this Sampling Point Within a Wetland?	**YES**	NO
Hydric Soils Present?	**YES**	NO			

Remarks

DATA FORM 1

WETLAND DETERMINATION

Applicant Name:_____ Application Number:_____ Project Name: Susquehanna # 21159.002

State:_____ County: Lycoming Legal Description: Township:_____

Date: 25 Oct 2007 Plot No.: DPM1 Section:_____

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1.		7. old field aster (Aster pilosus)	UPL
2.		8. Solidago canadensis	FACU
3.		9. Slender leaf golden rod (Solidago tenuifolia)	FACW
Saplings/shrubs		**Woody vines**	
4.		10.	
5.		11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC: 33% Other indicators:_____.

Hydrophytic vegetation: Yes ____ No ____. Basis:_____.

Soil

Series and phase: Braceville gravelly loam On hydric soils list? Yes____; No ✓.

Mottled: Yes____; No ✓. Mottle color:_____; Matrix color: 10YR 5/6

Gleyed: Yes____ No ✓ Other indicators:_____.

Hydric soils: Yes____ No ✓; Basis: in plowed, mowed field.

Hydrology

Inundated: Yes____; No ✓. Depth of standing water:_____.

Saturated soils: Yes____; No ✓. Depth to saturated soil:_____.

Other indicators:_____.

Wetland hydrology: Yes____; No ✓. Basis:_____.

Atypical situation: Yes____; No ✓.

Normal Circumstances? Yes ✓ No____.

Wetland Determination: Wetland_____; Nonwetland_____.

Comments: photos #1 wet - PA250001 10/25/07
#2 up PA250002

Determined by: EWoods, J.B. Schaeffer

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: near M3 | Application Number: ____ | Project Name: Susque. #21159.002

State: ____ County: Luzern | Legal Description: Township: ____

Date: 25 Oct 2007 | Plot No.: DP-M2 | Section: ____

Vegetation [list the three dominant species in each vegetation layer (5 if only 1 or 2 layers)]. Indicate species with observed morphological or known physiological adaptations with an asterisk.

Species	Indicator Status	Species	Indicator Status
Trees		**Herbs**	
1.		7. Wrinkle leaf goldenrod	Facw
2.		8. Carex sp.	
3.		9.	
Saplings/shrubs		**Woody vines**	
4. Silky dogwood	Facw	10.	
5.		11.	
6.		12.	

% of species that are OBL, FACW, and/or FAC: 100. Other indicators: ____.

Hydrophytic vegetation: Yes ✓ No ____. Basis: ____.

Soil

Series and phase: Braceville gravelly loam On hydric soils list? Yes ____; No ✓.

Mottled: Yes ✓; No ____. Mottle color: 10YR 6/4; Matrix color: 10YR 5/2.

Gleyed: Yes ____ No ____ Other indicators: edge of stream w 15" of water

Hydric soils: Yes ✓ No ____; Basis: ____.

Hydrology

Inundated: Yes ____; No ✓. Depth of standing water: 12".

Saturated soils: Yes ✓; No ____. Depth to saturated soil: 8".

Other indicators: ____.

Wetland hydrology: Yes ✓; No ____. Basis: ____.

Atypical situation: Yes ____; No ✓.

Normal Circumstances? Yes ✓ No ____.

Wetland Determination: Wetland yes; Nonwetland ____.

Comments: Photo PA 250001 10/25/07

Determined by: EVG, JB Schaeffer

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend PPL		Date: 26 March 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Old field/ Scrub shrub
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPMM1

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Elaeagnus angustifolia*	Shrub	FACU	9			
2	*Rosa multiflora*	Shrub	FACU	10			
3	*Dipsacus sylvestris*	Herb	FACU-	11			
4	*Solidago spp.*	Herb	UPL-OBL	12			
5	*Oenothera argillicola*	Herb	FACU-	13			
6				14			
7				15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) ≤20

Remarks

* = Dominant species

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	None present	(in)
Depth to Free Water in Pit	>18	(in)
Depth to Saturated Soil	10	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Fill				Drainage Class: Well Drained		
Taxonomy (Subgroup):			Field Observations Confirm Mapped Type?		YES	NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-8	A	10 YR 3/2	10 YR 3/6	Wet slightly sticky
8-14	B	10 YR 4/2	10 YR 4/3	
14-18	B	10 YR 3/1	10 YR 4/3	

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

Impenetrable > 18"

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	YES	**NO**			
Wetland Hydrology Present?	YES	**NO**	Is this Sampling Point Within a Wetland?	YES	**NO**
Hydric Soils Present?	YES	**NO**			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 26 March 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Palustrine Emerg./Scrub Shrub
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPMM2

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Lindera benzoin* *	Shrub	FACW-	9	*Symplocarpus foetidus*	Herb	OBL
2	*Cornus amomum*	Shrub	FACW	10			
3	*Alnus spp.*	Shrub	FAC-OBL	11			
4	*Phalaris arundinacea* *	Herb	FACW+	12			
5	*Lythrum salicaria* *	Herb	FACW+	13			
6	*Typha latifolia* *	Herb	OBL	14			
7	*Polygonum sagittatum* *	Herb	OBL	15			
8	*Juncus effuses*	Herb	FACW+	16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100

Remarks

* = Dominant species

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	0	(in)
Depth to Free Water in Pit	surface	(in)
Depth to Saturated Soil	surface	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Pope soils				Drainage Class: Well Drained	
Taxonomy (Subgroup): Fluventic Dystrudepts			Field Observations Confirm Mapped Type?	YES	**NO**

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-14	A	10 YR 4/1	10 YR 4/4	Wet sticky

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :
Impenetrable >14"

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**YES**	NO			
Wetland Hydrology Present?	**YES**	NO	Is this Sampling Point Within a Wetland?	**YES**	NO
Hydric Soils Present?	**YES**	NO			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 9 January 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Successional Old Field
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPO1

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Pinus Strobus*	Tree	FACU	9			
2	*Rosa multiflora*	Shrub	FACU	10			
3	*Rubus allegheniensis*	Shrub	FACU-	11			
4	*Ealeagnus spp.*	Shrub	FACU	12			
5	*Solidago canadensis*	Herb	FACU	13			
6	*Apocynum cannibinum*	Herb	FACU	14			
7				15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 0

Remarks

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	None Present	(in)
Depth to Free Water in Pit	>24	(in)
Depth to Saturated Soil Heavy rain on January 8, 2008	Surface	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Chenango gravelly loam			Drainage Class: Well Drained	
Taxonomy (Subgroup): Typic Dystrudepts		Field Observations Confirm Mapped Type?	**YES**	NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-14	Ap	10 YR 3/3	-	
14-24	B	10 YR 5/4	10 YR 4/6	

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

Soils were saturated throughout the soil profile due to recent heavy rains. Organic matter streaking was also observed throughout the soil profile.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	YES	**NO**			
Wetland Hydrology Present?	YES	**NO**	Is this Sampling Point Within a Wetland?	YES	**NO**
Hydric Soils Present?	YES	**NO**			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 9 January 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Palustrine Forested Wetland
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPO2

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Nyssa sylvatica* *	Tree	FAC	9	*Nyssa sylvatica*	Sapling	FAC
2	*Quercus palustris* *	Tree	FACW	10	*Osmunda cinnamomea*	Herb	FACW
3	*Acer rubrum* *	Tree	FAC	11	*Carex spp.*	Herb	FACU-OBL
4	*Quercus bicolor*	Tree	FACW+	12			
5	*Liriodendron tulipifera*	Tree	FACU	13			
6	*Lindera benzoin* *	Shrub	FACW-	14			
7	*Ilex verticillata* *	Shrub	FACW+	15			
8	*Vaccinium corymbosum*	Shrub	FACW-	16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100

Remarks

Dominant species = *

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	1	(in)
Depth to Free Water in Pit	1	(in)
Depth to Saturated Soil	Surface	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Atherton silt loam			Drainage Class: Poorly Drained	
Taxonomy (Subgroup): Aeric Endoaquepts		Field Observations Confirm Mapped Type?	**YES**	NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-7	A	10 YR 3/1	-	
7-11	B	10 YR 5/1	10 YR 5/8	
11-24	B	10 YR 5/1	10 YR 4/6	

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**YES**	NO			
Wetland Hydrology Present?	**YES**	NO	Is this Sampling Point Within a Wetland?	**YES**	NO
Hydric Soils Present?	**YES**	NO			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 21 February 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice, Jayme Schaeffer		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Upland Forest
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPOO1

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Prunus serotina*	Tree	FACU	9			
2	*Acer rubrum*	Tree	FACU	10			
3	*Carya cordiformis*	Sapling	FACU+	11			
4	*Lindera benzoin*	Shrub	FACW-	12			
5				13			
6				14			
7				15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 25

Remarks

Ground cover sparse with a very thick cover of leaves

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	None Present	(in)
Depth to Free Water in Pit	None Present	(in)
Depth to Saturated Soil	> 24	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated: Periodically
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required): None
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Pope soils			Drainage Class: Well Drained	
Taxonomy (Subgroup): Fluventic Dystrudepts		Field Observations Confirm Mapped Type?	**YES**	NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-9	A	10 YR 4/3	-	Wet Slightly Sticky
9-13	B	10 YR 4/4	-	Wet Slightly Sticky
13-24	B	10 YR 5/4	10 YR 3/2	Moist Friable

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	YES	**NO**			
Wetland Hydrology Present?	YES	**NO**	Is this Sampling Point Within a Wetland?	YES	**NO**
Hydric Soils Present?	YES	**NO**			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP	Date: 21 February 2008
Applicant/Owner: PPL	County: Luzerne
Investigator: Keith Maurice, Jayme Schaeffer	State: Pennsylvania
Do Normal Circumstances exist on the site? **YES** NO	Community ID: Palustrine Scrub Shrub Wetland
Is the site significantly disturbed (Atypical Situation)? YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse) YES **NO**	Plot ID: DPOO2

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 *Lindera benzoin*	Shrub	FACW-	9		
2			10		
3			11		
4			12		
5			13		
6			14		
7			15		
8			16		
Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-)			100		

Remarks

Ground cover sparse with a very thick cover of leaves

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	None Present	(in)
Depth to Free Water in Pit	None Present	(in)
Depth to Saturated Soil	14	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☒ Inundated: Periodically
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required): None
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Pope soils				Drainage Class: Well Drained		
Taxonomy (Subgroup): Fluventic Dystrudepts			Field Observations Confirm Mapped Type?		YES	**NO**

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-14	A	10 YR 3/2	10 YR 4/3	Wet Slightly Sticky
14-24	B	10 YR 4/2	10 YR 5/4	Wet Sticky

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**YES**	NO			
Wetland Hydrology Present?	**YES**	NO	Is this Sampling Point Within a Wetland?	**YES**	NO
Hydric Soils Present?	**YES**	NO			

Remarks

Boundary was determined by the gradual increase in slope and the relatively abrupt change from a spicebush monoculture to upland forest. Black Cherry and White Ash were common along boundary. Also a distinct change in soil matrix color was found.

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 10 January 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Successional Old Field
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPQ1

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Pinus Strobus*	Tree	FACU	9			
2	*Rosa multiflora*	Shrub	FACU	10			
3	*Ealeagnus angustifolia*	Shrub	FACU	11			
4	*Spiraea latifolia*	Shrub	FAC+	12			
5	*Solidago canadensis*	Herb	FACU	13			
6				14			
7				15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 20

Remarks

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	None Present	(in)
Depth to Free Water in Pit	None Present	(in)
Depth to Saturated Soil	Surface	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Chenango gravelly loam			Drainage Class: Well Drained	
Taxonomy (Subgroup): Typic Dystrudepts		Field Observations Confirm Mapped Type?	**YES**	NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-10	Ap	10 YR 4/3	-	
10-24	B	10 YR 4/6	-	

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

Soil is saturated due to recent rainfall.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	YES	**NO**			
Wetland Hydrology Present?	YES	**NO**	Is this Sampling Point Within a Wetland?	YES	**NO**
Hydric Soils Present?	YES	**NO**			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 10 January 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Palustrine Scrub Shrub Wetland
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPQ2

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Acer rubrum*	Sapling	FAC	9			
2	*Rosa multiflora*	Shrub	FACU	10			
3	*Cornus amomum*	Shrub	FACW	11			
4	*Spiraea latifolia* *	Shrub	FAC+	12			
5				13			
6				14			
7				15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100

Remarks

Dominant Species = *

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	0	(in)
Depth to Free Water in Pit	6	(in)
Depth to Saturated Soil	Surface	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Rexford loam				Drainage Class: Somewhat Poorly Drained	
Taxonomy (Subgroup): Aeric Fragiaquepts			Field Observations Confirm Mapped Type?	**YES**	NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-16	A	10 YR 4/2	5 YR 3/2	
16-24	B	10 YR 4/2	10 YR 5/6	

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**YES**	NO			
Wetland Hydrology Present?	**YES**	NO	Is this Sampling Point Within a Wetland?	**YES**	NO
Hydric Soils Present?	**YES**	NO			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 10 January 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Palustrine Forested Wetland
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPQ3

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Acer rubrum* *	Tree	FAC	9			
2	*Quercus palustris* *	Tree	FACW	10			
3	*Prunus serotina*	Tree	FACU	11			
4	*Fraxinus americana*	Tree	FACU	12			
5	*Cornus racemosa*	Shrub	FAC	13			
6	*Geum canadense*	Herb	FACU	14			
7	*Carex spp.*	Herb	FACU-OBL	15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100

Remarks

Dominant Species = *

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	0	(in)
Depth to Free Water in Pit	12	(in)
Depth to Saturated Soil	6	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Rexford loam				Drainage Class: Somewhat Poorly Drained
Taxonomy (Subgroup): Aeric Fragiaquepts		Field Observations Confirm Mapped Type?		**YES** NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-6	A	10 YR 3/2	10 YR 3/4	Moist Friable
6-22	B	10 YR 4/1	10 YR 4/3	
22-26	B	10 YR 3/2	10 YR 4/6	

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**YES**	NO			
Wetland Hydrology Present?	**YES**	NO	Is this Sampling Point Within a Wetland?	**YES**	NO
Hydric Soils Present?	**YES**	NO			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 10 January 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Upland Successional Old Field
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPQ4

VEGETATION

Dominant Plant Species		Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1	*Prunus serotina*	Tree	FACU	9		
2	*Quercus velutina*	Tree	UPL	10		
3	*Eleagnus angustifolia*	Shrub	FACU	11		
4	*Schizachyrium scoparium*	Herb	FACU-	12		
5	*Euthamia graminifolia*	Herb	FAC	13		
6				14		
7				15		
8				16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 20

Remarks

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	None Present	(in)
Depth to Free Water in Pit	None Present	(in)
Depth to Saturated Soil	10	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Chenango gravelly loam				Drainage Class: Well Drained
Taxonomy (Subgroup): Typic Dystrudepts		Field Observations Confirm Mapped Type?		**YES** NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-10	Ap	10 YR 3/3	-	Wet Slightly Sticky
10-24	B	10 YR 4/4	-	Wet Sticky

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

Saturated soils due to recent heavy rain.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	YES	**NO**			
Wetland Hydrology Present?	YES	**NO**	Is this Sampling Point Within a Wetland?	YES	**NO**
Hydric Soils Present?	YES	**NO**			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 26 March 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Upland Floodplain Forest
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPQQ1

VEGETATION

	Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1	*Acer rubrum* *	Tree	FAC	9		
2	*Prunus serotina*	Tree	FACU	10		
3	*Carya ovata*	Tree	FACU-	11		
4	*Liriodendron tulipifera*	Tree	FACU	12		
5	*Lindera benzoin* *	Shrub	FACW-	13		
6	*Alliara petiolata*	Herb	FACU-	14		
7				15		
8				16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100

Remarks

* = Dominant species
Ground cover very sparse due to time of year.

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	None present	(in)
Depth to Free Water in Pit	None present	(in)
Depth to Saturated Soil	>24	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Pope soils				Drainage Class: Well Drained	
Taxonomy (Subgroup): Fluventic Dystrudepts			Field Observations Confirm Mapped Type?	**YES**	NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-10	A	10 YR 4/3	10 YR 4/1	Wet slightly sticky
10-24	B	10 YR 4/4	-	Wet slightly sticky

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**YES**	NO			
Wetland Hydrology Present?	YES	**NO**	Is this Sampling Point Within a Wetland?	YES	**NO**
Hydric Soils Present?	YES	**NO**			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 26 March 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Palustrine Forested Wetland
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPQQ2

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 *Acer rubrum*	Tree	FAC	9		
2 *Fraxinus americana*	Tree	FACU	10		
3 *Nyssa sylvatica*	Tree	FAC	11		
4 *Lindera benzoin*	Shrub	FACW-	12		
5 *Symplocarpus foetidus*	Herb	OBL	13		
6 *Claytonia virginica*	Herb	FACU	14		
7			15		
8			16		
Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-)			66		

Remarks

* = Dominant species

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	None present	(in)
Depth to Free Water in Pit	17	(in)
Depth to Saturated Soil	10	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☒ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Pope soils			Drainage Class: Well Drained	
Taxonomy (Subgroup): Fluventic Dystrudepts	Field Observations Confirm Mapped Type?		YES	**NO**

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-16	A	10 YR 3/2	10 YR 3/4	
16-24	B	10 YR 4/2	7.5 YR 3/3	

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**YES**	NO			
Wetland Hydrology Present?	**YES**	NO	Is this Sampling Point Within a Wetland?	**YES**	NO
Hydric Soils Present?	**YES**	NO			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 9 January 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Upland deciduous forest
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPR1

VEGETATION

Dominant Plant Species		Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1	*Quercus velutina*	Tree	UPL	9		
2	*Carya ovata*	Tree	FACU-	10		
3	*Quercus rubra*	Tree	FACU-	11		
4	*Lindera benzoin*	Shrub	FACW-	12		
5	*Viburnum dentatum*	Shrub	FAC	13		
6	*Eulalia viminea*	Herb	FAC	14		
7				15		
8				16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 50%

Remarks: Upland-preferring trees predominated. Spicebush, arrow-wood and stilt grass were sparse.

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	0	(in)
Depth to Free Water in Pit	0	(in)
Depth to Saturated Soil	Surface	(in)

Saturation due to recent heavy rains.

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Braceville gravelly loam			Drainage Class: Moderately Well Drained	
Taxonomy (Subgroup): Typic Fragiochrepts			Field Observations Confirm Mapped Type?	**YES** NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-2	A	2.5 Y 2/1	2.5 YR 2.5/2	Saturated
2-20	B	10 YR 4/4	none	Saturated
20-24	B	10 YR 4/4	10 YR 5/1, 10 YR 3/2	Saturated

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks : Soils were saturated throughout the soil profile due to recent heavy rains.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	YES	**NO**			
Wetland Hydrology Present?	YES	**NO**	Is this Sampling Point Within a Wetland?	YES	**NO**
Hydric Soils Present?	YES	**NO**			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 3 April 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Palustrine Forested Wetland
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPR2

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Quercus palustris*	Tree	FACW	9	*Cinna arundinacea*	Herb	FACW+
2	*Acer rubrum*	Tree	FAC	10	*Microstegium vimineum*	Herb	FAC
3	*Nyssa sylvatica*	Tree	FAC	11			
4	*Lindera benzoin*	Shrub	FACW-	12			
5	*Vaccinium corymbosum*	Shrub	FACW-	13			
6	*Viburnum dentatum*	Shrub	FAC	14			
7	*Ilex verticillata*	Shrub	FACW+	15			
8	*Carex spp.*	Herb	FAC-OBL	16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100

Remarks

* = Dominant species

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	0	(in)
Depth to Free Water in Pit	surface	(in)
Depth to Saturated Soil	surface	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Atherton silt loam				Drainage Class: Poorly Drained			
Taxonomy (Subgroup): Aeric Endoaquepts				Field Observations Confirm Mapped Type?		**YES**	NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-4	A	7.5 YR 2.5/1	-	
4-24	B	10 YR 5/2	10 YR 5/6	
			10 YR 4/6	

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☑ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**YES**	NO			
Wetland Hydrology Present?	**YES**	NO	Is this Sampling Point Within a Wetland?	**YES**	NO
Hydric Soils Present?	**YES**	NO			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 3 April 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Palustrine Emerg./Scrub-Shrub
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPR3

VEGETATION

	Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1	*Acer rubrum*	Tree	FAC	9		
2	*Vaccinium corymbosum*	Shrub	FACW-	10		
3	*Salix discolor*	Shrub	FACW	11		
4	*Lindera benzoin*	Shrub	FACW-	12		
5	*Spirea latifolia*	Shrub	FAC+	13		
6	*Typha latifolia*	Herb	OBL	14		
7	*Onoclea sensibilis*	Herb	FACW	15		
8	*Carex spp.*	Herb	FAC-OBL	16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100

Remarks

* = Dominant species

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	0	(in)
Depth to Free Water in Pit	surface	(in)
Depth to Saturated Soil	surface	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☒ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Atherton silt loam			Drainage Class: Poorly Drained	
Taxonomy (Subgroup): Aeric Endoaquepts	Field Observations Confirm Mapped Type?		**YES**	NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-10	Ap	7.5 YR 2.5/1	5 YR 4/6	
10-16	B	10 YR 3/2	10 YR 2/1	
			10 YR 3/3	
16-24	B	2.5 Y 5/1	10 YR 4/6	
			10 YR 3/2	

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☑ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**YES**	NO			
Wetland Hydrology Present?	**YES**	NO	Is this Sampling Point Within a Wetland?	**YES**	NO
Hydric Soils Present?	**YES**	NO			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 9 January 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Palustrine Emerg./Scrub-Shrub
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPR4

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Spiraea latifolia* *	Shrub	FAC+	9			
2	*Agrostis gigantea* *	Herb	FACW	10			
3	*Juncus effusus* *	Herb	FACW+	11			
4	*Vernonia noveboracensis*	Herb	FACW+	12			
5	*Scirpus cyperinus*	Herb	FACW+	13			
6	*Onoclea sensibilis*	Herb	FACW	14			
7				15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100

Remarks

Dominant Species = *

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	0	(in)
Depth to Free Water in Pit	14	(in)
Depth to Saturated Soil	Surface	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Atherton silt loam			Drainage Class: Poorly Drained	
Taxonomy (Subgroup): Aeric Endoaquepts		Field Observations Confirm Mapped Type?	**YES**	NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-14	A	10 YR 3/1	10 YR 5/3	Wet Slightly Sticky
14-24	B	10 YR 4/2	5 YR 3/3	

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**YES**	NO			
Wetland Hydrology Present?	**YES**	NO	Is this Sampling Point Within a Wetland?	**YES**	NO
Hydric Soils Present?	**YES**	NO			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 9 January 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Successional Old Field
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPS1

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Populus tremula*	Tree	FACU	9	*Solidago spp.* *	Herb	
2	*Quercus palustris*	Tree	FACW	10			
3	*Pinus strobus*	Tree	FACU	11			
4	*Picea rubens*	Tree	FACU	12			
5	*Elaeagnus angustifolia*	Shrub	FACU	13			
6	*Rosa multiflora* *	Shrub	FACU	14			
7	*Rubus allegheniensis*	Shrub	FACU-	15			
8	*Spiraea latifolia* *	Shrub	FAC+	16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 0

Remarks

Dominant Species = *

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	None Present	(in)
Depth to Free Water in Pit	>24	(in)
Depth to Saturated Soil	Surface	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Chenango gravelly loam			Drainage Class: Well Drained	
Taxonomy (Subgroup): Typic Dystrudepts		Field Observations Confirm Mapped Type?	**YES**	NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-18	Ap	10 YR 4/3	-	
18-24	B	10 YR 5/4	10 YR 4/6	

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

Soils were saturated throughout the soil profile due to recent heavy rains.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	YES	**NO**			
Wetland Hydrology Present?	YES	**NO**	Is this Sampling Point Within a Wetland?	YES	**NO**
Hydric Soils Present?	YES	**NO**			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 9 January 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Palustrine Scrub/Shrub Wetland
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPS2

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Cornus amomum*	Shrub	FACW	9			
2	*Viburnum recognitum* *	Shrub	FACW-	10			
3	*Cornus racemosa* *	Shrub	FAC	11			
4	*Rosa multiflora*	Shrub	FACU	12			
5	*Elaeagnus angustifolia*	Shrub	FACU	13			
6	*Spiraea latifolia*	Shrub	FAC+	14			
7	*Onoclea sensibilis* *	Herb	FACW	15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 71

Remarks

Dominant Species = *

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	0	(in)
Depth to Free Water in Pit	9	(in)
Depth to Saturated Soil	Surface	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Atherton silt loam			Drainage Class: Poorly Drained	
Taxonomy (Subgroup): Aeric Endoaquepts		Field Observations Confirm Mapped Type?	**YES**	NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-12	A	10 YR 3/1	7.5 YR 2.5/3	
12-24	B	10 YR 7/1	10 YR 5/6	

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**YES**	NO			
Wetland Hydrology Present?	**YES**	NO	Is this Sampling Point Within a Wetland?	**YES**	NO
Hydric Soils Present?	**YES**	NO			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 26 March 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Old field/ Scrub shrub
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPSS1

VEGETATION

	Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1	*Elaeagnus angustifolia*	Shrub	FACU	9		
2	*Juglans nigra*	Sapling	FACU	10		
3	*Robinia pseudoacacia*	Sapling	FACU-	11		
4	*Solidago spp.* *	Herb	UPL-OBL	12		
5	*Oenothera biennis*	Herb	FACU-	13		
6	*Allium vineale*	Herb	FACU-	14		
7	*Alliara petiolata*	Herb	FACU-	15		
8	*Coronilla varia* *	Herb	UPL	16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) o

Remarks

* = Dominant species

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	None present	(in)
Depth to Free Water in Pit	None present	(in)
Depth to Saturated Soil	>12	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Fill				Drainage Class:	
Taxonomy (Subgroup):			Field Observations Confirm Mapped Type?	YES	**NO**

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-8	A	10 YR 3/2	10 YR 3/3	Wet slightly sticky
8-12	B	7.5 YR 2.5/1		

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

Impenetrable beyond 12". Soil chromas reflect historic rather than current conditions.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	YES	**NO**			
Wetland Hydrology Present?	YES	**NO**	Is this Sampling Point Within a Wetland?	YES	**NO**
Hydric Soils Present?	**YES**	NO			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 27 March 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Palustrine Emerg./Forested
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPSS2

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Acer rubrum*	Tree	FAC	9			
2	*Betula nigra*	Tree	FACW	10			
3	*Sambucus canadensis*	Shrub	FACW-	11			
4	*Lindera benzoin*	Shrub	FACW-	12			
5	*Typha latifolia* *	Herb	OBL	13			
6	*Phalaris arundinacea* *	Herb	FACW+	14			
7	*Lythrum salicaria*	Herb	FACW+	15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100

Remarks

* = Dominant species

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	0	(in)
Depth to Free Water in Pit	surface	(in)
Depth to Saturated Soil	surface	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Holly silt loam			Drainage Class: Poorly Drained	
Taxonomy (Subgroup): Fluvaquentic Endoaquepts	Field Observations Confirm Mapped Type?		**YES**	NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-8	A	10 YR 3/2		
8-12	B	7.5 YR 2.5/1		
12-18	B	10 YR 4/4		
18-24	B			

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

12-18 = heavy clay- wetland perched on top

18-24 = too soupy to obtain a sample

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**YES**	NO			
Wetland Hydrology Present?	**YES**	NO	Is this Sampling Point Within a Wetland?	**YES**	NO
Hydric Soils Present?	**YES**	NO			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 21 February 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice, Jayme Schaeffer		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Upland Floodplain Forest
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPXX1

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Acer saccharinum*	Tree	FACW	9			
2	*Lindera benzoin*	Shrub	FACW-	10			
3	*Acer saccharinum*	Sapling	FACW	11			
4	*Viburnum recognitum*	Shrub	FACW-	12			
5	*Cornus amomum*	Shrub	FACW	13			
6	*Rosa multiflora*	Shrub	FACU	14			
7	*Solidago spp.*	Herb	FACU-FACW	15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 83

Remarks

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	None Present	(in)
Depth to Free Water in Pit	> 24	(in)
Depth to Saturated Soil	> 24	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators: None
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required): None
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Pope soils			Drainage Class: Well Drained	
Taxonomy (Subgroup): Fluventic Dystrudepts		Field Observations Confirm Mapped Type?	**YES**	NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-14	A	10 YR 4/3	10 YR 5/2 7.5 YR 4/4	Wet Slightly Sticky
14-24	B	10 YR 4/4	10 YR 5/2 7.5 YR 4/6	Moist Firm

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**YES**	NO			
Wetland Hydrology Present?	YES	**NO**	Is this Sampling Point Within a Wetland?	YES	**NO**
Hydric Soils Present?	YES	**NO**			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 21 February 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice, Jayme Schaeffer		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Palustrine Forested Wetland
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPXX2

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Acer saccharinum*	Tree	FACW	9			
2	*Cornus amomum*	Shrub	FACW-	10			
3	*Sassafrass albidum*	Sapling	FACU-	11			
4	*Toxicodendron radicans*	Vine	FAC	12			
5	*Allium vineale*	Herb	FACU-	13			
6				14			
7				15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-)

Remarks

15 ft. proximity to standing water in old canal. Depth to water from top of bank is around 24 in.

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	None Present	(in)
Depth to Free Water in Pit	> 24	(in)
Depth to Saturated Soil	> 24	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators: None
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required): None
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Pope soils			Drainage Class: Well Drained	
Taxonomy (Subgroup): Fluventic Dystrudepts		Field Observations Confirm Mapped Type?	YES	**NO**

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-11	Ap	10 YR 3/2	-	Saturated
11-15	B	10 YR 4/2	10 YR 6/2	Wet Slightly Sticky
15-24	B	10 YR 5/2	10 YR4/6	Wet Slightly Sticky

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☑ Concretions: Starting at 11"
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**YES**	NO			
Wetland Hydrology Present?	YES	**NO**	Is this Sampling Point Within a Wetland?	**YES**	NO
Hydric Soils Present?	**YES**	NO			

Remarks

Boundary is based upon matrix color just below the AP layer. Very homogenous overstory.

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 2 April 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Upland Forest
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPZ1

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Acer rubrum* *	Tree	FAC	9			
2	*Fraxinus americana*	Tree	FACU	10			
3	*Prunus serotina*	Tree	FACU	11			
4	*Lindera benzoin* *	Shrub	FACW-	12			
5	*Prunus serotina*	Sapling	FACU	13			
6	*Elaeagnus angustifolia*	Shrub	FACU	14			
7	*Ligustrum vulgare*	Shrub	FACU	15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100

Remarks

* = Dominant species

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	None present	(in)
Depth to Free Water in Pit	None present	(in)
Depth to Saturated Soil	10	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Chenango gravelly loam			Drainage Class: Well Drained	
Taxonomy (Subgroup): Typic Dystrudepts		Field Observations Confirm Mapped Type?	**YES**	NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-4	A	10 YR 2/2	7.5 YR 3/4	
4-10	B	10 YR 3/3	-	
10-24	B	10 YR 5/4	7.5 YR 4/6	

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**YES**	NO			
Wetland Hydrology Present?	YES	**NO**	Is this Sampling Point Within a Wetland?	YES	**NO**
Hydric Soils Present?	YES	**NO**			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 2 April 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Palustrine Forested Wetland
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPZ2

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Acer rubrum* *	Tree	FAC	9	*Alliara petiolata*	Herb	FACU-
2	*Betula nigra*	Tree	FACW	10			
3	*Lindera benzoin* *	Shrub	FACW-	11			
4	*Fraxinus americana*	Sapling	FACU	12			
5	*Prunus serotina*	Sapling	FACU	13			
6	*Carya cordiformis*	Sapling	FACU+	14			
7	*Symplocarpus foetidus* *	Herb	OBL	15			
8	*Osmunda cinnamomea*	Herb	FACW	16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100

Remarks

* = Dominant species

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	None present	(in)
Depth to Free Water in Pit	>24	(in)
Depth to Saturated Soil	10	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☒ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Rexford loam			Drainage Class: Poorly Drained	
Taxonomy (Subgroup): Aeric Fragiaquepts	Field Observations Confirm Mapped Type?		**YES**	NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-12	A	10 YR 3/1	7.5 YR 3/4	
12-24	B	2.5 Y 6/1	10 YR 5/6	

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**YES**	NO			
Wetland Hydrology Present?	**YES**	NO	Is this Sampling Point Within a Wetland?	**YES**	NO
Hydric Soils Present?	**YES**	NO			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 27 March 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Upland forest
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPZ3

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 *Acer rubrum* *	Tree	FAC	9 *Cornus florida*	Tree	FACU-
2 *Prunus serotina*	Tree	FACU	10 *Alliara petiolata*	Herb	FACU-
3 *Liriodendron tulipifera*	Tree	FACU	11		
4 *Fraxinus americana*	Tree	FACU	12		
5 *Quercus alba*	Tree	FACU-	13		
6 *Carya ovata*	Tree	FACU-	14		
7 *Betula lenta*	Tree	FACU	15		
8 *Lindera benzoin* *	Shrub	FACW-	16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100

Remarks

* = Dominant species

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	None present	(in)
Depth to Free Water in Pit	>24	(in)
Depth to Saturated Soil	14	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Braceville gravelly loam			Drainage Class: Moderately Well Drained	
Taxonomy (Subgroup): Typic Fragiudepts	Field Observations Confirm Mapped Type?		**YES**	NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-2	A	10 YR 2/1	-	
2-17	B	10 YR 4/3.5	-	
17-24	B	10 YR 5/5	-	

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

Impenetrable beyond 12"

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**YES**	NO			
Wetland Hydrology Present?	YES	**NO**	Is this Sampling Point Within a Wetland?	YES	**NO**
Hydric Soils Present?	YES	**NO**			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 27 March 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Palustrine Scrub Shrub
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPZ4

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 *Lindera benzoin*	Shrub	FACW-	9		
2			10		
3			11		
4			12		
5			13		
6			14		
7			15		
8			16		
Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-)			100		

Remarks

* = Dominant species

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	None present	(in)
Depth to Free Water in Pit	None present	(in)
Depth to Saturated Soil	15	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Rexford loam				Drainage Class: Poorly Drained	
Taxonomy (Subgroup): Aeric Fragiaquepts		Field Observations Confirm Mapped Type?		**YES**	NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-7	A	10 YR 3/2		
7-15	B	7.5 YR 2.5/1	7.5 YR 4/6	
15-24	B	10 YR 4/1	7.5 YR 3/4	

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**YES**	NO			
Wetland Hydrology Present?	**YES**	NO	Is this Sampling Point Within a Wetland?	**YES**	NO
Hydric Soils Present?	**YES**	NO			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 2 April 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Successional Old Field
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPZ5

VEGETATION

	Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1	*Elaeagnus angustifolia* *	Shrub	FACU	9		
2	*Rosa multiflora* *	Shrub	FACU	10		
3	*Lindera benzoin*	Shrub	FACW-	11		
4	*Solidago spp.* *	Herb	UPL-FACW	12		
5	*Phytolacca americana*	Herb	FACU+	13		
6	*Apocynum cannabinum*	Herb	FACU	14		
7	*Alliara petiolata*	Herb	FACU-	15		
8	*Rubus occidentalis*	Herb	UPL	16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 0

Remarks

* = Dominant species

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	None present	(in)
Depth to Free Water in Pit	None present	(in)
Depth to Saturated Soil	>24	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Chenango gravelly loam			Drainage Class: Well Drained	
Taxonomy (Subgroup): Typic Dystrudepts		Field Observations Confirm Mapped Type?	**YES**	NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-2	A	10 YR 3/3	-	Wet slightly sticky
2-14-	B	10 YR 4/4	-	Wet slightly sticky
14-24	B	10 YR 5/6	-	Wet slightly sticky

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	YES	**NO**			
Wetland Hydrology Present?	YES	**NO**	Is this Sampling Point Within a Wetland?	YES	**NO**
Hydric Soils Present?	YES	**NO**			

Remarks

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 2 April 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Palustrine Scrub Shrub
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 1
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DPZ6

VEGETATION

	Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1	*Acer rubrum*	Tree	FAC	9		
2	*Betula alleghaniensis*	Tree	FAC	10		
3	*Lindera benzoin* *	Shrub	FACW-	11		
4	*Impatiens capensis* *	Herb	FACW	12		
5	*Symplocarpus foetidus* *	Herb	OBL	13		
6	*Lysimachia nummularia*	Herb	OBL	14		
7				15		
8				16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100

Remarks

* = Dominant species

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	0	(in)
Depth to Free Water in Pit	surface	(in)
Depth to Saturated Soil	surface	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☒ Saturated in Upper 12 inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Chenango gravelly loam			Drainage Class: Moderately Well Drained	
Taxonomy (Subgroup): Typic Fragiudepts	Field Observations Confirm Mapped Type?		YES	**NO**

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-2	A	10 YR 2/1	-	
2-24	B	10 YR 3/1	-	

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks :

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	**YES**	NO			
Wetland Hydrology Present?	**YES**	NO	Is this Sampling Point Within a Wetland?	**YES**	NO
Hydric Soils Present?	**YES**	NO			

Remarks

APPENDIX C

NRCS Soil Series Descriptions

LOCATION ARNOT NY PA
Established Series
Rev. RLM-STS-JDC
01/2008

ARNOT SERIES

The Arnot series consists of shallow, somewhat excessively to moderately well drained soils formed in loamy till. Bedrock is at depths of to 10 to 20 inches. Slope ranges from 0 to 70 percent. Saturated hydraulic conductivity in the mineral soil is moderately high or high. Mean annual temperature is 47 degrees F, and mean annual precipitation is 38 inches.

TAXONOMIC CLASS: Loamy-skeletal, mixed, active, mesic Lithic Dystrudepts

TYPICAL PEDON: Arnot channery silt loam, on a 6 percent slope in an idle area. (Colors are for moist soil unless specified otherwise.)

Ap-- 0 to 6 inches; very dark grayish brown (10YR 3/2), light brownish gray (10YR 6/2) dry, channery silt loam; weak medium and fine granular structure; friable; many fine and medium roots; 20 percent rock fragments; strongly acid; abrupt smooth boundary. (2 to 10 inches thick.)

Bw1-- 6 to 15 inches; dark yellowish brown (10YR 4/4) very channery silt loam; weak fine and medium subangular blocky parting to weak fine granular structure; friable; many fine and medium roots; 35 percent rock fragments; strongly acid; abrupt smooth boundary.

Bw2-- 15 to 17 inches; light olive brown (2.5Y 5/4) very channery silt loam; weak thin platy structure; friable; common fine roots; many fine pores; 50 percent rock fragments; few medium faint yellowish brown (10YR 5/6) soft masses of iron accumulation; strongly acid; abrupt smooth boundary. (Combined thickness of the Bw horizons is 2 to 16 inches thick.)

2R-- 17 inches; gray (5Y 5/1) fine grained sandstone bedrock.

TYPE LOCATION: Cortland County, New York; Town of Truxton, 2 1/4 miles south east of Crain Mills at junction of roads running west-southwest and west-northwest. USGS Cuyler, NY topographic quadrangle; Latitude 42 degrees, 41 minutes, 0 seconds N. and Longitude 75 degrees, 59 minutes, 2 seconds W. NAD 1927.

RANGE IN CHARACTERISTICS: Solum thickness and depth to bedrock range from 10 to 20 inches. Rock fragments of dominantly sandstone, siltstone, or shale range from 35 to 70 percent as a weighted average of the particle-size control section. Texture of the

fine-earth fraction is silt loam or loam throughout the profile. Reaction in unlimed areas ranges from extremely acid through moderately acid throughout the profile.

The A or Ap horizon has hue of 5YR through 2.5Y, or is neutral, value of 2 through 4, and chroma of 0 through 3. Dry colors have the same hue with value of 5 or 6 and chroma of 2 through 4. Structure is weak or moderate granular. Consistence is very friable or friable. Some pedons have a very friable or friable E horizon 1 to 3 inches thick with grayish colors.

The B horizon has hue of 2.5YR through 2.5Y, value of 4 through 6, and chroma of 3 through 6. Structure is very weak to moderate, fine or medium, subangular blocky; granular; or weak thin or medium platy. Consistence is friable or firm. Some pedons have few or common redoximorphic features in the lower part.

Some pedons have a C or 2Cr horizon that can range to 80 percent rock fragments.

The 2R horizon is hard sandstone, siltstone or shale. The bedding is horizontal and in many places the rock types are interbedded.

COMPETING SERIES: The Klinesville, Nassau, Sylvatus, and Weikert series are members of the same family. Klinesville soils are residual soils formed predominantly in red shale. Nassau soils have rock fragments dominated by shale or slate. Sylvatus soils are dominated by fragments of phylitte and slate and have a warmer soil temperature. Weikert soils have kaolinite as a significant component of the clay fraction.

GEOGRAPHIC SETTING: Arnot soils developed in a thin mantle of till of Wisconsin age. The till is derived mainly from acid sandstone, siltstone, and shale. In some places the regolith is a mixture of till and residuum. Slope ranges from 0 to 70 percent. The climate is humid and temperate. Mean annual precipitation ranges from 35 to 45 inches; mean annual temperature ranges from 45 to 50 degrees F.; and mean annual frost-free period ranges from 120 to 180 days. Elevation ranges from 1000 to 1800 feet above sea level.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Bath, Cadosia, Chippewa, Lackawanna, Lordstown, Maplecrest, Mardin, Morris, Oquaga, Tuller, Valois, Volusia and Wellsboro soils. Bath, Cadosia, Chippewa, Maplecrest, Mardin, Lackawanna, Morris, Valois, Volusia and Wellsboro soils developed in deep glacial till. Lordstown and Oquaga soils are moderately deep. Tuller soils are somewhat poorly to poorly drained.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Somewhat excessively drained to moderately well drained. The potential for surface runoff is medium to very high. Saturated hydraulic conductivity in the mineral soil is moderately high or high.

USE AND VEGETATION: Mainly forested. Some areas remain in rough pasture and hay land. Native vegetation is oak, beech, sugar maple, black cherry, hemlock, and white pine.

DISTRIBUTION AND EXTENT: The glaciated Allegheny Plateau and Catskills of New York, and northern Pennsylvania. MLRA 101 and 140. The series is of large extent.

MLRA OFFICE RESPONSIBLE: Amherst, Massachusetts.

SERIES ESTABLISHED: Cortland County, New York, 1957.

REMARKS: The Arnot series is considered to be the lithic analogue of the Lordstown and Oquaga series.

Diagnostic horizons and other features associated with the typical pedon are:
1. Ochric Epipedon - the zone from the surface to 6 inches (Ap horizon).
2. Cambic horizon - the zone from 6 to 17 inches (Bw horizons).
3. Lithic subgroup - as evidenced by bedrock at 17 inches.

National Cooperative Soil Survey
U.S.A.

LOCATION ATHERTON NY ME NJ OH PA
Established Series
Rev. MGC-JWW-SWF
03/2003

ATHERTON SERIES

The Atherton series consists of deep, poorly drained and very poorly drained soils formed in water-sorted materials. They are nearly level soils on outwash plains, terraces and kame-kettle landforms. Permeability is moderate or moderately slow in the solum and moderate or moderately rapid in the substratum. Slope ranges from 0 to 3 percent. The mean annual temperature is about 49 degrees F, and the mean annual precipitation is about 40 inches.

TAXONOMIC CLASS: Fine-loamy, mixed, active, nonacid, mesic Aeric Endoaquepts

TYPICAL PEDON: Atherton silt loam - hay. (Colors are for moist soils.)

Ap-- 0 to 9 inches; very dark gray (10YR 3/1) silt loam; moderate coarse granular structure; friable; many fine roots; common fine pores; few medium distinct dark red (2.5YR 3/6) masses of iron accumulation in the matrix; moderately acid; abrupt smooth boundary. (6 to 9 inches thick.)

Bg-- 9 to 22 inches; gray (5Y 5/1) silt loam; massive; friable; few fine roots in upper 6 inches; few fine pores; many (30 percent) medium distinct light olive brown (2.5Y 5/4) masses of iron accumulation in the matrix; 5 percent coarse fragments; moderately acid; clear wavy boundary. (3 to 16 inches thick.)

2Bw-- 22 to 38 inches; dark yellowish brown (10YR 4/4) gravelly silt loam; massive; friable; few pores; many (35 percent) medium and coarse distinct gray (5Y 5/1) iron depletions in the matrix; 25 percent coarse fragments; slightly acid; clear smooth boundary. (0 to 25 inches thick.)

2C-- 38 to 60 inches; dark grayish brown (10YR 4/2) gravelly loam; massive with crude stratification; few pores; common medium distinct gray (5Y 5/1) iron depletions and common coarse distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; 25 percent coarse fragments; slightly acid.

TYPE LOCATION: Steuben County, New York, Campbell Township. 1/2 mile north of Highway 333 in depressional area in terrace adjacent to Cohocton River. USGS Campbell, NY topographic quadrangle; Latitude 42 degrees, 14 minutes, 12 seconds N. and Longitude 77 degrees, 12 minutes, 27 seconds W., NAD 1927.

RANGE IN CHARACTERISTICS: The thickness of the solum ranges from 20 to 44 inches. Rock fragments range from 0 to 20 percent in horizons in the upper part of the solum including up to 15 percent greater than 3 inches in diameter. The weighted average rock fragment content ranges from 0 to 35 percent in the particle control section, including up to 5 percent greater than 3 inches in diameter. Rock fragments in the substratum ranges to 60 percent. Unless limed, reaction ranges from strongly acid to neutral in the A horizon and from moderately acid to slightly alkaline in the B and C horizons.

The A horizon has hue of 10YR or 2.5Y, value of 2 or 3 and chroma of 0 through 2. Texture is loam, silt loam or silty clay loam in the fine earth fraction. Structure is weak or moderate granular or fine subangular blocky. Consistence is friable or very friable. In pedons with A horizons thickness can range from 1 to 6 inches.

In uncleared areas A horizons are 4 to 8 inches thick and have color value of 2 or 3 moist and 4 or 5 dry. They may be underlain by E horizons 1 to 6 inches thick that have chroma of 0 or 1.

The Bg horizon has hue of 5YR through 5Y, value of 4 or 5 and chroma of 0 through 2 and has redoximorphic features. Texture is loam, silt loam or silty clay loam in the fine earth fraction. Consistence is friable or firm.

The Bw or IIBw horizon, which is usually in contrasting materials, has hue of 5YR through 5Y, value of 4 through 6 and chroma of 3 or 4 and it has distinct or prominent redoximorphic features. Texture is loam, silt loam or silty clay loam in the fine earth fraction with thin layers of gravel, sand, or silty clay in some pedons. They are massive or they have moderate prismatic or blocky structure. Consistence is friable or firm.

The C or 2C horizon has hue of 5YR through 5Y, value of 4 through 6 and chroma of 2 or 4 and it has distinct or prominent redoximorphic features. They are stratified with texture in the fine earth fraction typically ranging from loam to silty clay loam, but including textures from sand to silty clay.

COMPETING SERIES: The Kendaia series is in the same family. Kendaia soils have carbonates within a depth of 40 inches and lack stratification within 40 inches.

GEOGRAPHIC SETTING: The Atherton soils are nearly level soils in depressions in glacial outwash terraces, older stream terraces, and kame-kettle landforms. Slope ranges from 0 to 3 percent. The soil formed in water-sorted material which ranges widely in texture among layers below 20 inches. Mean annual precipitation ranges from 30 to 50 inches, mean annual air temperature from 45 degrees to 52 degrees F. and mean growing season from 120 to 200 days.

GEOGRAPHICALLY ASSOCIATED SOILS: The well drained Chenango, Hoosic and Tunkhannock soils, the moderately well drained Braceville and Castile soils and the somewhat poorly drained Red Hook soils are other members of drainage sequences in

which Atherton soils are the wettest member. Tioga and Barbour soils are on nearby first bottoms and Allard and Unadilla soils on silt-mantled terraces. Lordstown, Bath and related soils are on adjoining uplands.

DRAINAGE AND PERMEABILITY: Poorly to very poorly drained. The potential for surface runoff is very low. Permeability is moderate or moderately slow in the solum and moderate or moderately rapid in the substratum.

USE AND VEGETATION: Where undrained, the soil is in woodlots mostly of elm and soft maple, is idle or is pastured. Drained areas are used for growing corn, small grains, hay and pasture.

DISTRIBUTION AND EXTENT: Southern and eastern New York, eastern Ohio, western and northern Pennsylvania. MLRA 100, 101, 139, 140, 144A, and 146. The series is moderately extensive.

MLRA OFFICE RESPONSIBLE: Amherst, Massachusetts

SERIES ESTABLISHED: Licking County, Ohio, 1930.

REMARKS: This series has been used in MLRA 146. All soils in this area are now frigid. It will be removed when this area is updated.

The pedon description for the Atherton series was updated to modern terminology. The Atherton series typical pedon needs to be updated in the field.

Diagnostic horizons and other features recognized in the typical pedon:
(1) Ochric epipedon - the zone from the surface to 9 inches (Ap horizon).
(2) Cambic horizon - the zone from 9 to 38 inches (Bg and IIBg horizons).

LOCATION BRACEVILLE PA+NJ NY OH
Established Series
Rev. DGG-EAW
02/2000

BRACEVILLE SERIES

The Braceville series consists of very deep, moderately well drained soils formed in glacial outwash of stratified sand, silt, and gravel. They are on terraces, benches, fans, and moraines. Slopes range from 0 to 25 percent. Permeability is moderately slow to slow. Mean annual precipitation is 40 inches. Mean annual temperature is about 49 degrees F.

TAXONOMIC CLASS: Coarse-loamy, mixed, active, mesic Typic Fragiudepts

TYPICAL PEDON: Braceville gravelly loam - cultivated on a 3 to 8 percent slope.(Colors are for moist soil unless otherwise noted.)

Ap--0 to 8 inches, dark grayish brown (10YR 4/2) gravelly loam; weak medium granular structure; friable, nonsticky, slightly plastic; 15 percent rock fragments; strongly acid; abrupt smooth boundary. (6 to 11 inches thick.)

Bw1--8 to 18 inches, yellowish brown (10YR 5/4) gravelly loam; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; 20 percent rock fragments; strongly acid; clear wavy boundary. (5 to 15 inches thick.)

Bw2--18 to 24 inches, yellowish brown (10YR 5/4) gravelly loam; common medium distinct light yellowish brown (10YR 6/4) mottles; weak medium subangular blocky structure; friable, slightly sticky, slightly plastic; 20 percent rock fragments; strongly acid; abrupt wavy boundary. (4 to 14 inches thick.)

Bx--24 to 36 inches, brown (10YR 5/3) gravelly loam; common medium distinct grayish brown (10YR 5/2) and yellowish brown (10YR 5/6) mottles; grayish brown (10YR 5/2) faces of prisms; weak very coarse prismatic structure parting to weak medium platy; firm, brittle; few faint clay films lining pores; 30 percent rock fragments; strongly acid; gradual wavy boundary. (8 to 35 inches thick.)

C--36 to 60 inches, grayish brown (2.5Y 5/2) stratified sand and gravel; common medium distinct gray (N 5/) streak-like mottles; single grain; strongly acid.

TYPE LOCATION: Mercer County, Pennsylvania, East Lackawannock Township, two miles southwest of Mercer.

RANGE IN CHARACTERISTICS: Solum thickness ranges from 30 to 55 inches. Depth to the fragipan ranges from 15 to 30 inches. Depth to bedrock is from 5 to 50 feet or more. Depth to low chroma mottles ranges from 16 to 30 inches. The solum or C horizons are stratified within 40 inches and stratified sand and gravel is at depths of 30 to 72 inches. Rock fragments of dominately gravel range from 0 to 30 percent in the A and Bw horizons and from 20 to 50 percent in the Bx horizon. Reaction, where not limed, ranges from very strongly acid to moderately acid above the Bx, and from strongly acid to slightly acid in the Bx and C horizons.

The A horizon has hue of 2.5Y through 7.5YR, value of 3 or 4, and chroma of 2 through 4. It is sandy loam, loam or silt loam in the fine earth.

The Bw horizon has hue of 2.5Y through 7.5YR, value of 4 or 5, chroma of 3 through 6, and it can be mottled. It is sandy loam, loam, or silt loam in the fine earth. Structure is weak fine or medium subangular blocky. Consistency is friable.

The Bx horizon has hue of 2.5Y through 7.5YR, value of 4 or 5, chroma of 3 through 6, and it is mottled. It is sandy loam, loam, or silt loam in the fine earth. Structure is weak very coarse prismatic parting to weak medium or thick platy. Consistency is firm and brittle. Some pedons have thin BC horizons.

The C horizon has hue of 5Y through 5YR. It is usually gravelly loamy sand or sandy loam and includes stratified layers of sand, gravel, sandy loam, loam, or silt loam.

COMPETING SERIES: Bath, Broadalbin, Ira, Lackawanna, Mardin, Rushford, Sodus, Swartswood, Wellsboro, and Wurtsboro soils are in the same family.

All of the listed series lack stratified materials within the series control section, do not have C horizons that have loamy sand textures or have Cd horizons. Montauk soils lack Bx horizons and lack mottles above a depth of 30 inches.

The Atherton, Bridgeville, Fredon, Jimtown, Ludlow, Montauk, Nantucket, Red Hook, Rexford, Sciotoville, and Wethersfield soils are in related families. All of these soils except Rexford and Sciotville soils lack fragipans.

Rexford soils have a horizon with 50 percent or more redoximorphic depletions with chroma of 2 or less within a depth of 20 inches of the mineral surface and redoximorphic concentrations with 12 inches of the surface. Sciotoville soils have an argillic horizon.

GEOGRAPHIC SETTING: Braceville soils are nearly level to moderately steep soils on terraces, beaches, fans, and moraines. Slopes range from 0 to 25 percent. The soils formed in glacial outwash of stratified sand, silt, and gravel derived largely from noncalcareous gray sandstone and shale, but contain small amounts of reddish rocks and limestone. Some pedons have a thin silty mantle. Climate is humid and temperate, with mean annual precipitation of 34 to 44 inches; average annual temperature of 45 degrees to 52 degrees F., and the growing season is 120 to 170 days.

GEOGRAPHICALLY ASSOCIATED SOILS: Alton, Atherton, Chenango, Conotton, Fredon, Red Hook, Rexford, Riverhead, and Tunkhannock soils are on nearby landscapes. Alton, Chenango, Conotton, Riverhead, and Tunkhannock soils are well drained or somewhat excessively drained, lack fragipans, and commonly are on uplands above the Braceville soils. Atherton soils are poorly or very poorly drained on depressions or lowlands. Fredon, Red Hook, and Rexford soils have a horizon with dominant chroma of 2 or less within a depth of 20 inches.

DRAINAGE AND PERMEABILITY: Moderately well drained. Runoff is slow to medium and permeability is moderately slow to slow.

USE AND VEGETATION: About 85 percent is cleared and used for growing crops and pasture. Woodlands are dominately northern hardwoods.

DISTRIBUTION AND EXTENT: Northern Pennsylvania, southern New York, New Jersey and northeastern Ohio. Series is of moderate extent.

MLRA OFFICE RESPONSIBLE: Amherst, Massachusetts

SERIES ESTABLISHED: Trumbull County, Ohio, 1914.

REMARKS:
S-5= PA0014; Pedon S69PA-010-005 PSU Data and 18 Engineering Data Samples taken in PA.
Diagnostic Horizons and Features:
1. Ochric Epipedon from 0 to 9 inches assume dry color greater than 5/3.
2. Cambic Horizon from 8 to 24 inches.
3. Fragipan form 24 to 36 inches.
4. Aquic Conditions - redoximorphic concentrations occur in the Bw2 and low chroma redox depletions occur in the Bx horizon.

National Cooperative Soil Survey
U.S.A.

LOCATION CHENANGO NY NJ OH PA
Established Series
Rev. MGC-ERS-SWF
08/2004

CHENANGO SERIES

The Chenango series consists of very deep, well and somewhat excessively drained soils formed in water-sorted material on outwash plains, kames, eskers, terraces, and alluvial fans. Slope ranges from 0 to 60 percent. Mean annual temperature is 47 degrees F, and mean annual precipitation is 36 inches.

TAXONOMIC CLASS: Loamy-skeletal, mixed, superactive, mesic Typic Dystrudepts

TYPICAL PEDON: Chenango gravelly silt loam on a 3 percent slope in a cultivated field. (Colors are for moist soil unless otherwise noted.)

Ap-- 0 to 8 inches; very dark grayish brown (10YR 3/2) gravelly silt loam, light brownish gray (10YR 6/2) crushed and dry; weak fine and medium granular structure; friable; many fine roots; 20 percent pebbles; moderately acid; abrupt smooth boundary. (4 to 10 inches thick.)

Bw1-- 8 to 12 inches; dark yellowish brown (10YR 4/4) gravelly silt loam; very weak fine subangular blocky and very weak very fine granular structure; very friable; many fine roots; common fine pores; 15 percent dark grayish brown (10YR 4/2) material filling earthworm channels; 30 percent pebbles; strongly acid; gradual smooth boundary.

Bw2-- 12 to 20 inches; dark yellowish brown (10YR 4/4) very gravelly silt loam; very weak fine and medium subangular blocky structure; friable; few fine roots; common fine pores; 40 percent pebbles; strongly acid; gradual wavy boundary. (Combined thickness of the Bw horizon is 4 to 30 inches.)

BC-- 20 to 30 inches; brown (10YR 4/3) very gravelly loam; massive; friable; few fine roots; common fine and medium pores; 50 percent pebbles; strongly acid; clear wavy boundary. (0 to 18 inches thick.)

2C-- 30 to 72 inches; dark grayish brown (10YR 4/2), grayish brown (10YR 5/2), and brown (10YR 4/3) extremely gravelly loamy coarse sand; upper surface of pebbles have thin caps of dark grayish brown (10YR 4/2) loamy material; single grain except massive in caps; loose; few roots in upper part; 10 percent soft dark brown and dark yellowish brown weathered pebbles; strongly acid in the upper part grading to slightly acid with depth.

TYPE LOCATION: Tioga County, New York; 3 miles north of Owego, 100 feet east of road and 120 feet south of farm house. USGS Candor, NY topographic quadrangle; Latitude 42 degrees, 8 minutes, 52 seconds N. and Longitude 76 degrees, 15 minutes, 42 seconds W., NAD 1927.

RANGE IN CHARACTERISTICS: Solum thickness ranges from 24 to 50 inches. Depth to bedrock is greater than 60 inches. Rock fragments range from pebbles to flagstones. Rock fragment content ranges from 10 to 50 percent in the A horizon, 15 to 60 percent in the B horizon, and 30 to 70 percent in the C horizon. Depth to carbonates as coatings on pebbles is more than 72 inches.

The Ap horizon has hue of 7.5YR through 2.5Y, value of 3 through 5, and chroma of 2 or 3. Texture of the fine earth fraction ranges from sandy loam to silt loam. Structure is weak or moderate granular or subangular blocky. Consistence is very friable or friable. Unlimed reaction ranges from very strongly acid through moderately acid.

The B horizon has hue of 7.5YR through 2.5Y, value of 4 through 6, and chroma of 3 through 6, with 7.5YR hue restricted to the upper part. Texture of the fine earth fraction is fine sandy loam, sandy loam, loam, very fine sandy loam, or silt loam, with an average of less than 50 percent fine and coarser sand. Structure is very weak to moderate subangular blocky or granular, or it is massive. Consistence ranges from very friable through firm. Reaction ranges from very strongly acid through moderately acid.

The BC horizon, where present, has a hue of 7.5YR through 2.5Y, value of 4 through 6, and chroma of 3 through 6. The texture is very fine sandy loam, fine sandy loam, sandy loam, loam, or silt loam in the fine earth fraction and averages less than 50 percent fine sand and coarse sand. Structure is weak or very weak subangular blocky or the material is massive. Consistence ranges from very friable to firm. Reaction ranges from very strongly acid to neutral.

The 2C horizon has hue of 10YR or 2.5Y, value of 3 through 5, and chroma of 2 through 4. Texture of the fine earth fraction is loamy fine sand through coarse sand. Some pedons have a C horizon that has very channery analogues of sandy loam, loam, or silt loam. It is massive or single grain. Reaction ranges from strongly acid through slightly alkaline.

COMPETING SERIES: The Centralpark (T), Oquaga, and Tunkhannock series are in the same family. The Centralpark series is formed in a mantle of anthrotransported materials. The Oquaga soils lack stratified materials in the lower part of the substratum. Tunkhannock soils have hues of 7.5YR or redder throughout the B horizon.

The Berks, Brownsville, Calvin, Cardiff, Centralpark (T), Highsplint, Konnarock(T), Lippitt, Northcove, Parker, Slyco, Watt and Wyoming series were in the same family, but have not been classified to the 8th Edition of the Keys to Soil Taxonomy. Berks, Brownsville, Calvin, Cardiff, Highsplint, Lippitt, and Parker soils lack stratified materials in the lower part of the substratum. Konnarock(T), Sylco, and Watt soils have bedrock

within 40 inches. Wyoming soils have a weighted average of more than 50 percent sand coarser than very fine sand in the particle-size control section.

GEOGRAPHIC SETTING: Chenango soils are nearly level to very steep soils on outwash plains, alluvial fans, valley terraces and associated kames, eskers, and fluvial parts or moraines. Slope ranges from 0 to 60 percent. The soils formed in water-sorted gravelly and loamy drift. In some places the soils formed in alluvial deposits. The parent material is derived from gray sandstone, shale, and siltstone and lesser amounts of material from limestone and igneous rocks. Mean annual precipitation ranges from 30 to 42 inches, mean annual temperature ranges from 45 to 50 degrees F, and the mean annual frost-free season ranges from 130 to 180 days. Elevation ranges from 300 to 1,500 feet above sea level.

GEOGRAPHICALLY ASSOCIATED SOILS: Atherton, Braceville, Castile and Red Hook are wetter soils in the same drainage sequence. Tioga and Middlebury soils are on nearby flood plains. Allard and Unadilla soils are on nearby silt-mantled terraces. Lordstown, Mardin, and related soils are on adjoining uplands.

DRAINAGE AND PERMEABILITY: Well and somewhat excessively drained. The potential for surface runoff ranges from negligible to high. Permeability is moderate to moderately rapid in the solum and rapid in the substratum.

USE AND VEGETATION: Most lesser sloping areas have been cleared. They are used mainly for growing hay, corn, and small grains, but vegetables and grapes are important locally. More sloping areas are used mainly for growing pasture and hay. Woodlots contain sugar maple, red maple, American beech, ash, hemlock, and white pine in northernmost areas; oak and hickory are more conspicuous in the southern part of the series range.

DISTRIBUTION AND EXTENT: Central and southern New York, northern New Jersey and Pennsylvania, and northeastern Ohio. MLRA 100, 101,127,139, 140, 144A, 147, and 148. The series is extensive.

MLRA OFFICE RESPONSIBLE: Amherst, Massachusetts

SERIES ESTABLISHED: Reconnaissance Survey of Northern Pennsylvania, 1909.

REMARKS: Diagnostic horizons and other features recognized in the typical pedon are:
1) Ochric epipedon - from 0 to 8 inches (Ap horizon).
2) Cambic horizon - from 8 to 30 inches (Bw and BC horizons).
ADDITIONAL DATA: Characterization data is available for: 2 pedons from Tioga County, New York (S54NY-54-6 and S58NY-12-1); and 2 pedons from Pike County, Pennsylvania (S64PA-52-5 and S64PA-52-10).

National Cooperative Soil Survey
U.S.A.

LOCATION HOLLY OH IL NY PA WV
Established Series
Rev. RAR-JRS-LER
07/2005

HOLLY SERIES

The Holly series consists of very deep, very poorly and poorly drained soils formed in loamy alluvium on flood plains. Permeability is moderate or moderately slow in the solum and moderate or moderately rapid in the underlying material. Slope ranges from 0 to 2 percent. Mean annual precipitation is about 36 inches, and mean annual temperature is about 51 degrees F.

TAXONOMIC CLASS: Fine-loamy, mixed, active, nonacid, mesic Fluvaquentic Endoaquepts

TYPICAL PEDON: Holly silt loam - idle. (Colors are for moist soil unless otherwise stated.)

A-- 0 to 3 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate medium granular structure; friable; slightly acid; clear wavy boundary. (2 to 8 inches thick.)

Bg1-- 3 to 9 inches; dark gray (5Y 4/1) silt loam; weak medium subangular blocky structure; friable; common fine prominent brown (7.5YR 4/4) masses of iron accumulation in the matrix; slightly acid; clear smooth boundary.

Bg2-- 9 to 14 inches; dark gray (5Y 4/1) silt loam; weak coarse subangular blocky structure; friable; common medium prominent yellowish red (5YR 4/6) masses of iron accumulation in the matrix; slightly acid; clear smooth boundary.

Bg3-- 14 to 27 inches; gray (5Y 5/1) sandy loam; weak coarse subangular blocky structure; friable; common medium and fine prominent brown (7.5YR 4/4) and strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; slightly acid; clear wavy boundary. (Combined thickness of the Bg horizons is 10 to 32 inches.)

C1-- 27 to 35 inches; gray (N 5/0) loam; massive; friable; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; slightly acid; clear wavy boundary.

C2-- 35 to 43 inches; dark gray (N 4/0) sandy loam; massive; friable; slightly alkaline; clear wavy boundary.

2C3-- 43 to 60 inches; dark greenish gray (5BG 4/1) gravelly sand; single grain; loose; slightly alkaline.

TYPE LOCATION: Summit County, Ohio; Bath Township, about 1 1/2 miles northwest of Montrose; 1,100 feet east of Hametown Road and 2,200 feet south of Granger Road, T. 3 N., R. 12 W. USGS West Richfield, OH topographic quadrangle: Latitude 41 degrees, 8 minutes, 57 seconds N. and Longitude 81 degrees, 39 minutes, 36 seconds W., NAD 1927.

RANGE IN CHARACTERISTICS: Thickness of the solum ranges from 20 to 44 inches. Thickness of loamy alluvium over other materials ranges from 40 to more than 60 inches. The average clay content in the particle size control section ranges from 18 to 30 percent.

The A or Ap horizon has hue of 10YR, value of 2 to 4 (6 or more dry), and chroma of 1 or 2. It is silt loam, loam, silty clay loam, or sandy loam. Structure is commonly weak or moderate, fine to coarse, granular. In some pedons structure type is subangular blocky. Rock fragment content ranges from 0 to 10 percent by volume. It ranges from strongly acid to neutral.

The Bg horizon has hue of 10YR, 2.5Y, 5Y, or is neutral; value of 4 to 6; and chroma of 2 or less. It commonly is silt loam or loam and less commonly sandy loam or silty clay loam. Thin layers (less than 4 inches) with coarser or finer texture are present in some pedons. Structure is weak or moderate, fine to coarse, subangular blocky. Rock fragment content ranges from 0 to 15 percent by volume. It ranges from strongly acid to neutral in the upper part and from moderately acid to neutral in the lower part.

The Cg horizon has hue of 10YR to 5GY or is neutral, value of 4 to 6, and chroma of 0 to 2. It commonly is silt loam, loam, sandy loam, or clay loam. Below 40 inches the soil typically is stratified and includes textures of loamy sand, sand, or their gravelly analogues. Thin strata of silty clay loam are in some pedons. Rock fragment content ranges from 0 to 25 percent by volume. It ranges from strongly acid to slightly alkaline.

COMPETING SERIES: The Hatboro series is in the same family. Hatboro soils have sola with thicknesses of 30 to 60 inches, and contain an appreciable amount of mica.

GEOGRAPHIC SETTING: Holly soils are on broad flat areas and in slight depressions on flood plains receiving alluvium from upland areas of low-lime drift and noncalcareous sandstone and shale. Slope ranges from 0 to 2 percent. Elevation ranges from 570 to 1,170 feet above msl. Mean annual precipitation is 29 to 43 inches, and mean annual temperature is 47 to 54 degrees F. The frost-free period is 120 to 198 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Carlisle, Chagrin, Chili, Fitchville, Lobdell, Orrville, Sebring, Wayland, Wheeling, and Willette soils. Wayland soils with dark surfaces and Carlisle or Willette soils that formed in organic materials typically are in deeper depressions in the landscape. The well drained Chagrin soils,

moderately well drained Lobdell soils, and somewhat poorly drained Orrville soils are in a toposequence with Holly soils; all are in higher floodplain positions than the low lying Holly soils. Chili, Fitchville, Sebring, and Wheeling soils have argillic horizons and are on terraces of nearby landscapes; in addition, Chili and Wheeling soils formed in stratified outwash materials, and Fitchville and Sebring soils formed in lacustrine sediments.

DRAINAGE AND PERMEABILITY: Very poorly and poorly drained. The potential for surface runoff is negligible to low. Permeability is moderate or moderately slow in the solum and moderate or moderately rapid in the underlying material. The depth to an intermittent apparent seasonal high water table is +1.0 to 1.0 from October to June in normal years. Subject to rare to frequent flooding.

USE AND VEGETATION: Some areas of Holly soils have been cleared and used for pasture or cultivation. Many areas are used as natural areas for wetland wildlife habitat. Native vegetation is soft maple, elder, willow, and other trees tolerant of wet sites.

DISTRIBUTION AND EXTENT: Illinois, Ohio, southern New York, northwestern Pennsylvania, and West Virginia. MLRA's 101, 114, 124, 125, 126, 127, 128, 139, 140, 147, and 148. The series is of large extent, about 248,000 acres.

MLRA OFFICE RESPONSIBLE: Amherst, Massachusetts.

SERIES ESTABLISHED: Coffee County, Tennessee, 1908.

REMARKS: Diagnostic horizons and features recognized in this pedon are:
1. Ochric epipedon - 0 to 9 inches (A and Bg1 horizon).
2. Cambic horizon - 3 to 27 inches (Bg1, Bg2 and Bg3 horizons).
3. Aquic conditions - 0 to 60 inches.

Acreage based on 2004 data.

The alkaline phase mapped in an earlier survey likely will be recorrelated as a new series when its area of use is updated.

National Cooperative Soil Survey
U.S.A.

LOCATION MORRIS PA+NY

Established Series
Rev.EAW-ERS
1/99

MORRIS SERIES

The Morris series consists of very deep, somewhat poorly drained soils formed in till from red sandstone, siltstone, and shale. They have a dense fragipan layer that restricts root penetration and water movement. Slopes range from 0 to 25 percent. Mean annual precipitation is 41 inches, and mean annual temperature is 48 degrees F.

TAXONOMIC CLASS: Coarse-loamy, mixed, active, mesic Aeric Fragiaquepts

TYPICAL PEDON: Morris channery loam-woodland. (Colors are for moist soil unless otherwise noted.)

0e--0 to 1 inch; very dark brown (10YR 2/2) humus mat overlain by thin leaf litter.

A--1 to 5 inches; dark grayish brown (10YR 4/2) channery loam; moderate medium granular structure; friable, nonsticky, nonplastic; many roots; 25 percent rock fragments; very strongly acid; clear wavy boundary. (1 to 8 inches thick)

Bw1--5 to 9 inches; brown (7.5YR 4/4) channery loam; moderate fine subangular blocky structure; friable; nonsticky, nonplastic; many roots; 20 percent rock fragments; few medium faint brown (10YR 5/3) redoximorphic depletions; very strongly acid; clear wavy boundary.

Bw2--9 to 16 inches; pinkish gray (7.5YR 6/2) channery loam; weak medium subangular blocky structure; friable; nonsticky, nonplastic; common roots; 20 percent rock fragments; common medium distinct light brown (7.5YR 6/4) redoximorphic concentrations and gray (N 5/0) redoximorphic depletions; very strongly acid; clear wavy boundary. (Combined thickness of the Bw horizons is 6 to 20 inches.)

Bx1--16 to 43 inches; brown (7.5YR 4/4) channery loam; gray (N 6/0) faces of prisms; moderate very coarse prismatic structure parting to weak medium platy and blocky; very firm, brittle, slightly sticky, slightly plastic; few roots along prisms; common faint clay film in pores and few faint clay films on faces of peds; 15 percent rock fragments; common medium distinct gray (N 6/0) redoximorphic depletions; strongly acid; diffuse wavy boundary. (15 to 40 inches thick)

Bx2--43 to 66 inches; reddish gray (5YR 5/2) channery loam; gray (N 6/0) faces of prisms; moderate very coarse prismatic structure parting to moderate thick platy; few faint clay films in pores and few faint clay films on faces of peds; common faint black coatings on plates; 25 percent rock fragments; common medium distinct gray (N 6/0) redoximorphic depletions and light brown (7.5YR 6/4) redoximorphic concentrations; strongly acid.

TYPE LOCATION: Pike County, Pennsylvania; Blooming Grove Township, 1 1/4 miles west of village of Blooming Grove.

RANGE IN CHARACTERISTICS: Solum thickness is greater than 40 inches. Depth to the fragipan ranges from 10 to 22 inches. Depth to bedrock is 60 inches or more. Rock fragments of angular or

rounded sandstone, siltstone or shale range from 10 to 40 percent in the A and Bw horizons, and from 15 to 50 percent in the Bx and C horizons. They average less than 35 percent in the control section. Reaction ranges from very strongly acid to moderately acid in the upper part of the solum, and strongly acid to slightly acid in the lower part of the solum.

The A or Ap horizon has hue of 5YR through 10YR, value of 3 through 5, and chroma of 1 through 4. In uncultivated areas, the A horizon has hue of 5YR through 10YR, value of 2 through 4, and chroma of 1 or 2. Some pedons have an E horizon with hue of 5YR through 10YR, value of 3 through 6, and chroma of 2 or 3. Texture of the fine-earth fraction is loam or silt loam.

The Bw horizon above 20 inches has hue of 5YR through 10YR, value of 3 through 7, and chroma of 1 through 6. Texture of the fine-earth fraction is loam or silt loam. Some pedons have Bg of Eg horizons above the fragipan. The B horizon has redoximorphic features having chroma of 2 or less, or has chroma of 1 or less if redoximorphic features are absent within a depth of 20 inches from the surface. A subhorizon, from about 6 to 30 inches, has in 50 percent or more of the matrix chroma of 3 or more, or chroma of 2 if there are no redoximorphic concentrations.

The Bx horizon has hue of 2.5YR through 7.5YR, value of 3 through 5, and chroma of 2 through 6. Faces of prisms range in hue from 2.5YR through 10YR, value from 5 through 7, and chroma from 1 through 3. Texture of the fine-earth fraction is loam, silt loam, or silty clay loam.

Some pedons have a C horizon colors are similar to the Bx horizon. Texture of the fine-earth fraction is loam or silt loam.

COMPETING SERIES: The Scriba series is currently the only soil in the same family. Scriba soils have more than 45 percent sand in the particle-size control section. The Rexford series was in the same family, but has not been classified for CEC activity class. Rexford soils have stratified materials in the series control section.

GEOGRAPHIC SETTING: Morris soils are in till plains and slightly concave uplands. Slopes are dominantly 2 to 15 percent but range from about 0 to 25. The soils formed in firm glacial till derived from reddish sandstone, siltstone and shale. Mean annual precipitation ranges from 32 to 50 inches; mean air temperature ranges from 46 degrees to 50 degrees F.; and the frost free period ranges from about 120 to 165 days. Elevation ranges from 300 to 1700 feet above sea-level.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Norwich, Wellsboro, and Lackawanna soils which are in a drainage sequence with Morris soils. Lackawanna soils do not have redoximorphic features above the fragipan. Norwich soils are poorly drained and occur in nearby lower depressions or flat broader areas of the till plain. Arnot, Lordstown, and Oquaga soils are on nearby bedrock controlled landforms. These soils have bedrock within 40 inches of the surface.

DRAINAGE AND PERMEABILITY: Somewhat poorly drained. The potential for surface runoff ranges from very low through medium. Permeability above the fragipan is moderate and is slow or very slow in the fragipan.

USE AND VEGETATION: Many areas have been cleared but much is now idle. Hay, pasture, and small grains are the principal crops, but some areas are cropped to corn. Red maple, elm, hemlock, black ash, sugar maple, white pine, and oaks are the dominant trees in wooded areas.

DISTRIBUTION AND EXTENT: Southern New York, northern Pennsylvania, and northwestern New Jersey. MLRA's 127 and 140. The series is of moderate extent.

MLRA OFFICE RESPONSIBLE: Amherst, Massachusetts

SERIES ESTABLISHED: Chenango River Project, New York, 1936.

REMARKS: Diagnostic horizons and features recognized in this pedon are:
1. Ochric epipedon - the zone from the surface to a depth of about 5 inches (A horizon).
2. Cambic horizon - the zone from 5 inches to a depth of 16 inches (Bw1 and Bw2 horizons).
3. Fragipan - the zone from 16 inches to a depth of about 66 inches (Bx1 and Bx2 horizons).
4. Aquepts Suborder - the zone from 9-16" (Bw2 horizon) faces of peds are 2 chroma with redox concentrations
5. Aeric Subgroup - chroma of 3 or more in 50 percent or more of the matrix in a horizon between the Ap and a depth of 30 inches (Bx1 horizon)

Soil Interpretation Record No: PA0018, PA0019

National Cooperative Soil Survey
U.S.A.

LOCATION OQUAGA NY NJ PA
Established Series
Rev. LWK-OWR-STS
03/2003

OQUAGA SERIES

The Oquaga series consists of moderately deep, somewhat excessively drained soils formed in a thin mantle of till over sandstone, siltstone, and shale bedrock on nearly level to very steep uplands. Slope ranges from 0 to 70 percent. Permeability is moderate. Mean annual air temperature is 49 degrees F. and mean annual precipitation is 42 inches.

TAXONOMIC CLASS: Loamy-skeletal, mixed, superactive, mesic Typic Dystrudepts

TYPICAL PEDON: Oquaga very channery silt loam, forested. (Colors are for moist soil.)

A-- 0 to 4 inches; dark reddish brown (5YR 3/3) very channery silt loam, light reddish brown (5YR 6/3) dry; weak fine subangular blocky structure; very friable; many fine, common medium and coarse roots; 40 percent rock fragments; strongly acid; clear smooth boundary. (2 to 5 inches thick.)

Bw1-- 4 to 11 inches; dark red (2.5YR 3/6) and red (2.5YR 4/6) very channery loam; weak coarse subangular blocky structure parting to fine granular structure; very friable; many fine, common medium and coarse roots; many fine irregular pores; 36 percent coarse fragments; strongly acid; clear wavy boundary.

Bw2-- 11 to 28 inches; reddish brown (2.5YR 4/4) very channery loam; weak medium subangular blocky structure; very friable; many fine and few medium roots in the upper part of the horizon, many fine roots in the lower part; many fine irregular pores; 45 percent rock fragments; strongly acid; gradual wavy boundary. (Combined thickness of the Bw horizon is 16 to 32 inches.)

BC-- 28 to 34 inches; reddish brown (2.5YR 4/4) and dark reddish brown (2.5YR 3/4) very channery loam; massive; friable; few medium roots; 45 percent rock fragments; strongly acid; abrupt smooth boundary. (0 to 6 inches thick.)

2R-- 34 inches plus; weak red (10R 4/3) thinly bedded shale bedrock.

TYPE LOCATION: Sullivan County, New York; Town of Bethel, 0.35 mile west on NY Rte. 17B from the intersection of route 17B and White Lake Road, then 0.35 miles north and 0.25 miles west on a gravel road; Elevation 1400 feet. USGS Bethel, NY topographic quadrangle; Latitude 41 degrees, 40 minutes, 51 seconds N. and Longitude 74 degrees, 51 minutes, 01 second W. NAD 1927.

RANGE IN CHARACTERISTICS: Depth to bedrock ranges from 20 to 40 inches. Content of rock fragments ranges from 15 to 60 percent in surface horizons and from 25 to 85 percent in individual layers in the remainder of the soil. Unless limed, reaction ranges from extremely acid to moderately acid throughout the soil.

Some pedons have a thin O horizon.

The A or Ap horizon has hues ranging from 2.5YR to 10YR, values of 2.5 to 5, and chromas of 2, 3 or 4. Dry color value is 6 or more. It is channery or very channery, and the fine earth fraction is silt loam, loam, or sandy loam. It has granular or subangular blocky structure, and very friable or friable consistence. Some pedons have an E horizon at a depth of less than 5 inches.

The Bw horizon has hues of 2.5YR to 7.5YR, values of 3 to 6, and chromas of 3 to 8. The fine earth fraction is silt loam or loam. It has weak or very weak granular or subangular blocky structure and very friable to firm consistence.

The BC horizon has properties similar to the B and C horizons.

The C or 2C horizon, when present, have hues of 10R to 7.5YR, values of 3 to 5, and chromas of 2 to 4. It is sandy loam, loam or silt loam in the fine earth fraction. It is massive, with or without plate-like divisions.

COMPETING SERIES: The Chamate, Chenango, and Tunkhannock series are in the same family. Chamate soils are developed in residuum or colluvium. Chenango and Tunkhannock soils are very deep.

GEOGRAPHIC SETTING: Oquaga soils are in uplands and formed in a thin mantle of reddish till with lithology dominated by the local and underlying reddish sandstone, siltstone, and shale. Slope ranges from 0 to 70 percent. The climate is humid and temperate. Mean annual precipitation ranges from 35 to 50 inches; mean annual air temperature from 46 degrees to 52 degrees F., and mean growing season from 120 to 180 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the shallow Arnot and Tuller soils and the very deep Lackawanna, Wellsboro, and Morris soils.

DRAINAGE AND PERMEABILITY: Somewhat excessively drained. Internal drainage is medium. The potential for surface runoff is negligible to very high. Permeability is moderate or moderately rapid.

USE AND VEGETATION: Most of the soil is forested or used for unimproved native pasture. Hay, small grains, and corn are produced on the gentler slopes. Native vegetation is sugar maple, beech, white pine, white ash, oak and hemlock.

DISTRIBUTION AND EXTENT: Southern New York, northern Pennsylvania, and northwestern New Jersey. MLRA 127, 140, and 144A. The series is extensive with an estimated more than 100,000 acres.

MLRA OFFICE RESPONSIBLE: Amherst, Massachusetts

SERIES ESTABLISHED: Allegany County, New York, 1946.

REMARKS: A new pedon was selected since the Allegany Co. pedon may no longer fit the series concept. This series was used in MLRA 127. The use of a series with glacial parent material in MLRA 127 is questionable.

Diagnostic horizons and other features recognized in the typical pedon are:
1. Udic soil moisture regime (a humid, temperate climate).
2. Ochric epipedon - from 0 to 4 inches (A horizon)
3. Cambic horizon - from 4 to 28 inches (Bw and BC horizons)

Characterization data is available for 1 pedon from Sullivan Co. NY (S79NY105 9).

National Cooperative Soil Survey
U.S.A.

LOCATION POPE KY+AL GA IN MD MO NJ NY OH PA TN VA WV
Established Series
Rev. JHN-SJH-DBD-DHK-JDM
10/2005

POPE SERIES

The Pope series consists of very deep, well drained soils formed in alluvium on flood plains. Permeability is moderate or moderately rapid. Slopes range from 0 to 4 percent. Mean annual precipitation is about 48 inches and mean annual air temperature is about 53 degrees F. near the type location.

TAXONOMIC CLASS: Coarse-loamy, mixed, active, mesic Fluventic Dystrudepts

TYPICAL PEDON: Pope fine sandy loam, in a cultivated field on a nearly level flood plain. (Colors are for moist soil unless otherwise stated.)

Ap--0 to 8 inches; brown (10YR 4/3) fine sandy loam; moderate medium granular structure; very friable; many fine roots; very strongly acid; clear smooth boundary. (4 to 12 inches thick)

Bw1--8 to 26 inches; dark yellowish brown (10YR 4/4) fine sandy loam; few faint brownish yellow (10YR 6/6) mottles; weak medium subangular blocky structure; very friable; common fine roots; few fine pores; very strongly acid; gradual wavy boundary.

Bw2--26 to 42 inches; dark yellowish brown (10YR 4/4) fine sandy loam; weak fine and medium subangular blocky structure; very friable; few very fine roots; few fine pores; very strongly acid; gradual wavy boundary. (Combined thickness of the Bw horizon is 16 to 50 inches)

C--42 to 85 inches; dark yellowish brown (10YR 4/4) fine sandy loam; single grain; loose; few thin layers of sandy loam and loamy sand; very strongly acid.

TYPE LOCATION: Rowan County, Kentucky on Craney Creek; 0.4 mile east of the hamlet of Craney and 50 feet north of Craney Creek about 1/4 mile northeast of its confluence with the North Fork of the Licking River; 38 degrees, 04 minutes, 05 seconds N. latitude and 82 degrees, 20 minutes and 55 seconds W. Longitude; NAD 1983.

RANGE IN CHARACTERISTICS: Thickness of the solum ranges from 30 to 60 inches. Depth to bedrock is more than 60 inches. Rock fragments, mostly sandstone gravels and channers, range from 0 to 30 percent in the solum and 0 to 75 percent in the substratum. Reaction ranges from strongly acid through extremely acid, unless limed.

The Ap or A horizons have hue of 10YR, value of 3 to 6 and chroma of 3 to 6. If value is 3, dry color is 6 or more. Fine-earth texture is fine sandy loam, sandy loam, loam, or silt loam.

The Bw horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. Some pedons have iron depletions with chroma of 2 or less below 40 inches. Fine-earth texture is sandy loam, fine sandy loam, very fine sandy loam, loam or silt loam.

The C or 2C horizon has hue of 10YR or 7.5YR, value of 4 to 6, and chroma of 3 to 6. Some pedons have iron depletions with chroma of 2 or less. Fine-earth texture is loamy sand, loamy fine sand, fine sandy loam, sandy loam, loam, or sandy clay loam, or stratified layers of these textures. Some pedons have stratified sand layers below 40 inches.

COMPETING SERIES: The Comus and Linden series are members of the same family. Comus soils formed in alluvium high in mica. Linden soils allow 5YR or redder hue in the Bw horizon. Linden soils have redder colors in the solum. Series in closely related families are McNulty, Occum and Wenonah. These soils are all in a superactive CEC activity class. Additionally, McNulty soils occur in areas where mean annual precipitation ranges from 60 to 90 inches. Occum soils formed in alluvium derived mostly from gneiss, granite and schist. Wenonah soils formed in post glacial alluvium from glacial drift and contain more feldspars and weatherable minerals.

GEOGRAPHIC SETTING: Pope soils are on flood plains with slopes mainly less than 4 percent. They formed in alluvium weathered from Pennsylvanian aged acid sandstone, siltstone, and shale. Near the OSD site average annual air temperature ranges from 48 to 57 degrees F. and the average annual precipitation from 42 to 54 inches.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Allegheny, Atkins, Clymer, Cotaco, Cuba, Gilpin, Jefferson, Matewan, Monongahela, Morehead, Muskingum, Philo, Rowdy, Shelocta and Stendal series. Allegheny, Atkins, Cotaco, Gilpin, Jefferson, Monongahela, Muskingum, Rowdy and Shelocta soils are fine-loamy. Cuba, Morehead and Stendal soils are fine-silty. Allegheny, Clymer, Cotaco, Gilpin, Jefferson, Monongahela and Shelocta soils have argillic horizons. . Atkins soils are poorly drained. Cotaco and Morehead soils are moderately well or somewhat poorly drained. Monongahela and Philo soils are moderately well drained. Stendal soils are somewhat poorly drained. Gilpin, Matewan and Muskingum soils are moderately deep to bedrock. Monongahela soils have fragipans.

DRAINAGE AND PERMEABILITY: Well drained; runoff class is negligible to low and permeability is moderate or moderately rapid. Flooding frequency is normally rare or occasional, but some areas flood frequently. Seasonal high water table is greater than 6 feet.

USE AND VEGETATION: Largely cultivated to corn, sorghum, small grains, tobacco, hay, pasture and vegetables. Native vegetation is mixed, deciduous hardwood forests of mainly tulip poplar, white oak, river birch, sycamore, beech and hickory.

DISTRIBUTION AND EXTENT: Pope soils are found mainly in MLRAs 124, 125, 126, 128 and 116B, consisting of mountain and plateau areas of Kentucky, Georgia, Maryland, Missouri, Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia. Pope soils are also mapped less extensively in Alabama, Indiana, New Jersey and New York. The extent is large.

MLRA OFFICE RESPONSIBLE: Lexington, Kentucky

SERIES ESTABLISHED: Pope County, Arkansas; 1913.

REMARKS: Pope soils were classified in the Alluvial great soil group in the 1938 classification system. The 7/99 and 12/99 revisions update Pope to 8th edition standards. The CEC activity class placement is based on similar geographically associated soils such as Philo and Stendal. Competing series were also updated.
10/05 revision added location data and a review of over 40 pedons in KY that revealed only 2 instances of 7.5YR color in the Bw horizon, confirming that Pope is centered on the more yellow hues that differentiate it from the Linden Series.
Diagnostic horizons recognized in this pedon are:
Ochric epipedon: The zone from 0 to 8 inches (Ap horizon)
Cambic horizon: The zone from 8 to 42 inches (Bw1 and Bw2 horizons)
MLRAs: 115, 116B, 124, 125, 126, 127, 128, 140, 144A, 147, 148, 149A
Revised: 4/94-JHN,WHC,JMR; 7/99-SJH,DBD; 12/99-BAW,DHK; 10/05 JDM

LOCATION REXFORD PA
Established Series
Rev. BHC-GDM
1/87

REXFORD SERIES

The Rexford series consists of very deep, somewhat poorly drained to poorly drained soils on terraces and moraines. They formed in glacial outwash or stream terraces derived mainly from sandstone and shale. Slopes range from 0 to 15 percent.

TAXONOMIC CLASS: Coarse-loamy, mixed, mesic Aeric Fragiaquepts

TYPICAL PEDON: Rexford silt loam-cultivated. (Colors are for moist soil.)

Ap--0 to 8 inches; dark grayish brown (10YR 4/2) silt loam; weak fine granular structure; very friable, slightly sticky, slightly plastic; many fine roots; 10 percent rock fragments; slightly acid, abrupt wavy boundary. (6 to 10 inches thick)

Bw--8 to 12 inches; yellowish brown (10YR 5/4) loam; common fine distinct grayish brown (10YR 5/2) mottles; weak fine subangular blocky structure; friable, slightly sticky, slightly plastic; many fine roots; 10 percent rock fragments; moderately acid; clear wavy boundary. (2 to 6 inches thick)

Bg--12 to 17 inches; grayish brown (10YR 5/2) loam; common fine distinct yellowish brown (10YR 5/6) mottles; weak fine and medium subangular blocky structure; firm, slightly sticky, slightly plastic; common very fine roots; 10 percent rock fragments; moderately acid; gradual wavy boundary. (3 to 12 inches thick)

2Bx1--17 to 30 inches; brown (7.5YR 5/4) gravelly loam; many fine distinct gray (10YR 6/1) and strong brown (7.5YR 5/6) mottles; moderate very coarse prismatic structure parting to moderate medium and thick platy; very firm, brittle, slightly sticky, slightly plastic; few faint clay films in pores; 25 percent rock fragments; strongly acid; gradual wavy boundary. (8 to 20 inches thick)

2Bx2--30 to 38 inches; dark brown (7.5YR 4/4) gravelly loam; many coarse prominent light gray (10YR 7/2) and strong brown (7.5YR 5/8) mottles; moderate very coarse prismatic structure parting to moderate thick platy and weak fine subangular blocky; very firm, brittle, slightly sticky, slightly plastic; very few faint clay films in pores; 15 percent rock fragments; strongly acid; abrupt wavy boundary. (5 to 12 inches thick)

2C1--38 to 44 inches; brown (10YR 5/3) very gravelly sandy loam; massive; firm, nonsticky, nonplastic; 40 percent gravel; strongly acid; abrupt wavy boundary. (0 to 30 inches thick)

2C2--44 to 60 inches; olive brown (2.5Y 4/4) stratified sand and gravel; single grain; loose; strongly acid.

TYPE LOCATION: Tioga County, Pennsylvania; Covington Township, about 3 1/2 miles south of Mansfield, about 0.4 miles east of intersection of PA 660 and US 15.

RANGE IN CHARACTERISTICS: Solum thickness ranges from 24 to 50 inches. Depth to bedrock is more than 60 inches. Depth to stratified sand and gravel ranges from 35 to 72 inches. Depth to the fragipan ranges from 15 to 24 inches. Rock fragments range from 0 to 40 percent in A, B and Bx horizons and from 15 to 75 percent in the C horizon. Unlimed, the reaction ranges from very strongly to moderately acid above the fragipan and from strongly to slightly acid in the C horizon.

The A horizon has hue of 7.5YR through 2.5Y, value of 3 or 4, and chroma of 1 or 2. It is sandy loam, loam or silt loam in the fine-earth.

The B horizons have hue of 7.5YR through 2.5Y, value of 4 through 6, and dominant chromas of 1 or 2, with individual horizons with chroma 3 to 6 and are mottled. The Bw horizon of some pedons are free of mottling. The B horizons above the fragipan are sandy loam, loam or silt loam in the fine-earth.

The Bx horizons have hue of 5YR through 5Y, value of 4 through 6, and chroma of 1 through 4. They have both high and low chroma mottles. They are sandy loam, loam, or silt loam in the fine-earth. The secondary structure in some pedon is subangular blocky.

The C horizon has hue of 5YR through 5Y, value of 4 or 5, and chroma of 3 to 6. It is silt loam, loam or sandy loam in the fine-earth and ranges to stratified sand and gravel.

COMPETING SERIES: The Morris and Scriba series are in the same family. The Morris and Scriba soils do not have stratified material within the series control section.

Atherton, Braceville, Erie, Fredon, Halsey, Phelps, Red Hook and Volusia series are in related families. Atherton, Fredon, Halsey, Phelps and Red Hook soils do not have fragipans. Braceville soils do not have dominant chroma of 2 or less on ped faces within a depth of 20 inches. The Erie and Volusia soils have more than 18 percent clay within the series control section.

GEOGRAPHIC SETTING: Rexford soils are on nearly level to strongly sloping glacial outwash or stream terraces and water sorted moraines. Slopes range from 0 to 15 percent. The soils developed in water sorted materials derived largely from gray sandstone and shale. Climate is humid temperature with mean annual precipitation of 34 to 45 inches; mean annual temperature ranges from 45 to 52 degrees F., and the frost-free season ranges from 120 to 170 days.

GEOGRAPHICALLY ASSOCIATED SOILS: Atherton, Braceville, Fredon, Halsey, Phelps, Red Hook, Alton, Chenango, Howard and Tunkhannock soils are formed in

glacial outwash and the Barbour, Pope and Tioga soils are on nearby floodplains. None of these soils have fragipans.

DRAINAGE AND PERMEABILITY: Somewhat poorly drained to poorly drained. Runoff is slow to medium; permeability is slow in the fragipan.

USE AND VEGETATION: Most areas are cleared and used for hay and grain crops and pasture. Smaller areas are woodlands with stands dominantly of mixed northern hardwoods.

DISTRIBUTION AND EXTENT: Pennsylvania. The series is of moderate extent.

MLRA OFFICE RESPONSIBLE: Amherst, Massachusetts

SERIES ESTABLISHED: Venango County, Pennsylvania, 1971.

REMARKS: The Rexford soils were formerly in the Red Hook and Fredon series.

National Cooperative Soil Survey
U.S.A.

LOCATION WEIKERT PA+IN KY MD OH VA WV
Established Series
Rev. AWD-WRK-REP-ART
05/2004

WEIKERT SERIES

The Weikert series consist of shallow, well drained soils formed in material that weathered from interbedded gray and brown acid shale, siltstone, and fine-grained sandstone on gently sloping to very steep areas on uplands. Slope ranges from 0 to 100 percent. Permeability is moderately rapid. Mean annual precipitation is about 42 inches, and the mean annual air temperature is about 52 degrees F.

TAXONOMIC CLASS: Loamy-skeletal, mixed, active, mesic Lithic Dystrudepts

TYPICAL PEDON: Weikert channery silt loam, in a cultivated field on 8 to 15 percent slopes. (Colors are for moist soil unless otherwise noted.)

Ap--0 to 7 inches; brown (10YR 4/3) channery silt loam; weak fine granular structure; friable, nonsticky and nonplastic; many fine and medium roots; 30 percent angular and subangular shale channers; strongly acid, clear smooth boundary. (5 to 9 inches thick)

Bw--7 to 14 inches; yellowish brown (10YR 5/4) very channery silt loam; weak fine subangular blocky structure; friable, nonsticky and nonplastic; common fine roots; 50 percent angular and subangular shale channers; strongly acid; gradual wavy boundary. (3 to 12 inches thick)

C--14 to 18 inches; yellowish brown (10YR 5/4) extremely channery silt loam; massive; friable; nonsticky and nonplastic; few fine roots; common distinct sily and clay deposits on channers; 70 percent angular and subangular shale channers; very strongly acid; clear wavy boundary. (0 to 8 inches thick)

R--18 inches; dark gray (10YR 4/1) fractured acid shale and siltstone bedrock.

TYPE LOCATION: Franklin County, Pennsylvania; Hamilton Township, 3 miles west of Chambersburg, 2000 feet west of the intersection of Pennsylvania routes 4008 and 4010, 1000 feet south of route 4008; Chambersburg, PA topographic quadrangle; Latitude 39 degrees, 57 minutes, and 46 seconds N. and Longitude 77 degrees, 44 minutes, and 3 seconds W. NAD 27

RANGE IN CHARACTERISTICS: Solum thickness ranges from 8 to 20 inches. Depth to bedrock ranges from 10 to 20 inches. Rock fragments range from 5 to 50 percent in the A or Ap horizon, from 35 to 60 percent in the Bw horizon, and from 60 to 85 percent in the C horizon. The sand fraction and rock fragments have a low content of feldspars,

hydrobiotite, and chlorite. Unlimed reaction ranges from moderately acid to very strongly acid in the A or Ap horizon and moderately acid to extremely acid in the Bw and C horizons.

The A or Ap horizon has hue of 7.5YR or 10YR, value of 3 through 5, and chroma of 2 through 4. Texture is silt loam, or channery or very channery silt loam. Undisturbed pedons have a thin dark A horizon underlain by a 2 to 5 inch thick yellowish brown E horizon.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 through 6, and chroma of 3 through 6. Texture is very channery silt loam or very channery loam. The fine-earth fraction has about 10 to 25 percent clay, 40 to 60 percent silt, and 20 to 40 percent sand. Structure of the Bw is weak or moderate, fine or medium subangular blocky. Moist consistence is friable or very friable, nonsticky or slightly sticky, and nonplastic or slightly plastic.

The C horizon has hue of 7.5YR, 10YR, or 2.5Y, value of 4 through 6, and chroma of 3 through 8. Texture is extremely channery silt loam or extremely channery loam with common interstitial pores. The fine-earth fraction is much like the horizon above but has massive or platy bedrock controlled structure.

Some pedons have a Cr horizon beginning at depths of less than 20 inches. Fractures are less than 4 inches apart but displacement of the pieces is rare. Some of the fragments are coated with silt films.

The R consists of shale, siltstone, fine-grained sandstone, or alternate beds of such material. The bedrock is sometimes fractured.

COMPETING SERIES: These are the Arnot, Klinesville, Nassau, and Sylvatus series in the same family. Arnot and Nassau soils are formed in a thin mantle of glacial till or congeliturbate. Arnot and Nassau soils appear similar in the field but analytical data show 10 to 40 percent of the clay fraction of Weikert is kaolinite, whereas this mineral is lacking in the Arnot and Nassau soils. Sylvatus soils contain fragments of metasediments, primarily phyllite and slate. Klinesville soils have inherited hues redder than 7.5YR.

Bugley, Rohan, and Unicoi are a related family. They are all semiactive. In addition, Bugley soils have rock fragments of schist in the solum. Rohan soils have carbonaceous bedrock. Unicoi soils have a much higher content of feldspar, hydrobiotite, and chlorite in the sand fraction.

GEOGRAPHIC SETTING: Weikert soils are on gently sloping to very steep convex dissected uplands formed in weathered residuum from interbedded gray and brown acid shale, siltstone, and fine-grained sandstone. Slope gradients range from 0 to 100 percent. The climate is humid and temperate with an mean annual precipitation of 36 to 50 inches, mean annual air temperatures of 46 to 57 degrees F., and a growing season of 120 to 200 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These include Allenwood, Bedington, Berks, Cavode, Ernest, Gilpin, Hartleton, Muskingum, Rayne, Westmoreland, and Wharton series. All these soils are deeper than 20 inches to bedrock. In addition, Allenwood, Bedington, Gilpin, Rayne, and Westmoreland soils have argillic horizons and are nonskeletal. The subsoils of Cavode, Ernest, and Wharton soils have low chroma redoximorphic features.

DRAINAGE AND PERMEABILITY: Well drained. The potential for surface runoff is neglegible to high. Permeability is moderately rapid to rapid.

USE AND VEGETATION: Most is cleared and used for cropland and pasture or is idle. Forested areas are mixed, deciduous hardwoods.

DISTRIBUTION AND EXTENT: Pennsylvania, Maryland, Ohio, Indiana, West Virginia, Virginia, and Kentucky. The series is of large extent. MLRA's 120, 124, 125, 126, 127, 128, 130, 140, 147, 148.

MLRA OFFICE RESPONSIBLE: Morgantown, West Virginia

SERIES ESTABLISHED: Union County, Pennsylvania, 1939.

REMARKS: In 1994 the Type Location was visited and redescribed as part of the MLRA 147 update in Pennsylvania, West Virginia, and Maryland.

Some pedons sampled as Weikert have a CEC class of semiactive.

In some areas the Weikert series may include somewhat excessively drained soils.

Soils that are now within the range of the Weikert series were correlated as Montevallo (thermic) in several published soil surveys.

Diagnostic horizons and features recognized in this pedon are:
Ochric epipedon - from a depth of 0 to 7 inches (Ap horizon).
Cambic horizon - from a depth of 7 to 14 inches (Bw horizon).
Lithic contact at a depth of 18 inches (R horizon)

ADDITIONAL DATA: Lab samples number S93PA-055-039 and S93PA-055-040, taken from the same county as the type location, were used as the basis for placing this series into the active CEC activity class.

LOCATION WYOMING PA
Established Series
Rev. GDM-JRH
02/2000

WYOMING SERIES

The Wyoming series consists of very deep, somewhat excessively drained soils formed in gravelly, water-sorted material derived from red and gray sandstone, siltstone, and shale. Slopes range from 0 to 45 percent. Permeability is rapid. Mean annual precipitation is 39 inches. Mean annual temperature is 50 degrees F.
TAXONOMIC CLASS: Loamy-skeletal, mixed, active, mesic Typic Dystrudepts

TYPICAL PEDON: Wyoming very gravelly sandy loam - woodland. (Colors are for moist soil unless otherwise noted.)

Ap--0 to 7 inches; dark brown (10YR 3/3) very gravelly sandy loam; weak fine granular structure; very friable, nonsticky, nonplastic; many roots; 35 percent rock fragments; very strongly acid; abrupt smooth boundary. (5 to 12 inches thick)

Bw--7 to 15 inches; dark brown (7.5YR 4/4) very gravelly sandy loam; weak fine subangular blocky structur; very friable, nonsticky, nonplastic; common roots; 50 percent rock fragments; very strongly acid; gradual wavy boundary. (5 to 20 inches thick)

BC--15 to 25 inches; dark brown (7.5YR 4/4) extremely gravelly coarse sandy loam; weak fine subangular blocky structure; very friable, nonsticky, nonplastic; common roots; 60 percent rock fragments; very strongly acid; gradual wavy boundary. (0 to 18 inches thick)

C--25 to 65 inches; brown (10YR 4/3) extremely gravelly loamy coarse sand, with stratified sand and gravel; single grain; loose, nonsticky, nonplastic; 65 percent rock fragments; very strongly acid.

TYPE LOCATION: Wyoming County, Pennsylvania; Mehoopany Township, 2 1/2 miles east of Mehoopany, 2 miles east of intersection of Routes 65006 and T435, 100 feet west of T435.

RANGE IN CHARACTERISTICS: Solum thickness ranges from 18 to 35 inches. Depth to bedrock is commonly 10 feet or more. Rock fragments, dominantly of water-rounded sandstone or siltstone up to 8 inches in size, range from 15 to 50 percent by volume in the A horizon, from 20 to 60 percent in the B horizon and from 35 to 75 percent in the BC and C horizons. The soil ranges from extremely acid to moderately acid in all horizons, unless limed.

The Ap horizon has hue of 10YR through 5YR, value of 3 through 5, and chroma of 2 through 4. Undisturbed pedons have a thin A horizon and some pedons have an E horizon. Texture is fine sandy loam, sandy loam or loam in the fine-earth fraction.

The B horizon has hue of 10YR through 2.5YR, value of 4 or 5, and chroma of 3 or 4. Texture is coarse sandy loam, sandy loam or fine sandy loam in the fine-earth fraction with an average or more than 50 percent fine sand or coarser. Some pedons have a BA horizon.

The C horizon has hue of 10YR through 2.5YR, value of 4 or 5, and chroma of 2 through 4. Texture is sandy loam, loamy sand or sand in the fine-earth fraction but texture above a depth of 25 inches is sandy loam.

COMPETING SERIES: The Berks, Blasdell, Calvin, Cardiff, Chenango, Dekalb, Hazleton, Itswoot, Lehew, Lippitt, Manlius, Oquaga, Parker, Remote, Sylco, Tunkhannock, Warwick, and Watt series are in the same family. Berks, Blasdell, and Cardiff soils have B horizon textures of silt loam and loam. Calvin, Dekalb, Lehew, Lippitt, Manlius, Oquaga, Sylco, and Watt soils have bedrock between 20 and 40 inches. Chenango and Tunkhannock soils have B horizons whose texture is silt loam, loam or sandy loam with less than 50 percent sand coarser than very fine sand in the particle-size control section. Hazleton soils contain angular rock fragments and have B horizon texture of loam and sandy loam with less than 50 percent of fine sand coarser than very fine sand in the particle-size control section. Itswoots soils have sola thicker than 40 inches. Parker soils contain rock fragments of gneiss. Remote soils have more than 22 percent clay in the particle-size control section. Warwick soils have color value of 3 or less in the lower part of the series control section.

GEOGRAPHIC SETTING: Wyoming soils are nearly level to very steep soils on outwash terraces, moraines, kames, eskers, and valley trains. Slope gradients range from about 0 to 45 percent. They formed in gravelly, water-sorted material derived from red and gray sandstone, siltstone, and shale. The climate is humid and temperate. Mean annual precipitation ranges from 32 to 45 inches. Mean annual air temperature ranges from 45 to 55 degrees F., and the frost-free season ranges from 120 to 180 days.

GEOGRAPHICALLY ASSOCIATED SOILS: These include the competing Chenango and Tunkhannock series and the Barbour, Braceville, Linden, Lordstown, Mardin, Oquaga, Pope, and Wellsboro series. The Barbour, Linden, and Pope soils are on floodplains. Braceville, Mardin, and Wellsboro soils have a fragipan. Lordstown and Oquaga soils have bedrock within 40 inches.

DRAINAGE AND PERMEABILITY: Somewhat excessively drained. Runoff is slow to medium. Permeability is rapid.

USE AND VEGETATION: Most gently sloping areas are cleared and used for general farm crops. Some areas are being urbanized. Wooded areas contain maple, beech, ash, oak, hemlock and white pine.

DISTRIBUTION AND EXTENT: Pennsylvania and possibly New Jersey. The series is of moderate extent. Pennsylvania has about 40,000 acres.

MLRA OFFICE RESPONSIBLE: Amherst, Massachusetts

SERIES ESTABLISHED: Crawford County, Pennsylvania, 1973.

REMARKS: Diagnostic horizons and features recognized in this pedon are:
a. Ochric epipedon - the zone from the surface of the soil to a depth of about 7 inches (Ap horizon).
b. Cambic horizon - the zone from 7 to 15 inches (Bw horizon).

National Cooperative Soil Survey
U.S.A.

APPENDIX D

Rare Species Information

D-1

U.S. Fish and Wildlife Service

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pennsylvania Field Office
315 South Allen Street, Suite 322
State College, Pennsylvania 16801-4850

January 18, 2008

Rod Krich
UniStar Nuclear Energy, LLC
750 East Pratt Street, 14th Floor
Baltimore, MD 21202-3106

RE: USFWS Project #2008-0518

Dear Mr. Krich:

This responds to your letter of December 21, 2007, requesting information about federally listed and proposed endangered and threatened species within the area affected by the proposed nuclear powered steam electric plant located in Luzerne County, Pennsylvania. The following comments are provided pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) to ensure the protection of endangered and threatened species.

The project is within the range of the Indiana bat (*Myotis sodalis*), a species that is federally listed as endangered. Indiana bats hibernate in caves and abandoned mines during the winter months (November through March), and use a variety of upland, wetland and riparian habitats during the spring, summer and fall. Indiana bats usually roost in dead or living trees with exfoliating bark, crevices or cavities. Female Indiana bats form nursery colonies under the exfoliating bark of dead or living trees, such as shagbark hickory, black birch, red oak, white oak, and sugar maple, in upland or riparian areas.

Land-clearing, especially of forested areas, may adversely affect Indiana bats by killing, injuring or harassing roosting bats, and by removing or reducing the quality of foraging and roosting habitat. To determine whether the proposed project will affect Indiana bats, we will need additional project information, including site plans and a detailed project description, that describe how much forest disturbance will occur (area, tree species, and size classes).

This response relates only to endangered or threatened species under our jurisdiction, based on an office review of the proposed project's location. No field inspection of the project area has been conducted by this office. Consequently, this letter is not to be construed as addressing potential Service concerns under the Fish and Wildlife Coordination Act or other authorities.

To avoid potential delays in reviewing your project, please use the above-referenced USFWS project tracking number in any future correspondence regarding this project.

If you have any questions regarding this matter, please contact Pam Shellenberger of my staff at 814-234-4090.

Sincerely,

David Densmore
Supervisor

D-2

Pennsylvania Department of Conservation and Natural Resources

Pennsylvania Department of Conservation and Natural Resources

Bureau of Forestry

March 24, 2008

George Wrobel
CEG GNA Engineering
FAX: 585.771.3392 (hard copy will NOT follow—page 1 of 2)

Pennsylvania Natural Diversity Inventory Review, PNDI Number	**019535**
Unistar Nuclear Energy/ Berwick, PA NPP-1	
Salem Township; Luzerne County	

Dear Mr. Wrobel,

This responds to your request for information on species of special concern within the area under evaluation for this project. We screened this project for potential impacts to species and resources of special concern under the Department of Conservation and Natural Resources' responsibility, which includes plants, natural communities, terrestrial invertebrates and geologic features only.

PNDI records indicate that species and communities of special concern under DCNR's jurisdiction are known to occur in the vicinity of the above-mentioned project. **Please see the attached list for butterfly species found in the project area. If any earth disturbance is planned or more detailed project information becomes available, please submit this project to our office for further review of potential impacts to the attached species list.**

This response represents the most up-to-date summary of the PNDI data files and is good for one (1) year from the date of this letter. An absence of recorded information does not necessarily imply actual conditions on-site. A field survey of any site may reveal previously unreported populations. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered.

This finding applies to impacts to plants, natural communities, terrestrial invertebrates and geologic features only. To complete your review of state and federally-listed species of special concern, please be sure the U.S. Fish and Wildlife Service, the PA Game Commission and the Fish and Boat Commission has been contacted regarding this project either directly or by performing a search with the online PNDI ER Tool found at www.naturalheritage.state.pa.us.

Rebecca H. Bowen

Rebecca H. Bowen, Environmental Review Specialist, PNHP
DCNR/BOF/PNDI, PO Box 8552, Harrisburg, PA 17105 ~ Ph: 717-772-0258 ~ F: 717-772-0271 ~ c-rbowen@state.pa.us

Invertebrates of Special Concern (no plant or geological features hits)

Scientific	Common	Status	Habitat	Larval Food	Adult Food	Flight
Enodia anthedon	Northern Pearly-Eye	S3S4	damp deciduous woods usually near marshes or waterways; mixed or grassy woodlands	various grasses	dung, fungi, carrion, sap from willows poplars birches	June-Aug
Euphydras phaeton	Baltimore Checkerspot	S2S4	wet meadows, bogs, marshes	turtlehead, hairy beardtongue, english plantain, foxglove, white ash	nectar from milkweed, viburnums, wild rose	June-Aug
Poanes massasoit	Mulberry Wing	S3	freshwater marshes or bogs	carex stricta	any flower nectar	late June-mid Aug
Polites mystic	Long Dash	S3	open, moist areas including meadows, marshes, prairie swales, streamsides, woods edges	bluegrasses	milkweed, selfheal, mountain laurel, tick trefoil	May-Aug

** These species are known to reside on site. Please make plans that attempt to minimize impacts to the potential habitats of these species. Also note, if any earth disturbance is planned or more detailed project information becomes available, please submit this project to our office for further review of potential impacts to the attached species list.*

D3

Pennsylvania Game Commission

COMMONWEALTH OF PENNSYLVANIA
PENNSYLVANIA GAME COMMISSION
2001 ELMERTON AVENUE, HARRISBURG, PA 17110-9797

April 10, 2008

Mr. Rod Krich
UniStar Nuclear Energy, LLC
750 E. Pratt Street, 14th Floor
Baltimore, MD 21202-3106

In re: PNDI Search Database Search
UniStar Nuclear Energy, LLC, Berwick, PA NPP-1 Project
Salem Township, Luzerne County, PA

Dear Mr. Krich:

This is in response to your fax dated December 21, 2007 regarding the potential impacts of the project on special concern species of birds or mammals recognized by the Pennsylvania Game Commission (PGC).

Our office review has determined that your project area is located in proximity to known bat hibernacula. If a new nuclear powered steam electric plant is developed on the proposed project area, bats of the following species of bats may be impacted: the Small-footed Myotis (*Myotis leibii*), the Northern Myotis (*Myotis septentrionalis*), the Little Brown (*Myotis lucifugas*), the Big Brown (*Eptesicus fuscus*), and the Pipistrelle (*Pipistrellus subflavus*). If a decision is made to develop the plant, the activities associated with the development, and subsequent operation and maintenance of the plant facilities and grounds should be coordinated with the PGC. This determination may be reconsidered if project plans change or extend beyond the present project area, or if additional information becomes available on state species.

If you have any questions, please contact me at (717) 787-4250. Please be advised that this determination is only valid for one year from the date of this letter.

Very truly yours,

James R. Leigey

James R. Leigey
Wildlife Impact Review Coordinator
Division of Environmental
Planning and Habitat Protection
Bureau of Wildlife Habitat Management

Cc: File

D-4

Pennsylvania Fish and Boat Commission

Pennsylvania Fish & Boat Commission

established 1866

Division of Environmental Services
Natural Diversity Section
450 Robinson Lane
Bellefonte, PA 16823-9620
(814) 359-5237 Fax: (814) 359-5175

IN REPLY REFER TO:
SIR# 27486

April 14, 2008

George Wrobel
UniStar Nuclear Energy, LLC
750 East Pratt Street, 14th Floor
Baltimore, Maryland 21202

RE: Species Impact Review (SIR) – Rare, Candidate, Threatened and Endangered Species
Berwick, PA NPP-1
Salem Township, Luzerne County, Pennsylvania

Dear Mr. Wrobel:

I have examined the map accompanying your recent correspondence, which shows the location for the above-referenced project. Based on records maintained in the Pennsylvania Natural Diversity Inventory (PNDI) database and our own files, **one rare or protected species is known from the vicinity of the project area:**

Common Name	Scientific Name	PA Status
Eastern hognose snake	*Heterodon platyrhinos*	Special Concern
Yellow lampmussel	*Lampsilis cariosa*	Special Concern
Green floater	*Lasmigona subviridis*	Special Concern

Freshwater mussels are the most imperiled taxonomic group in North America. Nearly half of the species known to occur in the Commonwealth are now extirpated (locally extinct) from Pennsylvania. We are concerned about direct and indirect (i.e., runoff) effects that the proposed project may have on the species of concern. Freshwater mussel species are extremely vulnerable to physical (i.e., siltation, dredging, trenching, rip-rap) and chemical (i.e., pH, temperature, dissolved oxygen, organic contaminants, heavy metals) changes to their aquatic environment. Therefore, we recommend construction techniques that eliminate in-stream work, sedimentation and changes to water quality. I recommend that you avoid any in-stream disturbance or water quality degradation during and after the project installation. Storm sewers and retention basins should be designed so as to minimize/remove all silt from the water before it is released into the stream. Strict erosion and sedimentation control measures, as well as best management practices should be employed.

Provided that these recommendations are followed, in-stream work is avoided, strict E&S control measures are maintained, and best management practices are employed, we do not foresee any significant adverse impacts from the proposed activity to the freshwater mussel species of special concern or any other rare or protected species under Pennsylvania Fish & Boat Commission jurisdiction.

If you have any questions regarding this response, please contact Nevin Welte at 814-359-5234 and **refer to the SIR number at the top of this letter**. Thank you for your cooperation and attention to this matter of endangered species conservation and habitat protection.

Sincerely,

Christopher A. Urban, Chief
Natural Diversity Section

CAU/NW/mr

APPENDIX E

Qualifications Of Wetlands Delineators

ELIZABETH VAN EPS GARLO
Research Scientist/Community Ecologist

Ms. Garlo has over 20 years experience in various aspects of marine, estuarine, freshwater, and wetlands ecology. She has been program manager, principal investigator, and principal taxonomist for various benthic ecology, environmental quality, impingement, and entrainment investigations. She has written many environmental reports on impacts from nuclear power plants, pipeline and cable crossings, thermal outfalls, aquaculture etc. Ms. Garlo's primary areas of technical expertise are benthic ecology and taxonomy and larval fish taxonomy. She also is a NH certified wetlands scientist and does delineations and assessments.

EDUCATION

M.S. 1982, Zoology, North Carolina State University-minor, Statistics
B.S. 1967, Biology Southern Methodist University-minor, English

PROFESSIONAL EMPLOYMENT HISTORY

2002-Present	Normandeau Associates, Inc.
1999-2001	Blue Moon Environmental
1997-1998	New England Environmental Associates
1994-1997	New Hampshire Department of Environmental Services
1994-1996	University of New Hampshire
1987-1994	Normandeau Associates, Inc.
1982-1984	Battelle New England Research Lab
1979-1981	North Carolina State University (Research Assistant)
1971-1978	Ichthyological Associates, Inc.
1968-1971	Fishery Development Institute, Santiago, Chile (Peace Corps Volunteer, Fisheries Biologist)

PROFESSIONAL AFFILIATIONS

Estuarine Research Federation
NH Assoc. of Natural Resource Scientists
New England Estuarine Research Society

SELECTED PROJECT EXPERIENCE

Entergy Nuclear Operations, Inc. Whiteplains, NY (2004-Present) - Hudson River Ichthyoplankton Laboratory. Larval Fish Taxonomist.

FPL Energy Seabrook Nuclear Station, LLC, Seabrook, NH (1987-Present) - Environmental Monitoring in the Hampton-Seabrook Area. Arthropod and Mollusc Taxonomist, Data Analyst, Report Author.

Epsilon Assoc., Inc., Maynard, MA (2003 and 2006) -Eelgrass, submerged aquatic vegetation and shellfish survey: Preferred and alternative cable routes to Nantucket Island. Report Author, Data Analyst for pre- and post-construction reports.

US Army Corps of Engineers. New Bedford Harbor (2004) - Arthropod Taxonomist, Data Analyst, Report Author.

Algonquine Gas Transmission Co. and TRC Environmental, Boston, MA. (2003-2004) - HubLine PipelineProject Benthic Habitat Survey. Arthropod Taxonomist, Data Analyst, Report Author.

Royal Commission of Jubail, Saudi Arabia (2002) - Environmental Impact Study of Seawater Cooling Discharges. Report Author.

Maine Department of Marine Resources, W. Boothbay Harbor, ME. (2002) - Maine Aquaculture Review – Impacts of Salmon Farms. Data Analyst, Report Author.

Algonquine Gas Transmission Co. and Duke Energy, Portland, ME (1994) - Extensive wetlands flagging for the gas pipeline in Maine. Wetlands Scientist.

ELIZABETH VAN EPS GARLO
Research Scientist/Community Ecologist

SELECTED PROJECT EXPERIENCE (Continued)

New Hampshire Department of Transportation (1990) - Route 101/51 EIS (NH). Wetlands flagging and quantitative plant survey. Wetlands Scientist.

U.S. Mineral Management Service (1982-1984) - Georges Bank Benthic Survey for offshore oil drilling. Chief Crustacean Taxonomist.

Metropolitan District Commission (1982-1984) - Deer Island Sewage Treatment Environmental Impact Study (MA). Field Biologist, Arthropod Taxonomist.

Consolidated Edison (1983) - Hudson River Fish Study (NY). Report Author.

North Carolina State University (1982) - Currituck Sound Management Project (by computer model). Research Assistant.

General Public Utilities (1978-1979) - Profile-wire Intake Screen Feasibility Study, Forked River, NJ. Tested experimental intake screens for operation, biofouling, entrainment and impingement. Research Coordinator.

Public Service Electric and Gas Co. of NJ (1971-1977) - Atlantic Generating Station Baseline Monitoring Study, Absecon, NJ. Benthic Invertebrate Section Leader.

FOREIGN LANGUAGE

Spanish

SPECIAL TRAINING

Larval Fish Taxonomy and Ecology; Virginia Institute Marine Sci.; 2006.

Wetlands Scientist; certified by NH Board of Natural Scientists; 2000-present.
Wetland Soils and Plants. University of New Hampshire; 1989.
Aquaculture. Virginia Institute of Marine Science, Watchapregue, VA; 1979.
SCUBA diver. NAUI. 1967.

SELECTED PRESENTATIONS AND PUBLICATIONS

Van Eps, E. 1972. Growth and reproduction of the bay scallop, *Chlamys purpurata*, in natural and artificial conditions in Mejillones Bay, Chile. Sci. Bull. 117. Fish. Devel. Inst., Santiago, Chile.

Garlo, E.V. 1977. Opistobrachia found in the vicinity of Little Egg Inlet, New Jersey with notes on three species new to the state. Nautilus. 91(1): 23-28.

Garlo, E.V., C.B. Milstein, and A.E. Jahn. 1979. Impact of hypoxic conditions nt he vicinity of Little Egg Inlet, New Jersey in summer 1976. Estu. Coast. Mar. Sci. 8: 421-432.

Garlo, E.V. 1980. Abundance and distribution of benthic macroinvertebrates near Little Egg Inlet, New Jersey form 1972-1974. Internl. Rev. Gesam. Hydrobiol. 65(3): 361-372.

Milstein, C.B., G.J. Miller, and E.V. Garlo. 1981. Crustaceans new or rare to New Jersey waters. Bull. N.J. Academy Sci. 26(1): 30-32.

Garlo, E.V. 1982. A comparison of surf clam populations immediately after hypoxic conditions in 1976 and one year later. J. Shellfish Res. 2(1): 59-64.

Pembroke, A.E. and E. V. Garlo. 2004. Hubline Pipeline Project Benthic Habitat Survey. Poster Presentation. The Coastal Society: 19th International Conference. RI.

KEITH R. MAURICE
Project Biologist

Mr. Maurice has over 27 years' experience in the areas of wetlands, fisheries, and aquatic biology. He is responsible for providing a wide range of wetlands services to insure that projects comply with state and federal wetlands regulations, and qualify for necessary wetlands permits.

His duties include wetlands delineations, rare plant and animal surveys, environmental impact assessments, design of wetlands mitigation sites and preparation of applications for state and Federal wetlands permits. He also performs ecological evaluations in support of remediation activities at brownfield sites and coordinates environmental GIS mapping projects.

EDUCATION

M.A. 2000, Geography and Planning, West Chester University
B.S. 1980, Biology, State University of New York

PROFESSIONAL EMPLOYMENT HISTORY

1983-Present Normandeau Associates, Inc.
1980-1983 Ichthyological Associates, Inc.

PROFESSIONAL AFFILIATIONS

Society of Wetland Scientists
Philadelphia Botanical Club

SELECTED PROJECT EXPERIENCE

Evergreen Landscape Associates (2004-present) Wetlands services for municipalities. Delineated wetlands at several proposed municipal parks in Chester County, Pennsylvania. Prepared technical reports, and applications for state and federal wetlands permits. Project Manager and Biologist.

Jacques Whitford Company (2003-Present) Environmental regulatory compliance services for utilities and commercial development. Screened sites in southeastern Pennsylvania for wetlands and bog turtle habitat, prepared technical reports and provided guidance for meeting the requirements of state and federal wetlands regulations. Biologist.

Brown and Caldwell (2006-Present) Provided technical assistance with the restoration of wetland and upland habitats at a remediated Superfund Site in Burlington County, New Jersey. Also conducted post-construction monitoring at the site. Biologist.

Waste Management, Inc. (PA) (1989-Present) Delineated wetlands, prepared technical reports, impact assessments, mitigation design plans and permit applications for several landfill expansions. Project Manager/Biologist.

Waste Management, Inc. (PA) (2000-Present) Designed a 10.5-acre wetlands mitigation site to replace wetlands impacted by a landfill expansion and conducted post-construction monitoring for 5 years. Principal Designer.

Waste Management, Inc. (PA) (2000-Present) Natural stream channel design. Assisted with the design of a 1-mile stream diversion that replicated channel structure and flow patterns of an intermittent headwater stream. Currently using EPA Rapid Bioassessment Protocols to evaluate aquatic invertebrate habitat and assess development of riparian communities along the in constructed channel. Project Manager.

HNTB (2003-present) – Wetlands services for highway improvements. Delineated wetlands, surveyed for rare species habitat and prepared an application for New Jersey Pinelands Commission Public Development Approval. Project Manager and Biologist.

KEITH R. MAURICE
Project Biologist

SELECTED PROJECT EXPERIENCE (Continued)

Owens-Corning (2006-2007) – NJDEP Environmentally Sensitive Areas Protection Plan. Prepared ESA protection plan and GIS maps for an industrial facility in the New Jersey Meadowlands. These plans identify and prioritize natural resources that could potentially be impacted by an accidental discharge of hazardous materials from a regulated site. Project Manager and Biologist.

Jacques Whitford Company (PA) (2006) Evaluation of ecological receptors. PADEP Chapter 250 ecological screenings conducted as part of remedial investigations at former manufactured gas plant sites. Biologist.

Brown and Caldwell (2005-2006) - Surveys for rare species and rare species habitats in support of remediation of a Superfund site in Atlantic County, New Jersey. Prepared reports for review by regulatory agencies. Biologist.

Jacques Whitford Company (2002-2005) NJDEP Baseline Ecological Evaluations. Qualitative assessment of migration pathways for contaminants from brownfield sites and determination of potential impacts to nearby sensitive natural resources. Biologist.

Ocean County NJ Engineers' Office (2003-2006) - Conducted post-construction monitoring inspections at a wetlands mitigation site and coordinated control measures for invasive exotic plants. Project Manager/Biologist.

Johnson and Johnson (2002-2006) - Delineated wetlands at business campuses in New Jersey and Pennsylvania, and assisted with regulatory compliance tasks. Biologist.

Mangi Environmental (PA) (2004-2005) Endangered Species Act Section 7 consultations for 20-miles of realignments to a multi-use recreation trail in the Delaware Water Gap National Recreation Area. Tasks included preparing a Biological Assessment, obtaining, rare species clearance and GIS mapping for the realigned trail sections. Project Manager and Biologist.

Klienshmidt (2005) - Conducted a Phase I bog turtle habitat survey for a hydropower project on the Susquehanna River in southeastern Pennsylvania. Project Manager and Biologist.

Delaware County Solid Waste Authority (PA) (1996-2005) – Provided wetlands services for several landfill expansions including wetlands delineations, impact assessments, applications for PADEP and US Army Corps wetlands permits, mitigation design and post-construction mitigation site monitoring. Biologist.

Exelon Power (PA) (2004) - Environmental support for maintenance dredging of the Peach Bottom Power Station cooling water intake. . Services included the collection of sediment samples and preparation of applications for state and federal dredging permits. Project Manager/Biologist.

Exelon Power (PA) (2004) – Prepared an assessment of environmental regulatory approvals necessary for the installation of security facilities at three nuclear power stations. Project Manager/Biologist.

The H&K Group (2000-2004) – Provided wetlands delineation and regulatory compliance services in support of a several quarry expansions in Pennsylvania. Biologist.

KEITH R. MAURICE
Project Biologist

SELECTED PROJECT EXPERIENCE (Continued)

Martin Stone Quarries (PA) (1999-2003) - Performed post-construction monitoring of a wetlands mitigation complex. Evaluated success in meeting design goals and proposed remedial maintenance activities. Biologist.

Chester County, PA Department of Parks and Recreation (1999-2003) – Prepared a design plan for creating and enhancing over 40-acres of wetlands, vernal pools, and riparian zones. Particular emphasis was placed on habitat for migratory waterfowl, amphibians and rare species. Principal Designer.

Exelon Power (PA) (2002-2003) - Environmental regulatory compliance services for maintenance dredging at Eddystone Generating Station. Tasks included preparation of state and federal permit applications, collection of sediment cores and coordination of analyses through a vendor laboratory. Findings were compared to regulatory standards and summarized in a report for review by regulatory agencies. Project Manager and Biologist.

Brown and Caldwell (2002) – Delineated wetlands in support of remedial activities at a New Jersey Meadowlands Superfund Fund and for proposed developments at an industrial site in Morris County. Project Manager/Biologist.

Browning Ferris International (2002) – Surveys for bog turtle habitat and bog turtles at a landfill expansion site in southeastern Pennsylvania. Project Manager/ Biologist.

Allegheny Electric Corporation (MD) (2000-2001) GIS mapping and analyses in support of the relicensing of a hydropower project on the Potomac River. Biologist.

Southeastern Pennsylvania Transit Authority (2001) - Wetlands delineation and regulatory compliance services in support of improvements to commuter rail line station. Project Manager/Biologist.

The H&K Group (PA) (2001) - Identified wetlands that were especially well suited for detecting potential hydrologic impacts to wetlands from a nearby quarry operation based on proximity to the quarry, vegetation cover, hydrologic regime, and landscape position. Biologist.

Cowan Associates (PA) (2001) - Evaluated potential impacts expected to result from the proposed enclosure of a 250-feet section of intermittent stream using a combination of field collected data and existing natural resource information. Findings were summarized in a PADEP Environmental Assessment. Biologist.

Killam Associates (2000) – Wetlands delineation and regulatory compliance services for a municipal sewer line and outfall on the Schuylkill River in southeastern Pennsylvania. Project Manager and Biologist.

PECO Energy Company (PA) (1997-2000) Environmental regulatory compliance services for construction of a bridge and other infrastructure to support operation of a nuclear power station on the Susquehanna River. Services included field surveys for wetlands, and preparation of a Joint Permit Application Biologist.

Osram-Sylvania (PA) (1999) - Ecological assessment of aquatic species and wetlands for an ecological risk assessment that evaluated potential impacts of chromium-contaminated groundwater on a stream. Biologist.

KEITH R. MAURICE
Project Biologist

SELECTED PROJECT EXPERIENCE (Continued)

U.S. Army Corps of Engineers (1998) - South River Flood Control Project. Delineated wetlands along a 3.5-mile reach of the South River and prepared an application for an NJDEP Letter of Interpretation. Biologist.

The Home Depot (PA) (1997) – Managed wetlands regulatory compliance tasks necessary for the development of a retail outlet center. Project Manager and Biologist.

PECO Energy Company (PA) (1996) - Siting feasibility studies for electric power distribution modules and wetlands services for construction of a natural gas transmission line. Biologist

NJ Department of Transportation (1996) Delineated wetlands for several highway projects located throughout the state. Biologist

SPECIAL TRAINING

Threatened and Endangered Species in New Jersey – Rutgers University, 2007

NEPA and Transportation Decision Making PA Department of Transportation, 2005

Constructed Wetlands for Waste/Storm Water Treatment - Environmental Concern, 2005

Hydric Soils and Use of Field Indicators Natural Resources Conservation Service and US Army Corps of Engineers, 2005

Bog Turtles and the Environmental Review Process in Pennsylvania, 2004

Ecological Risk Assessments for Hazardous Waste Sites, 2004

NJDEP Freshwater Wetlands Regulations and Stream Encroachment Regulations Rutgers University 2003

Bioengineering – Eagle Hill Seminars in Ecological Restoration, 1999

Wetland Hydrology and Wetland Planting Techniques - Environmental Concern, 1997

Wetlands Construction - Wetland Training Institute, 1995

Certified in Habitat Evaluation Procedures: U.S. Fish and Wildlife Service, 1992

Wetland Delineation - US Army Corps of Engineers, 1988; Chesapeake Bay Program Federal Wetlands Task Group, 1989; Institute for Wetland & Environmental Education & Research, 1998

Numerous courses and seminars in plant taxonomy, wetlands ecology, soils, hydrology, and geographic information systems

NIOSH/OSHA 40-hour Hazardous Materials Safety and Handling Course

SELECTED PRESENTATIONS AND PUBLICATIONS

Maurice, K. R., Joan M. Welch, Christopher P. Brown, and Roger E. Latham. 2004. Pocono Mesic Till Barrens in Retreat: Topography, Fire and Forest Contagion Effects. Landscape Ecology 19: 603-620.

Maurice, K. R., R. W. Blye, and P. L. Harmon. 1987. Increased Spawning by American Shad Coincident with Improved Dissolved Oxygen in the Tidal Delaware River. Common Strategies of Anadromous and Catadromous Fishes, An International Symposium, American Fisheries Society Symposium. 1:79-88.

JAMES D. MONTGOMERY, PH.D.

ECOLOGY III, INC. • 804 SALEM BOULEVARD • BERWICK PA 18603
Telephone: 570-542-2191 • Fax: 570-542-1625

TITLE

Terrestrial Studies Director

EDUCATION

COOK COLLEGE, RUTGERS UNIVERSITY, NEW BRUNSWICK, NJ
Methodology of Delineating Wetlands (1991)
Understanding Soil Conditions of Wetlands (1991)

NATIONAL WETLANDS INSTITUTE
Wetlands Classification Training (1989)

NATIONAL ECOLOGY RESEARCH CENTER, COLORADO STATE UNIVERSITY
Habitat Evaluation Procedure (1988)

UNIVERSITY OF VIRGINIA
Field Course in Pteridology (Summer 1972)

SMITHSONIAN INSTITUTION
Summer Institute in Systematics (Jun-Jul 1970)

RUTGERS UNIVERSITY, NEW BRUNSWICK, NJ
Ph.D. (1964), M.S. (1961)

BUCKNELL UNIVERSITY, LEWISBURG, PA
B..S. (1959)

CERTIFICATION

Wetland Delineator - Baltimore District, U. S. Army Corps of Engineers

WETLAND DELINEATIONS AND EVALUATIONS

1989-present: Over 400 wetland delineations and evaluations performed for various clients.

EXPERIENCE

ECOLOGY III, INC., 804 SALEM BOULEVARD, BERWICK, PA 18603
TERRESTRIAL STUDIES DIRECTOR, 1985-PRESENT

- PERFORM WETLAND DELINEATIONS AND EVALUATIONS FOR ENGINEERING AND DEVELOPMENT FIRMS AND INDIVIDUALS, INCLUDING DETECTION OF WETLAND PRESENCE, MARKING OF WETLAND BOUNDARIES, AND SECURING CORPS OF ENGINEERS JURISDICTION DETERMINATIONS.

- SUPERVISE FLORA AND VEGETATION MONITORING WITH RESPECT TO THE INFLUENCE OF THE SUSQUEHANNA STEAM ELECTRIC STATION.

- COLLECT ENVIRONMENTAL SAMPLES FOR THE RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM AND EMERGENCY RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM.

ICHTHYOLOGICAL ASSOCIATES, INC., R. R. #1, BERWICK, PA 18603
TERRESTRIAL RESEARCH DIRECTOR, 1977-1986

- SAME RESPONSIBILITIES AS LISTED FOR ECOLOGY III, INC.

ICHTHYOLOGICAL ASSOCIATES, INC., 301 FOREST DRIVE, ITHACA, NY 14850
ENVIRONMENTAL BIOLOGIST, 1974-1977

- STUDIES OF FLORA AND VEGETATION AT VARIOUS SITES INCLUDING ABSECON, NJ (PROPOSED UNDERGROUND CABLE ROUTE IN SALT MARSH), THREE MILE ISLAND, PA (QUANTITATIVE STUDIES OF VEGETATION IN RELATION TO POSSIBLE COOLING TOWER SALT DRIFT), AND STAMFORD, NY (PROPOSED PUMPED STORAGE RESERVOIR SITE AND TRANSMISSION RIGHTS-OF-WAY).

WARDLAW COUNTY DAY SCHOOL, PLAINFIELD, NJ
INSTRUCTOR, 1973-1974

- SECONDARY LEVEL COURSES IN BIOLOGY AND CHEMISTRY

UNIVERSITY OF PENNSYLVANIA, PHILADELPHIA, PA
INSTRUCTOR, 1973

- SUMMER GRADUATE COURSE IN ECOLOGY AND SYSTEMATICS FOR DEPARTMENT OF LANDSCAPE ARCHITECTURE.

ALLENTOWN COLLEGE, CENTER VALLEY, PA
INSTRUCTOR, 1973 (TEMPORARY POSITION)

- COURSES TAUGHT: GENERAL BIOLOGY AND GEOBIOLOGY.

UPSALA COLLEGE, EAST ORANGE, NJ
ASSISTANT PROFESSOR

- COURSES TAUGHT: GENERAL BIOLOGY, PLANT TAXONOMY, PLANT MORPHOLOGY, PRINCIPLES OF EVOLUTION, AND ECOLOGY.

PROFESSIONAL ORGANIZATIONS

AMERICAN FERN SOCIETY
AMERICAN SOCIETY OF PLANT TAXONOMISTS
BRITISH PTERIDOLOGICAL SOCIETY
ECOLOGICAL SOCIETY OF AMERICA
PHILADELPHIA BOTANICAL CLUB

PROFESSIONAL PUBLICATIONS

MONTGOMERY, J. D. AND D. E. FAIRBROTHERS. 1992. NEW JERSEY FERNS AND FERN ALLIES. RUTGERS UNIV. PRESS., NEW BRUNSWICK, NJ 293 PP.

MONTGOMERY, J. D. AND W. H. WAGNER, JR. 1993. *DRYOPTERIS* IN FLORA OF NORTH AMERICA NORTH OF MEXICO. 2 + VOLS. UNIV. PRESS, NEW YORK, NY.

MONTGOMERY, J. D. 2000. *EQUISETACEAE* AND *SELAGINELLACEAE* IN THE PLANTS OF PENNSYLVANIA BY A. F. RHOADS AND T. A. BLOCK. UNIV. OF PENNSYLVANIA PRESS, PHILADELPHIA.

PARKS, J. C. AND J. D. MONTGOMERY. 2000. FERNS IN THE PLANTS OF PENNSYLVANIA BY A. F. RHOADS AND T. A. BLOCK. UNIV. OF PENNSYLVANIA PRESS, PHILADELPHIA.

OVER 40 ARTICLES PUBLISHED IN SCIENTIFIC JOURNALS.

CHRISTOPHER JOHN ROCHE
Project Biologist

Mr. Roche has over 8 years' experience in the areas of wetlands, conservation biology, wildlife biology, and natural resources management. He is responsible for providing a wide range of wetlands and terrestrial ecological services to insure that projects comply with state and federal regulations, and qualify for necessary permits. He has worked in a variety of ecosystems throughout the continental U.S. and the Territory of Guam with a variety of government, commercial, and residential clients, including over 20 military facilities.

His duties include wetlands delineations, rare plant and animal surveys and monitoring, environmental impact assessments, and preparation of applications for state and Federal wetlands permits.

EDUCATION

Certificate of Graduate Study *(In-progress); Ecology, Evolution, and Organismal Biology; Villanova University
B.S. 1998, Environmental Studies, Richard Stockton College of New Jersey

PROFESSIONAL EMPLOYMENT HISTORY

2008-Present	Normandeau Associates, Inc.
2002-2008	e^2M, Inc.
2001-2002	Matrix Environmental and Geotechnical Services
2000-2001	Hillmann Environmental Group, LLC

PROFESSIONAL AFFILIATIONS

The Wildlife Society (Northeast Section and Pennsylvania Chapter member)
Society for Conservation Biology
American Ornithologists' Union

SELECTED PROJECT EXPERIENCE

AREVA/UniStar Bell Bend Nuclear Power Plant (2008-Present) – Year-long wetlands delineation, plant community, regulatory compliance consulting, and impact assessment. Wetlands Biologist.

DMJM Harris (2008-Present) – Monitored an active bald eagle nest at the Philadelphia Navy Yard (PNY) and documented the successful fledging of one juvenile bird. Currently monitoring the behavior of the adult birds and juvenile as they continue to utilize the PNY, Delaware River, and surrounding areas of both PA and NJ for perching, roosting, and foraging. Biologist.

National Park Service (NPS) (2008) – Assisted in the preparation of an EA addressing the replacement of a failing seawall and concrete woven mattress with a new sheet pile wall and riprap slope in the American Memorial Park (AMME) located on the island of Saipan, Commonwealth of the Northern Mariana Islands (CNMI). Primary author of existing conditions and environmental consequences sections for the following resource areas: geology and soils, groundwater, water quality, biotic communities, and coastal resources. Prepared a coastal consistency determination for the NPS to ensure compliance with the Coastal Zone Management Act. Biologist.

Confidential Client (2008) – Assisted in the preparation of the marine geology and sediments resource areas for the Safe Harbor Energy LNG Deepwater Port License Application. The deepwater port consists of three components: an artificial island; LNG receiving, storage, and regasification facility; and a subsea pipeline in the New York Bight off Long Island, NY. Assessed existing conditions and environmental consequences sections for the marine geology and sediments resource sections. Biologist.

CHRISTOPHER JOHN ROCHE
Project Biologist

SELECTED PROJECT EXPERIENCE (Continued)

U.S. Coast Guard (USCG) (2008) – Assisted in the preparation of a Programmatic Environmental Impact Statement (PEIS) for the Future of the Long Range Aids to Navigation (LORAN) Program. The PEIS provides a general level of analysis of environmental impacts on the 24 LORAN Stations, 24 Monitoring Sites, and the LORAN Support Unit (LSU) for each of the four proposed actions: (1) Decommission the USCG LORANC Program and Terminate the North American LORANC Signal, (2) Transfer Management of the LORANC Program to another government agency, (3) Automate, Secure, and Unstaff LORANC Locations, and (4) No Action Alternative. Primary author of the existing conditions and environmental consequences sections for the following resource areas: geology and soils, wetlands and waters of the U.S., migratory birds and bats, and threatened and endangered species. Biologist.

U.S. Customs and Border Protection (CBP) (2007-2008) – Conducted an Environmental Due Diligence Assessment (EDDA) prior to construction of new fence sections on the U.S. – Mexico border for CBP's El Paso Sector in TX and NM. Utilizing American Society of Testing and Materials (ASTM) Standards, the proposed site was investigated primarily to identify Recognized Environmental Conditions (REC). Biologist.

CBP (2007-2008) – Assisted in the preparation of an EIS addressing construction of new fence sections on the U.S. – Mexico border for CBP's Rio Grande Valley Sector in TX. Primary author of existing conditions and environmental consequences sections for the geology and soils resource areas. Biologist.

CBP (2007-2008) – Assisted in the preparation of an EIS addressing construction of new fence sections on the U.S. – Mexico border for CBP's San Diego and El Centro Sectors in CA and Marfa Sector in TX. Primary author of existing conditions and environmental consequences sections for the following resource areas: geology and soils, hydrology and groundwater, floodplains, and wetlands and waters of the U.S. Biologist.

Air National Guard (ANG) (2007-2008) – Primary author of the Wildland Fire Management Plan (WFMP) for Smoky Hill Air National Guard Range (ANGR) in KS. Compiled National Wildfire Coordinating Group (NWCG) and ANG wildland firefighting monitoring requirements, attack plan procedures, and training requirements; wildfire and prescribed burn records; and data on cultural and natural resources on the Range into one comprehensive document that caters specifically to the needs of Smoky Hill ANGR wildland firefighters. Created adaptive management protocols designed to protect life, property, and sensitive resources on the Range; restore the natural role of fire to this grassland ecosystem; and successfully implement the military mission. Biologist.

ANG (2007-2008) – Conducted electroshock surveys of a pond and two stream sections on McEntire Joint Air National Guard Base (JANGB) in SC for determination of fish diversity and abundance. Surveyed natural areas on Base for the presence of herpetofauna and to determine ideal areas for a coverboard survey. Coverboards were placed in select locations as refugia and checked weekly in March and April to determine diversity and abundance of herpetofauna. Diversity and abundance data for fish and herpetofauna were then used to create a Fish, Reptile, and Amphibian Management Plan for McEntire JANGB. Biologist.

CHRISTOPHER JOHN ROCHE
Project Biologist

SELECTED PROJECT EXPERIENCE (Continued)

ANG (2006-2008) – Primary author of the Fish and Wildlife Management Plan (FWMP) for Warren Grove Range in NJ. Incorporated years of research conducted on the Range into one comprehensive document to direct fish and wildlife management on Warren Grove Range and develop adaptive management protocols which serve to protect biodiversity as well as successful implementation of the military mission. Biologist.

USAF Pacific Air Forces (PACAF) (2006-2008) - Primary author of the 2008 Integrated Natural Resources Management Plan (INRMP) for Andersen AFB on the Territory of Guam. Responsibilities included collection of field data and directing the research of climate, topography, geology, soils, surface water, ground water, wetlands, vegetative cover, fauna, and threatened and endangered species and developing adaptive management protocols which serve to protect biodiversity as well as successful implementation of the military mission. Biologist.

ANG (2005-2008) – Primary author of INRMPs for Selfridge Air National Guard Base (ANGB) in MI, Warren Grove Range in NJ, and Smoky Hill ANGR in KS. Responsibilities included directing the research of the climate, topography, geology, soils, surface water, ground water, wetlands, vegetative cover, fauna, and threatened and endangered species and developing adaptive management protocols which serve to protect biodiversity as well as successful implementation of the military mission. Successfully coordinated with the pertinent State wildlife agencies and USFWS Field Offices to fulfill Sikes Act requirements. Biologist.

Confidential Client (2007) – Assisted in the preparation of the terrestrial geology and soils resource areas for the onshore pipeline portion of the Port Dolphin LNG Deepwater Port License Application. The deepwater port consists of three components: two submerged unloading and mooring buoys, an offshore pipeline, and an onshore pipeline in the Gulf of Mexico off Tampa Bay, FL. Biologist.

U.S. Air Force Reserve Command (AFRC) (2007) – Conducted electroshock surveys of two ponds on Dobbins Air Reserve Base (ARB) in GA for determination of fish diversity and abundance. Surveyed natural areas on Dobbins ARB for the presence/absence of several rare plant and animal species. Biologist.

U.S. Air Force (USAF) Air Mobility Command (AMC) (2007) – Delineated wetlands for the AMC on a portion of Fort Dix in NJ as part of a project to link Fort Dix and McGuire AFB. Delineation performed in order to assist in project planning to avoid or minimize impacts to potential jurisdictional wetlands and buffers. Responsibilities included collection of wetland field data, utilizing a Trimble GPS unit to input wetland data points, and assisting with identification of soil types and vegetation. Biologist.

USAF AMC (2007) – Delineated wetlands on Moody Air Force Base (AFB) in GA to determine jurisdictional wetlands Base-wide. Responsibilities included collection of wetland field data, utilizing a Trimble GPS unit to input wetland data points, and assisting with identification of soil types and vegetation. Biologist.

CHRISTOPHER JOHN ROCHE
Project Biologist

SELECTED PROJECT EXPERIENCE (Continued)

ANG (2006-2007) – One of the primary authors of an INRMP for the Hardwood Air-to-Ground Range and Volk Field Combat Readiness Training Center (CRTC) in WI. Responsibilities included directing the research of the climate, topography, geology, soils, surface water, ground water, wetlands, vegetative cover, fauna, and threatened and endangered species and developing adaptive management protocols which serve to protect biodiversity as well as successful implementation of the military mission. Biologist.

Defense Logistics Agency (DLA) (2006-2007) – Primary author of the 2007 INRMP for the Defense Distribution Depot Susquehanna Pennsylvania (DDSP) in New Cumberland, PA. Responsibilities included collection of field data and directing the research of the climate, topography, geology, soils, surface water, ground water, wetlands, vegetative cover, fauna, and threatened and endangered species and developing adaptive management protocols which serve to protect biodiversity as well as successful implementation of the military mission. Successfully coordinated with the PA Game Commission (PAGC), PA Department of Conservation and Natural Resources (PADCNR), PA Fish and Boat Commission (PAFBC), and USFWS – PA Region and Region 5 Offices to fulfill Sikes Act requirements. Biologist.

ANG (2006) – Delineated wetlands and assessed functions and values of wetlands for the 179th Airlift Wing of the OHANG on Mansfield Lahm Municipal Airport in Mansfield, OH to determine jurisdictional wetlands for the RED HORSE Beddown Site. Responsibilities included collection of wetland field data, utilizing a Trimble GPS unit to input wetland data points, and assisting with identification of soil types and vegetation. Coordinated with OH Department of Natural Resources to determine if threatened and endangered species occurred within the boundaries of the Project Area. Biologist.

ANG (2005-2006) – Delineated wetlands on Hardwood Air-to-Ground Range and Volk Field CRTC to reconfirm jurisdictional wetlands on the Installations and determine if any new jurisdictional wetlands were present. Responsibilities included collection of wetland field data, utilizing a Trimble GPS unit to input wetland data points, and assisting with identification of soil types and vegetation. Biologist.

USAF AMC (2005-2006) – Delineated wetlands on McGuire AFB in NJ to determine jurisdictional wetlands Base-wide and prepared an application for an NJ Pinelands Commission (NJPC) Application for Development. Responsibilities included collection of wetland field data, utilizing a Trimble GPS unit to input wetland data points, and assisting with identification of soil types and vegetation. Biologist.

New Mexico Army National Guard (NMARNG) (2004-2006) – Primary author of the 2006 INRMP for four NMARNG Training Sites: Camel Tracks, Roswell WETS, Black Mountain, and Happy Valley. Responsibilities included collection of field data and directing the research of the climate, topography, geology, soils, surface water, ground water, wetlands, vegetative cover, fauna, and threatened and endangered species on each Training Site as well as developing adaptive management protocols which serve to protect biodiversity as well as successful implementation of the military mission. Successfully coordinated with NM Department of Game and Fish (NMDGF) and USFWS – NM Ecological Services Field Office to fulfill Sikes Act requirements. Biologist.

CHRISTOPHER JOHN ROCHE
Project Biologist

SELECTED PROJECT EXPERIENCE (Continued)

AMC (2004-2005) – Primary author of the 2005 INRMP for Fairchild AFB in WA. Responsibilities included collection of field data and directing the research of the Installation's climate, topography, geology, soils, surface water, ground water, wetlands, vegetative cover, fauna, and threatened and endangered species and developing adaptive management protocols which serve to protect biodiversity as well as successful implementation of the military mission. Successfully coordinated with the WA Division of Fish and Wildlife (WADFW), WA Natural Heritage Program (WANHP), and USFWS – Upper Columbia Fish and Wildlife Office to fulfill Sikes Act requirements. Biologist.

Arkansas Army National Guard (ARARNG) (2004-2005) – Performed an Environmental Baseline Survey (EBS) at an ARARNG Facility Maintenance Shop in Jonesboro, AR. Utilizing ASTM Standards, the proposed site was investigated primarily to identify REC. A findings report was then generated from the data collected in the field and the results of Federal and State environmental database searches. Biologist.

AFRC (2003-2005) – Primary author of the 2005 INRMP for Westover ARB in MA. Responsibilities included collection of field data and directing the research of the Installation's climate, topography, geology, soils, surface water, ground water, wetlands, vegetative cover, fauna, and threatened and endangered species and developing adaptive management protocols which serve to protect biodiversity as well as successful implementation of the military mission. Coordinated with the MA Division of Fish and Wildlife (DFW) and USFWS – Northeast Regional Office to fulfill Sikes Act requirements. Biologist.

AFRC (2004) – Delineated wetlands on Westover ARB in MA to reconfirm jurisdictional wetlands on Base and determine if any new jurisdictional wetlands were present. Responsibilities included collection of wetland field data, utilizing a Trimble GPS unit to input wetland data points, and assisting with identification of soil types and vegetation. Biologist.

USAF AMC (2004) – Delineated wetlands, conducted Federally-listed bog turtle habitat and swamp pink surveys, and mapped invasive species on McGuire AFB in NJ prior to privatization of the housing areas in the north portion of the Base. Responsibilities included collection of wetland field data, utilizing a Trimble GPS unit to input wetland data points, and assisting with identification of soil types and vegetation. Biologist.

U.S. Army (2004) – Performed an EBS prior to a proposed land transfer from Fort Hood in Killeen, TX to the Texas A&M University System (TAMUS). Utilizing ASTM Standards, the proposed site was investigated primarily to identify REC. Biologist.

AFRC (2003-2004) – One of the primary authors of the 2004 INRMP for March ARB in CA. Responsibilities included collection of field data and assisting the Project Manager in directing the research of the Installation's climate, topography, geology, soils, surface water, ground water, wetlands, vegetative cover, fauna, and threatened and endangered species and developing adaptive management protocols which serve to protect biodiversity as well as successful implementation of the military mission. Biologist.

CHRISTOPHER JOHN ROCHE
Project Biologist

SELECTED PROJECT EXPERIENCE (Continued)

ANG (2002-2004) – Inputted data collected in the fall of 2002 on Selfridge ANGB in MI to formulate a Fall Biological Survey Report. In the spring of 2003, collected accuracy assessment field data for vegetative cover types identified in the Fall Biological Survey and assisted in the recording of bat calls utilizing AnaBat II. Using data collected during the spring site visit, generated a vegetative key and photo-interpretation key for vegetative alliances on Base as well as an assessment of Indiana bat habitat for the Spring Biological Survey Report. In the summer of 2003, collected wildlife habitat suitability data using USFWS habitat evaluation procedure (HEP) and generated Summer Biological Survey Report to determine habitat suitability for wildlife on Selfridge ANGB. These three reports were then compiled into a Comprehensive Biological Survey Report. Biologist.

ANG (2002-2004) – Inputted data collected in the fall of 2002 on the Hardwood Air-to-Ground Range and Volk Field CRTC in WI and selected vegetative cover types to formulate a Fall Biological Survey Report. In the spring of 2003, collected wildlife habitat suitability data using USFWS HEP as well as GPS data of wild lupine locations to assist in assessing reproductive habitat for the Federally-listed Karner Blue Butterfly. In the summer of 2003, collected accuracy assessment data for the development of a vegetative key for the vegetative alliances on these Installations. Biologist

AFRC (2003) – One of the primary authors of the Erosion & Sedimentation Control and Grading Plan for Youngstown ARB in OH. Responsibilities also included the collection of field data and ensuring that the final document was to the satisfaction of the clients. Project Manager/Biologist.

USAF (2003) – Delineated wetlands in response to proposed changes to the west side of Manchester Road on Pope AFB in NC. Responsibilities included collection of wetland field data, utilizing a Garmin GPS unit to input wetland data points, and assisting with identification of soil types and vegetation. Assisted in the creation of a wetland delineation map utilizing GIS.

AFRC (2003) – Performed an EBS of the Claiborne Air-to-Ground Weapons Range in LA in response to proposed expansion of the buffer zone. Utilizing ASTM Standards, the proposed site was investigated primarily to identify REC. Responsibilities included successful coordination with the U.S. Forest Service (USFS) as the Range is located entirely within the Evangeline Unit of the Calcasieu Ranger District in the Kisatchie National Forest. Biologist.

ANG (2003) – Created a dichotomous key to implement the Warren Grove Range Erosion and Sedimentation Control and Roads Maintenance Plan.

AFRC (2003) – Assisted in the preparation of several EAs addressing construction activities and military airspace modifications on March ARB in CA. Primary author of the existing conditions and environmental consequences sections for the following resource areas: biological resources, water resources, and geological resources. Biologist.

NPS (2002-2003) – Performed a Phase I site assessment of Curry Village and the East Yosemite Valley in Yosemite National Park (YOSE). Utilizing ASTM Standards, the proposed site was investigated primarily to identify REC. Biologist.

CHRISTOPHER JOHN ROCHE
Project Biologist

SELECTED PROJECT EXPERIENCE (Continued)

Utah Army National Guard (UTARNG) (2002-2003) – Assisted in the preparation of several EAs for the UTARNG addressing construction activities and military training activities for several sites in throughout the state. Primary author of the existing conditions and environmental consequences sections for the following resource areas: biological resources, water resources, and geological resources. Biologist.

NJ Turnpike Authority (NJTA) (2002) – Assisted the Project Manager in the preparation of a threatened and endangered species survey report for the Newark Bay Bridge prior to a bridge repainting project. Assisted in designing the methodology for and performing the threatened and endangered species survey for the NJ state-listed peregrine falcon. Documented the presence of a nesting pair of peregrine falcons under the Newark Bay Bridge, and provided management strategies designed to assist the recovery of these sensitive species while allowing the project to commence. Biologist.

Verizon Wireless (2001-2002) – Delineated wetlands and conducted Phase I Environmental Site Assessments (ESAs) and NEPA screenings of proposed cellular tower and collocation sites throughout the state of NJ. Wetlands were identified and mapped to assist the client in applying for any necessary permits through the NJDEP. Utilized ASTM Standards to identify REC and identified threatened and endangered species habitat, historic sites, and historic structures. Biologist.

NJTA (2001-2002) – Assisted a diverse group of scientists in preparing Executive Order (EO) 215 EAs for the Grand Street Ramp Extension of the NJ Turnpike in Jersey City, NJ and the Route 9 Ramp Extension of the Garden State Parkway in Sayreville, NJ analyzing construction activities on biological resources, especially threatened and endangered species and wetlands, hazardous materials and wastes, cultural resources, land resources, aesthetic resources, water resources, and air quality in accordance with the requirements of the Clean Air Act. Conducted informal consultations with the USFWS as a part of these EAs. Biologist.

NJTA (2001-2002) – Assisted in the preparation and review of the EIS for the Route 92 Corridor project in Plainsboro, NJ. Assisted a diverse group of scientists in analyzing the affects of the highway construction activities on biological resources, especially threatened and endangered species and wetlands, hazardous materials and wastes, cultural resources, land resources, aesthetic resources, water resources, and air quality in accordance with the requirements of the Clean Air Act. Biologist.

Various Commercial Clients (2001) – Performed Phase I ESAs on various properties throughout NJ and NY for variouscommercial clients. Utilizing ASTM Standards, the proposed site was investigated primarily to identify REC. Biologist.

Verizon (2001) – Performed air quality monitoring at Verizon's 140 West building in response to the World Trade Center (WTC) disaster. This building was immediately adjacent the WTC and responsible for phone service to lower Manhattan. The collapse of the WTC resulted in the interruption of this service and the rupture of diesel and kerosene tanks in the sub-basement. Monitored the air quality of the areas occupied by workers and assisted in the remediation of these areas to reestablish safe levels. Industrial Hygienist.

CHRISTOPHER JOHN ROCHE
Project Biologist

SELECTED PROJECT EXPERIENCE (Continued)

Various Commercial Clients (1999-2001) – Performed indoor air quality investigations of commercial office buildings for the purpose of maintaining a database and in response to occupant complaints. These investigations consisted of the measurement of various common indoor air quality contaminants selected after consultation with the client. The information was then analyzed and findings issued to the client in report form with recommendations to remediate if necessary. Industrial Hygienist.

Various Commercial Clients (1999-2001) – Performed investigations of commercial buildings and private residences in response to complaints of microbial contamination. A visual inspection of the structure was conducted and samples of potential microbial growth were collected using sterile swabs and air sampling techniques. The samples were then sent to a lab for culture and the results analyzed and presented to the clients in a report format with recommendations if remediation was necessary. Assisted in the preparation of and implementation of this remediation. Industrial Hygienist.

NPS (1998) – Completed a voluntary internship as a biological research assistant in Carlsbad Caverns National Park (CAVE). Responsibilities included the collection of mountain lion scat and the observation of tracks and scrapes on a predetermined transect. Assisted in the cataloging of transect data for an ongoing study on mountain lion population density and dispersion on park lands. Additional responsibilities included field observation and data collection for an ongoing study of brown-headed cowbird nest parasitism on neo-tropical migrants, particularly the NM state-listed Bell's vireo. Conducted removal of invasive exotic plant and animal species on park lands, particularly American bullfrog in the Rattlesnake Springs Preserve. Collected and cataloged plant species on CAVE lands and determined if native or exotic to assist in the park's native re-vegetation plans. Biologist.

SPECIAL TRAINING

Systematic Conservation Planning: Concepts, Case Studies, and Application of Software Short Course; June 24, 2006

USAF UXO Safety Training, 2007

Habitat Evaluation Procedure (HEP) Training – Syracuse University, July 2003

Freshwater Wetlands Rules Revisions – Rutgers University, 2001

Using Microbial Communities to Assess Ecological Function of Salt Marshes – Rutgers University, 2001

SPECIAL TRAINING (Continued)

Bioremediation of Petroleum Contaminated Salt Marshes – Rutgers University, 2001

Threatened and Endangered Species of Northern New Jersey – Rutgers University, 2001

Environmental Audits and Site Assessments – Rutgers University, 2001

Introduction to Wetland Identification – Rutgers University, 2000

GIS for Environmental Evaluations – Rutgers University, 2000

NIOSH/OSHA 40-hour Hazardous Materials Safety and Handling Course

JAYME B. SCHAEFFER
Field Biologist

As a field biologist for Normandeau, Mr. Schaeffer has biological sampling experience surveying fish communities using electrofishing, seining, and ichthyoplankton netting techniques and assisted with the collection of benthic macroinvertebrate samples with sediment grab samplers. He also has experience collecting ichthyoplankton, fish, and crab samples as required for Clean Water Act 316(b) studies.

In addition, Mr. Schaeffer has training and experience in environmental sampling and measurement and has collected groundwater and surface water, and sediment samples for laboratory analysis.

EDUCATION

B.S. 2003, Wildlife and Fisheries Science, The Pennsylvania State University

PROFESSIONAL EMPLOYMENT HISTORY

2005-Present	Normandeau Associates, Inc.
2005	Bower's Marine
2005	Cabela's Inc.
2004	Lendacki Construction

PROFESSIONAL AFFILIATIONS

FLW Outdoors and Bass Anglers Sportsman Society (B.A.S.S.)

SELECTED PROJECT EXPERIENCE

Exelon Power (2005-Present) - Schuylkill Generating Station; Responsible for installing, operating, and maintaining entrainment and impingement sampling equipment for an ichthyoplankton study on the Schuylkill River in Pennsylvania. Field Biologist.

Exelon Power (2005-Present) - Fairless Hills Steam Generating Station; Responsible for installing, operating, and maintaining entrainment and impingement sampling equipment for an ichthyoplankton study on the tidal Delaware River in Pennsylvania. Field Biologist.

Exelon Power (2005-Present) – Eddystone Generating Station; Responsible for installing, operating, and maintaining entrainment and impingement sampling equipment for an ichthyoplankton and blue crab study on the tidal Delaware River in Pennsylvania. Field Biologist.

Hunting Ridge/Sandy Hill Landfills (2005-Present) - Collection of ground and surface water, leachate samples and monitoring methane levels of groundwater wells and along landfill boundaries. Environmental Technician.

Waste Management, Inc. (2005-Present) - Collection of filter cake samples from treatment plant at G.R.O.W.S. Landfill (Bucks County, PA.). Sampling and analysis program required for delisting of filter cake as a hazardous waste. Field Technician.

Exelon Power (2005-Present) - Cromby Generating Station; Responsible for installing, operating, and maintaining entrainment and impingement sampling equipment for an ichthyoplankton study on the Schuylkill River in Pennsylvania. Field Biologist.

North East Ecological Services (2006) – Setup and monitoring of two perspective sites for wind power generation in Lycoming County, PA. Monitoring done using "Anabat" technology for the detection of Pennsylvania bats. Biologist.

JAYME B. SCHAEFFER
Field Biologist

SELECTED PROJECT EXPERIENCE (Continued)

Clipper Wind Energy/TetraTech (2006) - Biologist to determine the species composition, spatial and temporal distribution of birds at a proposed wind energy site in Finger Lakes region of western New York (Paragon Wind Energy Project, Hornby NY). Determined identity and abundance of migrating land birds, colonial nesters and waterfowl, spring and summer 2006. These data were reported to the client with a discussion of the timing, height and duration of migration and potential impacts of rotating turbines on birds.

Environ Inc. (in association with Biodiversity Research Institute) (2006) - Penobscot River Mercury Study. Extensive study to assess mercury concentrations in water, sediment, invertebrates, fish, birds, and mammals in the Penobscot River from Millonocket Maine south to Islesboro. Work included live trapping of minks and otters, with blood and fur collection, as well as coordination with local trappers to secure carcasses, which were analyzed for fur and tissue. Project biologist.

Exelon, LLC (2006) – Amergen Facility; Assisted with the installation and removal of fish containment booms and the monitoring of aquatic conditions during a reactor outage at a nuclear generating facility. During the event, field teams of biologists monitored the facilities discharge canal looking for any stressed or dying fish or marine organisms, conducted water temperature surveys, and collected target fish species for analytical and beneficial use purposes. Biologist.

Cummmings/Riter Consultants, Inc. (2005) – Collection of fish tissue for PCB contaminant analysis in the Shenango River at Sharon, PA. These samples involved the use of electrofishing unit to obtain a representative sample of resident fish species in the vicinity of a superfund site. Biologist.

SPECIAL TRAINING

National Safety Council- Adult CPR & First Aid
Bat Ecology and Identification Summer 2006. Cal Butchkowski Pennsylvania Game Commission