

PMBelCOL PEmails

From: Spink, Thomas E [tespink@tva.gov]
Sent: Wednesday, August 13, 2008 9:01 AM
To: Mallecia Hood; Tomeka Terry; William Burton
Cc: Sterdis, Andrea Lynn; Neil Haggerty
Subject: Courtesy email copy of TVA's Response to Environmental Report - LTR 33 - ALTERNATIVE SITE SCREENING PROCESS
Attachments: ER Ltr 33 - Alt_RAI#02 _For Signature_.pdf

Mallecia:

I have enclosed a pdf copy of our response to two RAI's related to Alternative Sites / Alternative Plant Systems with this email as a courtesy. As always, the official submittal has been submitted to the Document Control Desk via paper copy using Federal Express services. The paper copy should arrive on August 13, 2008.

If you have any questions, please do not hesitate to call me.

Thomas E. Spink

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Tennessee Valley Authority, 1101 Market Street, LP 5A, Chattanooga, Tennessee 37402-2801

August 12, 2008

10 CFR 52.80

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

In the Matter of)
Tennessee Valley Authority)

Docket Numbers 52-014 and 52-015

**BELLEFONTE COMBINED LICENSE APPLICATION – RESPONSE TO
ENVIRONMENTAL REPORT REQUEST FOR ADDITIONAL INFORMATION –
ALTERNATIVE SITE SCREENING PROCESS**

Reference: Letter from Mallecia Hood (NRC) to Ashok S. Bhatnagar (TVA), Request for Additional Information Regarding the Environmental Review of the Combined License Application for Bellefonte Nuclear Plant, Units 3 and 4, dated July 11, 2008 [ML081840493].

This letter provides the Tennessee Valley Authority's (TVA) response to two of the Nuclear Regulatory Commission's (NRC) request for additional information (RAI) items included in the reference letter.

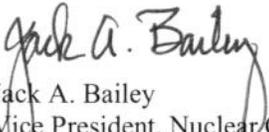
The enclosure to this letter provides a response to two of the NRC RAIs related to Alternative Sites / Alternative Plant Systems, as well as identifying any associated changes that will be made in a future revision of the BLN application. The status of the alternative sites / alternative plant systems RAIs is also provided in the enclosure.

If you should have any questions, please contact Thomas Spink at 1101 Market Street, LP5A, Chattanooga, Tennessee 37402-2801, by telephone at (423) 751-7062, or via email at tespink@tva.gov.

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August 12, 2008

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

Executed on this 12th day of AUG, 2008.



Jack A. Bailey
Vice President, Nuclear Generation Development
Nuclear Generation Development & Construction

Enclosures:

Responses to Environmental Report Requests for Additional Information –
Alternative Sites / Alternative Plant Systems

Attachment:

9.3-1/2 Tennessee Valley Authority, "Site Screening Process: Information
Complementary to Section 9.3.2 of the Bellefonte Nuclear Plant, Units 3 and 4,
COLA Applicant's Environmental Report," Rev. 0, August 2008. (Entire
document)

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cc (Enclosure and Attachment):

M. A. Hood, NRC/HQ

cc (w/o Enclosure and Attachment):

S.P. Frantz, Morgan Lewis

M.W. Gettler, FP&L

R.C. Grumbir, NuStart

P.S. Hastings, NuStart

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M.C. Kray, NuStart

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R.F. Smith-Kevern, DOE/HQ

G.A. Zinke, NuStart

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cc (w/o Enclosure and Attachment):

G.P. Arent, EQB 1A-WBN

A.S. Bhatnagar, LP 6A-C

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A. L. Sterdis, LP 5A-C

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EDMS, WT CA-K

ENCLOSURE
RESPONSE TO ENVIRONMENTAL REPORT REQUESTS FOR ADDITIONAL INFORMATION
ALTERNATIVE SITES / ALTERNATIVE PLANT SYSTEMS

**RESPONSE TO ENVIRONMENTAL REPORT
REQUESTS FOR ADDITIONAL
INFORMATION**

**ALTERNATIVE SITES /
ALTERNATIVE PLANT SYSTEMS**

Responses to Environmental Report Requests for Additional Information – Alternative Sites/Alternative Plant Systems

This enclosure provides the status of the nine requests for additional information (RAI) related to Alternative Sites/Alternative Plant Systems and provides the BLN responses to two of these requests.

Status of Requests for Additional Information Related to Alternative Sites and Alternative Plant Systems

<u>RAI Number</u>	<u>Date of TVA Response</u>
• 9.2-1	August 11, 2008. (Reference 2)
• 9.3-1 ^(a)	This letter – see following pages.
• 9.3-2	This letter – see following pages.
• 9.3-3	July 30, 2008. (Reference 1)
• 9.3-4	July 30, 2008. (Reference 1)
• 9.3-5	August 11, 2008. (Reference 2)
• 9.3-6	July 30, 2008. (Reference 1)
• 9.3-7	August 11, 2008. (Reference 2)
• 9.3-8	August 11 2008. (Reference 2)

(a) NRC issued two requests with the same RAI Number 9.3-1, one related to Alternative Sites and Alternative Plant Systems and one related to Historic and Cultural Resources. RAI Number 9.3-1 referred to in this table is related to Alternative Sites and Alternative Plant Systems, and will be addressed in a TVA submittal expected by August 6, 2008. RAI Number 9.3-1 related to Historic and Cultural Resources was addressed in TVA's letter dated July 30, 2008 (Reference 1).

Reference:

1. Letter from Andrea L. Sterdis (TVA) to NRC Document Control Desk, "Bellefonte Combined License Application – Response to Environmental Report Request for Additional Information – Criteria and Basis for Comparative Ratings Among Alternative Sites," dated July 30, 2008.
2. Letter from Jack A. Bailey (TVA) to NRC Document Control Desk, "Bellefonte Combined License Application – Response to Environmental Report Request for Additional Information – Alternative Sites / Alternative Plant Systems," August 11, 2008.

TVA Letter Dated: August 12, 2008

Responses to Environmental Report Requests for Additional Information – Alternative Sites/Alternative Plant Systems

NRC Review of the BLN Environmental Report

NRC Environmental Category: ALTERNATIVE SITES / ALTERNATIVE PLANT SYSTEMS

NRC RAI NUMBER: 9.3-1

Describe the systematic screening process to select alternative sites and optimization model that supported this process (Section 9.3.2.2).

BLN RESPONSE:

TVA's response to this RAI is presented in the attached siting report titled, "Site Screening Process: Information Complementary to Section 9.3.2 of the Bellefonte Nuclear Plant, Units 3 and 4, COLA Applicant's Environmental Report." This siting report provides the requested background on: 1) the portion of the siting process TVA historically used for identification and screening of generation sites, and 2) the relationship of that process to the present evaluation of siting options for the AP1000 reactors (i.e., how the current suite of candidate sites was derived and why they remain the suite of superior sites). The general relationship between the earlier TVA screening process and the current decisions is also addressed in this siting report. The additional information provided in the attached report is complementary to that presented in ER Subsection 9.3.2.

This response is PLANT-SPECIFIC.

ASSOCIATED BLN COL APPLICATION TEXT CHANGES:

None.

ATTACHMENT:

The following document is provided as Attachment 9.3-1/2, to this enclosure:

9.3-1/2 Tennessee Valley Authority, "Site Screening Process: Information Complementary to Section 9.3.2 of the Bellefonte Nuclear Plant, Units 3 and 4, COLA Applicant's Environmental Report," Rev. 0, August 2008. (Entire document)

TVA Letter Dated: August 12, 2008

Responses to Environmental Report Requests for Additional Information – Alternative Sites/Alternative Plant Systems

NRC Review of the BLN Environmental Report

NRC Environmental Category: ALTERNATIVE SITES / ALTERNATIVE PLANT SYSTEMS

NRC RAI NUMBER: 9.3-2

Provide a description and documentation of the “high-level screening assessments of numerous sites” referred to in paragraph 2 of Section 9.3.2.2.

BLN RESPONSE:

The attached TVA siting report, “Site Screening Process: Information Complementary to Section 9.3.2 of the Bellefonte Nuclear Plant, Units 3 and 4, COLA Applicant’s Environmental Report”, provides a description of process used to perform the high-level screening assessment referred to in the second paragraph of ER Subsection 9.3.2.2. The additional information provided in the attached report is complementary to the information provided in ER Subsection 9.3.2.

This response is PLANT-SPECIFIC.

ASSOCIATED BLN COL APPLICATION TEXT CHANGES:

None

ATTACHMENT:

The following document is provided as Attachment 9.3-1/2, to this enclosure:

- 9.3-1/2 Tennessee Valley Authority, “Site Screening Process: Information Complementary to Section 9.3.2 of the Bellefonte Nuclear Plant, Units 3 and 4, COLA Applicant’s Environmental Report,” Rev. 0, August 2008. (Entire document)

ATTACHMENT 9.3-1/2
TENNESSEE VALLEY AUTHORITY
SITE SCREENING PROCESS: INFORMATION COMPLEMENTARY TO SECTION 9.3.2
OF THE BLN COLA APPLICANT'S ENVIRONMENTAL REPORT
REV. 0, AUGUST 2008

Tennessee Valley Authority

Site Screening Process:

**Information Complementary to Section 9.3.2
of the Bellefonte Nuclear Plant, Units 3 and 4,
COLA Applicant's Environmental Report
(54 Pages)**

**Rev. 0
August 2008**

Site Screening Process

**Information Complementary to Section 9.3.2 of the
Bellefonte Nuclear Plant, Units 3 and 4, COLA
Applicant's Environmental Report**

**Revision 0
August 2008**

**Site Screening Process:
Information Complementary to Section 9.3.2 of the
Bellefonte Nuclear Plant, Units 3 and 4, COLA Applicant's Environmental Report**

Two sequential processes resulted in proposal of the Bellefonte Nuclear Plant, Units 3 and 4 (BLN) site as Tennessee Valley Authority's (TVA) preferred location for the siting of two AP1000 reactors in the present Combined License Application (COLA). The first was an historical process (described in this report) screening from a universe of potential sites down to a reasonably manageable number of candidate sites for further assessment and their comparison in previous TVA Final Environmental [Impact] Statements (FESs). These FESs resulted in the selection of superior sites for inventory and licensing as facilities for nuclear generation. The subsequent process comparing the current suite of candidate sites for AP1000 siting is discussed in the TVA COLA Applicant's Environmental Report (ER) and a companion document provided to NRC staff as the TVA alternative sites report titled, "Criteria and Basis for Comparative Ratings Among Alternative Brownfield and Greenfield Sites" (Reference 1).

The purpose of this present siting report is to provide background on: 1) the portion of the process TVA historically used for identification and screening of generation sites and 2) the relationship of that process to the present evaluation of siting options for the AP1000 reactors (i.e., how the current suite of candidate sites was derived and why they remain the suite of superior sites). The general relationship between the earlier TVA screening process and the current decisions is shown in Figure 1. This information is complementary to that presented in Section 9.3.2 of the ER.

Overview

During the late 1960s and throughout the 1970s, TVA conducted studies to identify and investigate sites within the TVA Region of Interest (ROI) meeting the basic requirements for future generating facilities (Reference 2). The early screening evaluations were generic, long-term, ongoing studies whose purpose was to review large geographical areas and to identify, investigate and select sites meeting the objectives noted below. The TVA Power Service Area (PSA) was divided into five general areas (Reference 2) in which sites were to be identified in order to serve power demand needs and reduce requirements for additional transmission infrastructure. Subsequent to their identification through the site screening process, the most suitable sites within the areas were acquired and placed in inventory status until such time that a specific project would be designated for that site. The surveys were confined to areas near the Tennessee and Cumberland River systems to provide adequate cooling water supplies.

Power plant siting, as conducted by TVA, was an interdisciplinary approach in which engineering, economic, and environmental factors were included. The power plant siting process used by TVA for the proposed BLN project is summarized in Section 9.3.2 of the ER. Two general summary descriptions of the logic and process are available (Reference 2), but searches of historic TVA electronic and hardcopy files both at TVA and the National Archives facilities in Georgia and

Pennsylvania where historical TVA records are housed, did not recover data on criteria rankings for specific sites.

TVA initially (late 1960s through 1970s) utilized a three-phase interdisciplinary approach (Phase 1 was later subdivided into two phases) to screening and selection of sites (Reference 3). "Compatibility" determinations in Phase 1 included use of exclusionary criteria such as those identified in Table 1. During this phase, 1) regional screening was conducted to compile and use available, interdisciplinary information (principally office-level studies) pertinent to siting a power generating facility; 2) the sites which appeared most feasible to consider further were identified, and 3) sites were screened for compatibility with objectives and a decision was reached to either reject a site or obtain the necessary rights from landowners to conduct studies in the succeeding phases. The primary goal of this phase was to determine if there were any characteristics about the sites that would preclude their use for construction of a power generating facility, and to develop a preliminary consideration of which were the better sites. Although exclusionary criteria (Table 1) were primarily considered in Phase I, key suitability criteria such as those affecting water availability or use were also considered. Phase II more strongly focused on use of the detailed information identified as "Evaluative" or "suitability" criteria in Table 1 to provide a basis for comparing candidate sites. Phase III consisted of in-depth engineering, environmental and other detailed on-site studies designed to acquire data for plant design, the development of an Environmental Impact Statement; and acquisition of PSAR onsite data. Following Phase III, a site-specific decision to proceed with a particular project was made.

Four objectives were addressed in conducting the potential site area identification process. These were identification of:

1. Potential site areas that exhibited a suitable combination of engineering, environmental, land use, cultural, and institutional characteristics for power plant siting;
2. Potential site areas of a developable size (1,000+ acres);
3. A manageable number of potential site areas;
4. A relatively even distribution of potential site areas along the Tennessee River corridor and within the defined TVA power service area.

Key elements of the overall processes TVA used in selecting BLN as the TVA-preferred site (Figure 1) were:

- As stated in the BLN COLA ER, TVA's ROI was and remains the TVA power service area.
- An extensive, geographically-broad, site screening of potential sites, conducted primarily in the 1970s, yielded a suite of candidate sites for generation siting decisions to be made at that time. The initial screening was based primarily upon exclusionary factors (described below) for engineering, hazardous materials and presence/absence of sensitive, protected species.

- Subsequent study was made of the resulting candidate sites and comparisons upon engineering, environmental and economic suitability factors. From the screening and comparison steps, seven sites were selected as superior and purchased for TVA inventory (including the current five candidate sites for the siting of AP1000 reactors). As generally presented in the FESs, the results of these comparisons were pertinent to each of the earlier inventory/siting decisions (i.e., those for Bellefonte Nuclear [BLN], Hartsville Nuclear [HVN], Phipps Bend Nuclear [PBN], Yellow Creek Nuclear [YCN] and Murphy Hill [MH], as well as the Watts Bar Nuclear (WBN) and Sequoyah (SQN) facilities.
- The historical suite of candidate sites in the earlier FESs constitute the potential sites for the present AP1000 siting decisions. Those superior sites selected for TVA inventory (i.e., BLN, HVN, YCN, PBN, and MH) constitute the suite of candidate sites for the current decisions on siting of AP1000 reactors.
- Current review of available file materials that characterized the siting process at that time. Electronic and hard copy files at TVA and hardcopy files at the National Archives storage facilities in Georgia and Pennsylvania (where TVA historical files are maintained) were examined to determine their applicability.
- A current TVA staff review (Appendix A, Table A-1) of the exclusionary and evaluative (suitability) criteria used, as to their continued pertinence and the probable effect of changes in intervening years on site screening.
- Review of the above mentioned FESs for basis of including or excluding potential sites and selection of preferred sites (i.e., those becoming the suite of candidate sites for the current decisions on siting of AP1000 reactors). Identification of any need and update of key information for the comparison of candidate sites was also performed. This information, as discussed and provided to NRC in the TVA alternative sites report (Reference 1), also served to characterize and confirm the continued viability of the current suite of AP1000 candidate sites.

This screening process (Figure 1) was subsequently followed by the noted comparison of current AP1000 candidate sites described in Reference 1. From among the suite of superior sites TVA had previously identified and acquired as inventory within the ROI, TVA proposed its BLN site for consideration by the NUSTART consortium as the location for which a COLA for the siting of two AP1000 nuclear reactors would be developed. The NUSTART consortium subsequently chose the BLN site, and TVA thereafter became the applicant of record for the COLA (submitted to NRC in October 2007).

As noted in Section 9.3.2 of the ER, this early screening process resulted in the suite of sites that were purchased as inventory by TVA for siting of such facilities. These sites and their selection have already undergone evaluation and documentation under the National Environmental Policy Act (NEPA), and except for

MH, licensing evaluation and documentation processes of the Atomic Energy Commission (AEC, predecessor to the NRC). These sites were purchased and now: 1) have operating nuclear generating facilities (WBN and SQN); or 2) were permitted as nuclear sites at which construction was initiated, but discontinued (BLN, HVN, PBN and YCN), and portions or most of the land was subsequently transferred to other governmental entities, i.e., HVN, PBN, and YCN; or 3) were maintained as part of TVA inventory of potential generation sites, i.e., MH and Saltillo (STO). As noted in the BLN ER, the STO site was eliminated from the present considerations because of continued uncertainties regarding foundation conditions.

Components of the Historical Screening Methodology

The general logic and arrangement of how information was acquired and handled throughout the years of site selection is discussed in this section. A computer program (IMGRID), which reflected the process logic, was eventually introduced by the TVA Division of Power Resource Planning to support handling of the intensive data requirements for this process. The screening methodology utilized elements both important and usable for practical site selection as listed in Table 1 (Reference 2) or as reflected in the referenced TVA site-specific FESs.

An optimization approach was developed to identify the best sites (Reference 2). In this context, optimization refers to the identification of those locations in a study area representing the coincidence of the best engineering, environmental, land use, cultural and institutional characteristics, or representing the best combination of these characteristics. To assist in decision-making, data elements and items used were generally grouped in six generic categories:

1. Engineering characteristics
2. Environmental impact – terrestrial features
3. Environmental impact – aquatic features
4. Land use – hazardous features
5. Land use – public land uses
6. Land use – private land uses.

A site screening model was developed for each of these generic categories (i.e., identification of important characteristics to consider and their use as either exclusionary or suitability criteria or for both purposes). The engineering characteristics were referred to as an “attractiveness” model, while the environmental and land use characteristics were termed “vulnerability” models. The information related to engineering attractiveness, adverse land use features and presence/absence of sensitive protected species was used as exclusionary criteria (Table 1) in initial screening to establish a reasonably manageable suite of potential sites. Those sites passing initial screening were then compared on the basis of suitability (evaluative) criteria. These logic and manner in which criteria were considered (Reference 2) is presented in Table 2.

Characterization of Engineering Attractiveness

This aspect was comprised of an index of engineering data elements (Table 1), except flooding and faulting (Reference 2). It was believed that flooding and faulting could be better assessed at a more site-specific scale. According to the site-specific FESs, the information on geology and foundation conditions was generalized in the discussion of sites (e.g., seismology was considered as more general than karst development alone). Transmission accessibility was also considered and discussed as a factor for comparing suitability of sites.

The range of engineering attractiveness for a site was scored according to its specific characteristics of the data elements noted in Table 1. The potential range of scores was established by the score that would result from a coincidence of the best conditions in a given location and the score that would result from a coincidence of the worst conditions. The difference in value between the hypothetical best score and the best site score actually found in the study area was noted as substantial (Reference 2). Therefore, the best site score actually occurring was used as the comparative base rather than the hypothetical best score. Engineering attractiveness was characterized on a scale from 1 to 6. At that point, the engineering attractiveness could be readily interfaced with other site screening characterizations based upon "vulnerabilities."

Characterization of Environmental and Land Use Vulnerability

A large number of data elements were used in the environmental and land use characterizations (Reference 2). The typical elements considered in those models are listed in Table 1. In addition to screening data elements used in site area identification, evaluative data elements were used as needed to assess the site areas. The environmental and land use features were characterized in two ways, i.e., their physical locations and as levels of impacts associated with being within a certain distance of those locations. However, for screening level analyses, the physical locations of the screening features were incorporated without the interpreted impact zones around those locations. In this fashion, for a particular site screening group, each location could assume one of two values, either existence or nonexistence of the features in that screening group. Based upon the judgment of the responsible technical staff (e.g., for aquatic biology), the factors that were considered, as well as the distance-related impact information, were used in the later evaluative steps comparing identified potential and candidate sites that had "passed" the initial screening criteria. All of the individual vulnerability site screening models were overlaid to form one composite characterization of vulnerability.

The Attractiveness-Vulnerability Interface

The interface between the attractiveness and vulnerability models was a matrix logic technique (Figure 2) utilized so that the interdisciplinary information could work in conjunction to identify potential sites (Reference 2). This approach indicated the relative engineering attractiveness and whether environmental/land use screening features existed in each area. The aim was to initially identify those areas that had the best (optimal) balance of engineering attractiveness and

environmental/land use impact. In order to better capture relative magnitudes of change in engineering attractiveness and to more precisely delineate the more significant impacts to environment/land use, elements (criteria) were parsed into the screening exclusionary and evaluative criteria as indicated in Table 1.

The process discussed above resulted in preliminary identification of several potential candidate sites. At the time candidate sites for the original BLN siting decision were identified, the BLN FES (TVA 1974) indicated more than 200 sites had been screened. Although this list, the original screening data and rankings are apparently no longer extant (see Overview section above), the results are reflected as the list of candidate sites that were identified, evaluated and compared in each of the site-specific TVA FESs (referenced in Subsection 9.3.2.2 of the ER) prepared for the candidate nuclear sites at the time of selection. As decisions on siting new generation in response to need for power were made over time, the number of potential sites considered at any specific time in the process also changed and varied as sites became unavailable.

As described in the individual site-specific TVA FESs (referenced in Subsection 9.3.2.2 of the ER), on-site surveys, economic and cost analyses, and more site-specific data collection and surveys were conducted to make the evaluative comparisons of the candidate sites under consideration. Although the evaluative processes at this stage varied slightly, each FES review documented the selection of a superior site among the identified candidates.

Potential Sites Considered and Their Relationship to Present Decisions

After identification of the need for additional capacity within the five primary load areas (based upon projected load and supply requirements and transmission flexibility), the number of alternative candidate sites considered for each decision at that time were as follows: eight for BLN; four for HVN; six for PBN; two for YCN; 15 for MH, seven for WBN and three for SQN (although decisions for SQN preceded the implementation of the National Environmental Policy Act [NEPA], alternative sites were still considered). Although the comparison of sites for MH included additional criteria, the MH FES indicated that all the sites had been previously identified under TVA's power plant siting program. Some sites were considered or reconsidered for different decisions. A total of twenty-eight (28) discrete candidate sites were considered in the TVA FESs for selection of inventory and siting. As noted above, this suite of sites is deemed the potential sites of the current AP1000 considerations from which the FES selected sites became the current set of AP1000 candidate sites. Table 3 lists the historical alternative candidate sites (and their approximate location) that were considered by TVA when selecting sites for inventory and siting of nuclear generation in the 1970s. The selected sites (BLN, HVN, PBN, YCN) of Table 3 are considered the present candidate sites for locating the AP1000 reactors. The historical candidate sites are considered the potential sites for the present considerations. The SQN and WBN sites were eliminated from the list of present candidate sites as discussed in the Subsection 9.3.2.4.1 of the BLN Combined License Application, Applicant's Environmental Report (BLN COLA ER).

The following section discusses the continued applicability of criteria and the likelihood of substantive changes to site conditions that might affect the viability,

comparative suitability of these potential sites or selection of the preferred (superior) sites.

Continued Validity of Criteria and Status of the Process

When considering the continued validity of criteria for the current selection process, four questions are pertinent. These questions are germane to assessing the likelihood of a previously excluded (rejected) or less suitable site becoming not only equal to, or better than, the slate of current candidate sites, but rising to the determination that the site is “obviously environmentally superior” to them. They are as follows:

1. Would the criteria still be pertinent and robust enough to serve as either exclusionary or suitability criteria in a current site selection process. A corollary is, are there any new criteria that need to be added?
2. What important general changes occurred in the intervening years (since the 1970s) that could substantively affect the use of a criterion?
3. In what manner would such changes to these criteria likely affect the general viability or suitability of sites? For an exclusionary criterion, would this (these) change(s) tend to generally decrease, increase or be neutral in regard to defining the number of acceptable sites within the TVA Power Service Area along the Tennessee and Cumberland Rivers. For a suitability criterion, would this (these) change(s) tend to generally increase, decrease or be neutral with regard to affecting the suitability ratings of sites within the TVA Power Service Area along the Tennessee and Cumberland Rivers? and
4. What general conclusions may be drawn from such considerations?

The above general questions were posed to a team of TVA staff, including specialists in water resource planning; river operations; water supply; flood protection; river navigation and transport; water quality; terrestrial and aquatic ecology; general fisheries; habitat assessment; protected and sensitive species; migratory bird populations; ecological monitoring; management of natural areas; geology and seismology; construction planning; transportation and hazardous materials; cultural resources; recreation planning; infrastructure development (e.g., gas pipelines, highways, etc.); transmission access; facility siting and socio-economics. Staff were given the list of criteria in Table 1 (with the addition of seismology and transmission access, for which consideration was also evident in the referenced TVA site-specific FESs). Staff responded by completing the matrix (Appendix A), which was subsequently also reviewed and discussed by TVA staff experts in facility siting, land use planning and regulatory affairs, as well as program management.

Conclusions drawn from this exercise and from the responses of technical staff provided in Appendix A, were as follows:

1. With few noted minor exceptions, the criteria remain valid, both generally and in their role as exclusionary or suitability criteria.

2. General trends affecting exclusionary criteria occurring in the intervening years would tend to exclude more (i.e., reduce the number of) sites and not increase the potential for previously excluded sites to become viable.
3. General trends affecting suitability criteria occurring in the intervening years would tend to be neutral or reduce the suitability of sites; not create substantive opportunity for improvements in suitability scoring for previously rejected potential sites, such that they would join the list of candidate sites; and not disproportionately affect the scoring of the present suite of candidate sites.

Although Executive Order 12898 for Environmental Justice (EJ) was not in effect at the time of the original reviews and TVA is not subject to the order, the assessment of potential EJ issues discussed in the TVA alternative sites report (Reference 1) indicates that there are no EJ issues for the current slate of candidate sites. Therefore, other potential sites may be equal to or worse than this suite of sites, but not substantively better.

Regarding socioeconomics, each of the sites currently considered by TVA are located close enough to one or more metropolitan areas that residents of these areas can commute to work at the site. Metropolitan areas provide a significant source of some types of workers. These areas could also provide housing accommodations for in-migrating workers who prefer a more urban setting or who cannot find the desired type of accommodations nearer the site. They have a large enough population that local impacts from workers who move into the area are relatively small and generally not noticeable. In turn, impacts on the site county and surrounding small counties would be reduced, so that impacts on schools and other public services are not as large. The greatest road traffic impacts generally would be in the area close to the plant; therefore, the longer commute would generally not cause a noticeable difference in impacts to traffic and might induce more carpooling. Locations more removed from a metropolitan area would not have these advantages and would be likely to incur greater impacts to housing, schools, other public services, and traffic, and are therefore less desirable from the standpoint of socioeconomic effects. Additional sites, other than those TVA has identified, would have similar advantages if located near one or more metropolitan areas, but these advantages would not be substantially greater than at the selected sites.

General Conclusions

Conditions for sites that did not meet the original exclusionary criteria or were eliminated in suitability comparisons are highly unlikely to have changed sufficiently in a positive manner to “add” those sites to a short list of superior candidate sites or to be competitive to the extent of becoming “obviously environmentally superior” to the current candidate sites. In general, most of the screening elements in the earlier assessments should be at least as favorable to the current candidate sites as compared to other sites.

This conclusion is based on several factors that include:

1. Previous disturbance and construction on the candidate sites (particularly brownfield sites) make it unlikely that any of them would be inferior to other sites that also met other criteria for plant siting.

2. The addition of many species to the federally protected list in intervening years, as well as substantive increases in knowledge of their distribution, would tend to exclude more sites.
3. The development of more infrastructure such as pipelines, airports, road and rail transportation; addition of state and locally managed areas for public and wildlife benefit; addition of listings on the National Register of Historic Places; and substantive population growth and urbanization in parts of the Tennessee River Valley would all work to exclude, or reduce the suitability of, more sites in the region.
4. The current suite of sites does not have known substantive or disproportionate socioeconomic or Environmental Justice concerns that would affect their status; other sites could not have substantively “better” ratings.

Based on the above factors it was concluded that the candidate sites considered in the submitted Applicant’s Environmental Report for the BLN site: 1) constitute a suite of superior sites from which the BLN site was selected, and 2) that it is adequately demonstrated that “obviously environmentally superior” brownfield or greenfield sites, as compared to BLN or the current suite of candidate sites for the AP1000 reactors decision, would be highly unlikely to occur.

References

1. TVA 2008. *Criteria and Basis for Comparative Ratings Among Alternative Brownfield and Greenfield Sites*, Revision 0, July 2008.
2. TVA 1977. Potential Site Area Screening Process – Area 3. Division of Power Resource Planning, Tennessee Valley Authority, Knoxville, TN.
3. TVA 1974. Site Selection Procedure for future power generating facilities – Draft, Division of Power Resource Planning, March 5, 1974, Tennessee Valley Authority, Chattanooga, TN.

Table 1
CLASSIFICATION OF HISTORICAL DATA ELEMENTS
BY SITE SCREENING MODEL AND ANALYSIS TECHNIQUE* (Reference 2)

Site Screening Model	Data Element	Analysis Technique*	
		Screening	Evaluative
Engineering Attractiveness	Karst Topography	X	
	Bedrock	X	
	Suitability for Rail	X	
	Flood Levels		X
	Grading	X	
	Suitability For Barge Facilities	X	
	Suitability For Highway	X	
	Faulting		X
Environmental Terrestrial Vulnerability	Threatened and Endangered Species - Plant, Federal	X	
	Threatened and Endangered Species – Plant, State		X
	Threatened and Endangered Species – Animal, Terrestrial, Federal	X	
	Threatened and Endangered Species – Animal, Terrestrial, State		X
	Potential Threatened and Endangered Species Habitat – Terrestrial		X
	Resident Canada Goose Production Areas		X
Environmental Aquatic Vulnerability	Water Quality		X
	Water Volume		X
	Threatened and Endangered Species Animal, Aquatic, Federal	X	
	Threatened and Endangered Species Animal, Aquatic, State		X
	Potential Threatened and Endangered Species Habitat – Aquatic		X
	Wood Duck Production Areas		X
	Migratory Waterfowl Rest/Feed Area		X
	Migratory Shorebirds		X
	Migratory Rest/Feed and Migratory Shorebirds		X
	Wood Duck Production Areas and Migratory Rest/Feed Area		X
	Trout Streams		X
	Warm Water Sport Fishing Streams		X
	Reservoir Sport Fishing Area		X
	Embayment Areas		X
Two-Story Reservoirs		X	
Migratory Spawning Areas		X	

Site Screening Model	Data Element	Analysis Technique*	
		Screening	Evaluative
Environmental Aquatic Vulnerability (continued)	Proposed Snail Darter Transplant Area		X
	State Mussel Sanctuary		X
	Productive Mussel Beds		X
Hazardous Land Use Vulnerability	Pipelines Natural Gas Major Transmission	X	
	Pipelines Natural Gas Distribution	X	
	Pipelines Petroleum Products	X	
	Airports	X	
	Transportation of Materials – Air	X	
	Transportation of Materials – Mainline Railroad	X	
	Transportation of Materials – Spur Railroad	X	
	Transportation of Materials – Highway	X	
	Transportation of Materials – Barge	X	
Public Land Use Vulnerability	Proposed State Parks		X
	State Forest	X	
	State Wildlife Management Areas	X	
	Proposed Natural Areas		X
	Public Parks, Playgrounds, Access Areas	X	
	Proposed Public Parks, Playgrounds, Access Areas	X	
	Commercial Recreational Development	X	
	Unused Recreational Potential		X
	Proposed Scenic Routes		X
	Unique Features		X
	Wilderness, Natural, Environmental Areas	X	
	National Forest	X	
	Property on National Register Of Historic Places	X	
	Property Eligible For National Register Of Historic Places		X
State Historic Sites		X	
Private Land Use Vulnerability	Urban-Build-Up Outside Corporate Limits	X	
	Existing Urban Build-Up	X	
	Designated Industrial		X
	Project Urban 2000		X

*Depending upon characterization indicated by factors shown in Table 2, criteria may become identified as “Screening (Exclusionary).” Evaluative Suitability

Table 2 Representative Scoring Method for Individual Elements (Reference 2)

ELEMENT NO.	ELEMENT NAME	DATA CODE	ITEM NAME
001-002	Study Area Mask - Reject Condition		
		99	Outside the study area
		0	Study area
003-004	Engineering Data File:		
	Potential for Karst Development	1	No karst development and little to no potential for karst development
		2	Minor or no development and minor to moderate potential for karst development
		3	Minor to moderate karst development and moderate to high potential for karst development
		4	Significant karst development
005-006	Engineering Data File:		
	Bedrock	1	Underlying formations consist mainly of shale, siltstone or sandstone, relatively thin overburden
		2	Underlying formations consist of interbedded shale and limestone or dolomite, overburden variable but generally thicker than No. 1.
		3	Underlying formations consist mainly of limestone or dolomite with some shale, moderately thick overburden
		4	Underlying formations consist mainly of limestone or dolomite with some shale, moderately thick overburden

ELEMENT NO.	ELEMENT NAME	DATA CODE	ITEM NAME
007-008	Engineering Data File:		
	Suitability for Railroad	1	No significant plant system design modification and/or site preparation required
		2	May require minor modification in plant system design and/or site preparation
		3	May require extensive modification in plant system design and/or site preparation
		4	Prohibitive plant system design modification and/or site preparation
009-010	Engineering Data File:		
	Maximum Flood Levels	1	No significant plant design modification and/or site preparation
		4	Involves prohibitive plant system design changes and/or site preparation
011-012	Engineering Data File:		
	Grading	1	No significant problems for site development (best)
		2	Average problems for site development (good)
		3	Significant problems for site development (fair)
		4	Prohibitive problems for site development (unacceptable)
013-014	Engineering Data File:		
	Suitability for Barge Facilities	1	No significant problems for site development (best)
		2	Average problems for site development (good)
		3	Significant problems for site development (fair)
		4	Prohibitive problems for site development (unacceptable)

ELEMENT NO.	ELEMENT NAME	DATA CODE	ITEM NAME
015-016	Engineering Data File:		
	Suitability for Highways	1	No significant problems for site development (best)
		2	Average problems for site development (good)
		3	Significant problems for site development (fair)
		4	Prohibitive problems for site development (unacceptable)
017-018	Engineering Data File:		
	Faulting	1	Area of no faulting or minor unmapped faulting
		4	Area of 200 feet on either side of a major known fault
019-020	Engineering Data File:		
	Water Quality – Predominant Type (Cells 50% Water)	0	Land
		1	No significant plant system design modification and/or site preparation required
		2	May require minor modification in plant system design and/or site preparation
		3	May require extensive modification in plant system design and/or site preparation
		4	Prohibitive plant system design modification and/or site preparation
		5	Data not available
6	Tellico Reservoir – No data available		

ELEMENT NO.	ELEMENT NAME	DATA CODE	ITEM NAME
021-022	Engineering Data File:		
	Water Quality	0	Land
		1	No significant plant system design modifications and/or site preparation required
		2	May require minor modifications in plant system design and/or site preparation
		3	May require extensive modifications in plant system design and/or site preparation
		4	Prohibitive plant system design modifications and/or site preparation
		5	Data not available
023-024	Environmental Data File:		
	Water Volume-Predominant Type	0	Land
		1	Areas capable of supporting 4 units with continuous discharge
		2	Areas capable of supporting 2 units with continuous discharge
		3	Areas capable of supporting 4 units with non-continuous discharge
		4	Areas capable of supporting 2 units with non-continuous discharge
		5	Areas not capable of supporting a power plant
		6	Areas not capable of supporting a power plant: Reevaluation
		7	Tellico Reservoir – No data available

ELEMENT NO.	ELEMENT NAME	DATA CODE	ITEM NAME
025-026	Environmental Data File:		
	Water Volume	0	Land
		1	Areas capable of supporting 4 units with continuous discharge
		2	Areas capable of supporting 2 units with continuous discharge
		3	Areas capable of supporting 4 units with non-continuous discharge
		4	Areas capable of supporting 2 units with non-continuous discharge
		5	Areas not capable of supporting a power plant
6	Areas not capable of supporting a power plant: Reevaluation required if assumptions change		
027-028	Environmental Data File:		
	Dispersion Characteristics (Meteorological Characteristics)	1	No significant impact on the design of a 750 MW fossil plant
		2	Emissions limitations in excess of New Source Performance Standards would be required
		3	Major modifications would be required for a 750 MW plant. May be prohibitive for larger units.
		4	Prohibitive to the siting of fossil-fueled power plants
5		Potential Level 4 – required further analysis	
029-030	Environmental Data File:		
	Waterfowl – Wetland Wildlife	0	No occurrence
		1	Wood duck production area
		2	Migratory resting and feeing
3		Migratory shorebirds area	

ELEMENT NO.	ELEMENT NAME	DATA CODE	ITEM NAME
		4	Resident goose production area
		5	Sandhill cranes migratory use
		6	Migratory resting/feeding and migratory shorebirds
		7	Wood duck production and migratory resting/feeding
031-032	Environmental Data File:		
	Fisheries and Molluscan Considerations	0	No occurrence
		1	Sport trout stream
		2	Warm water sport fishing stream
		3	Reservoir sport fishing area (known): probable production
		4	Embayment area – assumed productive – likely sport fishing
		5	Two-story reservoir
		6	Migratory spawning area (tailwater)
		7	Proposed snail darter transplant area
		8	State mussel sanctuary and migratory spawning area (tailwater)
		9	Productive mussel bed and proposed snail darter transplant area
033-034	Environmental Data File:		
	Threatened and Endangered Species and Potential	0	No occurrence
		1	Threatened and endangered plant – federal
		2	Threatened and endangered plant – state
		3	Threatened and endangered animal - terrestrial – federal
		4	Threatened and endangered animal - terrestrial – state
		5	Threatened and endangered animal - aquatic – federal

ELEMENT NO.	ELEMENT NAME	DATA CODE	ITEM NAME
		6	Threatened and endangered animal - aquatic – state
		7	Potential threatened and endangered habitat – terrestrial
		8	Potential threatened and endangered habitat – aquatic
		9	Coincidence of 7 and 8
		10	Coincidence of 3 and 4
		11	Coincidence of 3 and 7
		12	Coincidence of 2 and 3
		13	Coincidence of 5 and 8
035-036	Land Use, Institutional and Cultural Data File:		
	Population Density 1970	1	0-100 persons per square mile
		2	101-300 persons per square mile
		3	301-500 persons per square mile
		4	501-1000 persons per square mile
		5	1001-2000 persons per square mile
		6	2001-5000 persons per square mile
037-038 039-040	Land Use, Institutional and Cultural Data File:		
	Manufacturing Employment	0	None
		1	0 – 100 employees
		2	101 – 500 employees
		3	501 – 1000 employees
		4	1001 – 1500 employees
		5	1501 – 2000 employees
		6	2001 – 2500 employees
		7	2501 – 3000 employees
8	Data not readily available		
041-042	Land Use, Institutional and Cultural Data File:		
	Recreation, Public Reservations and Scenic and Natural Areas	1	Proposed state parks
		2	State forests
		3	State wildlife management areas

ELEMENT NO.	ELEMENT NAME	DATA CODE	ITEM NAME
		4	Proposed state natural area
		5	Public park, playground or access area
		6	
		7	Commercial recreation area
		8	Proposed commercial recreation area
		9	Private recreation
		10	
		11	Proposed state scenic route
		12	
		13	Wilderness, natural and environmental area
		14	Coincidence of 6 and 9
		15	National Forest
		17	Coincidence of 5 and 7
043-044	Land Use, Institutional and Cultural Data File:		
	Unusual Recreation Potential and Unique Features	0	None
		1	Area with unusual recreation potential
		2	Unique feature
045-046	Land Use, Institutional and Cultural Data File:		
	Historic and Cultural Features	1	Site on national register of historic places
		2	Site eligible for national register of historic places State historic areas
		3	State historic areas
		4	Two or more sites on national register
		6	Two or more sites on national register
		7	National register and state historic area both occurring in all cell
		8	National register and several state historic areas in all cell
		9	Existing and eligible national register occurring with state historic area

ELEMENT NO.	ELEMENT NAME	DATA CODE	ITEM NAME
047-048	Land Use, Institutional and Cultural Data File:		
	Landform Classification for Agricultural Suitability	1	Smooth low terraces and benches of rivers and creeks
		2	Dark red old terraces, hilly and rolling
		3	River and creek bottoms and connecting low terraces
		4	Shale valleys
		5	Siltstone ridges
		6	Limestone valleys
		7	Mountain footslopes
		8	Cumberland mountains escarpment and talus slope
		9	Cherty hills
10		Low chert hills	
047-048 (continued)	Landform Classification for Agricultural Suitability (continued)	11	Dark red old terraces – rolling
		12	Old terrace plains
		13	Cherty hills footslopes
		14	Shale and limestone valleys
		15	Rocky hills
		16	Red knobs
		17	Unaka mountains
		18	Black shale hills
049-050	Land Use, Institutional and Cultural Data File:		
	Land Use	0	Area not built-up nor expected to develop
		1	Graysville
		2	Dayton
		3	Decatur
		4	Spring City
		5	Rockwood
		6	Kingston
		7	Philadelphia
		8	Loudon
		9	Lenoir City
		10	Greenback
11		Vonore	

ELEMENT NO.	ELEMENT NAME	DATA CODE	ITEM NAME
		12	Residential, industrial and commercial outside corporate limits
		13	Designated industrial
		14	Projected urban expansion
		15	Timberlake urban development
		16	Potential industrial
		17	Potential Timberlake industrial
051-052	Land Use, Institutional and Cultural Data File:		
	Pipelines (Hazardous Land Use)	0	None
		1	Natural Gas – Major Transmission
		2	Natural Gas – Distribution
		3	Petroleum Products – Major Transmission
		4	Petroleum Products – Distribution
051-052	Pipelines (Hazardous Land Use) (continued)	5	Non-hazardous materials – Major Transmission
		6	Non-hazardous materials – Distribution
		7	Intersections
		8	More than one pipeline in cell
053-054	Land Use, Institutional and Cultural Data File:		
	Air Vector, Airports, Manufacturing and Storage Areas (Hazardous Land Use)	0	None
		1	Major Airport
		2	Local Airport
		3	Existing Manufacturing
		4	Proposed Manufacturing
		5	Storage Area
		6	Air Vector
		7	Two or more air vectors
	8	Intersection of two air vectors	
055-056	Land Use, Institutional and Cultural Data File:		
	Railroads (Hazardous Land Use)	0	None
		1	Mainline – Southern
		2	Mainline – L & N

ELEMENT NO.	ELEMENT NAME	DATA CODE	ITEM NAME
		3	Spur Line – Southern
		4	Spur Line – L & N
		5	Spur Line – TVA
		6	More than one line
		7	Junction of spurline and mainline
		8	Junction of spurline and spurline
		9	One spurline and one mainline
057-058	Land Use, Institutional and Cultural Data File:		
	County Boundaries	1	Roane
		2	Loudon
		3	Monroe
		4	Blount
		5	Rhea
		6	Hamilton
7	Meigs		
059-060	Land Use, Institutional and Cultural Data File:		
	Existing Road (Hazardous Lane Use)	0	None
		1	Interstate Highway
		2	U.S. Highway
		3	Major State Route
		4	Interstate Interchanges
		5	Interstate – U.S. Highway Intersection
		6	Interstate – State Route Intersection
		7	U.S. –State Route Intersection
8	State Route – State Router Intersection		
061-062	Engineering Data File:		
	Barge Channels	0	None
		1	Existing Sail Lines
		2	Proposed Sail Lines on Tellico Reservoir
		3	Existing Unloading Dock
		4	Proposed Unloading Dock
5	Existing Large Safety Harbors		

ELEMENT NO.	ELEMENT NAME	DATA CODE	ITEM NAME
063-064	Land Use, Institutional and Cultural Data file:		
	Agricultural Suitability	0	Water
		1	Very good
		2	Good
		3	Fair
		4	Poor
	5	Very Poor	
065-066	Land Use, Institutional and Cultural Data file:		
	Socio-Economic Impacts	1	Slight socio-economic impact
		2	Moderate socio-economic impact
		3	Severe socio-economic impact
067-068	Miscellaneous Data File:		
	Overlap Designation		
069	Miscellaneous Data File:		
	Tellico Reservoir	0	Land
		1	Reservoir

Legend 1

- 1 = Minimal impact
- 2 = Moderate impact
- 3 = Moderate - severe impact
- 4 = Severe impact
- 5 = Reject cells

Models Using Legend 1.

- 081-082 Recoded search from: T & E species - plant - federal
- 083-084 Recorded search from: T & E species - plant - state
- 085-086 Recoded search from: T & E species: animal - terrestrial - federal
- 087-088 Recoded search from: T & E species: animal - terrestrial - state
- 089-090 Recoded search from: T & E species habitat - terrestrial
- 091-092 Recoded search from: Resident Canada goose production area
- 093-094 Recoded search from: Sandhill crane migratory use area
- 095-096 Recoded search from: T & E species - animal - aquatic - federal
- 097-098 Recoded search from: T & E species - animal - aquatic - state
- 099-100 Recoded search from: Potential T & E habitat - aquatic
- 101-102 Recoded search from: Wood duck production area

103-104	Recoded search from:	Migratory waterfowl rest/feed area
105-106	Recoded search from:	Migratory shorebirds
107-108	Recoded search from:	Migratory rest/feed & migratory shorebirds
109-110	Recoded search from:	Wood duck production area & migratory rest/feed-area
111-112	Recoded search from:	Trout streams
113-114	Recoded search from:	Warm water sport fishing streams
115-116	Recoded search from:	Reservoir sport fishing arcs
117-118	Recoded search from:	Embayment areas
119-120	Recoded search from:	Two story reservoirs
121-122	Recoded search from:	Migratory spawning areas
123-124	Recoded search from:	Proposed snail darter transplant area
125-126	Recoded search from:	State mussel sanctuary
127-128	Recoded search from:	Productive mussel beds
129-130	Recoded search from:	Pipelines natural - gas major - transmission
131-132	Recoded search from:	Pipelines natural gas dist.
133-134	Recoded search from:	Pipelines petroleum products
135-136	Recoded search from:	Private recreation areas
137-138	Recoded search from:	Airports
139-140	Recoded search from:	Transportation of mail air
141-142	Recoded search from:	Transportation matls. mainline r/r
143-144	Recoded search from:	Transportation matls. r/r spur.
145-146	Recoded search from:	Transportation matls. highway
147-148	Recoded search from:	Transportation of matls. barge
149-150	Recoded search from:	Proposed state parks
151-152	Recoded search from:	State forest
153-154	Recoded search from:	State wildlife mgt. areas
155-156	Recoded search from:	Proposed natural areas
157-158	Recoded search from:	Public parks, playgrounds, access areas
159-160	Recoded search from:	Proposed public parks, playgrounds, access areas
161-162	Recoded search from:	Commercial recreational dev.
163-164	Recoded search from:	Unusual recreational potential
165-166	Recoded search from:	Proposed scenic routes
167-168	Recoded search from:	Unique features

169-170	Recoded search from:	Wilderness, natural, environmental areas
171-172	Recoded search from:	National forest
173-174	Recoded search from:	Property on nat'l register
175-176	Recoded search from:	Property on Nat. Reg. - eligible
177-178	Recoded search from:	State historic sites
179-180	Recoded search from:	Existing urban build-up
181-182	Recoded search from:	Urban build-up outside corp.
183-184	Recoded search from:	Designated industrial
185-186	Recoded search from:	Projected urban 2000

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Matrix: Flood Levels
and Water Quality (Expanded)

- 0 = Coincident condition does not exist
- 1 = No flooding/land
- 2 = Flooding/land
- 3 = No flooding/water
- 4 = Flooding/water

Table 3. Alternative Sites Considered (carried through the site comparison and analysis as historical candidate sites) in TVA Final Environmental Statements.

	Original Plant FESs	River²	River mile and Bank³	Site Name (if available)	Basis for Screening
1.	MH	TRM	10L	Little Cypress	Candidate site for MH coal gasification. Eliminated due to cost of barge access/fuel transportation.
2.	BLN, PBN, YCN, MH	TRM	174L	Saltillo	BLN, PBN - pending seismic design criteria. MH - candidate site.
3.	BLN,PBN, YCN	TRM	215R	Yellow Creek	BLN 1 & 2, PBN - pending seismic design criteria. BLN 3 & 4 - evaluated as candidate site. YCN - candidate site.
4.	MH	TRM	245L	Colbert County	Screened from consideration based on generic consideration of environmental, engineering and socioeconomic concerns.
5.	MH	TRM	285L	Courtland	Candidate site for MH coal gasification. Engineering cost cost of barge access due to distance to Tennessee River.
6.	MH	TRM	336R	Hobbs Island	Screened from consideration based on generic consideration of environmental, engineering and socioeconomic concerns.
7.	MH	TRM	336L	Coffee Bluff	Screened from consideration based on generic consideration of environmental, engineering and socioeconomic concerns.
8.	MH	TRM	347 – 348R	Sugar Tree Hollow	Screened from consideration based on generic consideration of environmental, engineering and socioeconomic concerns.
9.	MH	TRM	346L	Parches Cove	Screened from consideration based on generic consideration of environmental, engineering and socioeconomic concerns.

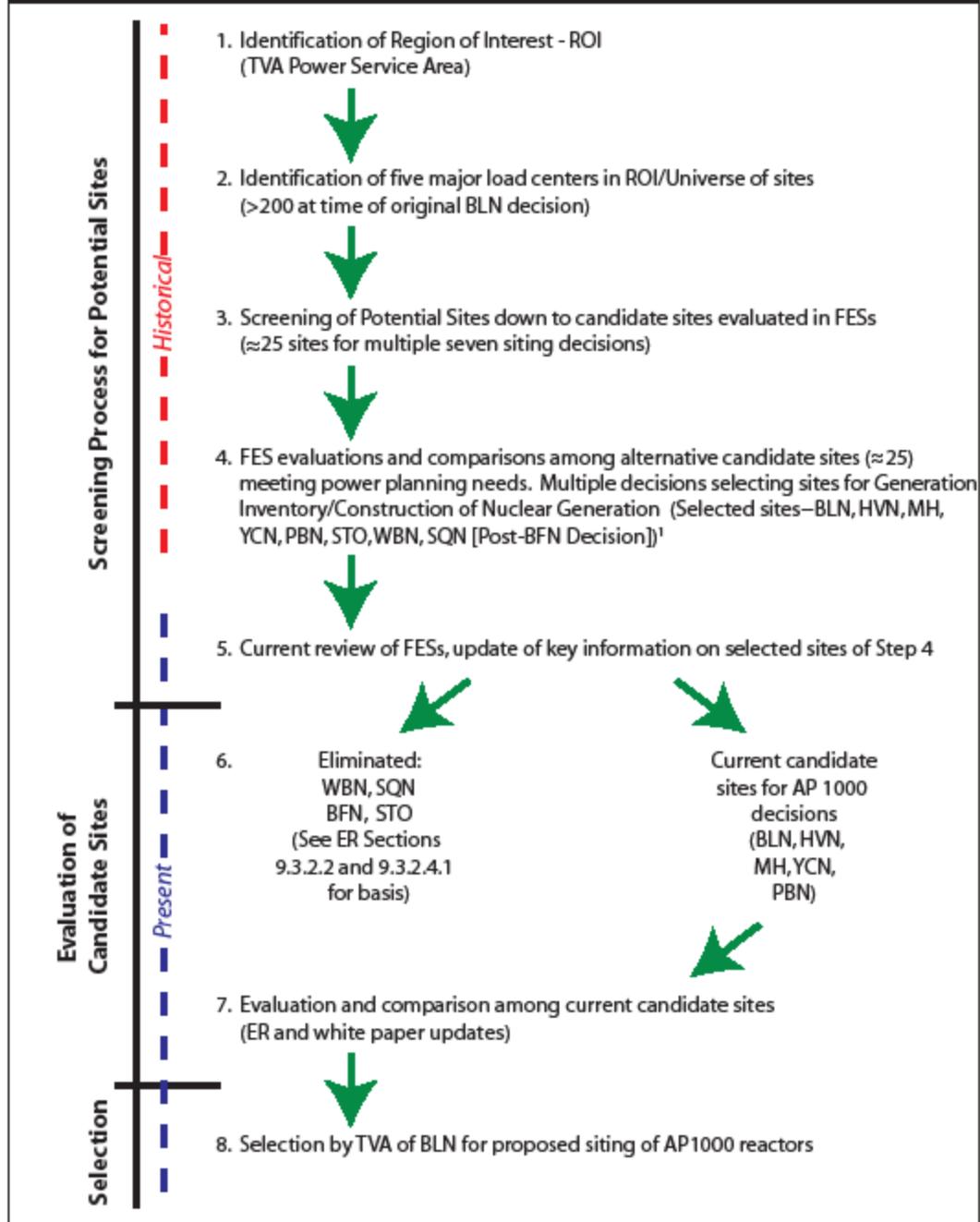
	Original Plant FESs	River²	River mile and Bank³	Site Name (if available)	Basis for Screening
10.	BLN, PBN, WBN, MH	TRM	370L ⁴	Murphy Hill	BLN, PBN, WBN, MH - evaluated as candidate site.
11.	BLN, WBN	TRM	386.5R	BLN (D)	BLN - Conflicting land use requirements and size limitations.
12.	BLN, PBN, WBN	TRM	392R	Bellefonte	Evaluated as candidate site.
13.	BLN, WBN	TRM	398.5R	BLN (F)	BLN - Depth of foundation rock, encroachment on wildlife management area.
14.	SQN	TRM	484.5R	Sequoyah	Existing nuclear plant site. Addressed in BLN COLA Subsection 9.3.2.4.1.
15.	BLN, WBN, SQN	TRM	499L	Blythe Ferry	BLN - Proximity to TN wildlife refuge, Hiwassee Island.
16.	MH	TRM	508R	Gillespie Bend	Screened from consideration based on generic consideration of environmental, engineering and socioeconomic concerns.
17.	MH	TRM	519.5R	Clear Creek	Candidate site for MH coal gasification. Eliminated due to cost of barge access/fuel transportation.
18.	PBN, WBN, SQN	TRM	528R	Watts Bar	Existing nuclear plant site. Addressed in BLN COLA Subsection 9.3.2.4.1.
19.	BLN, WBN	TRM	559R	Johnson Bend	BLN - Cost disadvantages due to topography. Unknown site geology.
20.	HVN	CRM	259	Antioch	Cost, transmission land use, engineering feasibility, proximity to water fowl refuge, population proximity.
21.	HVN	CRM	285	Hartsville	Evaluated as candidate site.

	Original Plant FESs	River ²	River mile and Bank ³	Site Name (if available)	Basis for Screening
22.	MH	CRM	293L	Taylorville	Screened from consideration based on generic consideration of environmental, engineering and socioeconomic concerns.
23.	HVN	DR	60L	Council Bend	Cost, barge facilities not feasible, extensive road improvements required, engineering feasibility.
24.	HVN	DR	146L	Rieves Bend	Barge facilities not feasible, extensive road improvements required, land use incompatibility, population proximity.
25.	PBN	HR	122R	Phipps Bend	Evaluated as candidate site.
26.	MH	LTRM	16L	Timberlake	Screened from consideration based on generic consideration of environmental, engineering and socioeconomic concerns.
27.	MH	MRM	878L	Oakton	Screened from consideration based on generic consideration of environmental, engineering and socioeconomic concerns.
28.	MH	GRM	100L	Paradise	Screened from consideration based on generic consideration of environmental, engineering and socioeconomic concerns.

NOTES:

1. These historical alternative sites constitute the potential sites of the present siting for AP1000 reactors.
2. CRM – Cumberland River Mile; DRM - Duck River Mile; GRM – Green River Mile; HRM – Holston River Mile; LTRM – Little Tennessee River Mile; MRM - Mississippi River Mile; TRM – Tennessee River Mile.
3. L = left bank; R = right bank (facing downstream).
4. Murphy Hill was identified in the Bellefonte Units 1 and 2 FES and Watts Bar FES as being located at TRM 369L. Actual location, per MH FEIS, is TRM 370L.

FIGURE 1. TVA SITE SCREENING AND EVALUATION PROCESS



¹BLN = Bellefonte; HVN = Hartsville Nuclear; MH = Murphy Hill; YCN = Yellow Creek Nuclear; PBN = Phipps Bend Nuclear; STO = Saltillo; WBN = Watts Bar Nuclear; SQN - Sequoyah Nuclear; BFN = Browns Ferry Nuclear

FIGURE 2. SCREENING MATRIX LOGIC BASED ON PHYSICAL LOCATIONS OF VULNERABILITIES AND ENGINEERING ATTRACTIVENESS

		Engineering Attractiveness					
		BEST			WORST		
		1	2	3	4	5	6
Vulnerability Screening Features	0 NONEXIST	(X)	(X)				
	1 EXIST						

(X) – LOCALITIES EVALUATED FOR IDENTIFICATION AS POTENTIAL SITES

APPENDIX A

Factors Influencing the Applicability of Historically-Used Exclusionary and Suitability Criteria and the Potential Effect of Intervening Changes in Conditions (e.g., Environmental, Sociological, Regulatory, etc.) or Trends Since the 1970's on the Site Selection Process.

Table A-1.

Factors Influencing the Applicability of Historically-Used Exclusionary and Suitability Criteria and the Potential Effect of Intervening Changes in Conditions (e.g., Environmental, Sociological, Regulatory, etc.) or Trends Since the 1970's on the Site Selection Process.

Site Screening Model	Historical (1970s) Criteria ² for Excluding Sites (X) or Evaluating (V) Suitability of Sites, i.e., Discriminating Between Generation Sites)	Would this criterion still function as an Exclusionary (X) or Evaluative (V) (Suitability) Criterion ² , as indicated in Column 1? ^(A)	What, if anything, has changed since the 1970's that could substantively affect 1) the use of this criterion for excluding or accepting sites ² , or 2) the suitability scoring of this criterion for sites ² . ^(B)	If an exclusionary criterion ² , would this (these) change(s) tend to generally decrease, increase or be neutral in regards to defining the number of acceptable sites within the TVA Power Service Area (along the Tennessee and Cumberland Rivers). ^(C)	If a suitability criterion ² , would this (these) change(s) tend to generally increase, decrease or be neutral with regard to affecting the ratings of sites within the TVA Power Service Area (along the Tennessee and Cumberland Rivers)? ^(D)
Engineering Attractiveness	Karst Topography (Major) (X)	<p>Assumed meaning and use: Landforms that are altered by chemical dissolution of bedrock as expressed by sinkholes, underground caverns, underground streams, etc.</p> <p>Yes, the degree of karst development should serve as an engineering adequacy criterion. With sufficient detailed geologic information, karst topography could be used as an exclusionary criterion when extreme karst effects were demonstrated. Karst topography as an exclusion criterion would be based more on economic considerations of construction than on ability to make the site</p>	With the exception of sites for which detailed foundation condition evaluations have been performed, there is no information that would substantially change the use of this criterion for exclusionary or evaluation purposes.	Detailed site information would tend to be increase the number of candidate sites excluded.	Detailed site information would tend to be neutral in its effect on the suitability evaluation of candidate sites.

		acceptable. However, lacking detailed information, the presence or potential presence of karst conditions could be used as a suitability evaluation criterion.			
	Bedrock (X)	<p>Assumed meaning and use: The foundation conditions at a site include the type and extent of rock and soil. Depth to bedrock, uniformity of foundation materials, shear wave velocity of rock and soils, liquefaction susceptibility of soils, the presence of expansive clays and other properties of the site rock and soil would be considered. The degree of karst development, if any, could be included in this criterion. However, karst topography was treated separately as part of this analysis. A description of foundation conditions was contained in Final Environmental Statements for other candidate sites typically in a section labeled "Geology".</p> <p>Yes, foundation conditions should serve as an engineering adequacy criterion. Lack of bedrock (soil sites) could be used to exclude sites;</p>	With the exception of sites for which detailed foundation condition evaluations have been performed, there is no information that would substantially change the use of this criterion for evaluation purposes. Geologic information available in the 1960s and 1970s would be sufficient to address site exclusion.	No changes have occurred that would impact this parameter as an exclusion criterion.	Detailed site information would tend to be neutral in its effect on the suitability evaluation of candidate sites.

		however, in general, this criterion should be treated as a suitability parameter.			
	Suitability for Rail (X)	Yes, still vital criterion. Required for alternative method of deliveries.	Increase in land development, reducing rural, undeveloped areas.	Decreases acceptable sites due to increased development in previously rural areas.	Decreases acceptable sites due to increased development in previously rural areas.
	Flood Levels (V)	Yes, we would look at the 100- and 500-year flood elevations along with existing PMF data.	1. 100-year, 500-year and PMF elevations may have changed 2. Executive Order 11988 criteria may not have been in place during the initial site screening.	The changes would likely be a minor factor because the revised flood elevations should not be significantly different.	The changes would likely be a minor factor because the revised flood elevations should not be significantly different.
	Grading (X)	Yes, the difficulty and cost of grading a site is still an important consideration.	1. There is a higher level of awareness of environmental issues. Concerns about these issues and the resulting legislation and regulations make it more time-consuming and expensive in many cases and may preclude grading to the extent that would be necessary at some sites. 2. It is possible that some sites have been graded or partially graded for other purposes.	1. Yes, changes related to environmental issues would generally tend to decrease the number of acceptable sites since the extent of concern and legal protection related to such issues has increased greatly. This could have a major affect on scoring for some sites. Any such affect would rate the site less favorably. 2. Yes, additional grading since the original selection process could increase the number of sites. However, such grading would normally occur only for specific purposes, and therefore most sites that	

				have been graded have also been converted to industrial, commercial, or residential uses. The existence of such uses would generally lessen the suitability of the site. The degree of change in criteria scoring could vary from very minor to major, but generally would be major. In most if not all cases the acceptability of the site would be negatively impacted.	
	Suitability for Barge Facilities (X) (V)	Yes - Access to navigable waters may be used as exclusionary or suitability criteria. - large components like generators are almost exclusively delivered by water.	1. The construction of Tellico Dam was completed after the original site study. 2. Growth of residential and industrial use of shoreline along the navigable waterway has taken place since 1970.	1. Tellico Dam created about 20 miles of additional navigable waterway that could have qualified additional sites - but did not provide a significant increase in available waterway (0.026%).	2. Subsequent growth along the waterways would likely reduce the scores of potential sites today - significant increase, especially in residential shoreline use.
	Suitability for Highway (X)	Yes, still vital criterion. Required for alternative method of deliveries and employee access.	Increase in land development, reducing rural, undeveloped areas.	Increases acceptable sites if highways were constructed during interim period, thereby improving site access. Decreases acceptable sites if roadways were constructed across the site during the interim period.	Increases acceptable sites if highways were constructed during interim period, thereby improving site access. Decreases acceptable sites if roadways were constructed across the site during the interim period.
	Faulting (V)	Assumed meaning and use: Offset of earth materials, typically rock, due to tectonic	More detailed interpretations of faulting in the New	If used as an exclusionary criterion, new information concerning this parameter	If used as a suitability criterion, new information would tend to decrease the

		<p>forces. Suitability would be based on proximity of faulting to the candidate site, length and offset of geologic strata along the fault, how recently displacement occurred along the fault, and how often new displacements (faulting events) occur along the fault. This term may have included an analysis of “capable faults” which is a regulatory term with specific definition and context. Where sufficient information was available, a determination of whether “capable faults” were present at or near the site was contained in the Geology section of Final Environmental Statements for other candidate sites.</p> <p>Yes, faulting should serve as an engineering adequacy criterion. In general, faulting should be considered as a suitability criterion; however, if enough information is known about a fault, it could be used to exclude candidate sites.</p>	<p>Madrid seismic zone currently available that were not available 35 to 40 years ago could be used to determine site suitability in a more precise fashion than was formerly possible.</p>	<p>would tend to decrease the number of sites available for consideration.</p>	<p>suitability of a small minority of sites.</p>
	<p>Seismology (FSAR consideration) (X,V)</p>	<p>Assumed meaning and use: An analysis of regional earthquake characteristics (rate, location, size) and earthquake potential to</p>	<p>Several factors have changed that would affect the use of this criterion as an exclusionary or</p>	<p>As an exclusionary criteria change 2a would tend to be neutral, change 2b would tend to be neutral, change 2c would tend to decrease</p>	<p>As a suitability criterion, change 2a would tend to decrease the attractiveness of candidate sites but the magnitude of the effect</p>

		<p>develop earthquake hazard information (size and location of earthquakes important to facility design and the expected ground motion from these earthquakes).</p> <p>Yes, seismology should serve as an engineering adequacy criterion. Seismology should be used as an exclusionary criterion during initial screening and then also be used as a suitability factor.</p>	<p>suitability criterion:</p> <p>a. Improved understanding of earthquake hazard in the region</p> <p>b. Emphasis on probabilistic vs. deterministic method of assessing earthquake hazard</p> <p>c. Revised national earthquake hazard maps by the U.S. Geological Survey</p> <p>d. Development of EPRI guidelines for seismic exclusionary criteria for nuclear power plant siting.</p>	<p>the number of candidate sites, and change 2d would have a strong tendency to reduce the number of candidate sites.</p>	<p>would be region-specific, change 2b would tend to make a minor increase in the attractiveness of candidate sites, change 2c would tend to make a minor to rarely moderate decrease the attractiveness of candidate sites, and change 2d would not apply to suitability since it would serve as an exclusionary criteria.</p>
	<p>Transmission Line Access (V)</p>	<p>Yes. Transmission Line Access influences overall project costs, schedule, and environmental considerations.</p>	<p>1) N/A</p> <p>2) Public opposition and construction lead times for new transmission lines have increased since the 1970s. Therefore, a lack of accessibility to transmission would tend to push more sites toward a suitability criteria score of 5 today. TVA's construction of transmission to planned nuclear plant sites in the 1970s and 80s has improved the</p>	<p>N/A</p>	<p>It would depend on the site. In general, for sites that have poor accessibility to existing transmission, it would tend to increase (worsen) this criteria score. If a site has good accessibility to existing transmission, it would tend to decrease (improve) or have a neutral impact on this criteria score.</p>

			scoring for those sites relative to sites lacking Transmission Line Access.		
Environmental Terrestrial	T&E Species – Plant, Federal (X)	Yes - the presence of Federally listed plant species on a site would tend to exclude that site.	1 - Increase in the number of Federally listed plant species in the region and better knowledge of distribution of listed species.	1 - Decrease in number of potentially viable sites. Due to the increase in the number of Federal listed plant species and known localities for these plants, more sites would likely be excluded because of known occurrences of Federally listed plant species.	1 - Likely to decrease the rating of more sites. Due to the increase in the number of Federal listed plant species and known localities for these plants in proximity to sites, more sites would likely be rated as less viable because of known occurrences of Federally listed plant species.
	T&E Species – Plant, State (V)	Yes - the presence of state listed plant species on a site could reduce the suitability of a site, but would not exclude that site.	1 - Increase in the number of State listed plant species in the region and better knowledge of distribution of listed species.	NA - Evaluative Only	1 - Likely to decrease the rating of more sites. Due to the increase in the number of State listed plant species and known localities for these plants, more sites would likely be rated as less viable because of known occurrences of State listed plant species.
	T&E Species Animal, Terrestrial, Federal (X)	Yes - the presence of Federal listed terrestrial animal species on a site would tend to exclude that site.	1 - Increase in the number of Federal listed terrestrial animal species in the region and better knowledge of distribution of listed species.	1 - Decrease in number of potentially viable sites. Due to the increase in the number of Federal listed terrestrial animal species and known localities for these species, more sites would likely be excluded because of known occurrences of Federal listed terrestrial animal species.	1 - Likely to decrease the rating of more sites. Due to the increase in the number of Federal listed terrestrial animal species and known localities for these species in proximity to sites, more sites would likely be rated as less viable because of known occurrences of State listed terrestrial animal species.

	T&E Species, Animal, Terrestrial, State (V)	Yes - the presence of State listed animal species on a site could reduce the viability of a site, but would not exclude that site.	Increase in the number of state listed animal species in the region and better knowledge of distribution of listed species.	NA - Evaluative Only	1. Likely to decrease the rating of more sites. Due to the increase in the number of State listed terrestrial animal species and known localities for these species, more sites would likely be rated as less viable because of known occurrences of State listed terrestrial animal species.
	Potential T&E Species Habitat - Terrestrial (V)	Yes - {may be elevated to an exclusionary criterion for Federal designated critical habitat} - the presence of habitat for T&E plant or terrestrial animal species on a site could reduce the viability of a site, but would not necessarily exclude that site.	1. Increase in the number of Federal and state listed terrestrial plant and animal species in the region and better knowledge of distribution of listed species. 2. Federal designation of critical habitat areas for some plant and terrestrial animal species in the region	2. Neutral. No new designations in areas along the Tennessee or Cumberland Rivers	1. Likely to decrease the rating of more sites. Due to the increase in the number of Federal and State listed plants and terrestrial animal species and known habitat requirements for these species, more sites would likely be rated as less viable because of the presence of suitable habitat for Federal or State listed plants or terrestrial animal species.
	Resident Canada Goose Production Area (V)	No. Resident Canada Geese are now so numerous and widespread that avoiding their habitat is no longer a concern.	1. Resident Canada Geese common to abundant across TVA area 2. Resident Canada Geese are adaptable and a range of habitats can qualify as Production Area		Continued use of this criterion would have little to no affect on rankings (i.e., be neutral) as most potential sites would rank as goose production areas.
Environmental Aquatic	Water Quality (V)	Yes, to ensure that TVA operations do not result in significant adverse impacts to	1. Implementation of Federal Water Pollution Control Act	N/A	1. Yes, potential decrease - The degree of impact on the criterion score would be

		water quality.	(Clean Water Act) and subsequent amendments, particularly 303(d) Listing, 305(b) reporting, and 402 permitting. 2. River system operations		dependent on the current status of a waterbody for supporting designated uses, the reason, if any, for impairment and the potential for a power plant to negatively impact use attainment. 2. Yes, slightly decrease to slightly increase - Because operational policy must maintain basic system benefits of flood control, power production, and navigation; and be environmentally, economically, and technically feasible, any changes to the criterion scores would be minor, with the direction (increase or decrease) of change, if any, having the potential to vary by site.
	Water Volume (V)	yes	1. Upstream development 2. TVA reservoir operating policy 3. Increased consumptive use associated with water withdrawals		1. No; change is neutral, and would not change criteria scoring more than in a very minor way. while upstream development causes local changes in terms of the hydrologic response of small watersheds, effect at TVA reservoirs is minimal. 2. No; change is neutral, and would not change

					<p>criteria scoring more than in a very minor way. While changes in TVA operating policy have occurred since initial siting, seasonally varying minimum pool levels at TVA reservoirs have NOT decreased, so water supply issues have not been impacted.</p> <p>3. No; change is neutral, and would not change criteria scoring more than in a very minor way. while increases in water withdrawals, and associated increases in consumptive use have occurred since initial siting, the impact at TVA reservoirs is minimal.</p>
	T&E Species, Animal, Aquatic, Federal (X)	Yes - the presence of Federal listed aquatic animal species on a site would tend to exclude that site	1. Increase in the number of Federal listed aquatic animal species in the region and better knowledge of distribution of listed species.	1. Decrease in number of potentially viable sites. Due to the increase in the number of Federal listed aquatic animal species and known localities for these species, more sites would likely be excluded because of known occurrences of Federal listed aquatic animal species on or adjacent to sites	1. Likely to decrease the rating of more sites. Due to the increase in the number of Federal listed aquatic animal species and known localities for these species in proximity of sites, more sites would likely be rated as less viable because of known occurrences of State listed terrestrial animal species on or adjacent to sites.
	T&E Species, Aquatic, State (V)	Yes - the presence of state listed animal species on a site could reduce the viability of a site, but would not exclude	1. Increase in the number of State listed aquatic animal species in the region and	NA - Evaluative only	1. Likely to decrease the rating of more sites. Due to the increase in the number of State listed aquatic

		that site.	better knowledge of distribution of listed species.		animal species and known localities for these species, more sites would likely be rated as less viable because of known occurrences of State listed terrestrial animal species on or adjacent to sites
	Potential T&E Species Habitat - Aquatic (V)	Yes - {could be elevated to an exclusionary criterion for Federal designated critical habitat} - the presence of habitat for T&E aquatic animal species on or adjacent to a site could reduce the viability of a site, but would not necessarily exclude that site.	1. Increase in the number of Federal and state listed terrestrial plant and animal species in the region and better knowledge of distribution of listed species. 2. Federal designation of critical habitat areas for some plant and terrestrial animal species in the region.	2. Decrease in number of acceptable sites. Multiple new critical habitat designations in the region, primarily in tributary systems to the Tennessee and Cumberland Rivers.	1. Likely to decrease the rating of more sites. Due to the increase in the number of Federal and State listed aquatic animal species and known habitat requirements for these species, more sites would likely be rated as less viable because of the presence of suitable habitat for Federal or State listed plants or terrestrial animal species.
	Wood Duck Production Area (V)	No. Wood duck populations have increased since 1960s/1970s and it is no longer necessary to consider them separately from migratory waterfowl.	1. Wood duck populations have increased to the point where species does not need its own criteria.		The continued use of this criterion would make little difference in site rankings (i.e., be neutral).
	Migratory Waterfowl Rest/Feed Area (V)	Yes. This is still an important resource area and has moderate to high stakeholder interest.	1. Overall migratory waterfowl numbers have shown long term decline in Valley. 2. Some former high quality areas are no longer heavily used by waterfowl and a few new high quality,		The changes would probably result in a minor change in site rankings, both positive and negative.

			heavily used areas have become established.		
	Migratory Shorebirds (V)	Yes. This is still an important resource area and has moderate to high stakeholder interest.	1. Populations of some shorebirds are declining. 2. A few formerly important shorebird sites in Valley are no longer heavily used 3. Our knowledge of important shorebird sites in the Valley has recently increased due to more systematic survey efforts and several important sites have been discovered.		The changes would probably result in minor changes in site rankings because characteristics of high quality shorebird sites are correlated with other criteria (positive with presence of embayments, wetlands, negative with suitability for barge facilities).
	Migratory Rest/Feed and Migratory Shorebirds (V)	No - this criterion largely overlaps the above Migratory Shorebirds criterion and little value in keeping it as separate criterion.	See comments for Migratory Shorebirds		See comments for Migratory Shorebirds
	Wood Duck Production Areas and Migratory Rest/Feed Area (V)	No - this criterion largely overlaps the above Wood Duck Production Areas criterion. See comments for Wood Duck Production Areas criterion.	See comments for Wood Duck Production Areas criterion.		See comments for Wood Duck Production Areas criterion.
	Trout Streams (V)	Yes, it would still function as an evaluative suitability criterion. All sites in the Tennessee and Cumberland Valleys would be considered managed trout fisheries and would not be considered wild trout fisheries.	1. Trout stocking below cold water released from TVA's storage reservoirs have increased to provide fishing opportunities for anglers.	N/A	Decrease, 1. Yes, the suitability of sites measured by this criterion would slightly decrease for waters of the state classified as cold water bodies due to special

					thermal discharge regulations which apply for trout waters in the Tennessee and Cumberland River Valley States. The rating decrease would be minimal due to new cooling water technologies for closed cycle cooling and EPA's CWA Section 316 (b) Phase I ruling for new power plants where receiving waters would be minimally affected by the discharge of the plant.
	Warmwater Sport Fishing Streams (V)	Yes, it would still function as an evaluative suitability criterion. There has been no change to the sport fisheries in the Tennessee and Cumberland Valleys.	No appreciable changes have occurred.	N/A	Neutral, No appreciable change to the suitability of sites measured by this scoring criterion for warm water sport fishing streams. Thermal tolerances of all fish species found in warm water sport fishing streams are within the range of state thermal limits.
	Reservoir Sport Fishing Area (V)	Yes, it would still function as an evaluative suitability criterion. There has been little to no change to the sport fisheries in the Tennessee and Cumberland Valleys.	1. Striped bass were introduced as a sport fish to provide fishing opportunities for anglers.	N/A	Neutral, 1. No, thermal tolerances of striped bass are greater than the state(s) thermal limits and would not appreciably change scoring for sites under this criterion.
	Embayment Areas (V)	Yes, to ensure that TVA operations do not result in significant adverse impacts to water quality or aquatic life.	1. Implementation of Federal Water Pollution Control Act (Clean Water Act) and	N/A	1. Yes, potential decrease - The degree of impact on the criterion score would be dependent on the current

			<p>subsequent amendments, particularly 303(d) Listing, 305(b) reporting, and 402 permitting</p> <p>2. River system operations</p> <p>3. There has been no appreciable change in the reservoir fisheries in the Tennessee and Cumberland Valleys.</p>		<p>status of a waterbody for supporting designated uses, the reason, if any, for impairment and the potential for a power plant to negatively impact use attainment.</p> <p>2. Yes, slightly decrease to slightly increase - Because operational policy must maintain basic system benefits of flood control, power production, and navigation; and be environmentally, economically, and technically feasible, any changes to the criterion score would be minor, with the direction (increase or decrease) of change, if any, having the potential to vary by site.</p> <p>3. No, neutral.</p>
	<p>Two-story Reservoirs (V) (Assumed to mean tributary reservoirs with viable habitat for cold water and warm water sport fishes.)</p>	<p>Yes, to ensure that TVA operations do not result in significant adverse impacts to water quality or aquatic life.</p>	<p>1. Implementation of Federal Water Pollution Control Act (Clean Water Act) and subsequent amendments, particularly 303(d) Listing, 305(b) reporting, and 402 permitting</p>	N/A	<p>1. Yes, potential decrease - The degree of impact on the criterion score would be dependent on the current status of a waterbody for supporting designated uses, the reason, if any, for impairment and the potential for a power plant to negatively impact use</p>

			<p>2. River system operations</p> <p>3. Cold water sport fishes (i.e., rainbow, brown, and/or lake trout) are stocked in some TVA reservoirs with suitable habitat (e.g., South Holston Watauga, and Fort Patrick Henry) to provide increased fishing opportunities.</p>		<p>attainment.</p> <p>2. Yes, slightly decrease to slightly increase - Because operational policy must maintain basic system benefits of flood control, power production, and navigation; and be environmentally, economically, and technically feasible, any changes to the criterion score would be minor, with the direction (increase or decrease) of change, if any, having the potential to vary by site.</p> <p>3. Yes, the suitability of sites measured by this criterion would slightly decrease for waters of the state classified as cold water bodies due to special thermal discharge regulations which apply for trout waters in the Tennessee and Cumberland River Valley States. The rating decrease would be minimal due to new cooling water technologies for closed cycle cooling and EPA's CWA Section 316 (b) Phase I ruling for new power plants where</p>
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					receiving waters would be minimally affected by the discharge of the plant.
	Migratory Spawning Areas (V)	Yes, it would still function as an evaluative suitability criterion. There has been no appreciable change in the migratory species spawning areas in the Tennessee and Cumberland Valleys.	1. Striped bass were introduced as a sport fish to provide fishing opportunities for anglers. 2. Most Resident Important Species (RIS) spawning areas have been identified in the Cumberland and Tennessee Valleys.	N/A	Neutral, 1. No, the suitability of sites for this criterion would not appreciably change because striped bass thermal tolerances are greater than the state thermal limits. 2. The majority of RIS Spawning areas have been located where spawning occurs. No appreciable change would occur to the suitability criteria.
	Proposed Snail Darter transplant Area (V)				
	State Mussel Sanctuary (V)	Yes - Sanctuaries are a priority in conservation of freshwater mussels.	1 There are more sanctuaries today. The ecological importance of sanctuaries has increased over time.	NA - Evaluative only	More sites would have more Sanctuaries nearby; thereby, lowering the site rating.
	Productive Mussel Beds (V)	Yes - Mussel harvest is still viable in some areas of the system, primarily in the lower Tennessee River but mussel stocks are in decline.	1. With the increase of mussel habitat placed in State Sanctuaries, and overall declines in mussel resources in the Tennessee and Cumberland Rivers, fewer productive commercial beds exist 2 Because of declines,	NA- Evaluative Only	1. Likely to decrease the rating of more sites. Placement of formerly productive mussel beds into Sanctuary areas increases protection of those sites.

			existing productive mussel beds are more important.		2. Likely to decrease the rating of some sites. Because formerly productive mussel beds have been removed from harvest and placed into sanctuaries, and because there is an overall decline in mussel populations, existing productive mussel beds are more important to State wildlife agencies and commercial mussel operations. 2 - Potential to increase the rating of some sites. Some areas on the Tennessee and Cumberland Rivers that formerly supported productive mussel beds no longer have this resource. Sites adjacent to these areas would rate higher because the restricted resource is no longer present.
Hazardous Land Use	Pipelines – Natural Gas (NG) Major Transmission (X)	Yes, safety considerations would indicate this criterion should remain exclusionary	There are currently 10 major NG interstate transmission pipelines traversing the TVA Power Service Area. One major NG line retirement in the 1990s	Neutral to a slight reduction in number of available sites. minor factor with regard to potential changes and determining overall number of sites	
	Pipelines NG Distribution (X)	Yes, safety considerations would indicate this criterion should remain exclusionary	Assumption is that the distribution system has expanded similar to urban build-up and increase in lands	Would tend to reduce the number of available sites similar to patterns for urban build-up and increase in lands	

			designated industrial.	designated industrial. Minor effect on number of available sites.	
	Pipelines Petroleum Products (X)	Yes, safety considerations would indicate this criterion should remain exclusionary	There are currently three (3) major interstate refined oil pipelines and two (2) major interstate crude oil pipelines traversing the TVA PSA	Neutral to at most a very minor reduction in number of available sites due to the low number of such pipelines crossing the TVA PSA. Minor factor with regard to potential changes and effect on number of available sites.	
	Airports (X)	Yes, still vital criterion.	Probable increase in number of airports.	Decreases acceptable sites due to increased development in previously rural areas and increase in hazard material transport.	Decreases acceptable sites due to increased development in previously rural areas and increase in hazard material transport.
	Transportation of Materials - Air (X)	Yes, still vital criterion.	Probable increase in number of flights carrying hazardous materials.	Decreases acceptable sites due to increase in hazard material transport over potential areas.	Decreases acceptable sites due to increase in hazard material transport over potential areas.
	Transportation of Materials – Mainline Railroad (X)	Yes, still vital criterion.	Probable increase in number of mainline rails and trains carrying hazardous materials.	Decreases acceptable sites due to increase in hazard material transport and transport routes.	Decreases acceptable sites due to increase in hazard material transport and transport routes.
	Transportation of Materials – Spur Railroad (X)	Yes, still vital criterion.	Probable increase in number of spur rails and trains carrying hazardous materials.	Decreases acceptable sites due to increase in hazard material transport and transport routes.	Decreases acceptable sites due to increase in hazard material transport and transport routes.
	Transportation of Materials – Highway (X)	Yes, still vital criterion.	Probable increase in number of roads/highways and trucks carrying hazardous materials.	Decreases acceptable sites due to increase in hazard material transport and transport routes.	Decreases acceptable sites due to increase in hazard material transport and transport routes.

	Transportation of Materials – Barge (X)	Yes, still vital criterion.	Probable increase in number of barges carrying hazardous materials.	Decreases acceptable sites due to increase in hazard material transport.	Decreases acceptable sites due to increase in hazard material transport.
Public Land Use	Proposed State Parks (V)	Yes. These areas are important for their natural and cultural resources, and recreation.	Slight increase since 1970's.	This would tend to reduce the number of acceptable sites.	More sites would have more Proposed State Parks nearby; thereby, lowering the site rating.
	State Forest (X)	Yes. State Forests are important areas for natural resource (including timber) management, and recreation.	Little or no change since the 1970's.	This criterion would be expected to result in little or no change the number of acceptable sites.	This criterion would be expected to result in little or no change in site ratings.
	State Wildlife Management Area (WMA) (X)	Yes. WMA's provide unique recreational opportunities.	There are more WMA's today, and they tend to be larger. Today, there is less private land available for these uses, and are there is a greater public demand for WMA's.	This would tend to reduce the number of acceptable sites.	More sites would have more WMA's nearby; thereby, lowering the site rating.
	Proposed Natural Areas (V)	Yes. These areas protect important biological and geological resources.	There are more Proposed Natural Areas today.	This would tend to reduce the number of acceptable sites.	More sites would have more Proposed Natural Areas nearby; thereby, lowering the site rating.
	Public Parks, Playgrounds, Access Areas (X)	Yes, zoning and federal grant regulations result in protection of <u>more</u> public recreation areas.	1. (X) Yes, Since 1970 the State Comprehensive Outdoor Recreation Plans Inventory (completed/updated every five-years) reflects an <u>overall increase</u> in public recreation areas.	As noted this would result in excluding sites a (decrease in #'s of potential sites). This would be a major scoring factor and result in mitigation requirements.	

	Proposed Public Parks, Playgrounds, Access Areas (V)	Yes, the communities continue to identify sites for parks and open space areas with important recreation characteristics.	2. (V) Increased zoning and comprehensive planning has resulted in protection of <u>more</u> areas proposed for public recreation.		Yes, Since the 1970's; zoning, comprehensive planning and capital improvement plans have resulted in an <u>increase</u> in public lands being planned for recreation developments; This criteria would result in lower suitability scores for possible sites, because of previously adopted plans. This would be a minor scoring factor.
	Commercial Recreational Development (X)	Assumption: that "Commercial Recreational Developments" are privately owned and purchase would be required from private owner with offer to assist with business relocation payments. In current TVA criteria this would be considered as a suitability criterion and no longer an exclusionary one.	2) (V) Yes, since 1970 as population has increased, public recreation development has been unable to keep up with demands for recreation opportunities. The result has been widespread development of <u>more</u> commercial recreation areas/facilities. This criterion would require evaluation of increased cost to purchase and relocate commercial recreation business. Tendency would be to continue to avoid commercial sites due to financial considerations and potential for impacts	Assumption: that "Commercial Recreational Developments" are privately owned and purchase would be required from private owner with offer to assist with business relocation payments. In current TVA criteria this would be considered as a suitability criterion, and no longer an exclusionary criterion as evaluated in the 1970's. State inventories of recreation areas reflect a large increase in #'s of commercial recreation areas over the past 30-40 years; which would result in lower suitability scores to a large number of sites.	Yes, since 1970 as population has increased public recreation development has been unable to keep up with demands for recreation opportunities. The result has been widespread development of <u>more</u> commercial recreation areas/facilities; which would be a cost consideration to suitability score. In general would lower suitability score of new sites.

			to local communities.		
	Unusual Recreational Potential (V)	Yes, Assumption: that areas with "Unusual/Unique Recreational Potential" are inventoried and planned for public ownership, protection and development for public recreation use (including informal recreation opportunities).	2) (V) Yes, This criterion would require evaluation of increased cost to purchase and replace unusual recreation opportunities.		Yes, Since the 1970's; zoning, comprehensive planning and capital improvement plans have resulted in an <u>increase</u> in public acquisition of "unusual/unique" lands for public recreation uses. This would result in lower suitability scores for new sites. This would be a minor scoring factor.
	Proposed Scenic Routes (V)	Yes, Proposed Scenic Rivers, Byways and Greenways/trails have met some standards of "Viewshed Quality" and are therefore candidates for inclusion in the statewide program.	2) (V) Active state programs are now in place to evaluate the scenic qualities of Rivers, Byways and Greenways/trails corridors as candidates for scenic designation, resulting in an increased number of proposed scenic routes for official designation.		Yes, Since the 1970's; active state programs have resulted in an <u>increase</u> in public areas/routes being <u>proposed</u> for scenic byways, rivers and greenways/trails designations. This would result in decrease the suitability scores of more sites. Since these are not yet officially designated areas, this criterion would require additional evaluation cost to first; verify then protect if possible the scenic quality and character of the corridor/route involved during and after construction.
	Unique Features (V)	Yes. Unique Features are an important part of natural and cultural history.	There has been a moderate increase in Unique Features since the 1970's.	This would tend to reduce the number of acceptable sites.	More sites would have more Unique Features nearby; thereby, lowering the site rating.

	Wilderness, Natural, Environmental Areas (X)	Yes. These areas are important in protection of cultural and natural resources. They provide venues for recreation and environmental awareness.	There has been a moderate increase in Wilderness, Natural, and Environmental Areas since the 1970's.	This would tend to reduce the number of acceptable sites.	More sites would have more Wilderness, Natural, and Environmental Areas nearby; thereby, lowering the site rating.
	National Forest (X)	Yes. National Forests are important areas for forest management and water quality protection. They provide a variety of multiple use opportunities.	Little or no change since the 1970's.	This criterion would be expected to result in little or no change the number of acceptable sites.	This criterion would be expected to result in little or no change in site ratings.
	Property on National Historic Register of Historic Places (X)	Yes. This would still be an exclusionary criterion.	More cultural sites would be recorded since this time	More sites would be excluded as there would be an increase in properties listed on the NRHP.	
	Property Eligible for National Register of Historic Places (V)	No - Should be X (eligible is equal to being listed on the NRHP)	More cultural sites would be recorded since this time	More sites would be excluded as there would be an increase in properties eligible for listing on the NRHP.	
	State Historic Sites (V)	Yes. This should still be an evaluative criterion	More cultural sites would be recorded since this time	More sites would be excluded as there would be an increase in state historic sites; although this increase and effect would be minor as there are fewer state historic sites than NRHP listed or eligible sites.	

Private Land Use	Urban Build-up Outside Corporate Limits (X)	Yes. Urban build-up (continued growth and urban sprawl) presents problems both in land acquisition (due to relatively small size of parcels) and in emergency planning and evacuation.	1. Urbanization and suburbanization have continued throughout much of the Valley over the past few decades, significantly increasing population and population density in many areas, especially near large to medium-sized population centers. Significant population decreases have generally been limited to relatively isolated areas that already had low population density.	1. Yes, this would generally decrease the number of acceptable sites and is highly unlikely to change any site from unacceptable to acceptable. It could be a major factor with regard to some sites, but be only a relatively minor factor for others, depending on the amount and geographic spread of the growth.	
	Existing Urban Build-up (X)	Yes, urban build-up presents problems in both land acquisition (due to relatively small size of parcels) and in emergency planning and evacuation.	1. Many cities in the Valley have expanded their geographic boundaries due to growth and lack of space. It is very unlikely that any have significantly contracted their boundaries.	1. Yes, the criterion applied today would exclude the same areas excluded earlier as well as some additional acreage. The extent of the additional acreage could be a major factor in some cases, but likely is a minor to moderate factor in other cases.	

	Designated Industrial (V)	Yes, use of planned industrial sites could have significant socioeconomic impacts to residents of the surrounding area.	<ol style="list-style-type: none"> 1. Some sites designated industrial are now developed industrial. 2. Some new sites have been designated industrial. 3. We are not aware of any major sites formerly designated industrial that have not been developed and have lost that designation. 		<ol style="list-style-type: none"> 1. This would decrease the suitability of the site due to the greater socioeconomic impacts. 2. Same as 1. 3. The suitability of the site probably would decrease, since it is likely that the reasons for losing the industrial designation would also make the sites less attractive for nuclear plant siting.
	Projected Urban 2000 (V)	Yes, sites that are likely to become urban could present socioeconomic issues.	<ol style="list-style-type: none"> 1. With continued urban and suburban growth throughout much of the Valley, more areas are likely to have significant projected urban growth than during the earlier assessment. 		<ol style="list-style-type: none"> 1. Yes, change would tend to generally decrease the suitability of a site. The extent could vary from major to minor.

Notes:

1. Siting objectives include: 1) identification of potential site areas which exhibit a suitable combination of engineering, environmental, land use, cultural, and institutional characteristics for power plant siting; 2) identification of potential site areas of a developable size (1,000+ acres); 3) identification of a manageable number of potential site areas; and 4) identification of a relatively even distribution of potential sites along the Tennessee River corridor and within the defined TVA service area that meet projected supply and load requirements

2. Exclusionary criteria are an all-or-none type of criteria. If the site exhibits an exclusionary characteristic, it is excluded (off the list of sites). However, even if a site passed the exclusionary criterion, a proximity function could then be applied as part of further suitability evaluation. Suitability scoring criteria are used for the comparison of suitability of sites, not initial screening. Scoring of a suitability criterion in the original TVA process (1960s-1970s) was typically on a scale of 0 to 5. For suitability criteria, zero (0) indicated “no impact;” and five (5) indicated an impact on or from the data item so great as to probably justify rejection from siting consideration. This column is to indicate, if something has changed since the 1970’s that would affect either type of criterion (Indicate which).
3. For example, 1) have new regulations or limiting criteria been implemented, 2) is more information available, 3) more federally listed species, 4) do we generally know other pertinent information about the environment of the Tennessee or Cumberland Rivers in general that would have an effect.

(A) Provide “yes or no” and succinctly explain basis of answer

(B) Use numbered bulleted listing.

(C) Provide “yes or no,” how and to what degree (e.g., would it be likely to change criteria scoring² in a minor way, by only a point, or be a major factor?)³ Succinctly provide basis and/or reasoning for your assessment for each bulleted item (from column 4).

(D) Provide “yes or no,” how and to what degree (e.g., would it be likely to change criteria scoring² in a minor way, by only a point, or be a major factor?)³ Succinctly provide basis and/or reasoning for your assessment for each bulleted item (from column 4).