ATTACHMENT B

AGENCY CORRESPONDENCE

B–1 THREATENED AND ENDANGERED SPECIES CONSULTATION

- **NOAA FISHERIES**
- **U.S. FISH & WILDLIFE SERVICE**
- **BIOLOGICAL ASSESSMENT**

B–2 WETLANDS / STREAMS

- **U.S. ARMY CORPS OF ENGINEERS**

B–3 CULTURAL RESOURCES CONSULTATIONS

- **VIRGINIA DEPARTMENT OF HISTORIC RESOURCES**

B–4 AGENCY COMMENTS ON COASTAL ZONE FEDERAL CONSISTENCY CERTIFICATION FOR THE EARLY SITE PERMIT

- **VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY**

B – 1

JPA SECTION 7

THREATENED AND ENDANGERED SPECIES CONSULTATION

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930-2298

JAN - 6 2004

Pao-Tsin Kuo
Program Director, License Renewal and Environmental Impacts
Division of Regulatory Improvement Projects
Office of Nuclear Reactor Regulation
United States Nuclear Regulatory Commission
Washington, DC 20555-0001

Re: Docket No. 52-008

Dear Mr. Kuo,

This responds to your letter dated December 21, 2003, requesting information on the presence of any federally listed threatened or endangered species and/or designated critical habitat for listed species under the jurisdiction of the National Marine Fisheries Service (NOAA Fisheries) in the vicinity of two sites for potential new nuclear power plants. The US Nuclear Regulatory Commission (NRC) is currently reviewing an application submitted by Dominion Nuclear North Anna LLC for an early site permit for the potential future construction of one or more new nuclear power plants. The preferred alternative for the location of the proposed new power plants is within the site boundaries of the existing North Anna Power Station, located on the south shore of Lake Anna Reservoir in Louisa County, Virginia. One of the alternate sites is within the site boundaries of the existing Surry Power Station located on the south bank of the James River in Surry County, Virginia.

No federally listed or proposed threatened or endangered species under the jurisdiction of NOAA Fisheries are known to exist in the vicinity of the existing North Anna Power Station. However, several threatened and endangered species are known to exist in the Chesapeake Bay, of which the James River is a tributary. While several species of sea turtles are known to be seasonally present in the Chesapeake Bay, none are likely to occur in the vicinity of the Surry Power Station.

The federally endangered shortnose sturgeon (*Acipenser brevirostrum*) is known to be present in the Chesapeake Bay. The NOAA Fisheries recovery plan (1998) indicates that shortnose sturgeon found in the Chesapeake Bay and its tributaries are considered part of the Chesapeake Bay population. The US Fish and Wildlife Service Reward Program for Atlantic Sturgeon began in 1996. Shortnose sturgeon have been incidentally captured via this program. As of spring 2003, fifty-two shortnose sturgeon were captured via the reward program in the Chesapeake Bay and its tributaries – four from the lower Susquehanna River, two in the Bohemia River, six in the Potomac River, two south of the Bay Bridge near Kent Island, one near Howell Point, one just

D074

north of Hoopers Island, one in the Elk River and two in Fishing Bay. The remaining shortnose sturgeon were captured in the upper Bay north of Hart-Miller Island. These fish were captured alive in either commercial gillnets, poundnets, fykenets, eel pots, hoop nets, or catfish traps. No critical habitat has been designated for shortnose sturgeon. On October 22, 2003, one shortnose sturgeon was observed in a pre-dredge trawl operation in Thimble Shoals Channel. This capture provides the only concrete evidence of recent shortnose sturgeon presence in the vicinity of the James River. However, the occurrence of shortnose sturgeon in other areas of the Bay suggests that this species is likely present in Virginia waters of the Chesapeake Bay and may be present in the James River. Habitat analysis in the James River has revealed that this river contains suitable spawning habitat for shortnose sturgeon. As such, shortnose sturgeon may be present in the vicinity of the Surry Power Station.

Section 7(a)(2) of the Endangered Species Act (ESA) states that each Federal agency shall, in consultation with the Secretary, insure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. Because shortnose sturgeon may be present in the vicinity of the Surry Power Station and may be affected by the construction and operation of a new nuclear power project, an action at the Surry site would have to undergo Section 7 consultation. The federal action agency, in this case the NRC, would be responsible for initiating Section 7 consultation. If the Surry Power Station alternative is chosen, please submit a description of the project along with an assessment of the projects impacts on shortnose sturgeon to the attention of the Endangered Species Coordinator, NOAA Fisheries, Northeast Regional Office, One Blackburn Drive, Gloucester, MA 01930. After reviewing this information, NOAA Fisheries will then be able to conduct a consultation under Section 7 of the ESA. If you have any questions or concerns about these comments or about the consultation process in general, please contact Julie Crocker of my staff at (978) 281-9328 ext. 6530.

Sincerely,

Mary A. Colligan
Assistant Regional Administrator
for Protected Resources

File Code: Sec 7 NRC Virginia

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
6669 Short Lane
Gloucester, VA 23061

Date: October 25, 2004

Project name: NRC's North Anna and Surry Power Stations

Project number: 9064 City/County, VA Surry, Louisa, Hanover, Caroline, Orange, + Spotsylvania

The U.S. Fish and Wildlife Service (Service) has reviewed your request for information on federally listed or proposed endangered or threatened species and designated critical habitat for the above referenced project. The following comments are provided under provisions of the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*).

_____ We believe that the proposed action will not adversely affect federally listed species or federally designated critical habitat because no federally listed species are known to occur in the project area. Should project plans change or if additional information on listed and proposed species becomes available, this determination may be reconsidered.

_____ We recommend that you contact **both** of the following State agencies for site specific information on listed species in Virginia. Each agency maintains a different database and has differing expertise and/or regulatory responsibility:

Virginia Dept. of Game & Inland Fisheries
Environmental Services Section
P.O. Box 11104
Richmond, VA 23230
(804) 367-1000

Virginia Dept. of Conservation and Recreation
Division of Natural Heritage
217 Governor Street, 2nd Floor
Richmond, VA 23219
(804) 786-7951

If either agency indicates a federally listed species **is present**, please resubmit your project description with letters from both agencies attached.

✓ If **appropriate habitat may be present**, we recommend surveys within appropriate habitat by a qualified surveyor. Enclosed are county lists with fact sheets that contain information the species' habitat requirements and lists of qualified surveyors. If this project involves a Federal agency (Federal permit, funding, or land), we encourage the Federal agency to contact this office if appropriate habitat is present and if they determine their proposed action is likely to affect federally listed species or critical habitat.

_____ Enclosed is information about communication towers and measures to minimize and avoid impacts to migratory birds, including a list of types of work that do not require further coordination with the Service.

_____ Determinations of the presence of waters of the United States, including wetlands, and the need for permits are made by the U.S. Army Corps of Engineers. They may be contacted at: Regulatory Branch, U.S. Army Corps of Engineers, Norfolk District, 803 Front Street, Norfolk, Virginia 23510, telephone (757) 441-7652.

Our website http://virginiafieldoffice.fws.gov contains many resources that may assist with project reviews. Point of contact is Eric Davis at (804) 693-6694, ext. 104.

Sincerely,

for Karen L. Mayne
Supervisor
Virginia Field Office

cc: CBFO (David Sutherland)

KEY

LE - federally listed endangered.

LT - federally listed threatened.

PE - federally proposed endangered.

PT - federally proposed threatened.

EX - believed to be extirpated in Virginia.

LE(S/A) - federally listed endangered due to similarity of appearance to a federally listed species.

LT(S/A) - federally listed threatened due to similarity of appearance to a federally listed species.

C - candidate species; the U.S. Fish and Wildlife Service has enough information to list the species as threatened or endangered, but this action is precluded by other listing activities.

SOC - species of concern; those species that have been identified as potentially imperiled or vulnerable throughout their range or a portion of their range. These species are not protected under the Endangered Species Act.

G - global rank; the species rarity throughout its total range.

G1 - extremely rare and critically imperiled with 5 or fewer occurrences or very few remaining individuals; or because of some factor(s) making it especially vulnerable to extinction.

G2 - very rare and imperiled with 6 to 20 occurrences or few remaining individuals; or because of some factor(s) making it vulnerable to extinction.

G3 - either very rare and local throughout its range or found locally (abundantly at some of its locations) in a restricted range; or vulnerable to extinction because of other factors. Usually fewer than 100 occurrences are documented.

G_T_ - signifies the rank of a subspecies or variety. For example, a G3T1 would apply to a subspecies of a species that is very rare and local throughout its range or found locally in a restricted range (G3) but the subspecies warrants a rank of T1, critically imperiled.

G_Q - The taxon has a questionable taxonomic assignment.

SURRY COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
BIRDS		
Haliaeetus leucocephalus[1]	Bald eagle	LT
PLANTS		
Aeschynomene virginica	Sensitive joint-vetch	LT

Species of Concern (No official Federal status)

INVERTEBRATES		
Speyeria diana	Diana fritillary	G3
Stygobromus araeus	Tidewater interstitial amphipod	G2
VASCULAR PLANTS		
Carex decomposita	Epiphytic sdege	G3
Chamaecrista fasciculata var. macrosperma	Marsh senna	G5T2
Desmodium ochroleucum	Creamflower tick-trefoil	G2G3
Rudbeckia heliopsidis[2]	Sun-facing coneflower	G2
Trillium pusillum var. virginianum	Virginia least trillium	G3T2

[1]Nesting occurs in this county; concentrated shoreline use has been documented on the James River.
[2]Surveys needed within 5-miles of Prince George County species location.

March 22, 1999
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

LOUISA COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
INVERTEBRATES		
Alasmidonta heterodon	Dwarf wedgemussel	LE

Species of Concern (No official Federal status)

INVERTEBRATES		
Elliptio lanceolata	Yellow lance	G3
Lasmigona subviridis	Green floater	G3

February 8, 2001
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

HANOVER COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
BIRDS		
Haliaeetus leucocephalus	Bald eagle	LT
INVERTEBRATES		
Alasmidonta heterodon	Dwarf wedgemussel	LE
VASCULAR PLANTS		
Aeschynomene virginica[1]	Sensitive joint-vetch	LT
Helonias bullata[2]	Swamp pink	LT
Isotria medeoloides[2]	Small whorled pogonia	LT

Species of Concern (No official Federal status)

INVERTEBRATES		
Elliptio lanceolata	Yellow lance	G3
Lasmigona subviridis	Green floater	G3
Sigara depressa	Virginia Piedmont water boatmen	G1G3
VASCULAR PLANTS		
Chamaecrista fasciculata var. macrosperma[1]	Marsh senna	G5T2

[1]This species has been documented in an adjacent county and may occur in this county.
[2]This species has been documented in an adjacent county & may occur in this county east of I-95.

November 12, 2002
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

CAROLINE COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
BIRDS		
Haliaeetus leucocephalus[1]	Bald eagle	LT
VASCULAR PLANTS		
Aeschynomene virginica[2]	Sensitive joint-vetch	LT
Helonias bullata	Swamp pink	LT
Isotria medeoloides	Small whorled pogonia	LT

Species of Concern (No official Federal status)

BIRDS		
Aimophila aestivalis	Bachman's sparrow	G3
INVERTEBRATES		
Sigara depressa	Virginia piedmont water boatman	G1G3
Stygobromus indentatus	Tidewater amphipod	G2G3
VASCULAR PLANTS		
Chamaecrista fasciculata var. macrosperma[2]	Marsh senna	G5T2
Desmodium ochroleucum	Creamflower tick-trefoil	G2G3
Eriocaulan parkeri	Parker's pipewort	G3
Juncus caesariensis	New Jersey rush	G2
Sabatia kennedyana	Plymouth gentian	G3

[1]Nesting occurs in this county; concentrated shoreline use has been documented on the Rappahannock River.
[2]This species has been documented in an adjacent county and may occur in this county.

May 29, 2001
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

ORANGE COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
INVERTEBRATES		
Alasmidonta heterodon[1]	Dwarf wedgemussel	LE

Species of Concern (No official Federal status)

INVERTEBRATES		
Elliptio lanceolata	Yellow lance	G3
Lasmigona subviridis	Green Floater	G3
Speyeria idalia	Regal fritillary	G3

[1]This species has been documented in an adjacent county and may occur in this county.

September 19, 2002
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

SPOTSYLVANIA COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
INVERTEBRATES		
Alasmidonta heterodon	Dwarf wedge mussel	LE
VASCULAR PLANTS		
Helonias bullata[1]	Swamp pink	LT
Isotria medeoloides	Small whorled pogonia	LT

Species of Concern (No official Federal status)

INVERTEBRATES		
Elliptio lanceolata	Yellow lance	G3
Lasmigona subviridis	Green floater	G3
Sigara depressa	Virginia Piedmont water boatmen	G1G3
Speyeria idalia	Regal fritillary	G3
NON-VASCULAR PLANTS		
Sphagnum carolinianum	Carolina peatmoss	G3

[1]This species has been documented in an adjacent county & may occur in this county east of I-95.

November 12, 2002
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

Bald Eagle

Haliaeetus leucocephalus

Description - The bald eagle occurs throughout the United States. It is a large bird-of-prey with dark brown plumage, a white head and tail, and a yellow bill, feet, and eyes. Juvenile eagles generally have a dark brown body, sometimes with white patches on the tail, belly, and underwings. The head and tail become completely white when full adult plumage is reached at four to five years of age.

Life History - The majority of Virginia's eagle population is found on the coastal plain. The bald eagle breeding season begins in mid-November when large nests are built (or the previous year's nest is repaired) usually in loblolly pine trees that are in close proximity to water. Eagles lay one to three eggs between mid-January and late March. In March, most eggs hatch and by June or July most young have fledged. However, the young will continue to use the nest for several weeks. In Virginia, during the summer and winter months, juvenile and nonbreeding adult eagles congregate along large rivers in areas with abundant food and little human disturbance. During the day, these eagles feed and perch along the river shoreline. In late afternoon, they move inland to roost either singly or communally. Roosts are typically located away from human disturbance and near water and a food source. Bald eagles feed primarily on fish, but will also eat carrion, waterfowl, small mammals, snakes, and turtles.

Conservation - The bald eagle was federally listed as an endangered species in the Chesapeake Bay Region on March 11, 1967. On July 12, 1995, the bald eagle was reclassified to threatened throughout the 48 lower states because the population had increased due to the banning persistent pesticides, habitat protection, and other recovery activities. On July 6, 1999, the bald eagle was proposed for removal from the list of endangered and threatened wildlife in the lower 48 states. This action was proposed because the available data indicated that this species has recovered. The recovery is due in part to habitat protection and management actions initiated under the Endangered Species Act. It is also due to reduction in levels of persistent pesticides occurring in the environment. If and when the eagle is no longer protected by the Endangered Species Act, it will still be protected by the Bald and Golden Eagle Protection Act, Migratory Bird Treaty Act, and state laws. Until the eagle is officially delisted, it will continue to receive protection pursuant to the Endangered Species Act. Bald eagles in the Chesapeake Bay are increasing. However, habitat destruction through urban and residential development and human disturbance in nesting, roosting, and foraging habitats continue to be a threat.

What You Can Do To Help - If you know of a bald eagle nest on or near property proposed for clearing, development, or logging please contact one of the following agencies for assistance:

Virginia Department of Game and Inland Fisheries
P.O. Box 11104
Richmond, Virginia 23230
(804) 367-1000

U. S. Fish and Wildlife Service
6669 Short Lane
Gloucester, Virginia 23061
(804) 693-6694

References

U.S. Fish and Wildlife Service. 1990. Chesapeake Bay Region bald eagle recovery plan: first revision. Newton Corner, Massachusetts.

U.S. Fish and Wildlife Service. 1999. Proposed rule to remove the bald eagle in the lower 48 states from the list of endangered and threatened wildlife. Federal Register 64(128): 36453-36464.

Watts, B.D., K.W. Cline, and M.A. Byrd. 1994. The bald eagle in Virginia: An information booklet for land planners. The Center for Conservation Biology, College of William and Mary, Williamsburg, Virginia.

U.S. Fish and Wildlife Service
Virginia Field Office
6669 Short Lane
Gloucester, Virginia 23061
(804) 693-6694
http://www.fws.gov
August 1999

Sensitive Joint-Vetch

Aeschynomene virginica

© M. Rollins

Description - The sensitive joint-vetch is an annual legume native to the eastern United States. Populations currently exist in Maryland, New Jersey, North Carolina, and Virginia. The historical range for the species extended to Delaware and Pennsylvania. In Virginia, populations are found along the Potomac, Mattaponi, Pamunkey, Rappahannock, Chickahominy, and James Rivers and their tributaries. This plant usually attains a height of three to six feet in a single growing season, but may grow as tall as eight feet. The flowers are yellow, streaked with red and the fruit is a pod, turning dark brown when ripe.

Life History - The joint-vetch occurs in fresh to slightly brackish tidal river systems, within the intertidal zone where populations are flooded twice daily. It typically occurs at the outer fringe of marshes or shores; its presence in marsh interiors may be a result of nutrient deficiencies, ice scouring, or muskrat herbivory. The sensitive joint-vetch is found in localities where plant diversity is high and annual species are prevalent. Bare to sparsely vegetated substrates appear to be a habitat feature of critical importance for establishment and growth of this species. Plants flower from July through September and into October in some years. Fruits are produced from July through late October, concurrent with flowering.

Conservation - The sensitive joint-vetch was federally listed as a threatened species on June 19, 1992. Threats to the species include sedimentation, competition from non-native plant species, dams, dredging, filling, recreational activities, shoreline stabilization, shoreline structures, road and bridge construction, commercial and residential development, water withdrawal projects, water quality degradation, agricultural practices, introduced pest species, mining, timber harvest, over-visitation, declines in muskrat populations, rise in sea level (this may also be a result of natural cycles), and collection. Natural threats are often identified with disturbances, such as wave and ice action associated with severe storm events, competition, herbivory, channel migration, sea level rise and natural sedimentation processes. Adequate habitat conservation for this species will only be achieved through on-site protection of marshes supporting plant populations when coupled with protection of the natural ecological processes responsible for creating and maintaining habitat for the sensitive joint-vetch.

What You Can Do To Help - Avoid the use of herbicides in or near waterways. If you are planning construction or stabilization activities along the shoreline in one of the counties indicated on the attached map, please contact the U.S. Fish and Wildlife Service.

References

Davison, S.E. and L.P. Bruderle. 1984. Element stewardship abstract for *Aeschynomene virginica* - sensitive joint vetch. The Nature Conservancy. Arlington, Virginia.

Hershner, C. and J.E. Perry. 1987. Population status of potentially threatened vascular plants from coastal plain tidal rivers in Virginia. College of William and Mary, Virginia Institute of Marine Science, Gloucester Point, Virginia.

Rouse, G.D. 1994. Sensitive joint-vetch life history and habitat study, 1993 Field Season, Mattaponi and Rappahannock River systems, Virginia. Schnabel Environmental Services. Richmond, Virginia.

U.S. Fish and Wildlife Service. 1995. Sensitive joint-vetch (*Aeschynomene virginica*) recovery plan. Hadley, Massachusetts.

U.S. Fish and Wildlife Service
Virginia Field Office
6669 Short Lane
Gloucester, Virginia 23061
(804) 693-6694
http://www.fws.gov
August 1999

Dwarf Wedge Mussel

Alasmidonta heterodon

B. Windsor

Description - The dwarf wedge mussel has a spotty distribution in Atlantic coast drainage rivers and their tributaries from Canada to North Carolina. It is a small mussel whose shell rarely exceeds 1.5 inches in length. The shell outline is ovate or trapezoidal. The female shell is shorter, trapezoidal, and inflated in the back whereas the male shell is elongate, compressed, and ovate. The outer shell layer is brown to yellowish-brown, with greenish rays in young or pale-colored specimens. This mussel is unique in that it has two lateral teeth on its right valve and only one tooth on its left valve (opposite of all other North American mussel species).

Life History - The dwarf wedge mussel lives in shallow to deep rivers and creeks of various sizes where the current is slow to moderate. This mussel lives on muddy sand, sandy, and gravel stream bottoms that are nearly silt free. Like other freshwater mussels,
this species is a filter feeder. It feeds on plankton collected from water that is passed over its gills. Reproduction occurs sexually. Females carry eggs in their gills. During spawning, the male releases sperm into the water column and the sperm is taken into the female through the gills. The resulting larvae (known as glochidia) are released from the female into the water column and must attach to a fish host to survive. While attached to the fish host, development of the glochidia continues. Once metamorphosis is complete, the juvenile mussel drops off the fish host and continues to develop on the stream bottom. Fish hosts for this species include the mottled sculpin (*Cottus bairdi*), slimy sculpin (*Cottus cognatus*), tessellated darter (*Etheostoma olmstedi*), and johnny darter (*Etheostoma nigrum*).

Conservation - The dwarf wedge mussel was federally listed as an endangered species on March 14, 1990. The decline of this species is due to human degradation of habitat and water quality which have resulted in the continuing decline and subsequent loss of this species from previously occupied habitat. Threats to the species include agricultural, domestic, organic, and industrial pollution; impoundments that destroy habitat and cause silt deposits, low oxygen levels, and fluctuations in water levels and temperatures of the flooded area; and erosion and siltation from land clearing and construction of bridges or roads.

What You Can Do To Help - If you reside on property that borders a stream or other waterway, avoid using chemicals or fertilizers. To help control erosion and reduce runoff, maintain a buffer of natural vegetation along streambanks. Install fencing to prevent livestock from entering streams to reduce trampling of mussels, siltation, and input of waste products. Protecting water quality is the most effective way to conserve mussels.

To find out more about the dwarf wedge mussel contact:

Virginia Department of Game and Inland Fisheries
P.O. Box 11104
Richmond, Virginia 23230
(804) 367-1000

References

Michaelson, D.L. and R.J. Neves. 1995. Life history and habitat of the endangered dwarf wedgemussel *Alasmidonta heterodon* (Bivalvia:Unionidae). Journal of the North American Benthological Society 14(2):324-340.

U.S. Fish and Wildlife Service. 1993. Dwarf wedge mussel (*Alasmidonta heterodon*) recovery plan. Hadley, Massachusetts.

U.S. Fish and Wildlife Service
Virginia Field Office
6669 Short Lane
Gloucester, Virginia 23061
(804) 693-6694
http://www.fws.gov
August 1999

Swamp Pink

Helonias bullata

Description - The swamp pink is a perennial evergreen herb found in scattered populations from New Jersey south to Georgia. Historically, this plant was found from Staten Island, New York to the southern Appalachians. In Virginia, this lily has been documented in four counties. Its bright green, lance-shaped leaves form a basal rosette. A hollow flower stalk rises one to two feet from the center of the rosette and produces a pink or lavender flower head that consists of 30 to 50 small fragrant flowers. Few of the plants in a population produce flowers.

Life History - Swamp pink occurs in a variety of wetland habitats that include bogs, spring seeps, stream edges, wet meadows, and headwater wetlands. Sites are saturated year-round, but are rarely flooded and soils are generally neutral to acidic. Wetland habitat is easily altered through both direct and secondary disturbance. It is difficult for seedlings to get established and they are particularly vulnerable to human foot traffic. Flowering occurs from March to May. The basal leaves turn reddish-brown in the winter and lie flat on the ground or are slightly raised. These winter leaves are often hidden by fallen leaf litter. Reproduction is primarily asexual and seed dispersal is limited.

Conservation - The swamp pink was federally listed as a threatened species on September 9, 1988 due to population decline and threats to its wetland habitats. Historically, wetland drainage and/or filling associated with urban and agricultural development have been the primary threat to this species. However, with the enactment of the federal Clean Water Act and state wetland legislation, direct habitat loss has been slowed. Secondary effects from activities such as timber clearing, land development, siltation from run-off associated with adjacent development, and agriculture have become the major threat. These activities affect the hydrologic regime and increase the release of sediments and pollution. Plant collection and soil compaction from trampling are also threats to this species.

What You Can Do To Help - If you find a plant that appears to be the swamp pink, take note of the location and photograph the plant, if possible. Please do not remove the plant!

U.S. Fish and Wildlife Service
Virginia Field Office
6669 Short Lane
Gloucester, Virginia 23061
(804) 693-6694
http://www.fws.gov
August 1999

Contact one of the following agencies for assistance:

Virginia Department of Agriculture
and Consumer Services
Office of Plant Protection
P.O. Box 1163
Richmond, Virginia 23209
(804) 786-3515

Virginia Department of
Conservation and Recreation
Division of Natural Heritage
217 Governor Street, 3rd Floor
Richmond, Virginia 23219
(804) 786-7951

U.S. Fish and Wildlife Service
Virginia Field Office
6669 Short Lane
Gloucester, Virginia 23061
(804) 693-6694

References

Stevens, E.C. 1991. Swamp pink. Pages 88-89 in K. Terwilliger, ed. Virginia's Endangered Species, Proceedings of a Symposium. McDonald and Woodward Publishing Company, Blacksburg, Virginia.

U.S. Fish and Wildlife Service. 1991. Swamp pink *(Helonias bullata)* recovery plan. Newton Corner, Massachusetts.

Small Whorled Pogonia

Isotria medeoloides

© D.D. Tyler

Description - The small whorled pogonia is a herbaceous perennial orchid. It has a widely scattered distribution in the eastern United States along the Atlantic coast from Maine to Georgia with outlying occurrences in the midwest and Canada. This species has pale green, elliptical leaves, usually five or six, that grow in a single whorl at the top of a hairless, grayish-green stem. The one or two flowers per plant are yellowish-green, unscented, and form in the center of the whorl.

Life History - In Virginia, the small whorled pogonia is found in ordinary looking third-growth upland forests with an open understory and a closed canopy where the topography is typically moderately sloping or almost level. The plants are usually associated with decaying vegetative matter such as fallen trunks and limbs, leaf litter, bark, and tree roots. The pogonia is found in soils that are acidic sandy loams with low nutrient content. The flowers appear in late April to mid-May. The small whorled pogonia reproduces primarily through self-pollination and occasionally vegetatively. It is often confused with the Indian cucumber-root (*Medeola virginiana*) and the large whorled pogonia *(Isotria verticillata*). The Indian cucumber-root has deep green leaves with a stem that is thin, hairy, and wiry. The large whorled pogonia has a reddish-purple stem and dark green leaves; its flower is reddish-purple.

Conservation - The small whorled pogonia was federally listed as an endangered species on September 10, 1982. It was reclassified as threatened on November 7, 1994. This was possible because at the time of reclassification 61% of the viable populations had been protected. The small whorled pogonia and its habitat continue to be threatened, directly and indirectly, by residential and commercial development. The upland habitat where it is found is seldom protected by federal or state laws unless it occurs on federally-owned property. Without voluntary landowner protection many pogonia populations have been and will be destroyed. Other threats to this species are collection by plant enthusiasts and browsing by white-tailed deer and invertebrates.

What You Can Do To Help - If you find a plant that appears to be the small whorled pogonia, take note of the location and photograph the plant, if possible. Please do not remove the plant!

Contact one of the following agencies for assistance:

Virginia Department of Agriculture and Consumer Services
Office of Plant Protection
P.O. Box 1163
Richmond, Virginia 23209
(804) 786-3515

Virginia Department of Conservation and Recreation
Division of Natural Heritage
217 Governor Street, 3rd Floor
Richmond, Virginia 23219
(804) 786-7951

U.S. Fish and Wildlife Service
Virginia Field Office
6669 Short Lane
Gloucester, Virginia 23061
(804) 693-6694

References

U.S. Fish and Wildlife Service. 1992. Small whorled pogonia (*Isotria medeoloides*) recovery plan, first revision. Newton Corner, Massachusetts.

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August 1999

SENSITIVE JOINT-VETCH
(Aeschynomene virginica)
SURVEY CONTACTS IN VIRGINIA

This list contains individuals who we have already determined are qualified to conduct surveys for the species listed above. This list does not include all individuals qualified or authorized to survey for this species. If you select someone not on this pre-approved surveyor list, please provide the proposed surveyor's qualifications to this office 30 days prior to the start of the survey. Please send copies of all survey results to this office. If the survey determines that any rare species are present, please contact this office to allow us the opportunity to work with you to ensure that a project avoids or minimizes adverse effects to rare species and their habitats. Inclusion of names on this list does not constitute endorsement by the U.S. Fish and Wildlife Service or any other U.S. Government agency. Listed alphabetically. September 8, 2004

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ATLANTIC SLOPE FRESHWATER MUSSELS
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SMALL WHORLED POGONIA
(Isotria medeoloides)
SURVEY CONTACTS IN VIRGINIA

This list contains individuals who we have already determined are qualified to conduct surveys for the species listed above. This list does not include all individuals qualified or authorized to survey for this species. If you select someone not on this pre-approved surveyor list, please provide the proposed surveyor's qualifications to this office 30 days prior to the start of the survey. Please send copies of all survey results to this office. If the survey determines that any rare species are present, please contact this office to allow us the opportunity to work with you to ensure that a project avoids or minimizes adverse effects to rare species and their habitats. Inclusion of names on this list does not constitute endorsement by the U.S. Fish and Wildlife Service or any other U.S. Government agency. Listed alphabetically. September 8, 2004

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BIOLOGICAL ASSESSMENT

North Anna
Early Site Permit Application

Louisa County, Virginia

Docket Number 52-008

January 2005

1.0 Introduction

On September 25, 2003[1], the U.S. Nuclear Regulatory Commission (NRC) received an application from Dominion Nuclear North Anna, LLC (Dominion) for an early site permit (ESP) for an ESP site (the North Anna ESP site) located within the existing North Anna Power Station (NAPS) site near the town of Mineral, in Louisa County, Virginia (Figure 1). Under the NRC regulations in Title 10 of the Code of Federal Regulations (CFR) Part 52 and in accordance with the applicable provisions of 10 CFR Part 51, which are the NRC regulations implementing the National Environmental Policy Act of 1969 (NEPA), the NRC is required to prepare an environmental impact statement (EIS) as part of its review of an ESP application. The NRC staff published in the Federal Register a Notice of Intent (68 FR 65961) to conduct scoping, prepare an EIS, and publish a draft EIS for public comment. The comment period for the draft EIS ends on March 1, 2005. The draft EIS is available on the NRC website at www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1811/ index.html. The final EIS will be issued after considering public comments on the draft. A separate safety evaluation report will also be prepared in accordance with 10 CFR Part 52.

The North Anna ESP site proposed by Dominion is located in Louisa County in central Virginia, near the town of Mineral. It is completely within the confines of the current NAPS site, which is located on a peninsula on the southern shore of Lake Anna, approximately eight kilometers (km) (five miles [mi]) upstream of the North Anna Dam. Lake Anna is approximately 27 km (17 mi) long, with 435 km (272 mi) of shoreline. The lake was created in 1971 by the construction of a dam on the main stem of the North Anna River. Virginia Electric and Power Company (Virginia Power), a subsidiary of Dominion Resources, Inc., owns the land above and below the lake surface and around the lake up to the expected high-water mark.

As part of the environmental review process, the NRC staff sent letters to staff at the United States Fish and Wildlife Service (FWS) and National Oceanic and Atmospheric Administration (NOAA) Fisheries (NRC 2003a,b) requesting lists of threatened and endangered species that potentially could be affected by the construction and operation of new power plants at NAPS. Specifically, the staff requested a list of species and information on protected, proposed, and candidate species, and critical habitat that may be in the vicinity of North Anna.

In a letter dated January 6, 2004 (NOAA 2004), NOAA Fisheries stated that "no federally listed or proposed threatened or endangered species under the jurisdiction of NOAA Fisheries are known to exist in the vicinity of the North Anna Power Station." The FWS replied by letter dated October 25, 2004 (FWS 2004a) with attached tables that identify two animal and three plant species listed by the Endangered Species Act (ESA) that occur or may occur in the counties adjacent to the NAPS. These species are the dwarf wedgemussel (*Alasmidonta heterodon*), bald eagle (*Haliaeetus leucocephalus*), small whorled pogonia (*Isotria medeoloides*), sensitive joint-vetch (*Aeschynomene virginica*), and swamp pink (*Helonias bullata*).

[1] The September 25, 2003, Environmental Report (ER) for this application was revised by letters dated October 2, 2003 (Revision 1), July 15, 2004 (Revision 2), and September 7, 2004 (Revision 3). Any reference in this Biological Assessment (BA) to the ER refers to Revision 3 (Dominion 2004), unless otherwise stated.

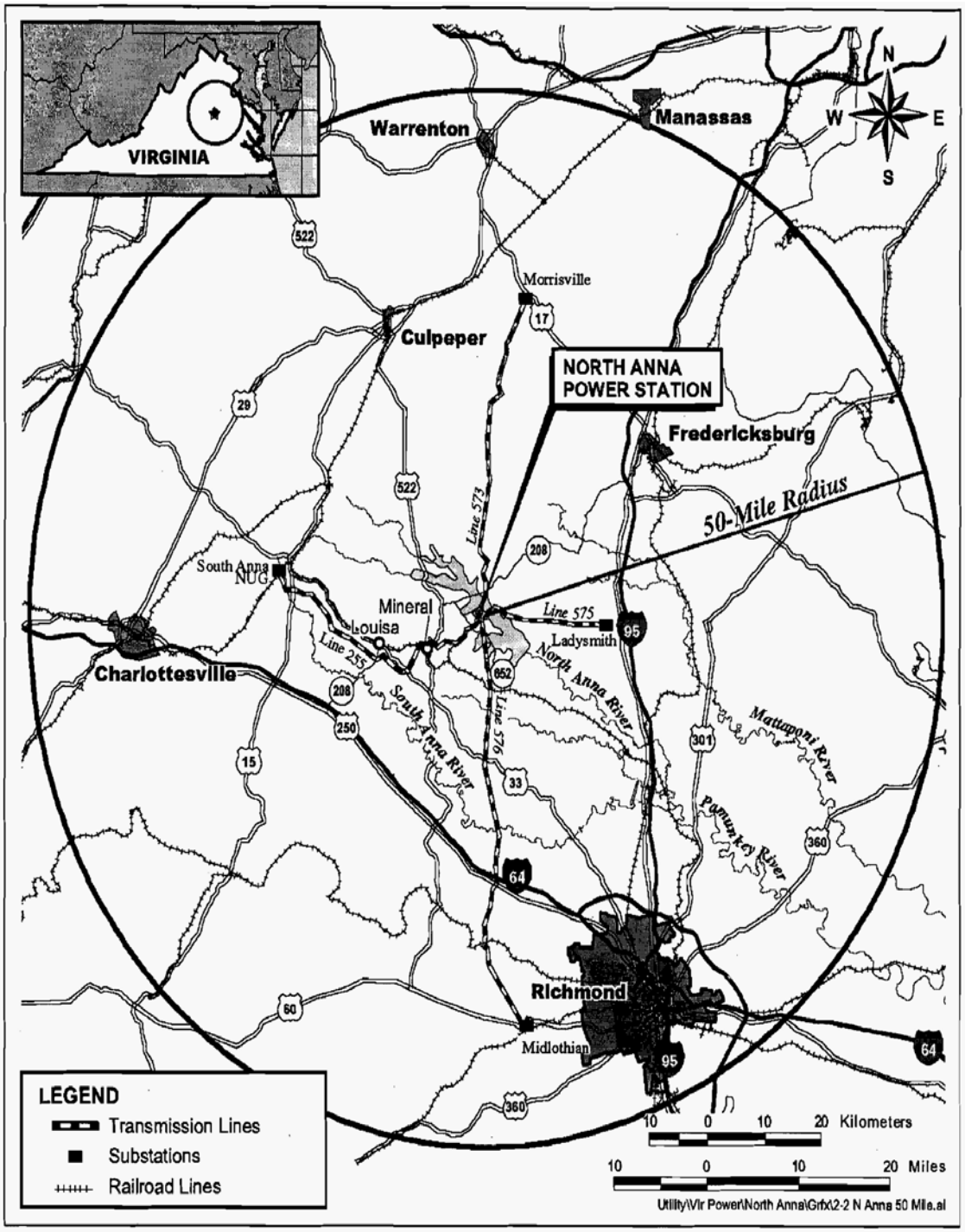

Figure 1. Location of North Anna ESP Site, 80-km (50-mi) Region

2.0 Project Description

The proposed Federal action is the issuance, under the provisions of 10 CFR Part 52, of an ESP for the North Anna ESP site for additional nuclear power facilities, and to conduct site preparation and limited construction activities identified in the application. The proposed action does not include approval to construct and operate new units but rather allows limited construction associated with site preparation activities. The complete construction and operation of new units are not presently proposed; therefore, this BA does not analyze the environmental impacts that could result from the actual construction and operation of two new nuclear units at the North Anna ESP site. Site preparation impacts are analyzed to determine whether activities proposed under the site redress plan might impact threatened and endangered species that occur in the vicinity of the NAPS.

No specific plant design has been selected by Dominion for the ESP site; instead, a set of bounding plant parameters has been specified to envelope future site development. This plant parameter envelope is based on the addition of power generation from two distinct units, to be designated as North Anna Units 3 and 4. Cooling water for Unit 3, the first of the proposed new units, would be provided by Lake Anna. Unit 4 would use dry cooling towers.

In this BA, the proposed ESP site is evaluated only for those activities related to the site preparation activities and the limited construction activities allowed by 10 CFR 52.25. The site redress plan provides for redress of impacts associated with site preparation and limited construction activities, if the applicant ultimately decides not to pursue construction of one or more nuclear units after the permitted activities have occurred. The activities permitted under 10 CFR 52.25 would allow for these site preparation and limited construction activities such as clearing and grading, and the construction of non-safety related facilities, which could include intake and discharge structures, cooling towers, turbine buildings, and non-safety related support facilities.

Dominion evaluated the existing transmission system that connects the NAPS site with the regional transmission grid, and determined that the existing transmission lines are sufficient to transmit all of the power generated by the existing and the postualated new nuclear units at the NAPS site. Therefore, no changes to the existing transmission system are proposed. The NRC examined the potential impacts of continued operation of the NAPS transmission lines in connection with the license renewal for NAPS Units 1 and 2 (NRC 2002) and determined that there would be no effect to threatened or endangered species. Because no changes to the lines or rights-of-way are anticipated, the transmission lines are not considered in this BA.

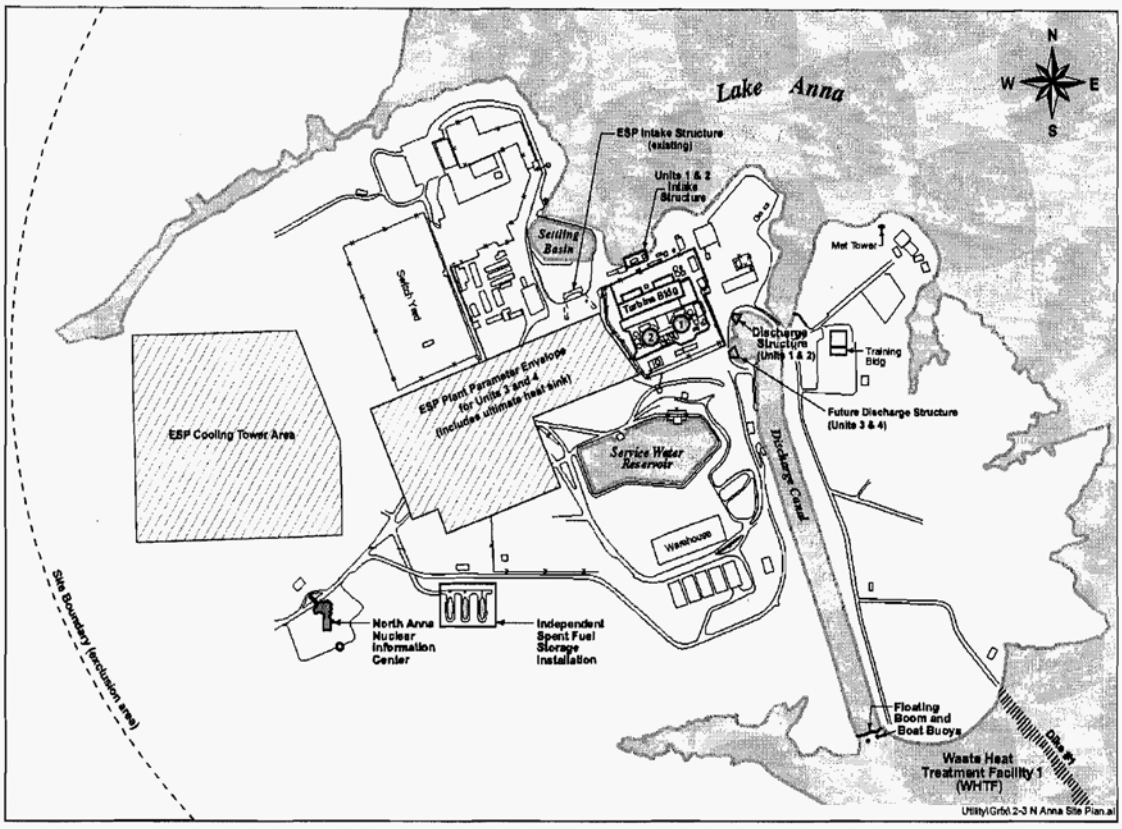

Figure 2. North Anna ESP Site Boundaries within the Existing NAPS Site

3.0 Potential Environmental Impacts

Site preparation activities may result in the removal of approximately 32 hectares (ha) (80 acres [ac]) of forested habitats, as well as grading of areas previously disturbed during construction of the existing NAPS units. In addition to direct habitat loss, there would likely be a temporary increase in ambient noise levels typical of land development and construction activities. Construction of intake and discharge structures would impact small portions of the Lake Anna shoreline.

Much of the proposed North Anna ESP site construction area consists of dirt roads, cleared areas, parking lots, buildings, and early succession habitats (Figure 2). The western portion of the current and proposed laydown area, located northeast of the current switchyard, can be classified as "old-field" habitat. None of the current or proposed laydown area is forested. The area proposed for temporary offices, located east of the switchyard, is an existing office complex; thus, undisturbed habitats would not be impacted. The proposed cooling tower site consists primarily of forested habitat.

4.0 Description of the Project Area

4.1 Terrestrial Biological Communities of the North Anna Site

The ESP site is located within the Piedmont Physiographic Province as described by Omernik (1987). Although forests in the Piedmont Province are nominally characterized by oak-hickory-pine forest (Woods et al. 1999), this portion of north-central Virginia has been settled since the colonial era and, therefore, no longer contains virgin forests. Vegetative cover surrounding the ESP site is an irregular patchwork of row crops, pastures, pine plantations, abandoned (old) fields, and second-growth forests of hardwoods and mixed pine-hardwoods (Dominion 2004).

Approximately 30 percent of the North Anna site consists of power generation and maintenance facilities, parking lots, roads, cleared areas, and mowed grass. Hardwood forests and planted pines exist on approximately 70 percent of the site that has not been cleared for the construction or operation of the existing units. These wooded areas are remnants of forests that were used for timber production prior to acquisition by Virginia Power and are dominated by a variety of oaks (*Quercus* spp.), yellow poplar (*Liriodendron tulipifera*), sweet gum (*Liquidambar styraciflua*), and red maple (*Acer rubrum*) trees. Scattered loblolly pines (*Pinus taeda*), Virginia pines *(P. virginiana*), and short-leaf pines *(P. echinata*) exist in some wooded areas (Dominion 2004).

The Piedmont region of Virginia is characterized as an irregular plain with low, rounded ridges and shallow ravines (Woods et al. 1999). There are no steep ridges on the ESP site. The rolling terrain at the site extends down slope to the waters of Lake Anna, resulting in essentially no marsh habitat along the shoreline at the site. Hydrophytic vegetation, such as cattail (*Typha* spp.) and rushes (*Juncus* spp.), are typically absent or extend only to approximately 0.3 meters (m) to 1 m (one to three feet [ft]) beyond the shoreline (Dominion 2004). Two intermittent streams flowing north into an unnamed arm of Lake Anna, just northwest of the power-block area, bisect the area where cooling towers are proposed to be located. A narrow band of wetlands is associated with each of these streams. A small (<.5 ha [one ac]) isolated wetland is located within the ESP site.

Wildlife species found in the forested portions of the North Anna site are those typically found in upland Piedmont forests of north-central Virginia. Frequently observed mammals, such as the white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), gray squirrel (*Sciurus carolinensis*), and gray fox (*Urocyon cinereoagenteus*), exist at the site, as do smaller mammals such as moles (Talpidae), shrews (Soricidae), and a variety of mice (Muridae) and voles (*Microtus* spp.). Woodchucks (*Marmota monax*) live in the grassy areas near forest edges at the site, and beavers (*Castor canadensis*) occur in Lake Anna and its tributaries. Various birds and herpifauna (e.g., snakes, turtles, lizards, and toads) live in the uplands and along the edge of Lake Anna (Dominion 2004).

Virginia Power has cooperated with the National Audubon Society in conducting periodic "Christmas Bird Counts" during December or January. Common bird species recorded in upland areas on and near the North Anna site during these surveys include the American crow (*Corvus brachyrhynchos*), blue jay (*Cyanocitta cristata*), Carolina chickadee (*Poecile carolinensis*), mourning dove (*Zenaida macroura*), black vulture (*Coragyps atratus*), turkey vulture (*Cathartes aura*), European starling (*Sturnus vulgaris*), song sparrow (*Melospiza melodia*), white-throated sparrow (*Zonotrichia albicollis*), dark-eyed junco (*Junco hyemalis*), northern cardinal (*Cardinalis*

cardinalis), house finch (*Carpodacus mexicanus*), tufted titmouse (*Baeolophus bicolor*), red-bellied woodpecker (*Melanerpes carolinus*), downy woodpecker (*Picoides pubescens*), and northern flicker (*Colaptes auratus*) (Audubon Society 2004). Species known to nest within forested areas at the North Anna site, along forested edges, and in open areas (for example, northern cardinal, Carolina chickadee, blue jay) are those that commonly nest in upland Virginia habitats. Virginia Power has placed bluebird nest boxes in suitable habitats at the North Anna site and has constructed roofed structures for swallows in some locations. Eastern bluebirds (*Sialia sialis*) annually use the nest boxes, and barn swallows (*Hirundo rustica*) nest beneath the roofed structures (Dominion 2004).

Several species of residential and migratory wading birds and waterfowl use Lake Anna. Numerous gulls, ducks, and geese were noted during Christmas Bird Counts (Audubon Society 2004), as were great blue herons (*Ardea herodias*). Virginia Power biologists have documented breeding at Lake Anna by mallards (*Anas platyrhynchos*), wood ducks (*Aix sponsa*), and Canada geese (*Branta canadensis*) (VEPCo 1986). Virginia Power, in association with the Louisa County Chapter of Ducks Unlimited, has placed wood duck nest boxes on Lake Anna, and wood ducks have used several of these nest boxes (VEPCo 1986). Belted kingfishers (*Ceryle alcyon*), great blue herons, and green-backed herons (*Butorides virescens*) are present at Lake Anna throughout the year, and belted kingfishers and green-backed heron presumably nest on or near the Lake Anna shoreline. There are no known great blue herons rookeries at Lake Anna (Dominion 2004). Waterfowl are typically most abundant at Lake Anna during the winter. Lake Anna provides important habitat for migratory waterfowl on the Atlantic flyway, especially during extremely cold winters when the elevated water temperature from station operation maintains a large ice-free body of water. The most common ducks observed during winter are mallard, American black duck (*Anas rubripes*), bufflehead (*Bucephala albeola*), and greater scaup (*Aythya marila*). The Canada goose, American coot (*Fulica americana*), ringed-billed gull (*Larus delawarensis*), and herring gull (*L. argentatus*) are also abundant on Lake Anna during the winter (Audubon Society 2004; VEPCo 1986).

4.2 Aquatic Biological Communities of the North Anna Site

The aquatic resources in the vicinity of the North Anna ESP site, the Waste Heat Treatment Facility (WHTF), and the North Anna River, are associated with Lake Anna (VEPCo 2001). Lake Anna was created to serve as the cooling water source for NAPS. The lake was formed during 1971 by erecting a dam on the main stem of the North Anna River, just upstream of the confluence of the North Anna River and Northeast Creek.

Lake Anna is typical of many shallow reservoirs found in the southern and mid-Atlantic states. Since impoundment, Lake Anna has gone through the typical ecological succession of reservoirs. The initial biotic community was highly productive because initial nutrient levels were high. Productivity subsequently decreased and ultimately stabilized (Paterson and Fernando 1970; Voshell and Simmons 1978). Aquatic communities in Lake Anna experienced gradual post-impoundment changes from riverine to lake communities. Some of these communities had stabilized in Lake Anna by 1975 (VEPCo 1986), and all have been relatively stable since 1985 (VEPCo 1986; VEPCo 2002).

Lake Anna contains numerous phytoplankton, zooplankton, and benthic macroinvertebrate communities. Seventy-seven genera of phytoplankton have been identified, and diatoms, green algae, blue-green algae (Cyanobacteria), and cryptomonads are the dominant forms. The zooplankton are dominated by small-bodied forms (rotifers and copepods). This has been attributed to selective predation upon larger-bodied zooplankton by landlocked schooling clupeids such as various shad species (Brooks and Dodson 1965). A total of 124 benthic taxa have been identified from Lake Anna (VEPCo 1986). Three bivalve species were collected in the North Anna basin prior to impoundment: *Elliptio complanatus*, *E. productus*, and *Sphaerium striatum* (AEC 1973).

In more recent years, the introduced Asiatic clam (*Corbicula* spp.) has dominated collections from both Lake Anna and the lower North Anna River. The Asiatic clam has spread rapidly throughout the United States since its first discovery in 1938 (VEPCo 1986). Its populations expand rapidly when they invade a new habitat, and densities stabilize as the species reach carrying capacity of the habitat. Asiatic clams are present throughout Lake Anna with the greatest population densities found at mid-lake (VEPCo 1989). After its initial invasion of Lake Anna, densities increased sharply from 1979 to 1981. Populations remained relatively stable between 1984 and 1988 (VEPCo 1989). Virginia Power received approval from VDEQ to discontinue Asiatic clam sampling in 1989. The zebra mussel (*Dreissena polymorpha*) has not been observed in Lake Anna.

Small numbers of unionid mussels (*Elliptio* spp.) and fingernail clams (Sphaeriidae) have also been collected. Acid drainage and sediment from the Contrary Creek mine site historically depressed freshwater mussel populations downstream from the Contrary Creek-North Anna River confluence; the first major mussel beds prior to the inpoundment of Lake Anna did not occur until 100 m (328 ft) downstream of the confluence of the North and South Anna Rivers (Reed and Simmons 1972). There are indications that mussel populations (*Elliptio* spp.) are recovering in the lower North Anna River (VEPCo 1986).

Thirty-nine species of fish (representing 12 families) have been identified in Lake Anna (VEPCo 1986). Species include those historically found in the North Anna River, those that had been in local farm ponds inundated by the new reservoir, and species introduced by the Virginia Department of Game and Inland Fisheries (VDGIF).

Recreational species include largemouth bass (*Micropterus salmoides*), smallmouth bass (*M. dolomieu*), striped bass (*Morone saxatilis*), walleye (*Stizostedion vitreum*), bluegill (*Lepomis macrochirus*), yellow perch (*Perca flavescens*), black crappie (*Pomoxis nigromaculatus*), white perch (*M. americana*), pumpkinseed (*L. gibbosus*), redear sunfish (*L. microlophus*), redbreast sunfish (*L. auritus*), channel catfish (*Ictalurus punctatus*), and white catfish (*Ameiurus catus*). Forage species include threadfin shad (*Dorosoma petenense*) and gizzard shad (*D. cepedianum)*. Striped bass and walleye are stocked annually by VDGIF. In 1994, sterile triploid herbivorous grass carp (*Ctenopharyngodon idella*) was stocked by Virginia Power to control the growth of the nuisance submerged aquatic plant hydrilla (*Hydrilla verticillata)* with the approval of the VDGIF.

Before the North Anna River was impounded, the fish community of the river downstream of the Contrary Creek inflow was dominated by pollution-tolerant species. In the years following impoundment (and reclamation of the Contrary Creek mine site), there was a steady increase in measures of abundance and diversity of fish. During 1984 to 1985, 38 species from ten families

were found in the North Anna River, compared to 25 species from eight families in the control stream, the South Anna River (VEPCo 1986). When species from the North Anna Reservoir were subtracted from the North Anna River totals, the two fish communities (North and South Anna River communities) showed striking similarities, indicating that the operation of the existing units had little or no effect on fish populations downstream from the dam.

The WHTF is the body of water into which waste heat from the existing units is discharged via the discharge canal. It is physically separated from the rest of Lake Anna by a series of dikes. The same aquatic communities occur in the WHTF that occur in the main reservoir. Fish can swim from the main reservoir into the WHTF and back. However, fish are not stocked in the WHTF, and angler access to this fishery is restricted to the land owners along this part of the shoreline.

There is no commercial fishing in Lake Anna or the North Anna River. There are no runs of anadromous fish in the North Anna River. The North Anna River is a tributary of the Pamunkey River, which has an annual run of American shad, but these shad do not move into the North Anna River (Jenkins and Burkhead 1994; Bilkovic et al. 2002). The Pamunkey Fish Hatchery in King William County, Virginia, is approximately 121 km (75 mi) downstream of the North Anna Dam. Shad reared at this facility are normally stocked in the Pamunkey River and the James River as fry. Young American eels (*Anguilla rostrata*) are found in the North Anna River, but are not sought by commercial fishermen. The American eel is a catadromous species, meaning that these fish begin their lives in the open ocean and migrate into coastal rivers where they spend much of their lives in fresh water (Rohde et al. 1994). Upon reaching sexual maturity, at age five to seven years, the eels migrate back to the ocean where they spawn and die. Eels in the North Anna River are juveniles, also known as "yellow eels."

The lower North Anna River downstream from the North Anna Dam is small, approximately 23 to 46 m (75 to 150 ft) wide, but supports a diverse assemblage of stream fishes. It is a popular fishing spot. Unless stream flow is unusually high, powerboats are impractical. Most anglers fish from shore or from canoes and kayaks. Recreational fishermen generally seek largemouth and smallmouth bass or redbreast sunfish. Bluegill and redear sunfish are present as well, but receive less attention from anglers.

5.0 List of Federally Threatened and Endangered Species

This section describes the threatened and endangered animal and plant species that potentially exist at or near the proposed ESP site. The FWS provided a list of species in the counties of interest (FWS 2004a) and also maintains current lists of threatened or endangered species on its website (FWS 2004b). The Virginia Department of Game and Inland Fisheries (VDGIF) (VDGIF 2004) and Virginia Department of Conservation and Recreation (VDCR 2004) also maintain lists of State-protected species on their websites. Species potentially occurring near the proposed North Anna ESP site that are listed as threatened or endangered by the FWS are listed in Table 1.

Table 1. Federally Threatened or Endangered Species Known or Potentially Occurring Near the Proposed North Anna ESP Site .

Scientific Name	Species	Counties	Status*
Invertebrates			
Alasmidonta heterdon	dwarf wedgemussel	Louisa, Orange, Hanover	FE
Birds			
Haliaeetus leucocephalus	bald eagle	Louisa, Orange, Caroline, Spotsylvania, Hanover	FT
Vascular Plants			
Isotria medeoloides	small whorled pogonia	Spotsylvania, Hanover, Caroline	FT
Aeschynomene virginica	sensitive joint-vetch	Hanover, Caroline	FT
Helonias bullata	swamp pink	Spotsylvania, Hanover, Caroline	FT

Status*: FE = Federally endangered, FT = Federally threatened
Sources: FWS 2004a, 2004b, VDCR 2004, VDGIF 2004

6.0 Description of Species and Habitats

In this section, each of the species listed in Table 1 is described, including its habitat requirements, status, and distribution in relation to the proposed project.

Dwarf Wedgemussel

The dwarf wedgemussel (*Alismidonta heterodon*) occurs sporadically in Atlantic coast rivers from Canada to North Carolina (FWS 1993). It is a small freshwater mussel (< 55 millimeters [2.17 inches]) long and roughly trapezoidal in shape. The outside of the shell is brown or yellowish-brown, with greenish rays visible in young or pale-colored specimens. The interior of the shell is bluish or silvery white and is iridescent in the posterior part of the shell. The hinge teeth are small but distinct. This species is unique in that it has two lateral teeth in the right valve and one in the left; other species have two lateral teeth in the left valve and one in the right (Environment Canada 2004).

The mussel is found in small streams to medium-sized rivers with slow to moderate current and fine sediment, sand, or gravel substrates. It appears to have poor tolerance for suspended silt. Stream-side vegetation seems to be required. The mussel releases a parasitic larvae, but the host fish species for the larvae is not known. The maximum life span of the mussel is believed to be 12-18 years. The mussel is vulnerable to pesticide and metal contamination, and to low oxygen levels. Impoundment of rivers has been a major negative factor on continued persistence of this species throughout its range, possibly due to dams blocking movements of host fish species (Environment Canada 2004).

The dwarf wedgemussel is known to occur in the South Anna River in Louisa County, VA (FWS 1993), but it has not been reported in the North Anna River or its tributaries. There are no rivers

or streams on the proposed North Anna ESP site that are suitable habitat for the dwarf wedgemussel.

Bald Eagle

Bald eagles (*Haliaeetus leucocephalus*) in Virginia are most common along the Chesapeake Bay, and along the lower reaches of several of the larger river systems such as the Potomac, Rappahannock, York, and James Rivers (VDGIF 2004, Watts and Byrd 2003). Most nest sites are found in the midst of large wooded areas adjacent to marshes or bodies of water, or in isolated trees located in marshes, on farmland, or in logged over areas where scattered seed trees remain (VDGIF 2004). Most eagle nests are less than 1.6 km (one mi) from feeding areas, although some can be as much as 3.2 km (two mi) from primary food sources. Wintering roost sites typically have the same characteristics as nest sites (VDGIF 2004). Bald eagle habitat usually occurs in undeveloped areas with little human activity. Bald eagles are primarily fish eaters but will prey upon mammals and birds when necessary, and they will eat carrion.

Bald eagles are occasionally observed along Lake Anna (six were observed during the 2003 Christmas Bird Count) (Audubon Society 2004). However, there are no known eagle nests near the proposed ESP site (NRC 2002). The VDGIF database indicates that one nest was located approximately eight km (five mi) downstream from Lake Anna Dam in 2000, but later surveys indicate this nest was not in use in 2003 (Watts and Byrd 2003). Dominion biologists indicated that there is a bald eagle nest near the north end of Lake Anna, approximately 16 km (10 mi) upstream of the existing units (Dominion 2004). Although the VDGIF information service does not include records of bald eagle nests on Lake Anna upstream from the NAPS, Watts and Byrd (2003) found that there was an occupied territory, but not an active nest, within the Mineral United States Geological Survey quadrangle in 2003. The Mineral quad is located west of the North Anna Power Station and includes the upper reaches of Lake Anna.

Small Whorled Pogonia

The small whorled pogonia (*Isotria medeoloides*) generally grows in open, dry, deciduous woods with acidic, sandy, loamy soil with low nutrient content. Suitable habitat for this species is limited on the NAPS site. It is not known to occur at the proposed North Anna ESP site (Dominion 2004; NRC 2002) and has not been reported in Louisa County. It has been reported to occur in the adjacent Spotsylvania and Caroline Counties, and potentially occurs in Hanover County (FWS 2004a, VDCR 2004).

Sensitive Joint-Vetch

The sensitive joint-vetch (*Aeschynomene virginica*) occurs in fresh to slightly-brackish tidal river systems in the intertidal area where the plants are flooded twice daily. Lake Anna and the North Anna River are not tidally influenced, and therefore, no habitat for the sensitive joint-vetch occurs at the proposed ESP site. The species is thought to potentially occur in Caroline and Hanover Counties (FWA 2004a) because suitable habitat is located within these counties, and the sensitive joint-vetch is known to occur in adjacent counties. However, any potential habitat would be located at least 48 km (30 mi) from the proposed North Anna ESP site.

Swamp Pink

The swamp pink (*Helonias bullata*), occurs in a variety of wetland habitats such as bogs, spring seeps, stream edges, and wet meadows. Sites are typically saturated year-round, but are rarely flooded. Soils are usually neutral to acidic. There is very little saturated ground or wetlands on the proposed North Anna ESP site; therefore, it is unlikely that there is suitable habitat within the affected area. The swamp pink is not known to occur at the North Anna site (Dominion 2004; NRC 2002) and has not been reported in Louisa County. It has been reported in Caroline County and is considered as potentially occurring in Hanover and Spotsylvania Counties (FWS 2004a).

7.0 Evaluation of Potential Impacts

Site preparation and limited construction activities would result in the removal of up to approximately 32 ha (80 ac) of forested habitat within the site. The ESP site does not contain any old growth timber, unique or sensitive plants, or unique or sensitive plant communities. Therefore, construction activities would not noticeably reduce the local or regional diversity of plants or plant communities. There are no areas designated by the FWS as critical habitat for endangered or threatened species at or near the site. No threatened or endangered plant species have been reported near the North Anna ESP site or in Louisa County, and no suitable habitat for threatened or endangered plant species is known to exist on the North Anna ESP site.

Movement of construction workers, materials, and equipment, and the operation of construction equipment (e.g., earth-moving equipment, portable generators, pile drivers, pneumatic equipment, and hand tools) would generate noise. Noise from human activities can affect wildlife by inducing physiological changes, nest or habitat abandonment, and behavioral modifications, or it may disrupt communications required for breeding or defense (Larkin 1996). However, it is not unusual for wildlife to adapt to noise from human activities (Larkin 1996). Although short-term noise levels from construction activities could be as high as approximately 110 decibels (e.g., impulse noise during pile-driving activities), these noise levels would not extend far beyond the boundaries of the ESP site. At a distance of 120 m (400 ft) from the construction site, noise levels from these activities would range from approximately 60 to 80 decibels. These noise levels are below the 80-to-85-decibel threshold at which birds and small mammals are startled or frightened (Golden et al. 1980). Thus, noise from construction activities would not be likely to disturb wildlife beyond 120 m (400 ft) from the construction site. Additionally, construction would occur adjacent to the existing operating Units 1 and 2, where wildlife has presumably become accustomed to typical, existing operating facility noise levels of approximately 50 to 60 decibels at the NAPS security fence (Dominion 2004).

There are no small streams to medium-sized rivers with slow-to-moderate current and fine sediment, sand, or gravel substrates on the ESP site. Two intermittent streams exist on the North Anna ESP site (Dominion 2004); however, they are not expected to support a population of dwarf wedgemussels. Besides being intermittent streams, they do not support fish populations that are essential to the life cycle of the dwarf wedgemussel. Proposed activities authorized under 10 CFR 52.25 would not adversely affect the North Anna River.

The 32 ha (80 ac) of forested habitat removed during construction presumably could be used by bald eagles for perching, roosting, or nesting. Eagles are occasionally observed in the vicinity of NAPS, but there is no indication that the proposed project site is regularly utilized by bald eagles. The nearest known bald eagle territory is believed to be approximately 16 km (ten mi) from site

preparation and construction activities at the proposed ESP site. The *Bald Eagle Protection Guidelines for Virginia* (USFWS and VGDIF 2000) recommends a buffer of 400 m (0.25 mi), in which construction activities should be limited. Although bald eagles may occasionally be observed near the plant, no nesting or roosting activity has ever been observed within an area that could be affected by construction or operational noise. No avian collisions with existing structures at the NAPS site have been noted (Dominion 2004); therefore, such collisions during the site preparation and construction phase would be unlikely.

8.0 Management Actions Related to the Species

To minimize construction-related impacts to wildlife, Dominion has stated that it would adhere to State permit conditions that may restrict the timing of certain construction activities (Dominion 2004). Dominion maintains a migratory bird protection program, including protection of nests and reporting bird (especially raptor) strikes and other events (Dominion 2001).

A few small wetland areas and two intermittent streams exist on the North Anna ESP site (Dominion 2004). Watercourses and wetlands would be avoided to the extent possible during any construction. Dominion has stated (Dominion 2004) that any work that has the potential to impact a wetland would be performed in accordance with applicable laws, regulations, permits, and authorizations. Wetland delineations and surveys would be conducted prior to commencement of construction activities. The Army Corps of Engineers has jurisdiction over wetlands under Section 404 of the Clean Water Act . If the areas are determined to be wetlands under the Clean Water Act, disturbance of the areas would either be avoided or other appropriate mitigation actions would be implemented as required by any applicable permits and regulations (Dominion 2004).

9.0 Conclusions

The proposed action is the issuance of an ESP for two additional nuclear power units at the North Anna ESP site. This BA has considered the potential impacts of site preparation and limited construction activities at the proposed site on species listed as threatened or endangered under the ESA, species proposed for such status, species considered candidates for listing under the ESA, or designated critical habitats for such listed species.

There is no habitat for the dwarf wedgemussel on the North Anna ESP site, and the proposed site preparation activities would not have an effect on, or occur near, the North Anna River or any other potential habitat areas. Therefore, the staff concludes that the proposed action would have no effect on the dwarf wedgemussel.

Because bald eagles have been observed in the vicinity of the North Anna ESP site, but have never been observed to nest or roost in the vicinity, the staff has concluded that the proposed action may affect, but are not likely to adversely affect bald eagles.

It is very unlikely that three protected plant species, small-whorled pogonia, sensitive joint-vetch, and swamp pink, may occur at the NAPS site. These species have never been reported in Louisa county, and there is no known habitat for these species on the North Anna ESP site. Therefore, the staff concludes that the proposed action would have no effect on the small-whorled pogonia, sensitive joint-vetch, and swamp pink.

10.0 References

10 CFR Part 51. Code of the *Federal Regulations*, Title 10, *Energy,* Part 51, " Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions."

10 CFR Part 52. Code of Federal Regulations, Title 10, *Energy,* Part 52, " Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants."

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401

May 20, 2005

United States Nuclear Regulatory Commission
Mr. Pao-Tsin Kuo,
Program Director
License Renewal and Environmental Impacts Program
Division of Regulatory Improvements Programs
Office of Nuclear Reactor Regulation
Washington, D.C. 20555-0001

Re: North Anna Nuclear Power Station ESP

Dear Mr. Kuo:

As requested in your January 31, 2005, letter, we have reviewed your Biological Assessment for the Early Site Permit (ESP) of the North Anna Power Station, located in Louisa County near Mineral, Virginia. The proposed action, as described in the assessment, is to allow for new site preparation, (i.e., clearing and grading) of approximately 80 acres of land within the existing grounds of the North Anna Power Station. Five federally listed species may be affected as a result of the project. The species include: the dwarf wedgemussel (*Alasmidonta heterdon*), the bald eagle (*Haliaeetus leucocephalus*), small whorled pogonia (*Isotria medeoloides*), sensitive joint-vetch (*Aeschyomene virginica*), and the swamp pink (*Helonias bullata*). We have reviewed the information you have enclosed, and are providing comments in accordance with Section 7 of the Endangered Species Act (87 Stat.884, as amended: 16 U.S. C. 1531 *et seq.*).

The Service concurs with the conclusion of your assessment that the proposed site preparation and limited construction activities for two additional nuclear power units at the North Anna site will have "no-effect" to the small-whorled pogonia, sensitive joint-vetch, and swamp pink, since none of these species have been documented in Louisa County and no appropriate habitat for the latter two species occurs on the power station site. The dwarf wedgemussel is known to occur in the South Anna River in Louisa County and may occur in other streams and rivers in the county. However, because no appropriate habitat occurs on the power plant site, no impact to this species is expected to result from ESP activities.

Bald eagles have been documented by the Virginia Department of Game and Inland Fisheries (VDGIF) to forage areas of Lake Anna. During winters of 2003 and 2004, up to six transient bald eagles had been observed along the forested shoreline. Two nesting territories also had been located ; one site was 10 miles upstream of the project area and a second site located five miles downstream of the Lake Anna Dam (2000). Since the eagle nests are significantly

downstream of the Lake Anna Dam (2000). Since the eagle nests are significantly distanced from the proposed project site and transient eagles have adequate foraging areas throughout Lake Anna and the increase of two new power station units will not involve additional transmission grids, the Service believes that the proposed expansion of the North Anna Power Station will not likely adversely effect bald eagles. It is foreseeable that as the Chesapeake Bay bald eagle population continues to expand and shoreline development pressures increase at other locations, more eagles will be attracted to lakes and other man-made reservoirs, such as Lake Anna, and may require additional protection measures to ensure successful nesting.

In summary, we concur with the conclusion of the Biological Assessment that early site permit actions at the North Anna Nuclear Power Station are not likely to adversely affect any of the Federally listed species potentially occurring there. If we can be of further assistance, please contact Craig Koppie, of the Endangered Species Branch at 410/573-4534.

Sincerely,

G. A. Moore

for John Wolflin,
Supervisor

cc: Ray Fernald, VDGIF

November 3, 2006

Mr. Michael T. Chezik
Regional Environmental Officer
United States Department of the Interior
Office of the Secretary
Office of Environmental Policy and Compliance
Custom House, Room 244
200 Chestnut Street
Philadelphia, PA 19106-2904

SUBJECT: REQUEST BY THE U.S. FISH AND WILDLIFE SERVICE FOR A MEMORANDUM OF AGREEMENT REGARDING EAGLE MANAGEMENT AT LAKE ANNA

Dear Mr. Chezik:

On August 21, 2006, you provided us with the Department of Interior's comments on the U.S. Nuclear Regulatory Commission's (NRC) NUREG-1811, Supplement to the Draft Environmental Statement for an Early Site Permit (ESP) at the North Anna ESP Site. You stated that "with the exception of the issue discussed in the paragraph below, the Draft Environmental Impact Statement adequately addresses issues of concern to the Department, including those regarding fish and wildlife resources, as well as species protected by the Endangered Species Act." In the subsequent paragraph you recommended that the NRC develop an eagle management plan to protect eagle habitat along sections of the lake shore while allowing development in others. Further, you expressed interest in pursuing a Memorandum of Agreement with the NRC, Virginia Dominion Power, and the Virginia Department of Game and Inland Fisheries (VDGIF) to address eagle management at Lake Anna. As suggested in your letter, we contacted Eric Davis of the U.S. Fish and Wildlife Service's (FWS's) Virginia Field Office and held a conference call with the above parties on September 26, 2006.

The purpose of the call was to discuss the request for a Memorandum of Agreement between FWS and other parties regarding development of an eagle management plan. The participants in the call were: Jack Cushing, NRC, Mike Sackchewsky, Pacific Northwest National Laboratory, Eric Davis, FWS, Tony Banks, Dominion Nuclear North Anna, LLC, and Andrew Zdanik and Jeff Cooper from VDGIF.

FWS confirmed that consultation was completed and that this request was not being made as part of the consultation process. The concern FWS expressed was that with the potential de-listing of the bald eagle, it would no longer be protected under the Endangered Species Act, but would be protected under the Bald and Golden Eagle Protection Act. Mr. Davis, thought that protection of the bald eagle may be more difficult under the Bald and Golden Eagle Protection Act than under the Endangered Species Act, therefore, an eagle management plan at Lake Anna would make protection easier.

Dominion suggested that FWS may want to consider working with Louisa County on its shoreline management guidelines as a possible means to address eagle management around the lake. VDGIF express concern that there may not be funding for VDGIF to work on eagle management once the eagle is delisted, because VDGIF is funded for the protection of endangered species.

The NRC stated that it does consult with the FWS on the eagle under the Endangered Species Act; however, the NRC does not have the regulatory authority to develop or enforce an eagle management plan. Therefore, there is no reason for the NRC to develop such a plan or enter into a memorandum of agreement regarding one.

If you have any further questions regarding the request for a memorandum of agreement, please contact the NRC Environmental Project Manager, Jack Cushing, at 301-415-1424, or JXC9@nrc.gov.

Sincerely,

/RA/

Brent Clayton, Acting Chief
Environmental Projects Branch A
Division of Site and Environmental Reviews
Office of New Reactors

Docket No. 52-008

cc: See next page

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Sincerely,

/RA/

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Office of New Reactors

Docket No. 52-008

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NAME	M. Viera	J. Cushing	R. Weisman	B. Clayton
DATE	10/06/06	09/28/06	10/20/06	11/03/06

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CONSULTANTS, INC.

EXECUTIVE SUMMARY

HABITAT ASSESSMENT FOR SELECTED RARE, THREATENED AND ENDANGERED SPECIES NEAR THE DOMMION NORTH ANNA POWER STATION LOUISA COUNTY, VIRGINIA

22 July 2008

Dominion Virginia Power is considering expansion of its North Anna Power Station located near Mineral in Louisa County, Virginia. An approximately 96 acre area located west of the existing facility might be impacted by the proposed construction. If this area is impacted, then the presence of rare, threatened or endangered species on the property must be considered. Dominion asked Davis Environmental Consultants, Inc. to evaluate this property for potential use by: (1) The Bald Eagle (*Haliaeetus leucocephalus*), (2) the Cerulean Warbler (*Dendroica cerulean*), (3) the Upland Sandpiper (*Bartramia longicauda*) and (4) the Loggerhead Shrike (*Lanius ludovicianus*). Virginia Natural Heritage Program lists all of these birds as threatened except for the Cerulean Warbler, which is not listed. There has been recent concern, however, for the Cerulean Warbler because of wide spread decline.

Habitat Descriptions

The property was visited on May 12, 2008 to assess the various habitats. Four habitat cover types were found as described below:

1. Recent Cut-over Forest Land - ± 62 Acres
   This area was found to be typical of a Piedmont Virginia mixed hardwood/pine cut-over. Nothing extraordinary was noted.

2. Deciduous Hardwood Forest – Three to Five Acres
   The forest was mature but not old growth. The diameter of the trees averaged about 16 inches. The largest was about 21 inches. All of the canopy trees were about the same height and little zonation between canopies, sub-canopy, shrub and ground cover layers was observed.

3. Young Mixed Pine/Hardwood – 23 to 24 Acres
   This young forest area was primarily 15 to 20 year old pine.

4. Grassy Field - ± Seven Acres
   This area was cleared within the last few years and has been colonized by a number of "old field" pioneer species.

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Species Accounts

Bald Eagle – In Virginia, Bald Eagles typically nest in an isolated super canopied pine tree with spreading limbs near the top of the tree, sufficient to support the bulky nest of this eagle. No such tree was found on the property and for that reason, the property is not likely to support nesting bald eagles.

Cerulean Warbler – Cerulean Warblers nest in large, mature, deciduous forest of 1,700 acres or more. No such forest area is found on or near the property.

Upland Sandpiper – Upland Sandpipers are referred to as "a quintessential species of grasslands", and as "an indicator species of native prairie . . .". Further, this species "prefers shorter vegetation for foraging than for nesting or brooding". Therefore, the structure of the grassland is important. The seven acre grassy field found on the property is too small an area, with grass that is too tall and lacks sufficient structure and diversity to support nesting Upland Plovers.

Loggerhead Shrike – Shrikes require short to medium height grassland intermixed with bare ground. Also, foraging and feeding perches, such as thorny Hawthorne Trees, barbed wire fences and utility lines are important. No suitable habitat for Shrikes (nesting or wintering) was found on the property.

Conclusions

No suitable nesting habitat for any of these four bird species was found on the subject 96 acre property and no suitable wintering habitat for the Shrike was found.

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Habitat Assessment For Selected Rare Threatened And Endangered Species Near the Dominion North Anna Power Station Louisa County, Virginia

June 11, 2008

Dominion Virginia Power is considering expansion of its North Anna Power Station located near Mineral in Louisa County, Virginia. An approximately 96-acre area located generally north and east of the intersection of Haley Drive and Kentucky Springs Road might be impacted by the potential construction. A small fringe south of Haley Drive is also included. The 96-acre study area includes ± 14 parcels and is hereafter referred to as the "property". The study area is shown as exhibit 1. Note that the aerial photo used for the exhibit does not show the recently logged areas. If impacted, the presence of rare, threatened or endangered species on this property must be considered. Mr. Bill Bolin of Dominion Virginia Power asked Davis Environmental Consultants, Inc. (DEC) to perform habitat evaluations on the property for four rare, threatened or endangered bird species. Habitat on the property was evaluated for potential use by: (1) the Bald Eagle *(Haliaeetus leucocephalus)*, (2) the Cerulean Warbler *(Dendroica cerulean)*, (3) the Upland Sandpiper *(Bartramia longicauda)* and (4) the Loggerhead Shrike *(Lanius ludovicianus)*. Virginia Natural Heritage Program lists all of these birds as threatened, except for the Cerulean Warbler which is not listed. The purpose of this effort was to assess the various habitats on the property, and based on the habitats found, to determine the likelihood that any of these bird species might nest on the property. Also, the potential for Shrike wintering habitat was considered. This assessment relies heavily upon information provided in The Birds of North America bulletins for the Cerulean Warbler, Loggerhead Shrike, and the Upland Sandpiper. Quoted information for each species account is from the corresponding bulletin unless indicated otherwise. The Bald Eagle information comes from personal communication with Dr. M.A. Byrd of The College of William and Mary and from personal experience.

Habitat Descriptions

Mr. Bill Bolin and Mr. Glenn Bishop of Dominion Power and Mr. Doug Davis of DEC visited the property on May 12, 2008 to assess the various habitats. Four habitat cover types were found on the property as described below:

1. Recent Cut-over

   An estimated 65%, or ± 62 acres, of the northeast part of the property has recently been timbered. Judging from stump sprout growth, it appears that this timbering occurred within the last one to three years. The area is typical of a Virginia mixed hardwood/pine cut-over. A number of shrubs and sub-canopy tree species and smaller individuals of canopy tree species, which were growing in the shade of the canopy before the logging, were exposed to full sunlight. With the increased light, these species and individuals are growing vigorously. These species include: Sourwood *(Oxydendrum arboreum)*, American Holly *(Ilex opaca)*, Dogwood *(Cornus florida)*, Highbush Blueberry *(Vaccinium corymbosum)*, Devil's Walking Stick *(Aralia spinosa)* and others. Native pioneer herbaceous plants such as Broomstraw

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(Andropogon virginicus) Dog Fennel *(Eupatorium capillifolium)*, Poke *(Phytolacca americana)* and Blackberry *(Rubus* sp.*)* are likewise common. Hardwood stump sprouts to six or eight feet tall in some areas are evident. Stump sprouting species include: Yellow Poplar (*Liriodendron tulipifera)*, Northern Red Oak *(Quercus rubra)*, Hickory *(Carya* sp.*)*, Water Oak *(Quercus nigra)* and others. There are also some areas of bare ground that were created by the logging disturbance. The logging occurred earlier (approximately three years ago) in the northeast part of the cut-over and later (one year ago) toward the southwest. This cut-over area will get increasingly dense as the shrubs, stump sprouts and small trees grow and will be a dense shrub thicket in three to five years. White-eyed Vireos *(Vireo griseus)* and Yellow Breasted Chats *(Icteria virens)* were heard singing in the cut-over during our site visit. In the next five to ten years, the cut-over area is expected to be preferred habitat for White-eyed Vireos, Chats and other early successional species.

2. Deciduous Hardwood Forest

A small area of mixed deciduous hardwood forest was found between two wetland drainages along the northwest boundary of the property. This deciduous hardwood forest area was estimated at three to five acres. The forest was mature, but not old growth. The DBH of the trees averaged about 16 inches. The largest were about 21 inches. Canopy species included Northern Red Oak *(Quercus rubra)*, Yellow Poplar *(Liriodendron tulipifera)*, Hickories *(Carya* sp.*)*, Red Maple *(Acer rubrum)*, Sweet Gum *(Liquidambar styraciflua)* and Beech *(Fagus grandifolia)*. Understory species included Dogwoods *(Cornus florida)*, Sourwood *(Oxydendrum arboreum)* and Mountain Laurel *(Kalmia latifolia)*. All of the canopy trees were about the same height and little zonation between canopy, sub-canopy, shrub and ground cover layers was observed.

3. Young Mixed Pine/Hardwood

Most of the forested part of the property (approximately 22 – 24 acres) is a young mixed pine/hardwood cover type. It appears that these areas were logged 15 to 20 years ago and pine and hardwood allowed to revegetate naturally. In some areas, Virginia Pine *(Pinus virginiana)* is dominant, while in other areas young hardwoods are dominant. These species include Red Maple, Sweet Gum and a smaller number of other hardwood species mentioned previously.

4. Grassy Field

The approximately seven-acre area located immediately north of the intersection of Kentucky Springs Road and Haley Drive was recently cleared and has been colonized by a number of herbaceous native pioneer species such as Broom Straw *(Andropogon virginica)* and Dog Fennel *(Eupatorium capillifolium)*.

Species Accounts

Bald Eagle – No suitable nesting habitat for the Bald Eagle was found on the property. The Bald Eagle was placed on the endangered species list more than 30 years ago. At that time Bald Eagle numbers were declining sharply in most areas of the lower 48 United States due to pesticide contamination. Since use of the offending pesticides was generally discontinued, Bald Eagle numbers have rebounded to where the eagle was recently removed

from the Federal Endangered Species List; however, the eagle remains on the State Threatened List. Bald Eagles are now a relatively common site in Virginia, with more than 500 nesting pairs counted in Virginia in the Spring of 2008. Historically, almost all Bald Eagle nests in Virginia were in super-canopy pine trees. Preferred sites were isolated from human disturbance. In recent years, some eagles have nested in deciduous trees and even occasionally on man-made structures. This is probably because the growing population of eagles has already occupied the preferred sites (super-canopy pines), forcing eagles to use deciduous trees and, rarely, man-made structures like duck blinds and utility towers. Also, eagles seem to be becoming more tolerant of human activities and disturbance. The important parameters for a Bald Eagle nest site appear to be a suitable structure to hold the nest that has open flight lines to and from the nest site. Although nearby Lake Anna does attract eagles, no substantial super-canopy trees, deciduous or pines, were found on the property. For that reason, the property is not likely to support nesting Bald Eagles.

Cerulean Warbler – No suitable nesting habitat for the Cerulean Warbler was found on the property. The Cerulean Warbler is "usually considered an area sensitive species" and has precise habitat requirements. "Important habitat elements for this species thus appear to be large tracks with big deciduous trees in mature to old growth forest with horizontal heterogeneity of the canopy" with "distinct zonation of canopy, sub-canopy, shrub and ground cover layers". No such habitat was found on the subject property. Even if the 3 to 5 acres of deciduous forest on the property was old and structured enough to provide suitable nesting habitat, it would be too small. "Minimum forest-tract size" is "700 hectares in the mid-Atlantic states..." This equates to more than 1700 acres. There is a forested area of approximately 30 acres located off of the property to the north. From aerial photos, it appears to be similar to the 3 to 5 acre deciduous forest on the property. Even if these two areas are considered together, they make only a maximum of ± 35 acres. Even if these 35 acres were suitable in character, they would still represent only 3% of the published estimate of the "minimum forest-tract size" for nesting for the Cerulean Warbler.

Upland Sandpiper – No suitable nesting habitat for the Upland Sandpiper was found on the property. The Upland Sandpiper is "an obligate grasslands species". The only grassland on the property is an approximately seven acre area located immediately north of the intersection of Kentucky Springs Road and Haley Drive. This property was recently cleared within the last year or so. Prior to clearing, these seven acres were in young Virginia Pine similar to the cover type category young Mixed Pine/Hardwood described above. Since the area was cleared, herbaceous native pioneer species have colonized, such as the grass Broom Straw. Other early successional species, such as Blackberry, Pine and Maple seedlings will undoubtedly become established. Therefore, this area that is presently "grassy" will become increasingly thicker and taller, unless the field site is periodically mowed to maintain its grassy character. Even if this field was maintained as grassland, this seven acres is not suitable for Upland Sandpiper habitat for a number of reasons. First, the seven acre grassy field surrounded by forested cover type is not large enough. Second, the structure and diversity of the grassland is inconsistent with preferred Upland Sandpiper nesting habitat.

No minimum acreage for grassland nesting habitat is referenced in the Birds of North America Bulletin on the Upland Sandpiper or in the Virginia Endangered Species Accounts.

However, the bulletin points to the need for large areas of grassland for this rare and declining species. Selected quotes are provided to illustrate this nesting habitat requirement: "A quintessential species of grasslands"..., "an indicator species for native prairie in the W. Dakotas"..., "in a number of eastern states, airports have become the main and in a few instances, the only suitable grassland breeding habitat remaining for Upland Sandpipers"..., (grasslands around) "Airports support (the) majority of small number of nesting pairs in some eastern states"..., "rare by 1984, (the decline was) coincident with loss of extensive upland hayfields". All of these descriptive quotes make it clear that the seven acre grassy field on the subject property is far too small to support breeding Upland Sandpipers.

The character and structure of the seven acre grassy field is likewise unsuitable for Upland Sandpipers. Preferred nesting habitat for Upland Sandpipers is typically dry grasslands "with low to moderate forb cover, low woody cover, moderate grass cover, moderate to high litter cover, and little bare ground", and this species "prefers shorter vegetation for foraging than for nesting or brooding" and "nest(s) in old fields, pastures and sedge/grass meadows until vegetation reaches 30 centimeters high". Thirty centimeters is just a little less than 12 inches. Therefore, Upland Sandpipers require grasslands with areas of varying height up to about 12 inches to support foraging, nesting and brooding. Further, the preferred grassland has moderate to high litter cover and little bare ground. The seven acre grassy field on the property does not meet these characteristics. The tallest grass is well over a foot high and because the grassy field is a result of recent bulldozer clearing, there is almost no litter cover and bare patches will persist for at least a few growing seasons.

The seven acre grassy field found on the property is too small in area, with grass that is too tall and lacks sufficient structure and diversity to support nesting Upland Sandpipers. Also, there are no recent records of this species nesting within about 60 miles of the study area.

Loggerhead Shrike – No suitable nesting or wintering habitat for the Loggerhead Shrike was found on the property. The Loggerhead Shrike, like other shrikes, is a unique song bird. The shrike is a small avian predator that acts in many ways like a small hawk. However, because shrikes lack the strong feet and talons of hawks, they impale their prey, such as mice and small birds, on thorns and barbed wire fences. Once the prey has been impaled, the shrike uses its hawk-like bill to dismember the prey. Habitat selection for the Loggerhead Shrike is defined by the birds' unique feeding habits. Virginia Department of Game and Inland Fisheries notes that "Loggerhead Shrikes inhabit grassland areas containing scattered trees and shrubs, particularly red cedar (*Juniperus virginiana*) and hawthorn (*Crataegus* spp.), grasses in ranges of short to medium heights intermixed with bare ground, as well as utility lines and barbed wire fences." Pastures generally meet these criteria and are therefore considered favored habitat for the Loggerhead Shrike. Sparse grass and bare ground are important components of shrike habitat (D.S.D. personal observation).

Shrike numbers in Virginia have declined in recent years and the Loggerhead Shrike has been listed as threatened in Virginia. Reuven Yosef, a shrike authority, indicates that "Despite its widespread distribution, the Loggerhead Shrike is one of the few North American passerines whose populations have declined continentwide in recent decades.

Changes in human land use practices, the spraying of biocides, and competition with species that are more tolerant of human induced changes appear to be major factors contributing to this decline".

The only area of grassland on the property is an approximately seven acre area located immediately north of the intersection of Kentucky Springs Road and Haley Drive, which is described at depth in the species account of the Upland Sandpiper. The grass in preferred shrike habitat is very short (an inch or two) and is typically maintained in that condition by active livestock grazing. That is why pastures are "considered favored habitat for the Loggerhead Shrike". As discussed above, the grass in the seven-acre field is too tall. Second, preferred shrike habitat typically has "scattered trees and shrubs, particularly Red Cedar . . . and Hawthorne . . .". No such perching or nesting trees remained on this seven acres after it was cleared. Third, with no thorny trees, such as Hawthorne or no barbed wire fences that might be associated with pasture, there are no impaling sites in the vicinity of this grassy field to help the shrike with feeding. For these reasons, the property is not likely to support nesting or wintering Loggerhead Shrikes.

Conclusions

The habitat on the approximately 96 acre study area located generally north and east of the intersection of Haley Drive and Kentucky Springs Road in Louisa County in Virginia was evaluated for suitable nesting habitat for the Bald Eagle, the Cerulean Warbler, the Upland Sandpiper and the Loggerhead Shrike. The habitat was also evaluated for wintering habitat for the shrike. No suitable nesting habitat for any of these four bird species was found, and no suitable wintering habitat for the shrike was found.

References

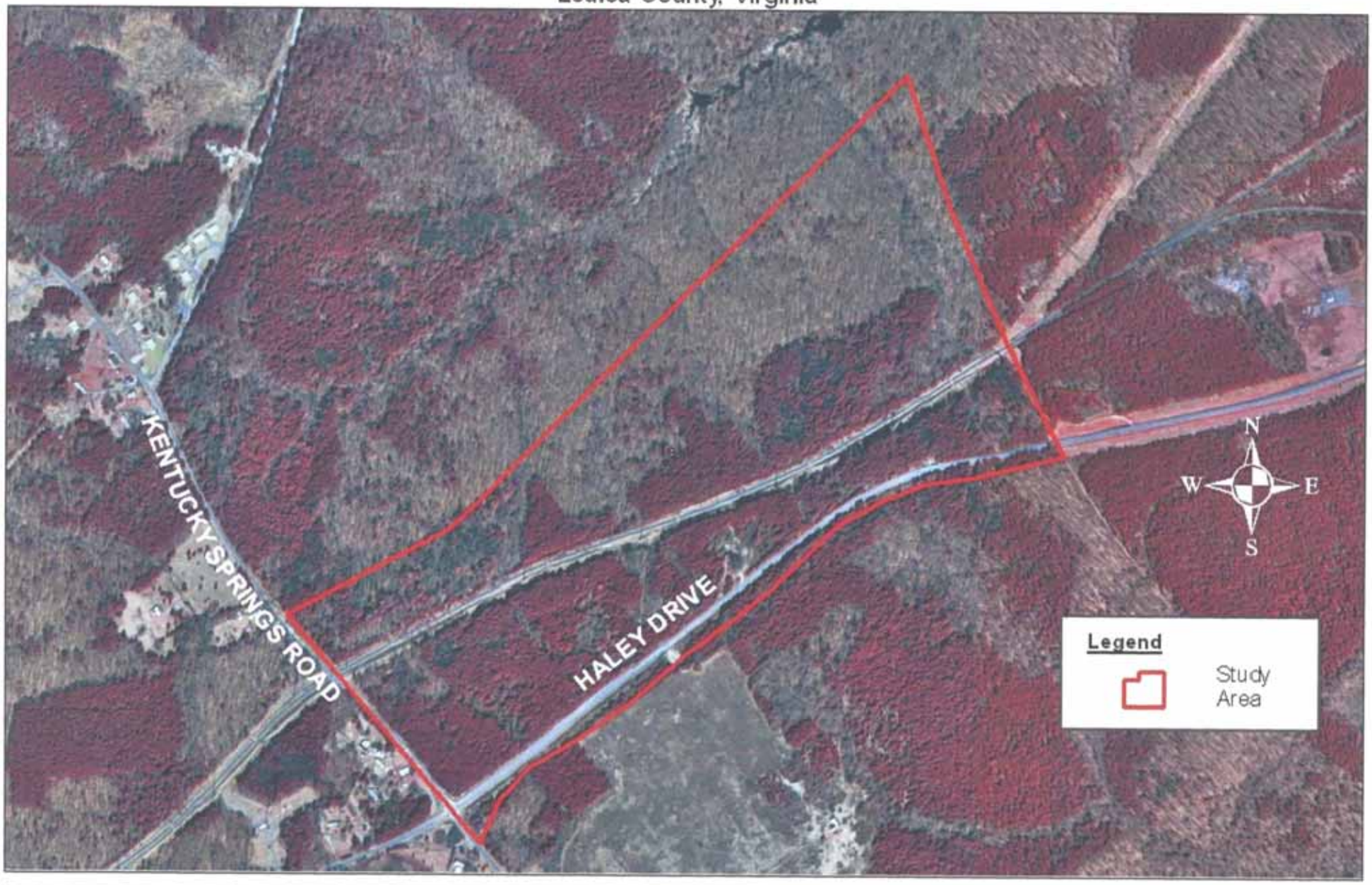
Hamel, P.B. 2000. Cerulean Warbler *(Dendroica cerulean)*. In The Birds of North America, No. 511 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

Houston, C.S., and D.E. Bowen, Jr. 2001. Upland Sandpiper *(Bartramia longicauda)*. In The Birds of North America, No. 580 (A.Poole and F. Gill, eds). The Birds of North America, Inc., Philadelphia, PA.

Terwilliger, K. 1991. Upland Sandpiper *(Bartramia longicauda)*. Virginia's Endangered Species.

Yosef, R. 1996. Loggerhead Shrike *(Lanius ludovicianus)*. In the Birds of North America, No. 231 (A.Poole and F. Gill, eds.). The Academy of Natural Sciences, Philadelphia, and The American Ornithologists' Union, Washington, D.C.

Study Area for Select Rare, Threatened, and Endangered Species near the Dominion North Anna Power Station, Louisa County, Virginia



DAVIS ENVIRONMENTAL CONSULTANTS, INC.
June 9, 2008

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L. Preston Bryant, Jr.
Secretary of Natural Resources

Joseph H. Maroon
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

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Richmond, Virginia 23219-2010
(804) 786-7951 FAX (804) 371-2674

September 29, 2009

Michael Sackschewky
Pacific Northwest National Laboratory
P.O. Box 999 MSIN K6-85
Richland, WA 99352

Re: North Anna Power Station Unit 3- North Anna 3 Project Site, Construction Staging Area and North Anna to Ladysmith Transmission Line Corridor

Dear Mr. Sackschewky:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

North Anna 3 Project Site and Construction Staging Area

According to the information currently in our files, this site may support habitat appropriate for small whorled pogonia (*Isotria medeoloides*, G2/S2/LT/LE) in forested areas within the proposed project areas. Small whorled pogonia grows in a variety of woodland habitats in Virginia, but tends to favor mid-aged woodland habitats on gently north or northeast facing slopes often within small draws. Direct destruction as well as habitat loss and alteration are principle reasons for the species' decline (Ware, 1991). Please note that small whorled pogonia is currently classified as threatened by the United States Fish and Wildlife Service (USFWS) and as endangered by the Virginia Department of Agriculture and Consumer Services (VDACS).

Due to the potential for this site to support populations of natural heritage resources, DCR recommends an inventory for the resource in the study area. With the survey results, we can more accurately evaluate potential impacts to natural heritage resources and offer specific protection recommendations for minimizing impacts to the documented resources.

DCR-Division of Natural Heritage biologists are qualified and available to conduct inventories for rare, threatened, and endangered species. Please contact J. Christopher Ludwig, Natural Heritage Inventory Manager, at chris.ludwig@dcr.virginia.gov or 804-371-6206 to discuss arrangements for field work. A list of other individuals who are qualified to conduct inventories may be obtained from the USFWS. Due to the legal status of these species, DCR also recommends coordination with the USFWS and the VDACS to ensure compliance with protected species legislation.

The Virginia Department of Agriculture and Consumer Services (VDACS), which has regulatory authority to conserve rare and endangered plant and insect species through the Virginia Endangered Plant and Insect Species Act, has established a Memorandum of Agreement with the Virginia Department of Conservation and Recreation (DCR). Under this Agreement DCR's Division of Natural Heritage, in consultation with VDACS, represents VDACS in its comments and recommendations regarding the potential impact of reviewed projects or activities on state-listed plant and insect species. Since it has been determined that this project or activity may impact small whorled pogonia a state-protected plant, VDACS will respond directly to ensure compliance with Virginia's Endangered Plant and Insect Species Act. Further correspondence regarding the potential impacts of this project or activity on state-listed plant and insect species should be directed to VDACS.

North Anna to Ladysmith Transmission Corridor

According to the information currently in our files, the Blanton's Powerline Conservation Site is within the powerline corridor (see attached map). Conservation sites are tools for representing key areas of the landscape that warrant further review for possible conservation action because of the natural heritage resources and habitat they support. Conservation sites are polygons built around one or more rare plant, animal, or natural community designed to include the element and, where possible, its associated habitat, and buffer or other adjacent land thought necessary for the element's conservation. Conservation sites are given a biodiversity significance ranking based on the rarity, quality, and number of element occurrences they contain; on a scale of 1-5, 1 being most significant.

The Blanton's Powerline Conservation Site has been given a biodiversity significance ranking of B5, which represents a site of general significance. The natural heritage resource of concern at this site is:

Stachys eplingii	Epling's Hedge-nettle	G5/S1/NL/NL

DCR recommends avoidance of this rare plant population during project construction and maintenance activities. Please note if there is any proposed widening of the existing transmission right-of-way which will entail forest removal, DCR also recommends a survey for Small whorled pogonia for this project area.

Our files do not indicate the presence of any State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

A fee of $315.00 has been assessed for the service of providing this information. Please find enclosed an invoice for that amount. Please return one copy of the invoice along with your remittance made payable to the Treasurer of Virginia, **DCR - Division of Natural Heritage, 217 Governor Street Richmond, VA 23219.** Payment is due within thirty days of the invoice date. Late payment may result in the suspension of project review service for future projects.

The Virginia Department of Game and Inland Fisheries maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from http://vafwis.org/fwis/ or contact Shirl Dressler at (804) 367-6913.

Should you have any questions or concerns, feel free to contact me at 804-371-2708. Thank you for the opportunity to comment on this project.

Sincerely,

S. Rene' Hypes
Project Review Coordinator

CC: Tylan Dean, USFWS
Keith Tignor, VDACS

Literature Cited

Ware, D.M.E. 1991. Small whorled pogonia. In Virginia's Endangered Species: Proceedings of a Symposium. K. Terwilliger ed. The McDonald and Woodward Publishing Company, Blacksburg, Virginia.

Accounts Payable

COMMONWEALTH OF VIRGINIA
Department of Conservation and Recreation
217 Governor Street,
Richmond, VA 23219

Fed I.D. # 54-6004497
DUNS # 809-74-4444

Make checks payable to the
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Payment is due 30 days
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INVOICE

Michael Sackschewky
Pacific Northwest National Laboratory
P.O. Box 999 MSIN K6-85
Richland, WA 99352

Invoice: H-8354

Date: September 29, 2009

Please detach and return remittance copy with payment to ensure proper credit to your account.

Taxpayer I.D.# _____

Contact: René Hypes
Division of Natural Heritage
(804) 371-2671 FAX# (804) 371-2674 TDD (804) 786-2121

DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	TOTAL AMOUNT
Impact Review	3	EA	90.00	270.00
Element Occurrences	3	AT	35.00	35.00

Site Reference
North Anna Power Station Unit 3- North Anna 3 Project Site, Construction Staging Area and North Anna to Ladysmith Transmission Line Corridor

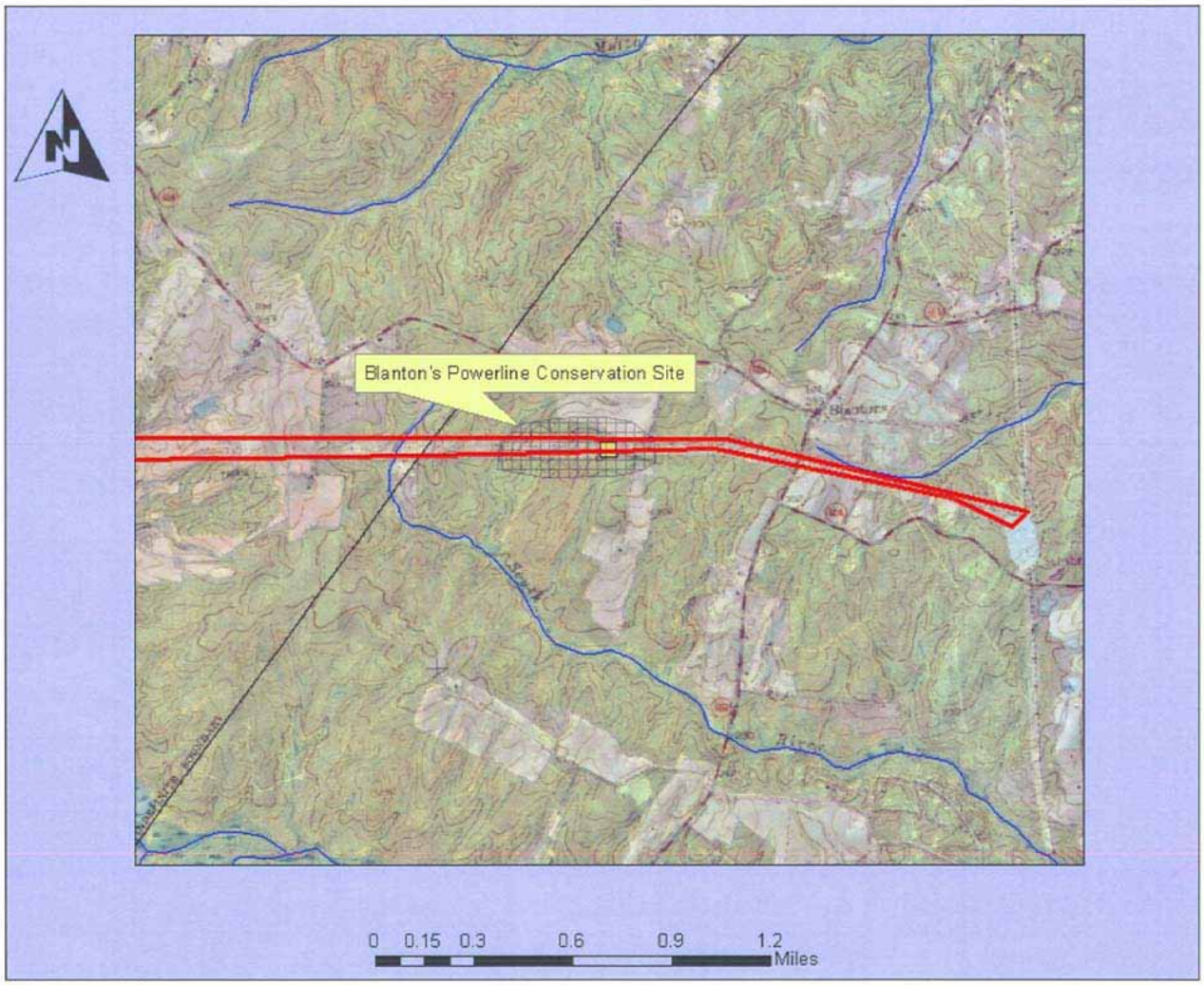
Credit Information: 199 02 00 10 50317 02199 645

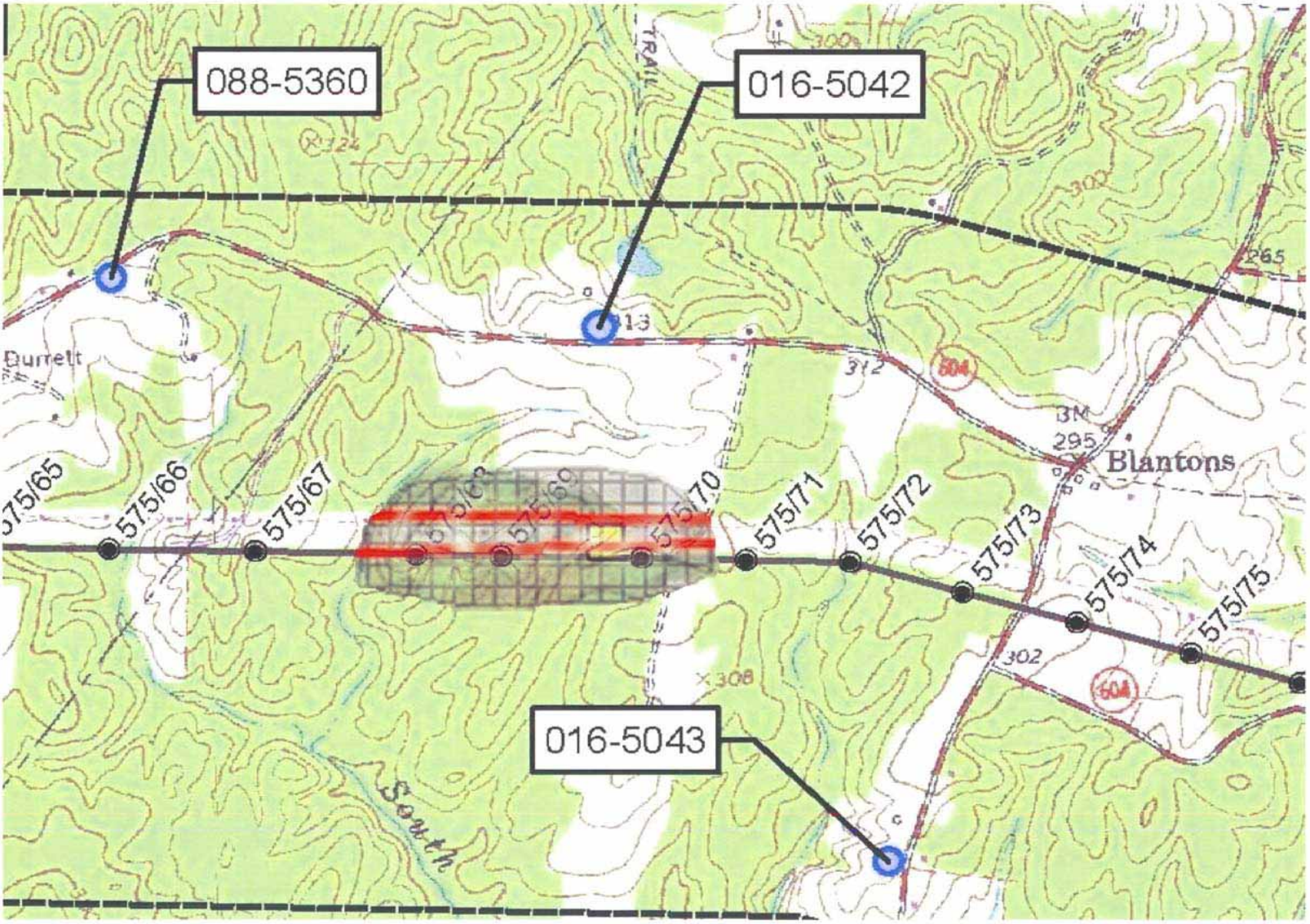
Amount Due: $315.00

The Department of Conservation and Recreation may charge interest on all past due accounts receivable in accordance with guidelines promulgated by the Department of accounts and at the underpayment rate prescribed in Section 58.1-15 of the Code of Virginia. Each past due account receivable may also be charged an additional amount which shall approximate the administrative cost incurred in collecting the past due amount. The Department may also assess late payment penalty fees as appropriate.

1 – Recipient Copy 2 – Remittance Copy 3 – Accounting Copy

North Anna to Ladysmith Transmission Corridor

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WILLIAMSBURG ENVIRONMENTAL GROUP, INC.

Environmental Consultants

November 12, 2009

Scott Slagley
AECOM
4840 Cox Road
Glen Allen, Virginia 23060

Re: Habitat Survey for the Small Whorled Pogonia (*Isotria medeoloides*)
North Anna Power Station, Louisa County, Virginia
WEG Project #4317B

Dear Mr. Slagley:

This report follows a habitat investigation for the federal-listed threatened and state-listed endangered small whorled pogonia (*Isotria medeoloides*) by Williamsburg Environmental Group, Inc. (WEG), for a portion of the North Anna Power Station Property in Louisa County, Virginia. The approximate 295-acre survey area is located within the North Anna River drainage basin and is situated northeast of Kentucky Springs Road (Route 652) along Haley Drive (Route 700).

Chris Senfield of WEG, who is endorsed by the U.S. Fish and Wildlife Service (FWS) as a survey contact for the small whorled pogonia (SWP), conducted the habitat survey. The survey was conducted in accordance with habitat criteria specific to the species. The following sections will present a brief description of the plant, the methodology utilized, and the results of this habitat survey for SWP.

Species Description – SWP is a self-pollinating perennial orchid (Family: Orchidaceae), four to twelve inches in height, with a characteristic whorl of five to seven leaves at the summit of a singular, hollow, pale green stem with one or two pale yellowish-green irregular flowers (Mehrhoff 1983, Gleason and Cronquist 1991, Vitt and Campbell 1997). Morphologically similar species include large whorled pogonia (*Isotria verticillata*) and Indian cucumber root (*Medeola virginiana*), the former distinguished from SWP by a reddish-purple stem and the latter by a wiry stem with cotton-like hairs (Ware 1991).

Habitat Factors – SWP occupies a very specific habitat type within its range. In particular, the species seems to require the following conditions: mature, mixed hardwood, upland forests; generally open understory conditions with minimal aggressive ground level species; generally level to moderately sloping land within shallow upland draws often, but not always, of northerly or easterly exposure; scattered ground-level sunlight; and, acidic, sandy loam soils (Ware 1991, Gleason and Cronquist 1991, Weakley 2008). In addition, many professionals have noted a prevalence of decaying logs and a well-developed detritus layer on the forest floor. These attributes tend to be present with the species when found, although the exact mechanisms associated with each affinity are not understood (Ware 1991).

Certain indicator species, among others, may also be helpful in identifying small whorled pogonia habitat, such as large whorled pogonia, strawberry bush (*Euonymus americanus*), tick trefoil

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(*Desmodium* spp.), and wintergreen (*Chimaphila maculata*). These species, among others, are considered associates, and occur frequently near documented SWP colonies. It should be noted that the absence of one or even several of the above-referenced habitat criteria does not necessarily preclude the species from occurring on a particular site. A habitat determination should therefore be based upon the experience of a qualified professional.

Methodology – The normal vegetative cycle of SWP is late spring to mid summer. Thus, the FWS will only accept detailed survey data collected within a certain season (approximately June 1st through July 20th in Louisa County, Virginia). Outside of this time frame, qualified survey contacts may conduct habitat surveys using the guidelines listed above to determine whether a particular site contains potential habitat for the species. The purpose for this type of survey is to approximately identify main portions of the site which may require in-season detailed surveys for the species. The out-of-season preliminary habitat survey conducted by WEG on this site occurred on November 5, 2009.

This SWP habitat survey was conducted using both on-site and off-site survey methods. On-site methods included general ground reconnaissance of the property boundary and most interior upland slopes. Notes were taken regarding cover types, community assemblages, slope aspect and grade, associate species, substrate, and other relevant information concerning habitat quality. Such reconnaissance and data collection allows for identification of potential SWP habitat, based on the presence of favorable habitat conditions for the target species.

Some areas within the project limits were assessed off-site using aerial photography interpretation. Aerial imagery accessed was dated February 2007. General on-site observations confirmed that this imagery was generally accurate in terms of existing community types and structures. Imagery was used to differentiate between existing hardwood and pine dominated communities, using observations from the on-site survey to generally confirm community types.

Results – Potential SWP habitat was found within the survey area at North Anna Power Station. Areas of potential habitat are depicted on the attached Small Whorled Pogonia Habitat Map. Potential habitat identified is generally found in semi-mature and mature upland forests comprised of hardwood and mixed hardwood vegetative communities. Typical vegetation observed in these communities includes white oak (*Quercus alba*), northern red oak (*Quercus rubra*), hickory (*Carya* spp.), tulip poplar (*Liriodendron tulipifera*), flowering dogwood (*Cornus florida*), sassafras (*Sassifras albidum*), American holly (*Ilex opaca*), eastern red cedar (*Juniperus virginiana*), redbud (*Cercis canadensis*), huckleberry (*Gaylussicia* spp.) and wintergreen. Additionally, these communities are generally gently to moderately sloping, with relatively open understories, an abundance of decomposing woody debris, and well developed detritus. Recent disturbance is infrequent and canopy gaps along existing stream and wetland drainageways are present.

The remainder of the site can generally be considered of poor habitat condition. These areas include several forested community types, land recently cleared for timber harvesting, existing railroads, maintained transmission lines, existing infrastructure and maintained lawns. Forested community types without potential SWP habitat include regenerative scrub, pine plantation, and

floodplain woodlands. The regenerative scrub areas were recently cut for timber resulting in early-growth loblolly pine (*Pinus taeda*), tulip poplar (*Liriodendron tulipifera*), sweet gum (*Liquidamber styraciflua*), blackberry (*Rubus argutus*), and honeysuckle (*Lonicera japonica*). Pine plantation woodlands are those that have been historically harvested and cultivated for pine timber. Forested floodplains contain wet to mesic soil conditions that support river birch (*Betula nigra*), red maple (*Acer rubrum*), sweet gum, ironwood (*Carpinus caroliniana*), greenbrier (*Smilax rotundifolia*) and honeysuckle.

Each of these woodland types are considered poor SWP habitat due to age structure, aggressive vegetative competition, improper moisture regime, regular disturbance, etc, and generally preclude potential for SWP habitat. However, since both on-site and off-site survey methods were necessary, it is possible that small enclaves of potential habitat may exist within them.

In summary, potential habitat for SWP exists within the survey area at North Anna Power Station. These areas are generally depicted on the Small Whorled Pogonia Habitat Map. Small enclaves of potential habitat may exist outside of these mapped areas, and WEG recommends a detailed in-season (June 1st to July 20th) survey to determine whether individuals of SWP are present in the survey area.

If you have any questions regarding the information presented herein, please feel free to call at your convenience. We appreciate the opportunity to provide these environmental services for the North Anna Power Station project.

Sincerely,

Chris Senfield
Ecologist II

Enclosures

References Cited

Gleason, H. A. and A. Cronquist. 1991. *Manual of Vascular Plants of Northeastern United States and Adjacent Canada.* New York Botanical Garden, Bronx, New York. p. 828.

Mehrhoff, L. A. III. 1983. Pollination in the genus *Isotria* (Orchidaceae). American Journal of Botany 70:1444-1453.

Vitt, P. and C. S. Campbell. 1997. Reproductive biology of *Isotria medeoloides* (Orchidaceae). Rhodora 99:56-63.

Ware, D. M. E. 1991. Small Whorled Pogonia, *Isotria medeoloides* (Pursh) Rafinesque. In *Virginia's Endangered Species*, K. Terwilliger, ed. McDonald and Woodward, Blacksburg, Virginia.

Weakley, A. S. 2008. *Flora of the Carolinas and Virginia*. Working draft. UNC Herbarium, University of North Carolina, Chapel Hill, NC.

WILLIAMSBURG ENVIRONMENTAL GROUP, INC.

Environmental Consultants

November 16, 2009

Scott Slagley
AECOM
4840 Cox Road
Glen Allen, Virginia 23060

Re: Habitat Survey for the Epling's Hedge-nettle (*Stachys eplingii*) and Small Whorled Pogonia (*Isotria medeoloides*)
Blantons Powerline Conservation Site, Caroline County, Virginia
WEG Project #4317A

Dear Mr. Slagley:

This report follows a habitat investigation for the Epling's Hedge-nettle (*Stachys eplingii*) and the federal-listed threatened and state-listed endangered small whorled pogonia (*Isotria medeoloides*) by Williamsburg Environmental Group, Inc. (WEG), for the Blantons Powerline Conservation Site in Caroline County, Virginia. The approximate 49-acre site is located within the South River drainage basin, south of Blantons Road (Route 604), and west of Countyline Church Road (Route 603). The survey area includes a portion of the right-of-way between towers 67 and 71 along transmission line 575, in addition to forested and open-field areas lying directly adjacent to the north and south. The approximate survey limits are depicted on the Epling's Hedge-nettle Habitat Map and the Small Whorled Pogonia Habitat Map (Attachments).

Chris Senfield of WEG, who is endorsed by the U.S. Fish and Wildlife Service (FWS) as a survey contact for the small whorled pogonia (SWP), conducted the habitat surveys. Surveys were conducted in accordance with habitat criteria specific to each plant. The following sections, starting with Epling's Hedge-nettle, will present a brief description of the plants, the methodology utilized, and the results of this habitat survey for Epling's Hedge-nettle and SWP.

Epling's Hedge-nettle

Species Description – Epling's Hedge-nettle is a perennial herb in the mint family (Lamiaceae), twenty to forty inches in height, with opposite, finely toothed leaves. Flowers are produced annually in early summer months, typically June or July. The inflorescence consists of generally 8 or more white irregular flowers, with purple/lavender spots or lines, growing in interrupted racemes (Gleason and Cronquist 1991, Godfrey and Wooten 1979). Other hedge-nettle species have a morphological similarity, which has been a cause for confusion in nomenclature in the past (Nelson and Fairey 1979). However, Epling's Hedge-nettle can be distinguished by short or absent petioles, leaf shape, and structure of hairs along the stem (Godfrey and Wooten 1979, Weakley 2008).

Habitat Description – Epling's Hedge-nettle seems to occupy a variety of habitat types and is sporadically distributed within its southeastern United States range. It is associated with several montane habitats of Georgia, North Carolina, South Carolina, and Virginia, including mesic

forests, bogs, and wet meadows, often occurring over calcareous or mafic substrates (Weakley 2008). The species has also been observed at lower elevations, with specimens noted near Washington D.C. (Nelson and Fairey, 1979) and within Caroline County, Virginia (Virginia Botanical Associates, 2009).

Methodology – Habitat surveys for Epling's hedge-nettle can occur year-round due to the variety of habitat types in which it has been observed. The purpose of this type of survey is to identify portions of a site where preferable habitat types or attributes may be present. Observations of existing habitat on the Blantons Powerline Conservation Site occurred during general site reconnaissance on November 5, 2009. During this time, notes were taken regarding cover types and community assemblages, and general observations were made regarding moisture regime of habitat types identified. Data gathered on-site was combined with off-site research performed to ascertain types of soil and substrate historically recorded within the survey area. This aspect was performed using the Soil Survey for Caroline County, Virginia, as prepared by the Natural Resources Conservation Service (NRCS).

Results – Potential habitat for Epling's Hedge-nettle was found within the Blantons Powerline Conservation Site. Areas of potential habitat are generally depicted on the attached Epling's Hedge-nettle Habitat Map. A portion of active agricultural field, located in the northeast portion of the site, was not included as potential habitat due to frequency of disturbance to the vegetative community and its underlying soil substrate.

Potential habitat identified includes woodland vegetation communities located to the north and south of the transmission line corridor. The majority of these communities can be identified as semi-mature to mature hardwood assemblages, with gently to moderately sloping topography. Additionally, the herbaceous vegetation community within the transmission line corridor was also identified as potential habitat. Regular maintenance within the transmission line corridor likely contributes to the meadow-like vegetative assemblage, limiting development of field succession. Both wooded and open areas have a range of moisture regimes, including hydric conditions in headwater wetland seepages, mesic conditions within shallow depressional swales, and xeric conditions near the highest point of the land. Signs of surface water influence seemed increased throughout the site, as a result of either water retention within disturbed, compacted soil or runoff from agricultural fields. Slopes are generally underlain by the Helena-Appling Complex soil type, portions of which have mafic substrates associated with parent material.

Small Whorled Pogonia

Species Description – SWP is a self-pollinating perennial orchid (Family: Orchidaceae), four to twelve inches in height, with a characteristic whorl of five to seven leaves at the summit of a singular, hollow, pale green stem with one or two pale yellowish-green irregular flowers (Mehrhoff 1983, Gleason and Cronquist 1991, Vitt and Campbell 1997). Morphologically similar species include large whorled pogonia (*Isotria verticillata*) and Indian cucumber root (*Medeola virginiana*), the former distinguished from SWP by a reddish-purple stem and the latter by a wiry stem with cotton-like hairs (Ware 1991).

Habitat Factors – SWP occupies a very specific habitat type within its range. In particular, the species seems to require the following conditions: mature, mixed hardwood, upland forests; generally open understory conditions with minimal aggressive ground level species; generally level to moderately sloping land within shallow upland draws often, but not always, of northerly or easterly exposure; scattered ground-level sunlight; and, acidic, sandy loam soils (Ware 1991, Gleason and Cronquist 1991, Weakley 2008). In addition, many professionals have noted a prevalence of decaying logs and a well-developed detritus layer on the forest floor. These attributes tend to be present with the species when found, although the exact mechanisms associated with each affinity are not understood (Ware 1991).

Certain indicator species, among others, may also be helpful in identifying small whorled pogonia habitat, such as large whorled pogonia, strawberry bush (*Euonymus americanus*), tick trefoil (*Desmodium* spp.), and wintergreen (*Chimaphila maculata*). These species, among others, are considered associates, and occur frequently near documented SWP colonies. It should be noted that the absence of one or even several of the above-referenced habitat criteria does not necessarily preclude the species from occurring on a particular site. A habitat determination should therefore be based upon the experience of a qualified professional.

Methodology – The normal vegetative cycle of SWP is late spring to mid summer. Thus, the FWS will only accept detailed survey data collected within a certain season (approximately June 1st through July 20th in Caroline County, Virginia). Outside of this time frame, qualified survey contacts may conduct habitat surveys using the guidelines listed above to determine whether a particular site contains potential habitat for the species. The purpose for this type of survey is to identify portions of the site that may require in-season detailed surveys for the species. The out-of-season preliminary habitat survey conducted by WEG on this site occurred on November 5, 2009.

This SWP habitat survey was conducted using general ground reconnaissance of the project boundary and all interior upland slopes. Notes were taken regarding cover types, community assemblages, slope aspect and grade, associate species, substrate, and other relevant information concerning habitat quality. Such reconnaissance and data collection allows for identification of potential SWP habitat, based on the presence of favorable habitat conditions for the target species.

Results – Potential SWP habitat was found within the Blantons Powerline Conservation Site. Areas of potential habitat are generally depicted on the attached Small Whorled Pogonia Habitat Map. Potential habitat is limited to semi-mature and mature upland forests comprised of hardwood and mixed hardwood vegetative communities. These communities are located both to the north and south of the existing transmission line. Typical vegetation observed in these communities includes white oak (*Quercus alba*), northern red oak (*Quercus rubra*), hickory (*Carya* spp.), tulip poplar (*Liriodendron tulipifera*), flowering dogwood (*Cornus florida*), American holly (*Ilex opaca*), eastern red cedar (*Juniperus virginiana*), huckleberry (*Gaylussicia* spp.) and wintergreen. Additionally, these communities are generally flat to gently sloping, with relatively open understories, presence of decomposing woody debris, and well developed detritus.

The remainder of the project area can be considered of poor habitat condition, with no current potential for SWP habitat. Community types with poor habitat conditions include a small area of pine-dominated forest, agricultural fields, maintained herbaceous meadow within the existing transmission line right-of-way, and existing roads. These communities are considered poor SWP habitat due to age structure, lack of appropriate vegetative structure, aggressive vegetative competition, improper moisture regime, regular disturbance, etc, and preclude potential for SWP habitat.

In summary, potential habitat for both Epling's Hedge-nettle and SWP exists within the Blantons Powerline Conservation Site. WEG recommends a detailed in-season survey (June 1st to July 20th) to determine if SWP is present. WEG also recommends a detailed survey for Epling's Hedge-nettle during the same timeframe, which falls within the plant's period of annual flower production. If you have any questions regarding the information presented herein, please feel free to call at your convenience. We appreciate the opportunity to provide these environmental services to AECOM and Dominion Virginia Power.

Sincerely,

C. Sf

Chris Senfield
Ecologist II

Enclosures

References Cited

Gleason, H. A. and A. Cronquist. 1991. *Manual of Vascular Plants of Northeastern United States and Adjacent Canada.* New York Botanical Garden, Bronx, New York. p. 828.

Godfrey, R. K. and J. W. Wooten. 1979. *Aquatic and Wetland Plants of Southeastern United States: Dicotyledons.* University of Georgia Press, Athens, GA. p. 621

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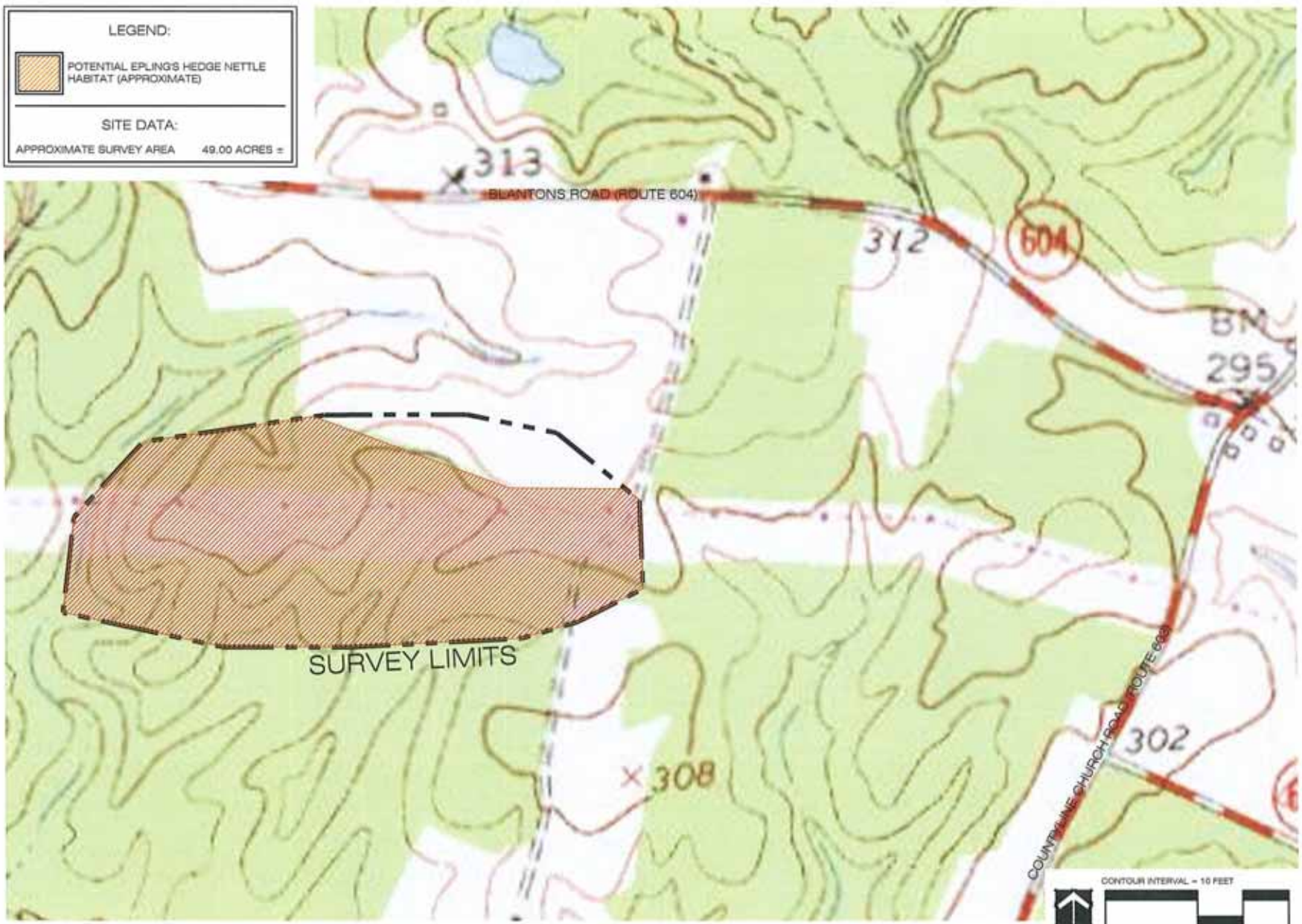
Vitt, P. and C. S. Campbell. 1997. Reproductive biology of *Isotria medeoloides* (Orchidaceae). Rhodora 99:56-63.

Ware, D. M. E. 1991. Small Whorled Pogonia, *Isotria medeoloides* (Pursh) Rafinesque. In *Virginia's Endangered Species,* K. Terwilliger, ed. McDonald and Woodward, Blacksburg, Virginia.

Weakley, A. S. 2008. *Flora of the Carolinas and Virginia.* Working draft. UNC Herbarium, University of North Carolina, Chapel Hill, NC.



WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
Environmental Consultants

EPLING'S HEDGE-NETTLE HABITAT MAP
BLANTONS POWERLINE CONSERVATION SITE
CAROLINE COUNTY, VIRGINIA

DATE: NOVEMBER 16 ,2009
JOB NUMBER: 4317A
SCALE: 1 INCH = 400 FEET
SOURCE: BASE MAP PROVIDED BY MAPTECH

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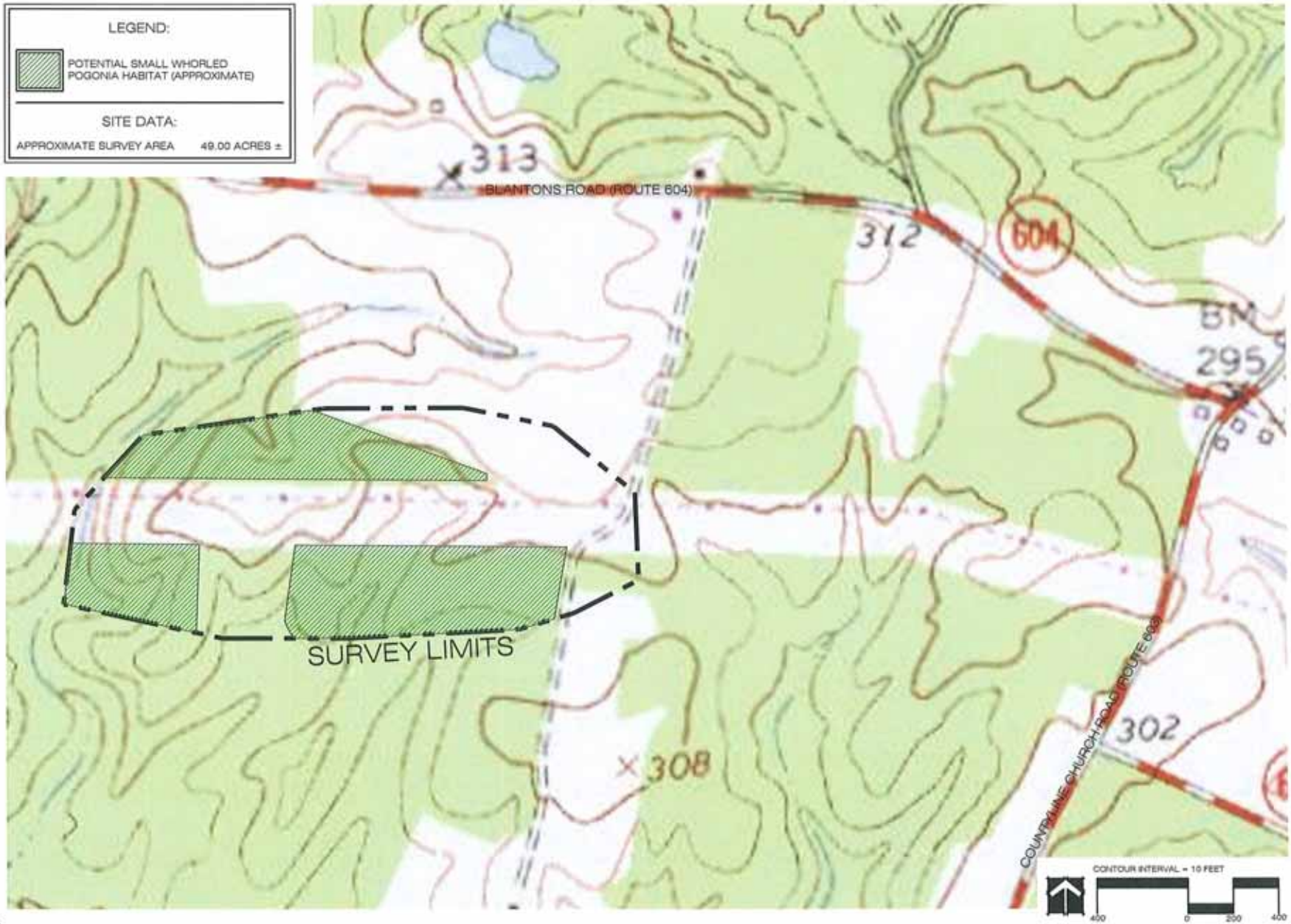

WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
Environmental Consultants

SMALL WHORLED POGONIA HABITAT MAP
BLANTONS POWERLINE CONSERVATION SITE
CAROLINE COUNTY, VIRGINIA

DATE: NOVEMBER 9 ,2009
JOB NUMBER: 4317A
SCALE: 1 INCH = 400 FEET
SOURCE: BASE MAP PROVIDED BY MAPTECH

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WILLIAMSBURG ENVIRONMENTAL GROUP, INC.

Environmental Consultants

June 4, 2010

Scott Slagley
AECOM
4840 Cox Road
Glen Allen, Virginia 23060

Re: Summary Report
Detailed Survey for the Small Whorled Pogonia (*Isotria medeoloides*)
North Anna Power Station, Louisa County, Virginia
WEG Project #4317B

Dear Mr. Slagley:

This report summarizes habitat investigations and detailed surveys for the federal-listed threatened and state-listed endangered small whorled pogonia (*Isotria medeoloides*) by Williamsburg Environmental Group, Inc. (WEG), for a portion of the North Anna Power Station Property in Louisa County, Virginia. The approximate 295-acre survey area is located within the North Anna River drainage basin and is situated northeast of Kentucky Springs Road (Route 652) along Haley Drive (Route 700).

Chris Senfield of WEG, who is listed by the U.S. Fish and Wildlife Service (FWS) as a survey contact for the small whorled pogonia (SWP), coordinated this survey in accordance with habitat criteria specific to the plant. The following sections will present a brief description of the plant, the methodology utilized, and the results of this habitat survey for SWP.

Species Description – SWP is a self-pollinating perennial orchid (Family: Orchidaceae), four to twelve inches in height, with a characteristic whorl of five to seven leaves at the summit of a singular, hollow, pale green stem with one or two pale yellowish-green irregular flowers (Mehrhoff 1983, Gleason and Cronquist 1991, Vitt and Campbell 1997). Morphologically similar species include large whorled pogonia (*Isotria verticillata*) and Indian cucumber root (*Medeola virginiana*), the former distinguished from SWP by a reddish-purple stem and the latter by a wiry stem with cotton-like hairs (Ware 1991).

Habitat Factors – SWP occupies a very specific habitat type within its range. In particular, the species seems to require the following conditions: mature, mixed hardwood, upland forests; generally open understory conditions with minimal aggressive ground level species; generally level to moderately sloping land within shallow upland draws often, but not always, of northerly or easterly exposure; scattered ground-level sunlight; and, acidic, sandy loam soils (Ware 1991, Gleason and Cronquist 1991, Weakley 2010). In addition, many professionals have noted a prevalence of decaying logs and a well-developed detritus layer on the forest floor. These attributes tend to be present with the species when found, although the exact mechanisms associated with each affinity are not understood (Ware 1991).

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Certain indicator species, among others, may also be helpful in identifying small whorled pogonia habitat, such as large whorled pogonia, strawberry bush (*Euonymus americanus*), tick trefoil (*Desmodium* spp.), and wintergreen (*Chimaphila maculata*). These species, among others, are considered associates, and occur frequently near documented SWP colonies. It should be noted that the absence of one or even several of the above-referenced habitat criteria does not necessarily preclude the species from occurring on a particular site. A habitat determination should therefore be based upon the experience of a qualified professional.

Methodology – Detailed field surveys for the SWP were conducted from May 25th to May 27th, 2010. During this time, the target species may be identified in vegetative phase (i.e. without flower or fruit). The normal vegetative cycle is late spring to mid summer. FWS approved the timing of the survey, which is not specifically defined for Louisa County, based on WEG's observation of the target species having emerged in May 2010 at locations in Virginia north of Louisa County. These observations were made by Chris Senfield and reported via personal communication with Kim Smith of FWS's Virginia Field Office.

This SWP detailed survey was conducted using general ground reconnaissance of the property boundary and all interior upland slopes. Notes were taken regarding cover types, community assemblages, slope aspect and grade, associate species, substrate, and other relevant information concerning habitat quality. Such reconnaissance and data collection allows for grouping of various regions into general habitat types: suitable, marginal, or poor, based on the presence of favorable habitat conditions for the target species. These categories represent the relative degree to which areas express favorable site attributes for the target species. Suitable habitat is present in areas that retain most of the habitat factors described above. Marginal habitat occurs in somewhat degraded areas, but based on professional judgment may still support the target species. Poor habitat is not sufficient for SWP colonization.

Detailed survey methods typically include utilization of contour transects. For the survey of potential habitat areas, a baseline is established and transects are walked parallel to the baseline on approximately 15-foot spacing, to ensure that the visual ranges of adjacent transects are overlapping. Each transect set is marked with flagging as it is searched, to ensure that subsequent transects are not established off course from the baseline. In areas determined to have marginal habitat for the species, a combination of transects and areal spot-checks are employed where topography, canopy density, and understory density reflect improved habitat.

Results – No SWP individuals were found within the survey area at North Anna Power Station. Several areas of marginal habitat and one area of suitable habitat are located generally in the northern part of the site. An additional area of marginal habitat is located in the southwestern portion of the survey, nearer to Route 700. The attached Small Whorled Pogonia Habitat Map depicts the approximate locations of both habitat types.

Suitable habitat generally consists of semi-mature and mature upland forests comprised of hardwood and mixed hardwood vegetative communities. The gently to moderately sloping area includes slopes with both north and east-facing aspects. In addition to a moderately open canopy, the area is characterized by an uneven-aged, partially open understory, with moderate levels of

detritus and decomposing woody debris. Overstory and sapling height vegetation includes white oak (*Quercus alba*), northern red oak (*Quercus rubra*), pignut hickory (*Carya glabra*), and American beech (*Fagus grandifolia*). The shrub stratum is well developed and includes flowering dogwood (*Cornus florida*), sassafras (*Sassifras albidum*), American holly (*Ilex opaca*), and young trees from canopy species. The herbaceous stratum varies in density and diversity and includes multiple associate species. Species found in this stratum include lowbush blueberry (*Vaccinium pallidum*), Virginia creeper (*Parthenocissus quinquefolia*), various seedlings from canopy species, false Solomon's seal (*Smilacina racemosa*), huckleberry wild yam root (*Dioscorea villosa*), mapleleaf viburnum (*Viburnum acerifolium*), large whorled pogonia, strawberry bush, common wintergreen, and tick trefoil.

Marginal SWP habitat in the survey area varies, from forests that share some (but not all) characteristics of the suitable habitat area, to younger forest communities that are degraded somewhat by various factors. Common degradation factors include increased shrub growth, few associate species, proximity to disturbance and evidence of past disturbance, thin/absent detritus, less decomposing woody debris, high light infiltration on the forest floor, and shallow to exposed bedrock in the soil substrate.

The remaining the survey area is considered poor, or inappropriate, SWP habitat, due to one or more limiting factors. Limiting factors include high density pine-dominated forests, clear-cut timber activity, immature forest communities, wetlands, streams, railroads, roadways/trails, and clearings in maintained areas along transmission lines or fields.

Conclusion – In summary, the results of this study show that SWP was not present within the survey area at North Anna Power Station. This report provides a summary of WEG's findings during the detailed survey for SWP for the purpose of inclusion with Dominion Virginia Power's Joint Permit Application for the North Anna Power Station. If you have any questions regarding the information presented herein, please feel free to call at your convenience.

Sincerely,

Chris Senfield
Ecologist II

Enclosures

References Cited

Gleason, H. A. and A. Cronquist. 1991. *Manual of Vascular Plants of Northeastern United States and Adjacent Canada.* New York Botanical Garden, Bronx, New York. p. 828.

Mehrhoff, L. A. III. 1983. Pollination in the genus *Isotria* (Orchidaceae). American Journal of Botany 70:1444-1453.

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Weakley, A. S. 2010. *Flora of the Carolinas and Virginia.* Working draft. UNC Herbarium, University of North Carolina, Chapel Hill, NC.

LEGEND:

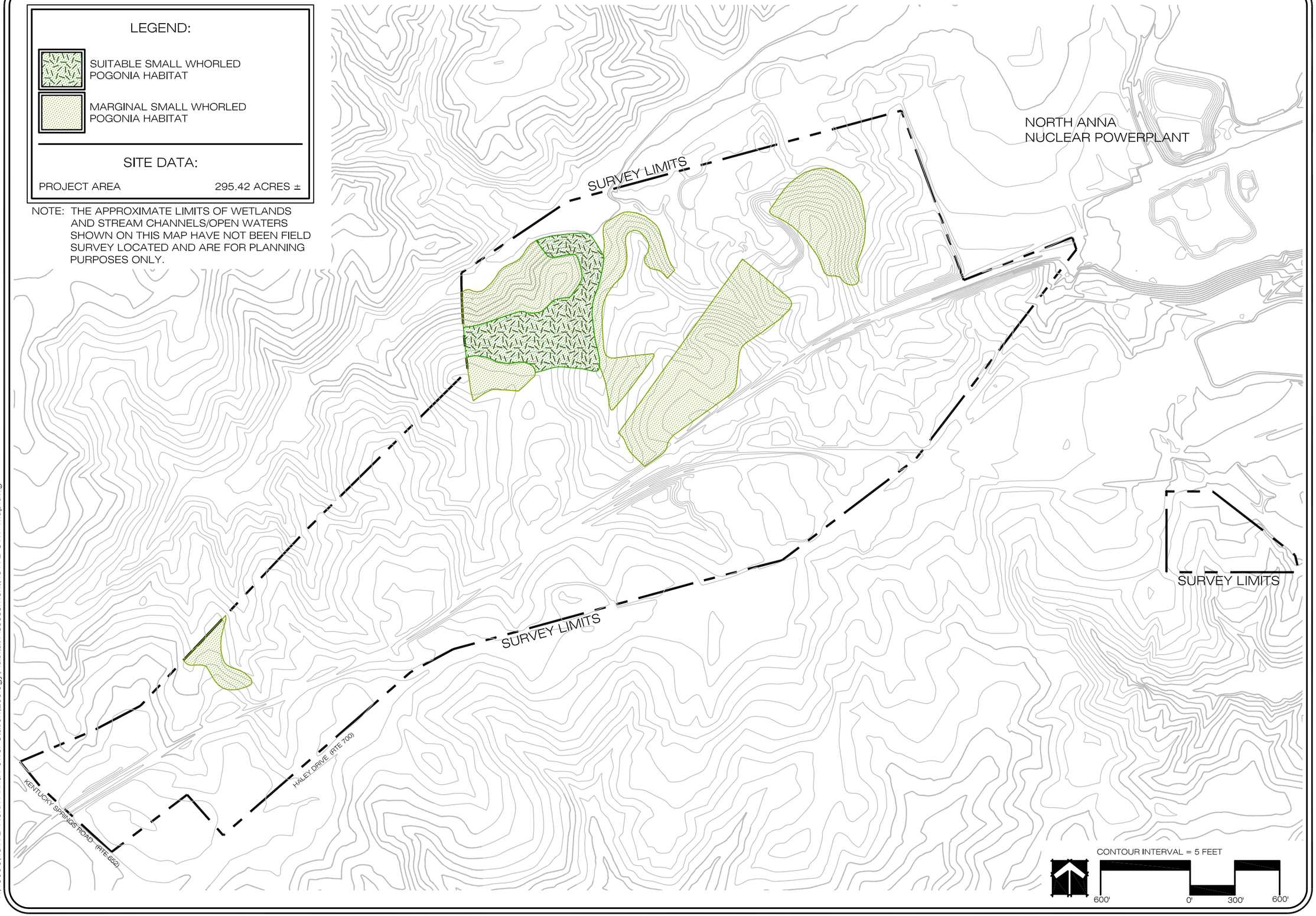
SUITABLE SMALL WHORLED POGONIA HABITAT

MARGINAL SMALL WHORLED POGONIA HABITAT

SITE DATA:

PROJECT AREA 295.42 ACRES ±

NOTE: THE APPROXIMATE LIMITS OF WETLANDS AND STREAM CHANNELS/OPEN WATERS SHOWN ON THIS MAP HAVE NOT BEEN FIELD SURVEY LOCATED AND ARE FOR PLANNING PURPOSES ONLY.



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Fredericksburg, Virginia 22407
(540) 785-5544

SMALL WHORLED POGONIA HABITAT MAP NORTH ANNA POWER STATION

LOUISA COUNTY, VIRGINIA

DATE: JUNE 4, 2010
JOB NUMBER: 4317B
SCALE: 1 INCH = 600 FEET
SOURCE: BASE MAP PROVIDED BY LOUISA COUNTY GIS

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WILLIAMSBURG ENVIRONMENTAL GROUP, INC.

Environmental Consultants

June 25, 2010

Scott Slagley
AECOM
4840 Cox Road
Glen Allen, Virginia 23060

Re: Summary Report
Detailed Survey for Small Whorled Pogonia (*Isotria medeoloides*)
Blanton's Powerline Conservation Site, Caroline County, Virginia
WEG Project #4317A

Dear Mr. Slagley:

This report summarizes habitat investigations and detailed surveys for the federal-listed threatened and state-listed endangered small whorled pogonia (*Isotria medeoloides*) by Williamsburg Environmental Group, Inc. (WEG), for the Blanton's Powerline Conservation Site in Caroline County, Virginia. The approximate 49-acre site is located within the South River drainage basin, south of Blanton's Road (Route 604), and west of Countyline Church Road (Route 603). The survey area includes a portion of the right-of-way between towers 67 and 71 along transmission line 575, in addition to forested and open-field areas lying directly adjacent to the north and south.

Chris Senfield of WEG, who is listed by the U.S. Fish and Wildlife Service (FWS) as a survey contact for the small whorled pogonia (SWP), conducted this survey in accordance with habitat criteria specific to the plant. The following sections will present a brief description of the plant, the methodology utilized, and the results of this habitat survey for SWP.

Species Description – SWP is a self-pollinating perennial orchid (Family: Orchidaceae), four to twelve inches in height, with a characteristic whorl of five to seven leaves at the summit of a singular, hollow, pale green stem with one or two pale yellowish-green irregular flowers (Mehrhoff 1983, Gleason and Cronquist 1991, Vitt and Campbell 1997). Morphologically similar species include large whorled pogonia (*Isotria verticillata*) and Indian cucumber root (*Medeola virginiana*), the former distinguished from SWP by a reddish-purple stem and the latter by a wiry stem with cotton-like hairs (Ware 1991).

Habitat Factors – SWP occupies a very specific habitat type within its range. In particular, the species seems to require the following conditions: mature, mixed hardwood, upland forests; generally open understory conditions with minimal aggressive ground level species; generally level to moderately sloping land within shallow upland draws often, but not always, of northerly or easterly exposure; scattered ground-level sunlight; and, acidic, sandy loam soils (Ware 1991, Gleason and Cronquist 1991, Weakley 2010). In addition, many professionals have noted a prevalence of decaying logs and a well-developed detritus layer on the forest floor. These attributes tend to be present with the species when found, although the exact mechanisms associated with each affinity are not understood (Ware 1991).

Certain indicator species, among others, may also be helpful in identifying small whorled pogonia habitat, such as large whorled pogonia, strawberry bush (*Euonymus americanus*), tick trefoil (*Desmodium* spp.), and wintergreen (*Chimaphila maculata*). These species, among others, are considered associates, and occur frequently near documented SWP colonies. It should be noted that the absence of one or even several of the above-referenced habitat criteria does not necessarily preclude the species from occurring on a particular site. A habitat determination should therefore be based upon the experience of a qualified professional.

Methodology – A detailed field survey for the SWP was conducted on June 3, 2010, a time frame that occurs within the sampling window suggested by the FWS (approximately June 1st through July 20th in Caroline County, Virginia). During this time, the target species may be identified in vegetative phase (i.e. without flower or fruit). The normal vegetative cycle is late spring to mid summer.

This SWP detailed survey was conducted using general ground reconnaissance of the property boundary and all interior upland slopes. Notes were taken regarding cover types, community assemblages, slope aspect and grade, associate species, substrate, and other relevant information concerning habitat quality. Such reconnaissance and data collection allows for grouping of various regions into general habitat types: suitable, marginal, or poor, based on the presence of favorable habitat conditions for the target species. These categories represent the relative degree to which areas express favorable site attributes for the target species. Suitable habitat is present in areas that retain most of the habitat factors described above. Marginal habitat occurs in somewhat degraded areas, but based on professional judgment may still support the target species. Poor habitat is not sufficient for SWP colonization.

Detailed survey methods typically include utilization of contour transects. For the survey of potential habitat areas, a baseline is established and transects are walked parallel to the baseline on approximately 15-foot spacing, to ensure that the visual ranges of adjacent transects are overlapping. Each transect set is marked with flagging as it is searched, to ensure that subsequent transects are not established off course from the baseline. In areas determined to have marginal habitat for the species, a combination of transects and areal spot-checks are employed where topography, canopy density, and understory density reflect improved habitat.

Results – No SWP individuals were found within the survey area at the Blanton's Powerline Conservation Site. Several areas of marginal habitat are located within the forested portions of the site. The attached Small Whorled Pogonia Habitat Map depicts the approximate locations of these marginal habitat areas.

Marginal SWP habitat in the survey area has degraded quality for several reasons. Common degradation factors include poorly developed detritus on the forest floor, dense shrub communities in the understory, inappropriate slope aspects, few associate species, reduced or absent decomposing woody debris, and increased light penetration from the surrounding open areas. Forested communities within marginal habitat areas identified are generally composed semi-mature to mature hardwood tree species in the canopy. The overstory is generally

dominated by tulip tree (*Liriodendron tulipifera*), white oak (*Quercus alba*), hickory (*Carya* spp.), northern red oak (*Quercus rubra*), and southern red oak (*Quercus falcata*). Tree species in the understory include some saplings from overstory species, in addition to black gum (*Nyssa sylvatica*), sweet gum (*Liquidambar styraciflua*), American holly (*Ilex opaca*), ironwood (*Carpinus caroliniana*), and flowing dogwood (*Cornus florida*). Shrub species in the understory include dense communities of American holly, interspersed with sassafras (*Sassafras albidum*), deerberry (*Vaccinium stamineum*), arrowood (*Viburnum dentatum*), and small canopy species. The herbaceous stratum is composed of seedlings from the aforementioned tree and shrub species, Virginia creeper (*Parthenocissus quinquefolia*), catbrier (*Smilax glauca*), roundleaf greenbrier (*Smilax rotundifolia*), huckleberry (*Gaylussacia baccata*) trailing club moss (*Lycopodium digitatum*), partridge berry (*Mitchella repens*), and bellwort (*Uvularia* spp.). Associates species scattered in the herbaceous strata include, striped prince's pine (*Chimaphila maculata*), lowbush blueberry (*Vaccinium pallidum*), strawberry bush (*Euonymus americana*), tick trefoil (*Desmodium* spp.), and one large whorled pogonia.

The remainder of the survey area is considered poor, or inappropriate, SWP habitat, due to one or more limiting factors. Limiting factors include the absence of forested communities within the transmission line corridor, agricultural land use, high density pine-dominated forests, immature forest communities, and wetland habitats.

Conclusion – In summary, the results of this study show that SWP was not present within the survey area at the Blanton's Powerline Conservation Site. This report provides a summary of WEG's findings during the detailed survey for SWP for the purpose of inclusion with Dominion Virginia Power's Joint Permit Application. If you have any questions regarding the information presented herein, please feel free to call at your convenience.

Sincerely,

Chris Senfield
Ecologist II

Enclosures

References Cited

Gleason, H. A. and A. Cronquist. 1991. *Manual of Vascular Plants of Northeastern United States and Adjacent Canada.* New York Botanical Garden, Bronx, New York. p. 828.

Mehrhoff, L. A. III. 1983. Pollination in the genus *Isotria* (Orchidaceae). American Journal of Botany 70:1444-1453.

Vitt, P. and C. S. Campbell. 1997. Reproductive biology of *Isotria medeoloides* (Orchidaceae). Rhodora 99:56-63.

Ware, D. M. E. 1991. Small Whorled Pogonia, *Isotria medeoloides* (Pursh) Rafinesque. In *Virginia's Endangered Species*, K. Terwilliger, ed. McDonald and Woodward, Blacksburg, Virginia.

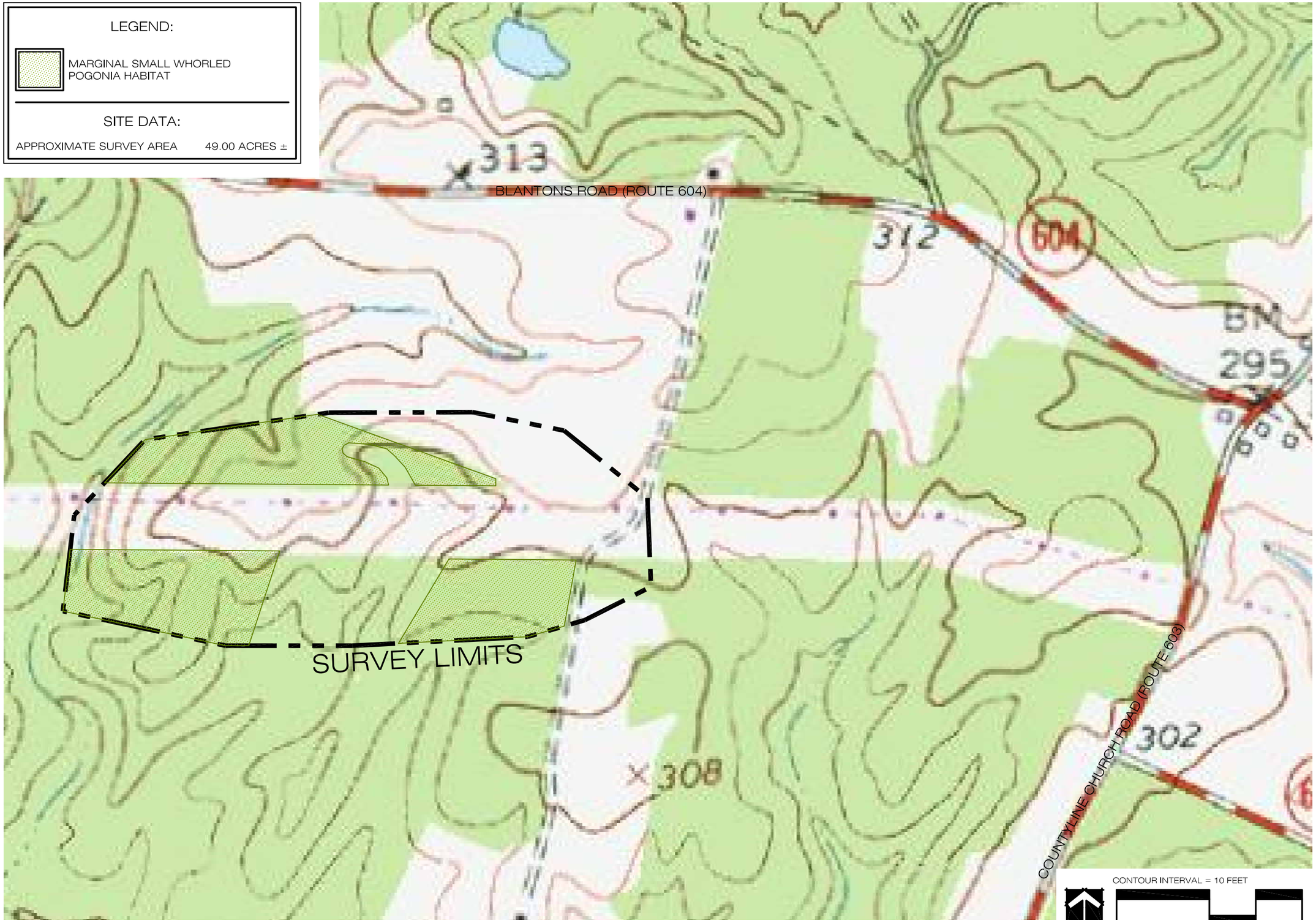
Weakley, A. S. 2010. *Flora of the Carolinas and Virginia.* Working draft. UNC Herbarium, University of North Carolina, Chapel Hill, NC.

LEGEND:

MARGINAL SMALL WHORLED POGONIA HABITAT

SITE DATA:

APPROXIMATE SURVEY AREA 49.00 ACRES ±



WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
Environmental Consultants
1008 Center Street
Williamsburg, Virginia 23188
(757) 220-6869
13921 Park Center Road
Suite 150
Herndon, Virginia 20171
(703) 437-3096
7501 Boulders View Drive
Suite 205
Richmond, Virginia 23225
(804) 267-2474
5705 Salem Run Blvd.
Suite 105
Fredericksburg, Virginia 22407
(540) 785-5544

SMALL WHORLED POGONIA HABITAT MAP BLANTONS POWERLINE CONSERVATION SITE

CAROLINE COUNTY, VIRGINIA

DATE: JUNE 25, 2010
JOB NUMBER: 4317A
SCALE: 1 INCH = 400 FEET
SOURCE: BASE MAP PROVIDED BY MAPTECH

T:\4300's\4317A-Dominion VA Power Transmission Line Corr\Ecology\Habitat Assessment\4317A SWP Map 6-25-10.dwg

B – 2

WETLANDS / STREAMS

DEPARTMENT OF THE ARMY
NORFOLK DISTRICT, CORPS OF ENGINEERS
FORT NORFOLK, 803 FRONT STREET
NORFOLK, VIRGINIA 23510-1096

September 7, 2006

Northern Virginia Regulatory Section
(Lake Anna)

Mr. Ken Roller
C/o Dominion Nuclear North Anna, LLC
5000 Dominion Blvd.
Glen Allen, VA 23060

Dear Mr. Roller:

This letter is in reference to the wetland delineation completed by Burgess & Niple for the North Anna Nuclear Power Station located in Louisa County, Virginia.

The delineation report as submitted to our office depicting wetlands and streams within the project area and shown on the site plan entitled "North Anna Power Station, Wetland Delineation"; dated January 2006 and revised August 1 2006 is hereby verified as accurate. Our basis for this includes application of the Corps' 1987 Wetland Delineation Manual and the positive indicators of wetland hydrology, hydric soils, and hydrophytic vegetation and the presence of an ordinary high water mark.

Any mechanized landclearing that disturbs the soil surface, such as with a bulldozer and/or root rake, and/or any filling or excavation in the wetlands and streams on this site may require a permit from the Department of the Army and/or the Virginia Department of Environmental Quality prior to such activities occurring.

If you have any questions, please call Regena Bronson at 301.475.2720.

Sincerely,

for

Bruce F. Williams
Chief, Northern Virginia Regulatory Section

DEPARTMENT OF THE ARMY
NORFOLK DISTRICT, CORPS OF ENGINEERS
FORT NORFOLK, 803 FRONT STREET
NORFOLK, VIRGINIA 23510-1096

REPLY TO
ATTENTION OF:

October 19, 2006

Lake Anna Nuclear Early Site, Louisa County

Supplemental Preapplication Information

1. A search of the Virginia Department of Historic Resources Data Sharing System revealed the following:

__ No known historic properties are located on the property.

___The following known architectural resources are located on the property (see attached map and listing)

_XX__ The following known archaeological resources are located on the property: 2 Cemeteries present on site.

2. A search of the Virginia Department of Conservation and Recreation data revealed the following:

XX__No known populations of federally listed threatened or endangered species are located on the property.

___The property is within a known concentration area for the following species: Small whorled pogonia

3. We suggest the following avoidance, minimization, and compensatory mitigation measures be incorporated into any plans you prepare for the property: All road and driveway crossing should be placed perpendicular to streams.

Please note this information is being provided to you based on the preliminary data you submitted to the Corps relative to project boundaries and project plans. Consequently, these findings and recommendations are subject to change if the project scope changes or new information becomes available and the accuracy of the data. Lastly, the Corps only consulted the federally-listed species in the Virginia Department of Conservation & Recreation's database. You may also want to consult the Virginia Department of Game and Inland Fisheries' database at www.dgif.va.state.us

DEPARTMENT OF THE ARMY
NORFOLK DISTRICT, CORPS OF ENGINEERS
FORT NORFOLK, 803 FRONT STREET
NORFOLK, VIRGINIA 23510-1096

REPLY TO
ATTENTION OF:

27 August 2008

Northern Virginia Regulatory Section
NAO-2008-002534 (Lake Anna)

Re: Confirmation of wetland delineation

Mr. Robert Hare
Dominion Resources Services, Inc.
5000 Dominion Boulevard
Glenn Allen, Virginia 23060

Dear Mr. Hare:

This letter is in reference to the delineation completed by EA Engineering, Science, and Technology, Inc. on the "Site Preparation" located at the Lake Anna North Anna Power Plant in Louisa County, Virginia.

The wetland delineation as flagged in the field and shown on the site plan entitled "Figure 2, Wetland Areas Delineated, Wetland A, B and C" and USACE date stamped July 25, 2008 is hereby verified as accurate. Our basis for this includes application of the Corps' 1987 Wetland Delineation Manual and the positive indicators of wetland hydrology, hydric soils, hydrophytic vegetation and the presence of an ordinary high water mark.

Any mechanized land clearing that disturbs the soil surface, such as with a bulldozer and/or root rake, and/or any filling or excavation in the wetlands on this site may require a permit from the Department of the Army and/or the Virginia Department of Environmental Quality prior to such activities occurring.

If you have any questions, please call 301.475.2720. For, and on behalf of, Keith Lockwood, Chief, Northern Virginia Regulatory Section:

Sincerely,

Regena Bronson
Project Manager
Northern Virginia Regulatory Section

DEPARTMENT OF THE ARMY
NORFOLK DISTRICT, CORPS OF ENGINEERS
FORT NORFOLK, 803 FRONT STREET
NORFOLK, VIRGINIA 23510-1096

REPLY TO
ATTENTION OF: 27 August 2008

Project: Site Preparation – Lake Anna Dominion Power Plant JD
County: Louisa
Project Number: NAO-2008- 02534

Supplemental Preapplication Information

1. A search of the Virginia Department of Historic Resources Data Sharing System revealed the following:

XX_ No known historic properties are located on the property.

_The following known architectural resources are located on the property (see attached map and listing):

__ The following known archaeological resources are located on the property (see attached map and listing); Cemetery

2. A search of the Virginia Department of Conservation and Recreation data revealed the following:

_XX_No known populations of federally listed threatened or endangered species are located on the property.

__The property is within a known concentration area for the following species:

3. We suggest the following avoidance, minimization, and compensatory mitigation measures are incorporated into any plans you prepare for the property: All road and driveway crossing should be placed perpendicular to streams. All stormwater ponds should be constructed without impacts to streams and wetlands.

Please note this information is being provided to you based on the preliminary data you submitted to the Corps relative to project boundaries and project plans. Consequently, these findings and recommendations are subject to change if the project scope changes or new information becomes available and the accuracy of the data. Lastly, the Corps only consulted the federally-listed species in the Virginia Department of Conservation & Recreation's database. You may also want to consult the Virginia Department of Game and Inland Fisheries' database at www.dgif.va.state.us

DEPARTMENT OF THE ARMY
NORFOLK DISTRICT, CORPS OF ENGINEERS
FORT NORFOLK, 803 FRONT STREET
NORFOLK, VIRGINIA 23510-1096

REPLY TO
ATTENTION OF:

27 August 2008

Northern Virginia Regulatory Section
NAO-2008-002533 (Harris Creek)

Re: Confirmation of wetland delineation

Mr. Robert Hare
Dominion Resources Services, Inc.
5000 Dominion Boulevard
Glenn Allen, Virginia 23060

Dear Mr. Hare:

This letter is in reference to the delineation completed by EA Engineering, Science, and Technology, Inc. on the "Route 700 Parcels" located southwest of the North Anna Power Station in Louisa County, Virginia.

The wetland delineation as flagged in the field and shown on the site plan entitled "Figure 2, Wetland Areas Delineated, and North Anna Power Station" and USACE date stamped July 25, 2008 is hereby verified as accurate. Our basis for this includes application of the Corps' 1987 Wetland Delineation Manual and the positive indicators of wetland hydrology, hydric soils, hydrophytic vegetation and the presence of an ordinary high water mark.

Any mechanized land clearing that disturbs the soil surface, such as with a bulldozer and/or root rake, and/or any filling or excavation in the wetlands on this site may require a permit from the Department of the Army and/or the Virginia Department of Environmental Quality prior to such activities occurring.

If you have any questions, please call 301.475.2720. For, and on behalf of, Keith Lockwood, Chief, Northern Virginia Regulatory Section:

Sincerely,

Regena Bronson
Project Manager
Northern Virginia Regulatory Section

DEPARTMENT OF THE ARMY
NORFOLK DISTRICT, CORPS OF ENGINEERS
FORT NORFOLK, 803 FRONT STREET
NORFOLK, VIRGINIA 23510-1096

REPLY TO
ATTENTION OF: 27 August 2008

Project: Route 700 Parcels – Lake Anna Power Plant JD
County: Louisa
Project Number: NAO-2008- 02533

Supplemental Preapplication Information

1. A search of the Virginia Department of Historic Resources Data Sharing System revealed the following:

_ No known historic properties are located on the property.

_The following known architectural resources are located on the property (see attached map and listing):
XX__ The following known archaeological resources are located on the property (see attached map and listing); Cemetery 054-5023

2. A search of the Virginia Department of Conservation and Recreation data revealed the following:

_XX_No known populations of federally listed threatened or endangered species are located on the property.

__The property is within a known concentration area for the following species:

3. We suggest the following avoidance, minimization, and compensatory mitigation measures are incorporated into any plans you prepare for the property: All road and driveway crossing should be placed perpendicular to streams. All stormwater ponds should be constructed without impacts to streams and wetlands.

Please note this information is being provided to you based on the preliminary data you submitted to the Corps relative to project boundaries and project plans. Consequently, these findings and recommendations are subject to change if the project scope changes or new information becomes available and the accuracy of the data. Lastly, the Corps only consulted the federally-listed species in the Virginia Department of Conservation & Recreation's database. You may also want to consult the Virginia Department of Game and Inland Fisheries' database at www.dgif.va.state.us

DEPARTMENT OF THE ARMY
NORFOLK DISTRICT CORPS OF ENGINEERS
FORT NORFOLK 803 FRONT STREET
NORFOLK VIRGINIA 23510-1096

24 September 2008

Northern Virginia Regulatory Section
NAO 2008-02731 (Lake Anna)

Mr. Robert Hare
C/o Dominion Virginia Power
5000 Dominion Boulevard
Glenn Allen, Virginia 23060

Dear Mr. Hare:

This letter is in reference to the delineation completed by EA Engineering, Science, and Technology, Inc., for the property known as the "Proposed Unit 3 500-kV Transmission Line" which extends 15 miles from Lake Anna Nuclear Power Plant (Louisa County) to the Ladysmith Substation in Caroline County, Virginia.

This letter shall serve to confirm the wetland delineation as surveyed and shown on the map titled, "Wetland Areas Observed within the Proposed Unit 3 500-kV Transmission Line Corridor, Figures 1-16", and USACE date stamped September 18, 2008.

Our basis for this determination is the application of the Corps' 1987 Wetland Delineation Manual and the positive indicators of wetland hydrology, hydric soils, and hydrophytic vegetation. The wetland is a water of the United States and is part of a tributary system to interstate waters (33 CFR 328.3(a)). These waters meet the Corps' definition of waters of the United States, are part of a tributary system to interstate waters (33 CFR 328.3 (a)) and have an ordinary high water mark (or high tide line).

Note: attach a "Notification of Administrative Appeal Options and Process Request for Appeal" Form to JD

Any work in these areas which is considered structure or fill under current regulation may require a Department of the Army permit and possibly authorization by state and local authorities. Your proposed work may require a Virginia Water Protection Permit from the Virginia Department of Environmental Quality (DEQ) and/or a permit from the Virginia Marine Resources Commission (VMRC). Please obtain all required permits before starting work in the delineated waters/wetland areas.

This letter contains an approved jurisdictional determination for your subject site. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 33 1. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and Request for Appeal (RFA) form. If you request to appeal this determination you must submit a completed RFA form to the North Atlantic Division Office at the following address:

James Haggerty, Regulatory Appeals Review Officer
Phone: (718) 765-7150 Fax (718) 765-7210
United States Army Corps of Engineers North Atlantic Division
Building 301, General Lee Avenue
Fort Hamilton Military Community
Brooklyn, NY 11252

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 C.F.R. part 33 1.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at

the above address by November 24, 2008. It is not necessary to submit an RFA form to the Division office if you do not object to the determination in this letter.

This jurisdictional determination is valid for a period of five years from the date of this letter.

If you have any questions, please call 301.475.2720. For, and on behalf of, Keith Lockwood, Chief, Northern Virginia Regulatory Section:

Sincerely,

Regena Bronson
Project Manager
Northern Virginia Regulatory Section

Attached: Notification of Appeal Process (NAP) fact sheet.

DEPARTMENT OF THE ARMY
NORFOLK DISTRICT, CORPS OF ENGINEERS
FORT NORFOLK, 803 FRONT STREET
NORFOLK, VIRGINIA 23510-1096

REPLY TO
ATTENTION OF: 24 September 2008

Project: Dominion North Anna Power Transmission Line JD
County: Louisa/Caroline
Project Number: NAO-2008- 02731

Supplemental Preapplication Information

1. A search of the Virginia Department of Historic Resources Data Sharing System revealed the following:

XX_ No known historic properties are located on the property.

_The following known architectural resources are located on the property (see attached map and listing):
__ The following known archaeological resources are located on the property (see attached map and listing); 44CE008

2. A search of the Virginia Department of Conservation and Recreation data revealed the following:

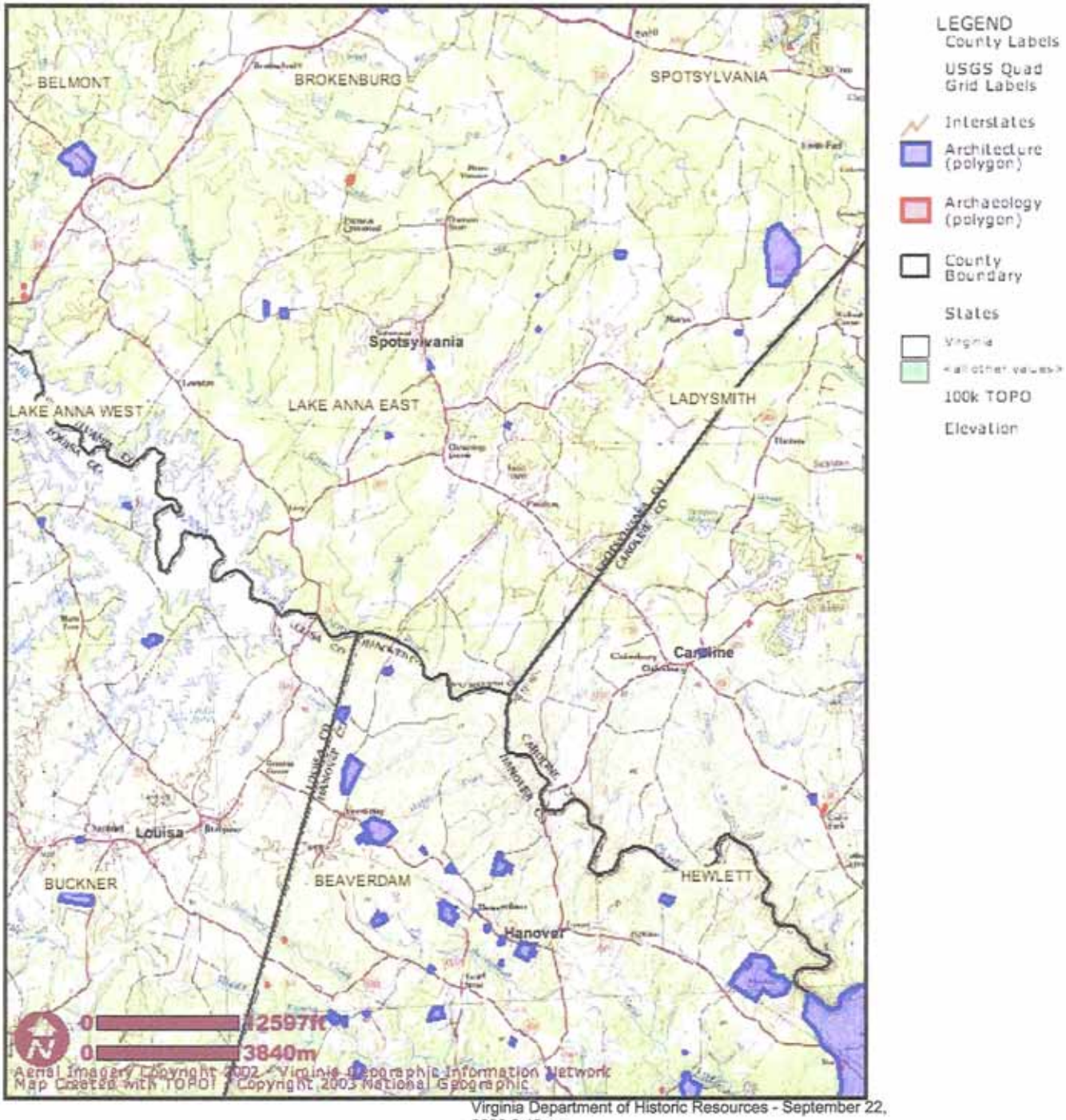
_XX_No known populations of federally listed threatened or endangered species are located on the property.

__The property is within a known concentration area for the following species:

3. We suggest the following avoidance, minimization, and compensatory mitigation measures are incorporated into any plans you prepare for the property: All road and driveway crossing should be placed perpendicular to streams. All stormwater ponds should be constructed without impacts to streams and wetlands.

Please note this information is being provided to you based on the preliminary data you submitted to the Corps relative to project boundaries and project plans. Consequently, these findings and recommendations are subject to change if the project scope changes or new information becomes available and the accuracy of the data. Lastly, the Corps only consulted the federally-listed species in the Virginia Department of Conservation & Recreation's database. You may also want to consult the Virginia Department of Game and Inland Fisheries' database at www.dgif.va.state.us

Virginia Department of Historic Resources Data Sharing System, 09/24/2008



Virginia Department of Historic Resources - September 22, 2008 9:43 am

LAke Anna Nuclear

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Dominion Power		File Number: NAO-2008-02731	Date: September 24, 2008
Attached is:			See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)		A
	PROFFERED PERMIT (Standard Permit or Letter of permission)		B
	PERMIT DENIAL		C
XX	APPROVED JURISDICTIONAL DETERMINATION		D
	PRELIMINARY JURISDICTIONAL DETERMINATION		E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.

- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:	If you only have questions regarding the appeal process you may also contact:
Regena Bronson Environmental Scientist PO Box 1704 Leonardtown, Maryland 20650 301.475.2720	**United States Army Corps of Engineers** **North Atlantic Division** **ATTN: Michael Vissichelli, Regulatory Appeals Review Officer** **Building 301, General Lee Avenue** **Fort Hamilton Military Community** **Brooklyn, NY 11252** **(718) 765-7163**

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

_____ Signature of appellant or agent.	Date:	Telephone number:

DEPARTMENT OF THE ARMY
NORFOLK DISTRICT CORPS OF ENGINEERS
FORT NORFOLK 803 FRONT STREET
NORFOLK VIRGINIA 23510-1096

Reply to
Attention of: 29 June 2009

Northern Virginia Regulatory Section
(NAO-2009-01581, Mattaponi River)

Mr. Robert Hare
C/o Dominion Virginia Power
5000 Dominion Boulevard
Glenn Allen, Virginia 23060

Dear Mr. Hare:

This letter is in reference to your request for a Corps of Engineers preliminary jurisdictional determination on the "Heavy Haul Route" for the North Anna Power Station Unit 3. The proposed route is from Walkerton, Virginia to Louisa, Virginia and crosses the following counties: King William, Hanover, Caroline and Louisa.

The map entitled "Locations of Interest Along Heavy Haul Route, Sheets 1 through 28", and dated June 2009 submitted by EA Engineering, Science and Technology provides the approximate location of the wetland and streams. Our basis for this includes application of the Corps' 1987 Wetland Delineation Manual and the positive indicators of wetland hydrology, hydric soils, and hydrophytic vegetation and the presence of an ordinary high water mark.

However, since this is a preliminary jurisdictional determination, this is not a legally binding determination regarding whether jurisdiction applies to the waters or wetlands in question.

Any mechanized landclearing that disturbs the soil surface, such as with a bulldozer and/or root rake, and/or any filling or excavation in the [wetlands and/or streams and/or ditches and/or ponds] on this site may require a permit from the Department of the Army and/or the Virginia Department of Environmental Quality prior to such activities occurring.

This preliminary jurisdictional determination is valid for a period of five years from the date of this letter. If you have any questions, please call 540-786-0080. For, and on behalf of, Nicholas L. Konchuba, Chief, Northern Virginia Regulatory Section:

Sincerely,

Regena Bronson
Project Manager
Northern Virginia Regulatory Section

Enclosure

DEPARTMENT OF THE ARMY
NORFOLK DISTRICT, CORPS OF ENGINEERS
FORT NORFOLK, 803 FRONT STREET
NORFOLK, VIRGINIA 23510-1096

REPLY TO
ATTENTION OF: 29 June 2009

Project: Dominion North Anna Power Station, Heavy Haul Route JD
County: King William, Hanover, Caroline and Louisa
Project Number: NAO-2009- 01581

Supplemental Preapplication Information

1. A search of the Virginia Department of Historic Resources Data Sharing System revealed the following:

_ No known historic properties are located on the property.

XX__ The impact areas will be required to be defined to determine if eligible historical properties are within the route from Walkerton, VA to Mineral, VA.

____The following known architectural resources are located on the property (see attached map and listing):
__ The following known archaeological resources are located on the property (see attached map and listing:

2. A search of the Virginia Department of Conservation and Recreation data revealed the following:

_ No known populations of federally listed threatened or endangered species are located on the property.

__The property is within a known concentration area for the following species: swamp pink (Helonias bullata), small whorled pogonia (Isotria medeoloides), sensitive joint vetch (Aeschynomene virginica, and dwarf wedge mussel *(Alasmidonta heterodon)*

3. We suggest the following avoidance, minimization, and compensatory mitigation measures are incorporated into any plans you prepare for the property: All road and driveway crossing should be placed perpendicular to streams. All stormwater ponds should be constructed without impacts to streams and wetlands.

Please note this information is being provided to you based on the preliminary data you submitted to the Corps relative to project boundaries and project plans. Consequently, these findings and recommendations are subject to change if the project scope changes or new information becomes available and the accuracy of the data. Lastly, the Corps only consulted the federally-listed species in the Virginia Department of Conservation & Recreation's database. You may also want to consult the Virginia Department of Game and Inland Fisheries' database at www.dgif.va.state.us

DEPARTMENT OF THE ARMY
NORFOLK DISTRICT CORPS OF ENGINEERS
FORT NORFOLK 803 FRONT STREET
NORFOLK VIRGINIA 23510-1096

Reply to
Attention of: 20 July 2009

Northern Virginia Regulatory Section
(NAO-2009-01725 (Lake Anna)

Mr. Robert Hare
C/o Dominion Virginia Power
5000 Dominion Boulevard
Glenn Allen, Virginia 23060

Dear Mr. Hare:

This letter is in reference to your request for a Corps of Engineers preliminary jurisdictional determination for the approximate 272-shoreline miles of Lake Anna in Louisa County, Virginia.

The study submitted by EA Engineering, Science, and Technology and dated July 2009 provides the approximate location of the wetland and streams for the shoreline of Lake Anna. The report includes an analysis used to identify wetlands at or below the 2% slope within the shoreline of Lake Anna. A June 26, 2009 site visit was conducted to evaluate five representative coves and the potential wetland impacts required to raise the lake level 3 inches. During the site visit we observed slopes of 10, 5, 3 and 2%, and agreed that the 2% slopes were representative of shoreline wetlands. Our basis for this includes application of the Corps' 1987 Wetland Delineation Manual and the positive indicators of wetland hydrology, hydric soils, and hydrophytic vegetation and the presence of an ordinary high water mark.

However, since this is a preliminary jurisdictional determination, this is not a legally binding determination regarding whether jurisdiction applies to the waters or wetlands in question.

Any mechanized landclearing that disturbs the soil surface, such as with a bulldozer and/or root rake, and/or any filling or excavation in the [wetlands and/or streams and/or ditches and/or ponds] on this site may require a permit from the Department of the Army and/or the Virginia Department of Environmental Quality prior to such activities occurring.

This preliminary jurisdictional determination is valid for a period of five years from the date of this letter. If you have any questions, please call 757-201-7652. For, and on behalf of, Nicholas L. Konchuba, Chief, Northern Virginia Regulatory Section:

Sincerely,

Regena Bronson
Project Manager
Northern Virginia Regulatory Section

DEPARTMENT OF THE ARMY
NORFOLK DISTRICT, CORPS OF ENGINEERS
FORT NORFOLK, 803 FRONT STREET
NORFOLK, VIRGINIA 23510-1096

REPLY TO
ATTENTION OF: 16 July 2009

Project: Lake Anna & WHTF Shoreline Wetland Delineation Report JD
County: Louisa, Orange and Spotsylvania
Project Number: NAO-2009- 01725

Supplemental Preapplication Information

1. A search of the Virginia Department of Historic Resources Data Sharing System revealed the following:

_ No known historic properties are located on the property.

XX__ The impacts areas will be required to be defined and to be determined if any eligible historical properties are within the lake shoreline of Lake Anna

____The following known architectural resources are located on the property (see attached map and listing):
__ The following known archaeological resources are located on the property (see attached map and listing:

2. A search of the Virginia Department of Conservation and Recreation data revealed the following:

_ No known populations of federally listed threatened or endangered species are located on the property.

__The property is within a known concentration area for the following species: swamp pink (Helonias bullata), small whorled pogonia (Isotria medeoloides), sensitive joint vetch (Aeschynomene virginica, and dwarf wedge mussel *(Alasmidonta heterodon)*

3. We suggest the following avoidance, minimization, and compensatory mitigation measures are incorporated into any plans you prepare for the property: All road and driveway crossing should be placed perpendicular to streams. All stormwater ponds should be constructed without impacts to streams and wetlands.

Please note this information is being provided to you based on the preliminary data you submitted to the Corps relative to project boundaries and project plans. Consequently, these findings and recommendations are subject to change if the project scope changes or new information becomes available and the accuracy of the data. Lastly, the Corps only consulted the federally-listed species in the Virginia Department of Conservation & Recreation's database. You may also want to consult the Virginia Department of Game and Inland Fisheries' database at www.dgif.va.state.us

B – 3

CULTURAL RESOURCES CONSULTATIONS

COMMONWEALTH of VIRGINIA

L. Preston Bryant, Jr.
Secretary of Natural Resources

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2801 Kensington Avenue, Richmond, Virginia 23221

Kathleen S. Kilpatrick
Director

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www.dhr.virginia.gov

August 9, 2006

Mr. Jack Cushing
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

RE: North Anna Early Site Permit Application (ESP) – Draft EIS, Supplemental
Louisa County, Virginia
DHR File No. 2000-1210; NUREG-1811; DEQ #06-125F

Dear Mr. Cushing:

We have received from the Virginia Department of Environmental Quality (DEQ) the above-referenced document for consideration. Previous correspondence from the Department of Historic Resources (DHR) on this proposed undertaking (see DHR letter of November 3, 2005 in DEIS, Appendix F-28) has advised the Nuclear Regulatory Commission (NRC) and Dominion Virginia Power (Dominion) of the need for a Programmatic Agreement (PA) between the NRC, DHR, and other consulting parties if the NRC does not wish to complete the identification and effect determination process prior to issuing the Early Site Permit (ESP), as required by Section 106 of the National Historic Preservation Act.

We are encouraged by the preliminary efforts of NRC and Dominion to identify historic properties that may be affected by this undertaking. Section 2.9 of the DEIS states that an archaeological site assessment has been conducted on the property (Voigt 2003) and that portions of the property appear to retain the potential to contain intact archaeological resources. This indicates to us that NRC and Dominion wish to complete the Section 106 process prior to permitting rather than addressing NRC's responsibilities programmatically. We have not, however, received the report of this assessment and cannot comment on its conclusions. We, therefore, recommend that NRC submit for our review the report of this archaeological assessment so we may provide comment on the need for further identification and evaluation studies.

In the absence of an executed PA or the completion of the Section 106 process, as laid out in 36

CFR Part 800, we find NRC's site redress plan to be insufficient to fully consider this undertaking's effects on historic properties. We expect continued consultation with NRC and Dominion to resolve this matter. If you have any questions, please contact me at (804) 367-2323, ext. 153 or e-mail roger.kirchen@dhr.virginia.gov.

Sincerely,

Roger W. Kirchen, Archaeologist
Office of Review and Compliance

Cc: Mr. Charles H. Ellis III, DEQ
Mr. John M. Fowler, Advisory Council on Historic Preservation

COMMONWEALTH of VIRGINIA

L. Preston Bryant, Jr.
Secretary of Natural Resources

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October 20, 2006

Mr. Jack Cushing
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

RE: *Archaeological Survey Dominion Early Site Permit Project North Anna Power Station, Louisa County, Virginia*
DHR File No. 2000-1210; NUREG-1811; DEQ #06-125F

Dear Mr. Cushing:

We have received for consideration the above-referenced document prepared by The Louis Berger Group, Inc. for Dominion Nuclear North Anna, LLC. We are pleased to inform you that the report meets the Secretary of the Interior's *Standards and Guidelines for the Documentation of Archaeological Sites* (48 FR 44734-44742) and our Department's *Survey Guidelines* (revised 2001).

The survey builds on two previous site assessments conducted on the property and employs a probability model based upon physiographic situation and field inspection. We find that the model is properly developed and executed and represents a reasonable and good faith effort to identify archaeological resources that may be affected by this project. The Area of Potential Effect (APE) contains two known historic-era cemeteries recorded as sites 44LS221 and 44LS222. No additional archaeological resources were identified within the APE. The consultant recommends that these cemeteries are *potentially eligible* for listing on the National Register of Historic Places and that additional archaeological evaluation is necessary to determine eligibility. We concur with these recommendations. We further recommend that these sites be avoided. If avoided, this project would likely have no negative impact on these resources.

Provided that the cemeteries can be avoided, the execution of this survey and submission of this report adequately satisfies the Commission's identification responsibilities, pursuant to 36 CFR

800 and preempt the necessity of a Programmatic Agreement, as encouraged in previous correspondence. We look forward to receiving the Commission's determination of effect for this undertaking. If you have any questions, please contact me at (804) 367-2323, ext. 153 or e-mail roger.kirchen@dhr.virginia.gov.

Sincerely,

Roger W. Kirchen, Archaeologist
Office of Review and Compliance

Cc: Mr. Charles H. Ellis III, DEQ
Mr. John M. Fowler, Advisory Council on Historic Preservation

November 3, 2006

Dr. Ethel Eaton, Manager
Office of Review and Compliance
Virginia Department of Historic Resources
2801 Kensington Avenue
Richmond, VA 23221

SUBJECT: NORTH ANNA EARLY SITE PERMIT REVIEW (TAC NO. MC1128)

Dear Dr. Eaton:

In your August 9, 2006, letter to the U.S. Nuclear Regulatory Commission (NRC), you recommended an additional archaeological survey with respect to the North Anna ESP site described in the application of Dominion Nuclear North Anna, LLC (Dominion or Applicant) for an early site permit (ESP). On September 21, 2006, Dominion forwarded the report *"Archaeological Survey, Dominion Early Site Permit Project, North Anna Power Station, Louisa County, Virginia,"* to your office. The report provides the results of an archaeological survey for the area of potential effects associated with potential future site development at the North Anna ESP property. With the exception of two previously recorded historic period cemeteries (Sites 44LS0221 and 44LS0222), no artifacts, cultural features, or cultural deposits were identified during the subsurface testing and pedestrian activities. The report concludes that additional evaluation would be required to determine if either of the cemeteries is eligible for inclusion in the National Register of Historic Places. Both cemeteries would be avoided during any construction activities associated with future development at the North Anna ESP site.

Based on results outlined in the report, and following a telephone conference on October 12, 2006, with Mr. Roger Kirchen of your office, the NRC concludes that there would be no adverse effect upon historic properties resulting from the North Anna ESP (see 36 CFR 800.5). This finding also satisfies the NRC's consultation responsibilities for this undertaking under Section 106 of the National Historic Preservation Act.

If you have any questions concerning the ESP application or other aspects of this project, please contact Mr. Jack Cushing, Senior Environmental Project Manager, at 301-415-1424 or by e-mail at JXC9@nrc.gov.

Sincerely,

/RA/

Brent Clayton, Acting Chief
Environmental Projects Branch A
Division of Site and Environmental Reviews
Office of New Reactors

Docket No. 52-008

cc: See next page

If you have any questions concerning the ESP application or other aspects of this project, please contact Mr. Jack Cushing, Senior Environmental Project Manager, at 301-415-1424 or by e-mail at JXC9@nrc.gov.

Sincerely,

/RA/

Brent Clayton, Acting Chief
Environmental Projects Branch A
Division of Site and Environmental Reviews
Office of New Reactors

Docket No. 52-008

cc: See next page

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North Anna Early Site Permit
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cc:

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President, Oakridge Civic Assn.
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Mr. Harry Ruth
For the Friends of Lake Anna
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Bumpass, VA 23024

Ms. Myra Cramer, Manager
Hanover Branch Library
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Hanover, VA 23069

Louisa County Library Branch
Jefferson-Madison Regional Library
881 Davis Highway
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Ms. Barbara Davidson, Manager
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COMMONWEALTH of VIRGINIA

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November 7, 2007

Mr. Tony Banks
Dominion Resource Services, Inc.
Innsbrook Technical Center
5000 Dominion Blvd.
Glen Allen, VA 23060

RE: Supplemental *Archaeological Survey, Dominion Combined License Project, North Anna Power Station, Louisa County, Virginia*
DHR File No. 2000-1210

Dear Mr. Banks:

We have received for consideration the above-referenced document prepared by The Louis Berger Group, Inc. for Dominion Resource Services, Inc. We are pleased to inform you that the report meets the Secretary of the Interior's *Standards and Guidelines for the Documentation of Archaeological Sites* (48 FR 44734-44742) and our Department's *Survey Guidelines* (revised 2003).

The survey investigated six proposed work areas for the expansion of Dominion's North Anna facility. The survey documented one previously unrecorded archaeological site (44LS0226), one known cemetery (44LS0227 and 054-5035), and one isolated find. The isolated find is, by definition, not eligible for listing in the National Register of Historic Places and no further work at this resource is warranted.

Site **44LS0226** is the remains of a late 19th to early 20th century domestic site. Based on the integrity of the site and its potential to add to our understanding of the African-American experience during the Reconstruction and Growth era, the consultant recommends site 44LS0226 as eligible for listing in the National Register. Until a formal Phase II evaluation of the site has been completed, we recommend this site be treated as *potentially eligible* for listing in the National Register and recommend avoidance or additional Phase II investigations.

The identified cemetery, recorded as both archaeological site **44LS0227** and architectural resource **#054-5035**, dates to the 19th century, although the absence of inscribed markers makes dating the burials difficult. The cemetery is currently fenced and no evidence is presented that suggests it extends beyond this established boundary. This site was not evaluated for National Register-eligibility during this study; however, we recommend *avoidance* of this resource. If avoidance is not feasible, additional evaluation

will be necessary to determine National Register-eligibility and a permit must be obtained from our office for its removal.

Considering our earlier comments to the Nuclear Regulatory Commission dated October 20, 2006, the results of this study, and Dominion's letter to our office dated October 11, 2007, we concur with your conclusion that this project will not negatively impact historic properties provided that the following resources are avoided and adequately protected during construction and operation of the facility: 44LS0221, 44LS0222, 44LS0226, and 44LS0227/054-5035. If at any point, avoidance of these sites is deemed impractical, please reinitiate consultation with our office concerning the effect of this undertaking on historic properties.

We look forward to receiving the Commission's formal determination of effect for this undertaking and working with all parties throughout this project. If you have any questions, please do not hesitate to contact me at (804) 367-2323, ext. 153 or e-mail roger.kirchen@dhr.virginia.gov.

Sincerely,

Roger W. Kirchen, Archaeologist
Office of Review and Compliance

Cc: Mr. Eric Voigt, The Louis Berger Group, Inc.

Ms. Alicia Williamson - NRC (sent 12/28/07)

Mr. Mike Murphy - VDEQ (sent 12/28/07)

COMMONWEALTH of VIRGINIA

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November 9, 2009

Mr. Tony Banks
Dominion Resource Services, Inc.
Innsbrook Technical Center
5000 Dominion Blvd.
Glen Allen, VA 23060

RE: (1) *Archaeological Survey, Dominion Combined License Project, North Anna Power Station, Louisa County, Virginia* (June 2009)

(2) *Cultural Resource Assessment of a Proposed Heavy Haul Route to the North Anna Power Station ESP Site, Louisa, Hanover, Caroline, and King William Counties, Virginia* (June 2009)

DHR File No. 2000-1210

Dear Mr. Banks:

We have received for consideration the above-referenced documents prepared by The Louis Berger Group, Inc. for Dominion Resource Services, Inc. We are pleased to inform you that these studies meet DHR's *Survey Guidelines* (revised 2003).

The archaeological survey covered 105.3 acres, which includes 9.7 acres within the existing North Anna property and 95.6 acres of adjacent and contiguous land. The survey identified six new archaeological sites and seven artifact locations. The locations are, by definition, not eligible for listing in the National Register of Historic Places and no further investigation of these resources is warranted. The consultant recommends, and DHR concurs, that sites **44LS0229**, **0230**, **0231**, **0232**, and **0234** are *not eligible* for listing in the National Register. The remaining site, **44LS0233**, is recommended as *potentially eligible* and DHR concurs. We understand that site 44LS0233 will be avoided and preserved in place throughout construction and operation of the new generation unit. Accordingly, we do not recommend further evaluation at this time. It has previously been agreed that four other recorded sites – 44LS0221, 44LS0222, 44LS0226, and 44LS0227 – will be avoided during construction and operation. If at any point, avoidance of these sites is deemed impractical, please reinitiate consultation with our office concerning the effect of this undertaking.

Regarding the *Cultural Resource Assessment*, we concur that if any ground-disturbing activity is to take place within the Haley East parcel, additional archaeological survey is warranted. Furthermore, DHR concurs with the recommendations regarding the need for additional cultural resource studies in support of the heavy haul route and must stress the importance of consultation with the Mattaponi and Upper Mattaponi on impacts to the

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Preservation Office
P.O. Box 519
Stephens City, VA 22655
Tel: (540) 868-7029
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historic ferry and archaeological sites along the North Anna River. Impacts, even if temporary and reversible, to historic districts through which the heavy haul route runs should also be considered.

Thank you for your continued consultation on the potential impacts of this project on historic resources. We look forward to working with NRC and Dominion to conclude the Section 106 process. If you have any questions, please do not hesitate to contact me at roger.kirchen@dhr.virginia.gov.

Sincerely,

Roger W. Kirchen, Archaeologist
Office of Review and Compliance

c: Mr. Eric Voigt, The Louis Berger Group, Inc.

COMMONWEALTH of VIRGINIA

L. Preston Bryant, Jr.
Secretary of Natural Resources

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November 9, 2009

Mr. Tony Banks
Dominion Resource Services, Inc.
Innsbrook Technical Center
5000 Dominion Blvd.
Glen Allen, VA 23060

Re: (1) *Archaeological Survey as part of a Cultural Resource Survey of the Proposed North Anna – Ladysmith 500kV Transmission Line, Louisa, Spotsylvania, and Caroline Counties, Virginia*

(2) *Architectural Survey of the Proposed North Anna – Ladysmith 500kV Transmission Line, Louisa, Spotsylvania, and Caroline Counties, Virginia*

DHR File No. 2009-0430

Dear Mr. Banks:

We have received the reports referenced above prepared by The Louis Berger Group, Inc. for Dominion Resources, Inc. These studies were conducted in accordance with Section II of DHR's *Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia* (January 2008). We reserve the right to provide additional comment as part of consultation with any responsible Federal agency under Section 106 of the National Historic Preservation Act, if applicable.

Archaeological shovel testing was conducted at 56 proposed tower locations and at several other points where warranted. The survey identified four new archaeological sites and three artifact locations. The locations are, by definition, not eligible for listing in the National Register of Historic Places and no additional investigation of these resources is warranted. The consultant recommends, and DHR concurs, that sites **44CE0624**, **44SP0616**, and **44SP0617** are *not eligible* for listing in the National Register and that site **44SP0618** is *potentially eligible* for listing. We understand that site 44SP0618 will be avoided. As such, no further investigations are warranted at this time. If and when access roads and staging areas are identified and if those locations require additional ground disturbance of intact soils, additional archaeological survey of those locations is recommended.

Regarding the architectural survey, the consultant recommends, and DHR concurs, that the Farm, Blantons Road (DHR ID #**016-5042**) is *potentially eligible* for listing in the National Register. It is our opinion that the three following properties in Spotsylvania County may also be potentially eligible and warrant additional consideration:

088-054 Pine Forest: Not surveyed due to inaccessibility. Though the report references the property being found ineligible in 1980, our review of the archives file reveals some confusion regarding eligibility. It appears that the property was reconsidered and found eligible, but that there was concern at that time about its deteriorated condition. The file contains 1980s correspondence from someone who acquired the property with plans to restore it; however, there is nothing in the file to indicate whether this ever occurred. If the property is still extant, it could be eligible, or the property may indeed be a ruin.

088-0126 Llangollen: This property was surveyed by the consultant and recommended ineligible due to exterior alterations and neglect. Intrigued by its form and two interior chimneys, we reviewed the archives file and concluded that this property may have significant interior features that would compensate for exterior integrity issues.

088-0133 Bel-air: This property was not surveyed due to inaccessibility. The archives file contains nothing recent and the photos show a property in neglected condition. Like Pine Forest, if this property is still standing and has received appropriate attention, it may be eligible.

In the case of Pine Forest and Bel-air, we recommend the use of aerial photos and/or Google Earth to confirm whether the properties are still standing. If they are extant and there is reason to conclude that they are in stable condition, we recommend consideration of the effect of the transmission line on these two properties. In the case of Llangollen, we recommend additional evaluation to include documentation of the interior.

Please provide the requested information at your earliest convenience. We are uncertain whether the tiered analysis of impacts on known resources as presented in Section I of DHR's *Guidelines for Assessing Impacts of Proposed Electric Transmission Lines and Associated Facilities on Historic Resources in the Commonwealth of Virginia* has been completed. Please ensure that this stage of analysis is satisfied prior to submitting your application to the SCC. Finally, please submit to our Archives the necessary architectural documentation for the 53 surveyed properties. If you have any questions concerning our review of this project, please do not hesitate to contact me at roger.kirchen@dhr.virginia.gov.

Sincerely,

Roger W. Kirchen, Archaeologist
Office of Review and Compliance

c: Mr. Eric Voigt, The Louis Berger Group, Inc.

DEPARTMENT OF THE ARMY
NORFOLK DISTRICT CORPS OF ENGINEERS
FORT NORFOLK 803 FRONT STREET
NORFOLK VIRGINIA 23510-1096

Reply to
Attention of: 9 March 2009

Northern Virginia Regulatory Section
NAO 2008-02534 (Lake Anna)

US Nuclear Regulatory Commission
OWFN 11 F-1
Attn: Ms. Alicia Williams
Washington, DC 20555-0001

Dear Ms. Williams:

This is in reference to your request for Corps' comments for the "Supplemental Environmental Impact Statement, Combined License (COL) at North Anna Power Station Unit 3" project in Caroline County.

Based on the Supplemental EIS draft submitted by you, any fill proposed in waters of the United States regulated under Section 404 of the Clean Water Act (33 U.S.C. 1344) and may require Department of the Army authorization. We recommend you submit the following information so we my conduct a public interest review:

1. A USGS topographic map depicting the location and boundaries of the project site for the proposed Units 3 and 4.
2. The complete proposed plan of development with a depiction of all work that is subject to regulation under Section 404 of the Clean Water Act (i.e. intake and outfalls structures within jurisdictional waters and/or wetlands).
3. A survey and/or report for the federally listed threatened species; swamp pink (Helonias bullata), small whorled pogonia (Isotria medeoloides), and sensitive joint vetch (Aeschynomene virginica.
4. Evidence that discharges of dredged or fill material into waters of the United States are avoided or minimized to the maximum extent practicable at the project site.
5. A compensatory mitigation plan that addresses the loss of wetlands and streams impacts by the proposed project.

In addition, our review of the Virginia Department of Historical Resources Data Sharing System (VDHR DSS) indicates that the proposed work may affect cultural resources. These resources may eligible for listing on the National Register of Historic Places (enclosed maps) and may be subject to compliance with Section 106 of the National Historic Preservation Act of 1966.

According to 36 CFR 800.2(a) (2):

"...If more than one Federal agency is involved in an undertaking, some or all [of] the agencies may designate a lead Federal agency, which shall identify the appropriate official to serve as the agency official who shall act on their behalf, fulfilling their collective responsibilities under section 106. Those Federal agencies that do not designate a lead Federal agency remain individually responsible for their compliance with this part."

Pursuant to the above provision, the United States Nuclear Regulatory Commission (USNRC) is hereby designated as the lead federal agency to fulfill the collective Federal responsibilities under Section

106 for the . North Anna Power Station Unit 3, if the USNRC determines an adverse effect on historic resources:

The Corps authorizes the USNRC to conduct Section 106 coordination on its behalf. If a Memorandum of Agreement is required by USNRC, under 36 CFR 800.6, the following clause should be included in the introductory text:

> *"WHEREAS,* pursuant to Section 404 of the Clean Water Act, *a Department of the Army permit will likely be required from the Corps of Engineers for this project, and the Corps has designated USNRC as the lead federal agency to fulfill federal responsibilities under Section 106; and*

Any work in these areas may require authorization by state and local agencies. Thank you for providing us the opportunity to provide early comment on the project.

If you have any questions, please call 540-786-0080. For, and on behalf of, Deborah Massenburg, Acting Chief, and Northern Virginia Regulatory Section:

Sincerely,

Regena Bronson
Project Manager
Northern Virginia Regulatory Section

Enclosure

ATTACHMENT B-4

AGENCY COMMENTS ON THE FEDERAL CONSISTENCY CERTIFICATION FOR THE EARLY SITE PERMIT

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

Street address: 629 East Main Street, Richmond, Virginia 23219
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Robert G. Burnley
Director

(804) 698-4000
1-800-592-5482

February 10, 2004

52-008

Ms. Pamela F. Faggert
Vice-President and Chief Environmental Officer
Dominion Virginia Power Company
5000 Dominion Boulevard
Glen Allen, Virginia 23060

RE: Federal Consistency Certification under the Coastal Zone Management Act and the Virginia Coastal Resources Management Program: North Anna Early Site Permit Application
DEQ-03-223F

Dear Ms. Faggert:

Thank you for your January 12, 2004 letter (received January 20) withdrawing the above federal consistency certification pursuant to our January 7 discussion with the Nuclear Regulatory Commission staff. As you requested, I am enclosing copies of the comments developed by our reviewing agencies thus far.

As you know, the Department of Environmental Quality (DEQ), through this Office, is responsible for coordinating Virginia's review of federal environmental documents and responding to appropriate federal officials on behalf of the Commonwealth. DEQ is also the lead agency for coordination of federal consistency reviews under the Virginia Coastal Resource Management Program and the federal Coastal Zone Management Act. The following agencies and planning district commission joined in this review (starred (*) agencies administer one or more of the Enforceable Policies of the Coastal Resources Management Program):

Department of Environmental Quality:
- Water Division*
- Air Division*
- Waste Division
- Northern Virginia Regional Office*
- Office of Environmental Impact Review* (this Office)

Department of Game and Inland Fisheries*

D074

Department of Agriculture and Consumer Services
Department of Conservation and Recreation*
Department of Health*
Department of Mines, Minerals, and Energy
Thomas Jefferson Planning District Commission.

In addition, the following agencies and localities were invited to comment (same reference (*) as above):

Marine Resources Commission*
Department of Historic Resources
Chesapeake Bay Local Assistance Department*
Louisa County
Spotsylvania County.*

The following summary of the comments submitted by reviewers is provided to inform Dominion Virginia Power Company ("Dominion"), as applicant, and the Nuclear Regulatory Commission ("NRC"), as federal licensing agency, of issues that may merit attention as the consistency certification is reconsidered and as the Draft Environmental Impact Statement is prepared.

Project Description and Background

Dominion filed an Early Site Permit Application ("Application") with the NRC to add two units to the North Anna Power Station. The NRC is to determine whether the site is suitable for constructing new reactors using an Early Site Permit (ESP). Permits are issued for 10 to 20 years and can be renewed for 20 years. Environmental issues are addressed as part of the ESP, independent of any review of any specific reactor design. The ESP process uses a Plant Parameters Approach, which postulates an envelope of possible reactor designs; Dominion is considering seven different designs. In this Application, Dominion has postulated a maximum of two reactors of up to 4300 megawatts each of rated thermal capacity. The two reactors that Dominion formerly proposed but then cancelled each had a rated electrical capacity of 907 megawatts. Dominion postulates that the first new unit (referred to as Unit 3 herein) would use once-through cooling; the second would use a cooling tower. Issues resolved with finality under the ESP process, including environmental issues, are not re-examined in any subsequent licensing action by the NRC. The ESP process does not approve a particular reactor design, nor allow the construction of the reactor. However, it does authorize construction of all the items identified in the site redress plan, including:

- site clearing
- foundations
- intake structures
- outfall structures.

Dominion has requested that NRC issue the permit for 20 years (the maximum) and allow land clearing, stream filling, and intake structure construction to proceed under the site redress plan.

Deficiencies in the Document

The Application includes proposed Unit 4, but does not identify a source of water for that unit. The NRC regulations, at 10 CFR section 51.29, require that "information provided to the Commission by an applicant for a license, ... shall be complete and accurate in all material respects." For ESP applications, the NRC requires information on "types of cooling system intake and outflows for **each** facility" (10 CFR section 52.17(v)) (emphasis added). Because no water source for Unit 4 is identified in the Application, DEQ's Water Division cannot form an opinion on prospects for approval of such a project, or whether it would be consistent with state laws and regulations. The logical water source for Unit 4 would be Lake Anna. Groundwater resources are not capable of producing the large quantities of water that would be needed; nor does there appear to be any surface water source nearby, other than the Lake. Unit 4 should be withdrawn from the Application unless its water source(s) and related cumulative impacts are identified. If Dominion leaves Unit 4 in the Application, but does not identify a water source, then NRC should consider denying the application for any site redress work associated with Unit 4.

If Lake Anna were the source of water identified for Unit 4, the additional heat load and evaporative losses would result in deeper and longer drawdown periods on the Lake and longer periods of low flows in the North Anna River. Given the small watershed, with average runoff of only 370 cubic feet per second (cfs), it is probable that the additional cumulative impact of a fourth unit would have an unacceptable impact on the Lake and the River downstream of it.

Federal Consistency Certification Issues

Federally licensed or permitted activities affecting coastal uses or resources must be conducted in a manner consistent with Virginia's approved Coastal Resources Management Program ("VCP"). In order to be consistent with the VCP, the project must be consistent with the Enforceable Policies of the VCP (15 CFR Part 930, section 930.50) (first enclosure). In addition, we recommend that applicants and federal licensing agencies take the Advisory Policies of the VCP into account (second enclosure).

The VCP applies in Virginia localities bordering the seacoast and our tidal tributaries, including Spotsylvania County, which is bounded by the North Anna River and Lake Anna. As DEQ's Office of Wetlands and Water Protection indicates, operation of one or both of the proposed generating units would diminish in-stream flows on the North Anna River, directly affecting the River and the anadromous fish habitat therein.

1. Fisheries Management Concerns. As the Department of Game and Inland Fisheries (DGIF) indicates (enclosed comments), the proposed addition of two generating units to the two that are already operating at the North Anna Power Station would have a number of adverse effects upon the lake and the river downstream of it.

(a) Water Withdrawal Increases in the Lake. Increases in water withdrawals would present complications for fish populations through increased fish impingement and entrainment in water intakes. Impingement, or the collisions of fish against water intake screens, would increase by 230% over current levels with the addition of the proposed intakes, according to DGIF. Estimated impingement mortality of striped bass would nearly double; it should be mentioned that striped bass is a leading Lake Anna sportfish annually stocked by DGIF.

Similarly, the number of fish entrained by virtue of increased water withdrawals from the Lake is expected to increase. Using estimates from the applicant's six-species category, DGIF states that the number of fish lost to entrainment could exceed 468 million fish annually, 63% of which would be gizzard shad, another important North Anna River species. (Confirmed, Ellis/Odenkirk, 2/9/04. The lower estimate by DEQ's Office of Wetlands and Water Protection is a sub-set of the above estimate; it is based on losses attributable to the addition of Unit 3 only (Ellis/Hassell, 2/9/04).

Existing intake criteria at the North Anna Power Station substantially exceed DGIF recommendations, as the chart shows:

	water velocity (feet per second)	screen mesh (millimeters)
DGIF recommendation	0.25 FPS	1.0 mm
existing criteria	0.70 FPS	9.5 mm

DGIF indicates that even its recommendations, which reflect current state-of-the-art technology, are not expected to provide full resource protection. The existing screen would be expected to exclude only compressed fish (such as sunfish) larger than 50 mm and elongated fish (such as striped bass and largemouth bass) larger than 86 mm. Accordingly, DGIF recommends that Dominion investigate further the addition of a submerged intake structure (a curtain wall as detailed on page 3-5-38 of the Application

that would reduce fish impingement and entrainment and align the intake criteria with current DGIF recommendations.

(b) Water Withdrawal Increases and the River Downstream. The addition of one or two new units to the North Anna Power Station would have significant impacts on downstream resources by reducing river flows and the frequency of higher flows. For example, the water budget presented in the Application shows that significant changes in flows have already taken place as a result of the construction of the dam; drought flow frequency (flows less than 20 cfs) occurs 5.3% of the time now, versus 4.2% of the time before the dam was built (1929-1971). Drought flow frequency would rise to 11.8% of the time with one additional unit; the flow analysis did not address what would happen with a fourth unit. The impact of a fourth unit should be addressed in this process, or else the fourth unit should be taken out of the permit application.

DGIF recommends an In-stream Flow Incremental Methodology (IFIM) Study as a means of determining flow recommendations downstream of the Lake. The study should include evaluation of a habitat time series (i.e., pre-project, current, and proposed conditions) for native and naturalized species, and may result in recommendations for different flow operating rules than currently exist for the downstream resource. The Tennant Method yields a summer flow in the range of 74 to 111 cfs for resource protection, and current minimum flows would be rated as poor to degraded in that regard. As DEQ's Office of Wetlands and Water Protection states, the addition of another generating unit, which is expected to increase the consumptive loss from the watershed by an additional 39 cfs, would create nearly perennial conditions of severe degradation every fall. See "Additional Analysis Needs," item 4, below.

(c) Water Temperature Increases. Water temperature increases resulting from the additional units are likely to affect fish habitat in Lake Anna and in the North Anna River. This issue has several aspects.

(i) Present Conditions. Dominion has documented the current situation and available literature (Application, pages 3-5-55 through 3-5-58). The current temperature and oxygen stratification patterns at the Lake limit the potential of the Lake fishery, but have not resulted in catastrophic fish kills to date. Adult striped bass grow slowly, exhibit reduced fitness, and have low maximum sizes as a result of the present marginal habitat conditions, but an important recreational fishery has nonetheless developed in this habitat. The Lake does not often stratify, but when it does the stratification is weak. Total temperature differences (top to bottom) in many cases were less than 1 degree Celsius (1.8 degrees Fahrenheit) based on DGIF samples taken in late summer and early fall at lower reservoir sites. Stratification patterns dictate striped bass habitat and are subject to much variability at Lake Anna. Accordingly, a horizontal and vertical increase in the thermal plume would exacerbate a currently tenuous situation.

(ii) Impacts of Water Temperature Increases; Mitigation. It is likely that a small increase in reservoir water temperature would have a dramatic effect, further reducing already limited habitat and perhaps jeopardizing the entire striped bass fishery. The maximum daily surface temperature is expected to rise by 7.2 degrees Fahrenheit (4 degrees Celsius) near the dam as a consequence of the proposed new generating units. Re-configuring the flow within the waste heat treatment facility (WHTF) to allow for more efficient cooling (i.e., forcing water to use the entire facility, consisting of three cooling lagoons, by sealing the lower tributary arm between Elk Creek and Millpond Creek and cutting a canal through the headwater areas; Ellis/Kauffman, 2/6/04) would expand the residence time within the WHTF and probably reduce thermal impacts to Lake Anna and the North Anna River.

(d) Alternatives. Given the scope and magnitude of aquatic resource impacts anticipated in the event of building out the two units, it seems prudent, according to the Department of Game and Inland Fisheries, to investigate alternatives to the heavily consumptive proposal of another once-through system and a new wet cooling tower. See "Additional Analysis Needs," item 2, below. One alternative, addressing the conflict between consumptive use and impingement and entrainment, would be to consider a single new reactor using a cooling tower with Lake Anna as its source water (see item 3(b)(ii), below). The Draft EIS should include a thorough analysis of this and other alternatives to the proposed project.

2. Wetland Management and Water Resources. DEQ's Water Division indicates that additional studies on the impacts to in-stream beneficial uses, water quality, and aquatic life would be needed to adequately assess the impacts of the proposed new generating units. Preservation of in-stream flows for protection of fish and wildlife habitat and resources and also recreation values is a beneficial use of state waters. Habitat and recreational uses are present in both the Lake and downstream, in the North Anna and Pamunkey Rivers. Conditions in a Virginia Water Protection Permit may include, but are not limited to, the volume of water to be withdrawn as part of the permitted activity.

(a) Consumptive Use and In-stream Flow. An additional unit of the size contemplated in the Application would be the largest single consumptive withdrawal ever considered in the history of the Virginia Water Protection Permit Program. The average annual flow of Lake Anna and the North Anna River is 370 cfs. The typical recommendation to the Water Division from the Department of Game and Inland Fisheries, in processing a Water Protection Permit, is not to allow cumulative consumptive use to exceed 10% of the river's flow. The current evaporation rate and the existing two generating units very often exceed this benchmark. Accordingly, permitting of additional withdrawals, even with prescriptive conditions, cannot be guaranteed.

For these reasons, DEQ's Office of Wetlands and Water Protection has recommended that Dominion withdraw its federal consistency certification, at least until such time as a Draft Environmental Impact Statement is available. Under the present circumstance, DEQ's Office of Wetlands and Water Protection could not agree with the certification that the project would be in compliance with the Enforceable Policies of the Virginia Coastal Resources Management Program, because that Office does not have the information necessary to allow such concurrence.

(b) Impingement and Entrainment. As mentioned above (item 1(a)), a once-through cooling process for Unit 3 will result in a significant addition to the number of aquatic organisms impinged (240,000) or entrained (148,000,000) every year (see item 1(a), above, for the Department of Game and Inland Fisheries (DGIF) estimate of the total losses with all units; this number is a sub-set of the DGIF estimate). While once-through cooling represents a cost saving over cooling towers, it results in higher impingement and entrainment losses. On the other hand, it has less consumptive loss per megawatt of electricity produced, because some of the heat in once-through cooling is dissipated by processes other than pure evaporation.

(i) Permitting Questions. DEQ's Office of Wetlands and Water Protection and its Northern Virginia Regional Office would normally address impingement and entrainment through the Virginia Water Protection Permit. However, because the intake is for cooling water and will not be built for some time, the impingement and entrainment issue will fall under the new regulations pursuant to Section 316(b) of the Clean Water Act and be addressed in the facility's Virginia Pollutant Discharge Elimination System (VPDES) permit. The new unit may be treated as an existing intake or a new intake under the section 316(b) regulations (see item 4 and also "Regulatory and Coordination Needs Summary," item 1, below).

(ii) Limiting Impingement/Entrainment versus Limiting Consumption. The proposed once-through cooling proposed for Unit 3 will raise impingement and entrainment losses as compared with a cooling tower, but it would reduce consumptive use. A cooling tower would also keep thermal conditions in the Lake tolerable for aquatic life. DEQ's Office of Wetlands and Water Protection recommends that the Draft EIS include an alternative not considered in the Application to address this matter: such an alternative would consist of a single new reactor using a cooling tower with Lake Anna as its source.

(c) Water Quantity Issues. For the purpose of this discussion, DEQ's Office of Wetlands and Water Protection assumes that only one additional unit is proposed, because proposed Unit 4 has no identifiable water source.

The proposed addition of Unit 3 would increase the frequency and duration of drawdowns in the Lake. The Application indicates, in Table 2.4.6, that the amount of time that Lake Anna would drop two feet or more would increase from 5.6% of the time to 11.6% of the time. As DEQ's Office of Wetlands and Water Protection indicates, this would mean that flow in the North Anna River below the dam is 20 cfs for 11.6% of the time. Under pre-dam conditions (1929-1971), the streamflow in the River below the dam was 20 cfs only 4.2% of the time, as the Department of Game and Inland Fisheries also points out (see item 1(b), above). This flow rate equals 5.4% of the River's mean annual flow (MAF) at the dam. Under the Tennant rating system, a stream flow of between 0 and 10% of MAF is rated as "severe degradation." Unlike natural drought, which is temporary, the addition of another generating unit which increases the consumptive loss from the watershed would create nearly perennial conditions of severe degradation every fall. For this reason, DEQ's Office of Wetlands and Water Protection is requesting additional studies; see "Additional Analysis Needs," items 1 and 2, below.

The addition of a fourth unit would cause a net loss of 35 additional cfs, according to DEQ's Northern Virginia Regional Office. This would bring the operating level of the lake down to 242 feet MSL, which is 6 feet lower than the target level at which the lake contingency plan currently goes into effect.

(d) Regulatory Authority under the Virginia Water Protection Permit Program. The Application and the request for concurrence with the consistency certification both fail to describe correctly the applicability of State laws and regulations pertaining to water withdrawals. Table 1.2.1 indicates that the Virginia Water Protection Permit regulation, 9 VAC 25-210, is only necessary for "discharge of dredge, fill, or pollutants into surface waters." In fact, since 2000, a wider range of activities in surface waters has been covered by this program, including water withdrawals in particular. Secondly, the attachment listing programs for coastal zone management consistency fails to make the connection, saying only that permits under *Virginia Code* section 62.1-44.15:5 are required to excavate in a wetland. These regulatory authorities should be clarified in the new submission of the federal consistency certification as well as in the license application and Draft EIS.

(e) Timing of NRC Action in relation to Virginia Water Protection Permit. DEQ's Office of Wetlands and Water Protection recommends that because of the lack of abundant water resources in the Lake Anna watershed and the possibility that a Virginia Water Protection Permit may not be issued, the Nuclear Regulatory Commission should consider one of the following:

- Do not issue the Early Site Permit until Dominion receives a Virginia Water Protection Permit; or

- Require that Dominion obtain a Virginia Water Protection Permit prior to conducting any work specified in the site redress plan associated with the Early Site Permit.

3. Non-point Source Water Pollution Control. Utility companies that undertake land-disturbing activities of 10,000 square feet or more for construction, installation, and maintenance of power lines (including essential supporting activities inside and outside the utility easement, such as sub-stations, staging areas, access roads, and borrow/spoil areas) must file general erosion and sediment control specifications annually with the Department of Conservation and Recreation's Division of Soil and Water Conservation for review and approval in accordance with the Virginia Erosion and Sediment Control Law (*Virginia Code* section 10.1-563.D.). All regulated activities must comply with the Erosion and Sediment Control specifications, irrespective of whether work is undertaken on company property or on an easement owned by another party (including VDOT right-of-way).

Construction of company buildings, facilities, and other structures are not regulated by section 10.1-563.D., and must therefore comply with the requirements of the appropriate local program. Dominion should contact Louisa County (David Fisher, Soil and Water Conservation Director, telephone (540) 967-0401) to ensure compliance with applicable local requirements.

Erosion and Sediment Control specifications should include, at a minimum, a description of all measures and policies that will be implemented on the project site to ensure compliance with the state program. Standard practices (general narrative and plan sheets with appropriate details and symbols) must be provided that meet the requirements of the 19 Minimum Standards in the Virginia Erosion and Sediment Control Regulations (see 4 VAC 50-30-40) that apply. Practices in the most current edition of the *Virginia Erosion and Sediment Control Handbook* must serve as minimum design criteria. Variance requests (especially those for MS-16, Trench Length) must be submitted for approval on a project-specific basis to ensure that site characteristics (soils, topography, adjacent areas) are fully considered.

Specifications covering all planned regulated activities for a given calendar year must be approved by the Department of Conservation and Recreation's Division of Soil and Water Conservation prior to initiation of the project. Questions may be addressed to the Division's central office (Lee Hill, telephone (804) 786-3998).

4. Point Source Water Pollution Control. As indicated above (item 2(b)(i)), the impingement and entrainment issue will fall under the new regulations pursuant to Section 316(b) of the Clean Water Act and be addressed in the facility's Virginia Pollutant Discharge Elimination System (VPDES) permit. Whether the new unit would

be treated as an existing intake or a new intake under the section 316(b) regulations is not yet clear. (See "Regulatory and Coordination Needs Summary," item 1, below.)

5. Air Pollution Control.

(a) Permitting Requirements. According to DEQ's Northern Virginia Regional Office, the project does not appear to require any air pollution control permits at this time. In light of the fact that the Application mentions concrete batch plants, however, we recommend that Dominion verify this "no permits required" conclusion with DEQ's Northern Virginia Regional Office (John Bowden, telephone (703) 583-3880) following completion of the design phase of the project.

(b) Fugitive Dust Rules. The Application did not indicate a commitment to abide by fugitive emissions rules. During construction, fugitive dust must be kept to a minimum by using control methods outlined in 9 VAC 5-50-60 et seq. of the Regulations for the Control and Abatement of Air Pollution. These precautions include, but are not limited to, the following:

- Use, where possible, of water or chemicals for dust control;
- Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials;
- Covering of open equipment for conveying materials; and
- Prompt removal of spilled or tracked dirt or other materials from paved streets and removal of dried sediments resulting from soil erosion.

(c) Open Burning Rules. If project activities include the burning of construction or demolition material, this activity must meet the requirements of the Regulations for open burning (9 VAC 5-40-5600 et seq.), and it may require a permit. The Regulations provide for, but do not require, the local adoption of a model ordinance concerning open burning. The applicant should contact Louisa County officials to determine what local requirements, if any, exist. The model ordinance includes, but is not limited to, the following provisions:

- All reasonable effort shall be made to minimize the amount of material burned, with the number and size of the debris piles;
- The material to be burned shall consist of brush, stumps and similar debris waste and clean burning demolition material;
- The burning shall be at least 500 feet from any occupied building unless the occupants have given prior permission, other than a building located on the property on which the burning is conducted;
- The burning shall be conducted at the greatest distance practicable from highways and air fields;

- The burning shall be attended at all times and conducted to ensure the best possible combustion with a minimum of smoke being produced;
- The burning shall not be allowed to smolder beyond the minimum period of time necessary for the destruction of the materials; and
- The burning shall be conducted only when the prevailing winds are away from any city, town or built-up area.

Advisory Policies and Other Environmental Issues

1. Natural Heritage Resources. The Department of Conservation and Recreation has searched its Biotics Data System for occurrences of natural heritage resources in the project area. "Natural heritage resources" are defined as the habitat of rare, threatened, or endangered plants and animals, unique or exemplary natural communities, significant geologic formations, and similar features of scientific interest. The Department of Conservation and Recreation (DCR) reports that natural heritage resources have not been documented in the project area.

The Department of Agriculture and Consumer Services (VDACS) has responsibility for state-listed endangered or threatened plant and insect species. VDACS indicates that the data bases maintained by the Department of Game and Inland Fisheries and the U.S. Fish and Wildlife Service, with whom Dominion consulted concerning endangered species, have incomplete records of state-protected plant and insect species. Recent changes in regulations implementing the Virginia Endangered Plant and Insect Species Act will necessitate further review of the project by VDACS or by DCR's Natural Heritage Division.

Under a memorandum of agreement between the Department of Conservation and Recreation and the Department of Agriculture and Consumer Services, DCR represents VDACS in commenting on potential impacts on state-listed threatened and endangered plant and insect species. According to DCR's records, the proposed project would not affect any documented state-listed plants or insects.

2. Recreation Impacts. The increased water withdrawal needed for new generating units would be likely to reduce lake levels during the summer and fall due to increased power plant demand and evaporation. Most of the 43,000 anglers visiting this important recreational lake every year use the ramps at the State Park or those belonging to commercial operators to gain access to the Lake. Pleasure traffic greatly exceeds angler traffic, by as much as 10 to 15 times according to DGIF wardens. Increased drawdowns proposed to serve the new units would adversely affect lake access, and local economic conditions in the process. For example, during the 2002 drought, the reservoir pool dropped from 250 feet above mean sea level to 245.1 feet, and most boat ramps could not support launches. If the third generating unit had been added in that situation,

the drawdown would have been an additional 2.5 feet, or 242.6 feet MSL. The Draft EIS should provide a full analysis of the impacts of the proposed units upon Lake recreation, along with an analysis of potential mitigation of such impacts. The analysis should include the time of year (presumably in the fall) that drawdowns occur (see "Additional Analysis Needs," item 3, below).

The project may affect the views from across the Lake as well as from Route 76, the interstate bicycle route. Designs for development of the proposed site should include efforts to minimize these visual impacts, according to the Department of Conservation and Recreation.

3. VPDES Stormwater General Permit Applicability. According to DEQ's Northern Virginia Regional Office, the disturbance of approximately 200 acres of land on the south side of Lake Anna for the proposed project will necessitate permit coverage under the Virginia Pollutant Discharge Elimination System (VPDES) permit for stormwater discharges associated with construction activity. Questions on fulfillment of this requirement may be addressed to DEQ's Northern Virginia Regional Office (John Bowden, telephone (703) 583-3880).

4. Solid and Hazardous Waste Management. The Application addressed solid and hazardous waste issues, but did not include a search of waste-related databases, according to DEQ's Waste Division. The Waste Division did a cursory review of its data files and did not find any contamination sites that might affect or be affected by the proposed project.

Any soil that is suspected of contamination, or wastes that are generated, must be tested and disposed of in accordance with applicable federal, state, and local laws and regulations. These include, but are not limited to, the Virginia Waste Management Act (*Virginia Code* sections 10.1-1400 et seq.), the Virginia Hazardous Waste Management Regulations (9 VAC 20-60), and the Virginia Solid Waste Management Regulations (9 VAC 20-80). (For additional citations, see the enclosed DEQ memo, Modena to Irons, dated January 29, 2004).

The Application addressed pollution prevention. DEQ encourages Dominion to implement pollution prevention principles in all projects, including the reduction of waste materials at the source, re-use of materials, and recycling of waste materials.

5. Alternatives Discussion. As mentioned above, the Draft EIS should demonstrate consideration and analysis of a single new unit with a cooling tower and Lake Anna as a water source (see "Federal Consistency...," items 1(e) and 2(b)(ii), above). Moreover, it should consider alternatives to the entire proposal as a means of

ensuring that significant environmental impacts do not occur to the fishery resources in and downstream of Lake Anna (see "Federal Consistency...," item 1(e), above).

6. Local and Regional Concerns. The Thomas Jefferson Planning District Commission considered this review at its regular meeting on January 8, 2004. The Commission had no comment on the project.

Additional Analysis Needs

1. Downstream Flows. DEQ's Office of Wetlands and Water Protection recommends that a range of variability study be performed, comparing the pre- and post-project Index of Hydrologic Alterations for the North Anna River immediately below the dam. The methodology for conducting such a study may be found at:

http://www.conserveonline.org/2000/12/a/en/iha_meth.pdf

DEQ's Office of Wetlands and Water Protection is interested in whether and to what extent the pre- and post-project conditions are different for the 90-day minima, creating long-term low-flow stress conditions. The range of variability analysis may not show a significant change in pre- and post-project conditions. The minimum flow release (20 cfs) is above the extreme minimum flows experienced by the river in its natural pre-dam state in the 1930 drought and similar to low flows in the 1933 drought. However, the full range of the record needs to be examined.

In addition, DEQ's Office of Wetlands and Water Protection is interested in whether the Lake and reactors have significantly changed the Julian date of annual maxima which could affect spring spawning. It is possible that the watershed and wintertime stream flows are large enough that the Lake returns to a full condition each spring, and the Julian date of annual maxima is not changed by the power plants, but the simulation modeling and range of variability analysis should be done to confirm this.

Performance of these statistical studies does not require field work, so they could be initiated immediately, and the results reported in the Draft Environmental Impact Statement ("Draft EIS").

2. In-stream Studies: Usable Habitat as a Function of Flow. DEQ's Office of Wetlands and Water Protection may also recommend further in-stream studies as a supplement to the Draft EIS or as pre-requisite to any permit issuance, depending on confirmation of the concerns expressed above regarding near-perennial low-flow conditions (see "Federal Consistency...," item 2(c), above). This work should characterize weighted usable habitat as a function of flow for the indigenous fishery species in the North Anna River.

DEQ's Office of Wetlands and Water Protection requests the daily output of the simulation models used by Dominion, if it is available in Excel worksheet format, to predict the frequency and duration of the lake drawdown, inflows, evaporation losses, and outflows that were used to develop Tables 5.2.3 and 5.2.4 in the Application.

A statistical analysis of the indicators of hydrologic alteration should be performed, and the results presented in the Draft EIS, according to DEQ's Office of Wetlands and Water Protection.

3. Impact on Recreational Uses of Lake Anna. The Application does not thoroughly address the water-based recreational uses of Lake Anna. While Table 5.2.4. demonstrates the frequency with which the Lake will fall below certain levels (see "Federal Consistency...," item 2(c) and "Advisory Policies...," item 2, above), we do not know the time of year this occurs and what impact it has on lake recreation. This information should be developed for the Draft EIS for the proposed project.

4. Submerged Intake Structure. The Department of Game and Inland Fisheries (DGIF) recommends that Dominion investigate further the addition of a submerged intake structure (a curtain wall as detailed on page 3-5-38 of the Application that would reduce fish impingement and entrainment and align the intake criteria with current DGIF recommendations (see "Federal Consistency...,"item 1(a), above). Results of this analysis should be provided in the Draft EIS for this project.

5. Federal Consistency Certification. Dominion's re-submission of the federal consistency certification may be accomplished separately or, as we would recommend, in conjunction with either the Draft or the Final EIS for this project but would, in any case, be subject to the requirements applicable to consistency certifications for federally licensed projects. These appear in the Federal Consistency Regulations at Title 15, Code of Federal Regulations, Part 930, sub-part D ("Consistency for Activities Requiring a Federal License or Permit," sections 930.50 through 930.66). The new consistency certification should reflect not only further development of the project proposal, but also appropriate additional analysis as detailed in this letter. Questions on consistency may be addressed to this Office (Charles Ellis, telephone 698-4488).

6. Draft Environmental Impact Statement. Although not required to satisfy the Federal Consistency Regulations, for administrative purposes we recommend that the federal consistency certification be submitted at the same time as the Draft EIS. This would allow for concurrent reviews of the two documents, and the information and analysis in the Draft EIS can support the analysis of the consistency certification. If you have questions about the interplay of the Draft EIS and the consistency certification requirement, please feel free to contact me at telephone 698-4325.

Regulatory and Coordination Needs Summary

1. Water Resources Permitting. As indicated previously, the proposed addition of either one or both of the proposed new generating units at the North Anna Power Station will require Virginia Water Protection Permits and, to the extent the land disturbance exceeds one acre, VPDES Stormwater General Permit coverage for construction activities. For water withdrawals requiring Virginia Water Protection Permits, Dominion must apply to DEQ's Office of Wetlands and Water Protection (Joe Hassell, telephone 698-4072). Results of the studies requested or recommended in regard to water resources (see "Additional Analysis Needs," items 1 and 2, above) should be submitted to that Office at 629 East Main Street, 9th floor, Richmond, Virginia 23219, Attn: Joseph P. Hassell. Copies of these study results should be submitted to the Department of Game and Inland Fisheries, attn: Gary Martel (Director, Fisheries Division), 4010 West Broad Street, Richmond, Virginia 23230. .

For land disturbance involving one acre or more, Dominion should apply to DEQ's Northern Virginia Regional Office (John Bowden, Deputy Regional Director, telephone (703) 583-3880) for coverage under the VPDES Stormwater General Permit for construction activities. Similarly, the issue of impingement and entrainment effects is to be addressed under new regulations implementing section 316(b) of the Clean Water Act; advice on this matter may be obtained from the same Office or from DEQ's Office of Wetlands and Water Protection (Joe Hassell, telephone (804) 698-4072).

2. Air Permitting. Questions relating to air quality rules and air permitting, for activities ranging from open burning to operation of concrete batch plants or other fuel-burning equipment, should be addressed to DEQ's Northern Virginia Regional Office (Mr. Terry Darton, Air Permits Manager, telephone (703) 583-3845).

3. Erosion and Sediment Control; Stormwater Management. Questions relating to the fulfillment of the Erosion and Sediment Control Plan and Stormwater Management Plan requirements should be addressed to the Department of Conservation and Recreation's Soil and Water Conservation Division (Lee Hill, telephone 786-3998). Questions on fulfillment of local erosion control requirements should be addressed to Louisa County (David Fisher, Soil and Water Conservation Director, telephone (540) 967-0401).

We hope this information is helpful to you.

Sincerely,

Ellie L. Irons
Program Manager
Office of Environmental Impact Review

Enclosures

cc: Michael P. Murphy, DEQ
Joseph P. Hassell, DEQ-Water
John B. Bowden, DEQ-NVRO
Jeffrey Talbott, DEQ-NVRO
Kotur S. Narasimhan, DEQ-Air
Thomas D. Modena, DEQ-Waste
Gary Martel, DGIF
Keith R. Tignor, VDACS
Derral Jones, DCR
Catherine M. Harold, CBLAD
Gerald P. Wilkes, DMME
Alan D. Weber, VDH
Rochelle Garwood, Thomas Jefferson PDC
David Fisher, Louisa County
C. Lee Hill, DCR-DSWC
Andrew J. Kugler, USNRC
Jud White, Dominion
Tony Banks, Dominion

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JAN 29 2004

DEQ-Office of Environmental Impact Review

COMMONWEALTH of VIRGINIA

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

Department of Game and Inland Fisheries

William L. Woodfin, Jr.
Director

January 27, 2004

Ms. Ellie Irons
Program Manager
Office of Environmental Impact Review
Virginia Department of Environmental Quality
629 East Main Street, 6th Floor
Richmond, VA 23219

Dear Ms. Irons:

I am responding to your November 6, 2003 request for comment on the North Anna Early Site Permit (ESP) Application. Staff members have reviewed pertinent portions of the ESP submitted to the Nuclear Regulatory Commission (NRC) for development of an Environmental Impact Statement to satisfy National Environmental Policy Act (NEPA) requirements.

Fish community impacts to Lake Anna and the North Anna River and public access to Lake Anna are the primary concerns of the Department of Game and Inland Fisheries (DGIF) relating to this proposal. The operation of the two additional nuclear power units (numbers three and four) is expected to result in: (1) water withdrawal increases from the reservoir, (2) water temperature increases in the reservoir, and (3) decreased flows in the North Anna River. These issues and other concerns are discussed below.

Water withdrawal increases to accommodate a third and fourth nuclear unit present biological complications for fish populations through increased fish impingement and entrainment. Annual estimated fish impingement of six "representative important species" with build-out (defined herein as the addition of a third "once-through" and a fourth "cooling tower" unit) is 426,887 fish including 4,441 striped bass, a leading Lake Anna sportfish stocked annually by DGIF. With the proposed intakes, the number of fish impinged would increase by 230% over current levels. Estimated impingement mortality of striped bass would nearly double as the result of build-out; however, the size and age distributions of impinged fish were not provided. The number of fish entrained is expected to increase in a similar fashion with an estimated 468,886,689 fish (from the applicant's six-species category) lost annually – including about 63% gizzard shad. Existing intake criteria at North Anna Power Station (velocity of 0.7 feet per second [FPS] and screen mesh of 9.5 mm) substantially exceed our current recommendations of 0.25 FPS and 1 mm mesh. Even our current recommendations are not expected to provide full resource protection but utilize current state-of-the-art technology. The existing screen would be expected to only exclude compressed fish such as sunfish larger than 50 mm and elongated fish

such as stripers and largemouth bass larger than 86 mm. Thus, it seems appropriate for the applicant to further investigate the addition of a submerged intake structure (curtain wall as detailed on page 3-5-38) to reduce fish impingement and entrainment and align intake criteria with current DGIF recommendations.

Water withdrawal increases are also likely to result in lower lake levels during summer and fall months due to increased power plant demand and evaporation. Lake Anna is an important recreational fishery, and most of the estimated 43,000 anglers annually access the reservoir by boat from one of the many commercial ramps or via the State Park. Pleasure boat traffic greatly exceeds angler traffic, and proposed increased drawdowns could have a deleterious impact on lake access (thereby impacting local economic conditions). For example, during the drought of 2002, the reservoir pool dropped from 250' MSL to 245.1' MSL, and most ramps could not support launches. With the addition of the third unit, the drawdown would have been an additional 2.5'. Estimates from our Wardens are that recreational boating is 10-15 times that of fishing boating. The Early Site Permit review needs to fully analyze impacts and discuss potential mitigation for impacts on recreational boating.

Addition of one to two new units will have significant impacts on downstream resources by reducing flow and the frequency of higher flows. The current minimum release is 40 cubic feet per second (CFS) with 20 CFS during drought periods. Drought releases are triggered when the lake declines to elevation 248' MSL. Current minimum releases are about 10% of mean annual flow and drought releases are about 5% of mean annual flow. It is apparent from the water budget that significant changes in the flow regime have occurred with significant increases in the time flows are under 100 CFS. Preliminary analysis of drought flow frequency indicates that prior to dam construction, flows less than 20 CFS occurred only 4.2% of the time, occur now at 5.3%, and would be expected to increase with one more unit to 11.8%. A fourth unit would increase that occurrence even more, but Unit 4 fails to be addressed in the flow analysis. It is highly unlikely that an outside source of water will be used for unit 4, and its water consumption should be addressed as if water were being withdrawn from the lake (or Unit 4 should not be part of the permitting process). We recommend use of the Index of Hydrologic Analysis to compare pre-lake, current and predicted flow conditions based upon the addition of units three and four. This will quantify the changes in the hydrologic regime.

Changes in the hydrologic regime would be expected to impact the downstream aquatic resource. A common desktop method for flow recommendations is the Tennant method. Resource agency flow recommendations using that method generally are in the range of 20-30% of mean annual flow for the summer and higher levels (60-100% MAF) for the spring spawning period. Recommendations using this method would yield summer flows in the range of 74 to 111 cfs for resource protection. Current minimum releases would be rated in the poor to

degraded range of resource protection. Since this is an over allocated resource, we recommend quantifiable procedures than the Tennant desktop method. An Instream Flow Incremental Methodology study should be conducted for the impacted downstream reaches. Such a study should include evaluation of a habitat time series (pre-project, current and proposed) for native and naturalized species and may result in a recommendations for different flow operating rules than currently exists for the downstream resource.

Water temperature increases predicted to occur as a result of build-out will likely impact fish habitat in Lake Anna and in the North Anna River. Probably the greatest issue is the potential decrease in striped bass habitat within the reservoir. The applicant documented the current situation and available literature concerning the phenomena of striped bass "habitat squeeze" in southeastern reservoirs (the impacts of summer thermal stratification patterns on the habitat needs of adult striped bass) on pages 3-5-55 to 3-5-58. Current conditions (temperature and oxygen stratification patterns) at Lake Anna limit the potential of this fishery but have not resulted in catastrophic fish kills to date. Adult striped bass grow slowly, exhibit reduced fitness (condition) and have low maximum sizes as a result of the marginal habitat conditions now present, but an important recreational fishery within this habitat capacity has developed. However, it is likely that even a small increase in reservoir water temperature would have a dramatic effect – further reducing already limited habitat and perhaps jeopardizing the entire striped bass fishery. The maximum daily surface temperature is expected to increase by 7.2°F near the dam. Currently, the lake frequently does not stratify, and when it does; many times it is a weak stratification. Total temperature differences (top to bottom) in many cases were less than 1°C based on DGIF samples taken during late summer and early fall at lower reservoir sites. Stratification patterns dictate striped bass habitat and are subject to a great deal of variability at Lake Anna – a horizontal and vertical increase in the thermal plume would exacerbate a currently tenuous situation.

Reconfiguring the flow within the WHTF to allow for more efficient cooling (e.g., forcing water to use the entire WHTF by sealing the lower tributary arm between Elk Creek and Millpond Creek and cutting a canal through the headwater areas) would expand the residence time within the WHTF and probably reduce thermal impacts to Lake Anna and the North Anna River. Conflicting information was provided concerning efficiency and water residence time in the WHTF: a figure of 14 days was listed on page 3-2-71, while a figure of seven days was listed on page 3-5-42.

Additional comments concern several inconsistencies in the applicant's report. The proposed fourth unit was addressed repeatedly throughout the document as a "closed-cycle cooling water system" using towers (either wet or dry); however, on page 3-5-45 a reference is made to this unit under "Scenario 3" as a once-through cooling system (e.g., a fourth once-

through unit). This reference is particularly disconcerting since no evaluations of the dramatic increase in water consumption and heat output under this scenario were discussed. In short, it appeared the possibility of a fourth once-through unit was never mentioned either before or after this point, and no review of its environmental impact was made. Frequent references were also made throughout the document to "make-up water" replacing water lost from the cooling processes originating "from an outside source", but these sources were not readily apparent. It seems likely that "outside sources" would likely either be surface or subsurface draws from within the Lake Anna watershed exacerbating the proposed aquatic impacts. A great deal of importance was placed on the Lake Anna water budget, and a key component of this equation was reservoir inflow. This variable was estimated due to an absence of stream gauges and real data, and 370 CFS was presented in Table 5.2-1. This figure was referenced from a model in Section 5.2.2, but no calculations were given with 370 CFS as a derivative. Thus, the figure's origin remains unclear.

Due to the scope and magnitude of aquatic resource impacts anticipated with build-out, it seems prudent to investigate alternatives to the heavily consumptive proposal of another once-through system and a new wet cooling tower.

I hope that this information is helpful as you contemplate license renewal at North Anna Power Station. Please do not hesitate to contact either John Odenkirk (540-899-4169) or John Kauffman (434-296-4731) of my staff if we can be of further assistance.

Sincerely,

Gary Martel
Director, Fisheries Division

cc: J. W. Kauffman
J. S. Odenkirk
D. K. Whitehurst
W. L. Woodfin, Jr.

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JAN 15 2004

DEQ-Office of Environmental Impact Review

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

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Robert G. Burnley
Director

(804) 698-4000
1-800-592-5482

Subject: North Anna Early Site Permit Coastal Zone Consistency Determination

To: Ellie Irons

From: Joseph P. Hassell *Joseph P. Hassell*

Copies: Mike Murphy, Larry Lawson, Terry Wagner, Ellen Gilinsky, DEQ; John Davy, DCR; Charlie Sledd, DGIF

Date: January 15, 2004

I. Summary

The Office of Wetlands and Water Protection and the Division of Water Resources have reviewed the Early Site Permit (ESP) Application. We believe that it is premature to concur that the issuance of this ESP would be consistent with Virginia's Coastal Zone Management Program nor does the application currently form an adequate basis for the preparation of an Environmental Impact Statement by the Nuclear Regulatory Commission (NRC). Additional studies on the impacts to instream beneficial uses from consumptive loss of water by one or both reactors would be required to adequately assess the environmental impacts of the project, particularly the impacts to the recreational use of the lake and the impacts to water quality and aquatic life downstream of Lake Anna within the North Anna River.

II. Background

Dominion Power filed an ESP application with the NRC to add two units to the North Anna Power Station. The NRC determines whether or not the site is suitable for constructing new reactors using an ESP. Permits are issued for 10 to 20 years and can be renewed for 20 years. Environmental issues are addressed as part of the ESP, independent of any review of any specific reactor design. The ESP process uses a Plant Parameters Approach, which postulates an envelope of possible reactor designs. Dominion is considering seven different designs. In this application Dominion has postulated a maximum of two reactors of up to 4300 megawatts each of rated thermal capacity. That is an extremely large outside envelope. The two reactors that Dominion formerly proposed but then cancelled each had a rated electrical capacity of 907

megawatts. Dominion postulates that the first new unit would use once through cooling. The second new unit would use a cooling tower. Issues resolved with finality under the ESP (including environmental issues) are not reexamined in any subsequent licensing action by the NRC. The ESP does not approve a particular reactor design nor allows the construction of the reactor. The ESP authorizes construction of all of the items identified in the site redress plan, in this case site clearing, foundations, intake structures and outfall structures. Dominion has requested that NRC issue the permit for 20 years (the maximum) and allow land clearing, stream filling and intake structure construction to proceed under the site redress plan.

III. Unit 4

Unit 4 is included in the ESP application, yet Dominion does not identify a source of water for Unit 4. NRC regulation, 10 CFR 51.29 requires that "information provided to the Commission by an applicant for a license,..., shall be complete and accurate in all material respects". For Early Site Permit Applications NRC regulation 10 CFR 52.17 (v), requires information on "types of cooling system intake and outflows for **each** facility" (emphasis added) Because no water source is identified in the ESP application, it is not possible to form an opinion on the prospects for approval of such a project or whether it would be consistent with State laws and regulations. The logical water source for Unit 4 would be Lake Anna. Groundwater resources are not capable of producing the large quantities of water needed, nor does there appear to be any surface water source nearby other than Lake Anna. The inclusion of Unit 4 should be withdrawn from the application unless its water source(s) and related cumulative impacts are identified. If Dominion leaves Unit 4 in the application, but does not identify a water source, then the NRC should consider denying the application for any site redress work associated with Unit 4

If the source of water for Unit 4 were Lake Anna, the additional heat load and evaporative losses would result in deeper and lengthier drawdown periods on the Lake and longer periods of low instream flows in the North Anna River. Although no analysis of the additional impacts have been provided, given the small watershed with average runoff of only 370 cfs, there is a good probability that the additional cumulative impact of a fourth unit would have an unacceptable impact on Lake Anna and the North Anna River.

IV. Coastal Zone Management Act Consistency

An applicant for a federal Permit or license shall provide in the application a certification that the proposed activity complies with the enforceable policies of the State approved program. The decision by Dominion to seek CZM consistency was appropriate. Although the power plant is located outside of the Coastal Zone proper, operation of the power plant will have a direct effect on the Coastal Zone because it will diminish instream flow on the North Anna River which is suitable anadromous fish habitat.

The Virginia Water Protection Permit is an enforceable part of the Virginia's Coastal Zone Management Program. The State Water Control Board issues Virginia Water Protection Permits

for projects impacting state waters if it has determined that the proposed activity will protect instream beneficial uses. The preservation of instream flows for purposes of the protection of fish and wildlife resources and habitat and recreation values is a beneficial use of Virginia's waters. These uses are present in both Lake Anna and downstream in the North Anna and Pamunkey Rivers. Conditions contained in a Virginia Water Protection Permit may include, but are not limited to, the volume of water which may be withdrawn as a part of the permitted activity. (§62.1 44:15.5 C, Code of Virginia).

The issuance of a permit for an additional unit of the size envisioned would constitute the approval of the single largest consumptive withdrawal ever considered in the history of the Virginia Water Protection Permit Program. This consumptive withdrawal would be from a water body with an average annual flow of 370 cubic feet per second. The typical recommendation that we receive from the Department of Game and Inland Fisheries is not to allow cumulative consumptive use to exceed 10% of the river's flow. The lake's current evaporation rate and the existing two units already surpass that mark much of the time. Therefore granting of additional withdrawals, even with prescriptive conditions, can not be guaranteed.

For the above reason, the Office of Wetlands and Water Protection recommends that Dominion withdraw their request for Coastal Zone Management Program consistency at least until such time as a draft environmental impact statement is available. If Dominion does not withdraw the request, then we cannot agree with Dominion's certification that the proposed activity is in compliance with the enforceable policies of Virginia Coastal Zone Management Program, due to a lack of information to make that determination. Dominion could definitively resolve the issue by applying for a permit for the proposed withdrawal. VWP Permits for water withdrawals have long durations and are granted for up to a 15-year term.

V. Water Quantity Issues:

For the purpose of this discussion we will assume only one unit is proposed, because as we have noted earlier, the second unit, unit 4, has no identifiable water source.

The addition of Unit 3 will affect water resources by increasing the frequency and duration of drawdown on Lake Anna and increasing the frequency and duration of low flow downstream. According to Table 2.4.6 in the ESP, the amount of time that Lake Anna would drop two feet or more will increase from 5.6 % of the time to 11.6 % of the time. Assuming the modeling is correct and assuming the current minimum low flow release stays the same, this will increase the amount of time that flow in the North Anna below the dam is equal to 20 cfs to 11.6% of the time. Under pre-dam conditions dam (1929-1971), streamflow in the North Anna River below the dam was 20 cfs or less only 4.2 % of the time. That statistic is based on streamflow records from USGS North Anna near Doswell gage adjusted to reflect the smaller drainage area at the dam site.

North Anna Early Site Permit Coastal Zone Consistency Determination (continued)

The State Corporation Commission set the original minimum release for the North Anna dam in 1969. The State Water Control Board proposed 80 cfs. The Attorney General in 1971 opined that because of the language of the Water Power Act §62.1 – 82, the State Corporation Commission was the appropriate authority to set such a release, and that the SWCB itself could not set a higher rate. In response to the drought of 1989-2002 and complaints about low water levels by lake front property owners, legislation was created that required the development of lake level contingency plans in VPDES permits that contained minimum releases for impoundments whose primary purpose was cooling water. This legislation applies only to Dominion and Lake Anna. Thus, the 40 cfs figure that the State Water Control Board did not think was sufficient in 1971 to protect downstream water quality has been cut in half by the lake level contingency plan whenever the lake level falls to 248.0 feet above mean sea level.

A minimum release of 20-cfs equals 5.4 % of the North Anna River's mean annual flow at the dam. Donald Tennant, a U.S. Fish and Wildlife Service fishery biologist, devised a well known rating system based on percentages of mean annual flow. In the Tennant rating system, a streamflow of 0% to 10 % of the mean annual flow is rated as "severe degradation". Unlike natural drought which is temporary, our concern is that with the addition of another unit, which is expected to increase the consumptive loss from the watershed by another 39 cfs, nearly perennial conditions of severe degradation will likely be created each fall. Accordingly we are requesting that Dominion perform additional statistical studies to determine whether these concerns have merit.

A range of variability study should be performed comparing the pre and post project Index of Hydrologic Alterations for the North Anna River immediately below the dam. The following URL address contains a methodology for conducting such a study:

http://www.conserveonline.org/2000/12/a/en/iha_meth.pdf

We are particularly interested in whether or not and to what extent the pre- and post- project conditions are different for the 90-day minima, thereby creating long-term low flow stress conditions. It is quite possible that the range of variability analysis will not show a significant change in pre- and post- project conditions. The minimum flow release (20 cfs) is above the extreme minimum flows experienced by the river in its natural pre-dam state in the 1930 drought and similar to low flows in the 1933 drought. However the full range of the record needs to be examined.

We are interested in whether or not the lake and reactors have significantly changed the Julian date of annual maxima which could impact spring spawning. It is possible that the watershed and winter- time stream flows are large enough that the lake returns to a full condition each and every spring and the Julian date of annual maxima is not changed by the power plants, but the simulation modeling and range of variability analysis should be done to confirm this.

We note that the performance of these statistical studies does not require field work, so they could be initiated immediately and hopefully the results reported in the draft environmental impact statement.

Pending the results of a range of variability study we might recommend further instream work as a supplement to the draft environmental impact statement or prior to the issuance of any permits. If our concerns regarding near perennial chronic low flow conditions are confirmed, we would recommend the performance of instream work to characterize weighted usable habitat as a function of flow for the indigenous fishery species of the North Anna River. We are not requesting these studies at this time but may request them in the future.

If it is available in Excel worksheet format we would appreciate being provided with the daily output of the simulation models used by Dominion to predict the frequency and duration of the lake drawdown, inflows, evaporation losses and outflows that were used to develop Table 5.2.3 and 5.2.4.

Another instream beneficial use that has not been thoroughly addressed by the ESP is how the additional consumptive use will affect the water-based recreational uses of Lake Anna. The most useful information appears in Table 5.2.4, which demonstrates the frequency with which the lake will fall below certain levels. What is not known is what time of year this occurs, presumably predominantly in the fall, and what impact this has on lake-based recreation.

VI. Impingement and Entrainment

A once through cooling process for Unit 3 will result in a significant number of aquatic organisms impinged (240,000) or entrained (148,000,000) annually. Normally, the Virginia Water Protection Permit is used to address this issue. However, in this case, because the intake is for cooling water and will not be built for some time, the impingement and entrainment issue will fall under the new Section 316(b) regulations and be addressed in the facility's VPDES permit. The Office of Water Permits and the Northern Regional Office will be the appropriate contacts. DEQ has had preliminary discussions with NRC and EPA on whether the new units would be treated as an existing intake or a new intake under the new 316(b) regulations. DEQ has not made a decision in this regard

Dominion proposes to first build Unit 3 as a once through cooling facility. Once through cooling represents a greater cost savings over cooling towers but will result in higher impingement and entrainment losses. On the positive side, once through cooling has lower consumptive loss per megawatt of electrical energy produced than the cooling towers because some of the heat in once through cooling is dissipated by processes other than pure evaporation.

Regardless of our ultimate decision on Section 316 (b), the use of a cooling tower may eventually be required, not just to reduce impingement and entrainment, but to keep the thermal conditions in the lake tolerable to aquatic life. DEQ's preference for once through cooling (to

reduce consumptive use) will be balanced against the need to keep thermal conditions acceptable and to limit impingement and entrainment. Therefore, an alternative not considered in the ESP application, namely the construction of a **single** new reactor using **a cooling tower** with **Lake Anna** as it source water, may ultimately prove to be the least environmentally damaging practicable alternative. Such an alternative should be thoroughly explored in the draft EIS.

VII. Comments on Regulatory Authority under the Virginia Water Protection Permit Program

Both the ESP application (Table 1.2.1 Federal State and Local Authorizations) and the request for CZM concurrence attachment which lists the applicable programs fail to correctly characterize the applicability of State laws and regulations related to water withdrawals. Table 1.2.1 claims that the Virginia Water Protection Permit Regulation, 9 VAC 25-210 is only necessary for the "discharge of dredge, fill or pollutants into surface waters"; actually since 2000 a wider range of activities in surface waters have been covered by this program, and in particular the program regulates water withdrawals. Likewise the attachment listing programs for coastal zone management consistency fails to make this connection, saying only that permits under §62.1-44.15.5 are required to excavate in a wetland. The regulatory authority under the Virginia Water Protection Permit Program should be clarified in the application.

VIII. Timing Issues and License Term

Dominion Resources has requested that the NRC issue a permit for a maximum of 20 years. Under the regulation, NRC has the authority to issue a permit for a term of not less than 10 years nor more than 20 years. Due to the lack of abundant water resources in the basin and the possibility that a VWP permit would not be issued, we would recommend that the NRC consider the following possibilities in issuing an ESP:

- Do not issue the ESP until Dominion receives a VWP Permit, or,
- Require that Dominion obtain a VWP Permit prior to conducting any work specified in the site redress plan.

IX. Conclusions and Recommendations

The site is probably not suitable for the construction of two new nuclear reactors of the size proposed due to a lack of sufficient water resources. Two new reactors would remove an additional 78-cfs from a watershed that had an average flow of only 370 cfs even before the lake and the first two reactors were built.

The site may be suitable for the construction of one additional unit, however there is no guarantee that the appropriate permits could be obtained. We would recommend that Dominion Power seek a Virginia Water Protection Permit as early in the process as practicable to resolve water resource issues prior to investing large sums of money in site preparation.

A request for concurrence with Coastal Zone Management Consistency should only be granted to the extent that the determination is given with the caveat that a Virginia Water Protection Permit would have to be obtained for the consistency determination to be valid. Probably the same qualifying statement can be applied to any necessary amendments to the VPDES permit to accommodate the additional thermal load on Lake Anna.

Additional instream flow studies would be needed before the DEQ would grant a permit to remove an additional 39-cfs from the Lake Anna Watershed. A statistical analysis that analyzes the indicators of hydrologic alteration should be performed and the results made available as a part of the preparation of the Draft Environmental Impact Statement.

If you cannot meet the deadline, please notify ELLIE IRONS at 804/698-4325 prior to the date given. Arrangements will be made to extend the date for your review if possible. An agency will not be considered to have reviewed a document if no comments are received (or contact is made) within the period specified.

REVIEW INSTRUCTIONS:

A. Please review the document carefully. If the proposal has been reviewed earlier (i.e. if the document is a federal Final EIS or a state supplement), please consider whether your earlier comments have been adequately addressed.

B. Prepare your agency's comments in a form which would be acceptable for responding directly to a project proponent agency.

C. Use your agency stationery or the space below for your comments. **IF YOU USE THE SPACE BELOW, THE FORM MUST BE SIGNED AND DATED.**

Please return your comments to:

MS. ELLIE IRONS
DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF ENVIRONMENTAL IMPACT REVIEW
629 EAST MAIN STREET, SIXTH FLOOR
RICHMOND, VA 23219
FAX #804/698-4319

RECEIVED
JAN 30 2004
DEQ-Office of Environmental Impact Review

Ellie Irons, Program Manager
Environmental Impact Review

COMMENTS

Statements in the project document concerning endangered species were reviewed. The document references consultation with USFWS and DGIF on federal and state listed endangered and threatened species. Databases maintained by these agencies have incomplete records of state protected plant and insect species. Recent changes in regulation of the Virginia Endangered Plant and Insect Species Act would necessitate further review of this project by the Natural Heritage Division of DCR or VDACS.

(signed) (Keith R. Tignor) (date) January 28, 2004

(title) Endangered Species Coordinator

(agency) VDACS, Office of Plant and Pest Service

PROJECT # 03-223F **8/98**

February, 2004
MEMORANDUM

TO: Ellie Irons, OCS

FROM: Jeff Talbott, NVRO

COPY: Tom Faha, NVRO

SUBJECT: Early Site Permit Review – Virginia Power – North Anna Facility
VPDES No. VA0052451

Here are the main concerns that are not address in the Joe Hassell's memo. They are:
1) Water level in the cold side of the lake.
2) Water level in the hot side of the lake.
3) Temperatures in the hot and cold side of the lake.
4) Effects on down stream users.

<u>The following are facts listed in the ESP report</u>

Unit 3 will be once-through cooling water system and have the following effects:
- Increase the water temp would effect the both the hot and cold sides of Lake Anna
- The additional uptake of 29 cfs
- During drought conditions, this could result in the operating level of the lake at 245'. Stated in the report that with Unit 3 operational during the drought years of 1981 and 2002 the draw down would have been 1.5 to 2.5 feet greater. The 245' is 3' lower than the target 248' in which the lake contingency plan currently goes into effect. This will have a significant effect on the lake and it's uses.

Unit 4 will be a closed cycle cooling tower system and will have the following effects:
- A further increase in the water temp in both the hot and cold sides.
- The additional uptake of 44 cfs with 9 cfs being discharged back into the lake with a net lost of 35 cfs.
- During drought conditions, this would result in the operating level of the lake at 242'. The 242' is 6' lower than the target 248' in which the lake contingency plan currently goes into effect. This will have a huge effect on the lake and it's uses.

The following is a statement in the report: "the water supply for the lake can support the water supply needs for Unit 3 and 4 on a long-term average basis. On a short-term basis during drought conditions there may be periods when an additional source of water maybe required." There were also statements that this may effect the downstream users.

Irons,Ellie

From: Bowden,John
Sent: Friday, January 30, 2004 10:11 AM
To: Irons,Ellie
Subject: Consistency Certification #03-223F

NVRO comments regarding North Anna Early Site Permit (ESP) sponored by the Nuclear Regulatory Commission are as follows:

1. Wetlands and Water Permitting-NVRO concurs with comments by Joe Hassel, Central Office, and have coordinated this review with him.

2. Water Program Compliance-The project as described will involve land disturbance activities on approximately 200 acres of land located in Louisa County, Virginia, within the existing site of the North Anna Power Station on the south side of Lake Anna. VPDES permit coverage for stormwater discharges associated with construction activity will be required. Observance of state and local erosion and sediment control requirements should minimize short term impacts to surface water quality.

3. Air Program Compliance-The summary of the applicable regulatory framework for the proposed project discusses the attainment status of two areas: Louisa County and the Richmond Metro Statistical Area. NVRO will defer to Central Office on the accuarcy of the non-attainment discussion. While the report acknowledges in the introduction that there are air regulatory issues related to construction (e.g., concrete batch plants), I see no discussion of the issue in detail, nor a commitment to abide by the relevant regulations pertaining to fugitive emissions.

4. Air Program Permitting-In the information package, it was stated that the facility would comply with all air permitting laws and regulation as they were derived from the Code of Federal Regulation and the Virginia Administrative Code. It went on to state the all appropriate applications would be provided once the design phase had been completed. Based on the information provided on the CD the Early Permitting Project does not require any air pollution control permits at this time.

John D. Bowden
Deputy Regional Director
Department of Environmental Quality
Northern Virginia Regional Office
(703) 583-3880
jdbowden@deq.state.va.us

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JAN 29 2004

DEQ-Office of Environmental Impact Review

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 10009, Richmond, Virginia 23240
Fax (804) 698-4500 TDD (804) 698-4021
www.deq.state.va.us

Robert G. Burnley
Director

(804) 698-4000
1-800-592-5482

MEMORANDUM

TO: Ellie Irons

FROM: Thomas Modena TDM

DATE: January 29, 2004

COPIES: Kevin Greene

SUBJECT: Coastal Zone Management Consistency Certification
North Anna Power Station Early Site Permit

The Waste Division has reviewed the North Anna Power Station Early Site Permit Coastal Zone Management Consistency Certification, Louisa County. We have the following comments concerning waste issues associated with this project.

The report addressed solid and hazardous waste issues, but did not include a search of waste-related databases. The Central Office of the Waste Division did a cursory review of its data files, and did not find any sites that might impact or be impacted by this project.

Any soil that is suspected of contamination or wastes that are generated must be tested and disposed of in accordance with applicable Federal, State, and local laws and regulations. Some of the applicable state laws and regulations are: Virginia Waste Management Act, Code of Virginia Section 10.1-1400 *et seq.*; Virginia Hazardous Waste Management Regulations (VHWMR) (9VAC 20-60); Virginia Solid Waste Management Regulations (VSWMR) (9VAC 20-80); Virginia Regulations for the Transportation of Hazardous Materials (9VAC 20-110). Some of the applicable Federal laws and regulations are: the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Section 6901 *et seq.*, and the applicable regulations contained in Title 40 of the Code of Federal Regulations; and the U.S. Department of Transportation Rules for Transportation of Hazardous Materials, 49 CFR Parts 107, 171.1-172.558.

Finally, pollution prevention was addressed in the report. VDEQ encourages all construction projects and facilities to implement pollution prevention principles, including the

reduction, reuse, and recycling of all solid wastes generated.

If you have any questions or need further information, please let me know.

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

Joseph H. Maroon
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

203 Governor Street
Richmond, Virginia 23219-2010
TDD (804) 786-2121

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JAN 07 2004
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MEMORANDUM

Date: 2 January 2004

To: Ellie Irons, Virginia Department of Environmental Quality

Derral Jones

From: Derral Jones, Planning Bureau Manager

Subject: DEQ#03-223F: North Anna Early Site Permit (ESP), Nuclear Regulatory Commission

The Department of Conservation and Recreation (DCR) functions to preserve and protect the environment of the Commonwealth of Virginia and advocate the wise use of its scenic, cultural, recreation and natural heritage resources. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, state unique or exemplary natural communities, significant geologic formations and similar features of scientific interest.

DCR has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. According to the information currently in our files, natural heritage resources have not been documented in the project area. This absence of data may indicate that the project area has not been surveyed rather than confirm that the area lacks natural heritage resources.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Virginia Department of Conservation and Recreation (DCR), DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

On page 5, under "Environmental Impacts", it indicates that the project will be undertaken in accordance with best management practices in the Virginia Erosion and Sediment Control

Handbook. The applicant also needs to be aware that utility companies that undertake land-disturbing activities of 10,000 square feet or more for construction, installation, and maintenance of lines (including essential supporting activities within and outside the easement, such as substations, staging areas, access roads, borrow/spoil areas) must file general erosion and sediment control (ESC) specifications annually with DCR's Division of Soil & Water Conservation (DCR-DSWC) for review and approval in accordance with Section 10.1-563D of the Virginia Erosion and Sediment Control Law (VESCL). All regulated activities must comply with the ESC specifications, whether work is undertaken on company property or an easement (including VDOT right-of way) owned by another party. Construction of company buildings, facilities, and other structures are not regulated at Section 10.1-563D, and therefore, must comply with the requirements of the appropriate local ESC Program. ESC specifications should include, at a minimum, a description of all ESC measures and policies that will be implemented on site to ensure compliance with the state program. Standard practices (general narrative and plan sheets with appropriate details, symbols, etc.) must be provided that meet the requirements of the 19 Minimum Standards (MS) in Section 4VAC50-30-40 of the Virginia Erosion and Sediment Control Regulations (VESCR) that apply to company activities. Practices in the most current edition of the *Virginia Erosion & Sediment Control Handbook* must serve as minimum design criteria. Variances requests (especially those for MS-16, trench length) must be submitted for approval on a project-specific basis to ensure that site-specific characteristics (soils, topography, adjacent areas) are fully considered.

Company-specific specifications that cover all planned regulated activities for a given calendar year must be approved by DCR-DSWC prior to project initiation. Inquiries and questions regarding ESC specifications should be directed to Mr. C. Lee Hill in DCR's Central Office, at (804) 786-3998. *[Reference: VESCL§10.1-563.D; VESCR §4VAC50-30-30, §4VAC50-30-40]*

If the site is determined to be suitable, the potential exists for visual impacts to the view from across the lake as well as from Route 76, the interstate bicycle route. Designs for the development of the proposed site should make efforts to minimize these visual impacts.

Thank you for the opportunity to comment on this project.

DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR PROGRAM COORDINATION

ENVIRONMENTAL REVIEW COMMENTS APPLICABLE TO AIR QUALITY

RECEIVED
DEC 1 9 2003
DEQ-Office of Environmental Impact Review

TO: Ellie Irons **DEQ - OEIA PROJECT NUMBER: 03 – 223F**

PROJECT TYPE: ☐ STATE EA / EIR / FONSI **X FEDERAL EA / EIS** ☐ SCC

X CONSISTENCY DETERMINATION/CERTIFICATION

PROJECT TITLE: NORTH ANN EARLY SITE PERMIT (ESP)

PROJECT SPONSOR: NUCLEAR REGULATORY COMMISSION

PROJECT LOCATION:
☐ OZONE NON ATTAINMENT AREA
☐ OZONE MAINTENANCE AREA
☐ STATE VOLATILE ORGANIC COMPOUNDS & NITROGEN OXIDES EMISSION CONTROL AREA

REGULATORY REQUIREMENTSMAY BE APPLICABLE TO:
☐ CONSTRUCTION
☐ OPERATION

STATE AIR POLLUTION CONTROL BOARD REGULATIONS THAT MAY APPLY:

1. ☐ 9 VAC 5-40-5200 C & 9 VAC 5-40-5220 E – STAGE I
2. ☐ 9 VAC 5-40-5200 C & 9 VAC 5-40-5220 F – STAGE II Vapor Recovery
3. ☐ 9 VAC 5-40-5490 et seq. – Asphalt Paving operations
4. **X 9 VAC 5-40-5600 et seq. – Open Burning**
5. **X 9 VAC 5-50-60 et seq. Fugitive Dust Emissions**
6. ☐ 9 VAC 5-50-130 et seq. - Odorous Emissions; Applicable to_____
7. ☐ 9 VAC 5-50-160 et seq. – Standards of Performance for Toxic Pollutants
8. ☐ 9 VAC 5-50-400 Subpart_____, Standards of Performance for New Stationary Sources, designates standards of performance for the_____
9. ☐ 9 VAC 5-80-10 et seq. of the regulations – Permits for Stationary Sources
10. ☐ 9 VAC 5-80-1700 et seq. Of the regulations – Major or Modified Sources located in PSD areas. This rule may be applicable to the _____
11. ☐ 9 VAC 5-80-2000 et seq. of the regulations – New and modified sources located in non-attainment areas
12. ☐ 9 VAC 5-80-800 et seq. Of the regulations – Operating Permits and exemptions. This rule may be applicable to _____

COMMENTS SPECIFIC TO THE PROJECT:

Subject to obtaining necessary construction permits as applicable.

K. S. Narasimhan

(Kotur S. Narasimhan)
Office of Air Data Analysis

DATE: December 19, 2003

If you cannot meet the deadline, please notify ELLIE IRONS at 804/698-4325 prior to the date given. Arrangements will be made to extend the date for your review if possible. An agency will not be considered to have reviewed a document if no comments are received (or contact is made) within the period specified.

REVIEW INSTRUCTIONS:

A. Please review the document carefully. If the proposal has been reviewed earlier (i.e. if the document is a federal Final EIS or a state supplement), please consider whether your earlier comments have been adequately addressed.

B. Prepare your agency's comments in a form which would be acceptable for responding directly to a project proponent agency.

C. Use your agency stationery or the space below for your comments. **IF YOU USE THE SPACE BELOW, THE FORM MUST BE SIGNED AND DATED.**

Please return your comments to:

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DEPARTMENT OF ENVIRONMENTAL QUALITY
OFFICE OF ENVIRONMENTAL IMPACT REVIEW
629 EAST MAIN STREET, SIXTH FLOOR
RICHMOND, VA 23219
FAX #804/698-4319

RECEIVED
JAN 30 2004
DEQ-Office of Environmental Impact Review

Ellie Irons, Program Manager
Environmental Impact Review

COMMENTS

No comments

(signed) Alan O. Weber (date) 1-27-04

(title)

(agency) VDH

PROJECT # 03-223F 8/98

If you cannot meet the deadline, please notify ELLIE IRONS at 804/698-4325 prior to the date given. Arrangements will be made to extend the date for your review if possible. An agency will not be considered to have reviewed a document if no comments are received (or contact is made) within the period specified.

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OFFICE OF ENVIRONMENTAL IMPACT REVIEW
629 EAST MAIN STREET, SIXTH FLOOR
RICHMOND, VA 23219
FAX #804/698-4319

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JAN 22 2004
DEQ-Office of Environmental Impact Review

Ellie Irons, Program Manager
Environmental Impact Review

COMMENTS

NO COMMENTS CONCERNING THE VA COASTAL RESOURCES MANAGEMENT PROGRAM

(signed) _____ (date) 20 January 2004

(title) GEOLOGIST

(agency) DMME

PROJECT # 03-223F 8/98

Thomas Jefferson
Planning District Commission
Regional planning linking transportation, land use, economy & environment

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DEQ-Office of Environmental Impact Review

City of Charlottesville
Kevin Lynch, Vice–Chair
Kevin O'Halloran

Albemarle County
Walter F. Perkins
Sally H. Thomas

Fluvanna County
Norma Hutner
Grant Tate

Greene County
Jeri Allen, Chair
Philip Anns

Louisa County
William Hale
David B. Morgan, M.D.

Nelson County
Connie Brennan
Fred Boger

Executive Director
Harrison B. Rue

January 22, 2004

Ms. Ellie Irons
Virginia Department of Environmental Quality
Office of Environmental Impact Review
629 East Main St., Sixth Floor
Richmond, VA 23219

Dear Ms. Irons:

The Thomas Jefferson Planning District Commission reviewed project #03-223F, North Anna Early Site Permit, at its regular meeting on January 8, 2004. However, the Commission had no comment on this project. Thank you for the opportunity to review the project.

Sincerely,

Rochelle Garwood
Senior Planner – Environment

300 East Main Street, P.O. Box 1505, Charlottesville, VA 22902–1505
Telephone (434) 979-7310 Fax (434) 979-1597 Virginia Relay Users: 711 (TDD)
email: info@tjpdc.org / web site: www.tjpdc.org

COMMONWEALTH of VIRGINIA

L. Preston Bryant, Jr.
Secretary of Natural Resources

DEPARTMENT OF ENVIRONMENTAL QUALITY
Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P. O. Box 10009, Richmond, Virginia 23240
Fax (804) 698-4500 TDD (804) 698-4021
www.deq.virginia.gov

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

November 21, 2006

Ms. Pamela F. Faggert
Vice-President and Chief Environmental Officer
Dominion Virginia Power Company
5000 Dominion Boulevard
Glen Allen, Virginia 23060

RE: Federal Consistency Certification under Coastal Zone Management Act, Virginia Coastal Resources Management Program: North Anna Early Site Permit Application - DEQ-05-079F

Dear Ms. Faggert:

The Commonwealth of Virginia has completed its review of the consistency certification for the above referenced project. The Department of Environmental Quality (DEQ) is responsible for coordinating Virginia's review of federal consistency certifications submitted pursuant to the Coastal Zone Management Act of 1972, as amended (CZMA). Pursuant to the CZMA, federal actions that can have foreseeable effects on Virginia's coastal uses or resources must be conducted in a manner which is consistent with the Virginia Coastal Resources Management Program (Virginia Coastal Program or VCP). The VCP is comprised of a network of enforceable policies administered by several agencies. Accordingly, DEQ, as the lead agency for the VCP, coordinated the review with agencies administering the enforceable and advisory policies.

The referenced project, which pertains to the site suitability for the proposed addition of new nuclear reactor units at the North Anna Power Station, is presently under review as an application submitted by Dominion Nuclear North Anna, LLC (Dominion) under the Early Site Permit Program administered by the U.S. Nuclear Regulatory Commission (NRC). Due to this federal licensing requirement, the project is also subject to federal consistency certification under the CZMA and to the environmental impact review process under the National Environmental Policy Act (NEPA).

We are also aware that a separate federal consistency certification under the CZMA will be required should Dominion later decide to apply to the NRC for a license for nuclear unit construction and operation pertaining to the referenced project. Dominion has acknowledged the requirement for this additional and separate federal consistency certification in its March 21, 2005, certification for the referenced project. The NRC also reconfirmed on a telephone conference call on November 9, 2006, that it, too, is aware of the separate certification requirement should

Dominion later decide to apply to the NRC for a license for nuclear unit construction and operation pertaining to the referenced project. Due to the relationship described in the NRC's Regulations (see 10 CFR Part 52 §52.39(a)(2)) between the finality of ESP determinations and subsequent findings required for issuance of a construction permit, operating license, or combined license by the NRC, throughout our review of the referenced project we sought to obtain an understanding of how the evaluations of the findings relating to the coastal effects required to be included in each separate consistency certification will be carried out.

The original federal consistency certification for the referenced project was submitted to DEQ on November 7, 2003. This original certification was withdrawn by Dominion on January 12, 2004. On March 21, 2005, Dominion resubmitted a federal consistency certification for the referenced project. The review process for the certification was first extended and then stayed by agreements between DEQ and Dominion pursuant to the Federal Consistency Regulations (see 15 CFR Part 930 §930.60(a)(3)(b)) because of the need to develop new information on a change in the cooling method design of the proposed third reactor unit. Our review of the federal consistency certification restarted on May 5, 2006, after the receipt of new information relative to the substantially different cooling method for proposed Unit 3.

Under the Federal Consistency Regulations, we must provide our concurrence with, or objection to, the federal consistency certification within six months of our receipt of the certification or at the earliest practicable time, whichever occurs first (see15 CFR Part 930 §930.62(a)). The restarted review was scheduled to conclude no later than November 3, 2006. On October 27, 2006, DEQ and Dominion agreed to stay the six-month review period until no later than November 16, 2006. On November 16, 2006, DEQ and Dominion agreed to stay the end of the review period until no later than November 21, 2006.

The following state agencies, regional planning district commissions, and localities joined in this review. The starred (*) agencies administer the enforceable policies under the Virginia Coastal Resources Management Program):

Department of Environmental Quality including:
- Division of Water Resources*
- Northern Virginia Regional Office*
- Waste Division
- Division of Air Programs Coordination*
- Office of Environmental Impact Review

Department of Game and Inland Fisheries*
Department of Conservation and Recreation:
- Division of Soil and Water Conservation*
- Division of Natural Heritage
- Division of Planning and Recreation Resources
- Division of Chesapeake Bay Local Assistance*

Department of Health*
Department of Transportation
Marine Resources Commission*
Department of Historic Resources
Thomas Jefferson Planning District Commission
Spotsylvania County

Louisa County
Hanover County

In addition, the following agencies, regional planning district commissions, and localities were invited to comment:

Department of Emergency Management
Department of State Police
RADCO Planning District Commission
Rappahannock-Rapidan Planning District Commission
Orange County
Town of Mineral

PROJECT DESCRIPTION

On September 25, 2003, Dominion Virginia Power Company/Dominion Nuclear North Anna, LLC ("applicant" or "Dominion") applied to the U.S. Nuclear Regulatory Commission for an Early Site Permit related to the possible addition of two new nuclear power units at the North Anna Power Station site at Lake Anna. The proposed site for the new units is in Louisa County, Virginia, near the town of Mineral. The proposed site is within the existing North Anna Power Station site, which is on a peninsula on the southern shore of Lake Anna about 5 miles upstream from the North Anna Dam. Dominion is considering adding the new units (Units 3 and 4) to the two units that are already in place at the North Anna Power Station site. NRC's Early Site Permit would, if issued, allow Dominion to "reserve" the site for as long as 20 years for up to two new nuclear power units, and to undertake certain site preparation and preliminary construction activities.

According to the federal consistency certification submitted in March 2005, the area that would be affected on a long-term basis as a result of permanent facilities on the ESP site is approximately 130 acres. The additional areas that would be disturbed on a short-term basis (for temporary facilities, laydown areas, etc.) total approximately 70 acres. Of these 200 acres, most are open areas used to stage equipment and materials for the existing Units 1 and 2 construction, operation and maintenance activities, and former Units 3 and 4 construction. Approximately 80 acres are wooded.

The site preparation and preliminary construction activities that would be authorized by the ESP, should the NRC later issue such a permit, would include the following:

- Site preparation for construction of the facility (including clearing, grading, construction of temporary access roads, and preparation of borrow areas).
- Installation of temporary construction support facilities (including warehouses, shops, concrete mixing plants, utilities, docking and unloading facilities, and construction support buildings).
- Excavation for facility structures.
- Construction of service facilities (including items such as roadways, paving, railroad spurs, fencing, exterior utility and lighting systems, switchyard interconnects, and sanitary sewage treatment facilities).

- Construction of cooling towers, intake and discharge structures, and circulating water lines as well as fire protection equipment, switchyard and other interconnections, and microwave towers.

If Dominion decides to proceed with any of the above site preparation activities, it would first be required to obtain any permits or authorizations necessary to conduct such site preparation activities. Also, if authorization is provided to Dominion to perform such site preparation activities, it will be subject to Dominion's obligation to perform such site redress as may be required by the Site Redress Plan approved by the NRC. The objective of the Site Redress Plan is to ensure that the site, should it not be fully developed for the intended purpose of new nuclear power generation, would be returned to an unattended, environmentally stable and aesthetically acceptable condition suitable for such non-nuclear use as is consistent with local zoning laws.

In the federal consistency certification for this project submitted for our review in March 2005, Dominion indicated that cooling water for proposed Unit 3 would be drawn from Lake Anna and that proposed Unit 4 would use dry cooling towers. As indicated above, Dominion has since developed a new method of cooling for the proposed Unit 3, which is a major aspect of the current federal consistency review. In addition, this revised cooling method is also currently the subject of the review of a Draft Environmental Impact Statement Supplement prepared by the NRC pursuant to NEPA. This new cooling method involves a closed-cycle, wet and dry cooling system that is intended to reduce the water demands associated with the once-through cooling proposed in the original certification. During periods of relative surplus (e.g. when lake levels are at or above 250 feet above mean sea level), the wet towers would be used. During dry periods (e.g. lake levels under 250 feet for 7 consecutive days or more), a dry cooling tower would be used, unless weather conditions dictate otherwise (the "maximum water conservation mode"). Proposed Unit 4 is to be air-cooled as contemplated in the March 2005 federal consistency certification. In addition, Dominion proposes to increase the maximum power level for each of the proposed new units from 4300 to 4500 Megawatts-thermal.

CONDITIONAL CONCURRENCE

Dominion has certified that "the activities that would be permitted by NRC issuance of an ESP would comply with enforceable policies of, and will be conducted in a manner consistent with, the Commonwealth of Virginia's federally coastal zone management program."

Based on the comments submitted by the agencies administering the Enforceable Policies of the VCP, we concur that this proposal is consistent with the VCP **provided** that the following two conditions, discussed in more detail below, are satisfied:

1) that prior to construction and operation of one or both of the proposed new units, including any site preparation and preliminary construction activities, Dominion shall obtain all required permits and approvals not yet secured for the activities to be performed that are applicable to the VCP's Enforceable Policies and that Dominion also adheres to all the conditions contained therein; and,

2) that should the U.S. Nuclear Regulatory Commission later approve Dominion's application and ultimately issue an Early Site Permit for the referenced project, in accordance with 15

CFR Part 930 §930.4(a)(3), the NRC shall include in the application approval and in the ESP the additional permit condition submitted by Dominion on November 10, 2006, at the request of the Department of Game and Inland Fisheries, which pertains to the completion of an Instream Flow Incremental Methodology study.

The provisions contained in the first condition listed above are necessary because the framework of the VCP is such that the issuance of the state permits and approvals associated with the Enforceable Policies of this Program constitutes a project's consistency with those Polices. Once a state permit or approval is issued pursuant to one or more of the VCP's Enforceable Policies for a project, and for as long as the project remains in compliance with the provisions therein, the project is deemed to be consistent with the VCP. Based on the information submitted by Dominion in its federal consistency certification, we anticipate that permits or approvals pursuant to the following Enforceable Polices will be required for the referenced project prior to the time construction or operation of the project may commence: Fisheries Management, Wetlands Management, Point Source Pollution Control, and Non-Point Source Pollution Control. Further, because the Early Site Permit program does not require submission of a final design for the construction and operation of the proposed new nuclear reactor units, additional permits or approvals pertaining to the Enforceable Policies of the VCP may be required for the referenced project.

As stated above, we are aware that another federal consistency certification submission and review will be required should Dominion later decide to apply to the NRC for a combined construction and operating license. We anticipate that the need for any additional permits or approvals applicable to the VCP's Enforceable Policies for the referenced project will be more clearly determined during the review of this additional federal consistency certification. Furthermore, this conditional concurrence in no way guarantees that the Commonwealth's agencies will later issue any or all of the permits and approvals applicable to the VCP's Enforceable Policies that Dominion would be required to obtain should it later seek to construct and operate one or both of the proposed new nuclear reactor units associated with the referenced project.

The second condition listed above is necessary due to the provisions of the NRC's regulations pertaining to the extent of the information that must be included in an ESP application. During the course of our review of this project, we found that the information provided to us in the consistency certification and the NEPA documents was not sufficient in all instances for a complete evaluation of coastal effects as they pertain to both the activities that would be authorized under the ESP **and** the activities that would result if one or both of the new nuclear reactors units are constructed and placed into operation. Complete information about the coastal effects associated with the construction and operation of the new nuclear units described in the referenced project was unavailable to us concerning protection of aquatic and other resources in Lake Anna and downstream. Therefore, as stated above, due to the relationship described in the NRC's Regulations (see 10 CFR Part 52 §52.39(a)(2)) between the finality of ESP determinations and subsequent findings required for issuance of a construction permit, operating license, or combined license by the NRC, the VCP will not conclusively concur with Dominion's consistency certification for the referenced project at this time.

Instead, at the request of the Department of Game and Inland Fisheries (DGIF), the following condition has been developed in order to obtain the necessary information to address the

unresolved issues and to help determine the subsequent implementation of appropriate design and operational standards, conditions, and protocols for the referenced project:

> Dominion Nuclear North Anna, LLC (Dominion) shall conduct a comprehensive In-stream Flow Incremental Methodology (IFIM) study, designed and monitored in cooperation and consultation with the Virginia Department of Game and Inland Fisheries (VDGIF) and the Virginia Department of Environmental Quality (VDEQ), to address potential impacts of the proposed Units 3 and 4 upon the fishes and other aquatic resources of Lake Anna and downstream waters. Development of the Scope of Work for the IFIM study shall begin in 2007, and the IFIM study shall be completed prior to issuance of a combined construction and operating license (COL) for this project. Dominion agrees to consult with VDGIF and VDEQ regarding analysis and interpretation of the results of that study, and to abide by surface water management, release, and in-stream flow conditions prescribed by VDGIF and VDEQ upon review of the completed IFIM study, and implemented through appropriate state or federal permits or licenses.

On November 10, 2006, Dominion notified the NRC that it was adding the language of the condition requested by the DGIF as a commitment in its ESP application and further requested that this commitment be included by the NRC as a permit condition in the Early Site Permit. (See enclosed letter from Eugene Grecheck to the NRC.) Further, the U. S. Nuclear Regulatory Commission in its November 14, 2006, letter to Dominion (see enclosed letter from Robert M. Weisman to Eugene S. Grecheck), has indicated that the NRC "agrees to include this proposed condition as an enforceable permit condition, should the agency approve the North Anna ESP application and ultimately issue a permit."

We are requiring that this condition be satisfied to ensure consistency of the referenced project with the Fisheries Management, Point Source Control, and Wetlands Management Enforceable Policies of the VCP. The comprehensive In-stream Flow Incremental Methodology study we have required in this conditional concurrence will provide the needed information for the VCP to undertake a more complete evaluation of the coastal effects of the entire range of activities associated with the proposed project. Additionally, according to the Virginia Department of Conservation and Recreation (DCR), the North Anna River is a spectacularly scenic and remote canoeing river with excellent fishing. In its earlier comments on the Draft Environmental Impact Statement for the referenced project, DCR recommended that a minimum in-stream flow recreation study be conducted to determine what the discharge rates should be from Lake Anna to support recreational boating on the North Anna River. The IFIM Study discussed above will also need to address the recreational issues described in DCR's comments. (Please also see "Advisory Policies" section below for additional comments from DCR about this Advisory Policy of the VCP.)

Moreover, because an ESP (if such a permit is later approved and issued by the NRC) would not authorize the construction and operation of the new nuclear reactor units proposed in the referenced project, and because a separate federal consistency certification would be required if Dominion later applies to the NRC for a combined construction and operating license for one or both of the proposed new nuclear reactor units, this conditional concurrence shall not be construed by any party involved as an assurance that the Commonwealth will later find all activities associated with the proposed project consistent with Enforceable Policies of the VCP. Likewise, this conditional concurrence in no way guarantees that the Commonwealth's agencies will later issue any or all of the permits and approvals applicable to the VCP's Enforceable Policies that Dominion

would be required to obtain should it later seek to construct and operate one or both of the proposed new nuclear reactor units associated with the referenced project.

In accordance with 15 CFR Part 930, §930.4, this conditional concurrence is based on Dominion complying with all conditions as stipulated above and the U.S. Nuclear Regulatory Commission completing the required action pursuant to §930.4(a)(3). If the requirements of paragraphs (a)(1) through (3) of 15 CFR Part 930, §930.4 are not met by Dominion or the NRC, then all parties shall treat this conditional concurrence as an objection pursuant to 15 CFR Part 930, §930.4(a)(1) and (b), and 15 CFR Part 930, §930.63. If this conditional concurrence later becomes an objection, in accordance with 15 CFR Part 930, §930.4(a)(1) and pursuant to 15 CFR Part 930, §930.63(e), DEQ will notify Dominion of the opportunity to appeal the VCP's objection to the Secretary of Commerce within 30 days after receipt of the VCP's concurrence/objection or 30 days after receiving notice from the NRC that Dominion's ESP application will not be approved as amended by the VCP's conditions.

If this conditional concurrence is later treated as an objection, in accordance with 15 CFR Part 930, §930.63 (b), (c), and (d), the Commonwealth would likely propose the alternative measures described in Appendix 1, which if adopted by Dominion, may permit the proposed project to be conducted in a manner consistent with the Enforceable Policies of the VCP.

Should this conditional concurrence become an objection, pursuant to 15 CFR Part 930, Subpart H, Dominion may request that the Secretary of Commerce override the objection (see 15 CFR Part 930, §930.63(e)). If this conditional concurrence is later treated as an objection, the VCP's notification of objection shall include a statement to the following effect:

> Pursuant to 15 CFR Part 930, subpart H, and within 30 days from receipt of this letter, you may request that the Secretary of Commerce override this objection. In order to grant an override request, the Secretary must find that the activity is consistent with the objectives or purposes of the Coastal Zone Management Act, or is necessary in the interest of national security. A copy of the request and supporting information must be sent to the Virginia Coastal Program/DEQ and the U.S. Nuclear Regulatory Commission. The Secretary may collect fees from you for administering and processing your request.

REMEDIAL ACTION

In accordance with 15 CFR Part 930, § 930.65, should an ESP later be approved and issued by the NRC for the referenced project, DEQ may notify the NRC if:

1) the VCP later maintains the referenced project is being conducted or is having an effect on any coastal use or resource substantially different than originally described and, as a result, is no longer consistent with the management program; or

2) the VCP later maintains the referenced project is being conducted or is having coastal effects substantially different than originally described and, as a result, the activity affects any coastal use or resource in a manner inconsistent with the management program.

Pursuant to 15 CFR Part 930, § 930.65, DEQ may request appropriate remedial action. Such remedial actions shall be linked to coastal effects substantially different than originally described. If after 30 days, the VCP still maintains that Dominion is failing to comply substantially with the management program, the Governor or DEQ may file a written objection with the Director (NOAA). If the Director finds that the Dominion is conducting an activity that is substantially different from the approved activity, Dominion shall, subject to the 15-day review provided pursuant to 15 CFR Part 930, § 930.65(e), submit an amended or new consistency certification and supporting information to the Federal agency and to the State agency, or comply with the originally approved certification.

SUPPLEMENTAL COORDINATION

In accordance with 15 CFR Part 930, §930.66, federally permitted activities previously determined to be consistent with the VCP, but which have not yet begun, require further coordination by the applicant if the proposed activity will affect any coastal use or resource in a substantially different way than originally described. Substantially different coastal effects are reasonably foreseeable if the applicant makes substantial changes in the proposed activity that are relevant to VCP Enforceable Policies, or if there are significant new circumstances or information relevant to the proposed activity and the effects of that activity on any coastal use or resource. In the event that the referenced project affects any coastal use or resource in a substantially different way than originally described, Dominion must notify DEQ through a supplemental consistency certification.

PUBLIC PARTICIPATION

In accordance with 15 CFR §930.61, DEQ invited public participation to assist the VCP in its review of the federal consistency certification for the referenced project. DEQ published a notice of the federal consistency review for the referenced project on its web site, during the first review, from April 15 through May 2, 2005. No public comments were received at that time.

For the restarted review in 2006, DEQ published a notice of the review on its web site from May 15 through June 16, 2006. On June 15, DEQ also published notice of an extended review period lasting until September 8. This notice also announced that DEQ would hold a public hearing on August 16. This notice was published on DEQ's web site and in three newspapers as follows:

Web site (http://www.deq.virginia.gov):	starting June 15
Richmond Times-Dispatch:	July 2
Lake Anna Observer:	July 15
Fredericksburg Free Lance-Star:	July 30

During the public review process, including the public hearing, we received comments from more than 500 individuals and organizations concerning this review.

In summary, the majority of the public comments received state that the proposed project currently under review is inconsistent with one or more of the following Enforceable Policies of the VCP: Fisheries Management, Wetlands Management, and Point Source Pollution Control.

Due to the volume of information provided by the public, the need for a careful analysis thereof, and in order to facilitate a timely review by agencies, DEQ compiled the major comments which represented the views of numerous individuals and several organizations and asked agencies to analyze the issues raised by the public. We included copies of detailed public comments and the transcript of the public hearing for reviewers' use in addressing the issues raised. A summary of the issues raised during the public comment period and any additional responses provided by agencies administering the applicable Enforceable and Advisory policies of the VCP are enclosed as Appendix 2.

It is important to note that many of the topics and issues identified in the correspondence and testimony submitted during the public comment period were either not applicable to the Enforceable Policies of the VCP as they specifically relate to the review of the federal consistency certification for the referenced project, or they were unrelated to the provisions of the CZMA. For example, we received extensive comments pertaining to the regulatory oversight of the existing facilities and operations at the North Anna Power Station rather than to the proposed new units described in the ESP application for the referenced project, particularly with regard to water temperatures. Also, a number of other comments submitted questioned whether DEQ's regulatory programs for water quality protection were appropriately approved and are being administered in accordance with the federal Clean Water Act (33 U.S.C. § 1370) relative to the existing facilities and operation of the North Anna Power Station. While these are important issues and DEQ has already referred these comments and questions to both the Virginia Attorney General's Office and to Region III of the U.S. Environmental Protection Agency, these matters are not germane to the CZMA.

After further review of the topics and issues raised during the comment period, none of the agencies that administer the Enforceable Policies of the VCP objected to Dominion's consistency certification for the project.

APPLICABLE ENFORCEABLE POLICIES OF THE VCP

The discussions which follow present state agencies' comments and conclusions with regard to each of the applicable Enforceable Policies of the VCP, along with conditions and stipulations stemming from the Enforceable Policies, with regard to the referenced project.

1. Fisheries Management Enforceable Policy

The program stresses the conservation and enhancement of finfish and shellfish resources and the promotion of commercial and recreational fisheries to maximize food production and recreational opportunities. This program is administered by the Marine Resources Commission (Code of Virginia § 28.2-200 thru 28.2-713) and the Department of Game and Inland Fisheries (DGIF).(See *Code of Virginia* § 29.1-100 thru 29.1-570).

The Department of Game and Inland Fisheries, as the Commonwealth's wildlife and freshwater fish management agency, exercises enforcement and regulatory jurisdiction over those resources, including state or federally listed endangered or threatened species, but excluding listed insects. DGIF is a consulting agency under the Fish and Wildlife Coordination Act (48 Stat. 401, as amended, 16 U.S.C. 661 *et seq.*), and provides environmental analysis of projects or permit applications coordinated through the Virginia Department of Environmental Quality, the Virginia

Marine Resources Commission, the Virginia Department of Transportation, the U.S. Army Corps of Engineers, the Federal Energy Regulatory Commission, and other state or federal agencies. The role of DGIF in these procedures is to determine likely impacts upon fish and wildlife resources and habitats, and to recommend appropriate measures to avoid, minimize, or compensate for those impacts.

Prior to requesting that the condition previously described above will need to be added to Dominion's application for the referenced project and that this condition must be included as an enforceable condition in the Early Site Permit (should the NRC ultimately decide to issue a permit for this project), DGIF submitted extensive comments and recommendations. These comments and recommendations are included in Appendix 1. If the conditional concurrence for the referenced project later becomes an objection pursuant to 15 CFR Part 930, §930.4(a)(1) and (b), and 15 CFR Part 930, §930.63, DGIF's comments and recommendations pertaining to the Fisheries Management Enforceable Policy, as well as any other comments and recommendations included in Appendix 1, would likely be proposed by the VCP as alternative measures, which if adopted by Dominion, may permit the proposed project to be conducted in a manner consistent with the Enforceable Policies of the VCP. Should the conditional concurrence for the referenced project later become an objection, the VCP may also describe additional alternative measures than those listed in Appendix 1. (Please also see Appendix 2 "Summary of Public Comments Received" for additional comments and responses provided by DEQ regarding this Enforceable Policy.) Questions about DGIF's comments and recommendations may be directed to Andy Zadnik, telephone (804) 367-2733.

2. Point Source Pollution Control Enforceable Policy

The point source program is administered by the State Water Control Board pursuant to § 62.1-44.15 of the *Code of Virginia*. Point source pollution control is accomplished through the implementation of the National Pollutant Discharge Elimination System permit program established pursuant to Section 402 of the federal Clean Water Act and is administered in Virginia as the Virginia Pollutant Discharge Elimination System (VPDES) permit program.

DEQ's Division of Water Resources stated that its concerns centered on the difference between the Division's recommendations on when to use air cooling for Unit 3 and the proposed cooling regime in the revised Early Site Permit application submitted by Dominion. Dominion proposed in its revised application to operate Unit 3 in its water conservation mode (air cooling) whenever the water level in Lake Anna falls below 250 feet above mean sea level ("250 feet msl"). The Division, along with the Department of Game and Inland Fisheries, recommended that in addition to this approach, the water conservation mode be employed for Unit 3 whenever stream flows in the North Anna River immediately below the dam were below certain target seasonal flows, in order to reduce withdrawals required for operation of Unit 3 and to mitigate impacts to stream flows during these periods.

The Division's original concerns have been largely addressed by the changes made by Dominion for cooling Units 3 and 4, and by discussions between program offices in DEQ. The proposal to operate air cooling (maximum water conservation mode) only when the lake level drops below 250 feet msl means that the air cooling would be implemented during times when it is least effective, i.e., during summer through late fall.

Notwithstanding the Division's concerns about the effectiveness of this maximum water conservation mode during summer to late fall, the maximum water conservation mode is warranted whenever the lake falls below a full condition. Water savings will accomplish the following:

- Reduce the ultimate lake drawdown;
- Benefit lakefront property owners;
- Shorten the time between more normal releases, and
- Reduce the risk of shutdown of the plant.

DEQ's Division of Water Resources agrees that Unit 3 should be operated in this fashion at a minimum (see enclosed DEQ memos, Hassell to Ellis, dated July 19, 2006, and Hassell to Ellis, dated October 19, 2006). However, it may not be realistic to require this operating scheme in the context of the federal consistency review, according to the Division. A future VPDES and/or Virginia Water Protection Permit (VWPP) will, according to the Division of Water Resources, include conditions reflective of the Division's July 19 recommendations.

During the review of the referenced project, the Division of Water Resources was concerned by the uncertainty that a new or modified VWPP would be required for water withdrawal impacts associated with the operation of one or both of the new units proposed in the referenced project. The VWPP is the primary controlling mechanism for regulation of impacts due to surface water withdrawals. However, the VPDES permit may also be used for this purpose. The current VPDES permit (#VA 0052541) for the North Anna Power Station contains minimum flow conditions and would need to be modified if Unit 3 were built. DEQ can require Dominion to abide by combined recommendations of the Division of Water Resources and the Department of Game and Inland Fisheries through a lawfully issued VPDES permit.

The DEQ Division of Water Resources also considered the following topics during its review of the referenced project:

- **Cumulative Impacts** According to DEQ-DWR, the use of air cooling only after lake levels begin to decline has been changed to more reliance on air cooling. This will reduce the time that the lake level will be down more than 2 feet (i.e., at 248 feet msl) from 11% of the time in an earlier proposal to 7% of the time with the present proposed configuration. By operating the third unit to take maximum advantage of air cooling, Dominion can minimize adverse impacts of the third unit on middle-range flows to an acceptable level.

- **Foreclosure of Development of Public Water Supplies in the Region** As discussed further in enclosed comments and in the Appendix 2 "Summary of Public Comments" the following is the status of water supply efforts in neighboring localities:

Locality	**Efforts**	**Impact on Lake Anna/N. Anna River or from Project**
Caroline County	Pursuing tidal intake from Rappahannock River	No impact on flows in York River basin

Hanover County	Purchases from Richmond, water skimmed from high river flows, use of quarry	No indication
Town of Orange	Water supply reservoir completed, water from Rapidan River	Net gain to region from inter-basin transfer
Spotsylvania County	Spotsylvania did not pursue Lake Anna water	No indication
Louisa County	Considering purchase from Fluvanna County, which has water withdrawal permit for water from James River; considering existing reservoir	No effect from Unit 3

- **Raising Lake Level** DEQ's Division of Water Resources states that raising the lake level 6 to 9 inches is not under consideration. No decision has been made with regard to a 3-inch increase recommended by DGIF; this would allow an additional 27 cubic feet per second (cfs) to be released into the North Anna River for 60 days each year. This proposal would require VPDES approval in the lake level contingency plan or else approval under a Virginia Water Protection Permit.

- **Blowdown Discharges from Unit 3** Concerns have been raised that the blowdown discharges from proposed Unit 3 will add heat and chemicals to the Lake and may affect its water quality. According to DEQ's Northern Virginia Regional Office, the existing VPDES permit (#VA0052451), which applies to Units 1 and 2, would need to be modified to address the cooling tower blowdown discharges attributable to Unit 3. Effluent guidelines specified in federal regulations (40 CFR Part 423) would be used in the permit action, which would also accord with water quality standards. Any added heat would be analyzed to determine whether a re-evaluation of the existing section 316(a) variance applicable to the North Anna Power Station is warranted. Similarly, the VPDES permit action would analyze the use of chemicals to ensure that numeric criteria of state water quality standards are met.

The Division of Water Resources is confident that with the presently proposed infrastructure for Units 2 (existing) and 3 (proposed), DEQ has the authority under its permitting programs to protect in-stream beneficial uses of the North Anna River, even in light of cumulative impacts of the new project. Therefore, the Division of Water Resources and the DEQ Northern Regional Office did not object to the VCP's conditional concurrence with the federal consistency certification for the referenced project. (Please also see Appendix 2 "Summary of Public Comments Received" for additional comments and responses provided by DEQ regarding this Enforceable Policy). Questions about the VPDES permit should be directed to DEQ's Northern Virginia Regional Office (Tom Faha, Water Permit Manager, telephone (703) 583-3846) or DEQ's Division of Water Resources (Joe Hassell, telephone (804) 698-4072).

3. Wetlands Management Enforceable Policy

The purpose of the wetlands management program is to preserve tidal wetlands, prevent their despoliation, and accommodate economic development in a manner consistent with wetlands preservation. The tidal wetlands program is administered by the Virginia Marine Resources Commission (*Code of Virginia* § 28.2-1301 thru § 28.2-1320).

The Virginia Water Protection Permit program administered by the Department of Environmental Quality includes protection of wetlands, both tidal and non-tidal. This program is authorized by Code of Virginia § 62.1-44.15.5 and the Water Quality Certification requirements of Section 401 of the Clean Water Act of 1972. Due to the relationship of the VWPP Program's surface water withdraw authorities and the nature of the provisions of the VPDES permit for the referenced project, the comments pertaining to water withdrawal matters are included in the Point Source Pollution Control Enforceable Policy discussion above. (Please also see Appendix 2 "Summary of Public Comments Received" for additional comments and responses provided by DEQ regarding this Enforceable Policy). Questions about VWPP should be directed to DEQ's Division of Water Resources (Joe Hassell, telephone (804) 698-4072).

4. Non-Point Source Pollution Control Enforceable Policy

This enforceable policy is administered by the Department of Conservation and Recreation, Division of Soil and Water Conservation. According to the Department of Conservation and Recreation (DCR), any land disturbance exceeding an area of 2,500 square feet must comply with the Virginia Erosion and Sediment Control Law, which requires that the applicant prepare and submit an Erosion and Sediment Control Plan to DCR's James River Watershed Office. Questions should be addressed to that Office (James McCutcheon, telephone (804) 225-2992).

5. Coastal Lands Management Enforceable Policy

This program is a state-local cooperative program administered by the Department of Conservation and Recreation's Division of Chesapeake Bay Local Assistance and 84 localities in Tidewater, Virginia established pursuant to the Chesapeake Bay Preservation Act (see § 10.1-2100 thru § 10.1-2114 *Code of Virginia* and Chesapeake Bay Preservation Area Designation and Management Regulations. (See 9 VAC 10-20-10 *et seq. Virginia Administrative Code.*)

According to the Department of Conservation and Recreation's Division of Chesapeake Bay Local Assistance, the project area, which is in Louisa County, is not within a Chesapeake Bay Preservation Act jurisdiction (Baird/Ellis, 10/30/06). Questions about Coastal Lands Management matters should be DCR's Division of Chesapeake Bay Local Assistance (Alice Baird, telephone (804) 225-2307).

6. Subaqueous Lands Management Enforceable Policy

The management program for subaqueous lands establishes conditions for granting or denying permits to use state-owned bottomlands based on considerations of potential effects on marine and fisheries resources, wetlands, adjacent or nearby properties, anticipated public and private benefits, and water quality standards established by the Department of Environmental Quality, Water Division. The program is administered by the Virginia Marine Resources Commission (VMRC) (§ 28.2-1200 thru 28.2-1213 of the *Code of Virginia*). Since Lake Anna is a man-made impoundment of the North Anna River, the Commission has jurisdiction over encroachments over the historic, flooded stream channel. Questions about Subaqueous Lands should be directed to VRMC (Jeff Madden, telephone (757) 247-2200).

7. Air Pollution Control Enforceable Policy of the VCP

The program implements the federal Clean Air Act to provide a legally enforceable State Implementation Plan for the attainment and maintenance of the National Ambient Air Quality Standards. This program is administered by the State Air Pollution Control Board (§ 10-1.1300 of the *Code of Virginia*).

Permitting Requirements Heating and other fuel-burning facilities may require permits from DEQ. Questions on these requirements may be addressed to DEQ's Northern Regional Office.

Fugitive Dust Control During construction activities, fugitive dust must be kept to a minimum by using control methods outlined in 9 VAC 5-50-60 *et seq.* of the Regulations for the Control and Abatement of Air Pollution. These precautions include, but are not limited to, the following:

- Use, where possible, of water or chemicals for dust control;
- Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials;
- Covering of open equipment for conveying materials; and
- Prompt removal of spilled or tracked dirt or other materials from paved streets and removal of dried sediments resulting from soil erosion.

Open Burning Requirements In addition, if project activities include the burning of any material, this activity must meet the requirements of the Regulations for open burning (9 VAC 5-40-5600 *et seq.*), and it may require a permit (see item 6(a), above). The Regulations provide for, but do not require, the local adoption of a model ordinance concerning open burning. Dominion should contact appropriate local officials to determine what local requirements, if any, exist. The model ordinance includes, but is not limited to, the following provisions:

- All reasonable effort shall be made to minimize the amount of material burned, with the number and size of the debris piles;
- The material to be burned shall consist of brush, stumps and similar debris waste and clean-burning demolition material;
- The burning shall be at least 500 feet from any occupied building unless the occupants have given prior permission, other than a building located on the property on which the burning is conducted;
- The burning shall be conducted at the greatest distance practicable from highways and air fields;
- The burning shall be attended at all times and conducted to ensure the best possible combustion with a minimum of smoke being produced;
- The burning shall not be allowed to smolder beyond the minimum period of time necessary for the destruction of the materials; and
- The burning shall be conducted only when the prevailing winds are away from any city, town or built-up area.

DEQ's Air Division did not state any objections to the referenced project. For questions about Air Pollution Control contact DEQ's Northern Regional Office (Terry Darton, telephone (703) 583-3845).

ADVISORY POLICIES OF THE VCP

The discussions which follow present state agency comments and recommendations with regard to each of the advisory policies of the VCP that are applicable to the referenced project, issues raised by the public pertaining to these advisory policies, and responses to these issues from agencies with jurisdiction on the appropriate policy. Although not required for the purposes of consistency, in accordance with 15 CFR § 930.39(c), Dominion and the NRC should consider the advisory policies (recommendations) of the Virginia Coastal Resources Management Program as they pertain to the referenced project.

Coastal Natural Resource Areas

These areas are vital to estuarine and marine ecosystems and/or are of great importance to areas immediately inland of the shoreline. Such areas receive special attention from the Commonwealth because of their conservation, recreational, ecological, and aesthetic values. These areas are worthy of special consideration in any planning or resources management process and include the following resources:

a) Wetlands
b) Aquatic Spawning, Nursery, and Feeding Grounds
c) Coastal Primary Sand Dunes
d) Barrier Islands
e) Significant Wildlife Habitat Areas
f) Public Recreation Areas
g) Sand and Gravel Resources
h) Underwater Historic Sites

Wildlife Habitat

The Department of Game and Inland Fisheries (DGIF) has notified Dominion and the Nuclear Regulatory Commission of the existence of at least two new bald eagle nests at Lake Anna. DGIF understands that NRC may consult informally with the U.S. Fish and Wildlife Service regarding these nests. DGIF supports this consultation and also recommends that Dominion contact DGIF to address potential adverse impacts upon bald eagles attributable to this project (Jeff Cooper, biologist, telephone (540) 899-4169).

Public Recreation Areas

We received comments from the Virginia Department of Conservation and Recreation (DCR) regarding Public Recreation Areas. In its earlier comments on the Draft Environmental Impact Statement for the referenced project, DCR recommended that a minimum in-stream flow recreation study be conducted to determine what the discharge rates should be from Lake Anna to

support recreational boating on the North Anna River. DCR stated that an air-cooled Unit 3 would have no impacts upon water-related recreation.

According to DCR, Lake Anna supports a significant amount of recreational activity from people getting to the lake from public and private lands. Lake Anna State Park is a particular example of the public investment in facilitating public use of the Lake. DCR stated that the proposed new generating facilities may deplete the water available for other uses and that impacts of those facilities upon the lake temperature, particularly in the summer months, can affect the downstream fishery. DCR further commented that the North Anna River is a spectacularly scenic and remote canoeing river with excellent fishing. Between State Route 601 and U.S. Route 301, the North Anna River is heavily used because it presents some of the most beautiful and remote paddling opportunities in the mid-Atlantic region. During periods of low rainfall, releases from the Lake Anna Dam are less than what is needed to support recreational boating on the River. DCR further recommended that discharge rates from the Lake Anna Dam should be adequate to meet minimum in-stream flows needed for recreational boating from State Route 601 to U.S. Route 301.

The scope of the IFIM Study discussed above will also need to address the recreational issues described in DCR's comments.

Comments Received from State Agencies Regarding Other Issues

1. Health Impacts

During the initial review of the federal consistency certification in 2005, DEQ-OEIR requested the Virginia Department of Health (VDH) to comment on two concerns raised by citizens relative to potential health effects of new nuclear power reactor units: the direct effects of heat from immersion in ambient waters by recreational bathers, and the potential adverse effects of any changes in concentrations of micro-organisms in those waters. VDH provided analysis and comments in a letter dated September 15, 2005 (enclosed).

Risks to Health from Heat According to VDH, if a person is exposed to hot water that is 113 degrees Fahrenheit (F.) or higher, there is a risk of burn injury, correlated with the water temperature and the length of time one is submerged. Submersion can be expected to result in second-degree burns (no irreversible damage) after two hours of exposure. Immersion in water at temperatures above normal body temperature (98.6 degrees F.) can be expected to affect body temperature, sweating, and heart rate. Persons with heart disease, young children, pregnant women, and the elderly are believed to be particularly vulnerable, as are people with spinal cord or peripheral nerve disorders.

Microbiological Risks to Health According to VDH, a species of amoeba (*Naegleria fowleri*) that inhabits freshwater ponds, lakes, rivers, minimally chlorinated pools, and hot springs can cause a disease called primary amoebic meningoencephalitis (PAM), which is a rare but nearly always fatal infection. This infection occurs when water containing these amoebae incidentally enters the nose during swimming or other aquatic activity, followed by migration to the brain through the olfactory nerve. Symptoms occur one day to two weeks after exposure; death typically occurs 3 to 7 days after symptoms occur. According to death certificate data cited by VDH, there have been 35 deaths nationally, including one in Virginia, attributable to PAM during the period 1979 through 2002.

Recommendations According to VDH, vulnerable classes of people (see item 1(a), above) should avoid prolonged immersion in waters warmer than normal body temperature. All people should avoid water bodies with temperatures over 104 degrees F. To reduce the risk of PAM, swimmers should avoid waters when surface water temperatures are greater than or equal to 95 degrees F. They should also avoid shallow, stagnant areas, minimize forceful entry of water up nasal passages during jumping or diving (such as by nose plugs or holding the nose), and avoid digging in sediment while under water. Further questions may be directed to the Department of Health (Khizar Wasti, telephone (804) 864-8182).

2. Historic Structures and Archaeological Resources

In earlier comments (June 8, 2006, prior to issuance of the Supplement to the Draft EIS, and November 3, 2005), the Department of Historic Resources (DHR) indicated that there had not been sufficient identification of historic properties that may be affected by the construction of proposed Units 3 and 4. If such identification could not be completed by the time of a Final Environmental Impact Statement, then a Programmatic Agreement would be necessary.

Since writing those earlier comments, DHR has received and reviewed an archaeological survey report, entitled *Archaeological Survey Dominion Early Site Permit Project North Anna Power Station, Louisa County, Virginia,* prepared by the Louis Berger Group, Inc., for Dominion Nuclear North Anna, LLC. (DHR File No. 2000-1210.)

Review of the Survey Report According to DHR, the survey report meets the Secretary of the Interior's *Standards and Guidelines for the Documentation of Archaeological Sites* (Federal Register, Volume 48, pages 44734-44742) and also the DHR *Survey Guidelines* (revised 2001).

The survey builds on two previous site assessments conducted on the property in question, and employs a probability model based on the physiographic situation and field inspection. The Department of Historic Resources states its finding that the model is properly developed and executed, and represents a reasonable, good-faith effort to identify archaeological resources that may be affected by the proposed project. The Area of Potential Effect (APE) contains two known historic-era cemeteries recorded as sites 44LS221 and 44LS222. No additional archaeological resources were identified within the APE.

Recommendations The survey consultant recommends that the two cemeteries are potentially eligible for listing on the National Register of Historic Places, and that further archaeological evaluation would be necessary to determine eligibility. The Department of Historic Resources concurs with these recommendations.

DHR further recommends that the two cemetery sites be avoided in project development. If they are avoided, the project would likely have no negative effect on the archaeological sites.

Conclusions According to DHR, the execution of the survey and submission of the survey report satisfies the identification responsibilities of the Nuclear Regulatory Commission, provided that the cemeteries can be avoided. These responsibilities stem from Title 36, Code of Federal Regulations, Part 800. Satisfaction of these responsibilities pre-empts the necessity of a Programmatic Agreement.

The Department of Historic Resources looks forward to receiving the Nuclear Regulatory Commission's determination of effect for this project. Questions may be directed to DHR (Roger Kirchen, telephone (804) 367-2323, ext. 153).

3. Road and Traffic Impacts

Any Virginia Department of Transportation VDOT land use requirements, lane closures, traffic control or work zone safety issues should be closely coordinated with the affected cities/counties and VDOT's Louisa Residency (telephone (540) 967-3710).

Also, VDOT provided responses to comments from citizens pertaining to road and transportation issues. In its responses, VDOT indicated that it would work with Dominion to ensure that the roads in the vicinity of the North Anna Power Station are maintained and that necessary improvements are in place prior to any major activities at the project site. VDOT has requested a traffic impact analysis from Dominion; this would compare the future background traffic in the area with future traffic, including construction traffic ("total traffic"), and would identify areas of impacts. The impacts -- some of which would be temporary, from construction, and some of which would be permanent -- are the responsibility of Dominion. The traffic impact analysis should also provide mitigation measures to reduce the impacts. (Please also see Appendix 2 "Summary of Public Comments Received" for additional comments and responses provided by VDOT regarding road and traffic Impacts).

OTHER MATTERS RELATED TO THIS CONISISTENCY CERTIFICATION REVIEW

1. Regional Government Comments

The Thomas Jefferson Planning District Commission responded to discussion, in the NRC's Supplement to the Draft EIS, of potential need to modify water releases at the North Anna Dam to maximize shad habitat and preserve downstream river resources. The Commission noted that DEQ would be responsible for determining modification to water releases and recommended appropriate action by DEQ in this regard.

2. Local Government Comments

Spotsylvania County reiterated earlier comments, provided in the review of the Draft EIS. The County adopted a resolution on February 8, 2005, which recited a number of concerns about the Early Site Permit process, chiefly the demands of the proposed project for Lake Anna water in light of the rapidly growing population in the Lake region and the impacts on area residents and visitors of lowering the water level of the Lake. The County objected to the ESP process.

Louisa County indicated, on behalf of its Board of Supervisors, that the County had raised several questions with Dominion and was satisfied with the answers. Louisa County supports issuance of the Early Site Permit by the Nuclear Regulatory Commission.

Hanover County provided copies of earlier comments with its September 8, 2006, (enclosed) comment letter on the current federal consistency certification review. Hanover County submitted the following comments:

Background: County Relationship to Rivers Hanover County is immediately downstream from the North Anna Dam, and relies on the North Anna River as the water source for its Doswell Water Treatment Plant, as well as the receiving water for discharges from the County's Doswell Wastewater Treatment Plant. The County also relies, further downstream, on the Pamunkey River, which receives a significant part of its flow from the North Anna River. The Pamunkey River is the receiving water for discharges from Hanover County's Courthouse and Totopotomoy Wastewater Treatment Plants. In addition, the North Anna and Pamunkey Rivers are important fisheries habitats and also recreational amenities for County residents. Several industries in the County also rely on the North Anna River.

Effects The County states that, according to the data provided by NRC and Dominion, low-flow conditions in the North Anna River will be exacerbated by the installation of the proposed new reactors. Although the proposed new cooling method would reduce the downstream impact of these new units, there would be an adverse impact on flows. Hanover County states that the current minimum releases are below those recommended by the State's natural resource agencies, and the County is concerned about the reduction in flows, which will affect County industries, water and wastewater treatment plants, and the environment.

Earlier Correspondence to NRC, January 7, 2004 In response to the Nuclear Regulatory Commission's notice of intent to prepare a Draft Environmental Impact Statement (Federal Register, Volume 68, No. 226, dated November 24, 2003, pages 65961-65962), Hanover County wrote to NRC, stating its background information above. The County reviewed state legislative action mandating reduced minimum releases of 20 cfs in the event of drought, saying that downstream users have designed their water intake and wastewater discharge systems around a 40-cfs low-flow condition. The County recommended inclusion of its prior comments (below) in the scope of an environmental impact statement.

Earlier Correspondence to DEQ's Valley Regional Office, November 6 and 21, 2000 DEQ's Valley Regional Office held a public hearing on November 6, 2000, according to the County's correspondence, regarding its draft VPDES permit for Dominion. The draft permit included reference to a Lake Level Contingency Plan, which the County supported (November 6 letter, enclosed). The County's comments referred to earlier correspondence by the Lake Anna Civic Association (LACA), and its requested changes to the Lake Level Contingency Plan (LLCP). Hanover County supported a 248 foot msl lake level, stating that LACA's preference for a normal level of 250 foot msl (triggering reduced flows below 40 cfs in anticipation of a drought) was not realistic because the 40 cfs minimum flow has been mandated by regulation since 1968, predating the improvements around the Lake. It was the County's view at the time that an "action level" higher than 248 feet msl would require a reduction in flows below 40 cfs on a "regular basis" and would be inconsistent with legislative language that reductions would be required due to "drought conditions." The County's water intake pumps require the seven-year, ten-day low flow ("7Q10" flow, or 42 cfs) in order to function properly. Similarly, the County's permitted wastewater discharge depends on the 7Q10 flow. Accordingly, the County stated its opposition to any effort to reduce discharge levels below 40 cfs.

The County's November 21, 2000, letter urged retention of the 248-foot msl level at which discharge rates would be reduced. The County indicated that while a reduction to 20 cfs in drought periods is a 50% decrease in minimum downstream flow, which is inequitable, it is relatively insignificant in maintaining lake levels because of other factors such as evaporation rates (pages 2-3

of letter). The County reiterated its support of the draft permit language relating to the Lake Level Contingency Plan. The County also provided additional documentation on the history of the release rate.

Thank you for the opportunity to review the federal consistency certification for the proposed Early Site Permit for the North Anna Power Station. If you have questions on these comments, please feel free to call Michael Murphy at (804) 698-4003.

Sincerely,

Richard F. Weeks, Jr.
Chief Deputy

Enclosures

cc: Andrew K. Zadnik, DGIF
John Kauffman, DGIF
Robert S. Munson, DCR
Susan E. Douglas, VDH-ODW
Khizar Wasti, VDH-OHHC
Robert B. Stroube, VDH
Joseph P. Hassell, DEQ-DWR
Thomas A. Faha, DEQ-NVRO
Jeffrey P. Madden, MRC
Mary T. Stanley, VDOT
Roger W. Kirchen, DHR
Alice R. T. Baird, DCR-DCBLA
Ellie L. Irons, DEQ-OEIR
Harrison B. Rue, Thomas Jefferson PDC
Jeffrey Walker, Rappahannock-Rapidan PDC
Robert Wilson, RADCO PDC
C. Lee Lintecum, Louisa County
J. Randall Wheeler, Spotsylvania County
Frank W. Harksen, Jr., Hanover County
Ted Coberly, Orange County
Jim Candeto, Town of Mineral
Jack Cushing, NRC

Policy Issues and Questions: Additional Analysis by DEQ's Division of Water Resources and Northern Virginia Regional Office.

Cumulative Impacts. According to DEQ-DWR, the use of air cooling only after lake levels begin to decline has been changed to more reliance on air cooling. This will reduce the time that the lake level will be down more than 2 feet (i.e., at 248 feet msl) from 11% of the time in an earlier proposal to 7% of the time with the present proposed configuration. By operating the third unit to take maximum advantage of air cooling, Dominion can minimize adverse impacts of the third unit on middle-range flows to an acceptable level.

Foreclosure of Development of Public Water Supplies in the Region. As discussed further in enclosed comments and in the "Review of Public Comments," below, following is a listing of the status of water supply efforts in neighboring localities:

Locality	**Efforts**	**Impact on Lake Anna/N. Anna River or from Project**
Caroline County	Pursuing tidal intake from Rappahannock River	No impact on flows in York River basin
Hanover County	Purchases from Richmond, water skimmed from high river flows, use of quarry	No indication
Town of Orange	Water supply reservoir completed, water from Rapidan River	Net gain to region from inter-basin transfer
Spotsylvania County	Spotsylvania did not pursue Lake Anna water	No indication
Louisa County	Considering purchase from Fluvanna County, which has water withdrawal permit for water from James River; considering existing reservoir	No effect from Unit 3

Raising Lake Level DEQ's Division of Water Resources states that raising the lake level 6 to 9 inches is not under consideration. No decision has been made with regard to a 3-inch increase recommended by DGIF; this would allow an additional 27 cubic feet per second (cfs) to be released into the North Anna River for 60 days each year. This proposal would require VPDES approval in the lake level contingency plan or approval under a VWP Permit.

Blowdown Discharges from Unit 3 According to DEQ's Northern Virginia Regional Office, blowdown discharges from proposed Unit 3 may add heat and chemicals to the "hot side" that may affect water quality. The existing VPDES permit #VA0052451, which applies to Units 1 and 2, would need to be modified to address the cooling tower blowdown discharges attributable to Unit 3. Effluent guidelines specified in federal regulations (40 CFR Part 423) would be used in the permit action, which would also accord with water quality standards. Any added heat would be analyzed to determine whether it warrants a re-evaluation of the existing section 316(a) variance applicable to the North Anna Power Station. Similarly, the VPDES permit action would analyze the use of chemicals to ensure that numeric criteria of state water quality standards are met.

APPENDIX 2

Summary of Public Comments Received

Review of Public Comments

DEQ published a notice of the federal consistency review for the referenced project on its web site, during the first review, from April 15 through May 2, 2005. No public comments were received at that time.

For the restarted review in 2006, DEQ published a notice of the review on its web site from May 15 through June 16, 2006. On June 15, DEQ published notice of an extended review period lasting until September 8. This notice also announced that DEQ would hold a public hearing on August 16. This notice was published on DEQ's web site and in three newspapers as follows:

Web site (http://www.deq.virginia.gov):	starting June 15
Richmond Times-Dispatch:	July 2
Lake Anna Observer:	July 15
Fredericksburg Free Lance-Star:	July 30

This summary includes responses to comments we received about the referenced project that pertain to the Enforceable Policies of the Virginia Coastal Program (VCP). During the public review process, including the public hearing, we received comments from more than 500 individuals and organizations concerning this review. When more than one individual or organization submitted comments about the same or similar topic, we grouped these comments for the purposes of providing a response.

It should also be noted that throughout the public comment period and at the public hearing, we received a variety of comments that did not pertain either directly to the referenced project or to one or more of the Enforceable Policies of the VCP. For the most part, we determined that many of these comments pertained to approvals and monitoring requirements already in place for the operation of the existing units at the North Anna Power Station and not to the activities that would by authorized by an Early Site Permit, which is the subject of this consistency review. A number of other comments were determined to be related to matters that will considered should Dominion seek approval for a combined license from the U.S. Nuclear Regulatory Commission (NRC) for the construction and operation of new nuclear reactor units at its North Anna Power station.

Examples of the topics included in these unconformable comments are:

- questions about the appropriateness of the U.S. Environmental Protection Agency's approval of the Virginia Pollutant Discharge Elimination System

(VPDES) permitting program, as it is being administered by the Virginia Department of Environmental Quality (DEQ).

- comments about the differences in the manner in which the "warm" and "cold" sides of Lake Anna are currently regulated by DEQ and the Department of Game and Inland Fisheries (DGIF).
- Comments about safety, transportation, certain health concerns, etc., which are not within the specific authorities of the Enforceable Policies of the VCP.

While we did endeavor to route these comments to an appropriate agency for consideration and possible response, we were not able to utilize these unconformable comments, or any responses received to them, for the purposes of determining consistency review of the federal consistency certification submitted by Dominion for the referenced project. It is anticipated that many of the issues and concerns presented in these comments will be the subject of discussion during the upcoming review of the existing VPDES permit for the current operations at the North Anna Power Station.

It is also anticipated that many of the issues and concerns presented in these comments will be considered during the reviews that will be required should Dominion later seek approval for a combined license from the NRC for the construction and operation of new nuclear reactor units at its North Anna Power station. One of these reviews will be of a separate federal consistency certification that Dominion will be required to submit to the VCP prior to when the NRC may finalize its decision with regard to approval and issuance of the combined license. These unconformable comments are listed at the end of this summary.

Public Comments Received Pertaining to the Enforceable Policies

The following is a summary of the comments received during the public comment period for the referenced project and any responses received from the agencies that administer the Enforceable Policies of the VCP. The public comment period during which these comments were received, began on May 15, 2006, and ended on September 8, 2006. The summary lists the individuals and organizations that submitted comments related to the Enforceable Policies of the VCP as they pertain to the referenced project. In some cases, when more than individual or organization submitted comments about similar topics, we have compiled any responses received on those topics.

In addition to the separate responses to public comments described below from the agencies which administer the Enforceable Policies of the VCP, an overriding response to many of these comments and concerns is the requirement for an Instream Flow Incremental Methodology study to be completed as a condition of the VCP's concurrence with federal consistency certification for the referenced project. The information obtained through this study will be used to address the issues raised in many of the public comments pertaining to there being insufficient information available presently to appropriately address concerns about lake level, fisheries impacts, flow requirements in the North Anna River, protection of sufficient water for other users downstream, and recreation. As was stated in the VCP November 21, 2006, response

letter, because an additional federal consistency certification submission and review will be required if Dominion seeks approval for a combined construction and operating license, the VCP is not forgoing (by conditionally concurring at this time) its opportunity pursuant to the CZMA to establish any necessary specific requirements related to water quality and quantity pertaining to the referenced project.

As a result, the reply to many of the public comments summarized below is that no separate responses were received on these topics.

1. Friends of Lake Anna

DEQ's Office of Environmental Impact Review received a considerable number of comments from the Friends of Lake Anna ("FOLA") concerning the referenced project that concerned either or both the federal consistency certification and the NEPA documents.

We have determined that many of FOLA's comments did not pertain to the authorities provided to the VCP under the provisions of CZMA or to the Enforceable Policies of the VCP. Moreover, we found that the majority of FOLA's comments pertained to concerns about the current operation of the North Anna Power Station, but not directly to the referenced project. Throughout the review process of the federal consistency certication for the referenced project, we did make every effort to explain to FOLA representatives the distinctions among the various federal and Virginia statutes and regulatory programs that pertain to the exiting and proposed operation of facilities at the North Anna Power Station. We wish to recognize and thank FOLA for its diligence in providing its detailed comments and concerns about both existing operations at the North Anna Power Station and the proposals described in the referenced project. We encourage FOLA to stay involved in both the upcoming consideration of the reissuance of the existing VPDES permit for the current operations at North Anna, and the federal and state reviews of the application for a combined construction and operating license of one or both of the proposed new units – should Dominion later apply to the NRC for such a license.

Comments submitted by FOLA that did pertain to both the referenced project and the Enforceable Policies of the VCP are summarized below. Included in each summary are any responses we received from the state agencies which administer the VCP's Enforceable Policies. The other comments we received from FOLA that did not conform to the VCP's authorities under the CZMA or to the referenced project, are summarized in a different section of this appendix.

FOLA letter dated June 15, 2006 On July 27, DEQ forwarded FOLA comments and questions to a number of agencies and localities to solicit additional comments. These comments and questions were entitled "Partial Concerns #2 with the data contained in Dominion's Application for the North Anna ESP 6 dated April 2006 and the related NRC Safety Report dated September 2005." The issues were discussed in nine categories:

1) Numbers of workers, residential growth, traffic on small local roads
2) Emergency evacuation capabilities
3) Need for new schools
4) Meeting water needs with the Lake and the North Anna River
5) Cooling towers, noise, and fog
6) Lake level raising for drought preparedness
7) Water levels, flows, and temperatures
8) Confusing documentation and processes
9) Safety report

We determined that four of these categories relate directly to the VCP's Enforceable Policies as they pertain to the referenced project:

4) Water needs
5) Cooling towers
6) Lake level
7) Water level

Responses from DEQ's Division of Water Resources: DEQ-DWR provided additional comments concerning issues #4, 6, 7, and 8, as follows:

- With regard to water needs (issue #4), DEQ-DWR stated that Louisa and Spotsylvania Counties appear to be focusing on sources of water supply other than the Lake. Spotsylvania has recently permitted water supply projects. Louisa appears to be contemplating water from Bowlers' Mill Reservoir, the James River via Fluvanna County, and the Rapidan River via Orange County.

- With regard to raising the lake level 6 to 12 inches to aid in times of drought (issue #6), DEQ-DWR states that DGIF has suggested surcharging the lake 3 inches in the spring to boost in-stream releases over the summer, an idea that DEQ-DWR would not favor without further study. There is no state consideration of a 6- to 12-inch lake level increase, according to DEQ-DWR.

FOLA Public Hearing Presentation A representative of the Friends of Lake Anna spoke at the Public Hearing on August 16, 2006, and provided a written copy of the testimony that was presented. Some highlights of the presentation follow. Where it was clear, we have organized the comments made as they are related to the Enforceable or Advisory Policies of the VCP.

Fisheries Under the fisheries management enforceable policy discussion (presentation, page 2), FOLA cites the Department of Game and Inland Fisheries finding that fish will continue to be adversely affected even if the changes to the third reactor have been made. FOLA cites the increase in drought conditions as a major reason for this effect.

Downstream Recreation FOLA cites the Department of Conservation and Recreation for the proposition that the North Anna River is a spectacularly scenic and remote canoeing river with excellent fishing, and that a minimum in-stream flow recreation study should be conducted to determine a discharge rate from the Lake Anna Dam that would sustain recreational boating from State Route 601 downstream to U.S. Route 301.

Drought frequency Under the Point Source Pollution Control Enforceable Policy of the VCP, FOLA cites the Commonwealth's Comments on the Draft EIS (DEQ-04-216F, comments mailed March 3, 2005) for the proposition that large water withdrawals would adversely affect the beneficial uses of the North Anna River. Specifically, FOLA cites DGIF and DEQ analyses as indicating that the proposed Unit 3 would increase the drought cycle and cause decreased water flows during seven months of each year.

Water temperature limitations According to FOLA, the water temperature currently exceeds the temperature necessary to protect aquatic resources. Any additional temperature increases, such as from the blow-down discharges from water cooling towers, would affect fisheries, public access, and recreation.

Responses Received: No separate responses were received regarding these comments.

2. Lake Anna Civic Association/Waterside Property Owners' Association

On August 28 and 29, 2006, DEQ-OEIR received letters and e-mail correspondence from the Lake Anna Civic Association (LACA) and the Waterside Property Owners' Association (WPOA) covering a number of issues. A summary of these issues was presented in the Commonwealth's comments on the SDEIS and the relevant sections are copied here.

Quality of Cooling Water Discharges WPOA indicates its concern with the chemical nature of hot make-up water returning to the Lake from proposed Units 3 and 4, and inquires whether there are criteria for the discharge.

Bald Eagle Protection According to WPOA, the Commonwealth requires a 1/4-mile buffer between construction activities and any bald eagle nest, and inquires about how the applicant will protect the closest nest.

Decision Responsibility on Lake Levels WPOA indicates its understanding, from the SDEIS, that the determination of lake levels is up to Virginia regulators, and asks which ones. WPOA also asks how residents can be assured that the lake level will remain at 250 feet msl.

Water Use and Dry Cooling WPOA states that blowdown and make-up water taken from the reservoir would be 38.7 cfs at Unit 3's 100% power level, while the discharge over the dam is 40 cfs or 20 cfs in a drought. Thus the blowdown and make-up water use

would be as much as the downstream discharge when the lake is at 250 feet or less. WPOA recommends dry cooling for Unit 3 to preserve the water in the watershed.

VPDES Permit and Temperatures WPOA quotes the SDEIS as saying that the new plant can operate to a 242-foot msl lake level and an inlet water temperature of 100 degrees F., and states that this is a much greater variance than allowed in the VPDES permit, which allows an inlet temperature of 95 degrees. WPOA urges the Department of Health (VDH) to put limits on the temperature of the water at the exit of the power plant, and states that the situation will get worse with the addition of Unit 3.

Sprayers for Cooling WPOA urges that sprayers be used in the discharge canal on hot days, as is done for Units 1 and 2.

Pre-Lake Water Flows The SDEIS indicated that historic pre-dam minimum flows were 5 cfs (page 2-10, section 2.6), whereas the Department of Game and Inland Fisheries stated that such flows were 12 cfs (July 7, 2006 letter, Table 1). WPOA states that this discrepancy should be resolved.

Availability of Dry Cooling WPOA states that foreign nuclear reactors use air cooling technology, and that Dominion has not stated clearly why it cannot be proposed for Unit 3 as well as Unit 4.

Duration of 20 cfs flow WPOA cites the SDEIS for the proposition that the 20-cfs flow will increase from 6% to 11% of the time if Unit 3 operates as proposed; this means an increase from 22 days to 40 days of low flow (SDEIS, page 5-11, section 5.3.2). However, Dominion stated in its Revision 7 that the duration of the 20-cfs discharge would go from 5.2% to 7% of the time. The discrepancy should be resolved.

Responses from the Department of Health On September 8, the Department of Health's (VDH) Division of Public Health Toxicology responded that there appeared to be no point for which a VDH response was in order on the comments submitted by LACA and WPOA.

Responses from DEQ's Northern Virginia Regional Office On September 7, DEQ-OEIR received comments (e-mailed) from DEQ's Northern Virginia Regional Office responding to four of the issues raised above. With regard to water quality and the chemical discharge, DEQ-NVRO states:

> Chemical usage and effluent discharge concentrations will be evaluated against applicable water quality criteria if and when Dominion applies for a modification of their [sic] VPDES permit for Units 3 and 4. The permit will contain the necessary conditions to assure that the water quality standards are met.

With regard to lake levels, DEQ-NVRO indicates that the existing VPDES permit does not have any requirement for maintaining the lake level at 250 feet above mean sea level, and that the existence of such a requirement is not known to DEQ-NVRO staff.

DEQ-NVRO indicates that lake levels might be addressed by regulatory action of the Department of Conservation and Recreation's Division of Dam Safety.

With respect to the section 316(a) variance and temperature limits in the VPDES permit, DEQ's NVRO states the following:

> The 316(a) variance does not set a maximum temperature level of the effluent or for temperatures in the lake. In accordance with 9 VAC 25-260-90 [state water quality regulations], the temperature criteria in 9 VAC 25-260-50 through 9 VAC 25-260-80 are superseded because Dominion demonstrated in a 316(a) study and through subsequent annual fishery monitoring that the heat rejection limits set forth in the VPDES permit do not impair the fishery of Lake Anna or the North Anna River.

With respect to the sprayers for cooling, DEQ-NVRO stated that in setting effluent limits and permit conditions in VPDES permits, the agency does not dictate the processes or treatment units that permittees must use to comply with effluent limits. Dominion may use sprayers if it believes sprayers will aid in permit compliance.

Responses Received: No additional agency responses were received about these comments.

3. Southern Environmental Law Center

A representative of the Southern Environmental Law Center (SELC) spoke at the August 16, 2006, Public Hearing. SELC also sent separate correspondence in connection with this review.

SELC Public Hearing Presentation SELC stated that its earlier comments of October 2005 voiced concerns regarding the amount of lake water evaporation that the once-through cooling system (proposed in the 2003-2004 federal consistency certification, the Draft EIS, and the initial 2005 federal consistency certification) would have induced, as well as potential downstream impacts from the corresponding reduction in flows in the North Anna and Pamunkey Rivers. Citing earlier DEQ statements, the SELC representative indicated that the Lake Anna watershed is relatively small, so that even slight increases in the consumptive use of water could have significant downstream impacts. Reductions in water releases to the North Anna River could adversely affect the State's management of its coastal fisheries. SELC cited recent correspondence by the Department of Conservation and Recreation, which stated that lower downstream flows could also affect recreational uses of the North Anna and Pamunkey Rivers.

SELC also indicated that a number of counties are considering the North Anna and Pamunkey Rivers as sources for drinking water. For this reason, putting additional strain on these rivers undermines the Commonwealth's policy goal of avoiding coastal resource use conflicts. The change from closed-cycle, once-through cooling to the wet-dry cooling method offers only slight improvement in reducing lake water evaporation.

SELC points out the difference in Dominion's analysis and that of the NRC: Dominion says that the minimum flow of 20 cfs at the dam would be reached about 7.3% of the time, while the SDEIS, by NRC, indicates that this flow level would be reached 11% of the time. The latter is just slightly lower than the percentage of time at 20 cfs with the once-through cooling system, which was 11.7%.

SELC's representative stated that DEQ's Division of Water Resources and the Department of Game and Inland Fisheries based their recommendations on Dominion's analysis and suggested that they should re-evaluate the recommendations in light of the information in the SDEIS. However,.if DEQ and the Department of Game and Inland Fisheries decide that their recommended conditions are sufficient to protect coastal resources, then SELC recommends that the Commonwealth object to the federal consistency certification, rather than conditionally concur, and that the objection be maintained until Dominion affirmatively and unquestionably incorporates the agency recommendations into its project design.

September 8, 2006 Comments A short summary of the SELC comments follows.

Downstream flows While the revised cooling system design for Unit 3 reduces concerns with regard to the discharge of heated water to Lake Anna, concerns regarding reduced flows downstream remain, because evaporation from the cooling towers would equal or possibly surpass that from the Lake surface under the once-through system originally proposed.

Potential impacts of low flows in this relatively small watershed may be significant, and the ability of the Lake and the River to withstand additional consumptive use merits close scrutiny, according to SELC. The mean annual flow at the Dam is approximately 370 cfs. The Virginia Water Protection Permit for the existing reactors requires a minimum discharge of 20 cfs from the Dam to the North Anna River. This is equal to 5.4% of the River's mean annual flow at the Dam. Under the Tennant rating system, which is a stream flow grading technique based on percentages of mean annual flow, a flow of less than 10% of the mean annual flow is rated as "severe degradation." Moreover, with additional evaporative losses caused by the operation of the third reactor, the duration of 20-cfs flows would increase from 5.8% to 7.3% of the time, according to Dominion's analyses, or to 11% of the time according to NRC's initial review in the Draft EIS.

These low flows could have impacts conflicting with the Fisheries Management enforceable policy of the Virginia Coastal Resources Management Program. Specifically, they could:

- Adversely affect anadromous fish habitat.
- Adversely affect early life stages and spawning of fish in the river, because these stages take place during typically drier months of the year (July through October), and they need substantial flows to survive in any abundance.
- Adversely affect downstream boating and fishing recreational uses of the River.

- Encounter or give rise to potential conflicts in uses, in light of the considerations of several counties (one upstream and three downstream of the Lake) of using the North Anna River or the Pamunkey River for local water supplies. This last effect would undermine the Commonwealth's coastal program policy goal of avoiding coastal resource use conflicts.

Recommendations on flows SELC recommends that DEQ obtain a commitment by Dominion to use air cooling for both Units 3 and 4 in order to minimize impacts upon coastal resources.

Objection Recommendation SELC recommended that DEQ object to the certification.

Responses Received: No separate responses were received regarding these comments.

4. Natural Resources Defense Council The Natural Resources Defense Council (NRDC), in a letter dated September 8, presented nine major arguments against state concurrence with the federal consistency certification. The statements of these arguments follow, with highlights from the text of each.

Concurrence now would be premature and not in the interests of ensuring protection of Virginia's coastal zone management area. NRDC indicated that the ESP process is not a required step in the NRC process. Environmental concerns that the NRC deems "resolved" during the ESP proceeding cannot be raised again at a subsequent stage of NRC's licensing process. Faced with a project whose design is continually evolving, this foreclosing aspect is not in the state's favor. Since the environmental impacts of the evolving proposal are defined by a general "plant parameter envelope" comprised of nominal operating values instead of those pertaining to a site-specific detailed plant design, NRDC saw significant disadvantages for state concurrence.

Understanding of the long-term and cumulative environmental impacts from operating the proposed Unit 3 "wet-dry" hybrid cooling system is currently insufficient to support a federal consistency determination. NRDC stated its view that, according to the SDEIS, for times of full power operation and a "hot and humid atmosphere at tower level," (a fairly typical condition for a peak power summer day in central Virginia), the applicant is committing only that "a minimum of one-third of the rejected heat from Unit 3 would actually be removed by the dry tower system. The remaining excess heat would be dissipated by the wet tower system" It appeared to NRDC that this is the only commitment Dominion is making.

The SDEIS fails to analyze a reasonable range of reasonably foreseeable impacts from operating Unit 3. In this discussion, NRDC presented three parameters for the original proposal that DEQ found unacceptable, and compared them with the same

parameters estimated in the SDEIS, for the wet-dry, semi-closed loop system. This information is presented in the table below.

Parameter	Originally proposed	Proposed in SDEIS
Rate of lake water withdrawal	1,140,000 gallons per minute	22,269 gallons per minute in normal "Energy Conservation" mode
Induced evaporation rate	28 cfs	20 cfs
Additional lake level drawdown during drought	3.4 feet	1.6 feet

NRDC asserted that the estimated impacts remain significant, stating, for example, that the induced evaporation rate from operation of the wet-dry cooling system is still 71 percent of the environmentally unacceptable once-through system. The additional lake level drawdown is still nearly half that of the once-through cooling system, and there are uncertainties associated with this calculation that NRC and Dominion have not bounded with a sensitivity analysis.

The projected lake levels pose environmental and energy security risks that require further detailed analysis before concurrence can be granted. NRDC pointed out that the analysis of lake levels by NRC looks back to 1978, noticing that from then until 2003, Lake Anna has been under the 250 foot msl target level 62.7 percent of the time, due to the combined effects of reduced inflows and evaporative effects of operating Units 1 and 2. The additional Unit 3 wet-dry system would, if added in 1978, have increased the figure slightly, to 66.4 percent of the time, while reducing the total time the Lake was at or above 250 feet by 3.7%. Similarly, the frequency of lake levels below 248 feet (and the reduction of downstream flows from 40 cfs to 20) would have been higher with the addition of Unit 3. Looking backward, the addition of Unit 3 would have reduced downstream flows. NRDC pointed out that NEPA calls for an analysis of "reasonably foreseeable" impacts; and there was no analysis of the anticipated hydrological conditions in the next 40 to 60 years (life expectancy of the new unit), as affected by population increases, climate, water tables and recharge rates, competing uses, or evaporation rates. Moreover, there was no analysis of potential negative feedback loops -- for example, in which increased natural heating of cooling intake water increases the evaporation rate of both types of cooling systems (wet-dry and existing once-through), leading to higher discharge temperatures and/or increase net withdrawals from the lake. This would lead to reduced lake volume, further heating of the reduced volume of lake water, and the cycle would repeat itself. NRDC stated that no one knows how vulnerable the proposed setup is to such a negative feedback loop scenario, but regulators might, in such case, be faced with decisions whether to shut down or reduce power or incur serious ecological damage.

The status quo is not an acceptable baseline for NEPA analysis. According to NRDC, the NRC analysis in the SDEIS assumes that the current environmental impacts of Units 1 and 2 are acceptable as a baseline. However, these operations have resulted in excessive temperatures in the main body of the Lake (i.e., well outside of the cooling

lagoons) and produced many days of reduced flows into the lower reaches of the North Anna River. NRDC proposed that a more credible baseline for analysis, and for estimating cumulative impacts, would be the temperatures, flows, and fauna in the River before it was impounded to form the Lake. For example, prior to dam construction, flows of 25 cfs or less would occur for about 10 weeks once every 10 years. One can calculate from NRC's modeling data that operation of Units 1 and 2 has increased that frequency to 30 weeks every ten years.

The SDEIS unreasonably discards dry-cooling (air cooling) for Unit 3 as an alternative meriting detailed analysis, but DEQ should not. NRDC cited earlier analysis by DEQ's Division of Water Resources which compared North Anna with other nuclear reactors along the East Coast to compare water resources available to them with those at North Anna. Dominion has proposed a dry-cooling system for proposed Unit 4, and recognized that Lake Anna would not support once-through wet cooling, or even a combination wet and dry system, for Unit 4. NRDC stated that the dry-cooling of Unit 3 is mentioned only briefly in the SDEIS, but that the SDEIS indicates that the dry cooling system for Unit 3 would "largely eliminate the [unit's] impact on aquatic biota in Lake Anna and the North Anna River downstream." However, the SDEIS fails to identify the dry-cooling option as an "environmentally preferable alternative" deserving further analysis. NRDC argued that the difference in electrical output between a unit with dry cooling and that with wet-dry cooling is too small to "make or break the economics of a project of this magnitude" or lead NRC to summarily dismiss the dry-cooling option as being environmentally inferior.

NRDC further believed that the lack of these analyses in the Draft EIS and the SDEIS is another substantive reason to object to the federal consistency certification.

Responses Received: No separate responses were received about these comments.

5. Blue Ridge Environmental Defense League. In a letter to DEQ dated August 16, the Blue Ridge Environmental Defense League ("League") stated that the basic consistency issue is whether Dominion had provided enough information to allow DEQ to assess whether the proposed project would be consistent with the Coastal Resources Management Program; the League answered the question in the negative.

The League stated that even if the plant parameter envelope is bounded by the thermal power benchmark (Dominion plans to add 9000 MWth of new power generating capacity, according to the League), the Commonwealth has no assurance that water usage for more than the two existing units will not exceed safe levels. The NRC's SDEIS provides details on the plant parameter envelope, indicating that seven possible reactor designs are under consideration. The SDEIS indicates where the approximately 1,800-acre footprint for the reactors would be, but the plant parameter envelope review is based on educated guesswork, according to the League, because Dominion apparently cannot provide NRC with the necessary data. As the SDEIS indicates:

> In some cases, the design-specific information called for in the ESRP [Environmental Standard Review Plan, NUREG-1555, Volume 1, a source of guidance for NRC review of early site permit applications] were [sic] not provided in the Dominion ESP application because it did not exist or was not available. Therefore, the NRC staff could not apply the ESRP guidance in those review areas.... Because the Dominion PPE [plant parameter envelope] values do not reflect a specific design, *they were not reviewed by the NRC staff for correctness* [emphasis added by the League].

The League quotes the SDEIS as stating that the standard used by NRC for its environmental review was that PPE values were "not unreasonable." The League thought that this "not-unreasonable" standard is not supportable or acceptable for use as a basis for a consistency determination by DEQ. It referred to additional prose in the SDEIS, to the effect that at the combined construction and operating license ("COL") stage, Dominion will need to show that its design falls within design parameters specified in the Early Site Permit. If proposed reactor characteristics do not fall within the PPE, NRC staff will then consider whether the difference between the characteristics and the PPE value is significant. According to the League, this means that DEQ's assessment of consistency with the Coastal Resources Management Program must include potential coastal resources impacts from both construction and operation of two or more actual reactors. The League cites the Coastal Zone Management Act (section 307(c)(2)) for the proposition that a federal agency undertaking a development project must ensure that the project is, to the maximum extent practicable, consistent with enforceable policies.

Responses Received: No separate responses were received to these comments.

6. Other Public Comments

General Comments Several citizens submitted comments concerning the issues of water evaporation and reduced downstream flows in the North Anna River, neither of which they believed would be addressed by the proposed modified cooling method for Unit 3. On August 8, DEQ-OEIR sent an example comment to VDH (Office of Drinking Water and Division of Public Health Toxicology, inviting VDH to address the question of water supply and downstream flows in light of Spotsylvania County's objection on the basis that diminished flows downstream would be harmful to the County.

Responses: No additional responses were received from VDH to these comments.

Christian and Barton, on behalf of Bear Island Paper Company. In a letter dated September 8, 2006, Christian and Barton provided Bear Island Paper Company's comments (hereinafter attributed to "Bear Island"). Bear Island believes that the proposed expansion of North Anna (i.e., addition of Units 3 and 4) would give rise to substantial increases in the number and severity of low-flow conditions in the North Anna River. Bear Island relies on the River at points below the Dam for intake of water

and for discharge of treated industrial wastewater and stormwater associated with its Doswell facility. These additional periods of low flows can be expected to materially and adversely affect the operations of Bear Island by restricting its ability to withdraw water from the River, as needed and as permitted, as well as putting at increased risk the ability of the combined wastewater flows from Bear Island and Hanover County to meet current permit requirements and water quality standards.

In this connection, Bear Island refers to Hanover County's comments on the federal consistency certification and the concerns about negative impacts on downstream flows raised by DEQ in its March 3, 2005, comments on the Draft EIS for the Early Site Permit. Bear Island does not believe that the modification of the plans for the additional units since March 2005 fully addresses these concerns, and requests that DEQ object to the federal consistency certification or at least require further evaluation of downstream effects, alternative designs, and potential mitigation.

Responses Received: We did not receive any separate responses to these comments.

Unconformable Comments Received

The comments summarized in this section were all determined to be not related to the VCP's authorities pursuant to the CZMA as they pertain to the referenced project. These comments do not pertain to either directly to the referenced project or to one or more of the Enforceable Policies of the VCP. For the most part, we determined that many of these comments pertained to approvals and monitoring requirements already in place for the operation of the existing units at the North Anna Power Station, and not to the activities that would by authorized by an Early Site Permit, which is the subject of this consistency review. A number of other comments were determined to be related to matters that will considered if and when Dominion seeks approval for a combined license from the U.S. Nuclear Regulatory Commission (NRC) for the construction and operation of new nuclear reactor units at its North Anna Power station.

Attached to this Appendix are copies of correspondence we received from the U.S. EPA and two of the DEQ programs that administer the Point Source Pollution Control and Wetlands Enforceable Policies of the VCP. This correspondence explains why these comments do not conform to the VCP's authorities pursuant to the CZMA as they pertain to the referenced project. As a result, the reply to many of the public comments summarized below is that no separate responses were received on these topics.

1. Friends of Lake Anna

FOLA June 14, 2006 Letter DEQ's Office of Environmental Impact Review received a June 14, 2006, letter from the Friends of Lake Anna ("FOLA") entitled "Lake Anna Cooling Lagoon concerns with the North Anna ESP." This letter raised several questions about the cooling lagoon ("hot side") of Lake Anna, and the regulation of its discharge point and discharge temperature under the Clean Water Act. DEQ forwarded this letter to the Department of Game and Inland Fisheries, DEQ's Division of Water Resources, DEQ's Northern Virginia Regional Office, and the Department of Health and requested comments by July 17 on:

- Provisions of law or regulation exempting the "hot side" of the lake from regulatory purview.
- Monitoring responsibilities and any differences in how they are carried out in different parts of the Lake.
- Whether FOLA's characterizations of agency responsibilities were correct.
- Any temperature limits in permits that apply to the "hot side" of the lake.

Responses from the Department of Game and Inland Fisheries: DGIF responded to this inquiry (e-mail dated June 21) by stating that fishing licenses are required for anglers in the "hot side" of the Lake, since that side is corporately owned. However, fisheries on that side are not actively managed (i.e., sampling, habitat work) because there is no public access. Game wardens enforce boating laws and promote safety, however, in connection with fishing and boating.

Responses from DEQ's Division of Water Resources: DEQ-DWR responded to this inquiry (e-mail dated June 16), stating that the Friends of Lake Anna appear concerned with the operation of the two existing units, and that Dominion, DEQ, or NRC all do not contemplate any additional thermal load to the Lake from either new proposed unit.

Responses from Department of Health: VDH responded (enclosed letter, Stroube to Irons, dated July 14), stating that the issues in the e-mail and in the FOLA comments pertain to the regulation and monitoring of water temperature in the cooling lagoon or "Waste Heat Treatment Facility," and that such regulation and monitoring are not under the regulatory or statutory authority of VDH. VDH routinely provides consultation and recommendations to agencies and citizens regarding adverse human health impacts from exposure to chemical, biological, and radiological agents, according to the letter. Reference was made to an earlier VDH letter assessing potential risks and recommending ways to minimize such risks (September 15, 2005 letter, Stroube to Burnley, enclosed.)

FOLA June 15, 2006 Letter On July 27, DEQ passed additional FOLA comments and questions to a number of agencies and localities and requested responses. These comments and questions were in a letter dated June 15, entitled "Partial Concerns #2 with the data contained in Dominion's Application for the North Anna ESP 6 dated April 2006 and the related NRC Safety Report dated September 2005." The issues were discussed in nine categories:

1) Numbers of workers, residential growth, traffic on small local roads
2) Emergency evacuation capabilities
3) Need for new schools
4) Meeting water needs with the Lake and the North Anna River
5) Cooling towers, noise, and fog
6) Lake level raising for drought preparedness
7) Water levels, flows, and temperatures
8) Confusing documentation and processes
9) Safety report.

Because a number of these issues fall outside the purview of the framework of coastal zone management program consistency, as well as the environmental issues under consideration as we reviewed the Supplemental Draft EIS, under NEPA, DEQ requested the review of issues as follows (here we repeat the above listing, indicating agencies to address each item):

1) Workers' numbers
2) Evacuation
3) Schools
8) Documentation, processes
9) Safety report

Responses from DEQ's Division of Water Resources: DEQ-DWR provided additional comments concerning issues #9, as follows:

> With regard to the safety report, DEQ-DWR's purview extends only to making sure that there is enough water to cool the reactors. The water for this purpose is sufficient, according to DEQ-DWR.

Responses from Department of Transportation: VDOT responded to these comments from citizens (as indicated in the Commonwealth's Comments on the SDEIS):

> VDOT indicated that it would work with Dominion to ensure that the roads in the vicinity of the North Anna Power Station are maintained and that necessary improvements are in place prior to any major activities at the project site. VDOT has requested a traffic impact analysis from Dominion; this would compare the future background traffic in the area with future traffic including construction traffic ("total traffic"), and would identify areas of impacts. The impacts -- some of which would be temporary, from construction, and some of which would be permanent -- are the responsibility of Dominion. The traffic impact analysis should also provide mitigation measures to reduce the impacts. According to VDOT, an evacuation plan was not included in the SDEIS and therefore cannot be addressed.

FOLA July 24, 2006, E-Mail DEQ received correspondence dated July 24, 2006, via e-mail from FOLA, and entitled "Partial Concerns #3 with the Data contained in Dominion's application for the North Anna ESP 6 dated April 2006." The comments related to Dominion's Revision 6 and the NRC Safety Report dated September 2005. DEQ forwarded this correspondence to the following agencies for any additional comments:

U.S. Environmental Protection Agency (EPA)
DEQ's Division of Water Resources (DEQ-DWR)
DEQ's Northern Virginia Regional Office (DEQ-NVRO)
Department of Game and Inland Fisheries (DGIF)
Department of Conservation and Recreation's Division of Natural Heritage (DCR-DNH)
Department of Conservation and Recreation's Division of Planning and Recreation Resources (DCR-DPRR)
Department of Health (VDH)
Army Corps of Engineers (ACOE), Norfolk District

Responses Received: We received no separate responses directed to these issues.

FOLA Public Hearing Presentation A representative of the Friends of Lake Anna spoke at the Public Hearing on August 16, 2006, and provided a written copy of the testimony that was presented.

Model project FOLA favors the addition of the third and fourth units at the North Anna Power Station and believes that, if its environmental concerns are taken into account, the new reactor units could become a model for continued growth of nuclear energy throughout the country.

Responses Received: No additional response was received on this matter.

FOLA September 5 Letter In a letter dated September 5, 2006, the Friends of Lake Anna (FOLA) asked that a number of additional concerns, relating to the conduct of the public hearing process and the extent of public involvement with the Safety Report, be considered in the NEPA and CZMA review processes.

Dominion's Attempt to Influence Public Hearings According to FOLA, more than 50% of the speakers at the NRC public meeting on August 15, and the DEQ Public Hearing on federal consistency on August 16, were Dominion employees, retirees, or contractors. Whenever a Dominion person spoke, a busload of approximately 60 of Dominion's retirees would clap loudly and voice approval of the comments. Before the end of the DEQ hearing, an announcement was made by one of the retirees that the Vepco/Dominion bus was leaving for Richmond; about 60 people got up and left the hearing.

FOLA stated its belief that, in an auditorium with a capacity of about 300 people, the numbers of employees, retirees, and contractors for the applicant made a mockery of the public hearing process. FOLA cited the federal government's NEPA obligation:

> "It is the continuing responsibility of the Federal Government to use all practicable means consistent with other essential consideration of national policy to improve and coordinate Federal plans, functions, programs, and resources to the end that the Nation may *[in part]* (1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations; (2) assure for all Americans safe, healthful, productive, and esthetically and culturally pleasant surroundings; (3) attain the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences; ..."

FOLA then asks how this domination of the hearing process can be prevented in future public hearings.

Response from DEQ's Policy Division: These hearings are for the public and DEQ does not control or limit who may participate on either side of an issue. It is not, however, a process that leads to conclusions based upon what appears to be majority or minority opinion, but rather based upon the substantive merits of the information provided.

Safety Report and Public Involvement FOLA made reference to the March 1979 Three-Mile Island nuclear plant incident in Pennsylvania, stating that the absence of water in the steam generators meant that no heat could be removed from the reactor. The result was a partial melt-down of fuel in the reactor. FOLA's representative at the NRC public meeting asked a number of questions relating to the safety of the North Anna Power Station and the North Anna Dam. He stated that the Lake, which provides cooling water for the plant, would empty out in the event of an attack on the dam, and that re-filling the Lake would take three years. The FOLA letter urged that the air cooling method for the proposed Unit 4 could be used, as well, for Unit 3, and that this makes more sense than water-cooling for Unit 3 in a small watershed such as that of Lake Anna.

> **Conclusions** FOLA stated that the public needs to be involved in reviewing the Safety Report, and to be given time for it in light of the voluminous documentation that has been provided over the review period, and the continuing changes that the documentation reflects. FOLA requested an extension of the public comment period for review of all of this material.

Responses Received: No additional responses were received regarding these matters.

2. Lake Anna Civic Association/Waterside Property Owners' Association

On August 28 and 29, 2006, DEQ-OEIR received letters and e-mail correspondence from the Lake Anna Civic Association (LACA) and the Waterside Property Owners' Association (WPOA) covering a number of issues. A summary of these issues was presented in the Commonwealth's comments on the SDEIS and the relevant sections are copied here.

Transportation According to WPOA, the NRC staff deems the road network in the vicinity of the project site to be "well developed." WPOA seeks a construction traffic management plan, worked out with members of the public, and improvements including a traffic light to the intersection of State Routes 652 and 700.

Responses received from the Department of Transportation: In a September 5 e-mail, VDOT indicated that its August 16 comments for the SDEIS sufficiently address this issue. In the August 16 comments, VDOT stated:

> Currently, VDOT does not have any plan for improving the road network in this area. There are some developments that are proposing road improvements in this area of the County, the largest being the Cutalong Club development. This development is proposing to move the Route 208 connection with Route 652 to eliminate the skewed intersection and add the required turning lanes at the intersection. The plans are under design and are proposed to be built within the next several years.

Cost Savings: Reduced Intake Size and Cooling Towers Dominion says that adding cooling towers will add $200 million to the $2.5 billion cost of each unit. However, the intake for the proposed Unit 3 will be much smaller than the original intake, which also required dredging and shoreline alteration. Dominion did not address this potential cost saving.

Responses: No additional agency comments were received on this matter.

3. Southern Environmental Law Center

A representative of the Southern Environmental Law Center (SELC) spoke at the August 16, 2006, Public Hearing. SELC also sent separate correspondence in connection with this review.

September 8, 2006 Comments A short summary of the SELC comments follows.

"Hot side" jurisdiction SELC stated that Dominion neglects potential thermal impacts on the "hot side" of Lake Anna by insisting that under state law, it may treat this part of the lake as its private property. SELC stated its belief that, regardless of the ownership of land under or surrounding the Lake, the "hot side" inundated numerous existing streams and remains "waters of the United States," and thus subject to the Clean Water Act and the Coastal Zone Management Act. SELC urged DEQ to reduce existing thermal impacts in the "hot side" of the lake by requiring compliance with water quality standards to be measured at the point of discharge from the plant. While this issue relates to the renewal of Dominion's NPDES permit, it should be analyzed thoroughly, in the view of SELC, before a consistency decision is taken.

Responses Received: No separate responses were received to this comment.

4. Louisa County Public Schools The Louisa County School Board indicated its neutrality on whether the additional reactors should be built, but expressed its disagreement with the findings of the SDEIS that impacts on demography, housing, and education would be "small" and that "mitigation is not warranted." The School Board stated that additional tax revenues to the County from the new reactors would accrue only after schools had already been affected by as many as 200 new students (compared to a system of 4,400 students now, operating at capacity). There are three new subdivisions approved, comprising approximately 1,800 new houses, that are likely to be built in the vicinity of the project in the next few years.

Apart from the large (proportional) increase in student population, the School Board is also concerned about teacher retention due to the difficulty in finding affordable housing in the County. With an influx of construction workers, this competition for housing will get more difficult.

Accordingly, the Louisa County School Board notes that the federal government has shown its keen interest in nuclear energy by funding 50% of the impact study (approximately $8-10 million), and requests DEQ and the Nuclear Regulatory Commission to assist the County in obtaining a federal grant to offset or minimize the negative impact of the large nuclear construction project in the rural county.

Responses: No responses were received on these comments.

5. Natural Resources Defense Council The Natural Resources Defense Council (NRDC), in a letter dated September 8, presented nine major arguments against state concurrence with the federal consistency certification. The statements of these arguments follow, with highlights from the texts of each.

Before concurring that the environmental impacts of activities in the ESP are consistent with the enforceable policies of the Coastal Zone Management Program, DEQ has a duty to resolve outstanding issues surrounding the existing VPDES permit for the North Anna Power Station. In this portion of its letter, NRDC referred to Public Hearing comments by the Friends of Lake Anna, restating its own view that the VPDES permit is an Enforceable Policy of the VCP. NRDC stated that irrespective of the legal merits of the claim that the State has erred in continuing to designate the cooling lagoons as a "waste heat treatment facility," Dominion cannot plausibly claim that the waters are indeed private, but then evade strict monitoring of Clean Water Act compliance at the Dike 3 discharge point.

NRC's ESP review process is defective and hinders meaningful participation by the public. In this discussion, NRDC cited the Friends of Lake Anna's view, and the views of others reflected in these Comments, that NRC accepts changes to the proposed project without adding opportunity for public comments or to make revisions in the Draft EIS under review. NRDC recommended that DEQ should treat the date of the last revision as the starting date for federal consistency certification.

The NRC's site comparison methodology is flawed and obscures important environmental advantages of alternative sites. NRDC was not persuaded by the NRC staff determination that another site is not "obviously superior" to North Anna on environmental grounds, and that it fails to indicate whether any other site would be "superior." The imprecise language -- impacts are described as "small," "moderate," or "large" -- apparently allows NRC staff to recommend any site Dominion prefers short of causing an obvious catastrophe. NRC stated its belief that the ESP process raises three sets of legal issues:

- possible violation of citizens' due process rights under NEPA, the Administrative Procedures Act, and the NEPA regulations;
- the tailored analysis of alternatives may have unreasonably failed to identify one of Dominion's alternative sites, such as the Surry Plant, as "obviously superior" when the impacts of heat dissipation and also those of water withdrawal at Surry are clearly less than they are at Lake Anna; and

- the questionable analysis of the vulnerability of the North Anna site to both climate change and terrorist threats.

Responses Received: No separate responses were received about these comments.

6. Other Public Comments

Delegate W. R. "Bill" Janis In a letter to NRC dated August 14, 2006, (enclosed), Delegate Janis, who represents Louisa and Goochland Counties and the northwestern part of Henrico County, expressed his concurrence with the NRC staff's conclusion that the Early Site Permit should be issued. Delegate Janis indicated that Dominion's North Anna and Surry plants provide 34 percent of the electricity used in Virginia.

With regard to the once-through cooling method of the existing reactors, Delegate Janis states that Dominion has agreed to spend $200 million on a cooling tower system for the third reactor, obviating any need for lake water for cooling. He indicates that there is no scientific evidence of adverse public health or environmental impact of the existing "waste heat treatment facility."

Responses Received: No separate responses were received about these comments.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

NOV 0 9 2006

Ms. Ellie L. Irons, Program Manager
Office of Environmental Impact Review
Virginia Department of Environmental Quality
Room 631
629 East Main Street
Richmond, Virginia 23219

Re: October 2, 2006 letter on "National Pollutant Discharge Elimination System (NPDES) Permit jurisdiction Under the Clean Water Act: North Anna Power Station, Louisa County, Virginia: Proposed New Units 3 and 4. DEQ-05-079f"

Dear Ms. Irons:

On behalf of the U.S. Environmental Protection Agency (EPA) EPA Region III, I am responding to the above-referenced letter to Brian Trulear of my staff. Your letter raises several questions regarding Clean Water Act requirements relating to the thermal discharge from the North Anna power plant of Dominion Nuclear North Anna LLC (Dominion).

As you state, these questions have arisen in public hearings before the Virginia Department of Environmental Quality (VaDEQ) in a "federal consistency" review relating to Dominion's "Early Site Permit" application to the Nuclear Regulatory Commission (NRC). Dominion has applied to the NRC for an "Early Site Permit" (ESP) for the siting of new nuclear reactor units at the North Anna plant. Because the permitted facility is located in Virginia's federally-approved coastal management zone, VaDEQ is conducting the "federal consistency" review required by the Coastal Zone Management Act (CZMA).

Your letter raises important issues concerning the applicability of Clean Water Act requirements to the North Anna plant, particularly concerning: (a) VaDEQ's longstanding determination that the so-called "hot side" of the lake is a "waste heat treatment facility" and not a "water of the United States" (or "surface water" under 9 VAC 25-31-10); and (b) the granting of a thermal discharge variance pursuant to Section 316(a) of the Clean Water Act.

EPA is certainly willing to consult with VaDEQ on the issues raised in your letter. However, the NRC, and not EPA, is the federal permitting agency for the Early Site Permit presently under consideration. Thus, EPA does not have a formal role under the CZMA or its implementing regulations to review or consult on this federal consistency certification. See 15 C.F.R. 930.57. For this reason, we believe that the CZMA proceeding is not a forum in which

EPA may make formal Clean Water Act (CWA) applicability determinations relating the Lake Anna plant. That said, EPA has an opportunity to review these issues in two contexts pertinent to the thermal discharge from Lake Anna plant. First, under the National Environmental Policy Act and Section 309 of the Clean Air Act, EPA has the authority to review the Environmental Impact Statements (EIS) required for federal activities, permits and licenses. In August 28, 2006 comments to NRC on Supplement 1 of the Draft EIS for the North Anna ESP Site (attached), EPA has already commented on the subject of thermal discharge effects, as well as other environmental issues related to the ESP.

Second, under Section 402 of the Clean Water Act and the Memorandum of Agreement for the delegation of the program, EPA has the authority to review selected Virginia Pollutant Discharge Elimination System (VPDES) permits issued by VaDEQ. Prior VPDES permits for the North Anna plant, as well as the draft permit VaDEQ submitted to EPA on February 24, 2006, have included a CWA 316(a) variance for thermal discharges at Outfall 001. This outfall is located at the Dike 3 discharge from the cooling lagoons into Lake Anna, rather than the canal discharging cooling water from the North Anna plant. In prior VPDES permits issued for the North Anna facility, as well as the February 2006 draft-permit, VaDEQ has applied the "waste treatment system" exception in the Virginia regulations, 9 VAC 25-31-10, to exempt the so-called "hot side" of the lake from the definition of "surface waters."

As noted in your letter, EPA did not object to VaDEQ's February 24, 2006 draft permit for the North Anna plant. However, at the time of EPA's review, and to date, VaDEQ has not commenced the public comment period for the North Anna draft VPDES permit. The agreement between EPA and Virginia governing the delegated VPDES program provides for VaDEQ to resubmit proposed permits to EPA for additional review if (a) the draft permit is subject to significant adverse comments during the public comment period, or (b) if VaDEQ's proposed final permit differs from the draft permit previously reviewed by EPA. If significant adverse comments are submitted in the upcoming public comment period for the North Anna draft VPDES permit, EPA expects that VaDEQ, as the delegated State Permitting Authority, would review and respond to such comments. In such a case, the proposed permit would be resubmitted to EPA for review in accordance with the VPDES delegation agreement.

Please do not hesitate to contact me, or Mr. Mark Smith of my staff at (215) 814-3105, if you have further questions or comments on this matter.

Sincerely,

Jon M. Capacasa, Director
Water Protection Division

Enclosure

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

August 28, 2006

Mr. Jack Cushing
OWFN 11 F-1
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

RE: Comments to Supplement 1 of the Draft Environmental Impact Statement for an Early Site Permit (ESP) at the North Anna ESP Site – NUREG-1811 (North Anna ESP project), CEQ # 20060290.

Dear Mr. Cushing:

In accordance with the National Environmental Policy Act (NEPA), Section 309 of the Clean Air Act, and the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 CFR 1500-1508), the U. S. Environmental Protection Agency (EPA) has reviewed the Supplement 1 of the Draft Environmental Impact Statement (SDEIS) for the above referenced project. As you are aware Supplement 1 is due to changes made by the project sponsor, Dominion North Anna, LLC. Those changes included modifying Unit 3 cooling system from a once-through system to a closed cycle, combined wet and dry system and to raise the power level in both Units 3 and 4 from 4300 Megawatts-thermal (MWt) to 4500 MWt. Due to the limited information provided as well as limited time available to conduct a comprehensive review, we are unable to provide an inclusive set of comments.

Under EPA's system for rating Environmental Impact Statements, we are rating the environmental impacts associated with the North Anna ESP project as Environmental Concerns 2 (EC-2). An EC rating means the review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. The numeric rating assesses the adequacy of the Environmental Impact Statement. The 2 rating indicates that the SDEIS does not contain sufficient information to fully assess environmental impacts that should be avoided in order to fully protect the environment. The basis for these ratings is reflective in the following comments. A copy of our rating system is attached, and can also be found at: http://www.epa.gov/Compliance/nepa/comments/ratings.html.

If you any questions regarding this issue please feel free to contact Kevin Magerr at (215) 814-5724.

Sincerely,

William Arguto,
NEPA Team Leader

Attachments: Comments, EPA Rating System Criteria

COMMENTS FOR THE NORTH ANNA PROJECT

1. The Purpose and Need provision of SDEIS does not include an assessment of the energy needs that the addition of two nuclear power units at the North Anna facility would be intended to satisfy. The focus of the Purpose and Need was restricted to simply the suitability of siting two nuclear power units at the facility without any assessment of the need for the two additional units. EPA believes an energy needs assessment should be included in the NRC's NEPA review at a point in the process when such an assessment--including an assessment of options other than construction of additional units --would be meaningful. This is especially a concern because the NRC apparently has not yet resolved issues related to the interface of the ESP with the combined construction and operating license, combined license (COL) process. See **http://www.nrc.gov/reactors/new-licensing/esp/generic-esp-issues.html**. It is unclear whether the energy needs analysis will be included under the NRC's Construction Permit/operating license EIS.

2. The SDEIS only evaluates alternative sitings for nuclear power plants and does not evaluate alternative energy sources. As stated above, EPA believes an assessment of alternative energy sources should be included the NRC's NEPA review at a point in the process when such an assessment would be meaningful. This is especially a concern because the NRC apparently has not yet resolved issues related to the interface of the ESP with the COL process. See **http://www.nrc.gov/reactors/new-licensing/esp/generic-esp-issues.html**. It is unclear whether alternative energy sources will be included under the NRC's Construction Permit/operating license EIS.

3. The SDEIS should include further discussion into the thermal variance issued under the existing NPDES permit for Units 1 and 2. As discussed in the SDEIS the most significant surface water quality concern with the existing units is the localized elevated temperatures. Elevated temperatures can place stresses on the aquatic communities due to reduction in dissolved oxygen. This condition has been compounded in Lake Anna by the tributaries being impaired by low dissolved oxygen (DO) levels. The DO impairment to the tributaries is significant enough for the Commonwealth of Virginia to designate them under Section 303(d) of the Clean Water Act. EPA has concern that the proposed project may not be accounted for under the existing thermal variance for units 1 and 2.

4. The SDEIS should investigate the existing and potential impacts of the proposed project to the trophic condition of Lake Anna. High temperature and low DO along with high nutrients can cause algal blooms in the lake. Algal blooms are known to accelerate lake eutrophication and can cause human and animal health effects.

5. EPA has concern that the twenty year horizon allotted under the SDEIS does not have any protective assurance that unforeseen population growth and/or additional stressors on the Air or Water resources will be accounted for. Typically an action that has not occurred within three years of an EIS requires at a minimum a supplemental EIS.

6. The SDEIS does not provide information on the delineation (in acres) or the type of

wetlands impacted by the construction and operation of the proposed facility, nor does it include any mitigation for the loss of wetlands.

7. The SDEIS does not provide information on the linear feet of streams impacted by the construction and operation of the proposed facility, nor does it include any mitigation for the loss.

8. The Virginia Department of Environmental Quality – Game and Inland Fisheries (appendix F-50) have raised issues related to fish impingement and entrainment as well as increase water temperature and circulation flow patterns associated with the water demand of the proposed units during SDEIS application review. It is unclear under the SDEIS what was modeled, what the results of the modeling were and what was the mitigation, if any being proposed.

9. Information regarding the demographic make up of the communities in close proximity to the areas of potential impact is not well defined. The document does not contained detailed information regarding the exact demographics of the areas that would be most impacted by site activities. Community characterization at the small community level would be most helpful. What is the make up of the areas closest to the site? Are there areas close to the site where multiple site activities might take place? What would the cumulative impacts be on such a community?

10. What is the rationale of using national averages for the assessment of minority and low-income populations? The comparison of community data to national averages alone seems unreasonable. With the vast disparities among the make up of communities across the country, and the Regional differences we see in community make up, it seems inappropriate that a national benchmark would be applied in the assessment. It is much more appropriate from a statistical point of view to use state and county level benchmarks. That is, state and county averages for minority and low-income populations should be used for identifying the areas of concern. In view of the fact that the poverty level differs from one state to another, it would seem more reasonable that the assessment would use state level data.

11. The data used in the determination of populations of Environmental Justice concern is out dated. The assessment needs to be redone using the most recently available census information (2000 Census data).

12. The Environmental Justice assessment provided in the document is vague. Little information of use is provided, and no documentation is presented to support conclusions. It is difficult to determine if the conclusions drawn in this document are valid based upon the scarce information provided related to potential impacts and target populations.

13. The listing of groups and organizations contacts lacks representative groups from the Environmental Justice and grassroots community. While a number of tribes were listed in the contacts list, the listing lacked local community-based organizations, local

churches and other groups traditionally associated with the Environmental Justice movement. Failure to conduct adequate and appropriate outreach and communication can be most problematic. It also represents a major problem from the Environmental Justice point of view. It is strongly suggested that a more comprehensive outreach and community involvement plan be instituted. Please consult "The Model Plan for Public Participation", developed by the Public Participation and Accountability Subcommittee of the National Environmental Justice Advisory Council (please see http://www.epa.gov/compliance/resources/publications/ej/nejac/model-public-part-plan.pdf).

14. It is not clear as to the methods used to determine the level or degree of impact anticipated. What are the criteria upon which the conclusions are based?

15. The document is too broad in its consideration of potential plant designs. The document intends to allow for the citing of 7 potential designs for nuclear units. While adequate design information exists for a few of the designs, by the admission of the NRC there is inadequate design information available for some of the proposed units from which to make accurate environmental assessments of the impacts. The document should limit its scope to those nuclear plant designs for which reasonable data existed for assessing environmental impacts. If the NRC continues to consider those reactor units as viable it should develop a supplemental EIS or an additional EIS when environmental information becomes available. Based on a review of the SDEIS, the document should be limited to the following units: ACR-700, Advanced Boiling Water Reactor, Advanced Pressurized Water Reactor (Surrogate AP1000), and the Economic Simplified Boiling Water Reactor.

16. Chapter 1, Pg 1-3 line 22 - The document states that a detailed design of the reactor or reactors is not needed at this time. However, there should be enough design information or data available on any reactor design to accurately bound the environmental impact. For several of the desired plant designs, this information is either not available or not provided as part of the SDEIS in order to substantiate Plant Parameter Envelope information.

17. Chapter 3, Section 3.2 - The approach to develop a plant parameter envelope, while valid, is much more useful for developing a generic environmental impact statement. The approach proves less useful when referring to a specific action at a site. This approach is less credible when used to encompass reactor designs for which no accurate design parameters exist (the gas cooled reactors, and the IRIS next generation pressurized water reactors).

18. Chapter 3, Section 3.2.1.2 - If unit 4 will be a dry cooling tower, then it will require some combination of water treatments, which should be relatively straightforward based on the draft designs. There should exist enough information for this analysis to be included in the SDEIS.

19. Chapter 3, Pg 3-14, Line 14 - Please explain why radioactive waste management

systems have not been identified. The description of the high level waste storage facility, security of this facility and the monitoring (frequency and type) are not addressed.

20. Chapter 3, Pg 3-14, Line 20 - If adequate design information is only available to accurately estimate liquid and gaseous effluents for 4 reactors, then this SDEIS should only apply to those reactors. The usefulness of the information included in this SDEIS is limited to those plants used as a design basis for the Plant Parameter Envelope (PPE). Otherwise, problems will arise when a PPE has been established, but a new design must be "shoe-horned" into the parameters established by the PPE (which were based on other reactor designs).

21. Chapter 3, Section 3.2.4 - The SDEIS should state all the Federal and State regulations that apply.

22. Chapter 6, Pg 6-13, Line 5 - Note that the impacts of gas-cooled reactors would need to be assessed at the construction permit (CP) or COL stage, when more data is available on the design.

23. Chapter 6, Pg 6-16, Line 16 - Note that the document states that there exists significant uncertainty in the final design of any gas-cooled reactors. Thus, the SDEIS should be limited to exclude the design of these reactors until specifics on the design are known. Same comment for Pg 6-30, Line 19.

24. Chapter 7, Section 7.8 - The statement that the impact of operating the new units is "well below the estimated effects from natural radiation" misses the point. The public has no control over natural radiation, but the point of this SDEIS is to evaluate the impacts of siting 2 new nuclear units so that an informed decision can be made as to its merit.

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Obtaining Environmental Impact Statements

EPA Comments on Environmental Impact Statements

EPA Compliance with NEPA

Environmental Impact Statement (EIS) Rating System Criteria

EPA has developed a set of criteria for rating draft EISs. The rating system provides a basis upon which EPA makes recommendations to the lead agency for improving the draft EIS.

- Rating the Environmental Impact of the Action
- Rating the Adequacy of the Draft Environmental Impact Statement (EIS)

RATING THE ENVIRONMENTAL IMPACT OF THE ACTION

- **LO (Lack of Objections)** The review has not identified any potential environmental impacts requiring substantive changes to the preferred alternative. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposed action.

- **EC (Environmental Concerns)** The review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact.

- **EO (Environmental Objections)** The review has identified significant environmental impacts that should be avoided in order to adequately protect the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). The basis for environmental Objections can include situations:

  1. *Where an action might violate or be inconsistent with achievement or maintenance of a national environmental standard;*
  2. *Where the Federal agency violates its own substantive environmental requirements that relate to EPA's areas of jurisdiction or expertise;*
  3. *Where there is a violation of an EPA policy declaration;*
  4. *Where there are no applicable standards or where applicable standards will not be violated but there is potential for significant environmental degradation that could be corrected by project modification or other feasible alternatives; or*
  5. *Where proceeding with the proposed action would set a precedent for future actions that collectively could result in significant environmental impacts.*

- **EU (Environmentally Unsatisfactory)** The review has identified adverse environmental impacts that are of sufficient magnitude that EPA believes the proposec action must not proceed as proposed. The basis for an environmentally unsatisfactory determination consists of identification of environmentally objectionable impacts as defined above and one or more of the following conditions:

1. *The potential violation of or inconsistency with a national environmental standard is substantive and/or will occur on a long-term basis;*

2. *There are no applicable standards but the severity, duration, or geographical scope of the impacts associated with the proposed action warrant special attention; or*

3. *The potential environmental impacts resulting from the proposed action are of national importance because of the threat to national environmental resources or to environmental policies.*

Return to Top

RATING THE ADEQUACY OF THE DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS)

- **1 (Adequate)** The draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

- **2 (Insufficient Information)** The draft EIS does not contain sufficient information to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the proposal. The identified additional information, data, analyses, or discussion should be included in the final EIS.

- **3 (Inadequate)** The draft EIS does not adequately assess the potentially significant environmental impacts of the proposal, or the reviewer has identified new, reasonably available, alternatives, that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. The identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. This rating indicates EPA's belief that the draft EIS does not meet the purposes of NEPA and/or the Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS.

Memorandum

To: Charles Ellis

From: Thomas A. Faha, Water Permit Manager, NRO

Date: November 9, 2006

Subject: NRO VPDES Program comments on Coastal Zone Program Consistency Determination for North Anna Power Station Early Site Permit

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We have reviewed Dominion's proposal for the addition of Units 3 and 4 and potential impacts to the water quality standards as they are governed by the VPDES permit program.

The proposed activity will require a modification of VPDES permit VA0052451. We do not see any overt conflict the proposal has with current regulations that would cause us to recommend denial of the modification of the permit. However, this should not be construed to guarantee that the permit will be modified as proposed by Dominion.

Only when Dominion makes a request for the permit modification can staff begin the process of evaluating the proposal and prepare a permit that will protect the water quality standards. The effects of discharges associated with the new units will ultimately be determined through the permit modification process. It is not possible at this time to predetermine what future permit conditions will be since it is likely that the water quality standards for Lake Anna, along with other waters of the state, will change in the coming years. While it is uncertain what conditions future permits will require, it is certain that they must assure protection of the criteria and standards. A modified permit that addresses the proposed units will be reviewed by other offices in DEQ, EPA, other state agencies, and the public; the modification will undergo a public participation process. The decision on whether or not the modification is approved and under what conditions will be decided by the State Water Control Board.

The above is our recommendation as far as the VPDES program is concerned for the proposed units.

Your office received numerous comments concerning the discharges of waters associated with the proposed Units. Nearly all of the comments were linked to the conditions for Units 1 and 2 as regulated through the existing VPDES permit; the status of the WHTF and related comments about effluent and ambient water temperatures. These comments pertain to the existing facility and can be addressed through the reissuance of the VPDES permit for the North Anna Power Plant which we are currently engaged.

The following is a consolidation and summary of comments concerning water discharges.

1. <u>Regulatory Status of the WHTF</u>

Many comments were received stating that the Waste Heat Treatment Facility (WHTF), or cooling lagoons, should be considered waters of the United States and therefore subject to the Water Quality Standard regulations and protection thereof as provided through the VPDES permit regulation. With this comment were many related comments such as:

- point of compliance should be moved from Dike 3 to the discharge canal;
- temperature limits should apply at the end of the discharge canal;
- derivation of current heat rejection limits;
- effluent limits and protection of human health within the WHTF;

- water quality monitoring within the WHTF;
- use of sprayers to assist in cooling water in the WHTF;
- requiring a new 316(a) variance study.

Staff acknowledges that the WHTF is an anomaly and not something that would be created under current laws and regulations. Its creation occurred prior to the Clean Water Act and NPDES permit regulations. Since 1968 the state has considered the WHTF as a treatment facility and not subject to water quality standards. The definition of *surface waters* in the VPDES permit regulation exempts treatment facilities.

The State Water Control Board issued Certificate 1912 in June 1968 approving the creation of Lake Anna and the WHTF. When the Board issued the certificate the intention was for the WHTF to be separated from the lake by a series of dikes so that it could serve as a treatment facility and thereby protect the water quality standards of the lake. This intent was reaffirmed in subsequent 401 Certificates issued by the SWCB in 1972 and 1973.

In 1969 the State Corporation Commission issued a license to Virginia Power for the creation of the lake and lagoons. This action too made clear the intent to distinguish the purpose of both bodies of water and the special function of the lagoons to treat the power plants cooling waters.

Dominion Power owns all of the land under both Lake Anna and the WHTF and up to the 255msl elevation around both water bodies. Landowners adjacent to Dominion have deeds with Dominion specifying the terms of use for the water bodies. There are two different deeds, one for those who live on the Lake and one for those who are adjacent to the WHTF. The deed for the latter states that the cooling lagoons are not public bodies of water and that they are a private water treatment facility that serve as cooling lagoons.

For these reasons the SWCB and DEQ have continued the practice of not considering the WHTF as subject to the water quality standards even though the law and regulations have changed. As such, the VPDES permit(s) for the North Anna Power Plant have not contained any conditions requiring the WHTF to meet water quality standards or treatment requirements.

Staff recognizes the public's comments and concerns and will work with them and Dominion when reissuing the VPDES permit.

2. <u>Permit violations, lake temperatures, and 316(a) variance</u>

Citizen monitoring in Lake Anna has shown that temperatures in the Lake have exceeded the temperature criteria in the water quality standards. Statements were subsequently made that Dominion's effluent has caused and contributed to these elevated levels and therefore they violated the permit.

The VPDES permit does not set an ambient water temperature criterion that Dominion must abide by and therefore Dominion has not violated its permit. The permit specifies the maximum amount of heat Dominion is authorized to discharge and they have complied with that requirement.

It is common for water bodies to exceed the water quality criteria because of solar radiation. In Lake Anna this is likely to occur in the shallow reaches near its tributaries. While Dominion's effluent from the WHTF does add to the temperatures in the Lake, and perhaps above the criterion, there has been no violation of the permit or water quality consequence.

Dominion has been granted a variance by the State Water Control Board in accordance with part 316(a) of the Clean Water Act and Virginia's Water Quality Standards, 9VAC25-260-90 and -140.E. The variance must be reevaluated by DEQ and renewed, if so decided, by the SWCB when the permit is reissued every five years.

The variance in essence states that the amount of heat discharged by the power plant is sufficient to assure the protection and propagation of aquatic life and wildlife in Lake Anna and the North Anna River downstream of the dam. The amount of heat may contribute to water temperatures exceeding the criteria but the exceedance will not have any detrimental impact.

The original study was conducted in the mid 1980s and approved by the SWCB in 1986. Each year subsequent to that Dominion has conducted fish surveys in the Lake and North Anna River. The surveys have indicated the fishery is healthy, that the intent of the temperature criteria has been met, and the validity of the variance.

3. Blowdown discharges from Unit 3

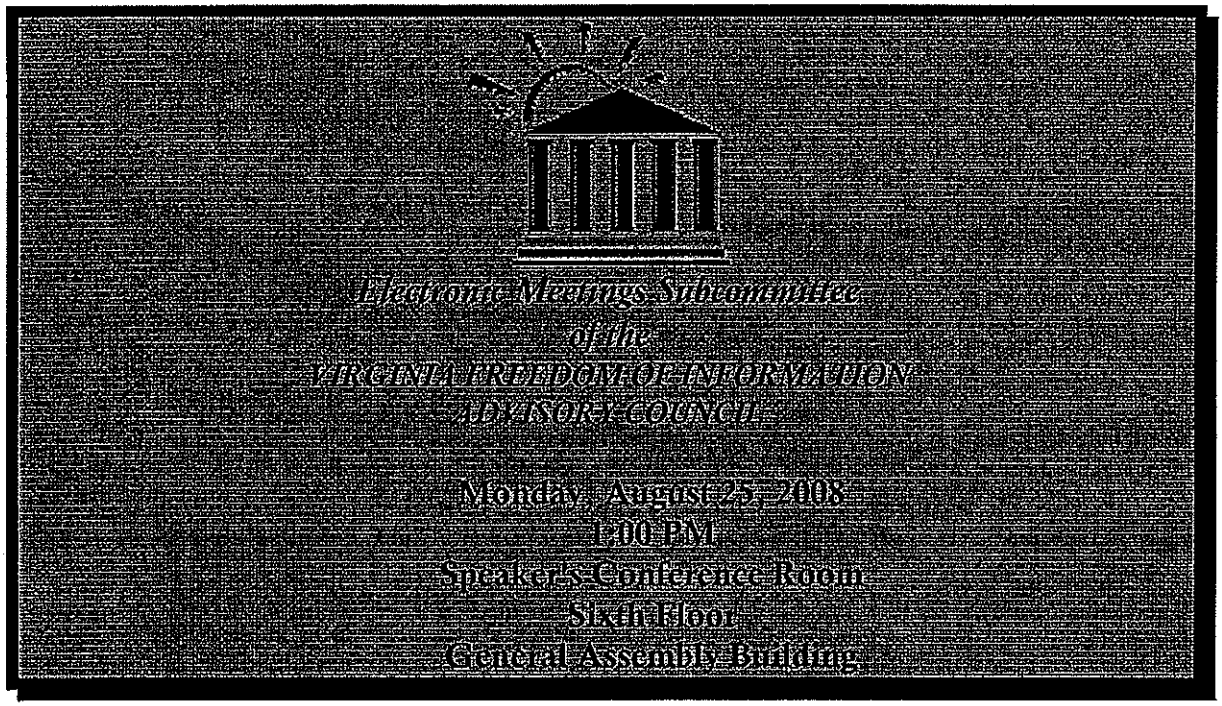
The blowdown discharges from Unit 3 will add additional heat and chemicals to the WHTF and may affect the water quality of the lake.

Should Dominion proceed with Unit 3 as proposed, as stated above, they must first ask for the VPDES permit to be modified. Should the permit be modified, it will address the cooling tower blowdown discharges through effluent guidelines specified in 40CFR Part 423 and in accordance with the water quality standards. The addition of heat will be analyzed to determine if it is significant and if it warrants a reevaluation of the 316(a) variance. The use of chemicals will be analyzed to assure the numeric criteria of the water quality standards are protected.

4. Comments on the draft VPDES permit for Units 1 and 2

Several comments were received about the draft permit for the current facility. The draft is not yet ready for public comments as it will undergo further internal review before comments are solicited from the public.

Please let me know if you have any questions.



SUGGESTED AGENDA

1. Call to Order and introduction of new subcommittee members.
2. Further consideration of HB 1332 (Landes)/SB 423 (Puckett)--electronic meetings provisions affecting the Air and Water Boards of the Department of Environmental Quality. Review of draft legislation.
3. Public Comment.
4. Discussion.
5. Other Business.
6. Adjournment.

Subcommittee Members

Craig Fifer (Chair)	Senator Houck
Ralph L. "Bill" Axselle, Jr.	E. M. Miller
Frosty Landon	John Selph

Staff

Maria J.K. Everett
Alan Gernhardt

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