Greg Gibson
Vice President, Regulatory Affairs

750 East Pratt Street, Suite 1600
Baltimore, Maryland 21202

UniStar
NUCLEAR ENERGY

10 CFR 50.4
10 CFR 52.79

September 25, 2009

UN#09-403

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: UniStar Nuclear Energy, NRC Docket No. 52-016
Calvert Cliffs Nuclear Power Plant, Unit 3
Responses to RAI 1015, 1016, 1017, and 1018

Reference: 1) Laura Quinn (NRC) to Greg Gibson (UniStar Nuclear Energy), "Request for Additional Information Related to the Environmental Review for the Calvert Cliffs Combined License Application – Alternative Sites," dated September 18, 2009.

The purpose of this letter is to provide responses to requests for additional information (RAIs) identified in Reference 1. Enclosure 1 provides our responses to RAI No. 1015, 1016, 1017, and 1018 and includes revised Combined License Application (COLA) content. The submittal of the enclosed RAI responses addresses all of the outstanding items needed to publish the environmental impact statement (EIS) and information necessary for completion of regulatory reviews.

Our responses to RAIs identified in Reference 1 do not include any new regulatory commitments. A Licensing Basis Document Change Request has been initiated to incorporate the revised COLA changes into a future revision to the COLA.

D096
NRO

If there are any questions regarding this transmittal, please contact me at (410) 470-4205, or Mr. Dimitri Lutchenkov at (410) 470-5524.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on September 25, 2009

for Greg Gibson

Enclosures: 1) Responses to NRC Request for Additional Information, RAI No. 1015, 1016, 1017, and 1018, Calvert Cliffs Nuclear Power Plant Unit 3

cc: Surinder Arora, NRC Project Manager, U.S. EPR Projects Branch
Laura Quinn, NRC Environmental Project Manager, U.S. EPR COL Application
Getachew Tesfaye, NRC Project Manager, U.S. EPR DC Application (w/o enclosure)
Loren Plisco, Deputy Regional Administrator, NRC Region II (w/o enclosure)
Silas Kennedy, U.S. NRC Resident Inspector, CCNPP, Units 1 and 2
U.S. NRC Region I Office

GTG/INJ/mfd

Enclosure 1
Responses to NRC Requests for Additional Information
RAI No. 1015, 1016, 1017, and 1018
Calvert Cliffs Nuclear Power Plant Unit 3

RAI No. 1015

Question 1: ESRP 9.3 and RG 4.2

In UniStar's August 29, 2009 submittal, the score for criteria 1d (Distance to dedicated land) in Table 6-1 of the Alternative Site Evaluation Report (ASER), was revised from the July 17, 2009 submittal for the Bainbridge alternative site from 1 to 2.8. However, Appendix C of the ASER states that Deer Creek Park is 6.9 miles from the Bainbridge site. This appears to match the criterion for a score of 3 in ER Table 9.3-2, which is for dedicated land >5 miles from the site but less than 10. Explain why the Bainbridge site was scored 2.8 instead of 3 (or higher if scaling by use of decimals). [Site Audit Information Need 9]

Response

The score for Criterion 1d in ER Table 6-1 of the Alternate Site Evaluation Report (ASER) for the Bainbridge site was revised from 1 to 2.8 to correct a transcription error with the adjacent Beiler value that occurred in Rev. 0 of the ASER.

Criterion 1d was subjectively scored by a Delphi Panel. Although scoring bases were provided for Criterion 1d to guide the subjective scoring, the Delphi Panel team members' subjective scoring reflected their personal knowledge base and other considerations. All Delphi Panel team members, except one, scored Criterion 1d for the Bainbridge site as a 3. Based upon the prescriptive process/procedure defined in the ASER, once the subjective scoring had stabilized, the averaged Delphi Panel scores were used for each subjectively scored criterion. Consequently, the averaged scores will not correspond exactly with the identified scoring bases. This is an acceptable approach for the Delphi process.

As verified by sensitivity analysis, correction of the transcription error or the use of the average of the Delphi Panel scores does not change the outcome of the ASER. More explicitly, the alternative sites identified in ASER Rev 0 remain unchanged and are carried forward into ASER Rev 1.

COLA Impact

The COLA will not be revised as a result of this response.

Question 2: ESRP 9.3 and RG 4.2

In UniStar's August 29, 2009 submittal, the ranking score values for criteria 1b (hazardous waste or spoils areas) in Table 6-1 of the ASER for the Bainbridge and EASTALCO alternative sites have been modified from the values in the July 17, 2009 submittal. The justification text in Appendix C of the ASER did not change for either site. Explain the basis for the modified scores. [Site Audit Information Need 9]

Response

During the investigation of the scoring basis for certain Criteria 1 scores, it was found that transcription errors have been made for several scores for the Bainbridge, EASTALCO, and Conowingo alternative sites. These errors were corrected to reflect final Delphi panel scores. Based on the prescriptive process/procedure defined in the ASER, once the subjective scoring had stabilized, the averaged Delphi Panel scores were used for each subjectively-scored criterion. Consequently, the averaged scores will not correspond exactly with the identified scoring bases. This is an acceptable approach for the Delphi process.

As verified by sensitivity analysis, correction of the transcription error or the use of the average of the Delphi Panel scores does not change the outcome of the ASER. More explicitly, the alternative sites identified in ASER Rev 0 remain unchanged and are carried forward into ASER Rev 1.

COLA Impact

The COLA will not be revised as a result of this response.

Question 3: ESRP 9.3 and RG 4.2.

In UniStar's August 29, 2009 submittal, the score for criteria 1c (Zoning) changed from the July 17, 2009 score of 5 to 2 in Table 6-1 of the ASER for the Bainbridge alternative site. The staff notes that (1) the Port Deposit website says that industrial uses are permitted at the Bainbridge site http://www.portdeposit.org/?a=bainbridge1, and (2) an area zoned for industrial facilities should be scored 5 according to Environmental Report (ER) Table 9.3-2. Explain the basis for the modified score. [Site Audit Information Need 9]

Response

The score for Criterion 1c in Table 6-1 of the ASER for the Bainbridge site was revised from 5 to 2.0 to correct a transcription error with the adjacent Beiler value that occurred in Rev. 0 of the ASER.

Criterion 1c was subjectively scored by a Delphi Panel. Although scoring bases were provided for Criterion 1c to guide the subjective scoring, the Delphi Panel team members' subjective scoring reflected their personal knowledge base and other considerations. Although the cited website states that industrial uses are permitted, as noted by the NRC, the site is zoned as Bainbridge Special Use and other uses are permitted as well. The current zoning and permitting of other uses, along with the current land use plan (i.e., mixed-use development, including commercial and residential), may have factored into some of the Delphi Panel team members' scoring of this criterion, which ranged from a 5 to a 1. Based on the prescriptive process/procedure defined in the ASER, once the subjective scoring had stabilized, the averaged Delphi Panel scores were used for each subjectively-scored criterion. Consequently, the averaged scores will not correspond exactly with the identified scoring bases. This is an acceptable approach for the Delphi process.

As verified by sensitivity analysis, correction of the transcription errors does not change the outcome of the ASER. More explicitly, the alternative sites identified in ASER Rev 0 remain unchanged and are carried forward into ASER Rev 1.

COLA Impact

The COLA will not be revised as a result of this response.

Question 4: ESRP 9.3 and RG 4.2

In UniStar's August 29, 2009 submittal, the score for criteria 1e (Topography) for the Thiokol alternative site is 4.4. The justification for the Thiokol site in Appendix C of the ASER reads exactly the same as EASTALCO, which is scored 5. Why is the Thiokol site scored differently than the EASTALCO site? [Site Audit Information Need 9]

Response

Criterion 1e was subjectively scored by a Delphi Panel. Although scoring bases were provided for Criterion 1e to guide the subjective scoring, the Delphi Panel team members' subjective scoring reflected their personal knowledge base and other considerations. Although both sites have 33 ft of relief across the site, the EASTALCO site relief is primarily at and along the eastern edge of the site while the rest of the site was essentially flat; however, the Thiokol site is more undulating with the 33 ft of relief throughout the site. The difference in distribution of the relief across the sites may have factored into some of the Delphi Panel team members' scoring of this criterion, which ranged from a 5 to a 3 for the Thiokol site but were all scores of 5 for the EASTALCO site. Based on the prescriptive process/procedure defined in the ASER, once the subjective scoring had stabilized, the averaged Delphi Panel scores were used for each subjectively-scored criterion. Consequently, the averaged scores will not correspond exactly with the identified scoring bases. This is an acceptable approach for the Delphi process.

As verified by sensitivity analysis, correction of the transcription errors does not change the outcome of the ASER. More explicitly, the alternative sites identified in ASER Rev 0 remain unchanged and are carried forward into ASER Rev 1.

The foregoing also exemplifies differences that can occur between the scoring by the Delphi Panel which was provided with overall site characteristics, in this instance the total relief of the entire site, and the subsequent evaluation made for ER Section 9.3.2. Although the scoring criteria directed the panel to score both sites as a 5.0 based upon its consideration of the entire site, Section 9.3.2, Proposed and Alternative Site Evaluation, assesses a proposed 420 acre footprint plant location using the NRC three level standard, of significance which in this case is more favorable toward the EASTALCO site. The impacts of the site relief are mitigated by the selection of the plant footprint.

Apparent inconsistencies, characterized by the foregoing, are observable in many areas when detailed comparisons of ASER scores are compared to the determinations of significance contained in ER Section 9.3.

COLA Impact

The COLA will not be revised as a result of this response.

Question 5: ESRP 9.3 and RG 4.2

The staff requests additional explanatory information for the items below regarding the scores in Table 7-1 of the ASER for the proposed Calvert Cliffs site for ranking criteria 1b, 1d, and 1e. Site Audit Information Need 9]

A. For criteria 1b (Hazardous waste or spoils areas), the justification text in Appendix C of the ASER clearly states that no remediation is expected. This seems to align with a score of 5 in ER Table 9.3-2 rather than 4.8 shown in Table 7-1.

Response (A)

Criterion 1b was subjectively scored by a Delphi Panel. Although scoring bases were provided for Criterion 1b to guide the subjective scoring, the Delphi Panel team members' subjective scoring reflected their personal knowledge base and other considerations. Two of the Delphi Panel team members, which included experts intimately familiar with the Calvert Cliffs site, scored Criterion 1b for Calvert Cliffs as a 4, whereas all other members scored the criterion as a 5. Based on the prescriptive process/procedure defined in the ASER, once the subjective scoring had stabilized, the averaged Delphi Panel scores were used for each subjectively-scored criterion. Consequently, the averaged scores will not correspond exactly with the identified scoring bases. This is an acceptable approach for the Delphi process.

As verified by sensitivity analysis, correction of the transcription errors does not change the outcome of the ASER. More explicitly, the alternative sites identified in ASER Rev 0 remain unchanged and are carried forward into ASER Rev 1.

COLA Impact

The COLA will not be revised as a result of this response.

B. For criteria 1d (Distance to dedicated land), Appendix C of the ASER states that there is dedicated land (Calvert Cliffs State Park) less than 1 mile from the site, which seems to correspond to a score of 1 in ER Table 9.3-2. Why was the site scored 1.4 in Table 7-1, and what was the purpose of changing the score from the previous value in the July 17, 2009 submittal of 1.3?

Response (B)

Errors in transcription of original scores were corrected to reflect final Delphi panel scores, resulting in the change of 1.3 to 1.4.

Criterion 1d was subjectively scored by a Delphi Panel. Although scoring bases were provided for Criterion 1d to guide the subjective scoring, the Delphi Panel team members' subjective scoring reflected their personal knowledge base and other considerations. The Delphi Panel team members, which included experts intimately familiar with the Calvert Cliffs site, subjectively scored Criterion 1d for Calvert Cliffs from a 3 to a 1. Based on the prescriptive process/procedure defined in the ASER, once the subjective scoring had stabilized, the

averaged Delphi Panel scores were used for each subjectively-scored criterion. Consequently, the averaged scores will not correspond exactly with the identified scoring bases. This is an acceptable approach for the Delphi process.

As verified by sensitivity analysis, correction of the transcription errors does not change the outcome of the ASER. More explicitly, the alternative sites identified in ASER Rev 0 remain unchanged and are carried forward into ASER Rev 1.

COLA Impact

The COLA will not be revised as a result of this response.

C. For criteria 1e (Topography), relief of 98 feet (Appendix C of the ASER) seems to correspond with the range defined for a value of 3 (between 50 and 100 feet of relief) according to ER Table 9.3-2. Why is it scored 4.4 in Table 7-1 and what was the purpose of changing the score from the previous value in the July 17, 2009 submittal of 4.8?

Response (C)

The score for Criterion 1e in ER Table 6-1 of the ASER for the Calvert Cliffs site was revised from 4.8 to 4.4 to correct a transcription error that occurred in the July 17, 2009 submittal.

Criterion 1e was subjectively scored by a Delphi Panel. Although scoring bases were provided for Criterion 1e to guide the subjective scoring, the Delphi Panel team members' subjective scoring reflected their personal knowledge base and other considerations. The Delphi Panel team members, which included experts intimately familiar with the Calvert Cliffs site, subjectively scored Criterion 1e for Calvert Cliffs from a 5 to a 3. Based on the prescriptive process/procedure defined in the ASER, once the subjective scoring had stabilized, the averaged Delphi Panel scores were used for each subjectively-scored criterion. Consequently, the averaged scores will not correspond exactly with the identified scoring bases. This is an acceptable approach for the Delphi process.

As verified by sensitivity analysis, correction of the transcription errors does not change the outcome of the ASER. More explicitly, the alternative sites identified in ASER Rev 0 remain unchanged and are carried forward into ASER Rev 1.

COLA Impact

The COLA will not be revised as a result of this response.

Question 6: ESRP 9.3.2.2.3-8, 9.3.2.3.3 and 9.3.3

In the selection of alternative sites from the list of candidate sites in ER Table 9.3-4, the Bainbridge and Eastalco sites are scored 42 and 39, respectively for hydrology. The proposed Calvert Cliffs site is shown with a score of 36. Explain why the Bainbridge and Eastalco sites rate higher in ER Table 9.3-4 for hydrology than the proposed Calvert Cliffs site, but in ER Table 9.3-8 they are shown with higher impact levels than the Calvert Cliffs site for water. [Site Audit Information Need 11]

Response

The assigned weighted scores for the sites do not have any direct correlation to the environmental impact levels identified for the evaluation criteria. The respective scores for Hydrology for the Bainbridge, EASTALCO, and Calvert Cliffs sites reflect the results of the alternate site evaluation process whereby the inclusive (entire) properties associated with these three sites were ranked. There is a fundamental difference in relating raw weighted scores for evaluation criteria to the environmental impact levels assigned to a particular alternate site, because the impact levels are evaluated in relation to impacts predicted over and above the specific criteria used for the initial scoring in the ASER.

Furthermore, the intent and sole purpose of the ASER is to implement a prescriptive and systematic site-selection process search for alternatives to a Proposed Site, Calvert Cliffs 3, and then compare the Alternative Sites to the Proposed Site in regard to environmental impacts to identify if environmental preference can be established for an alternate site. In order for the process to be fair, a standard set of reconnaissance level source data is utilized to conduct the evaluations/comparisons. This ensures a consistent and repeatable process. Once Alternative Sites are established more granular information can be identified and used for the finite set of Alternative Sites to develop more insightful descriptions of the sites in Section 9.3 of the ER. The ASER and Section 9.3 of the ER are separate and distinct processes with different levels of information. In order to maintain the integrity, equal basis of information and repeatability of the ASER process, any newer more granular information identified in support of Section 9.3 of the ER cannot and should not be retrofitted into the ASER. The difference between the reconnaissance-level data sources used for the two evaluations (i.e., the screening-level candidate site evaluation and more detailed alternative site evaluation) is the reason for apparent discrepancies between Appendix C of the Alternate Site Evaluation Report (i.e., the screening-level candidate site evaluation) and the identified ER sections (i.e., the more detailed alternative site evaluation).

For the screening-level evaluation, three subcriteria were included in the overall score for Criterion 2, Hydrology. Of these three subcriteria, the only difference in scoring for the Bainbridge, EASTALCO and Calvert Cliffs sites occurred in Subcriterion 2a, Water Quality. Each of the sites was scored the same for Subcriteria 2b and 2c. For Subcriterion 2a, the Calvert Cliffs site was scored as a 2 for having the Middle Central Chesapeake Bay segment of the Chesapeake Bay, designated as mesohaline water (i.e., moderately brackish water), as a cooling water source. Bainbridge was scored a 4 for having a portion of the Northern Chesapeake Bay surface water segment of the Susquehanna River, designated as tidal fresh water estuary, as a cooling water source. EASTALCO was scored a 5 for having a portion of the Potomac River, the Middle Potomac River Area Sub-Basin surface water segment, which is

designated as fresh waters, as a cooling water source. The resulting weighted scores for Criterion 2 for Calvert Cliffs, Bainbridge, and EASTALCO are 36.0, 42.0, and 45.0. Please note that ER Table 9.3-4 contains a typographical error for the EASTALCO site and the correct weighted score should be 45.0. As verified by sensitivity analysis, correction of the transcription error or the use of the average of the Delphi Panel scores does not change the outcome of the ASER. More explicitly, the alternative sites identified in ASER Rev 0 remain unchanged and are carried forward into ASER Rev 1.

While the Bainbridge and EASTALCO properties demonstrate a higher water quality and, thus, screening-level propensity for EPR development based on the evaluation criteria than the Calvert Cliffs property (e.g. scores of 42 and 45 versus 36), Calvert Cliffs compares more favorably in regard to overall hydrologic impacts than for Bainbridge and EASTALCO.

For example, as described in ER Section 9.3.2.1.3 for the Calvert Cliffs site, the impacts to water resources at the site from construction and operation of the new reactor unit are anticipated to be SMALL due to the large size of both the surface water and groundwater resources at the site and the current rural nature of the area and resultant low usage of these resources.

As described in ER Section 9.3.2.2.3 for the Bainbridge site, overall water related impacts to the surrounding area attributable to the construction and operation of the proposed facility would be MODERATE due to the fraction of available water that may be pulled from the Susquehanna River under low flow conditions.

As described in ER Section 9.3.2.3.3 for the EASTALCO site, the hydrology impacts are expected to be MODERATE due to the potential restrictions to withdraw a significant portion of the Potomac River during low flow conditions.

COLA Impact

The COLA ER will be revised as a result of this response. COLA ER Table 9.3-4 will be revised to correct the typographical error for the EASTALCO site for Criterion 2. The weighted score for Criterion 2 for EASTALCO should be 45.0.

Table 9.3-4 Weighted Scoring of Candidate Site

	CCNPP	Bainbridge	Conowingo	EASTALCO	Thiokol
1. Land Use	26.5	23.7	20.3	22.9	19.4
2. Hydrology	36.0	~~42.0~~ 45.0	42.0	39.0	36.0
3. Terrestrial Resources	21.8	18.2	18.2	29.1	18.2
4. Aquatic Biological Resources	7.3	7.3	7.3	21.8	7.3
5. Socioeconomics	18.7	22.0	24.2	27.5	19.8
6. Environmental Justice	16.5	18.9	18.9	11.8	11.8
7. Historical and Cultural Resources	14.8	4.9	4.9	9.9	19.8
8. Air Quality	14.0	14.0	14.0	16.0	18.0
9. Human Health	18.2	6.1	12.1	16.2	20.2
10. Postulated Accidents	4.6	4.6	4.6	4.6	13.7
11. Transport of Radioactive Material	6.0	6.0	6.0	3.0	6.0
12. Transmission Corridors	34.7	30.9	27.0	30.9	23.2
13. Population	39.0	21.7	21.7	13.0	39.0
14. Facility costs	16.5	25.6	11.8	17.6	8.5
15. Geology	28.4	28.4	32.0	26.7	26.7
16. Wetlands	30.5	41.7	30.5	41.7	30.5
Total:	**333.5**	**316.0**	**295.5**	**331.7**	**318.1**

Note: The scoring for the Proposed Site (CCNPP) is not required when ranking the Candidate Sites to select the Alternative Sites but is included here for reference.

Question 7: ESRP 9.3

Regarding the criteria used to score and rank the candidate sites and to compare the alternative sites to the proposed site in the August 29, 2009 submittal of the Alternative Site Evaluation report, explain the rationale used when scoring sites according to criteria 3a and 4a (listed species). It appears that, with the exception of the Bainbridge site, the sites do not have the endangered/threatened terrestrial habitats (August 29, 2009 ER Rev 5 Sections 9.3.2.3.4, 9.3.2.4.4) or aquatic habitats (August 29, 2009 ER Rev 5 Sections 9.3.2.3.4, 9.3.2.3.5, and 9.3.2.4.5) but are scored as having such habitat. For example, the Thiokol site has a score of 1 for criterion 3a (the entire site falls within a known location of a Federally listed species), but the August 29, 2009 Revision 5 of ER Section 9.3.2.3.5 states that there is no suitable habitat on the Thiokol site for Federally listed terrestrial species. Similarly, criterion 4a is scored 1, but the revised ER text, in the August 29, 2009 submittal, states that a federally listed species occurs downstream of the Thiokol site. Clarify the application of criteria 3a and 4a for each candidate site, and state which Federally and State-listed species are considered at each candidate site, including the Conowingo site.

Explain how a State-listed terrestrial and a State-listed aquatic species can be known to occur one mile south of the Eastalco site if the species cannot be identified (Appendix C of the August 29, 2009 Alternative Site Evaluation Report, Page C-6, criteria 3a and 4a).

The Eastalco aquatic ecology section (August 29, 2009 Revision 5 of ER Section 9.3.2.3.5) discusses the occurrence of the Federally listed shortnose sturgeon in the Potomac River. Provide the reasoning for the discussion, especially since the text mentions that one was recorded 10 miles from the Thiokol site and not at the site itself. Is this species likely to occur in the stretch of the river near the Eastalco site?

Identify which Federally listed aquatic species at the Bainbridge site may have habitat encompassing wetlands as stated in Appendix C of the August 29, 2009 Alternative Site Evaluation report. The August 29, 2009 ER Revision 5 Section 9.3.2.3.5 does not mention any Federally listed species that use wetlands. Rectify the apparent discrepancy between the Appendix C statement about wetlands habitat on the site and the statement in Table 9.3-12 in Revision 5 of 9.3 that the Bainbridge site does not contain any wetlands.

Response

For the screening-level (i.e., reconnaissance-level) site evaluation, in order to prevent bias for or against sites where additional threatened and endangered (T&E) information may have been available at some sites for some species but not consistently available for all species for all sites, a metric that was consistently available for all sites within the Region of Interest (ROI) had to be identified and applied to all candidate sites for a fair comparison. As stated in Appendix A of the Alternative Site Evaluation Report, the established metric for both Criteria 3a and 4a for the screening-level evaluation of the candidate sites for selection of the alternative sites was "existence of mapped Federal and State T&E habitat on or adjacent to the site."

Based on geospatial data downloaded from Maryland Department of Natural Resources (MDNR) websites (MDNR, 2009a; MDNR, 2009b), buffered areas that primarily contain habitat for rare, threatened, and endangered species and rare natural community types were mapped and used to score each site based on the scoring bases identified in Appendix A of the Alternate

Site Evaluation Report. The mapped areas included regulated areas identified by the MDNR, such as Natural Heritage Areas, Wetlands of Special State Concern, Colonial Waterbird Colonies, and Habitat Protection Area. This screening-level geospatial data was consistently available for evaluation of candidate sites throughout the ROI. For consistent comparison, each site was scored for Criteria 3a and 4a based on this geospatial data, without regard for additional data that may have been known or later identified for certain species at some of the sites. However, information on the specific species of concern in each of the mapped habitat areas was not available from the MDNR geographical information system (GIS) data and, therefore, cannot be provided for the candidate site evaluation.

However, once the alternative sites were identified, additional data on T&E species beyond the initial screening-level geospatial data were obtained when available from internet-based and hard-copy reconnaissance-level data sources. The additional data on various T&E species at the alternative sites were then used to describe the potential environmental impacts on the terrestrial and aquatic resources documented in the ER. The difference between the reconnaissance-level data sources used for the two evaluations (i.e., the screening-level candidate site evaluation and more detailed alternative site evaluation) is the reason for apparent discrepancies between Appendix C of the Alternate Site Evaluation Report (i.e., the screening-level candidate site evaluation) and the identified ER sections (i.e., the more detailed alternative site evaluation).

RAI No. 1017, Aquatic Ecology Question 2, provides some detail on the above question regarding the Short Nose Sturgeon. Given its identification in reaches of the Potomac River below the Great Falls, it is unlikely that this species would be found in the vicinity of the EASTALCO site.

References:

MDNR, 2009a. Maryland's Natural Heritage Areas, Wildlife & Heritage Service, website: http://dnrweb.dnr.state.md.us/gis/data/sampledata.asp?data=NHA, accessed on June 19, 2009.

MDNR, 2009b. Sensitive Species Project Review Areas, website: http://dnrweb.dnr.state.md.us/gis/data/sampledata.asp?data=SSPRA, accessed on June 19, 2009.

COLA Impact

The COLA will not be revised as a result of this response.

RAI No. 1016

Terrestrial Ecology

Question 1: ESRP 9.3.2.2.4-3 and 9.3.2.3.4

Accessing a water supply for reactor cooling would require a pipeline at Bainbridge that drops down the Port Deposit bluffs to the Susquehanna River. A 5.8-mi pipeline would be needed to supply water from the Potomac River to the EASTALCO site. Provide the total area (length, width, total acreage) that would be temporarily and permanently impacted by the cooling water pipeline and intake from construction/upgrade at each alternative site. Would wetlands or streams be impacted by this construction? If so, describe the extent of wetlands/streams that would be impacted at each site.

Response

To determine potential off site impacts primarily associated with water line and transmission right-of-way (ROW), conceptual paths were identified utilizing GIS tools. These work products allowed for discrete calculation of wetland and stream impacts needed for completeness of alternative site evaluations. However, because these work products characterize 3rd party properties and are considered sensitive from a liability risk standpoint and, as such, are not included in any responses forwarded to the NRC. These work products can however be reviewed by NRC staff via reading rooms..

ER Table 9.3-12 Comparison of Wetland and Waterway Impacts CC3 vs. Alternate Sites,provides details of the impacts to these wetlands and streams in acres or linear feet as appropriate. Included in ER Table 9.3-12 are the assumptions made to calculate these impacts, such as the proposed water line ROW size (120' throughout, accommodating 2-60" pipes) and the impacts associated with its installation.

Note that as described in ER Table 9.3-12, impacts associated with construction of a water line ROW or transmission line ROW are considered to be temporary impacts capable of being restored following construction.

COLA Impact

COLA ER Tables 9.3-12, 9.3-13, and 9.3-14 will be revised as follows to reflect the latest wetland and stream impact revisions:

Table 9.3-12 Comparison of Wetland and Waterway Impacts: from~~CC3 vs.~~ Alternative Sites Evaluation Reconnaissance Level Data

	Proposed Site		Alternative Sites					
	Calvert Cliffs 3[13]		Bainbridge		EASTALCO		Thiokol[14]	
Property Acreage	2057.2		1068.6		1742.1		620.0	
Wetlands – Total Property[1] (ac)	173.2		4.6		~~21.0~~ 22.0		49.8	
Wetlands – Site[2] (ac)	6.6		0.0		0.0		34.5	
Streams – Total Property[3] (LF)	21805		8654		32944		7055	
Streams – Site[4] (LF)	3604		1557		1311		3435	
Wetlands Affected – Site[5] (ac)	6.6		0.0		0.0		34.5	
Streams Affected – Site[6] (LF)	3604		1557		1311		3435	
Off-Site Wetlands/Waterways Affected –ROWs and Interconnects (ac/LF)[7]	Wetlands	Streams	Wetlands	Streams	Wetlands	Streams	Wetlands	Streams
CWIS (in-water components)(ac)[8]	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
CW Pump House (ac.)[9]	NA	NA	0	0	0	0	0	0
Water Line ROW (ac)[10]	NA	NA	1.3	0	3.2	865	0.4	0
Transmission Line ROW (ac)[11]	0	0	~~3.0~~ 5.2	~~4926~~ 3517	0.2	1820	26.6	4051
RR Spur/Improvements (ac)	NA	NA	NA	NA	NA	NA	NA	NA
Access Roadways (ac)	NA	NA	NA	NA	NA	NA	NA	NA
Other Off-Site Uses (ac)[12]								

[1]"*Total Property*" includes the entirety of the alternate site facility contiguous land holdings (black outline).

[2]"*Site*" includes the 420 parcel on the Total Property selected for EPR development (red outline).

[3]Describes the total length of all streams on the Total Property in linear feet. Includes both mapped perennial and intermittent waterways and obvious drainage ways observed during site inspections or interpreted from desktop mapping.

[4]Describes streams within the 420 EPR Site, calculated in the same manner as streams for "Total Property".

[5] An assumption has been made that any wetlands within the 420 acre Site would be affected.

[6]An assumption has been made that any streams within the 420 acre Site would be affected by construction.

[7]An assumption has been made that any wetlands or streams within the ROWs or interconnects would be affected by construction. Impacts associated with ROW construction and some in-water construction activities are temporary in nature.

[8]An assumption has been made to allow a 100'x100' area of impact for in-water cooling water intake system (CWIS) components. No alternate sites are proposed to use shoreline intake structures; all intake/discharge structures are proposed to be sited at a depth of -20' MLW or greater. Horizontal directional drilling (HDD) is proposed to access off shore locations.

[9]A cooling water pump house would be located alongshore to the selected cooling water source, and would occupy 0.5 acre total area.

[10]For the purposes of this evaluation, it has been assumed that any water line ROW would require a 120' width for construction to allow installation of 2-60" pipes.

[11]For new transmission line construction or reconductoring of existing circuits to accommodate the EPR, a 300' wide cleared ROW is assumed to be required. The Transmission Corridor for the Thiokol site is different from the one in the March 2009 Requests for Additional Information Responses (UN#09-140)

[12]Other off-site uses include any required parking, laydown, staging requiring land alteration.

[13]ER Section 4.1.1.1 (Rev. 5) states the CCNPP3 and supporting facilities will be located on 2,070 acres; ER Section 4.3.1.3 (Rev. 5) states the construction of CCNPP3 will permanently fill approximately 8,350 LF of stream and 11.72 acres of delineated wetland areas. This table provides data primarily for the approximate 420-acre EPR Site (see Footnote 2) for consistent comparison with the alternative sites and, therefore, some data in this table will be different from quantities of affected acreage stated in the ER Rev. 5.

[14] ER Section 9.3.2.4.5 (UN#09-319) states that the Thiokol site has approximately 49.2 ac of non-tidal wetlands and 14,411 LF of stream within the 619 ac Thiokol site. This table provides data primarily for an approximate 420-acre EPR site within the overall property boundary. Therefore the data on affected wetlands and streams in this table will differ from the data presented in ER Section 9.3.2.4.5 (UN#09-319). ~~[13]ER Section 4.1.1.1 claimed the CCNPP3 and supporting facilities would be located on 2,070 acres; ER Section 4.3.1.3 stated the construction of CCNPP3 would permanently fill approximately 8,350 LF of stream and 11.72 acres of delineated wetland areas~~

~~[14] RAI Section 9.3.2.4 states the former Thiokol site is a 620 ac property; RAI Section 9.3.2.4.5 states the Thiokol site has approximately 49.2 ac of non-tidal wetlands and 14,411 LF of stream (Source: National Wetlands Inventory, Branch of Resource and Mapping Support, Geospatial Data – The Wetlands Geo Web; U.S. Fish and Wildlife Service, Website: http://www.fws.gov/wetlands/. Accessed July 2008.)~~

Sources: USFWS, 2008. National Wetlands Inventory, U.S. Fish and Wildlife Service, CONUS_wet_poly, Classification of Wetlands and Deepwater Habitats of the United States, Washington, DC, FWS/OBS-79/31, National Wetlands Metadata, website: http://www.fws.gov/wetlands/Data/DataDownloadState.html, accessed: June 17, 2009.

MDNR, 2002. Wetlands of Special State Concern Data, Geospatial Data from the Maryland Department of Natural Resources, Metadata, website: http://dnrweb.dnr.state.md.us/gis/data/data.asp, accessed June 27, 2009.

Table 9.3-13 Summary of Wetlands on Alternate Sites

	Number of discrete wetlands or systems	Wetland types (NWI classification)	Description
Calvert Cliffs 3	5	1. Freshwater Forested/Shrub Wetland 2. Freshwater Pond 3. Freshwater Pond 4. Freshwater Forested/Shrub Wetland 5. Freshwater Pond	1. 4.7 ac of PFO[1] 2. 0.5 ac of PUB[2] 3. 0.02 ac of PUB 4. 0.5 ac of PFO 5. 0.9 ac of PUB
Bainbridge	~~3~~ 5	1. ~~Riverine~~ Freshwater Forested/Shrub Wetland 2. ~~Riverine~~ Freshwater Pond 3. Riverine 4. Riverine 5. Freshwater Forested/Shrub	1. ~~1.3~~ 3.7 ac 2. ~~0.8~~ 0.9 ac 3. ~~2.2~~ 1.3 ac 4. 3.2 ac 5. 0.7 ac
EASTALCO	~~8~~ 10	1. Freshwater Emergent Wetland 2. Freshwater Emergent Wetland 3. Freshwater Forested/Shrub Wetland 4. Freshwater Forested/Shrub Wetland 5. Freshwater Forested/Shrub Wetland 6. Freshwater Emergent Wetland 7. Riverine 8. Freshwater Emergent Wetland 9. Freshwater Emergent Wetland 10. Freshwater Forested/Shrub Wetland	1. 0.2 ac 2. 0.4 ac 3. 0.1 ac 4. 0.3 ac 5. 0.9 ac 6. 0.03 ac 7. 1.3 ac 8. 0.2 ac 9. 0.3 ac 10. 0.7 ac
Thiokol	~~5~~ 14	1. Freshwater Forested/Shrub Wetland 2. Freshwater Forested/Shrub Wetland 3. Freshwater Forested/Shrub Wetland 4. Freshwater Forested/Shrub Wetland 5. Freshwater Forested/Shrub Wetland 6. Freshwater Forested/Shrub Wetland 7. Freshwater Forested/Shrub Wetland 8. Freshwater Pond	1. 2.5 ac of PFO 2. 31.9 ac of PFO 3. 0.08 ac 4. 0.3 ac 5. 4.3 ac 6. 0.1 ac 7. 0.1 ac 8. 0.5 ac

		9. Freshwater Emergent Wetland 10. Freshwater Forested/Shrub Wetland 11. Freshwater Emergent Wetland 12. Estuarine and Marine Wetland 13. Estuarine and Marine Deepwater 14. Freshwater Emergent Wetland	9. 1.9 ac 10. 5.2 ac 11. 1.1 ac 12. 6.3 ac 13. 6.8 ac 14. 0.3 ac

[1] PFO is a palustrine forested wetland
[2] PUB is a palustrine unconsolidated bottom wetland
Sources: USFWS, 2008. National Wetlands Inventory, U.S. Fish and Wildlife Service, CONUS_wet_poly, Classification of Wetlands and Deepwater Habitats of the United States, Washington, DC, FWS/OBS-79/31, National Wetlands Metadata, website: http://www.fws.gov/wetlands/Data/DataDownloadState.html, accessed: June 17, 2009.
MDNR, 2002. Wetlands of Special State Concern Data, Geospatial Data from the Maryland Department of Natural Resources, Metadata, website: http://dnrweb.dnr.state.md.us/gis/data/data.asp, accessed June 27, 2009.

Table 9.3-14 Summary of Waterways on Alternate Sites

	Number of/names of streams	Stream type	Description
Calvert Cliffs 3	A. Johns Creek	A. Perennial	A. 4661 LF
	B. Tributary to the Bay	B. Perennial	B. 2093 LF
	C. Tributary of Johns Creek	C. Perennial	C. 7400 LF
	D. Goldstein Branch	D. Perennial	D. 2051 LF
	E. Tributary of Perrin Branch	E. Intermittent	E. 4517 LF
	F. Tributary of Perrin Branch	F. Perennial	F. 1083 LF
Bainbridge	A. Tributary of Susquehanna River	A. Perennial	A. 2638 LF
	B. Happy Valley Branch	B. Perennial	B. 6016 LF
	C. Tributary of Susquehanna River	C. Perennial	~~3. 1244 LF~~ C. 1279
	D. Tributary of Susquehanna River	D. Perennial	D. ~~319~~ 312 LF
	E. Tributary of Susquehanna River	E. Perennial	E. ~~319~~ 308 LF
	F. ~~Basin Run~~ Octoraro Creek	F. Perennial	F. ~~1429~~ 1433 LF
	G. ~~Octoraro Creek~~ Tributary to Octoraro Creek	G. Perennial	G. ~~1432~~ 185 LF
	~~H. Tributary of Octoraro Creek~~	~~H. Perennial~~	~~H. 183 LF~~
EASTALCO	A. Tributary of Tuscarora Creek	A. Perennial	A.2693 LF
	B. Tuscarora Creek	B. Perennial	B. 12319 LF
	C. Tributary of Tuscarora Creek	C. Intermittent	C. 6001 LF
	D. Tributary of Tuscarora Creek	D. Perennial	D. 3399 LF
	E. Tributary of Tuscarora Creek	E. Intermittent	E. 4634 LF
	F. Horsehead Run	F. Intermittent	F. 3898 LF
	G. Tributary of Tuscarora Creek	G. Intermittent	G. 120 LF
	H. Tuscarora Creek	H. Perennial	H. 745 LF
	I. Tributary of Tuscarora Creek	I. Perennial	I. 395 LF
	J. Tributary of Tuscarora Creek	J. Perennial	J. 327 LF
	K. Tributary of Tuscarora Creek	K. Perennial	K. 378 LF
	L. Tributary of Tuscarora Creek	L. Perennial	L. 403 LF
	M. Tributary of Tuscarora Creek	M. Perennial	M. 317 LF
Thiokol	A. Tributary of Burnt Mill Creek	A. Perennial	A. 5430 LF
	B. Rich Neck Creek	B. Perennial	B. 2250 LF
	C. Tributary of Burnt Mill Creek	C. Perennial	C. 312 LF
	D. Horse Landing Creek	D. Perennial	D. 486 LF
	E. Tributary of Persimmon Creek	E. Perennial	E. 332 LF
	F. Persimmon Creek	F. Perennial	F. 324 LF
	G. Tributary of Killpeck Creek	G. Perennial	G. 300 LF
	H. Killpeck Creek	H. Perennial	H. 300 LF
	I. Tributary of Patuxent Creek	I. Perennial	I. 445 LF
	J. Tributary of Patuxent Creek	J. Perennial	J. 354 LF
	K. Tributary of Patuxent Creek	K. Perennial	K. 308 LF
	L. Tributary of Patuxent Creek	L. Intermittient	L. 201 LF
	M. Tributary of Patuxent Creek	M. Perennial	M. 310 LF
	L. Swanson Creek	L. Perennial	L. 379 LF

Sources:
USFWS, 2008. National Wetlands Inventory, U.S. Fish and Wildlife Service, CONUS_wet_poly, Classification of Wetlands and Deepwater Habitats of the United States, Washington, DC, FWS/OBS-79/31, National Wetlands Metadata, website: http://www.fws.gov/wetlands/Data/DataDownloadState.html, accessed June 17, 2009.

MDNR, 2002. Wetlands of Special State Concern Data, Geospatial Data from the Maryland Department of Natural Resources, Metadata, website: http://dnrweb.dnr.state.md.us/gis/data/data.asp, accessed June 27, 2009.

Question 2: ESRP 9.3.2.2.4-4 and 9.3.2.3.4

Identify any other activities associated with construction and operation that would occur outside the proposed 420-ac footprint on the Bainbridge and EASTALCO sites, such as landfill use, transportation infrastructure upgrades, laydown yards, etc. that would impact terrestrial resources. Provide a list and quantify impacts to habitats, wetlands, and streams that would occur outside each 420-ac site.

Response

For the purposes of the evaluation of Alternate Sites versus the Calvert Cliffs site, land use impacts are assumed to be contained within the 420 acre site footprint and defined water and transmission line ROWs (see Terrestrial Ecology Question 1 response), for which associated impacts to land, wetlands, and streams outside the 420 acre footprint are quantified. Use of external landfills or other sites as described in the COLA ER are not expected or assumed to require upgrades or expansion to accommodate the Calvert Cliffs project or EPR site development at any Alternate Site.

COLA Impact

The COLA will not be revised as a result of this response.

Question 3: ESRP 9.3.2.2.4-4 and 9.3.2.3.4

Provide a list of data sources used to estimate impacts to terrestrial resources at the Bainbridge and EASTALCO sites and identify the assumptions made when estimating impacts at each site.

Response

BAINBRIDGE SITE

Assumptions made when estimating impacts to terrestrial resources at the Bainbridge site are described in the following paragraphs.

Federally-listed species. The puritan tiger beetle uses the sandy frequently disturbed bases of river bluffs in Maryland (USFWS, 1993). There is no suitable habitat at or adjacent to the Bainbridge Naval Training Center and the species would not be likely to occur there. The river banks where the proposed water intake and cooling water discharge would be located do not provide suitable habitat for this species.

The Bainbridge Naval Training Center contains no open canopy sedge meadows or fens. Absent this specialized habitat, the bog turtle would not occur on the site (USFWS, 2001).

The bald eagle may occur along the Susquehanna River as a transient or to forage. The current forest types and stand ages present within the Bainbridge Naval Training Center site are unlikely to contain trees suitable for nesting or roosting by bald eagles. In addition, the site contains no open water areas that would be suitable for foraging (Sibley, 2000). Therefore, the bald eagle would not be expected to occur on the site. The bald eagle may forage along the Susquehanna and Sassafras Rivers near the Bainbridge Naval Training Center site, but would not be impacted by the construction and operation of the facility.

The forested land on the site could support the Delmarva fox squirrel, but is marginal due to the lack of large diameter trees, relatively dense shrub layer, and lack of nearby row crop production (USFWS, 2001). The Delmarva fox squirrel is unlikely to occur on the Bainbridge Naval Training Center site.

The potential for impacts to the Delmarva fox squirrel from construction and operation of the facility and from installation of water and electrical transmission lines is SMALL. No other federally-protected terrestrial species would be impacted by the project.

State-listed species. While there are 32 state-protected terrestrial species known to occur in Cecil County with potential to occur within the proposed Bainbridge site, it is unlikely that many, if any, of these species would actually occur on the site. Mitigation measures that would be implemented during construction would minimize the potential for direct impacts. Any impacts to state-protected terrestrial species would likely be SMALL.

There is potential for impacts to the logperch, creeper, and map turtle, but mitigation features designed into the project would minimize that potential. The potential for impacts to state-protected aquatic species is SMALL.

The proposed water lines for the Bainbridge site would follow U.S. Highway 222 and be within or adjacent to previously disturbed land for most of their length. The potential for impacts to state-protected species from installation of the water lines would be SMALL.

The list of data sources used to estimate impacts to terrestrial resources at the Bainbridge site includes:

Maryland Department of Natural Resources, 2009b. Natural Heritage Program – RTE Animals – Hellbender, available at: http://www.dnr.state.md.us/wildlife/rtehellbender.asp, accessed August 24, 2009.

NatureServe Explorer, 2009a. Helionas bullata – L, available at: http://www.natureserve.org/explorer/servlet/NatureServe?searchName=Helonias+bullata, accessed August 21, 2009.

NatureServe Explorer, 2009b. Percina caprodes - (Rafinesque, 1818), available at: http://www.natureserve.org/explorer/servlet/NatureServe?sourceTemplate=tabular_report.wmt&loadTemplate=species_RptComprehensive.wmt&selectedReport=RptComprehensive.wmt&summaryView=tabular_report.wmt&elKey=106504&paging=home&save=true&startIndex=1&nextStartIndex=1&reset=false&offPageSelectedElKey=106504&offPageSelectedElType=species&offPageYesNo=true&post_processes=&radiobutton=radiobutton&selectedIndexes=106504, accessed August 24, 2009.

NatureServe Explorer, 2009c. Strophitus undulatus - (Say, 1817), available at: http://www.natureserve.org/explorer/servlet/NatureServe?sourceTemplate=tabular_report.wmt&loadTemplate=species_RptComprehensive.wmt&selectedReport=RptComprehensive.wmt&summaryView=tabular_report.wmt&elKey=107752&paging=home&save=true&startIndex=1&nextStartIndex=1&reset=false&offPageSelectedElKey=107752&offPageSelectedElType=species&offPageYesNo=true&post_processes=&radiobutton=radiobutton&selectedIndexes=107752, accessed August 24, 2009.

NatureServe Explorer, 2009d. Graptemys geographica - (Le Sueur, 1817), available at: http://www.natureserve.org/explorer/servlet/NatureServe?sourceTemplate=tabular_report.wmt&loadTemplate=species_RptComprehensive.wmt&selectedReport=RptComprehensive.wmt&summaryView=tabular_report.wmt&elKey=101200&paging=home&save=true&startIndex=1&nextStartIndex=1&reset=false&offPageSelectedElKey=105092&offPageSelectedElType=species&offPageYesNo=true&post_processes=&radiobutton=radiobutton&selectedIndexes=105092&selectedIndexes=103126&selectedIndexes=103688&selectedIndexes=103582&selectedIndexes=101200&selectedIndexes=105841&selectedIndexes=106155&selectedIndexes=106258&selectedIndexes=104337&selectedIndexes=105779&selectedIndexes=102685&selectedIndexes=817347&selectedIndexes=101897&selectedIndexes=104427&selectedIndexes=104282&selectedIndexes=102795&selectedIndexes=103963&selectedIndexes=103965, accessed August 24, 2009.

Rhodes, A.F. and T.A. Block, 2007. The Plants of Pennsylvania: An Illustrated Manual, Second Edition, University of Pennsylvania Press.

Sibley, D.A., 2000. The Sibley Guide to Birds of Eastern North America, The Audubon Society, 490 p. Note: Copyright protected. Electronic version not available for printing. Reference available for purchase.

U.S. Fish and Wildlife Service, 1993a. Puritan Tiger beetle (Cicindela puritana G. Horn.) Recovery Plan, Hadley, Massachusetts, 45 p.

U.S. Fish and Wildlife Service, 1993b. Delmarva Fox Squirrel (Sciurus niger cinereus) Recovery Plan, Second Revision, Hadley, Massachusetts, 104 p.

U.S. Fish and Wildlife Service, 2001. Bog Turtle (Clemmys muhlenbergii), Northern Population Recovery Plan, Hadley, Massachusetts, 103 p.

Weakley, A.S., 2009. Flora of the Carolinas, Virginia, and Georgia, and Surrounding Areas: Working Draft of 5 August, 2009, UNC Herbarium, North Carolina Botanical Garden, University of North Carolina at Chapel Hill.

EASTALCO SITE

Assumptions made when estimating impacts to terrestrial resources at the EASTALCO site are described in the following paragraphs.

Federally-listed species. The bald eagle is the only federally-protected species that may occur on or adjacent to the EASTALCO site and may occur along the Potomac River as a transient or to forage. There are no suitable nest or roost trees on the EASTALCO site and the site contains no open water areas that would be suitable for foraging. Therefore, the bald eagle would not be expected to occur on the site. The bald eagle may forage along the Potomac River, but would not be impacted by the construction and operation of the facility. No impacts to federally protected terrestrial species would be likely.

State-listed species. Of the 11 terrestrial state-protected animal species, only three may occur on the site (Butterflies and Moths of North America, 2009; Sibley, 2000; Whitaker and Hamilton, 1998). The green tiger beetle may occur along the bank of the Potomac River where pipes would be placed to reach the water intake and cooling water discharge locations. Pre-construction surveys, site design modifications, and implementation of mitigation measures would minimize the potential for impacts to this species. Bewick's wren may forage on the EASTALCO site, but there is no suitable nesting habitat on the site. Bewick's wren would be expected to leave the area during construction and no impacts to this species would be expected. The upland sandpiper may forage or nest on the site. Pre-construction surveys, site design modifications, and implementation of mitigation measures would minimize the potential for impacts to this species and no disturbance would occur until after young had fledged if active nests are found.

The EASTALCO site is highly disturbed, consisting primarily of row crop fields and fence rows. Only 3 of the 48 state-protected plant species that are known to occur in Frederick County could occur in these disturbed habitats (narrow-leaved horse gentian, potato dandelion, and tall dock), and none is likely to occur there (Rhoads and Block, 2007; Weakley, 2009). The potential for impacts to state-protected terrestrial species from development and operation of the site is SMALL. There are few state-protected species that could occur in the disturbed habitats present and none would be likely to occur. Implementation of mitigation measures would minimize the potential for impacts to state-protected species.

Proposed water intake lines, cooling water discharge lines, and electrical transmission lines to serve the EASTALCO site would likely cross undeveloped habitats and multiple streams.

Because these lines would disturb more natural communities than occur on the EASTALCO site, there would be a greater potential for impacts to state-protected species. Route adjustments to water lines and electrical transmission lines based on data from pre-construction surveys and mitigation measures that would be implemented during construction would minimize the potential for impacts. Any impacts to state-protected terrestrial species from construction of the proposed water intake and cooling water discharge lines and from construction of electrical transmission lines would likely be SMALL to MODERATE.

The list of data sources used to estimate impacts to terrestrial resources at the EASTALCO site is:

Butterflies and Moths of North America, 2009. Occurrence maps, species accounts, checklists, and photographs: Species detail, Edward's hairstreak, available at: http://www.butterfliesandmoths.org/species?l=1499, accessed August 24, 2009.

Rhodes, A.F. and T.A. Block., 2007. The Plants of Pennsylvania: An Illustrated Manual, Second Edition, University of Pennsylvania Press.

Sibley, D.A., 2000. The Sibley Guide to Birds of Eastern North America, The Audubon Society, 490 p. Note: Copyright protected. Electronic version not available for printing. Reference available for purchase.

Weakley, A.S., 2009. Flora of the Carolinas, Virginia, and Georgia, and Surrounding Areas: Working Draft of 5 August, 2009, UNC Herbarium, North Carolina Botanical Garden, University of North Carolina at Chapel Hill.

Whitaker, J.O., Jr. and W.J. Hamilton, Jr., 1998. Mammals of the Eastern United States, Third Edition, Comstock Publishing Associates, 583 p. Note: Copyright protected. Electronic version not available for printing. Reference available for purchase.

COLA Impact

The COLA will not be revised as a result of this response.

RAI No. 1017

Aquatic Ecology

Question 1: ESRP 9.3.2.2.5-2 and 9.3.2.3.5

No discussion was provided in the revised ER alternative site text about any Federally or state listed aquatic species. In particular, the possible occurrence of listed freshwater mussels in the Susquehanna River or Potomac River was not discussed. The environmental report prepared by the State of Maryland for the Catoctin Power Plant that was proposed for the Eastalco site in 2004 stated that the State of Maryland thought that Tuscarora Creek, which runs through the site, could be occupied by listed freshwater mussels.

State-listed freshwater mussels have been found within Cecil and Frederick Counties and a Federally listed mussel is listed from Cecil County (see revised ER Tables 9.3.5 and 9.3.6). Is it likely that Federally or State-listed freshwater mussels occur in the Susquehanna River near the Bainbridge site? Is it likely that Federally or State-listed freshwater mussels occur in the Potomac River near the Eastalco site? Is it likely that Federally or State-listed freshwater mussels occur in Tuscarora Creek on or near the Eastalco site? Provide the reasons for the conclusions. [Site Audit Information Need 36]

Response

It is the opinion of UNE that the level of screening level information available on state-protected aquatic species does not support any level of additional assessment for protected mussel species at the specific cooling water intake system (CWIS) location for the Bainbridge and EASTALCO sites or Tuscarora Creek. As described in the ER, there are known protected species (including mussels for at least one site) in the waterways representing the cooling water source for both sites. Based upon review of additional information, no readily accessible information on protected species at the specific locations of the CWIS for Bainbridge or EASTALCO was found.

According to testimony provided to the Maryland Public Service Commission relating to the Application of Catoctin Power, LLC relating to the construction of a power plant at the EASTALCO site, no threatened or endangered species were discovered during vegetative and wildlife surveys conducted in 2002 and there are no records of listed species occurring on the site (MDNR, 2004).

Since field investigations go beyond the required reconnaissance, UniStar has not conducted any site specific in-field assessments to support an analysis of potential rare, threatened, or endangered species at the rivers and streams associated with Alternate Sites. It is assumed, however, the adherence to permit conditions and application of appropriate construction and operation best management practices (BMPs) will negate significant short- and long-term impact to aquatic species inhabiting the water sources associated with each alternate site.

References

Maryland DNR, Maryland Power Plant Research Project, Interim Draft Environmental Review Catoctin Power Project, October 1, 2004

COLA Impact

The COLA will not be revised as a result of this response.

Question 2: ESRP 9.3.2.2.5-3 and 9.3.2.3.5

During the site tour on August 18, 2009, Eastalco staff mentioned that Tuscarora Creek was a designated trout stream but there was uncertainty about whether this designation applied to the section of stream that is on the site. Identify the entity that designates trout streams? Is Tuscarora Creek a designated trout stream? If so, what portions of the creek are so designated and how does this affect any potential impacts to the creek or wetlands associated with it? [Site Audit Information Need 36]

Response

The Maryland Department of Natural Resources (MDNR) has jurisdiction over trout streams in the state.

Tuscarora Creek is neither designated a habitat for the native Brook Trout nor is it stocked by DNR with Rainbow or Brown Trout. It is not designated as a trout stream.

According to the MDNR (Adoption Statement, Maryland Brook Trout Management Plan, 2006) the Little Tuscarora Creek, a tributary of Tuscarora Creek, is listed as Brook Trout habitat. The Little Tuscarora Creek and its tributaries are located west of Route 15 in the hills leading to South Mountain. Although the specific reaches of the Little Tuscarora Creek, its Clifford Branch, and another unnamed tributary, are not specified it is estimated that these waters are more than three miles from the EASTALCO site.

Tuscarora Creek is a subwatershed of the Upper Monocacy River (UMR) watershed system. The MDNR conducted a Stream Corridor Assessment of the UMR watershed and surveyed a 21 mile reach of Tuscarora Creek (MDNR, 2004). The results indicated the Tuscarora Creek watershed had the highest percentage of urban land use and eroded areas when compared to the five other subwatersheds (MDNR, 2004). Large areas of inadequate stream buffers and several fish barriers were also observed during the survey.

The EASTALCO site is predominately agricultural lands. Trout prefer clean, cold water streams, and to maintain cooler stream temperatures and filter agricultural and urban runoff, a large riparian buffer is ideal (MDNR, 2007 and Watershed and Clean Water Grants Program [WCWGP], 2002). For example, Baltimore County, Maryland passed an ordinance requiring maintenance of a 100 ft. riparian buffer around trout streams (Baltimore County, no date). The agricultural lands on the EASTALCO site have led to narrow riparian buffers. As a result, the Tuscarora stream is poorly shaded and stream temperatures would likely be warmer than trout-preferred cold habitats. The small riparian buffer, along with the results of the UMR watershed assessment, indicates trout species are not likely to occur on the EASTALCO site.

The U.S. Fish and Wildlife Service (USFWS) and the U.S. Park Service conducted a study from May 2004, to July 2007, to assess the status and life history of the shortnose sturgeon in the Potomac River (USFWS, 2009a). The results indicated adult habitat for the sturgeon is present in the Potomac River, and several individuals have been detected in different reaches of the river using telemetry methods (USFWS, 2009a and USFWS, 2009b). A female shortnose sturgeon was captured at Cole's Point in Virginia within 10 miles of the Former Thiokol Site

(USFWS, 2009a). The other telemetry observations were further upstream from the site between the Route 301 Bridge and Chain Bridge located north of Washington DC (USFWS, 2009a). However, the study failed to prove whether shortnose sturgeon spawning occurs in the river (USFWS, 2009a).

REFERENCES

EPA, 2006. Model Ordinances to Protect Local Resources, Aquatic Buffers, Language from Baltimore County, MD; Buffer Protection and Management Ordinance, Baltimore County, MD, Environmental Protection and Resource Management, available at: http://www.epa.gov/nps/ordinance/buffers.htm, accessed August 25, 2009.

Maryland Department of Natural Resources (MDNR), 2007. Maryland DNR – Fisheries Service – Fish Facts: Brook Trout, available at: http://www.dnr.state.md.us/fisheries/fishfacts/brooktrout.asp, accessed August 24, 2009.

Maryland Department of Natural Resource (MDNR), 2004. Upper Monocacy River Stream Corridor Assessment Survey, Watershed Assessment and Targeting Division, Watershed Services.

U.S. Fish and Wildlife Service (USFWS), 2009a. Shortnose Sturgeon in the Potomac River, U.S. Fish and Wildlife Service Update, Maryland Fishery Resources Office, July 2009, available at: http://www.fws.gov/northeast/marylandfisheries/reports.html, accessed August 25, 2009.

USFWS, 2009b. Maryland Fishery Resources Office Northeast Region, Shortnose Sturgeon Monitoring Program, available at: http://www.fws.gov/northeast/marylandfisheries/projects/Shortnose%20Sturgeon.html, accessed August 24, 2009.

Watershed and Clean Water Grants Program (WCWGP), 2002. Riparian Forest Buffers: A Restoration Solution for Maryland's Chesapeake Bay Program, January 2002, available at: http://na.fs.fed.us/watershed/factsheets/Riparian.pdf, accessed August 24, 2009.

Maryland DNR, Adoption Statement, Maryland Brook Trout Management Plan, 2006

COLA Impact

The COLA will not be revised as a result of this response.

Question 3: ESRP 9.3.2.2.5-4 and 9.3.2.3.5

What is the importance of commercial and recreational fishing in the stretch of both the Potomac and Susquehanna rivers that would most likely to be affected by the installation and operation of the proposed cooling water intake and discharge system at the Eastalco and Bainbridge sites compared to other regions of the river? [Site Audit Information Need 38]

Response

The Potomac and Susquehanna Rivers are both known to be popular for recreational fishing, however no evidence of commercial fishing in these waterways in the vicinity of the proposed CWIS structures was found during site evaluation, nor was any significant differentiation among the use data for the downstream segments of these rivers evident in the data reviewed.

During the period of construction, recreational fishing in the vicinity of the intakes and outfalls would be affected. Subsequent to the completion of construction there would be little or no impacts upon recreational fishing with the exception of the small waterside exclusion areas.

COLA Impact

The COLA will not be revised as a result of this response.

Question 4: ESRP 9.3.2.2.5-5 and 9.3.2.3.5

The installation of intake/discharge facilities could differ substantially depending on the substrate present in the water bodies affected and methods required for the installation. The ER alternative site text for the EASTALCO site, Section 9.3.2.2.5, states that dredging in the Potomac River would be necessary without considering whether the substrate in that stretch of the river is sediment or rock. Should the substrate be primarily rocky, excavation, which could include blasting, might be required.

The aquatic ecology section 9.3.2.2.5 also does not consider the potential use of horizontal directional drilling (HDD), which is mentioned in the revised ER text (Section 9.3.2.3.8) as possibly being necessary to construct the EASTALCO pipeline through the C&O Canal National Historic Place. Use of HDD (or similar methodology) also could require drilling into the Potomac River. The text of ER section 9.3.2.2.5 describes the same dredging process and impacts for the Bainbridge site. Based on observations made during the site visit, dredging may be a reasonable presumption for the Bainbridge site, but not necessarily for the EASTALCO site, which likely could occupy a somewhat rocky part of the Potomac River. Describe the potential differences in impacts from the installation at each site.

What are the potential impacts, including the potential for blasting and impacts associated with HDD or similar methodology, to aquatic resources within the Potomac River from the installation of the intake/discharge pipeline(s) and facilities for the EASTALCO site?

Response

It is understood and expected that the different environmental conditions found within the waterways serving the alternate sites as cooling water sources would have varying levels of sensitivity to CWIS installation and operation. Assumptions defining the potential for impacts such as substrate material could be made (lower Potomac expected to have soft substrate bottom, Susquehanna assumed to be rocky), however the local site-specific conditions could vary widely from these generalizations, and the selection of specific sites for intake and discharge structures would be based in part upon obtaining sites that would optimize constructability as well as minimizing environmental impacts. Data were not used in the evaluation of potential impacts to the aquatic environment in site scoring. Rather, it was assumed that technology would be adjusted to fit the varying conditions among the alternate sites to regulate impacts, and consequently differences in projected aquatic impacts among the alternate sites is moderated.

It has been assumed throughout the site evaluation process that the method of in-water work most protective of the environment would be used, such as employment of HDD technology or micro tunneling as applicable, rather than use of cut and cover or surface lay with armament installation options. However, the use of these techniques can not be asserted with any certainty. Limited data on topics such as specific local soil characteristics and geology, scouring velocity and substrate material in the location of the CWIS components prevents the descriptions in the ER from being more definitive in their descriptions of work methodology. The acquisition of such data clearly exceeds reconnaissance.

It is assumed and stated in the ER that the underwater disturbance associated with CWIS installation and operation will be approximately one-half acre. This area will likely be affected regardless of the methods of in-water work. If use of a coffer dam to be able to work in the dry or simple employment of siltation curtains is a suitably protective method for the work area, such

methods would be employed to protect the environment during in-water work. Consequently, impacts of operation outside of the ½ acre work area are expected to be minimal and comparable among alternate sites. Major differentiators in predicting impacts to the aquatic environment would be factors such as exceptional water depth, an unusually high concentration of protected species, or specially designated habitats or water quality classification, and in this regard the EASTALCO, Bainbridge, and Thiokol alternates are not easily differentiated based on available data.

Blasting might be required, with a potential in the Susquehanna and upper Potomac based on the general characteristics of the region and visible rocky substrate. Dredging of up to ½ acre is assumed to be required for the work required at Bainbridge to allow CWIS installation, and would require HDD or a similar technology to access the CWIS offshore in-water location. Ultimately, however, the assumption of ½ acre of direct in-water impact and employment of BMPs to avoid secondary and incidental impacts is meant to be applied to all alternate sites, and with these assumptions impacts to aquatic organisms are minimized and secondary impacts controlled, regardless of the waterway-specific differences among the alternate sites.

In the absence of a specific design concept for the intake and discharge structures, it can be assumed that some amount of dredging in the area of the river bank will be necessary at all of the sites, however it is not possible to define the need for, as well as the extent and nature of, excavation of the river bottom. The evaluation of design alternatives would consider the physical conditions at the site and the water body, potential environmental impacts, potential operational impacts and costs.

COLA Impact

The COLA will not be revised as a result of this response.

Question 5: ESRP 9.3.2.2.5-7, 9.3.2.3.5, and ESRP 9.3.2.2.4-1

Clarify the description of the numbers, sizes, and potential impacts to streams, ponds, and wetlands on the Bainbridge and Eastalco sites. For example, the ER text states (p. 19) that the Bainbridge site "contains several small ponds and no streams or other wetlands ...." However, during the visit the staff observed a pond, two streams, and a large stand of Phragmites, which is likely indicative of a wetland, on the site. Additionally, ER Tables 9.3-12 through 9.3-14 indicate that there are wetlands and streams on the Bainbridge and Eastalco properties. The total acreage of wetlands and linear feet of streams at the alternative sites does not appear to be calculated consistently. There are similar inconsistencies between the text and tables regarding the numbers of streams on the Eastalco site. Please clarify these discrepancies regarding the presence of ponds, streams, and wetlands at the Bainbridge and Eastalco sites.

Response

The text in the ER, such as that quoted from page 19, was completed based upon screening level (desktop) data consistently applied to all of the sites evaluated, and was not revised based upon observations made during site visits completed months after the evaluation, scoring, and selection of Alternate Sites. Observation of potential wetland areas such as the observation of Phragmites at the Bainbridge site made after the ER text was written also were not included in the Alternate Site evaluation process or discussed in supporting documentation.

While information gained during the alternative site audit, such as the observation of wetlands, is considered in regard to the potential to make significant changes in the site scoring and Alternative Site designation, the overall alternative site evaluation process does not include a requirement to rescore each Alternate Site based on in-field observations. Also, because there are wetlands present on the site they are not necessarily included in the plant footprint associated with the site.

To properly evaluate the description of wetlands located on the Alternative Sites and their respective water or transmission line rights-of way (ROW), it is important to have the set of associated figures prepared in support of off-site wetland and stream impact evaluation. These figures are located within the CC3 READING ROOM, and show the potential locations of water and transmission line ROWs, as well as all wetlands and streams located upon them based on screening level data, where they fall within the Alternate Sites or ROWs, and whether or not they would potentially be impacted by construction.

As shown on the READING ROOM figure set and (corrected versions of) Tables 9.3-12, 9.3-13, and 9.3-14, small amounts of wetlands and streams are found on the Bainbridge and EASTALCO sites, and the ER text has been edited to consistently reflect this. Total and impacted areas of wetlands and streams on both the entire property, the 420 acre EPR development site and off site ROW's are presented in Table 9.3-12.

COLA Impact

The COLA ER Tables 9.3-12, 9.3-13, and 9.3-14 will be revised to reflect the latest wetland and stream impact revisions. The markup of these tables is provided with the response to RAI No. 1016 Question 1.

Question 6: ESRP 9.3.2.3.5-1

The ER alternative sites text did not discuss potential impacts to the Potomac river from siting a reactor and its associated structures at the EASTALCO site. In the resolution table (enclosure 1 of the 8/29/2009 submittal) it states a report was prepared to address potential impacts to any Virginia State-listed species that could occur in the Potomac River near the EASTALCO site, but it was not attached. Provide the topical report referred to in the resolution table. [Information Needs 36]

Response

ER Section 9.3.2.3.5 does discuss potential construction and operational impacts to the Potomac River from siting a reactor and associated structures at the EASTALCO site beginning in the fourth paragraph of that section. The topical report referred to in Enclosure 1 of the 8/29/09 submittal is provided below in its entirety.

The Virginia Department of Game and Inland Fisheries (VDGIF) maintains a list of special status faunal species for Virginia (VDGIF, 2009). The list was compared to species information for Cecil, Frederick, St. Mary's and Calvert counties in Maryland (UniStar Nuclear Services, LLC, 2009). Species protected in either Maryland or Virginia that occur in the Maryland counties are listed in Table 1 below. Although Cecil and Calvert counties do not abut Virginia, they are included for reference. No species protected only in Virginia were identified.

Table 1
Threatened and Endangered Species regulated in Maryland and Virginia

County/Species	Federal Status	Maryland Status	Virginia Status
Cecil			
Shortnose sturgeon (Acipenser brevirostrum)	E	E	E
Bog turtle (Glyptemys muhlenbergii)	T	T	E
Bald eagle (Haliaeetus leucocephalus)	-	T	T
Frederick			
Brook floater (Alasmidonta varicose)	-	E	E
Upland sandpiper (Bartramia longicauda)	-	E	T
Bald eagle (Haliaeetus leucocephalus)	-	T	T
Loggerhead shrike (Lanius ludovicianus)	-	E	T
Green floater (Lasmigona subviridis)	-	E	T
Bewick's wren (Thryomanes bewickii)	-	E	E
St. Mary's			
Dwarf wedgemussel (Alasmidonta heterodon)	E	E	E

Table 1
Threatened and Endangered Species regulated in Maryland and Virginia

County/Species	Federal Status	Maryland Status	Virginia Status
Bald eagle (Haliaeetus leucocephalus)	-	T	T
Calvert			
Bald eagle (Haliaeetus leucocephalus)	-	T	T

E = endangered
T = threatened

Sources: UniStar Nuclear Services, LLC, 2009; VDGIF, 2009

No formal coordination with Virginia is needed to permit a facility on a waterbody forming the border between the states. However, if there is potential for impacts to federally listed species, coordination with the U.S. Fish and Wildlife Service will be required.

Both Maryland and Virginia serve on the Chesapeake Bay Program along with the U.S. Environmental Protection Agency (USEPA) and other stakeholders. That program is currently developing a Total Maximum Daily Load (TMDL) for the Chesapeake Bay watershed (CBP, 2009). The TMDL is scheduled for completion in 2010. Although the TMDL is focused on nutrient and sediment loading, it could affect discharge limits from the proposed facility (USEPA, 2009).

REFERENCES

Chesapeake Bay Program, 2009. Water Quality Steering Committee, available on: http://www.chesapeakebay.net/committee_wqsc_info.aspx?menuitem=16618, accessed August 24, 2009.

UniStar Nuclear Services, LLC, 2009. Calvert Cliffs Nuclear Power Plant Unit 3, Combined License Application, Part 3: Environmental Report, Rev. 5, June

United States Environmental Protection Agency (USEPA), 2009. Chesapeake Bay TMDL, available at: http://www.epa.gov/chesapeakebaytmdl/, accessed August 24, 2009.
Virginia Department of Game and Inland Fisheries (VDGIF), 2009. Wildlife Information, available at: http://www.dgif.virginia.gov/wildlife/, accessed August 24, 2009.

COLA Impact

The COLA will not be revised as a result of this response.

Question 7: ESRP 9.3

The August 29, 2009 submittal of ER section 9.3 provided some textual description of the intake and discharge pipelines, transmission line(s), and the intake and discharge locations for the Bainbridge and Eastalco sites. In order to do a comparison among all the alternative sites and the proposed site, provide a more detailed textual description of the intake and discharge pipeline(s), transmission line(s), and the intake and discharge locations that includes a compass direction in which the pipelines will travel from the site to the water source (intake and discharge locations), transmission line right-of-way width and length (in feet or miles) with the compass direction in which the transmission lines will travel from the site to the substation, and location of the intake and discharge structures. Also provide a map or textual description of the 420 ac site with the major plant components such as the substation, the nuclear footprint, cooling towers, etc. Describe the numbers and sizes of the streams and wetlands that would be affected (such as was provided for Thiokol) and describe the potential impacts to aquatic resources from construction onsite and within the pipeline routes and transmission corridors. Describe any methods or procedures that will be used to avoid sensitive habitat or Federally or state listed threatened and endangered species. [Related to Site Audit Information Need 37 and 39]

Response

Figures have been prepared to address the request to describe transmission and water line corridor ROWs, and are located within the CC3 READING ROOM. These figures show the potential locations of water and transmission line ROWs, wetland and streams within the ROWs, and major land use features along the corridors and adjacent to the cooling water intake locations.

Tables 9.3-12 to 9.3-14 provides the numbers, sizes, types, and references to the locations of streams and wetlands located on the Alternative Sites and associated water and transmission ROWs. Location references are tied to the project layout and ROW figures located within the CC3 READING ROOM. Tables 9.3-12 to 9.3-14 also provide assumptions made in the calculation of wetlands and streams within Alternative Sites and associated ROWs, as well as select construction standards used in impact calculations, such as water pipeline ROW characteristics as requested.

As described in Table 9.3-12, the calculation of impacts to streams and wetlands on ROWs assumes that such features falling within the ROW width (120 feet for water line ROW, 300 feet for transmission ROW) are impacted. It is expected that construction operations will be completed entirely within the ROWs, and that no additional off site support areas are needed. It is also assumed that while a conversion in type may occur; wetlands within ROWs may be restored. Because the range of ROW impacts among the Alternative Sites is small (0 to 3.2 acres total), no additional consideration of the effects of change in wetland type (e.g. forested to emergent) resulting from long term ROW maintenance has been included.

The text of the ER does not provide significant detail on the land types that the water and transmission ROWs traverse. For context in comparing the ROWs and land use impacts, the following is provided for reference:

- The Bainbridge potential water pipeline ROW is predominantly broad leaf deciduous forest, with a small component crossing existing roadway. The potential Bainbridge transmission ROW that is not composed of existing maintained ROW is predominantly deciduous forest, single family residential, and agricultural land uses.

- The EASTALCO potential water and transmission corridor ROWs are almost entirely agricultural lands, with a small component of existing paved and unpaved roadways.
- The potential Thiokol water ROW is routed along a road through an area of deciduous forest, and the potential transmission ROW is a mix of forested and active agricultural lands.

No extraordinary methods were proposed for the specific purpose of avoiding threatened or endangered species at the Alternative Sites and associated ROWs. This is based upon both the lack of any predicted major disturbance to habitats supporting state or federally protected species and the standardized use of BMPs and adherence to policies considered protective of natural resources. As mentioned in the response to Question 4. (ESRP 9.3.2.2.5-5 and 9.3.2.3.5), it has been assumed throughout the site evaluation process that the methods used for construction that are most protective of the environment would be employed, such as employment of HDD. It is also expected that implementation of the most effective available BMPs would be required by regulatory permit conditions.

It is assumed that regulatory restrictions, including time-of-year restrictions for in-water work and tree clearing restrictions for sensitive bird and bat periods would be followed during construction of any EPR site, and that advancement of development plans for any project would bring into view necessary restrictions needed to be appropriately protective of protected and common fish and wildlife species. From an alternative site evaluation perspective, any differences in the ability to construct and operate an EPR resulting from concessions made to accommodate protected wildlife species was not found to be a significant differentiator among sites.

COLA Impact

The COLA will not be revised as a result of this response.

RAI No. 1018

Socioeconomics (this RAI is not related to Alternative Sites)

Question 1: ESRP 2.5.2.2-1 and 5.8.2

Because millage rates go up and down, evaluation of taxes as part of the community characteristics requires more historical tax information than can be obtained from the single year (2005) previously furnished.

Provide the following tax-related information:

1. Property tax payments that Constellation has made to Calvert County over the 1999-2008 period.
2. Proportion of Calvert County's tax revenues attributed to Units 1 and 2.
3. Reasonable estimates of the expected annual tax benefits (specifically, property taxes) expected to be paid during constructing and operations.
4. Submit on the docket so it can be referenced, estimates of the approximate percentage of Calvert County tax revenues that would be attributed to Unit 3.

Response

This information has been provided in letter UN# 09-354 dated September 16, 2009.

COLA Impact

The COLA will not be revised as a result of this response.