



August 3, 2012

Ms. Kimberly Q. Lanterman
Dominion Resources, Inc.
5000 Dominion Boulevard
Glen Allen, VA 23060

**Re: Detailed Survey for the Small Whorled Pogonia (*Isotria medeoloides*)
North Anna Power Station, Louisa County, Virginia
Latitude: 38°03'01.26"N Longitude: 77°48'52.68"W
WEG Project #4317B**

Dear Ms. Lanterman:

This report presents the results of 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 (Figure 1-1). 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) (Figure 1-2).

Sean Wender 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).

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 striped prince's pine (*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 June 25th to June 26th, 2012, a time frame that occurs within the sampling window suggested by the FWS. 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 within previously identified habitat areas that were surveyed by WEG in 2010. Notes were previously 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. Although some clearing and construction activities have occurred within the site since the previous survey in 2010, all habitat areas remain intact. Increased vegetative growth in the understory of some habitat areas was noted but the character of the habitat areas overall has not changed enough to warrant reclassification. 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 area, nearer to Route 700. The attached Small Whorled Pogonia Habitat Map depicts the approximate location and areal extent of both habitat types. The representative habitat photographs are provided in Attachment A. The FWS Survey Summation Form is provided in Attachment B.

Conclusion

In summary, the results of this study show that SWP was not present within the survey area at the North Anna Power Station and adjacent Route 700 property. This result is consistent with the previous survey conducted by WEG in 2010. Areas of suitable and marginal habitat previously identified by WEG remain intact within several semi-mature and mature upland hardwood communities. If you have any questions regarding this investigation or the results presented herein, please feel free to call at your convenience.

Sincerely,

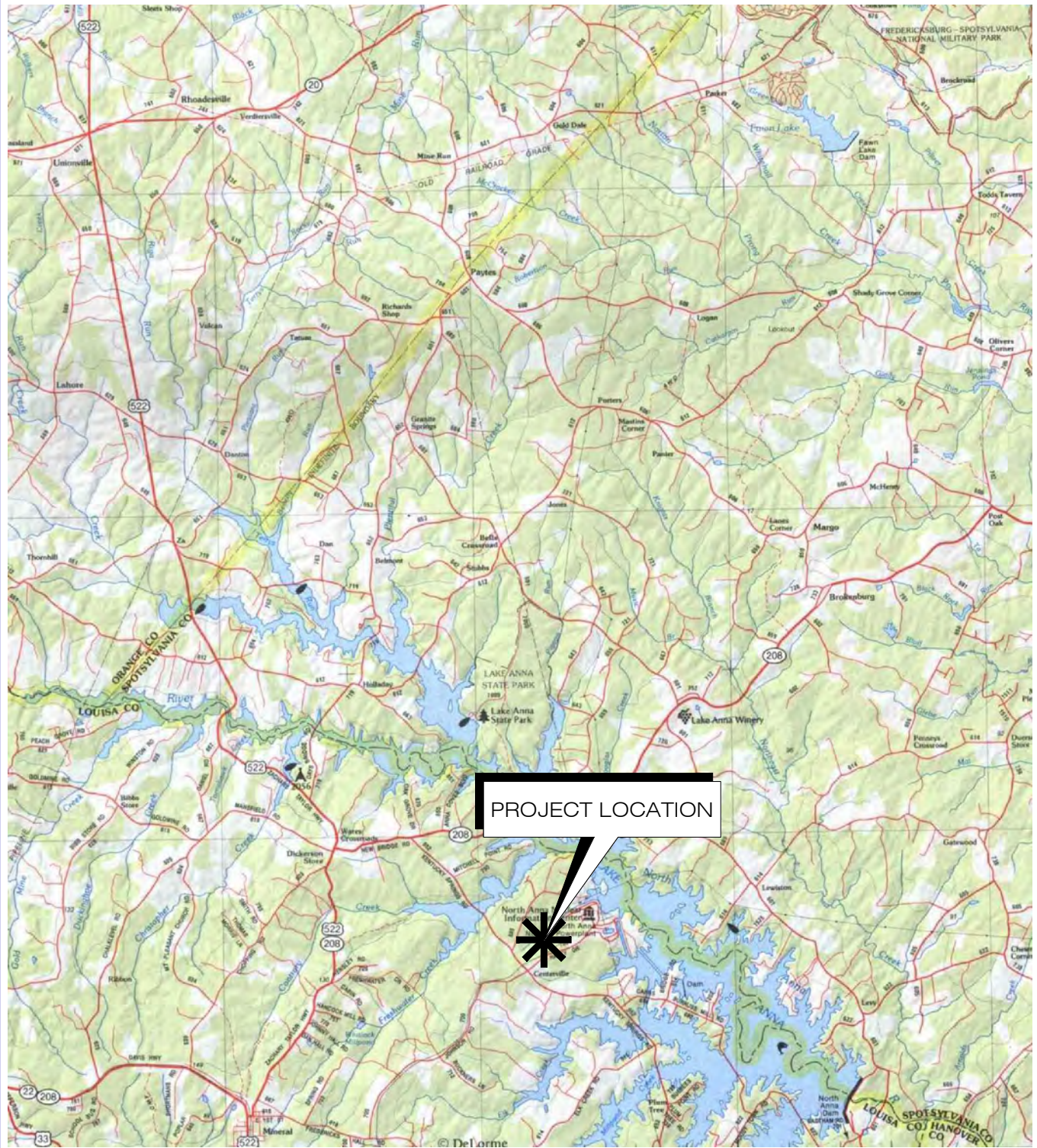


Sean M. Wender, PWD
Senior Ecologist

Attachments

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.
- 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.



2.4 MILES 1.2 0 MILES 2.4 MILES
 SCALE: 1 INCH = 2.4 MILES



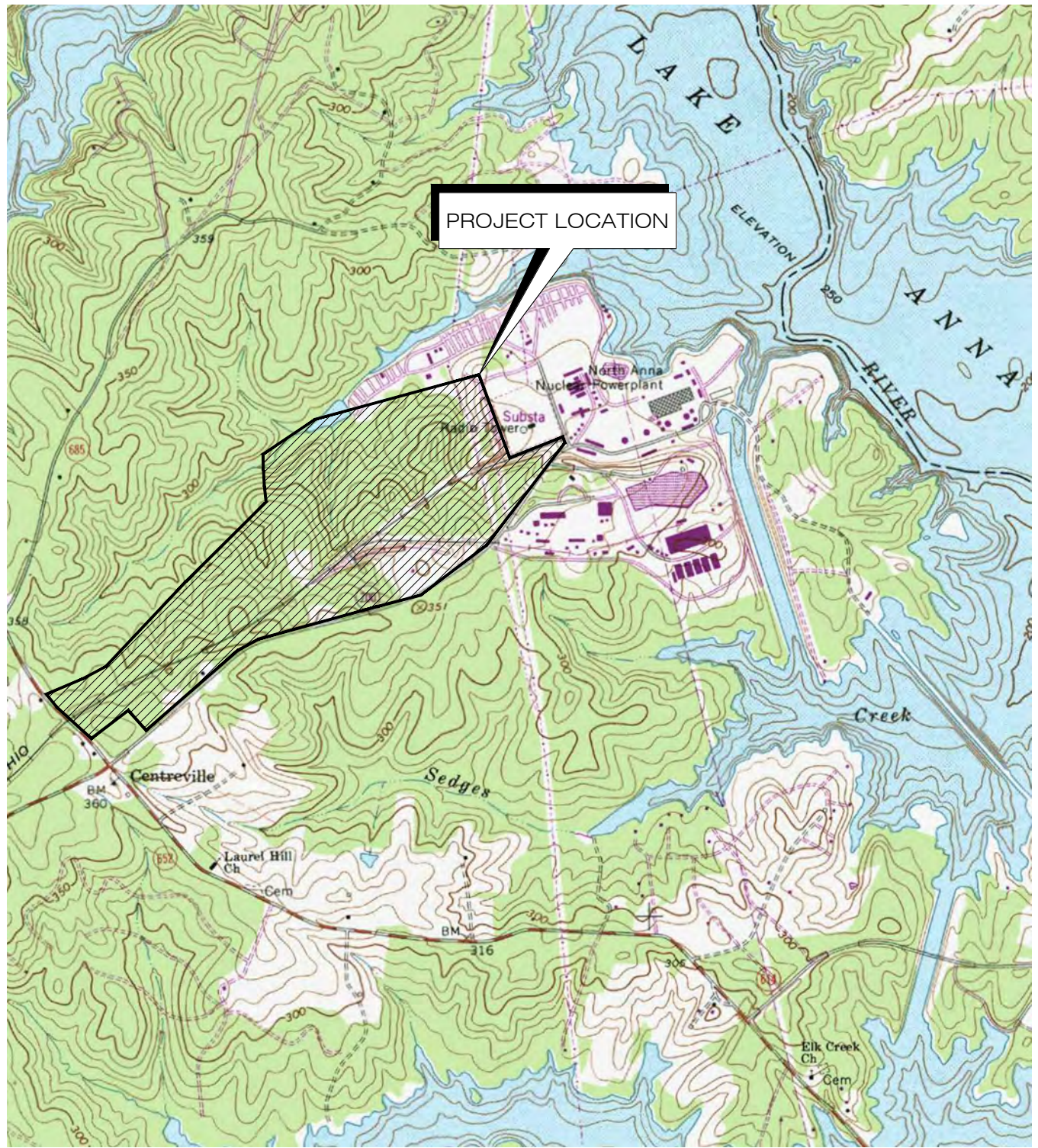
**WILLIAMSBURG
 ENVIRONMENTAL
 GROUP, INC.**

**FIGURE 1-1
 PROJECT VICINITY MAP
 NORTH ANNA POWER STATION**

SOURCE: VIRGINIA ATLAS AND GAZETTEER,
 DeLORME MAPPING CO., 2005.

LOUISA CO., VA

JULY 2012



2000' 1000' 0' 2000'
 SCALE: 1 INCH = 2000 FEET



LATITUDE: 38° 03' 1.26"
 LONGITUDE: 77° 48' 52.68"

SOURCE: USGS 7.5 MINUTE SERIES TOPOGRAPHIC MAP,
 LAKE ANNA WEST, VA QUADRANGLE,
 1973 (REVISED 1983)



**WILLIAMSBURG
 ENVIRONMENTAL
 GROUP, INC.**

**FIGURE 1-2
 PROJECT LOCATION MAP
 NORTH ANNA POWER STATION**

LOUISA CO., VA

AUGUST 2012

Appendix A

Representative Photographs



Photograph 1: View of a small area of marginal SWP habitat within the southwest portion of the project.



Photograph 2: View of suitable SWP habitat within the northcentral portion of the project.



*Photos taken by: Sean Wender
Williamsburg Environmental Group, Inc.
June 25th to June 26th, 2012
WEG Project # 4317C*



Photograph 3: View of marginal SWP habitat within the center of the eastern half of the project.



Photograph 4: View of marginal SWP habitat within the northeastern corner of the project.



*Photos taken by: Sean Wender
Williamsburg Environmental Group, Inc.
June 25th to June 26th, 2012
WEG Project # 4317C*

Appendix B

FWS Survey Summation Form




**Please provide a clear copy of a USGS topographic map(s),
with the survey area(s) clearly indicated on the map(s).**

| SURVEY SUMMATION FORM | | Year: | 2012 | |
|---|---|---------------|-------|-------------|
| Report Title: | Detailed Survey for Small Whorled Pogonia (<i>Isotria medeoloides</i>), North Anna Power Station | | | |
| Collector(s): | Sean Wender, Jason Mann | | | |
| Quad(s): | Lake Anna West | | | |
| County / City: | Louisa County, Virginia | | | |
| Survey Site Information ⁽¹⁾ : | The survey was conducted within an approximate 295-acre study area generally northeast of Kentucky Springs Road (Rte 652) , northwest of Haley Drive (Rte 700), with a disconnected portion of the study area just south of the existing powerplant. | | | |
| Habitat Type: | <input checked="" type="radio"/> Appropriate <input checked="" type="radio"/> Not Appropriate <input type="radio"/> Not Definitive | | | |
| SPECIES INFORMATION: | | | | |
| Target Species: | <i>Isotria medeoloides</i> | | | |
| Target Species Found? | <input type="radio"/> YES <input checked="" type="radio"/> NO | | | |
| Species (common or scientific name): | Number of Specimens ⁽²⁾ | | | |
| | Live | Fresh Dead | Relic | Unspecified |
| <u>N/A</u> | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| Comments: | This detailed survey for <i>Isotria medeoloides</i> was completed between June 25th and June 26th, 2012. Much of the approximate 295-acre study area can be considered poor, inappropriate SWP habitat due to limiting factors including pine-dominated forests, dense regenerative communities, and highly disturbed historic land use. Appropriate SWP habitat includes several areas of marginal habitat and one area of suitable habitat, within more open semi-mature and mature hardwood communities. | | | |

(1) This is detailed information on where the survey was done (Example: 50 yards above, and 200 yards below the Route 623 crossing of the Pamunkey River). This information will assist in mapping of the survey data.

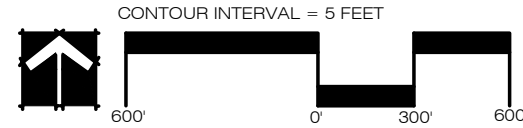
(2) Place a check mark in any of the columns if present but not counted.

LEGEND:

-  SUITABLE SMALL WHORLED POGONIA HABITAT
-  MARGINAL SMALL WHORLED POGONIA HABITAT
-  PHOTO STATION LOCATION


SITE DATA:

PROJECT AREA 287.38 ACRES ±



SMALL WHORLED POGONIA HABITAT MAP
NORTH ANNA POWER STATION
 LOUISA COUNTY, VIRGINIA

DATE: AUGUST 2, 2012
 JOB NUMBER: 4317B
 SCALE: 1 INCH = 600 FEET
 SOURCE: BASE MAP PROVIDED BY LOUISA COUNTY GIS



WILLIAMSBURG ENVIRONMENTAL GROUP, INC.
 Environmental Consultants

13821 Park Center Road
 Suite 100
 Williamsburg, Virginia 23186
 (703) 437-3096

5209 Center Street
 Williamsburg, Virginia 23186
 (703) 229-9888

6705 Stearn Run Blvd
 Suite 105
 Richmond, Virginia 23226
 (804) 287-5474