

## **Wetlands Delineation and Exceptional Value Wetlands Analysis Report for the Proposed Bell Bend Nuclear Power Plant Site, Luzerne County, Pennsylvania**

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were detected during these studies with the exception of the peregrine falcon (*Falco peregrinus*). In 2007 and 2008, a pair of peregrine falcons (Pennsylvania endangered) nested and successfully raised young on a cliff site along the Susquehanna River approximately 2 miles from the site. Despite the nearby nest, only one observation of a peregrine falcon was made over the site during the 41 field-days of the terrestrial fauna surveys. Therefore, most peregrine falcon activity associated with this nest site likely takes place closer to the river (AREVA, 2011c).

### **Pennsylvania Department of Conservation and Natural Resources**

PDCNR has jurisdiction over rare plants, natural communities, terrestrial invertebrates and certain geological features in Pennsylvania. PDCNR replied that there were no known occurrences of plants or geological features of state concern within the site. However, in the 2008 response letter the agency listed four butterfly species of concern known to occur in the project vicinity including the northern pearly-eye (*Enodia anthedon*), Baltimore checkerspot (*Euphydras phaeton*), mulberry wing (*Poanes massasoit*) and long dash (*Polites mystic*). In the 2010 response letter the agency revised the initial list to include only Baltimore checkerspot and mulberry wing as species of concern known to occur in the project vicinity. Long dash and northern pearly-eye have been removed from the Pennsylvania Natural Heritage Program (PNHP) tracked species list due to a recent revision of state ranks (AREVA, 2011c).

Butterfly surveys were conducted onsite during June and July 2008 by an experienced entomologist (Daniel Bogar) to determine the presence or absence of species of special concern. No northern pearly-eye, mulberry wing or Baltimore checkerspot butterflies were detected during the study; however, one long dash was collected. In addition, black dash (*Euphyes conspicua*), a new butterfly species of special concern for Luzerne County, was collected and observed during the survey (AREVA, 2011c). The black dash is no longer a species of special concern and has been removed from the PNHP list of tracked species.

The PNHP classifies mulberry wing as vulnerable (S2) and the Baltimore checkerspot as imperiled (S3) (PNHP, 2011). Wetlands onsite potentially provide suitable habitat for these butterflies based on habitat descriptions provided by PDCNR and information researched by Normandeau concerning life histories, and breeding/foraging preferences of these species (AREVA, 2011c; USGS, 2010). PDCNR requested that attempts be made to minimize impacts to potential habitat for these butterflies within the site. Current development plans largely avoid all wetlands habitat and, therefore, comply with PDCNR requests.

### **Pennsylvania Fish and Boat Commission**

PFBC has jurisdiction over fishes, reptiles, amphibians, aquatic invertebrates and freshwater mussels designated as special concern in Pennsylvania. The agency's 2008 reply indicated that three species classified as "special concern" were known from the vicinity of the site and comprised the eastern hognose snake (*Heterodon platyrhinos*), yellow lampmussel (*Lampsilis cariosa*) and green floater (*Lasmigona subviridis*). In the 2010 response letter the agency revised the initial list to include northern cricket frog (*Acris crepitans crepitans*), a state endangered species, and no longer listed the eastern hognose snake. In addition, the status of yellow lampmussel and green floater was changed from special concern to rare.

As noted above, comprehensive field studies were undertaken during the period of July 2007

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through June 2010 to document the occurrence and distribution of terrestrial and aquatic fauna onsite. Taxa surveyed included fishes, reptiles, amphibians and freshwater mussels. No Federally listed threatened or endangered species were observed; however, the northern cricket frog, a state listed endangered species, was heard vocalizing within the project area (AREVA, 2010; 2011a; 2011c). Note that the presence of the northern cricket frog was limited to two separate auditory observations of the species and no individuals of the species were observed visually. A 2011 letter from the PFBC indicated that adverse impacts to northern cricket frog were not anticipated as a result of the project. One state listed candidate fish species, brook stickleback (*Culaea inconstans*), was collected during the aquatic survey (AREVA, 2011a). No previous occurrences of the brook stickleback are known from the Susquehanna River or adjacent waterbodies in the vicinity of BBNPP and it is probable that the single brook stickleback was introduced through human action (i.e. bait bucket or aquarium fish). In addition, these surveys also detected the presence of four other reptiles designated by the PFBC as "Species of Special Concern" (PFBC 2010a). Species observed consisted of the eastern ribbon snake (*Thamnophis sauritus*), wood turtle (*Glyptemys insculpta*), map turtle (*Graptemys geographica*), and eastern box turtle (*Terrapene carolina carolina*) (AREVA, 2011c). To varying degrees, wetlands onsite would provide habitat for all of these species (Shaffer 1999).

Additionally, aquatic ecological surveys conducted during 2007 in the Susquehanna River confirmed the presence of the yellow lampmussel and green floater in the vicinity of the proposed BBNPP intake and discharge structures (AREVA, 2010). The PNHP classifies yellow lampmussel as vulnerable (S3) to apparently secure (S4) and the green floater as imperiled (S2) (PNHP, 2011).

### **Summary**

Jurisdictional Federal and state natural resource management agencies were contacted regarding the potential presence of species of special concern within 0.5-miles radius of an area encompassing the site, PPL-owned lands to the north and the Susquehanna Riverlands. Responses from these agencies indicated that potential occurrences of Federally-listed threatened or endangered species were limited to the Indiana bat, only. In addition, the only potential occurrence of a state-listed threatened or endangered species was the northern cricket frog. However, seven special concern taxa that are still currently tracked by state agencies were noted as potentially occurring onsite. These species consisted of two bats, eastern small-footed myotis and northern myotis; two butterflies, Baltimore checkerspot and mulberry wing; one snake, eastern hognose snake; and two mussels, yellow lampmussel and green floater.

Comprehensive field studies of aquatic and terrestrial fauna, including an Indiana bat mist net survey and an Indiana bat roost tree survey, were conducted throughout the site during the period of July 2007 through July 2011. These studies did not detect any Federally-listed threatened or endangered species, or other Federal species of special concern. However, some of the interior forest and many of the forest edges surveyed during the Indiana bat roost tree survey provided densities of potential roost trees (PRTs) suitable for Indiana bat roosting habitat with forested wetlands providing higher quality roosting habitat than forested uplands on the site (AREVA, 2011d). No Pennsylvania-listed threatened species were detected and occurrences of state-listed endangered species were limited to a single peregrine falcon observation and two auditory observations of the northern cricket frog. The peregrine falcon nest is located along the Susquehanna River approximately 2-miles from the site.



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A total of seven other state-tracked species were documented onsite during these studies and included one bat, northern myotis (candidate rare); and two mussels, yellow lampmussel (vulnerable to apparently secure), and green floater (imperiled). Four reptiles designated as species of special concern were also observed and consisted of the eastern ribbon snake, wood turtle, map turtle, and eastern box turtle. Northern myotis was the only species of special concern that was both observed onsite and reported by the jurisdictional agencies as potentially occurring in the vicinity of the BBNPP site. Various measures are available to protect rare species during site construction.

In conclusion, site wetlands do not qualify as Exceptional Value under this criterion since they do not provide habitat for Federal or state-listed threatened or endangered species. Even though PRT densities in some of the surveyed forested areas were suitable for Indiana bat roosting habitat, there are no known occurrences of Indiana bat in the wetland or upland areas on the site. Additionally, the northern cricket frog was heard during a 2007 field survey but was not visually confirmed as being present onsite.

**2. *Wetlands that are hydrologically connected to or located within 1/2-mile of wetlands identified in question 1 and that maintain the habitat of the threatened or endangered species within the wetlands identified above.***

Information concerning the presence of species of special concern within a 0.5-mile radius of an area encompassing the site, PPL-owned lands to the north and the Susquehanna Riverlands was requested from jurisdictional natural resource management agencies and is summarized above. Site wetlands do not qualify as Exceptional Value under this criterion.

**3. *Wetlands that are located in or along the floodplain of the reach of a wild trout stream or waters listed as Exceptional Value under Chapter 93 (relating to water quality standards) and the floodplain of streams tributary thereto, or wetlands within the corridor or a watercourse or body of water that has been designated as a National wild or scenic river in accordance with the Wild and Scenic Rivers Act of 1968 or designated as wild or scenic under the Pennsylvania Scenic Rivers Act.***

Wetlands onsite are not located in or along the floodplain of an Exceptional Value water, or within the corridor of a watercourse or body of water that has been designated as a wild or scenic river at the state or Federal level. Walker Run and the Susquehanna River are not designated as Exceptional Value in PADEP's Chapter 93 Water Quality Standards. They are classified as having the protected uses of Cold Water Fishes (CWF) and Warm Water Fishes (WWF), respectively (PADEP, 2006a). In addition, neither watercourse is designated as wild or scenic at either the state or federal level (PDCNR 2010).

Walker Run is not designated by PFBC as a Class A Wild Trout Stream but is included in the agency's May 2010 list of "Pennsylvania Stream Sections that Support Wild Trout" from its headwaters down to the confluence with the North Branch of the Susquehanna River. In April and July 2008, Normandeau collected small numbers of brown trout (*Salmo trutta*) in Walker Run at stations located onsite, as well as stations located upstream and downstream of the site. The size range of the specimens indicated the presence of a naturally reproducing brown trout population and this was confirmed by a subsequent PFBC fisheries survey of the stream. As a

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result, Walker Run was designated by PFBC as a Wild Trout Stream from its headwaters down to the confluence with the North Branch of the Susquehanna River on December 19, 2009.

Therefore, 25 PA Code 105.17 condition 3 “Wetlands that are located in or along the floodplain of the reach of a wild trout stream” is met and the wetlands associated with Walker Run and its eastern tributary are Exceptional Value wetlands.

- 4. Wetlands located along an existing public or private drinking water supply, including both surface water and groundwater sources, which maintain the quality or quantity of the drinking water supply.***

Walker Run is not used as a public or private drinking water supply. Although the Susquehanna River may be used as a water supply in some regions, the river is not used for this purpose in the vicinity of the site. Site wetlands do not qualify as Exceptional Value under this criterion.

- 5. Wetlands located in areas designated by the Department as "natural" or "wild" areas within state forest or park lands, wetlands located in areas designated as Federal wilderness areas under the Wilderness Act or the Federal Eastern Wilderness Act of 1975 or wetlands located in areas designated as National Natural Landmarks by the Secretary of the Interior under the Historic Sites Act of 1935.***

The site is wholly-owned by PPL and none of the above state or Federal designations are applicable. Site wetlands do not qualify as Exceptional Value under this criterion.

**SUMMARY**

In summary, BBNPP site wetlands do meet Exceptional Value Wetlands criterion 3. BBNPP site wetlands associated with Walker Run and its eastern tributary meet the Chapter 105.17 criteria for Exceptional Value wetlands since it has been determined by the PFBC that Walker Run meets the criteria for classification as a stream section that supports naturally reproducing wild trout.

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## **TABLES**

Table 1. Soils Mapped in the BBNPP Project Boundary<sup>1</sup>.

Name	Drainage Class	Hydric Status
Atherton silt loam	Poorly to very poorly	Hydric
Arnot-Rock outcrop complex, steep	Well	Not hydric
Braceville gravelly loam	Moderately well	Not hydric <sup>2</sup>
Chenango gravelly loam	Well	Not hydric
Holly silt loam	Poorly	Hydric
Morris very stony silt loam	Somewhat poorly and poorly	Not hydric <sup>2</sup>
Oquaga & Lordstown channery silt loams	Well	Not hydric <sup>2</sup>
Oquaga & Lordstown extremely stony loams	Well	Not hydric <sup>2</sup>
Pope soils	Well	Not hydric <sup>2</sup>
Rexford loam	Somewhat poorly and poorly	Hydric
Wayland silt loam	Poorly and very poorly	Hydric
Weikert & Klinesville channery silt loam	Well	Not hydric <sup>2</sup>
Wellsboro very stony silt loam	Moderately well and somewhat poorly	Not hydric <sup>2</sup>
Wyoming gravelly loam	Somewhat excessively	Not hydric

<sup>1</sup> Sources: Penn State Cooperative Extension. 2010. SoilMap Version 2.<sup>2</sup> May have inclusions of hydric soil in seepage areas, bottomlands, depressions and/or drainageways.

Table 2. Common plants identified in the BBNPP Project Boundary.

Scientific Name <sup>3,4</sup>	Common Name	Indicator Status <sup>1, 2</sup>
<u>Trees and Saplings</u>		
<i>Acer saccharinum</i>	silver maple	FACW
<i>Acer rubrum</i>	red maple	FAC
<i>Ailanthus altissima</i>	tree-of-heaven	FACU-
<i>Betula alleghaniensis</i>	yellow birch	FAC
<i>Betula lenta</i>	sweet birch	FACU
<i>Betula nigra</i>	river birch	FACW
<i>Betula populifolia</i>	gray birch	FAC
<i>Carya cordiformis</i>	bitternut hickory	FACU+
<i>Carya ovata</i>	shagbark hickory	FACU-
<i>Carya tomentosa</i>	mockernut hickory	UPL
<i>Celtis occidentalis</i>	hackberry	FACU
<i>Cornus florida</i>	flowering dogwood	FACU-
<i>Fagus grandifolia</i>	American beech	FACU
<i>Fraxinus americana</i>	white ash	FACU
<i>Fraxinus pennsylvanica</i>	green ash	FACW
<i>Juglans nigra</i>	black walnut	FACU
<i>Juniperus virginiana</i>	eastern red cedar	FACU
<i>Liriodendron tulipifera</i>	yellow poplar	FACU
<i>Malus</i> spp.	apple	UPL
<i>Nyssa sylvatica</i>	black gum	FAC
<i>Pinus resinosa</i>	red pine	FACU
<i>Pinus strobus</i>	eastern white pine	FACU
<i>Pinus sylvestris</i>	Scots pine	UPL
<i>Platanus occidentalis</i>	American sycamore	FACW-
<i>Populus deltoides</i>	eastern cottonwood	FAC
<i>Populus tremuloides</i>	quaking aspen	FACU
<i>Prunus serotina</i>	black cherry	FACU
<i>Quercus alba</i>	white oak	FACU-
<i>Quercus bicolor</i>	swamp white oak	FACW+
<i>Quercus palustris</i>	pin oak	FACW
<i>Quercus rubra</i>	northern red oak	FACU-
<i>Quercus velutina</i>	black oak	UPL
<i>Robinia pseudoacacia</i>	black locust	FACU-
<i>Sassafras albidum</i>	sassafras	FACU-
<i>Tilia americana</i>	American basswood	FACU
<i>Tsuga canadensis</i>	eastern hemlock	FACU
<i>Ulmus rubra</i>	slippery elm	FAC
<u>Woody Vines</u>		
<i>Lonicera japonica</i>	Japanese honeysuckle	FAC-
<i>Parthenocissus quinquefolia</i>	Virginia creeper	FACU
<i>Rubus flagellaris</i>	northern dewberry	UPL
<i>Smilax glauca</i>	cat greenbrier	FACU

Table 2. (Continued)

Scientific Name <sup>3,4</sup>	Common Name	Indicator Status <sup>1, 2</sup>
<u>Woody Vines</u>		
<i>Smilax rotundifolia</i>	common greenbrier	FAC
<i>Toxicodendron radicans</i>	poison ivy	FAC
<i>Vitis labrusca</i>	fox grape	FACU
<u>Shrubs</u>		
<i>Alnus</i> spp.	alders	FAC-OBL
<i>Alnus serrulata</i>	smooth alder	OBL
<i>Cornus amomum</i>	silky dogwood	FACW
<i>Cornus racemosa</i>	swamp dogwood	FAC
<i>Elaeagnus angustifolia</i>	Russian olive	FACU
<i>Hamamelis virginianus</i>	American witch-hazel	FAC-
<i>Ilex verticillata</i>	winterberry	FACW+
<i>Kalmia latifolia</i>	mountain laurel	FACU
<i>Ligustrum obtusifolium</i>	privet	FACU
<i>Lindera benzoin</i>	northern spicebush	FACW-
<i>Lonicera tatarica</i>	tartarian honeysuckle	FACU
<i>Rhus typhina</i>	staghorn sumac	FACU
<i>Rosa multiflora</i>	multiflora rose	FACU
<i>Rubus allegheniensis</i>	Allegheny blackberry	FACU-
<i>Rubus occidentalis</i>	black raspberry	UPL
<i>Sambucus canadensis</i>	American elder	FACW-
<i>Salix discolor</i>	pussy willow	FACW
<i>Salix nigra</i>	black willow	FACW+
<i>Spiraea latifolia</i>	broad-leaf meadow-sweet	FAC+
<i>Vaccinium corymbosum</i>	highbush blueberry	FACW-
<i>Viburnum cassinoides</i>	withe-rod	FACW
<i>Viburnum dentatum</i>	arrow-wood	FAC
<i>Viburnum prunifolium</i>	black-haw	FACU
<u>Herbs</u>		
<i>Achillea millefolium</i>	common yarrow	FACU
<i>Acorus calamus</i>	sweetflag	OBL
<i>Agropyron repens</i>	quack grass	FACU-
<i>Agrostis gigantea</i>	redtop	FACW
<i>Alisma subcordatum</i>	subcordate water-plantain	OBL
<i>Alliaria petiolata</i>	garlic mustard	FACU-
<i>Allium vineale</i>	field garlic	FACU-
<i>Ambrosia artemisiifolia</i>	common ragweed	FACU
<i>Anthoxanthum odoratum</i>	sweet vernal grass	FACU
<i>Apocynum cannabinum</i>	clasping leaf dogbane	FACU
<i>Arctium minus</i>	common burdock	UPL
<i>Arisaema triphyllum</i>	swamp jack-in-the-pulpit	FACW-

Table 2. (Continued)

Scientific Name <sup>3,4</sup>	Common Name	Indicator Status <sup>1,2</sup>
<u>Herbs</u>		
<i>Artemisia vulgaris</i>	mugwort	UPL
<i>Asclepias incarnata</i>	swamp milkweed	OBL
<i>Asclepias syriaca</i>	common milkweed	FACU-
<i>Aster pilosus</i>	white heath aster	UPL
<i>Aster puniceus</i>	swamp aster	OBL
<i>Aster simplex</i>	panicked aster	FACW
<i>Barbarea vulgaris</i>	winter-ress	FACU
<i>Bidens</i> spp.	beggar-ticks	FACW-OBL
<i>Boehmeria cylindrica</i>	false nettle	FACW+
<i>Bromus inermis</i>	smooth brome grass	UPL
<i>Carex</i> spp.	sedges	FAC-OBL
<i>Carex lurida</i>	shallow sedge	OBL
<i>Carex stricta</i>	uptight sedge	OBL
<i>Chenopodium album</i>	lamb's quarters	FACU+
<i>Cicuta bulbifera</i>	water hemlock	OBL
<i>Cinna arundinacea</i>	stout wood-reedgrass	FACW+
<i>Cirsium arvense</i>	Canada thistle	FACU
<i>Cirsium vulgare</i>	bull thistle	FACU-
<i>Claytonia virginica</i>	spring beauty	FACU
<i>Conyza canadensis</i>	horseweed	UPL
<i>Coronilla varia</i>	crown-vetch	UPL
<i>Cyperus</i> spp.	nutsedges	FACW
<i>Dactylis glomerata</i>	orchard grass	FACU
<i>Daucus carota</i>	Queen Anne's lace	FACU
<i>Dennstaedtia punctilobula</i>	hayscented fern	UPL
<i>Dichanthelium clandestinum</i>	deer-tongue witchgrass	FAC+
<i>Digitaria sanguinalis</i>	common crabgrass	FACU-
<i>Dipsacus sylvestris</i>	teasel	FACU-
<i>Dryopteris spinulosa</i>	spinulose wood-fern	FAC+
<i>Eleocharis</i> spp.	spikerushes	FACW-OBL
<i>Erechtites hieraciifolia</i>	American burn	FACU
<i>Erigeron annuus</i>	daisy fleabane	FACU
<i>Erigeron philadelphicus</i>	Philadelphia fleabane	FACU
<i>Erythronium americanum</i>	dogtooth violet	FAC
<i>Eulalia viminea</i>	Nepal microstegium	FAC
<i>Eupatoriadelphus</i> spp.	Joe-Pye-weed	FAC-FACW
<i>Eupatorium perfoliatum</i>	common boneset	FACW+
<i>Euthamia graminifolia</i>	flat-top fragrant goldenrod	FAC
<i>Fragaria virginianum</i>	Virginia strawberry	FACU
<i>Fragaria virginianum</i>	Virginia strawberry	FACU
<i>Galium mollugo</i>	wild madder	FACU
<i>Geum canadense</i>	white avens	FACU
<i>Glyceria striata</i>	fowl manna grass	OBL
<i>Hesperis matronalis</i>	dames rocket	FACU-



Table 2. (Continued)

Scientific Name <sup>3,4</sup>	Common Name	Indicator Status <sup>1,2</sup>
<u>Herbs</u>		
<i>Holcus lanatus</i>	common velvet grass	FACU
<i>Hypericum perforatum</i>	St. John's wort	FACU
<i>Impatiens capensis</i>	jewelweed	FACW
<i>Juncus effusus</i>	soft rush	FACW+
<i>Juncus tenuis</i>	path rush	FAC-
<i>Lamium purpureum</i>	purple dead nettle	UPL
<i>Leersia oryzoides</i>	rice cutgrass	OBL
<i>Lemna</i> spp.	duckweeds	OBL
<i>Leucanthemum vulgare</i>	oxeye daisy	UPL
<i>Lilium canadense</i>	Canada lily	FAC+
<i>Lotus corniculatus</i>	birds-foot trefoil	FACU-
<i>Ludwigia alternifolia</i>	seedbox	FACW+
<i>Ludwigia palustris</i>	marsh seedbox	OBL
<i>Lycopodium obscurum</i>	tree clubmoss	FACU
<i>Lycopodium tristachyum</i>	ground cedar	UPL
<i>Lycopus</i> spp.	bugleweeds	OBL
<i>Lysimachia ciliata</i>	fringed loosestrife	FACW
<i>Lysimachia nummularia</i>	moneywort	OBL
<i>Lythrum salicaria</i>	purple loosestrife	FACW+
<i>Maianthemum canadense</i>	false lily-of-the-valley	FAC-
<i>Mentha</i> spp.	mints	FACU-OBL
<i>Mitchella repens</i>	partridge-berry	FACU
<i>Oenothera biennis</i>	common evening-primrose	FACU-
<i>Onoclea sensibilis</i>	sensitive fern	FACW
<i>Osmunda cinnamomea</i>	cinnamon fern	FACW
<i>Oxalis</i> spp.	wood-sorrel	FACU-UPL
<i>Panicum dichotomiflorum</i>	fall panic grass	FACW-
<i>Phalaris arundinacea</i>	Reed canary grass	FACW+
<i>Phleum pretense</i>	timothy grass	FACU
<i>Phragmites australis</i>	common reed	FACW
<i>Phytolacca americana</i>	common pokeweed	FACU+
<i>Plantago lanceolata</i>	English plantain	UPL
<i>Plantago major</i>	common plantain	FACU
<i>Pilea pumila</i>	clearweed	FACW
<i>Poa pratensis</i>	Kentucky bluegrass	FACU
<i>Poa trivialis</i>	rough bluegrass	FACW
<i>Podophyllum peltatum</i>	may-apple	FACU
<i>Polygonum arifolium</i>	halberd-leaf tearthumb	OBL
<i>Polygonum cespitosum</i>	cespitose knotweed	FACU-
<i>Polygonum hydropiperoides</i>	swamp smartweed	OBL
<i>Polygonum pennsylvanicum</i>	Pennsylvania smartweed	FACW
<i>Polygonum perfoliatum</i>	mile-a-minute	FAC
<i>Polygonum perfoliatum</i>	mile-a-minute	FAC
<i>Polygonum sagittatum</i>	arrow-leaved tearthumb	OBL

Table 2. (Continued)

Scientific Name <sup>3,4</sup>	Common Name	Indicator Status <sup>1,2</sup>
<u>Herbs</u>		
<i>Polygonum virginianum</i>	Virginia knotweed	FAC
<i>Potentilla canadense</i>	dwarf cinquefoil	UPL
<i>Potentilla simplex</i>	old field cinquefoil	FACU-
<i>Prunella vulgaris</i>	heal-all	FACU+
<i>Ranunculus acris</i>	common buttercup	FAC+
<i>Rubus hispidus</i>	bristly blackberry	FACW
<i>Rudbeckia hirta</i>	black-eyed Susan	FACU-
<i>Rudbeckia laciniata</i>	cut-leaf coneflower	FACW
<i>Rumex crispus</i>	curly dock	FACU
<i>Sagittaria latifolia</i>	broad-leaf arrow-head	OBL
<i>Saponaria officinalis</i>	bouncing-bet	FACU-
<i>Schizachrium scoparium</i>	little bluestem	FACU-
<i>Scirpus cyperinus</i>	wool-grass	FACW+
<i>Scirpus</i> spp.	bulrushes	FACW-OBL
<i>Setaria faberi</i>	Japanese bristle grass	UPL
<i>Setaria glauca</i>	yellow bristle grass	FAC
<i>Smilacina racemosa</i>	feather false-Solomon's-seal	FACU
<i>Solanum carolinense</i>	Carolina nightshade	UPL
<i>Solidago canadensis</i>	Canada goldenrod	FACU
<i>Solidago gigantea</i>	giant goldenrod	FACW
<i>Solidago rugosa</i>	wrinkled goldenrod	FAC
<i>Sparganium</i> spp.	burreeds	OBL
<i>Symplocarpus foetidus</i>	skunk-cabbage	OBL
<i>Taraxacum officinale</i>	common dandelion	FACU-
<i>Thelypteris noveboracensis</i>	New York fern	FAC
<i>Tridens flavus</i>	purple-top tridens	FACU
<i>Trifolium pratense</i>	red clover	FACU-
<i>Typha latifolia</i>	broad-leaved cattail	OBL
<i>Urtica dioica</i>	stinging nettle	FACU
<i>Uvularia sessilifolia</i>	sessile-leaf bellwort	FACU-
<i>Verbascum blattaria</i>	moth mullein	UPL
<i>Verbascum thapsus</i>	common mullein	UPL
<i>Verbena hastata</i>	blue vervain	FACW+
<i>Vernonia noveboracensis</i>	New York ironweed	FACW+

<sup>1</sup>National List of Plant Species that Occur in Wetlands 1996 National Summary: Northeast (Region 1).

<sup>2</sup>All Modifiers of (+) and (-) Have been Dropped from Indicator Status for Wetland Delineations Conducted Under the USACE Regional Supplements.

<sup>3</sup>Additional species observed only during the 2010 surveys are indicated in blue font.

<sup>4</sup>Additional species observed only during the 2011 surveys are indicated in red font.

## **FIGURES**

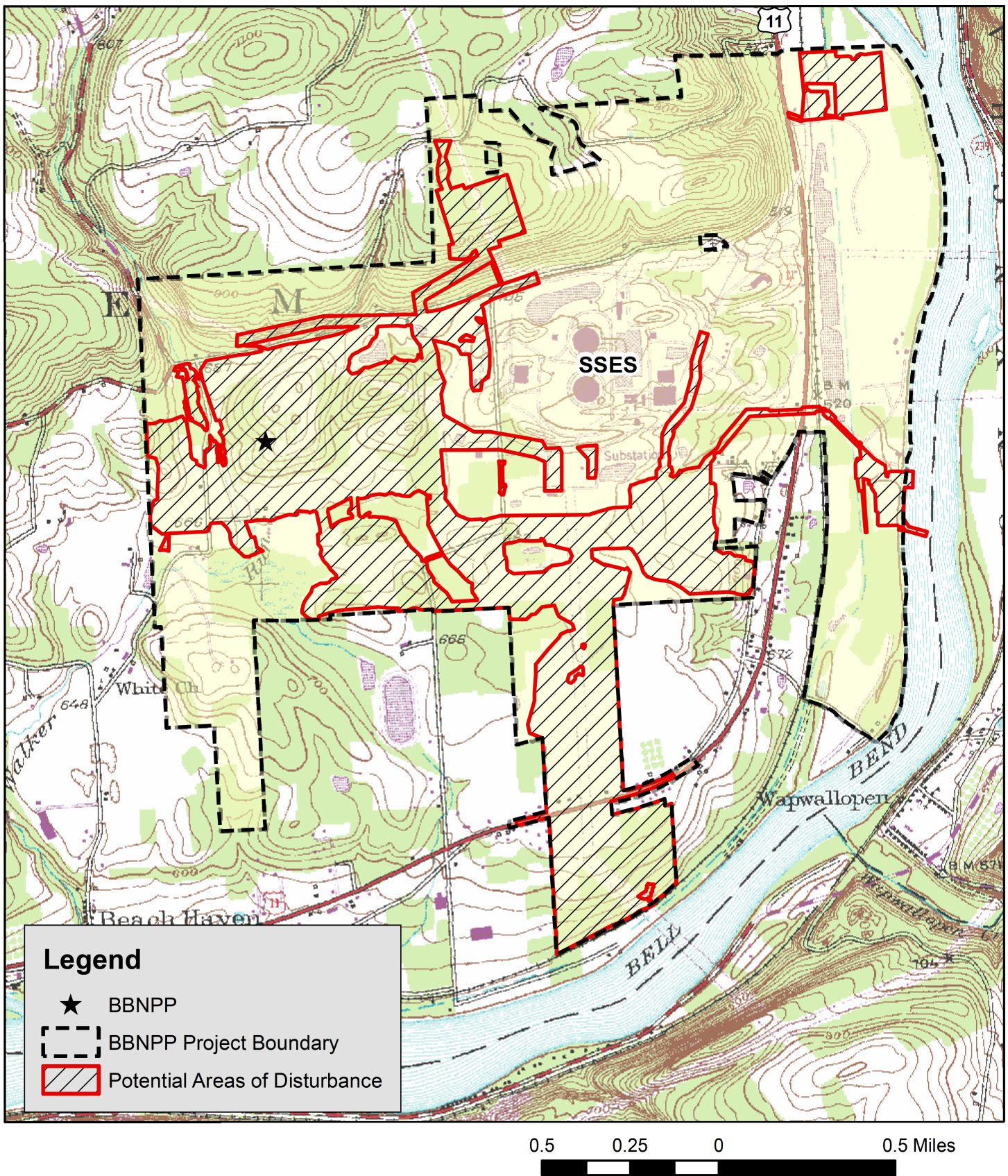


Figure 1.  
**Bell Bend NPP  
Site Location Map**

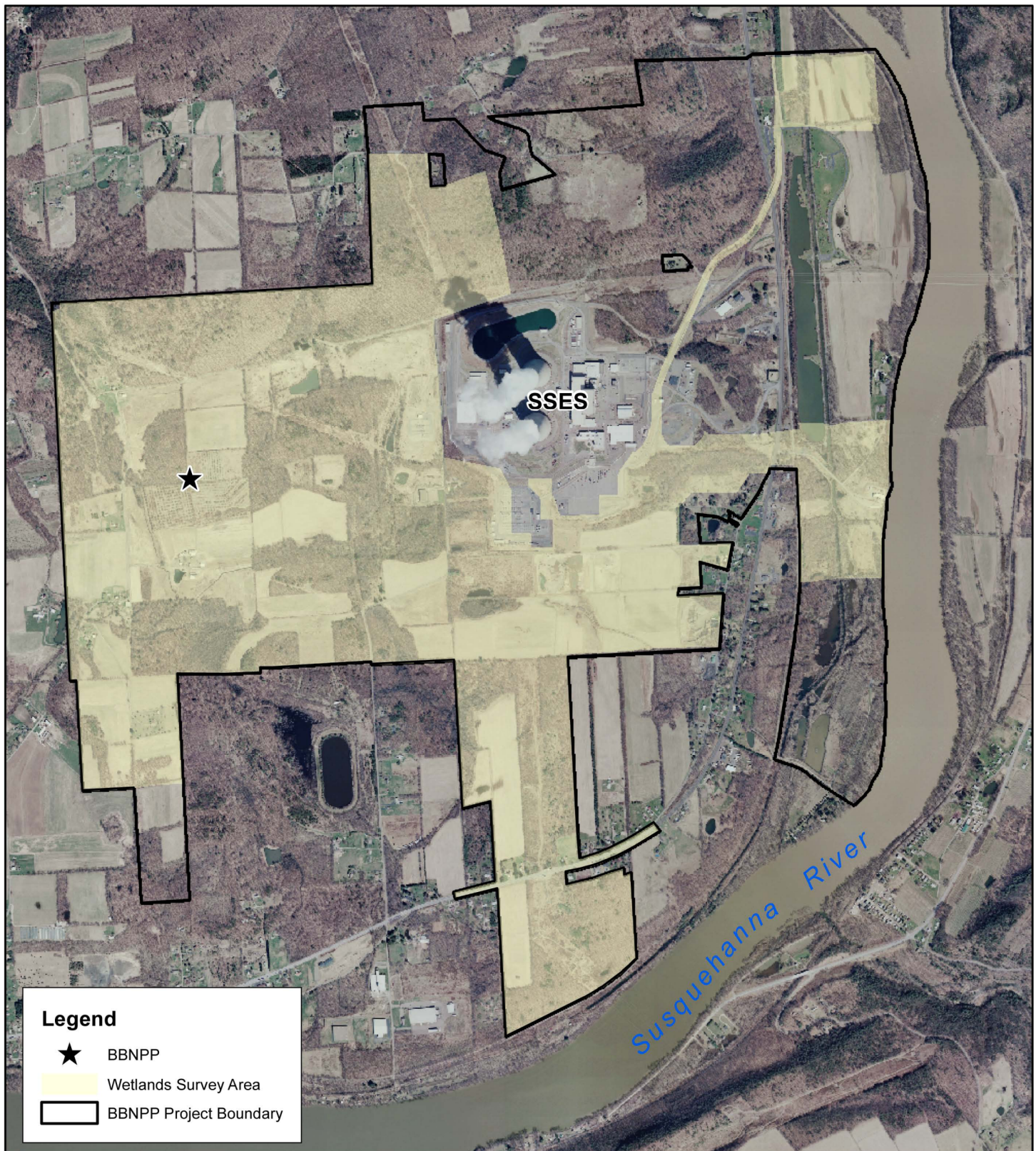


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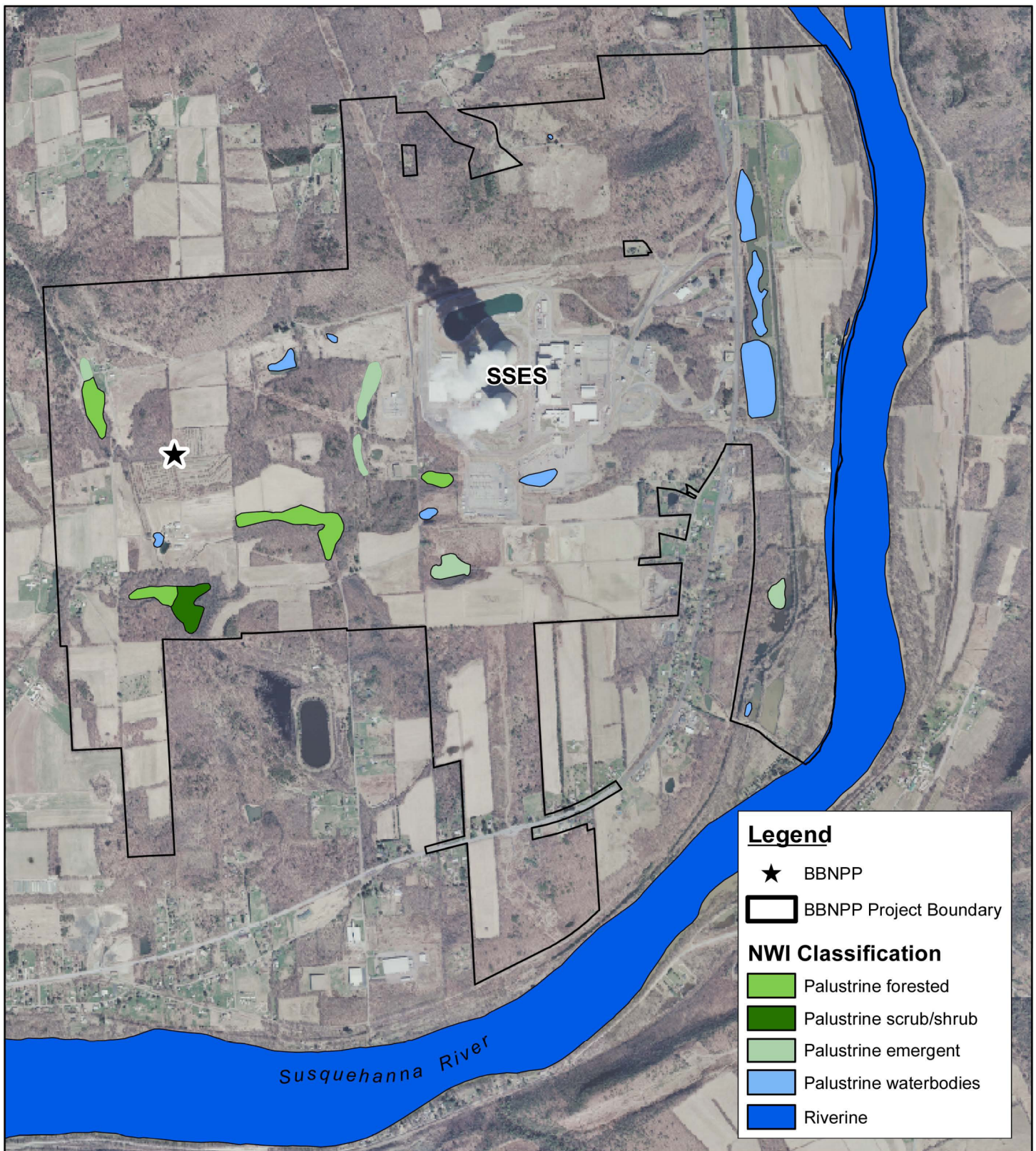
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prepared by: s.sherman  
project: 22474.000

rev. date: 09/30/10, 09/06/11  
prepared for: b.lees  
file name: Figure1.BBNPP\_Site\_USGS









Note:  
Aerial Photography from PAMAP Program, PA DCNR,  
Bureau of Topographic and Geologic Survey, 2005  
USFWS NWI Berwick, PA Quad, 1976

2,000 1,000 0 2,000 Feet

Figure 3.  
**Bell Bend NPP**  
**National Wetlands Inventory Map**

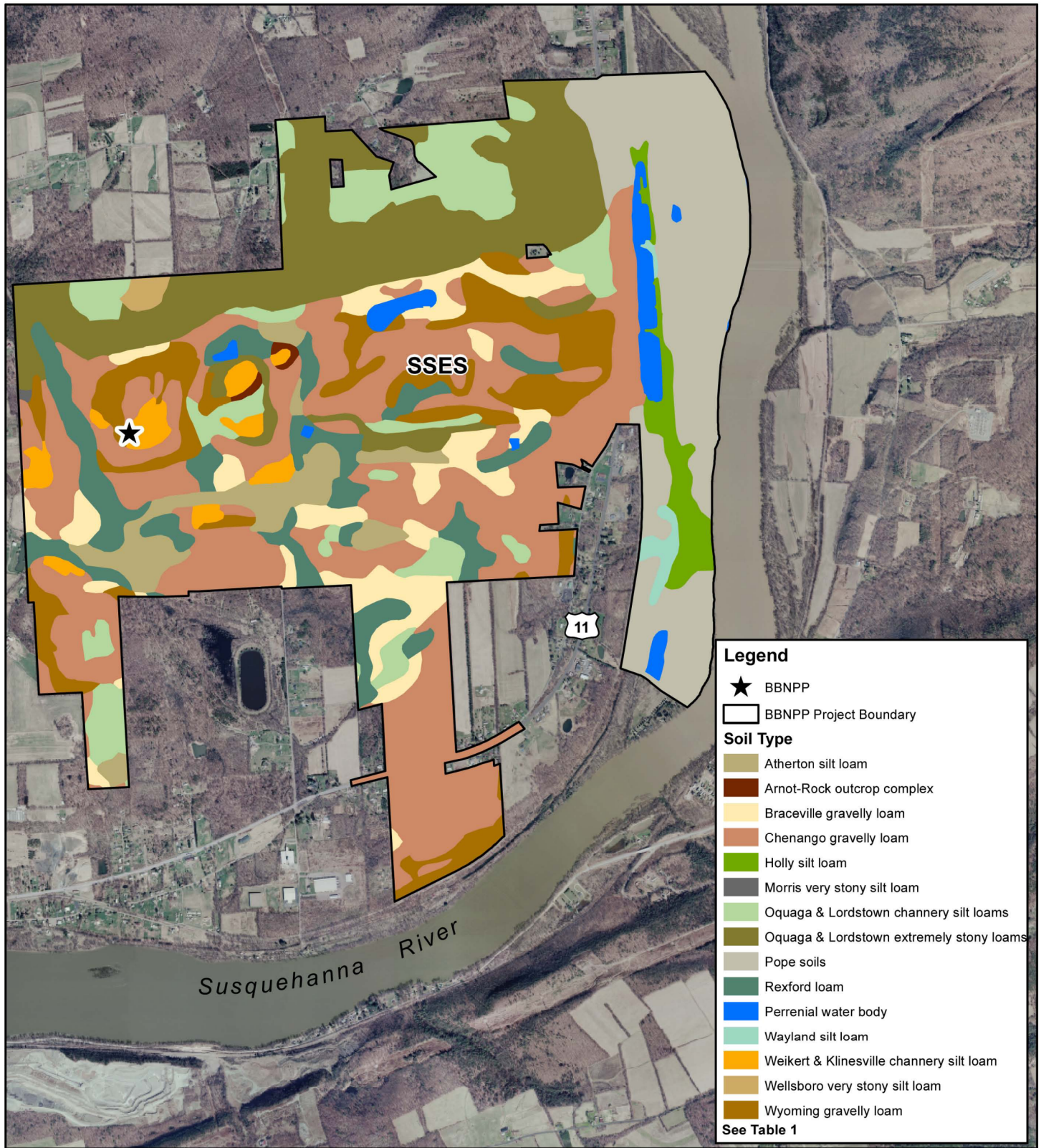


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project: 22474.000

rev. date: 10/01/10, 09/06/11  
prepared for: b.lee  
file name: Figure3.BBNPP\_Site\_NWI





Note:  
Aerial Photography from PAMAP Program, PA DCNR,  
Bureau of Topographic and Geologic Survey, 2005  
SoilDataMart.nrcs.usda.gov

2,600 1,300 0 2,600 Feet

**Figure 4.**  
**Bell Bend NPP**  
**Soil Survey Map**



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file name: Figure4.BBNPP Site Soils