APPENDIX B

Data Sheets

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: PPL Application Number: _____ Project Name: Bell Bend NPP

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

Date: 7/24/07 Plot No.: DPA1 A Section: woods / 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: PPL | Application Number: | Project Name: Bell Bend NPP

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

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

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 spp

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: FAC-Neutral test; Local Soil Survey data

Wetland hydrology: Yes X ; No ____. Basis: 2 secondary indicators

Atypical situation: Yes X ; No ____.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland X ; Nonwetland _____.

Comments: dry conditions

Determined by: J. Montgomery
K. Marcinek

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: PPL Application Number: _____ Project Name: Bell Bend NPP

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

Date: 24 Oct 2007 Plot No.: DPAA1 Section: Near AA30

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: PPL Application Number: Project Name: Bell Bend NPP

State: County: Luzerne Legal Description: Township:

Date: 24 Oct 2007 Plot No. DPAA2 Section: Near AA30

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. High bush/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 mottles

Hydrology

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

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

Other indicators: oxidized root channels; FAC Neutral test.

Wetland hydrology: Yes ✓; No ___. Basis: 2 2° indicators.

Atypical situation: Yes ___; No ✓.

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

Wetland Determination: Wetland yes ; Nonwetland ___.

Comments:

Determined by: E. Gark JB Schaffer

PA25003 & 4
Photos ~~2 & 3~~ 3/4 wet down 2' break in slope spice bush dense, arrow wood, oak pin oak
PA25000 2 & 5 up tied on red oak sapling + black (oak) platy bark, princess pine, oak seedlings

Not relevant - K. Mausice 4/30/08

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: PPL Application Number: _____ Project Name: Bell Bend NPP

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

Date: 7/25/07 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. [illegible]		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: PPL Application Number: _____ Project Name: Bell Bend NPP

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: FAC Neutral test, local soil survey data.

Wetland hydrology: Yes X; No ____. Basis: 2 2° indicators.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland X; Nonwetland ____.

Comments: dry conditions

Determined by: J. Montgomery

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: PPL Application Number: _____ Project Name: Bell Bend NPP

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

Date: 7/25/07 Plot No.: DPB3 B Section: for wetland 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. 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 veg.

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: FAC-Neutral test; Local soil survey data.

Wetland hydrology: Yes X; No ____. Basis: 2 2° indicators

Atypical situation: Yes ____; No X.

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: 2 October 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice/Chris Roche		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: DP BBB1

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Liriodendron tulipfera*	Tree	FACU	9	*Smilax rotundifolia*	Vine	FAC
2	*Quercus rubra*	Tree	FACU-	10	*Lycopodium clavatum*	Herb	FAC
3	*Betula allegheniensis*	Tree	FAC	11	*Thelypteris noveboracensis*	Herb	FAC
4	*Acer rubrum*	Tree	FAC	12			
5	*Acer rubrum*	Sapling	FAC	13			
6	*Lindera benzoin*	Shrub	FACW-	14			
7	*Betula allegheniensis*	Sapling	FAC	15			
8	*Quercus rubra*	Sapling	FACU-	16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 73

Remarks: Large amount of windthrow from mid-July thunderstorm.

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): Braceville gravelly loam			Drainage Class: Moderately Well Drained	
Taxonomy (Subgroup): Typic Fraguidepts			Field Observations Confirm Mapped Type?	**YES** NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Texture, Concretions, Structure, ect
0-3	A	10 YR 3/1	-	MFR
3-12	A	10 YR 4/2	-	MFR
12-20	B	10 YR 5/4	7.5 YR 5/8	MFR
20-24	B	10 YR 5/3	5 YR 5/8	WSS

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: Near wetland boundary flag BBB-4.

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 2 October 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice/Chris Roche		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: DP BBB2

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Acer rubrum*	Tree	FAC	9	*Smilax rotundifolia*	Vine	FAC
2	*Nyssa sylvatica*	Tree	FAC	10	*Fagus grandifolia*	Tree	FACU
3	*Quercus bicolor*	Tree	FACW+	11	*Fagus grandifolia*	Sapling	FACU
4	*Fraxinus pennsylvanica*	Tree	FACW	12	*Impatiens capensis*	Herb	FACW
5	*Quercus palustris*	Tree	FACW	13	*Osmunda cinnamomea*	Herb	FACW
6	*Ilex verticillata*	Shrub	FACW+	14	*Polygonum arifolium*	Herb	OBL
7	*Lindera benzoin*	Shrub	FACW-	15			
8	*Viburnum dentatum*	Shrub	FAC	16			

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

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	≤ 2	(in)
Depth to Free Water in Pit	0	(in)
Depth to Saturated Soil	0	(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 to 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
0-10	A	10 YR 2/1	10 YR 5/1	WS
12-18	B	10 YR 4/1	10 YR 6/1	MFI
18-24	B	10 YR 6/1	7.5 YR 5/8	MFI

HYDRIC SOIL INDICATORS:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☒	Sulfidic Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☒	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☒	Gleyed or Low-Chroma Colors	☐	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: Standing water of several inches depth in several areas. 50 feet W of wetland boundary flag BBB-5. Water table close to surface in growing season in the Rexford soil series.

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 2 October 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice/Chris Roche		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: 2
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DP BBB3

VEGETATION

	Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1	*Fagus grandifolia*	Tree	FACU	9		
2	*Fagus grandifolia*	Sapling	FACU	10		
3	*Acer rubrum*	Tree	FAC	11		
4	*Smilax rotundifolia*	Vine	FAC	12		
5	*Lindera benzoin*	Shrub	FACW-	13		
6	*Alliaria petiolata*	Herb	FACU-	14		
7	*Parthenocissus quinquefolia*	Vine	FACU	15		
8				16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 43

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	>22	(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 Fraguidepts			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	-	MFR
7-16	B	10 YR 5/5	-	MFR
16-22	B	10 YR 5/6	7.5 YR 5/8	MFR

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 at 22 inches.

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: 50 feet N of wetland boundary flag BBB-44.

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 2 October 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice/Chris Roche/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: 2
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DP BBB4

VEGETATION

	Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1	*Acer rubrum*	Tree	FAC	9		
2	*Nyssa sylvatica*	Tree	FAC	10		
3	*Acer rubrum*	Sapling	FAC	11		
4	*Nyssa sylvatica*	Sapling	FAC	12		
5	*Lindera benzoin*	Shrub	FACW-	13		
6	*Symplocarpus foetidus*	Herb	OBL	14		
7	*Pilea pumila*	Herb	FACW	15		
8				16		

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

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	(in)
Depth to Free Water in Pit	0	(in)
Depth to Saturated Soil	0	(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 to 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	5 YR 2.5/1	5 YR 4/6	WS
7-24	B	10 YR 6/1	7.5 YR 5/8	WS

HYDRIC SOIL INDICATORS:

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

Remarks: Saturated to surface.

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: Gradual to abrupt slope along boundary. 50 feet S of wetland boundary flag BBB-44.
Water table close to surface in growing season in the Rexford soil series.

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-) 16

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

Remarks : The NRCS Luzerne County Soil Survey indicates that the Rexford series has a high water table early in the growing season at a depth of 6" to 18" inches. A fragipan is present at a depth of 18" to 37" and restricts the downward movement of water.

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: PPL Application Number: _____ Project Name: Bell Bend NPP

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

Date: 10/8/07 Plot No.: DP C3 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: >50% Fac or greater rx.

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. Gould

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: PPL | Application Number: | Project Name: Bell Bend NPP

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 spp.

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: Matted vegetation = wetland drainage patterns, a 1° indicator

Atypical situation: Yes ___; No X.

Normal Circumstances? Yes X No ___.

Wetland Determination: Wetland X; Nonwetland ___.

Comments: dry conditions

Determined by: J. Montgomery, L. Carl.

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: PPL Application Number: _____ Project Name: Bell Bend NPP

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 leaves, FAC-Neutral test.

Wetland hydrology: Yes X; No ____. Basis: 2 2° indicators.

Atypical situation: Yes ____; No X.

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:

Red maple and spicebush are common in wetlands and uplands. Ground cover is sparse due to the time of year.

* = 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): 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	None Present	(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	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfidic Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☒	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☒	Gleyed or Low-Chroma Colors	☐	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: PPL Application Number: _____ Project Name: Ball Band NPP

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	UpI
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 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: > 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: PPL Application Number: _____ Project Name: BellBend NPP

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: FAC Neutral test; Local soil survey data

Wetland hydrology: Yes X; No ____. Basis: 2 2° indicators

Atypical situation: Yes ____; No X.

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: 2 October 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice/Chris Roche		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Palustr. 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: DP DDD1

VEGETATION

	Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1	*Juncus effusus*	Herb	FACW+	9		
2	*Scirpus cyperinus*	Herb	FACW+	10		
3	*Bidens sp.*	Herb	FACW	11		
4	*Boehmeria cylindrica*	Herb	FACW+	12		
5	*Quercus palustris*	Sapling	FACW	13		
6	*Fraxinus americana*	Sapling	FACU	14		
7	*Aster simplex*	Herb	FACW	15		
8				16		

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

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	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): Rexford loam			Drainage Class: Somewhat Poorly to 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
0-14	Ap	2.5 YR 5/1	10 YR 3/3	MFR, WSS
14-24	B	2.5 YR 7/1	7.5 YR 5/6	WS

HYDRIC SOIL INDICATORS:

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

Remarks : MFR at 0-6 inches, WSS from 6 to 13 inches. Historic oxidized root pores observed.

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 Currently not saturated within 12 inches, but certainly saturated for 2 to 3 weeks in growing season. Water table close to surface in growing season in the Rexford soil series. Data point was collected near the end of or outside the growing season.

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: PPL Application Number: _____ Project Name: Bell Bend NPP

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

Date: 10/12/07 Plot No.: DPE1 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 noveboracc.	Fac
3.		9. Solidago rugosa	Fac
Saplings/shrubs		**Woody vines**	
4. Rosa multiflora	Facu	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. Gould

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: PPL Application Number: _____ Project Name: Bell Bend NPP

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

Remarks: Pope soils can have unmapped inclusions of the hydric Holly and Wayland soil series. Impenetrable beyond 12" in depth due to a high concentration of coarse fragments. Coal fines are present beginning at 8" in depth.

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			

Remark: This area may have been disturbed by past construction activities and it consists of a mozaic of wetland and upland microsites. Coal fines indicate periodic flooding by the Susquehanna River. Hydrologic conditions documented at DP FF2 are typical for most of the area immediately south of the vicinity of the SSES intake structure.

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

Remarks: Pope soils can have unmapped inclusions of the hydric Holly and Wayland soil series. Impenetrable beyond 14" in depth due to a high concentration of coarse fragments. Coal fines are present.

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: This area was possibly disturbed by past construction activities and it consists of a mozaic of wetland and upland microsites. Coal fines indicate periodic flooding by the Susquehanna River. There's a shallow pond at western end of this area and shallow depressions with standing were scattered throughout this section.

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 2 October 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice/Chris Roche		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: DP FFF1

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Solidago canadensis*	Herb	FACU	9			
2	*Eleagnus angustifolia*	Shrub	FACU	10			
3	*Apocynum cannabinum*	Herb	FACU	11			
4	*Toxicodendron radicans*	Herb	FAC	12			
5	*Fragaria virginianum*	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	>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 gravelly loam			Drainage Class: Somewhat Poorly to 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
0-18	Ap	10 YR 3/3	-	MFR
18-24	B	7.5 YR 5/5	-	MFR

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 : Mapped by NRCS as Rexford loam but matches the description for the Chenango series. Data point is located near the edge of the Rexford mapping unit, which bounds a Chenago mapping unit.

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: 50 feet SW of wetland boundary flag FFF-42.

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP	Date: 2 October 2008
Applicant/Owner: PPL	County: Luzerne
Investigator: Keith Maurice/Chris Roche/Jayme Schaeffer	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: DP FFF2

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Glyceria sp.*	Herb	OBL	9	*Spiraea latifolia*	Herb	FAC+
2	*Juncus effusus*	Herb	FACW+	10	*Carex sp.*	Herb	FAC-FACW
3	*Polygonum sagitattum*	Herb	OBL	11			
4	*Polygonum pensylvanicum*	Herb	FACW	12			
5	*Vernonia noveboracensis*	Herb	FACW	13			
6	*Carex lurida*	Herb	OBL	14			
7	*Scirpus cyperinus*	Herb	FACW+	15			
8	*Lycopus sp.*	Herb	OBL	16			

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

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	>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: Somewhat Poorly to 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	Ap	10 YR 4/1	7.5 YR 4/6	WSS
7-24	B	10 YR 6/1	7.5 YR 4/6	WSS

HYDRIC SOIL INDICATORS:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfidic Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☒	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☒	Gleyed or Low-Chroma Colors	☐	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: S and W boundary is old field, agricultural lands border the N and E. 50 feet NE of wetland boundary flag FFF-42.
Water table is close to the surface in the Rexford series during the growing season (early spring).

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 2 October 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice/Chris Roche		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: 2
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DP FFF3

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Rosa multiflora*	Shrub	FACU	9			
2	*Eleagnus angustifolia*	Shrub	FACU	10			
3	*Apocynum cannabinum*	Herb	FACU	11			
4	*Toxicodendron radicans*	Herb	FAC	12			
5	*Solidago canadensis*	Herb	FACU	13			
6	*Daucus carota*	Herb	FACU	14			
7	*Polygonum perfoliatum*	Vine	FAC	15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 29

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	>20	(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
0-10	Ap	10 YR 4/2	10 YR 5/4	MFR
10-20	B	7.5 YR 5/6	-	WS/WSS

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 20 inches. No water in bore hole.

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: 50 feet NW of wetland boundary flag FFF-9.

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 2 October 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice/Chris Roche		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: 2
Is the area a potential Problem Area? (if needed, explain on reverse)	YES **NO**	Plot ID: DP FFF4

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Sambucus canadensis*	Shrub	FACW-	9			
2	*Vernonia noveboracensis*	Herb	FACW	10			
3	*Onoclea sensibilis*	Herb	FACW	11			
4	*Eupatoriadelphus sp.*	Herb	FACW	12			
5	*Spiraea latifolia*	Herb	FAC+	13			
6	*Solidago gigantea*	Herb	FACW	14			
7				15			
8				16			

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

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	>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: Somewhat Poorly to 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	5 YR 3/4	WS
15-24	B	10 YR 6/1	7.5 YR 5/8	WSS

HYDRIC SOIL INDICATORS:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfidic Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☒	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☒	Gleyed or Low-Chroma Colors	☐	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: Currently not saturated within 12 in., but water table close to surface in growing season in the Rexford soil series. Data collected near the end of or outside of the growing season. 50 feet SE of wetland boundary flag FFF-6.

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: PPL Application Number: _____ Project Name: Bell Bend NPP

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.	upl
2. Quercus rubra	FACU	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: 43. Other indicators: _____.

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

Soil

Series and phase: Chenango grlv. 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: PPL | Application Number: | Project Name: Ball Bend NPP

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 spp.

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____ 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; FAC-Neutral; Local Soil Survey data

Wetland hydrology: Yes X; No____. Basis: 2 2° indicators.

Atypical situation: Yes____; No X.

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: PPL Application Number: _____ Project Name: Ball Band NPP

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

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

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

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. Cook

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: PPL Application Number: _____ Project Name: Bell Bend NPP

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

Date: 10/1/07 Plot No.: DPG4 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. Acer rubrum	FAC	7. Dennstaedtia punct.	FACU
2. Pinus strobus	FACW	8. Lycopodium obscurum	FACU
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 X; No ____. 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: FAC Neutratest; Local soil survey data.

Wetland hydrology: Yes X; No ____. Basis: 2 2° indicators.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland X; Nonwetland _____.

Comments:

Determined by: J. Montgomery, L. Gaub

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: PPL Application Number: _____ Project Name: Ball Bend NPP

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: 18. Other indicators: _____.

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

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. Gorbo

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: PPL Application Number: _____ Project Name: Bell Bend NPP

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 corymbosa	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 or.

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; FAC-Neutral

Wetland hydrology: Yes X; No ____. Basis: 2 2° indicators.

Atypical situation: Yes ____; No X.

Normal Circumstances? Yes X No ____.

Wetland Determination: Wetland X; Nonwetland ____.

Comments: dry conditions

Determined by: J. Montgomery, L. Gamble

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: PPL Application Number: _____ Project Name: ~~Ball Bend~~ NPP

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 ~~wl~~.

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. Cook

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: PPL Application Number: _____ Project Name: Bell Bend NPP

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

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

(147)

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, E. Gould

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: PPL Application Number: _____ Project Name: Bell Bend NPP

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

Date: 10/10/07 Plot No.: DPS1 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 wo.

Soil

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

Mottled: Yes ____; No X. Mottle color: —; Matrix color: 10YR5/3.

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. Cook

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: 100 Other indicators: _____.

Hydrophytic vegetation: Yes X No ___. Basis: 100% FAC or greater.

Soil

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

Mottled: Yes X; No ___. Mottle color: 10YR 5/6; 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: FAC-Neutral test; Local soil survey data.

Wetland hydrology: Yes X; No ___. Basis: 2 2° indicators

Atypical situation: Yes ___; No X.

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: PPL Application Number: _____ Project Name: Ball Bend NPP

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 (unident)	
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: PPL | Application Number: | Project Name: Bell Bend NPP

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 graminif.	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: 7.5YR 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 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: PPL Application Number: _____ Project Name: Ball Bank NPP

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

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 spp.

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: PPL Application Number: _____ Project Name: Bell Bend NPP

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: 10YR5/2.

Gleyed: Yes ___ No X Other indicators: streamside.

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: 10-16".

Other indicators: streamside; FAC-Neutral; Local soil survey data

Wetland hydrology: Yes X; No ___. Basis: 2 2° indicators.

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: PPL Application Number: _____ Project Name: Ball Bend NPP

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	Facu
5. Elengnus 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. Coulo

DATA FORM 1

WETLAND DETERMINATION

Applicant Name: PPL Application Number: _____ Project Name: Ball Band NPP

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

Date: 10/25/07 Plot No.: DPK6 Section: (Kills)

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 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 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 Grnd

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	FACU-FACW	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. Low soil chromas and mottling reflect historic conditions of the source area 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	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfidic Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☒	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☒	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Remarks : The Luzerne County Soil Survey indicates that Holly soils are frequently flooded and have a seasonal high water table within 6" of the surface during wet periods and after flooding.

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

Remarks : The Luzerne County Soil Survey indicates that Holly soils are frequently flooded and have a seasonal high water table within 6" of the surface during wet periods and after flooding.

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: PPL Application Number: _____ Project Name: Ball Bend NPP

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

Date: 10/18/07 Plot No.: DP1A 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 3/4.

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: PPL Application Number: _____ Project Name: Ball Bend NPP

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

Date: 10/18/07 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 up.

Soil

Series and phase: Rexford silt 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	Heavy clay
Impenetrable > 15"				

HYDRIC SOIL INDICATORS:

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

Remarks: The county soils survey indicates that Holly soils are frequently flooded and have a seasonal high water table within 6" of the surface during wet periods and after flooding.

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: PPL Application Number: _____ Project Name: Bell Bend NPP

State: _____ County: Luzerne 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)	FA
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 X. 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 X.

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

Determined by: EWBailo, L.B. 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	FACU-FACW	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 :

Substrate consists of fill from construction of the adjacent intake structure. Low chroma and mottling reflect historic conditions of the source area rather than current conditions. Coal fines are present starting at 14" in depth and the substrate is impenetrable at > 18" in depth.

Saturated conditions are likely due to 1-inch of rain that fell on March 19th combined with low permeability in the fill.

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	FACW-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	None Present	(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
Impenetrable >14"				

HYDRIC SOIL INDICATORS:

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

Remarks : Pope soil series can have unmapped inclusions of hydric Holly and Wayland soil series.
An actively flowing seep was present and the water table was at the soil surface.

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 October 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice/Chris Roche		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: DP NNN 1

VEGETATION

	Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1	*Rosa multiflora*	Shrub	FACU	9		
2	*Eleagnus angustifolia*	Shrub	FACU	10		
3	*Onoclea sensibilis*	Herb	FACW	11		
4	*Parthenocissus quinquefolia*	Herb	FACU	12		
5	*Solidago canadensis*	Herb	FACU	13		
6	*Acer rubrum*	Herb	FAC	14		
7	*Rubus sp.*	Herb	FAC	15		
8	*Vitis labrusca*	Herb	FACU	16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 38

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	≥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): Chenango gravelly loam			Drainage Class: Somewhat Excessively 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 5/3	10 YR 6/4	MFR
12-24	B	10 YR 5/4	7.5 YR 4/6	WS

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: Abrupt transition to upland forest on S boundary, upland scrub-shrub on E, W and N boundaries.
30 feet N of wetland boundary flag NNN-13.

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 2 October 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice/Chris Roche		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Palustr. 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: DP NNN2

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Salix nigra*	Shrub	FACW+	9	*Polygonum sagittatum*	Herb	OBL
2	*Cornus amomum*	Shrub	FACW	10			
3	*Solidago gigantea*	Herb	FACW	11			
4	*Aster puniceus*	Herb	OBL	12			
5	*Onoclea sensibilis*	Herb	FACW	13			
6	*Verbena hastata*	Herb	FACW+	14			
7	*Juncus effusus*	Herb	FACW+	15			
8	*Vernonia noveboracensis*	Herb	FACW+	16			

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

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	0	(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: Somewhat Excessively 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
0-11	Ap	2.5 YR 4/1	5 YR 4/6	WS
11-24	B	10 YR 6/1	7.5 YR 5/8	WS

HYDRIC SOIL INDICATORS:

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

Remarks : Unmapped hydric soil inclusion present in sampled area. Wetlands were located at toe of slope and are likely the result of ponded runoff or groundwater seepage.

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 Saturated to surface. 50 feet E of wetland boundary flag NNN-17.

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

Remarks : The Luzerne County Soil Survey indicates that Atherton soils have a water table that is at or near the surface during the growing season.

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 October 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice/Chris Roche		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: DP PPP1

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Vernonia noveboracensis*	Herb	FACW	9			
2	*Scirpus cyperinus*	Herb	FACW+	10			
3	*Aster puniceus*	Herb	OBL	11			
4	*Typha latifolia*	Herb	OBL	12			
5	*Euthamia graminofolia*	Herb	FAC	13			
6	*Solidago canadensis*	Herb	FACU	14			
7	*Onoclea sensibilis*	Herb	FACW	15			
8	*Solidago rugosa*	Herb	FAC	16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 88

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	0	(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: Somewhat Excessively 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
0-8	Ap	10 YR 4/2	5 YR 4/6	WS
8-24	B	10 YR 6/1	10 YR 5/4	WS

HYDRIC SOIL INDICATORS:

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

Remarks : Unmapped hydric soil inclusion present in sampled area. Wetlands were located at toe of slope and are likely the result of ponded runoff or groundwater seepage.

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: At least 50% of wetland PPP saturated to surface. Abrupt transition to upland scrub-shrub on S, E, and N boundaries. Boundary to W is agricultural land. 25 feet W of wetland boundary flag PPP-6.

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	None present	(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	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfidic Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☒	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☒	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Remarks : NRCS Luzerne County Soil Survey indicates that Rexford soils have a high water table early in the growing season.

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	FAC-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	None present	(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	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfidic Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☒	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☒	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Remarks : Luzerne County Soil Survey indicates that Rexford soils have a high water table early in the growing season.

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

Remarks: Pope soils can have unmapped inclusions of hydric Holly and Wayland soils.

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	None present	(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	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☒	Sulfidic Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☒	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☒	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Remarks: The Luzerne County Soil Survey indicates that Atherton soils have a seasonal high water table at or near the surface during the growing season.

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	None Present	(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	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☒	Sulfidic Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☒	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☒	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Remarks: The Luzerne County Soil Survey indicates that Atherton soils have a seasonal high water table at or near the surface during the growing season.

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: Bounded to the south by agricultural land.

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	None Present	(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	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☒ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☒ Gleyed or Low-Chroma Colors	☐ Other (Explain in Remarks)

Remarks: The Luzerne County Soil Survey indicates that Atherton soils have a seasonal high water table at or near the surface during the growing season.

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: Bounded to the south by agricultural land.

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 3 October 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice/Chris Roche		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Upland 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: DP RRR1

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Betula lenta*	Sapling	FACU	9			
2	*Liriodendron tulipfera*	Sapling	FACU	10			
3	*Lindera benzoin*	Shrub	FACW-	11			
4	*Dennstaedtia punctilobula*	Herb	UPL	12			
5	*Tsuga canadensis*	Tree	FACU	13			
6	*Dryopteris spinulosa*	Herb	FAC+	14			
7	*Rubus allegheniensis*	Shrub	FACU-	15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 29

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	>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: 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
0-3	A	10 YR 4/1	-	MFR
3-10	B	10 YR 5/3	-	WSS
10-18	B	10 YR 6/3	10 YR 4/6	WSS

HYDRIC SOIL INDICATORS:

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

Remarks: Area where data collected was on a moderately steep slope but was mapped as Rexford loam, a hydric soil. Beyond the first three inches soil was more typical of Chenango gravelly loam. The Chenango series was mapped in close proximity to where data point collected. No water in bore hole. Impenetrable beyond 18 in.

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 October 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice/Chris Roche		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Palustr. 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: DP RRR2

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Sambucus canadensis*	Shrub	FACW-	9			
2	*Lindera benzoin*	Shrub	FACW-	10			
3	*Ilex verticillata*	Shrub	FACW+	11			
4	*Hamamelis virginianus*	Shrub	FAC-	12			
5	*Bidens sp.*	Herb	FACW-	13			
6	*Spharganium sp.*	Herb	OBL	14			
7	*Impatiens capensis*	Herb	FACW	15			
8				16			

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

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	0	(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 to 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
0-3	A	10 YR 4/1	7.5 YR 4/6	
3-18	B	10 YR 6/2	10 YR 5/4	

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 : Impenetrable at 18 inches. Saturated to surface.

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 Presence of sphagnum moss at sampling site used as secondary indicator of hydrology.
Water table is close to the surface during the growing season (early spring) in the Rexford soil series

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	FACU-FACW
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-) ≤ 33

Remarks: The dominant goldenrod present is probably *S. canadensis* (FACU).

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 dentatum* *	Shrub	FAC	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-) 72

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

Remarks: The Luzerne County Soil Survey indicates that Atherton soils have a seasonal high water table at or near the surface during the growing season.

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	FACU-FACW	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-) 0

Remarks: The dominant goldenrod present is probably *S. canadensis* (FACU).

* = 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		Coal fines present
Impenetrable > 12"				

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 :

Substrate likely consists of fill from construction of nearyby SSES facilities. Low chroma and mottling reflect historic conditions of the source area 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	None present	(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		Heavy clay

HYDRIC SOIL INDICATORS:

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

Remarks: The wetland appears to be perched on top of the heavy clay layer at 12 to 18 inches as the substrate was too soupy at > 18" for a sample with an auger.

The Luzerne County Soil Survey indicates that Holly soils are frequently flooded and have a seasonal high water table within 6" of the surface during wet periods and after flooding.

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 October 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice/Chris Roche/Jayme Schaeffer		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: DP SSS1

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Acer rubrum*	Tree	FAC	9			
2	*Lindera benzoin*	Shrub	FACW-	10			
3	*Maianthemum canadense*	Herb	FAC-	11			
4	*Mitchella repens*	Herb	FACU	12			
5	*Dennstaedtia punctilobula*	Herb	UPL	13			
6				14			
7				15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 40

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	>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: Somewhat Excessively 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
+1-0	O	-	-	leaf layer
0-10	A	10 YR 4/2	10 YR 5/6	WSS
10-24	B	10 YR 4/6	7.5 YR 5/8	WSS

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: 10 feet SW of wetland boundary flag SSS-17.

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 3 October 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice/Chris Roche/Jayme Schaeffer		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Palus. Emerg. (10% 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: DP SSS2

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Acorus calamus*	Herb	OBL	9			
2	*Leersia oryzoides*	Herb	OBL	10			
3	*Polygonum punctatum*	Herb	OBL	11			
4	*Acer rubrum*	Tree	FAC	12			
5	*Acer rubrum*	Herb	FAC	13			
6	*Quercus palustris*	Tree	FACW	14			
7	*Alisma subcordatum*	Herb	OBL	15			
8	*Carex sp.*	Herb	FAC-OBL	16			

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

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	4	(in)
Depth to Free Water in Pit	1	(in)
Depth to Saturated Soil	0	(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 to 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	A	10 YR 4/1	7.5 YR 4/6	
15-24	B	10 YR 5/2	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 : 50 feet SW of wetland boundary flag SSS-8

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: 10 feet SW of wetland boundary flag SSS-17.

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 3 October 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice/Chris Roche		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: DP T1

VEGETATION

	Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1	*Acer rubrum*	Tree	FAC	9		
2	*Lindera benzoin*	Shrub	FACW-	10		
3	*Ilex verticillata*	Shrub	FACW+	11		
4	*Viburnum dentatum*	Shrub	FAC	12		
5	*Onoclea sensibilis*	Herb	FACW	13		
6	*Toxicodendron radicans*	Herb	FAC	14		
7	*Uvularia sessilifolia*	Herb	FACU-	15		
8				16		

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

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	>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: Somewhat Poorly to 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 3/1	10 YR 5/6	WSS
6-24	B	10 YR 4/2	10 YR 5/4	WS

HYDRIC SOIL INDICATORS:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfidic Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☒	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☒	Gleyed or Low-Chroma Colors	☐	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: Water table close to surface in growing season in the Rexford soil series. Data collected near the end of or outside of the growing season. Located 30 feet E of wetland boundary flag T-20.

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 3 October 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice/Chris Roche/Jayme Schaeffer		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: DP TTT1

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Prunus serotina*	Tree	FACU	9			
2	*Acer rubrum*	Tree	FAC	10			
3	*Lindera benzoin*	Shrub	FACW-	11			
4	*Toxicodendron radicans*	Herb	FAC	12			
5	*Dryopteris spinulosa*	Herb	FAC+	13			
6				14			
7				15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 80

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	>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: Somewhat Excessively 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
0-8	A	10 YR 3/3	-	MFR
8-24	B	7.5 YR 4/6	-	MFR

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 : No water in bore hole.

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 October 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice/Chris Roche/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: DP TTT2

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Onoclea sensibilis*	Herb	FACW	9	*Symplocarpus foetidus*	Herb	OBL
2	*Polygonum cespitosum*	Herb	FACU-	10			
3	*Pilea pumila*	Herb	FACW	11			
4	*Lycopus sp.*	Herb	OBL	12			
5	*Impatiens capensis*	Herb	FACW	13			
6	*Lindera benzoin*	Shrub	FACW-	14			
7	*Acer rubrum*	Tree	FAC	15			
8	*Quercus palustris*	Tree	FACW	16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 89

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	18	(in)
Depth to Saturated Soil	0	(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 to 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
0-24		10 YR 2/1	5 YR 4/6	WS

HYDRIC SOIL INDICATORS:

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

Remarks: Saturated to surface.
Water table is close to the surface during the growing season (early spring) in the Rexford soil series

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: 30 feet E of TTT-18.

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 3 October 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice/Chris Roche		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Upland mowed 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: DP UUU1

VEGETATION

	Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1	*Holcus lanatus*	Herb	FACU	9		
2	*Prunella vulgaris*	Herb	FACU+	10		
3	*Plantago lanceolata*	Herb	UPL	11		
4	*Agrostis gigantea*	Herb	FACW	12		
5	*Schizachyrium scoparium*	Herb	FACU-	13		
6	*Phleum pratense*	Herb	FACU	14		
7				15		
8				16		

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

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	>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): Chenango gravelly loam			Drainage Class: Somewhat Excessively 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 4/3	7.5 YR 3/4	MFR/WSS
14-24	B	10 YR 5/5	10 YR 5/8	WS

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 : No water in bore hole.

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: 30 feet NE of wetland boundary flag UUU-56.

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 3 October 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice/Chris Roche		State: Pennsylvania
Do Normal Circumstances exist on the site?	**YES** NO	Community ID: Palustrine Emergent
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: DP UUU2

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Lysimachia nummalaria*	Herb	OBL	9			
2	*Agrostis gigantea*	Herb	FACW	10			
3	*Carex sp.*	Herb	FAC-OBL	11			
4	*Solidago rugosa*	Herb	FAC	12			
5	*Mentha sp.*	Herb	FACU	13			
6				14			
7				15			
8				16			

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

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	21	(in)
Depth to Saturated Soil	20	(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 to 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	Ap	10 YR 5/1	7.5 YR 4/4	WS
12-24	B	10 YR 5/2	7.5 YR 3/4	MFI/WSS

HYDRIC SOIL INDICATORS:

☐	Histosol	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfidic Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☒	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☒	Gleyed or Low-Chroma Colors	☐	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: Water table is close to the surface during the growing season (early spring) in the Rexford soil series.

ROUTINE WETLAND DETERMINATION

Project/Site: Bell Bend NPP		Date: 3 October 2008
Applicant/Owner: PPL		County: Luzerne
Investigator: Keith Maurice/Chris Roche		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: DP VVV1

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	*Acer rubrum*	Tree	FAC	9			
2	*Lindera benzoin*	Shrub	FACW-	10			
3	*Prunus serotina*	Tree	FACU	11			
4	*Toxicodendron radicans*	Herb	FAC	12			
5	*Quercus palustris*	Tree	FACW	13			
6	*Maianthemum canadense*	Herb	FAC-	14			
7				15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 67

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	>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: 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
1-0	O		-	leaf layer
0-3	A	10 YR 3/2	10 YR 5/4	MFR
3-6	B	10 YR 4/3	7.5 YR 5/6	MFR
6-24	B	10 YR 6/3	7.5 YR 5/8	MFR/DRL
			10 YR 6/2	

HYDRIC SOIL INDICATORS:

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

Remarks: Soil moist, friable to 18 inches; then becomes dry, loose. Area mapped as Rexford loam but soils were not hydric. This area likely mapped as Rexford due to proximity to Walker Run. This proximity and the presence of hydrophytic vegetation may have led to this area being mapped as Rexford loam.

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: A water table close to surface in growing season could account for dominant presence of hydrophytic veg. No hydric soils and no hydrological indicators except for FAC neutral secondary confirmed this data point does not exist within a wetland. This area mapped as an upland inclusion (VVV) in Wetland UUU/TTT.

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 dentatum*	Shrub	FAC	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-) 71

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	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☐ Gleyed or Low-Chroma Colors	☐ 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-) 60

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

Remarks: County soil survey states that Pope soils may have unmapped inclusions of hydric Holly and Wayland soils. Wetland is located in close proximity to the canal and the depth to water from top of bank is around 24".

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 the soil matrix color just below what appears to be a historic plow layer (Ap).
The forest overstory is very similar in both the wetlands and adjacent uplands.

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: Red maple and spicebush predominate throughout uplands and wetlands within the project area.

* = 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: Saturated soil conditions were likely due to rainfall in March that was well above average.

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

Remarks: The county soil survey indicates that Rexford soils have a seasonal high water table near the surface early in the growing season.

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: 2
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	*Alliaria 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: Red maple and spicebush predominate throughout uplands and wetlands within the project area.

* = 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	☐ Concretions
☐ Histic Epipedon	☐ High Organic Content in Surface Layer in Sandy Soils
☐ Sulfidic Odor	☐ Organic Streaking in Sandy Soils
☐ Aquic Moisture Regime	☐ Listed on Local Hydric Soils List
☐ Reducing Conditions	☐ Listed on National Hydric Soils List
☐ Gleyed or Low-Chroma Colors	☐ 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 Scrub Shrub
Is the site significantly disturbed (Atypical Situation)?	YES **NO**	Transect ID: 2
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	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfidic Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☒	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☒	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Remarks: Wetland is located adjacent to a stream and may be an area of groundwater discharge.

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: 3
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	FACU-FACW	12			
5	*Phytolacca americana*	Herb	FACU+	13			
6	*Apocynum cannabinum*	Herb	FACU	14			
7	*Alliaria petiolata*	Herb	FACU-	15			
8	*Rubus occidentalis*	Herb	UPL	16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) ≤ 33

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: 3
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	None present	(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	☐	Concretions
☐	Histic Epipedon	☐	High Organic Content in Surface Layer in Sandy Soils
☐	Sulfidic Odor	☐	Organic Streaking in Sandy Soils
☐	Aquic Moisture Regime	☐	Listed on Local Hydric Soils List
☐	Reducing Conditions	☐	Listed on National Hydric Soils List
☒	Gleyed or Low-Chroma Colors	☐	Other (Explain in Remarks)

Remarks: Groundwater discharges through numerous seeps into this wetland and then flows through it in a braided pattern.

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 DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bell Bend NPP City/County: Luzerne Sampling Date: 4/30/12
Applicant/Owner: PPL State: PA Sampling Point: DPAM-1
Investigator(s): KRM/CJR/JBS Section, Township, Range: Salem Township
Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): concave
Slope (%): 0-3% Lat: -76.171631 Long: 41.084587 Datum: NAD 83
Soil Map Unit Name: Rexford loam NWI classification: PFO/PSS
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X No ____	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes X No ____	

Remarks: (Explain alternative procedures here or in a separate report.)
Borders agricultural field to north, Market St. to east, paved driveway to south, and mowed upland along banks of farm pond to west.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes X	No ____	Depth (inches): 11
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DPAM-1

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	80	Y	FAC
2. Populus deltoides	20	Y	FAC
3.			
4.			
5.			
6.			
7.			
	100	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Ilex verticulata	20	Y	FACW
2. Lindera benzoin	15	Y	FACW
3. Rosa multiflora	5	N	FACU
4. Cornus ammomum	5	N	FACW
5. Viburnum dentatum	1	N	FAC
6.			
7.			
	46	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Viburnum dentatum	5	Y	FAC
2. Symplocarpus foetidus	3	Y	OBL
3. Onoclea sensibilis	2	N	FACW
4. Rosa multiflora	2	N	FACU
5. Arisaema triphyllum	1	N	FACW
6. Toxicodendron radicans	1	N	FAC
7.			
8.			
9.			
10.			
11.			
12.			
	14	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	3	x 1 =	3
FACW species	43	x 2 =	86
FAC species	107	x 3 =	321
FACU species	7	x 4 =	28
UPL species	0	x 5 =	0
Column Totals:	160 (A)		438 (B)

Prevalence Index = B/A = 2.737

Hydrophytic Vegetation Indicators:

- ___ Rapid Test for Hydrophytic Vegetation
- X Dominance Test is >50%
- X Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DPAM-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6.5	10YR 3/1	60	7.5YR 3/3	20	C	M	loam	
6.5-15	10YR 5/1	58	7.5YR 3/3	40	C	M	loam	
15-24	10YR 6/1	40	7.5YR 6/8	60	C	M	loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bell Bend NPP City/County: Luzerne Sampling Date: 5/5/10
Applicant/Owner: PPL State: PA Sampling Point: DPAN-1
Investigator(s): KRM/CJR Section, Township, Range: Salem Township
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex
Slope (%): 15 Lat: -76.1717 Long: 41.08329 Datum: NAD 83
Soil Map Unit Name: Chenango gravelly loam NWI classification: UPL mowed field
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation Y, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No X
Hydric Soil Present? Yes ____ No X
Wetland Hydrology Present? Yes ____ No X

Is the Sampled Area within a Wetland? Yes ____ No X
If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)
This is an upland mowed field bordering Market St. to east with wetland AN/AM bordering the north, west, and South. Field appears to be mowed on a regular basis. Upland point DPAN-1 is 19 feet southeast (120°) from WL-AN10.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)
- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)*
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)
- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes ____ No X Depth (inches): ____
Water Table Present? Yes ____ No X Depth (inches): ____
Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 10 *

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
* Saturation beginning at 10 inches likely due to significant rainfall on 5/4/10.

VEGETATION – Use scientific names of plants. Sampling Point: DPAN-1

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Carya ovata	30	Y	FACU
2. Prunus serotina	15	Y	FACU
3. Juglans nigra	10	N	FACU
4.			
5.			
6.			
7.			
	55	= Total Cover	

Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		= Total Cover	

Herb Stratum (Plot size: 30)			
1. Carex 1	25	Y	FAC-OBL
2. Carex 2	10	Y	FAC-OBL
3. Lilium canadense	10	Y	FAC
4. Potentilla canadensis	10	Y	UPL
5. Dactylis glomerata	7	N	FACU
6. Taraxacum officinale	7	N	FACU
7. Erythronium americanum	5	N	FAC
8. Smilacina racemosa	1	N	FACU
9. Anthoxanthum odoratum	1	N	FACU
10. Claytonia virginica	1	N	FACU
11. Allium vineale	1	N	FACU
12. Erigeron philadelphicus	1	N	FACU
Eulalia viminea	(80)1	N	FAC
		= Total Cover	

Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	35	x 1 =	35
FACW species	0	x 2 =	0
FAC species	16	x 3 =	48
FACU species	74	x 4 =	296
UPL species	10	x 5 =	50
Column Totals:	135 (A)		429 (B)

Prevalence Index = B/A = 3.18

Hydrophytic Vegetation Indicators:

___ Rapid Test for Hydrophytic Vegetation

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DPAN-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/1	100					SL	roots 10%
2-10	7.5YR 4/3	100					SL	
10-24	7.5YR 5/4	100					SL	sat. beg. @ 10, rain day prev.

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

soil saturated beginning @ 10 inches, rained previous day

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: BBNPP City/County: Luzerne Sampling Date: 5/5/10
Applicant/Owner: PPL State: PA Sampling Point: DPA0-1
Investigator(s): KRM/CJR Section, Township, Range: Salem Township
Landform (hillslope, terrace, etc.): Hillslope-toe Local relief (concave, convex, none): Concave
Slope (%): 5 Lat: -76.1715 Long: 41.0827 Datum: NAD 83
Soil Map Unit Name: Chenango gravelly loam NWI classification: PFO/PSS
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation Y, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X No ____	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes X No ____	

Remarks: (Explain alternative procedures here or in a separate report.)
- Approximately 50% of wetland is regularly mowed.
- Data point is midway between A0-1 & A0-2.
- Bounded on west by Market St, on north by upland forest on east by upland forest, and south by upland mowed field.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes X	No ____	Depth (inches): 8
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Concave depression at the toe of a slope. Groundwater seep at the top of this wetland.

VEGETATION – Use scientific names of plants. Sampling Point: DPAO-1

Tree Stratum (Plot size: 15')	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	50	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	50	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Viburnum lantanoides	25	Y	FAC
2. Lindera benzoin	10	Y	FACW
3. Sambucus canadensis	3	N	FACW
4. Ilex verticillata	1	N	FACW
5.			
6.			
7.			
	39	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Impatiens capensis	70	Y	FACW
2. Fraxinus pennsylvanica	5	N	FACW
3. Toxicodendron radicans	5	N	FAC
4. Arisaema triphyllum	2	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	82	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	91	x 2 =	182
FAC species	80	x 3 =	240
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	171 (A)		422 (B)

Prevalence Index = B/A = 2.47

Hydrophytic Vegetation Indicators:

- ___ Rapid Test for Hydrophytic Vegetation
- X Dominance Test is >50%
- X Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DPAO-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	7.5 YR 3/1	100					Sandy loam	saturated to surface
5-14	7.5 YR 4/1	90	2.5 YR 3/6	10	C	PL	sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bell Bend NPP City/County: Luzerne Sampling Date: 5/5/10
Applicant/Owner: PPL State: PA Sampling Point: DP10-7
Investigator(s): KRM, CJR Section, Township, Range: Salem Township
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex
Slope (%): 1c Lat: -76.1714 Long: 41.08272 Datum:
Soil Map Unit Name: Chenango gravelly loam NWI classification: UPL Forest
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation no, Soil no, or Hydrology no significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation no, Soil no, or Hydrology no naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)
- approximately 25 feet N of A0-7
- bounded on south by upland mowed field, west by wetland A0, east and north by upland forest

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____
Water Table Present? Yes _____ No X Depth (inches): _____
Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 6

Wetland Hydrology Present? **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Saturated likely due to recent rainfall

VEGETATION – Use scientific names of plants. Sampling Point: DPAO-2

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	40	Y	FAC
2. Juglans nigra	20	Y	FACU
3. Fraxinus americana	20	Y	FACU
4. Carya ovata	15	N	FACU
5.			
6.			
7.			
	95	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15)			
1. Carya ovata	5	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	5	= Total Cover	

Herb Stratum (Plot size: 5)			
1. Impatiens capensis	70	Y	FACW
2. Fraxinus americana	40	Y	FACU
3. Aster simplex	10	N	FACW
4. Alliaria petiolata	10	N	FACU
5. Toxicodendron radicans	5	N	FAC
6. Prunus serotina	1	N	FACU
7. Rosa multiflora	1	N	FACU
8. Lonicera tatarica	1	N	FACU
9. Geum canadense	1	N	FACU
10.			
11.			
12.			
	139	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	80	x 2 =	160
FAC species	45	x 3 =	135
FACU species	114	x 4 =	456
UPL species	0	x 5 =	0
Column Totals:	239 (A)		751 (B)

Prevalence Index = B/A = 3.18

Hydrophytic Vegetation Indicators:

___ Rapid Test for Hydrophytic Vegetation

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DPAO-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/1	100					sandy loam	
6-24	10YR 5/4	95	5YR 4/6	5	C	M	sandy loam	saturated

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

saturation from 6 to 24 inches likely due to recent rainfall

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bell Bend NPP City/County: Luzerne Sampling Date: 4/30/10
Applicant/Owner: PPL State: PA Sampling Point: DPAF-1
Investigator(s): KRM, CJR, JBS Section, Township, Range: SALEM Township
Landform (hillslope, terrace, etc.): depression on hillside Local relief (concave, convex, none): concave
Slope (%): 10 Lat: -76.170573 Long: 41.082386 Datum: NAD 83
Soil Map Unit Name: Chenango gravelly loam NWI classification: PEM
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation YES, Soil NO, or Hydrology NO significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
Are Vegetation NO, Soil NO, or Hydrology NO naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present?	Yes X No _____	

Remarks: (Explain alternative procedures here or in a separate report.)
Surrounded on all sides by mowed hayfield. Wetland occurs completely in depression on hillside.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No X	Depth (inches): _____
Water Table Present?	Yes X	No _____	Depth (inches): 10
Saturation Present? (includes capillary fringe)	Yes X	No _____	Depth (inches): 0-6

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
VEGETATION IS DISTURBED DUE TO MOWING. SITE IS LOCATED IN AN AGRICULTURAL HAY FIELD.

Water Table measurement was taken from auger hole that was dug approx. 20 hrs earlier. High clay content in soil makes pit water table rise slowly. This is likely to be a perched water table.

VEGETATION – Use scientific names of plants. Sampling Point: DPAP-1

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: 5')			
1. Aster simplex	60	Y	FACW
2. Juncus effusus	25	Y	FACW
3. Trifolium pratense	10	N	FACU
4. Taraxicum officinale	2	N	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	97 = Total Cover		

Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	
FACW species	85	x 2 =	170
FAC species	0	x 3 =	
FACU species	12	x 4 =	48
UPL species	0	x 5 =	
Column Totals:	97 (A)		218 (B)

Prevalence Index = B/A = 2.247

Hydrophytic Vegetation Indicators:

- ___ Rapid Test for Hydrophytic Vegetation
- X Dominance Test is >50%
- X Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DPAP-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-11	2.5 Y 5/2	70	7.5 YR 4/6	25	C	M,PL	clay loam	heavy roots in upper 3"
11-24	10 YR 5/1	75	7.5 YR 4/6	20	C	M	clay loam	
			10 YR 6/2	5	C	M	clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

Heavy roots in upper 3" of soil. Roots lessen and then disappear at 6".

This likely functions as a hydric soil due to the prevalence of hydrophytic vegetation and perched water table.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bell Bend NPP City/County: Luzerne Sampling Date: 5/5/10
Applicant/Owner: PPL State: PA Sampling Point: DPAP-2
Investigator(s): KRM/CJR Section, Township, Range: Salem Township
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Convex
Slope (%): 10 Lat: -76.1706 Long: 41.08225 Datum: NAD83
Soil Map Unit Name: Chenango gravelly loam NWI classification: Upland mowed hayfield
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation Y, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?** **Yes** _____ **No** X
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)
upland mowed hayfield.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____
Water Table Present? Yes _____ No X Depth (inches): _____
Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
A perched water table is not present.

VEGETATION – Use scientific names of plants. Sampling Point: DPAP-2

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	____ = Total Cover		

Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	____ = Total Cover		

Herb Stratum (Plot size: 15)			
1. Poa pratensis	25	Y	FACU
2. Aster simplex	15	Y	FACW
3. Taraxicum officinale	10	N	FACU
4. Anthoxanthum odoratum	5	N	FACU
5. Trifolium pratense	2	N	FACU
6. Onoclea sensibilis	1	N	FACW
7. Ranunculus acris	1	N	FAC
8.			
9.			
10.			
11.			
12.			
	59 = Total Cover		

Woody Vine Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
	____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	16	x 2 =	32
FAC species	1	x 3 =	3
FACU species	42	x 4 =	168
UPL species	0	x 5 =	0
Column Totals:	59 (A)		203 (B)

Prevalence Index = B/A = 3.44

Hydrophytic Vegetation Indicators:

___ Rapid Test for Hydrophytic Vegetation

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: DPAP-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 5/2	82	10YR 6/6	3	C	M	Clayey loam	
			2.5YR 3/4	15	C	M	—	
12-19	10YR 5/4	100					Clayey loam	
19-24	10YR 5/6	40	7.5YR 4/6	30	C	M	Clayey loam	
			7.5YR 6/1	30	D	M	—	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bell Bend NPP City/County: Luzerne Sampling Date: 4/30/10

Applicant/Owner: PPL State: PA Sampling Point: DPAC-1

Investigator(s): KRM/CJR/JBS Section, Township, Range: Salem Township

Landform (hillslope, terrace, etc.): Shallow Depression Local relief (concave, convex, none): Concave

Slope (%): 0-5% Lat: -76.169671 Long: 41.088683 Datum: NAD 83

Soil Map Unit Name: Chenango gravelly loam NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation Y, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present?	Yes X No _____	

Remarks: (Explain alternative procedures here or in a separate report.)

Vegetation is regularly mowed. Wetland bounded by upland forest to north and mowed fields to the west, south, and east.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____ No X	Depth (inches): _____
Water Table Present?	Yes _____ No X	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____ No X	Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

A perched water table is likely present.

VEGETATION – Use scientific names of plants. Sampling Point: DPAQ-1

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: 15)			
1. Fraxinus americana	1	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	1 = Total Cover		

Herb Stratum (Plot size:)			
1. Eleocharis spp.	15	Y	OBL
2. Solidago rugosa	15	Y	FAC
3. Cornus ammomum	1	N	FACW
4. Potentilla simplex	1	N	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	32 = Total Cover		

Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	15	x 1 =	15
FACW species	1	x 2 =	2
FAC species	15	x 3 =	45
FACU species	2	x 4 =	8
UPL species	0	x 5 =	0
Column Totals:	33 (A)		70 (B)

Prevalence Index = B/A = 2.12

Hydrophytic Vegetation Indicators:

- ___ Rapid Test for Hydrophytic Vegetation
- X Dominance Test is >50%
- X Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: DPAO-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-11	10YR 5/2	65	7.5YR 5/4	20	C	PL,M	clay loam	Roots are 20% of matrix at ≤ 6in.
11-20	10YR 6/4	80	10YR 6/2	10	D	M	Sandy	No roots
			7.5YR 5/6	5	C	M		
20-25	7.5YR 4/6	60	10YR 6/2	40	D	M	Sandy Loam	Small % sandy

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

Likely functions as a hydric soil due to the prevalence of hydrophytic vegetation.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bell Bend NPP City/County: Luzerne Sampling Date: 5/5/10
Applicant/Owner: PPL State: PA Sampling Point: DPAQ-2
Investigator(s): KAM/CJR Section, Township, Range: Salem Township
Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Convex
Slope (%): 0 Lat: -76.1695 Long: 41.08857 Datum: NAD 83
Soil Map Unit Name: Chenango gravelly loam NWI classification: UPL mowed field
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation Y, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes ____ No X	

Remarks: (Explain alternative procedures here or in a separate report.)
Field is mowed periodically

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ____ No X	Depth (inches): ____
Water Table Present?	Yes ____ No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes ____ No X	Depth (inches): 21

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Soil saturated at depth of 21".

VEGETATION – Use scientific names of plants. Sampling Point: DPAQ-2

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: 5')			
1. Schizachyrium scoparium	90	Y	FACU
2. Solidago rugosa	5	N	FAC
3. Aster pilosus	5	N	UPL
4. Potentilla canadensis	1	N	UPL
5. Taraxacum officinale	1	N	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	102 = Total Cover		

Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	5	x 3 =	15
FACU species	91	x 4 =	364
UPL species	6	x 5 =	30
Column Totals:	102 (A)		409 (B)

Prevalence Index = B/A = 4.01

Hydrophytic Vegetation Indicators:

___ Rapid Test for Hydrophytic Vegetation

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DPAQ-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 4/3	89	10YR 5/6	10	C	M	Clayey loam	
			2.5YR 3/6	1	C	M		
12-21	7.5YR 5/6	100					Clayey loam	
21-24	7.5YR 5/6	70	5YR 5/8	30	C	M	Clayey loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bell Bend NPP City/County: Luzerne Sampling Date: 6/15/10
Applicant/Owner: PPL State: PA Sampling Point: DP-AS1
Investigator(s): CJR Section, Township, Range: Salem Township
Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave
Slope (%): 0 Lat: -76.1704 Long: 41.08249 Datum: NAD 83
Soil Map Unit Name: Rexford loam NWI classification: PEM
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)
PEM bounded by Walker Run on east, west, and south; upland mowed field to north.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No _____ Depth (inches): 0-8
Water Table Present? Yes X No _____ Depth (inches): surface
Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): surface

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Pockets of standing water up to 8".

VEGETATION – Use scientific names of plants. Sampling Point: DP-AS1

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: 5')			
1. Juncus effusus	40	Y	FACW
2. Typha latifolia	40	Y	OBL
3. Carex stricta	20	N	OBL
4. Carex lurida	20	N	OBL
5. Solidago rugosa	5	N	FAC
6. Symplocarpus foetidus	5	N	OBL
7. Impatiens capensis	5	N	FACW
8.			
9.			
10.			
11.			
12.			
	135 = Total Cover		

Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	85	x 1 =	85
FACW species	45	x 2 =	90
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	135 (A)		190 (B)

Prevalence Index = B/A = 1.41

Hydrophytic Vegetation Indicators:

- ___ Rapid Test for Hydrophytic Vegetation
- X Dominance Test is >50%
- X Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: DP-AS1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-20+	10YR 2.5/1	100					Loamy Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

Soil saturated to surface with standing pools of water to 8".

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bell Bend NPP City/County: Luzerne Sampling Date: 6/15/10

Applicant/Owner: PPL State: PA Sampling Point: DP-AS-

Investigator(s): CJR Section, Township, Range: Salem Township

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex

Slope (%): 3 Lat: -76.1706 Long: 41.08455 Datum: NAD83

Soil Map Unit Name: Chenango gravelly loam NWI classification: upland mowed fld

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation Y, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present?	Yes _____	No X	

Remarks: (Explain alternative procedures here or in a separate report.)

Upland mowed field bounded by PEM to south and Market Street to north, west, and east.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP-AS2

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: 5')			
1. Poa pratensis	80		FACU
2. Trifolium pratense	40		FACU
3. Digitaria sanguinalis	30		FACU
4. Taraxacum officinale	5		FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	155 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	155	x 4 =	620
UPL species	0	x 5 =	0
Column Totals:	(A)		(B)

Prevalence Index = B/A = 4.0

Hydrophytic Vegetation Indicators:

___ Rapid Test for Hydrophytic Vegetation

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes _____ No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-AS2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 5/3	100					Clay loam	
8-20+	10YR 6/4	80	7.5YR 5/8	20	C	M	Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bell Bend NPP City/County: Luzerne Sampling Date: 6/15/10
Applicant/Owner: PPL State: PA Sampling Point: DP-AV1
Investigator(s): CJR Section, Township, Range: Salem Township
Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): Concave
Slope (%): 0 Lat: -76.1698 Long: 41.08402 Datum: NAD83
Soil Map Unit Name: Rexford loam NWI classification: PEM
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present?	Yes X No _____	

Remarks: (Explain alternative procedures here or in a separate report.)
Concave wetland located in upland meadow in floodplain of Walker Run.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No _____ Depth (inches): 0-2
Water Table Present? Yes X No _____ Depth (inches): Surface
Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): Surface

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Pockets of surface water 0-2" deep.

VEGETATION – Use scientific names of plants. Sampling Point: DP-AV1

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: 5')			
1. Juncus effusus	40	Y	FACW
2. Bromus inermis	30	Y	UPL
3. Solidago rugosa	20	N	FAC
4. Carex flurida	20	N	OBL
5. Ranunculus acris	2	N	FAC
6. Setaria Faberi	1	N	UPL
7.			
8.			
9.			
10.			
11.			
12.			
	113 = Total Cover		

Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	40	x 2 =	80
FAC species	22	x 3 =	66
FACU species	0	x 4 =	0
UPL species	31	x 5 =	155
Column Totals:	113 (A)		321 (B)

Prevalence Index = B/A = 2.84

Hydrophytic Vegetation Indicators:

- ___ Rapid Test for Hydrophytic Vegetation
- ___ Dominance Test is >50%
- X Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-AV1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 5/1	80	7.5YR 4/6	20	C	PL	Clay loam	
7-16	10YR 7/2	50	7.5YR 4/6	25	C	M	Clay Loam	
			7.5YR 5/1	25	D	M		
16-20+	10YR 6/1		10YR 5/6	40	C	M	Clay Loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bell Bend NPP City/County: Luzerne Sampling Date: 6/15/10
Applicant/Owner: PPL State: PA Sampling Point: DP-AV2
Investigator(s): CJK Section, Township, Range: Salem Township
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex
Slope (%): 1 Lat: -76.1699 Long: 41.08393 Datum: NAD 83
Soil Map Unit Name: Rexford loam NWI classification: upland mowed field
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation Y, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)
Meadow is mowed periodically and bounded on east and west by PEM, Walker Run to north, and hillslope upland to south.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)
- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)
- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ____ Depth (inches): ____
Water Table Present? Yes ____ No ____ Depth (inches): ____
Saturation Present? (includes capillary fringe) Yes ____ No ____ Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: DP-AV2

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: 5')			
1. Setaria faberi	60	Y	UPL
2. Solidago canadensis	40	Y	FACU
3. Solidago rugosa	20	N	FAC
4. Ranunculus acris	5	N	FAC
5. Bromus inermis	5	N	UPL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	130 = Total Cover		

Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	25	x 3 =	75
FACU species	40	x 4 =	160
UPL species	60	x 5 =	300
Column Totals:	125 (A)		535 (B)

Prevalence Index = B/A = 4.28

Hydrophytic Vegetation Indicators:

___ Rapid Test for Hydrophytic Vegetation

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-AV2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/4	90	7.5YR 5/8	10	C	M	Sandy loam	
8-20	10YR 5/4	90	7.5YR 5/8	10	C	M	Sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bell Bend NPP City/County: Luzerne Sampling Date: 6/15/10
Applicant/Owner: PPL State: PA Sampling Point: DP-AW1
Investigator(s): CJR Section, Township, Range: Salem Township
Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave
Slope (%): 0-3 Lat: -76.1693 Long: 41.0842 Datum: NAD 83
Soil Map Unit Name: Braceville gravelly loam NWI classification: PEM
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** Yes X No _____
Hydric Soil Present?	Yes X No _____	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present?	Yes X No _____	

Remarks: (Explain alternative procedures here or in a separate report.)
Wetland bounded by access road to east, upland meadow to south, upland meadow and Walker Run to west, fill from building foundation to north.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes X No _____ Depth (inches): <1
Water Table Present? Yes X No _____ Depth (inches): Surface
Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): Surface

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Soil saturated to surface, standing water in depressions < 1";

VEGETATION – Use scientific names of plants. Sampling Point: DP-AW1

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: 5')			
1. Juncus effusus	60	Y	FACW
2. Carex lurida	60	Y	OBL
3. Carex stricta	25	N	OBL
4. Impatiens capensis	1	N	FACW
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	151 = Total Cover		

Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	85	x 1 =	85
FACW species	61	x 2 =	122
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	146 (A)		207 (B)

Prevalence Index = B/A = 1.42

Hydrophytic Vegetation Indicators:

- ___ Rapid Test for Hydrophytic Vegetation
- X Dominance Test is >50%
- X Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-AW1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 4/1	70	7.5YR 4/6	30	C	PL	Loamy clay	
8-20	10YR 6/1	60	10YR 5/8	40	C	M	Sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) **(LRR R, MLRA 149B)**
- ___ Polyvalue Below Surface (S8) **(LRR R, MLRA 149B)**
- ___ Thin Dark Surface (S9) **(LRR R, MLRA 149B)**
- ___ Loamy Mucky Mineral (F1) **(LRR K, L)**
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) **(LRR K, L, MLRA 149B)**
- ___ Coast Prairie Redox (A16) **(LRR K, L, R)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR K, L, R)**
- ___ Dark Surface (S7) **(LRR K, L)**
- ___ Polyvalue Below Surface (S8) **(LRR K, L)**
- ___ Thin Dark Surface (S9) **(LRR K, L)**
- ___ Iron-Manganese Masses (F12) **(LRR K, L, R)**
- ___ Piedmont Floodplain Soils (F19) **(MLRA 149B)**
- ___ Mesic Spodic (TA6) **(MLRA 144A, 145, 149B)**
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

Gravel in soil past 8", pieces of charcoal also present past 8".

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bell Bend NPP City/County: Luzerne Sampling Date: 6/15/10
Applicant/Owner: PPL State: PA Sampling Point: DP-AW2
Investigator(s): CJR Section, Township, Range: Salem Township
Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Convex
Slope (%): 0-3 Lat: -76.1694 Long: 41.0842 Datum: NAD83
Soil Map Unit Name: Braceville gravelly loam NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ___ No X	**Is the Sampled Area within a Wetland?** Yes ___ No X
Hydric Soil Present?	Yes ___ No X	If yes, optional Wetland Site ID: ___
Wetland Hydrology Present?	Yes ___ No X	

Remarks: (Explain alternative procedures here or in a separate report.)
Small convex upland bounded on west by Walker Run and by emergent wetland to the east, north, and South.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)
- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)
- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___ No X	Depth (inches): ___
Water Table Present?	Yes ___ No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___ No X	Depth (inches): ___

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP-AW2

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: 5')			
1. Poa pratensis	60	Y	FACU
2. Setaria faberi	32	Y	UPL
3. Taraxacum officinale	1	N	FACU
4. Juncus effusus	1	N	FACW
5. Cirsium arvense	1	N	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	95 = Total Cover		

Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	1	x 2 =	2
FAC species	0	x 3 =	0
FACU species	62	x 4 =	248
UPL species	32	x 5 =	160
Column Totals:	95 (A)		410 (B)

Prevalence Index = B/A = 4.32

Hydrophytic Vegetation Indicators:

___ Rapid Test for Hydrophytic Vegetation

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-AW 2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-8	10YR 3/3	100					Clay loam	
8-18	10YR 5/3	95	10YR 4/6	5	C	M	Clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** X

Remarks:

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bell Bend NPP City/County: Luzerne Sampling Date: 6/15/10
Applicant/Owner: PPL State: PA Sampling Point: DP-AX1
Investigator(s): CJR Section, Township, Range: Salem Township
Landform (hillslope, terrace, etc.): floodplain Local relief (concave, convex, none): concave
Slope (%): 0-3 Lat: -76.1694 Long: 41.08355 Datum: NAD83
Soil Map Unit Name: Rexford loam NWI classification: PFO
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? Yes X No ____
If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)
Forested wetland bounded by access road to east, upland forest to west, Walker Run to north, and hillslope upland meadow to south.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)
- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)
- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Yes X No ____ Depth (inches): 3-5
Water Table Present? Yes X No ____ Depth (inches): Surface
Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): Surface

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Forested wetland located in depressional area in floodplain of Walker Run. Many pockets of standing water 3"-5" deep.

VEGETATION – Use scientific names of plants. Sampling Point: DP-AX1

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer rubrum	60	Y	FAC
2. Quercus palustris	5	N	FACW
3.			
4.			
5.			
6.			
7.			
	65	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15)			
1. Lindera benzoin	50	Y	FACW
2. Acer rubrum	5	N	FAC
3.			
4.			
5.			
6.			
7.			
	55	= Total Cover	

Herb Stratum (Plot size: 5)			
1. Impatiens capensis	80	Y	FACW
2. Symplocarpus foetidus	50	Y	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	130	= Total Cover	

Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	50	x 1 =	50
FACW species	135	x 2 =	270
FAC species	65	x 3 =	195
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	250 (A)		515 (B)

Prevalence Index = B/A = 2.06

Hydrophytic Vegetation Indicators:

- ___ Rapid Test for Hydrophytic Vegetation
- X Dominance Test is >50%
- X Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-AX1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10 YR 2/1	100					Loamy clay	
18+	10 YR 4/1	60	10 YR 5/1	40	D	M	Sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

Soil completely saturated with standing water in depressional areas (3" to 5" deep) throughout.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bell Bend NPP City/County: Luzerne Sampling Date: 6/15/10

Applicant/Owner: PPL State: PA Sampling Point: DP-AX2

Investigator(s): CTR Section, Township, Range: Salem Township

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex

Slope (%): 8 Lat: -76.1696 Long: 41.08373 Datum: NAD83

Soil Map Unit Name: Rex ford loam NWI classification: upland mowed field

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation Y, Soil Y, or Hydrology Y significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	If yes, optional Wetland Site ID: _____

Remarks: (Explain alternative procedures here or in a separate report.)

Upland mowed field bounded by hillslope meadow to west, PEM to north, PFO wetland to east and south. Area appears to have been disturbed in past, gravel in soil (refusal at 6") suggests fill and vegetation appears to be periodically mowed

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DP-AX 2

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: 5')			
1. Setaria faberi	80	Y	UPL
2. Potentilla canadensis	60	Y	UPL
3. Toxicodendron radicans	20	N	FACU
4. Parthenocissus quinquefolia	20	N	FACU
5. Solidago canadensis	15	N	FACU
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	195 = Total Cover		

Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	55	x 4 =	220
UPL species	140	x 5 =	700
Column Totals:	195 (A)		920 (B)

Prevalence Index = B/A = 4.72

Hydrophytic Vegetation Indicators:

___ Rapid Test for Hydrophytic Vegetation

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ___ No X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP-AX2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-6	10YR 4/3	100					Loam	very gravelly

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Auger refusal at 6", very gravelly.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bell Bend NPP City/County: Luzerne Sampling Date: 7/12/11
Applicant/Owner: PPL State: PA Sampling Point: DPBG-1
Investigator(s): KRM, CJR Section, Township, Range: Salem Township
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): Convex
Slope (%): 5 Lat: 41.07086059 Long: -76.14545347 Datum: WGS 84
Soil Map Unit Name: Wyoming gravelly loam (WyF) NWI classification: Upland Forest
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	**Is the Sampled Area within a Wetland?** Yes _____ No X
Hydric Soil Present?	Yes _____	No X	If yes, optional Wetland Site ID: _____
Wetland Hydrology Present?	Yes _____	No X	

Remarks: (Explain alternative procedures here or in a separate report.)
Upland forest - does not meet any indicators for wetland vegetation, wetland hydrology or hydric soil.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____
Water Table Present? Yes _____ No X Depth (inches): _____
Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No indicators of wetland hydrology.

VEGETATION – Use scientific names of plants. Sampling Point: DPBG-1

Tree Stratum (Plot size: 30)	Absolute % Cover	Dominant Species?	Indicator Status
1. Quercus velutina	60	Y	FACU
2. Carya ovata	1	N	FACU
3. Acer rubrum	2	N	FAC
4.			
5.			
6.			
7.			
	63	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15)			
1. Acer rubrum	30	Y	FAC
2. Quercus velutina	15	Y	FACU
3. Lindera benzoin	1	N	FACW
4.			
5.			
6.			
7.			
	46	= Total Cover	

Herb Stratum (Plot size: 5)			
1. Prunus serotina	1	N	FACU
2. Acer rubrum	1	N	FAC
3. Carya ovata	2	Y	FACU
4. Quercus velutina	2	Y	FACU
5. Sassafras albidum	2	Y	FACU
6. Fraxinus americana	1	N	FACU
7. Parthenocissus quinquefolia	2	Y	FACU
8.			
9.			
10.			
11.			
12.			
	11	= Total Cover	

Woody Vine Stratum (Plot size: NA)			
1. ~			
2.			
3.			
4.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 14.3 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ Rapid Test for Hydrophytic Vegetation

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks: (Include photo numbers here or on a separate sheet.)

Black oak dominated upland forest.

SOIL

Sampling Point: DPBG-1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	10YR 2/1	100					SL	dry, loose
1-4	10YR 3/2	100					SL	dry, loose
4-12	10YR 4/4	100					L	dry, loose, rocky

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Well drained upland soil. Does not meet any hydric soil indicators.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bell Bend NPP City/County: Luzerne Sampling Date: 7/12/11

Applicant/Owner: PPL State: PA Sampling Point: DPBG-2

Investigator(s): KRM, CJR Section, Township, Range: Salem Township

Landform (hillslope, terrace, etc.): Toeslope Local relief (concave, convex, none): Concave

Slope (%): 0-3 Lat: 41.07064853 Long: -76.14551919 Datum: WGS 84

Soil Map Unit Name: Wyoming gravelly loam (WyF) NWI classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X No ____	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes X No ____	

Remarks: (Explain alternative procedures here or in a separate report.)

Forested section of a moderately sized PFO/PEM wetland. Located in a toe of slope landform position and with a hydrologic regime based on groundwater discharge. Man made/modified and may have been a farm pond.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- X Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): 2"
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Saturation to surface. Groundwater seeps. Water also enters from a culvert discharge point in the northeast corner. Discharges to the canal. Meets 3 primary and four secondary hydrologic indicators.

VEGETATION – Use scientific names of plants.

Sampling Point: DPEC-2

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus serrulata	25	Y	OBL
2. Betula nigra	5	N	FACW
3. Acer rubrum	10	Y	FAC
4.			
5.			
6.			
7.			
	40	= Total Cover	

Sapling/Shrub Stratum (Plot size: 15')			
1. Alnus serrulata	15	Y	OBL
2. Acer rubrum	2	N	FAC
3. Lindera benzoin	1	N	FACW
4.			
5.			
6.			
7.			
	18	= Total Cover	

Herb Stratum (Plot size: 5')			
1. Impatiens capensis	15	Y	FACW
2. Carex sp.	1	N	FACW-OBL
3. Eulalia viminea	10	Y	FAC
4. Rosa multiflora	2	N	FACU
5. Lindera benzoin	3	N	FACW
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	31	= Total Cover	

Woody Vine Stratum (Plot size:)			
1. NA			
2.			
3.			
4.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ Rapid Test for Hydrophytic Vegetation
- X Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

A dense and vigorous stand of alders is located in the center of the PFO portion of this wetland complex.

SOIL

Sampling Point: UPBG-2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 2/2	100					organic	saturated, greasy
2-6	2.5Y 5/1	100					SL	saturated
6-12	2.5Y 4/1	70	10YR 3/3	30	C	M	SL	saturated, gravelly

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- X Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: See below

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

Meets 2 hydric soil indicators.

No restrictive layer was observed. Soils are saturated by groundwater discharge.

WETLAND DETERMINATION DATA FORM – Northcentral and Northeast Region

Project/Site: Bell Bend NPP City/County: Luzerne Sampling Date: 7/12/11
Applicant/Owner: PPL State: PA Sampling Point: DPBG-3
Investigator(s): KRM CJR Section, Township, Range: Salem Township
Landform (hillslope, terrace, etc.): Pond fringe Local relief (concave, convex, none): Concave
Slope (%): 0 Lat: 41.07026385 Long: -76.14600641 Datum: WGS 84
Soil Map Unit Name: Wyoming gravelly loam (WyF) NWI classification: PEM
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation N, Soil N, or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation N, Soil N, or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X No ____	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes X No ____	

Remarks: (Explain alternative procedures here or in a separate report.)
Lemna sp. abundant on open water. Pond full of largemouth bass and sunfish sp. Pond w/ emergent edge and scrub/shrub and forested wetland borders.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)
- X Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- X Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- X Other (Explain in Remarks)

Secondary Indicators (minimum of two required)
- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- X Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): ≤ 24"
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0"

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Soil boring taken on edge of wetland. Meets 4 primary and 3 secondary hydrologic indicators. "Other" primary indicator = true aquatic plants - Lemna spp. (Duckweed).

VEGETATION – Use scientific names of plants.

Sampling Point: DPBG-3

Tree Stratum (Plot size: NA)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: NA)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		

Herb Stratum (Plot size: 5)			
1. Impatiens capensis	15	N	FACW
2. Polygonum sagittatum	5	N	OBL
3. Polygonum perfoliatum	5	N	FAC
4. Typha latifolia	60	Y	OBL
5. Polygonum hydropiperoides	5	N	OBL
6. Holcus lanatus	7	N	FACU
7. Leersia oryzoides	10	N	OBL
8. Poa trivialis	7	N	FACW
9. Carex lurida	3	N	OBL
10. Lemna sp.	20	Y	OBL
11.			
12.			
	137 = Total Cover		

Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

- ___ Rapid Test for Hydrophytic Vegetation
- X Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub – Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

Broadleaved cattail dominated emergent wetland associated with a shallow waterbody.

SOIL

Sampling Point: DPBG-3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	7.5YR 3/2	100					SL	wet, sticky, saturated
5-12	Gley2 6/10B	90	7.5YR 5/6	10	C	M	L	gravel present

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surface (S7) (**LRR R, MLRA 149B**)
- ___ Polyvalue Below Surface (S8) (**LRR R, MLRA 149B**)
- ___ Thin Dark Surface (S9) (**LRR R, MLRA 149B**)
- ___ Loamy Mucky Mineral (F1) (**LRR K, L**)
- X Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ 2 cm Muck (A10) (**LRR K, L, MLRA 149B**)
- ___ Coast Prairie Redox (A16) (**LRR K, L, R**)
- ___ 5 cm Mucky Peat or Peat (S3) (**LRR K, L, R**)
- ___ Dark Surface (S7) (**LRR K, L**)
- ___ Polyvalue Below Surface (S8) (**LRR K, L**)
- ___ Thin Dark Surface (S9) (**LRR K, L**)
- ___ Iron-Manganese Masses (F12) (**LRR K, L, R**)
- ___ Piedmont Floodplain Soils (F19) (**MLRA 149B**)
- ___ Mesic Spodic (TA6) (**MLRA 144A, 145, 149B**)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: heavy/tight soil

Depth (inches): 5"

Hydric Soil Present? Yes X No ___

Remarks:

Shallow aquitard begins at 5"

Gleyed soil beginning at 5" in depth and extending to at least 12". This layer is a "tight" soil that likely has a high bulk density and perches surface water (episaturation). This boring was taken near the wetland boundary.

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.

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 SOIL SURVEY REGIONAL OFFICE (MO) 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).

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.

WAYLAND SERIES

The Wayland series consists of very deep, poorly drained and very poorly drained, nearly level soils formed in recent alluvium. These soils are in low areas or slackwater areas on flood plains. Saturated hydraulic conductivity is moderately high or high in the mineral soil. Slope ranges from 0 through 3 percent. Mean annual temperature is 49 degrees F. and mean annual precipitation is 36 inches.

TAXONOMIC CLASS: Fine-silty, mixed, active, nonacid, mesic Fluvaquentic Endoaquepts

TYPICAL PEDON: Wayland silt loam, on a 1 percent slope in a pasture of native grasses. (Colors are for moist soil.)

A-- 0 to 6 inches; very dark grayish brown (10YR 3/2) silt loam; light brownish gray (10YR 6/2) dry; strong medium and coarse granular structure; friable; common fine prominent yellowish brown (10YR 5/8) masses of iron accumulation within old root channels; neutral; clear smooth boundary (4 to 9 inches thick.)

Bg1-- 6 to 12 inches; dark grayish brown (10YR 4/2) silt loam; weak fine and medium subangular blocky structure; friable; slightly sticky; many fine roots in upper part; common medium distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; slightly acid; clear smooth boundary.

Bg2-- 12 to 18 inches; grayish brown (10YR 5/2) silt loam; weak fine and medium subangular blocky structure; friable; slightly sticky; many fine roots in upper part; common medium distinct yellowish brown (10YR 5/6) and dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; slightly acid; clear wavy boundary. (Combined thickness of the Bg horizon ranges from 12 to 24 inches thick.)

C1-- 18 to 46 inches; gray (5Y 5/1) silt loam; massive; friable; common medium distinct strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; neutral; abrupt wavy boundary.

C2-- 46 to 72 inches; gray (5Y 6/1) silty clay loam; massive; firm in place, slightly plastic; common medium distinct strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; slightly effervescent; slightly alkaline.

TYPE LOCATION: Chautauqua County, New York; in the town of Kiantone; 1/4 mile south of the intersection of U.S. Highway 62 and New York State Route 60, 1/4 mile east of U.S. Highway 62. USGS Jamestown, NY topographic quadrangle; Latitude 42 degrees, 03 minutes, 06 seconds N. and Longitude 79 degrees, 11 minutes, 38 seconds W., NAD 1927.

RANGE IN CHARACTERISTICS: Thickness of the solum ranges from 15 through 30 inches. Thickness of the silty deposits over stratified materials ranges from 36 inches through more than 60 inches. Bedrock is deeper than 60 inches. Depth to carbonates ranges from 24 through 60

inches. Rock fragments are commonly absent but can range up to 5 percent by volume within a depth of 36 inches and from 0 through 30 percent below depths of 36 inches. Rock fragments are mostly gravel or cobbles.

The A or Ap horizon has hue of 10YR or 2.5Y, value of 2 through 4, and chroma of 1 or 2, or it is neutral. It is fine sandy loam, silt loam or silty clay loam with or without mucky analogs. It has moderate or strong, fine through coarse, granular or subangular blocky structure. Reaction ranges from strongly acid through neutral. Thickness of the A horizon ranges from 2 through 6 inches.

The B horizon, up to 24 inches thick, has hue of 7.5YR through 5Y, value of 3 through 6, and chroma of 0 through 2. The texture is silt loam or silty clay loam. Structure is weak or moderate, fine, medium, or coarse subangular blocky through weak or moderate, coarse prismatic. Consistence is friable or firm and usually contains high chroma redoximorphic features. Reaction ranges from strongly acid through neutral.

The C horizon has hue of 7.5YR through 5Y or has gleyed hues including 5BG, 5GY, and 5G, with value of 3 through 6, and chroma of 1 or 2, or the horizon is neutral. It is silt loam or silty clay loam. The C horizon is massive. It is friable or firm and usually contains high chroma redoximorphic features. Reaction ranges from strongly acid through moderately alkaline.

The 2C horizon, where present, has color ranges similar to the C horizon. Texture ranges from fine sandy loam through silty clay loam in the fine-earth fraction. Reaction ranges from moderately acid through moderately alkaline.

COMPETING SERIES: The Melvin, Rahm, and Stanhope series are in the same family. Melvin soils have a mean annual temperature of greater than 50 degrees and are formed in alluvium of non-glacial origin. Rahm soils have a buried acid paleosol within 40 inches. Stanhope soils lack carbonates within 60 inches.

The Aetna, Atkins, Holderton, Saco, Shoals, Sloan, Stendal, Wakeville, and Wyalusing series are similar soils in related families. Aetna soils have a buried mollic epipedon. Atkins and Stendal soils are strongly acid throughout; in addition, Atkins soils have a fine-loamy particle-size control section. Holderton soils have a coarse-loamy particle-size control section, Wakeville soils have a coarse-silty particle-size control section, and both soils have dominant chroma of 3 or more in a subhorizon between 10 and 30 inches. Saco and Shoals soils have a coarse-silty particle-size control section. Sloan soils have a mollic epipedon. Wyalusing soils have a coarse-loamy over sandy or sandy skeletal particle-size control section.

GEOGRAPHIC SETTING: Wayland soils are on nearly level or depressed parts of flood plains of streams receiving runoff from uplands that contain some calcareous drift. They are mainly in or bordering areas of Wisconsin glaciation. Slope ranges from 0 through 3 percent. The climate is humid temperate. Mean annual precipitation ranges from 30 through 45 inches; mean annual temperature ranges from 47 through 50 degrees F., and mean frost-free period ranges from 110 through 160 days. The elevation ranges from 150 through 1700 feet above sea level.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the Chenango, Hamlin, Howard, Middlebury, Palmyra, Teel, Tioga, and Wakeville series. Chenango, Howard, and Palmyra soils do not have aquic moisture regimes and formed in adjacent gravelly outwash deposits. Well drained Hamlin, moderately well drained Teel, and somewhat poorly drained Wakeville soils are in a drainage sequence with Wayland soils. Middlebury and Tioga soils also formed in alluvial deposits but do not have aquic moisture regimes and have coarse-loamy particle-size control sections.

DRAINAGE AND SATURATED HYDRAULIC CONDUCTIVITY: Poorly and very poorly drained. The potential for surface runoff is negligible to very high. Saturated hydraulic conductivity is moderately high or high in the mineral soil. An apparent water table is at the surface or to a depth of 0.5 feet below the surface with occasional ponding.

USE AND VEGETATION: Native vegetation is red maple, alder, willow, and other trees tolerant of wet sites. Some areas have been cleared and drained, and are used for growing pasture or crops.

DISTRIBUTION AND EXTENT: Southern and western New York, northern Pennsylvania and north-eastern Ohio. MLRA's 101, 139, 140, 142 and 144A. The soils are of large extent.

MLRA OFFICE RESPONSIBLE: Amherst, Massachusetts

SERIES ESTABLISHED: Steuben County, New York, 1931.

REMARKS: Wayland series were classified as Entisols and classified to Mollic Fluvaquents. Most pedons have a B horizon and those pedons with a B horizon will now classify as Inceptisols and classified to Fluvaqentic Endoaquepts to the eighth edition. Older surveys using Wayland series need to consider which classification is suitable for their surveys.

Diagnostic horizons and other features recognized in this pedon are:
1. Ochric epipedon - the zone from 0 to 6 inches (A horizon).
2. Cambic horizon - the zone from 6 to 18 inches (Bg horizons).

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.

WELLSBORO SERIES

The Wellsboro series consists of very deep moderately well and somewhat poorly drained soils formed in till derived from red sandstone, siltstone, and shale. Slope ranges from 0 to 50 percent. Permeability is moderate in the surface and upper subsoil layers and slow or very slow in the lower subsoil and substratum. Mean annual precipitation is 41 inches. Mean annual temperature is 48 degrees F.

TAXONOMIC CLASS: Coarse-loamy, mixed, active, mesic Typic Fragiudepts

TYPICAL PEDON: Wellsboro silt loam - cropland. (Colors are for moist soils unless otherwise noted.)

Ap--0 to 7 inches; dark brown (7.5YR 3/2) silt loam, light brown (7.5YR 6/3) dry; weak fine granular structure; friable; many roots; 10 percent rock fragments; moderately acid (limed); abrupt smooth boundary. (5 to 12 inches thick.)

Bw1--7 to 11 inches; reddish brown (5YR 4/4) silt loam; weak fine subangular blocky structure; friable; slightly sticky, slightly plastic; many roots; 10 percent rock fragments; moderately acid; clear wavy boundary.

Bw2--11 to 18 inches; reddish brown (2.5YR 4/4) loam; moderate medium subangular blocky structure; friable; slightly sticky, slightly plastic; many roots; 10 percent rock fragments; strongly acid; abrupt wavy boundary.

Bw3--18 to 22 inches; reddish brown (5YR 4/4) channery loam; moderate medium subangular blocky structure; friable; few roots; 15 percent rock fragments; common medium distinct yellowish red (5YR 5/8) iron concentrations and gray (5YR 6/1) iron depletions; very strongly acid; abrupt wavy boundary. (Combined thickness of the Bw horizons is 5 to 26 inches.)

Bx1--22 to 31 inches; dark reddish brown (2.5YR 3/4) gravelly loam; moderate very coarse prismatic structure parting to weak medium subangular blocky; firm; brittle, slightly sticky, slightly plastic; very few faint clay films in pores; weak red (10R 5/2) thin silt coats on faces of prisms; 20 percent rock fragments; very strongly acid; diffuse boundary. (5 to 30 inches thick.)

Bx2--31 to 52 inches; dusky red (10R 3/4) gravelly loam; weak very coarse prismatic structure parting to moderate medium platy; firm; brittle; weak red (10R 5/2) coatings on faces of prisms decreasing in thickness with depth; few faint clay films and few black Mn coats on face of plates and in pores in the interior of prisms; 25 percent rock fragments; very strongly acid; diffuse boundary. (0 to 30 inches thick.)

Cd--52 to 72 inches; dusky red (10R 3/4) gravelly loam; moderate medium plate-like divisions; firm; 15 percent rock fragments; very strongly acid.

TYPE LOCATION: Columbia County, Pennsylvania; Sugarloaf Township, 2 miles south southeast of village of Central, 2.4 miles east intersection of Pa. routes 118 and 487 (old route 254), 6/10 miles south on township road and 150 feet west into field. USGS Red Rock, PA topographic quadrangle; Latitude 41 degrees, 16 minutes, 11 seconds N. and Longitude 76 degrees, 21 minutes, 35 seconds W. NAD 1927.

RANGE IN CHARACTERISTICS: Solum thickness is greater than 40 inches. Depth to the fragipan ranges from 12 to 30 inches. Depth to bedrock is 60 inches or more. Rock fragments of subangular and rounded sandstone, siltstone or shale range from 5 to 40 percent in the A and B horizons, and from 15 to 45 percent in the Bx and C horizons. Typically rock fragments average about 5 to 25 percent by volume above the fragipan and 15 to 40 percent by volume in and below the fragipan. The control section has less than 35 percent rock fragments by volume. Reaction commonly ranges from very strongly acid through moderately acid unless limed but the range includes extremely acid.

The Ap horizon has hue of 5YR through 10YR, value of 3 or 4, and chroma 2 or 3. Dry color value is 6 or more. Texture is loam or silt loam in the fine-earth fraction.

Pedons in wooded areas have an A horizon with hue of 5YR through 10YR, value of 2 through 4, and chroma of 1 or 2. These pedons also may have an E horizon with hue of 5YR through 10YR, value of 3 through 6, and chroma of 2 or 3. Texture is loam, silt loam, or fine sandy loam in the fine-earth fraction.

A B/E horizon may also be present in some pedons. Colors and textures of the B part of the B/E are similar to those of the Bw horizon. The E part of the B/E has color and texture similar to the E horizon.

The Bw horizon above 20 inches has hue of 2.5YR through 10YR, value of 4 to 6, and chroma of 3 through 6. The lower part of the Bw horizon includes subhorizons with chroma of 2. The Bw horizon has both high and low chroma redoximorphic features. Texture is loam or silt loam in the fine-earth fraction.

Some pedons have an E' horizon above the fragipan. Texture is fine sandy loam, loam, or silt loam in the fine-earth fraction.

The Bx horizon has chroma of 10R through 5YR, value of 3 through 5, and chroma of 2 through 4. Faces of prisms range in hue from 10R through 7.5YR, value of 4 through 7, and chroma of 2 or 3. Texture is sandy loam, loam, or silt loam in the fine-earth fraction. Structure of the Bx horizon is weak or moderate, coarse or very coarse prismatic. Prisms have platy, blocky, or massive interiors.

The Cd horizon is similar in color and texture to the Bx horizon.

COMPETING SERIES: The Bath, Braceville, Broadalbin, Ira, Lackawanna, Mardin, Rushford(T), Sodus, Swartswood, and Wurtsboro series are in the same family. The Bath, Broadalbin, and Mardin soils have hue of 7.5YR or yellower in the fragipan. Braceville soils

have stratified sand and gravel within the series control section. Ira, Sodus, Swartswood, and Wurtsboro soils have less than 60 percent silt plus very fine sand in the particle-size control section. Lackawanna soils do not have redoximorphic features above the fragipan. Rushford(T) soils have a silty lacustrine substratum with few or no rock fragments.

GEOGRAPHIC SETTING: Wellsboro soils are on nearly level to steep glaciated uplands. Slope ranges from 0 to 50 percent. The soils developed in firm till derived from reddish sandstone, siltstone, and shale. Mean annual precipitation ranges from 32 to 50 inches, mean annual air temperature ranges from 45 to 50 degrees, F., and the frost free season ranges from about 110 to 165 days.

GEOGRAPHICALLY ASSOCIATED SOILS: The Lackawanna, Morris, and Norwich soils are in a drainage sequence with Wellsboro. Morris soils have dominant chroma of 2 or less within 20 inches. Norwich soils have dominant chromas of 2 or less in all horizons below the Ap, or below 6 inches. Arnot, Lordstown, Maplecrest, and Oquaga soils are nearby. Arnot soils are shallow to bedrock; Lordstown and Oquaga soils are moderately deep. Maplecrest soils are well drained and lack a fragipan.

DRAINAGE AND PERMEABILITY: Moderately well and somewhat poorly drained. The potential for surface runoff is low to very high. Internal drainage is slow. Permeability is moderate in the surface and upper subsoil and slow or very slow in the fragipan and substratum.

USE AND VEGETATION: Many areas have been cleared and are used for growing hay, small grain, pasture, and potatoes. Some areas are idle. Woodlots contain sugar maple, American beech, red oak and white pine.

DISTRIBUTION AND EXTENT: The glaciated Allegheny Plateau of northwestern New Jersey, southern New York and northern Pennsylvania. MLRA 140. The series is extensive.

MLRA OFFICE RESPONSIBLE: Amherst, Massachusetts

SERIES ESTABLISHED: Tioga County, Pennsylvania, 1929.

REMARKS: Diagnostic horizons and features recognized in this pedon are:
1. Ochric epipedon - the zone from the surface of the soil to a depth of about 7 inches (Ap horizon).
2. Cambic horizon - the zone from 7 to 22 inches (Bw horizon).
3. Fragipan - the zone from 22 to 52 inches (Bx horizon).
4. Udic soil moisture regime (a humid, temperate climate).

Soil Interpretation Record No: PA0027, PA0028, PA0227

The activity class is based on pedon S86NY025-5 from Delaware County, NY.

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

A request for updated information concerning species of special concern was submitted to the USFWS by PPL Bell Bend LLC on 20 September 2010. A response from the USFWS is anticipated.

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

Date November 1, 2010 **PNDI Number: 21008**

Terry L. Harpster
PPL Bell Bend, LLC
38 Bomboy Lane, Suite 2
Berwick, PA 18603
FAX: 570-802-8119(Hard copy will not follow)
Re: Bell Bend Nuclear Power Plant
County: Luzerne Township: Salem

Dear Mr. Harpster,

Thank you for submission of the Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review Receipt Number 21008 for review. PA Department of Conservation and Natural Resources screened this project for potential impacts to species and resources of concern under DCNR's responsibility, which includes plants, terrestrial invertebrates, natural communities, and geologic features only.
There are no plant species or geologic features of concern in your project area. There are two terrestrial invertebrates of concern that were known to be in the project area.

Euphydras phaeton, **Baltimore Checkerspot, habitat is wet meadows, bogs, and marshes with flight in June through August. Larval food is Turtlehead, Hairy Beardtongue, English plantain, Foxglove and White Ash and the adult food is nectar from Milkweed, Virburnums and Wild Rose.**
Poanes massasolt, **Mulberry Wing, habitat is freshwater marshes or bogs with flight in late June through mid August. Larval food is** *Carex stricta* **and adult food is any flower nectar.**

When more detailed project information becomes available, please submit this project to our office for further review of potential impacts to these terrestrial species.

This response represents the most up-to-date summary of the PNDI data files and is valid for one (1) year from the date of this letter. An absence of recorded information does not necessarily imply actual conditions on-site. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered. Should the proposed work continue beyond the period covered by this letter, please resubmit the project to this agency as an "Update" (including an updated PNDI receipt, project narrative and accurate map.

This finding applies to impacts to DCNR only. To complete your review of state and federally-listed threatened and endangered species and species of special concern, please be sure the U.S. Fish and Wildlife Service, PA Game Commission, and the Pennsylvania Fish and Boat Commission have been contacted regarding this project as directed by the online PNDI ER Tool found at www.naturalheritage.state.pa.us

Sincerely,

Richard Shockey, Environmental Review Manager FOR Chris Firestone, Wild Plant Program Mgr.
Ph: 717-772-0263 ~ c-rshockey@state.pa.us

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

Bureau of Forestry **March 20, 2008** PNDI **019535**

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

"To manage all wild birds, mammals and their habitats for current and future generations."

ADMINISTRATIVE BUREAUS:

ADMINISTRATION.....717-787-5670
HUMAN RESOURCES.....717-787-7856
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CONTRACTS AND PROCUREMENT.....717-787-6594
LICENSING.....717-787-2084
OFFICE SERVICES.....717-787-2118
WILDLIFE MANAGEMENT.....717-787-5529
INFORMATION & EDUCATION.....717-787-6286
WILDLIFE PROTECTION.....717-783-6526
WILDLIFE HABITAT MANAGEMENT.....717-787-6818
REAL ESTATE DIVISION.....717-787-6568
AUTOMATED TECHNOLOGY SERVICES.....717-787-4076

www.pgc.state.pa.us

BUREAU OF WILDLIFE HABITAT MANAGEMENT
717-787-6818

December 28, 2010 **Large Project Review**

Mr. Bradley A. Wise
PPL Bell Bend, LLC
Two North Ninth Street (GENGL4)
Allentown, Pennsylvania 18101-1179

Re: Bell Bend Nuclear Power Plant Project – Proposed Electrical Plant
Salem Township, Luzerne County, Pennsylvania

Dear Mr. Wise,

Thank you for submitting the Pennsylvania Natural Diversity Inventory (PNDI) Environmental Review Receipt Number Bell Bend Nuclear Power Plant Project for review. The Pennsylvania Game Commission (PGC) screened this project for potential impacts to species and resources of concern under PGC responsibility, which includes birds and mammals only.

Potential Impact Anticipated

PNDI records indicate species or resources of concern are located in the vicinity of the project. The PGC has received and thoroughly reviewed the information that you provided to this office, as well as PNDI data, and has determined that potential impacts to the following endangered species may be associated with your project:

Scientific Name	Common Name	PA Status	Federal Status
Myotis sodalis	Indiana Bat	ENDANGERED	ENDANGERED

Next Steps

Indiana bats are a federally listed endangered species under the jurisdiction of the U.S. Fish and Wildlife Service. As a result, our agency defers comments on potential impacts to Indiana bats to the U.S. Fish and Wildlife Service.

This response represents the most up-to-date summary of the PNDI data files and is valid for one (1) year from the date of this letter. An absence of recorded information does not necessarily

imply actual conditions on site. Should project plans change or additional information on listed or proposed species become available, this determination may be reconsidered.

Should the proposed work continue beyond the period covered by this letter, please resubmit the project to this agency as an "Update" (including an updated PNDI receipt, project narrative and accurate map). If the proposed work has not changed and no additional information concerning listed species is found, the project will be cleared for PNDI requirements under this agency for an additional year.

This finding applies to impacts to birds and mammals only. To complete your review of state and federally-listed threatened and endangered species and species of special concern, please be sure that the U.S. Fish and Wildlife Service, the PA Department of Conservation and Natural Resources, and/or the PA Fish and Boat Commission have been contacted regarding this project as directed by the online PNDI ER Tool found at www.naturalheritage.state.pa.us.

Sincerely,

Olivia A. Braun
Environmental Planner
Division of Environmental Planning & Habitat Protection
Bureau of Wildlife Habitat Management
Phone: 717-787-4250, Extension 3128
Fax: 717-787-6957
e-Mail: OBraun@state.pa.us

A PNHP Partner

Pennsylvania Natural Heritage Program

OAB/oab

cc: Pamela Shellenberger, U.S. Fish & Wildlife Service
Librandi Mumma, PGC
DuBrock, PGC
Brauning, PGC
Butchkoski, PGC
Turner, PGC
Terry L. Harpster, PPL
File

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

March 10, 2011

IN REPLY REFER TO
SIR# 35087

BRADLEY WISE
PPL
TWO NORTH NINTH ST
ALLENTOWN, PA 18101

RE: Secondary Species Impact Review (SIR) #35087
BELL BEND NUCLEAR POWER PLANT
SALEM Township, LUZERNE County, Pennsylvania

Dear Mr. WISE:

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, the following rare or protected species are known from the vicinity of the project site:

Common Name	Scientific Name	PA Status
Northern cricket frog	*Acris crepitans*	endangered
Yellow lampmussel	*Lampsilis cariosa*	rare
Green floater	*Lasmigona subviridis*	rare

You sent additional information related to this project in response to our letter of October 14, 2010. According to our review of the wetland delineation report, the field survey of terrestrial fauna, and the proposed project plan, we do not anticipate adverse impacts from the proposed project to the northern cricket frog, which has not been confirmed on the site.

However, it has come to our attention that the proposed water withdrawal as well as the intake and outfall structures, have the potential to adversely impact the freshwater mussel species of concern. Preliminary mussel surveys confirmed the presence of rare mussels in the project area. These survey results were referenced in the wetland delineation report, but this office has not yet received the survey results. Additional mussel surveys and instream flow analysis are planned in 2011. The results of this work should be forwarded to this office for review of the potential impacts from the proposed project to the Commonwealth's freshwater mussel resources.

Note that this office performed no field inspection of the project area. Consequently, comments in this letter are not meant to address other issues or concerns that might arise concerning matters under Pennsylvania Fish and Boat Commission jurisdiction or that of other authorities. If you have any questions regarding this response, please contact Nevin Welte at 412-586-2334 and **refer to the SIR**

number at the top of this letter. Thank you for your cooperation and attention to this matter of nongame species conservation.

Sincerely,

Christopher A. Urban, Chief
Natural Diversity Section

CAU/NW/mr

Cc: Tom Shervinski, PFBC
Mark Hartle, PFBC
Eugene Trowbridge, PADEP
Jennifer Kagel, USFWS

Pennsylvania Fish & Boat Commission

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Division of Environmental Services
Natural Diversity Section
450 Robinson Lane
Bellefonte, PA 16823-9620
(814) 359-5237 Fax: (814) 359-5175

October 14, 2010

IN REPLY REFER TO
SIR# 35087

BRADLEY WISE
PPL
TWO NORTH NINTH ST
BERWICK, PA 18603

RE: Species Impact Review (SIR) – Rare, Candidate, Threatened and Endangered Species
BELL BEND NUCLEAR POWER PLANT
UPDATE TO SIR 27486
SALEM Township, LUZERNE County, Pennsylvania

Dear Mr. WISE:

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, the following rare or protected species are known from the vicinity of the project site:

Common Name	Scientific Name	PA Status
Northern cricket frog	*Acris crepitans*	endangered
Yellow lampmussel	*Lampsilis cariosa*	rare
Green floater	*Lasmigona subviridis*	rare

The Northern cricket frog is a small (less than 2") frog species found in a wide variety of habitats including permanent bodies of water such as slow-moving streams, ponds, lakes, marshes, bogs, and swamps, but also semi-permanent ponds and seasonal forest pools.. Breeding occurs from May to August with metamorphosed froglets emerging July to September. The Northern cricket frog occurs in small, isolated populations in eastern Pennsylvania. These small populations are threatened by pollution, and filling/clearing of wetlands and breeding habitat.

If wetlands, waterways, or vernal pools are to be directly or indirectly impacted by the project activity, we will need to conduct a more thorough evaluation of the potential adverse impacts to the northern cricket frog. Please provide us with the following information to assist us with our review: detailed project plans including a project narrative, identification and delineation of wetlands or streams within the direct and indirect impact area, and color photographs (dated, labeled, and keyed to a map) of wetlands, vernal pools, or waterways expected to be impacted. A habitat assessment or presence/absence survey may be requested for the species of 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 in the Susquehanna River 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 river. Strict erosion and sedimentation control measures, as well as best management practices should be employed.

If wetlands or water bodies *are not* to be disturbed by the proposed activity, and provided that best management practices are employed and strict erosion and sedimentation control measures are maintained, I do not foresee any adverse impacts to the species of concern listed above or any other rare or protected species under Pennsylvania Fish and Boat Commission jurisdiction.

Note that this office performed no field inspection of the project area. Consequently, comments in this letter are not meant to address other issues or concerns that might arise concerning matters under Pennsylvania Fish and Boat Commission jurisdiction or that of other authorities. If you have any questions regarding this response, please contact Kathy Gipe at 814-359-5186 and **refer to the SIR number at the top of this letter.** Thank you for your cooperation and attention to this matter of nongame species conservation.

Sincerely,

Christopher A. Urban, Chief
Natural Diversity Section

CAU/KDG/mr

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

NORMANDEAU ASSOCIATES
ENVIRONMENTAL CONSULTANTS

ELIZABETH VAN EPS GARLO, NHCWS

Community Ecologist/ Wetland Scientist

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 wetlands delineation and assessment.

EDUCATION

M.S.	1982, Zoology, North Carolina State University-minor, Statistics
B.S.	1967, Biology Southern Methodist University-minor, English

PROFESSIONAL EXPERIENCE

2002-Present	Normandeau Associates
1999-2001	Blue Moon Environmental
1997-1998	New England Environmental Associates
1994-1997	New Hampshire Dept. of Environmental Services, Wetlands Bureau
1994-1996	University of New Hampshire
1987-1994	Normandeau Associates
1982-1984	Battelle New England Research Laboratory
1979-1981	North Carolina State University (Res. Assistant)
1971-1978	Ichthyological Associates
1968-1971	Fishery Development Institute, Santiago, Chile (Peace Corps)

PROFESSIONAL AFFILIATIONS

Estuarine Research Federation
NH Assoc. 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. Data Analyst, Report Author, Arthropod and Mollusc Taxonomist.

Northeastern Utilities: Deerfield - Madbury transmission line upgrade, Deerfield, NH (2009) - Wetland boundary delineation. Wetlands Scientist.

AREVA: Bell Bend Nuclear Power Plant (proposed), Berwick, PA (2007 and 2009) - 640 acre wetland boundary delineation, and site walk with USACE. Wetlands Scientist.

Calais LNG: Calais, ME. (2008) – design, implement, analyze data and write up a benthic ecology survey for a proposed 1000 ft pier in the St. Croix River estuary. Environmental and Resource Report Author.

Quoddy Bay LNG, Eastport, ME (2006) - Wetland boundary delineation and vernal pool identification. Wetlands Scientist.

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.

Algonquine Gas Transmission Co. and TRC Environmental, Boston, MA. (2003-2004) - HubLine Pipeline Project 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, Data Analyst.

Maine Department of Marine Resources, W. Boothbay Harbor, ME. (2002) - Maine Aquaculture Review – Impacts of Salmon Farms. Report Author, Data Analyst.

Algonquine Gas Transmission Co. and Duke Energy, Portland, ME (1994) - Extensive wetlands flagging for the gas pipeline in Maine. Wetlands Scientist.

New Hampshire Department of Transportation (1990) - Route 101/51 EIS (NH). Wetlands delineation 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.

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

Wetlands Scientist; certified by NH Board of Natural Scientists; 2000-present.

Larval Fish Taxonomy and Ecology; Virginia Institute Marine Sci.; 2006.

Wetland Soils and Plants. University of New Hampshire; 1989.

Aquaculture. Virginia Institute of Marine Science, Watchapregue, VA; 1979.

SCUBA diver. NAUI; 1967.

SELECTED PRESENTATIONS

Pembroke, A.E. and E. V. Garlo. 2004. Hubline Pipeline Project Benthic Habitat Survey. Poster Presentation. The Coastal Society: 19th International Conference. RI.

SELECTED PEER-REVIEWEDD ARTICLES 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 in the 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 Converence. Newport, RI

NORMANDEAU ASSOCIATES
ENVIRONMENTAL CONSULTANTS

KEITH R. MAURICE

Senior Scientist

Mr. Maurice has over 30 years' experience in wetlands studies, fisheries science, and aquatic biology. He is currently 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, preparation of applications for state and Federal wetlands permits, and project related meetings with regulatory officials. 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 EXPERIENCE

1983-Present Normandeau Associates
1980-1983 Ichthyological Associates

PROFESSIONAL AFFILIATIONS

Society of Wetland Scientists
Philadelphia Botanical Club

PROFESSIONAL CERTIFICATIONS

Certified Wetland Delineator

SELECTED PROJECT EXPERIENCE

AREVA/UniStar Bell Bend Power Plant (2008-Present) – Environmental services in support of power plant siting in Luzerne County, Pennsylvania. Wetlands delineations, plant community mapping, impact assessment, regulatory compliance consulting, and agency meetings. Lead Wetlands Biologist.

Waste Management (1989-Present) - Wetlands delineations, impact assessments, mitigation design plans, technical reports, and state/federal wetlands permit applications for several landfill expansions in Lackawanna County, Pennsylvania. Project Manager and Biologist.

Reading Area Water Authority (2010) - Environmental regulatory compliance and sediment evaluation services for a reservoir maintenance dredging project in Berks County, Pennsylvania. Biologist

AREVA/Unistar Bell Bend Power Plant (2009) - Evaluation of alternative power plant sites and transmission corridors based on impacts to wetlands, rare species and publicly owned forest lands. Lead Wetlands Scientist.

Penn Wind/PA Solar (2009) – Best management practices manual for protection of eastern spadefoot toad during construction of a solar energy facility in Northumberland County, Pennsylvania. Biologist

First Wind (2009) - Fatal flaw analysis for a wind energy project in northeastern West Virginia. Biologist.

Glatfelter Paper Company (2009) - Wetlands delineations, bog turtle habitat surveys, PADEP Chapter 105 Exceptional Value Wetlands evaluations and wetlands permitting consultations for closure of an industrial landfill in York County, Pennsylvania. Project Manager and Biologist.

The H&K Group (1997-2009) – Wetlands delineations, regulatory compliance services, and post-construction monitoring of wetlands mitigation sites for quarry expansions and commercial developments in eastern Pennsylvania. Project Manager and Biologist.

Fisher Mines Thomas Northeast Tract (2007-2008) - Wetlands permitting, impact assessment, rare species screens, wetlands mitigation planning and meetings with regulatory officials for a surface coal mine expansion in Lycoming County, Pennsylvania. Biologist.

Evergreen Landscape Associates (2004-2008) - Wetlands services for municipal parks in Chester County, Pennsylvania. Wetlands delineations, technical reports, rare species screens and applications for state and federal wetlands permits. Project Manager and Biologist.

Jacques Whitford Company (2003-2008) - Environmental regulatory compliance services for utilities and commercial development in southeastern Pennsylvania. Wetlands delineations, bog turtle habitat surveys, technical reports, and environmental regulatory compliance consulting. Project Manager and Biologist.

Jacques Whitford Company (2007-2008) - PADEP Act 2 Land Recycling Program screening level ecological risk assessments at former manufactured gas plant sites. Project Manager and Biologist.

SAIC (2007) - PADEP ecological screening and evaluation of ecological receptors for brownfield site remediation in Dauphin County, Pennsylvania. Biologist.

Owens-Corning (2007) - NJDEP Environmentally Sensitive Areas GIS maps and Protection Plan for an industrial facility in the New Jersey Meadowlands to prevent impacts to ecologically sensitive natural resources by an accidental discharge of hazardous materials from the site. Project Manager and Biologist.

Brown and Caldwell (2006-2007) - Restoration and post-construction monitoring of wetland and upland habitats at a remediated Superfund Site in the New Jersey Pinelands. Project Manager and Biologist.

HNTB (2003-2007) - Wetlands delineations, rare species habitat surveys, and preparation of an application for New Jersey Pinelands Commission Public Development Approval for highway improvements in Ocean County, New Jersey. Project Manager and Biologist.

Waste Management (2000-2007) - Natural stream channel design for a 1-mile stream diversion that replicated channel structure and flow patterns of an intermittent headwater stream in northeastern Pennsylvania. EPA Rapid Bioassessment Protocols were then used to evaluate aquatic invertebrate habitat and assess development of riparian communities along the constructed channel. Biologist.

Waste Management (2000-2006) - Designed a 10.5-acre wetlands mitigation site to replace wetlands impacted by a landfill expansion in Lackawanna County, Pennsylvania. Conducted post-construction monitoring for five years following PADEP and U.S. Army Corps protocols. Principal Designer.

PPL Corporation (2006) – Mapped submerged aquatic vegetation and fisheries habitat for a 12-mile reach of the Susquehanna River in south-central Pennsylvania for use in GIS analyses. Biologist.

Brown and Caldwell (2005-2006) - Surveys for rare species/habitats in support of Superfund site remediation in Atlantic County, New Jersey. Project Manager and Biologist

Ocean County NJ Engineers' Office (2003-2006) - Conducted post-construction monitoring inspections and coordinated invasive plant control measures for a wetlands mitigation site. Biologist.

Johnson and Johnson (2002-2006) - Delineated wetlands at business campuses in New Jersey and Pennsylvania, and assisted with regulatory compliance tasks. Project Manager and Biologist.

Klienshmidt (2005) - Conducted a Phase I bog turtle habitat survey for a hydropower project on the Susquehanna River in Lancaster County, Pennsylvania. Project Manager and Biologist.

Mangi Environmental (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 including preparation of a Biological Assessment, obtaining rare species clearances and overseeing GIS mapping for the realigned trail sections. Project Manager and Biologist.

Exelon Power (2004-2005) - Environmental permitting, impact assessment, and sampling/regulatory evaluation of sediment for maintenance dredging at power plants in southeastern Pennsylvania. Biologist.

Jacques Whitford Company (2002-2005) - NJDEP Site Remediation Program baseline ecological evaluations of hazmat sites to assess contaminant migration pathways and determine potential impacts to nearby ecologically sensitive natural resources. Project Manager and Biologist.

Delaware County Solid Waste Authority (1996-2005) – Wetlands delineations, impact assessments, applications for PADEP and US Army Corps wetlands permits, and mitigation site design and post-construction monitoring for several landfill expansions in Berks County, Pennsylvania. Biologist.

Exelon Power (2004) - Prepared a summary of environmental regulatory approvals necessary for the installation of security facilities at three nuclear power stations in southeastern Pennsylvania. Biologist.

Chemsol (2002-2004) - Construction supervision and post-construction monitoring of created wetlands at a Superfund site in Middlesex County, New Jersey. 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.

Brown and Caldwell (2002) - Delineated wetlands at a New Jersey Meadowlands Superfund site and for proposed developments at an industrial park in Morris County, New Jersey. 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 and Biologist.

Southeastern Pennsylvania Transit Authority (2001) - Wetlands delineation and regulatory compliance services in support of improvements to a commuter rail line station. Project Manager and Biologist.

The H&K Group (2001) - Identified wetlands that were especially well suited for detecting potential hydrologic impacts from a nearby quarry operation based on proximity to the quarry, vegetation cover, hydrologic regime, and landscape position. Project Manager and Biologist.

Cowan Associates (2001) - Evaluated potential impacts for the proposed enclosure of a 250-feet section of intermittent stream in Bucks County, Pennsylvania. Project Manager/Biologist.

Allegheny Electric Corporation (2000-2001) - GIS mapping and analyses for the relicensing of a hydropower project on the Potomac River in Washington County, Maryland. Biologist.

PECO Energy Company (1996-2001) - Environmental regulatory compliance services for construction of a bridge and dredging of cooling water intake bays at a nuclear power station on the Susquehanna River in York County, Pennsylvania. Project Manager and 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.

Osram-Sylvania (1999) – Stream and wetland evaluations for an ecological risk assessment of chromium contaminated groundwater at a site in Tioga County, Pennsylvania. Project Manager and Biologist.

U.S. Army Corps of Engineers (1998) - Delineated wetlands along a 3.5-mile reach of the South River and prepared an application for an NJDEP Letter of Interpretation for a proposed flood control project in Middlesex County, New Jersey. Biologist.

The Home Depot (1997) - Wetlands permitting for a retail outlet center in Chester County, Pennsylvania. Project Manager and Biologist.

PECO Energy Company (1996) - Siting feasibility studies for electric substations and wetlands services for construction of a natural gas transmission line in southeastern, Pennsylvania. Biologist.

NJ Department of Transportation (1996) - Delineated wetlands for several highway projects spread throughout the state. Biologist.

SPECIAL TRAINING

OSHA-40 Hour Safety Certification and 8 Hour Safety Certification Refresher (Current)

Field Indicators of Hydric Soils in the Coastal Plain - Association of Profession Soil Scientists, 2009

Regional Delineation Manual Supplements Implementation and Use - U.S. Army Corps of Engineers, 2009

Ecological Risk Assessment Training - NJDEP, 2004 and PADEP, 2009

New Jersey Regionalized Water Budget Manual - Rutgers University, 2008

US Army Corps of Engineers and Pennsylvania DEP Wetlands Regulatory Update, 2008

Threatened and Endangered Species in New Jersey - Rutgers University, 1998 & 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 - NRCS and US Army Corps of Engineers, 2005

Bog Turtles and the Environmental Review Process in Pennsylvania, 2004

NJDEP Freshwater Wetlands Regulations and Stream Encroachment Regulations -Rutgers University 2003

Bioengineering for Stream Restoration - 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 Training - 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

SELECTED PEER-REVIEWED ARTICLES 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.

NORMANDEAU ASSOCIATES
ENVIRONMENTAL CONSULTANTS

CHRISTOPHER JOHN ROCHE

Project Biologist

Mr. Roche has over 9 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, electrofishing for fish community surveys, macroinvertebrate sampling, 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 EXPERIENCE

2008-Present	Normandeau Associates
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

SELECTED PROJECT EXPERIENCE

AREVA (2008-Present) – Year-long wetlands delineation, plant community, regulatory compliance consulting, and impacts 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.

Fisher Mining Co. (2008) – Macroinvertebrate sampling in support of ecological studies to evaluate the effectiveness of a treatment facility on acid mine drainage into Otter Run, Lycoming Co., PA. Sampling conducted using rock baskets placed at reference and experimental stations. Biologist.

Aventis Pasteur (2008) – Fish sampling in support of ecological studies on the impact of discharge from a veterinary pharmaceutical plant on Swiftwater Creek in the Pocono Mountains in northeast PA. Biologist.

Exelon Energy (2008) – Fish sampling in support of ecological studies for the Limerick Generating Station Water Supply Modification Demonstration Project and Wadesville Mine Pool Withdrawal and Stream Flow Augmentation Demonstration Project. Biologist.

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.

Exelon Energy (2008) – Fish sampling in the East Branch Perkiomen Creek, part of the Point Pleasant Water Diversion Project, Bucks and Montgomery Counties, PA. 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.

Woodard & Curran (2008) – Data search, literature synthesis, and reference annotation for potential effects regarding the construction of a proposed onshore and nearshore LNG Terminal in the intertidal and marine estuarine portion of the St. Croix River in the vicinity of Calais, ME. Analysis of the proposed Vessel Route was also conducted. Information gathered and summarized for coastal and marine avifauna.

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.

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 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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

ANG (2003) – Created a dichotomous key to implement the Warren Grove Range Erosion and Sedimentation Control and Roads Maintenance Plan.

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.

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.

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.

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.

Various Commercial Clients (2001) – Performed Phase I ESAs on various properties throughout NJ and NY for various commercial clients. Utilizing ASTM Standards, the proposed site was investigated primarily to identify REC. Biologist.

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 (May-July 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

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

NORMANDEAU ASSOCIATES
ENVIRONMENTAL CONSULTANTS

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 EXPERIENCE

2005-Present	Normandeau Associates
2005	Bower's Marine
2005	Cabela's Inc.
2004	Lendacki Construction

PROFESSIONAL AFFILIATIONS

The Wildlife Society
Pennsylvania Society for Ornithology

SELECTED PROJECT EXPERIENCE

AREVA/UniStar Bell Bend Nuclear Power Plant (2007-Present) - Extensive year-long survey of terrestrial vertebrates, wetlands and upland habitats including birds, mammals, reptiles and amphibians. Also assisted in fisheries data collection in multiple water bodies around proposed site (Salem Township, Luzerne County, PA). Biologist.

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.

Reading Anthracite Company (2008) – Wind RTE & Wildlife. Conducted a wildlife and habitat survey as requested by the Pennsylvania Game Commission in response to a PNDI review for a proposed wind power project in Schuylkill County. Included a hibernacula survey for Northern myotis and small-footed bats as well as an Indiana bat mist net survey and an Allegheny woodrat habitat survey. Field Biologist.

AREVA (2008) – Conducted an Indiana bat survey at the site of the proposed Bell Bend Nuclear Power Plant 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.

Clipper Wind Energy/TetraTech (2006) - Determined 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. Biologist.

Geryville Materials, Inc. (2006) –Conducted an Indiana Bat Mist Net Survey on a 700-acre proposed quarry site in Lower Milford Township, Lehigh County, PA. Field Biologist.

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 an 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