August 12, 1974

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Atomic Safety and Licensing Board
U.S. Atomic Energy Commission
Washington, D. C. 20545

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Mr. Glenn O. Bright
Atomic Safety and Licensing Board
U.S. Atomic Energy Commission
Washington, D. C. 20545

In the Matter of Tennessee Valley Authority
(Bellefonte Nuclear Plant, Units 1 and 2)
Docket Nos 50-438 and 50-439

Dear Members of the Board:

Enclosed are "AEC Regulatory Staff's Proposed Findings of Fact and Conclusions of Law in the Form of a Proposed Partial Initial Decision on Environmental Matters and Site Suitability" and "AEC Regulatory Staff's Proposed Transcript Corrections".

Sincerely,

William D. Paton
Counsel for AEC Regulatory Staff

Enclosures (2)

cc w/enclosures:
See page 2.

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UNITED STATES OF AMERICA
ATOMIC ENERGY COMMISSION

Before the Atomic Safety and Licensing Board

In the Matter of	)	
	)	
TENNESSEE VALLEY AUTHORITY	)	Docket Nos. 50-438, 50-439
	)	
(Bellefonte Nuclear Plant, Units 1 and 2)	)	
	)	

AEC REGULATORY STAFF'S PROPOSED TRANSCRIPT CORRECTIONS

The Regulatory Staff proposes the following additional transcript corrections:

July 11, 1974

PAGE	LINE	CORRECTION
473	21	Change "employers" to "employer".
492	10	Change "the conomic cost" to "the economic cost".
493	23	Change the word "design" to the word "cost".
495	1	Change the word "on" to the word "with".
497	17	Change "on the shoreline" to "with the shoreline"; and change "on the deep water" to "with the deep water".
532	17	Change the word "is" to the word "was".

PAGE	LINE	CORRECTION
538	8	Change the word "will" to the word "would".
540	21	Add the word "can" after the word "Applicant" at the end of the line.
545	9	Delete the word "difference,".
546	7	Insert the words "impacts of" between the words "environmental" and "power".
563	7	Change the words "some site" to the words "the society".
563	13	Add the words "if I" before the word "could" at the beginning of the line.
565	1	Delete the first sentence, "An organism is one scale and that is it."
567	11	Change "choices" to "choice".
567	25	Change the word "came" to the word "claim".
568	24	Change the word "have" to the word "vary".
569	4	Change the words "Are you" to the words "If you are".
572	2	Change the word "reduction" to the word "production".
578	6	Change the word "coded" to the word "quoted".

PAGE	LINE	CORRECTION
581	10	Delete the word "additive" at the end of the line.
583	10	Change the word "benefit" to "cost-benefit".
584	24	Delete the word "there" at the end of the line.
586	4	Insert the word "of" between the words "coefficient" and "variations".
587	12	Change the words "low bank" to the word "overbank".
594	18	Change the word "irredressable" to the word "irreversible".
594	19	Change "kt" to the word "it".
598	14	Change the word "or" to the word "of".
611	17	Change "gas fires" to the word "gasifiers".
611	18	Change "gas fire" to the word "gasifier".
611	20	Change the word "gas" to the word "gasifier".
611	21	Delete the word "fire".

Respectfully submitted,

William D. Paton

William D. Paton
Counsel for AEC Regulatory Staff

Dated at Bethesda, Maryland,
this 12th day of August, 1974.

8/12/74

UNITED STATES OF AMERICA
ATOMIC ENERGY COMMISSION

In the Matter of	)	
	)	
TENNESSEE VALLEY AUTHORITY	)	Docket Nos. 50-438
	)	50-439
(Bellefonte Nuclear Plant,	)	
Units 1 and 2)	)	

AEC REGULATORY STAFF'S PROPOSED FINDINGS OF FACT AND CONCLUSIONS OF LAW IN THE FORM OF A PROPOSED PARTIAL INITIAL DECISION ON ENVIRONMENTAL MATTERS AND SITE SUITABILITY[1/]

I
PRELIMINARY STATEMENT

1. The Tennessee Valley Authority (hereinafter referred to as TVA or the Applicant) filed with the Atomic Energy Commission (AEC or Commission) an application, docketed on June 21, 1973, for licenses to construct its proposed Bellefonte Nuclear Plant, Units 1 and 2 (Bellefonte plant, Bellefonte 1 and 2, or the facility), two pressurized water nuclear reactors, each of which is designed for initial operation at approximately 3600 megawatts thermal with a gross electrical output of approximately 1221 megawatts. The proposed facility is to be located at the Bellefonte

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1/ Proposed Findings of Fact and Conclusions of Law on Radiological Health and Safety Issues will be filed by the parties at the conclusion of the hearing on that phase of the application. The Staff will file a proposed construction permit with its proposed findings on radiological health and safety issues.

site in Jackson County, Alabama, approximately 6 miles northeast of Scottsboro, Alabama.

2. On August 3, 1973, the Commission published a Notice of Receipt of Application for Construction Permits and Facility Licenses and Availability of Applicant's Draft Environmental Statement (38 F.R. 20932). Also published by the Commission on that same date, was a Notice of Hearing on Application for Construction Permits which, among other things, appointed an Atomic Safety and Licensing Board to conduct the proceeding and provided an opportunity for persons whose interest may be affected by construction of the facility to file petitions with the Commission for leave to intervene in the proceeding (38 F.R. 20932-3).

3. On September 4, 1973, John Frank Hurt, Mary Texas Garner (a minor), William Texas Garner (a minor), Mary Texas Hurt Garner, William E. Garner, Veda N. Darwin, Homer T. Darwin, Nellie P. Nolen, and W. R. Nolen (hereinafter Joint Intervenors), filed a Petition for Leave to Intervene in the captioned proceeding, while the Department of Public Health of the State of Alabama filed a petition to participate pursuant to 10 CFR 2.715(c) on August 27, 1973. Other requests for intervention were filed by Daniel Payne Hale and Lyle A. Taylor.

4. On November 1, 1973, the Board conducted a prehearing conference in Scottsboro, Alabama and on November 9, 1973, issued an order in which it admitted the Department of Public Health of the State of Alabama for participation under 10 CFR § 2.715(c). The Board also admitted the Joint Intervenors as parties to the proceeding and granted them until December 3, 1973 to amend their Petition for Leave to Intervene. It was noted in our order that Daniel Payne Hale and Lyle A. Taylor did not appear at the prehearing conference, but an additional 20 days was afforded them in which to advise the Board if they desired to pursue their petition to intervene. Ward G. Van Orman, who appeared at the November 1, 1974 prehearing conference and expressed an interest in intervention, was given until December 3, 1973 to file a Petition for Leave to Intervene and was ordered to show good cause for his late filing in accord with the requirements set forth in 10 CFR § 2.714(a).

5. On January 22, 1974, the Board denied the Petitions for Leave to Intervene filed by Daniel Payne Hale and Lyle A. Taylor and by Ward G. Van Orman for failure to comply with 10 CFR § 2.714 but stated that special consideration would be given to the Petitioners in the event they wish to make limited appearances.

6. At the second prehearing conference, held March 20, 1974 in Scottsboro, Alabama, the parties presented a document to the Board entitled "Stipulation of Contentions" which had resulted from efforts of all parties to define issues contained in the original petition for leave to intervene filed by Joint Intervenors. The contentions were submitted by the parties "for purposes of discovery only".[2/] The Board permitted the parties to proceed with discovery on this basis, taking cognizance that it was the intent of the parties to further refine the issues upon termination of the discovery period.[3/]

7. On April 30, 1974, the Applicant and the Joint Intervenors stipulated and agreed that the sole issue to be placed in controversy by the Joint Intervenors would be whether the access railroad to the proposed Bellefonte Nuclear Plant should follow the route proposed in the Applicant's Draft Environmental Statement or the alternative route described therein.[4/] The Board accepted this issue as a legitimate area of controversy.[5/] On July 9, 1974, the first day of the hearing, the Applicant and the Joint Intervenors advised the Board that a settlement of the remaining issue between them had been concluded

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2/ "Stipulation of Contentions" filed March 21, 1974, p.1.

3/ Tr. p.54.

4/ TVA DES pp.2.9-3 - 2.9-4.

5/ Order relative to Environmental Hearing, June 19, 1974.

and as a result, the Joint Intervenors withdrew from further participation in the proceeding. Since there were matters of controversy between the AEC Regulatory Staff (Staff) and the Applicant, this was a contested proceeding as defined in 10 CFR § 2.4(n).

8. Limited appearance statements were made by John M. Hammond, Ward G. Van Orman, Faith Young, and William E. Garner on July 9, 1974, the first day of the hearing.[6/] The Applicant and regulatory staff responded to substantive questions raised on the record by these statements.[7/]

9. The record in this case consists of transcripts of prehearing conferences on November 1, 1973 and March 20, 1974 and transcripts of the three days of evidentiary hearings on July 9, 10 and 11, 1974. Four exhibits were introduced by each of the parties and admitted into evidence as follows: TVA's Final Environmental Statement,[8/] TVA's Preliminary Draft Analysis of Bellefonte Entrainment Data,[9/] TVA's Outdoor Recreation Plan,[10/] and a letter dated July 9, 1974, signed by the attorney for the

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6/ Starting at Tr.86, 100, 134, and 139.

7/ App. at Tr.147 et. seq. and Staff at Tr. 151 et. seq.

8/ App. Ex.1, admitted into evidence at Tr. p.167.

9/ App. Ex.2, admitted into evidence at Tr. p.338.

10/ App. Ex.3, admitted into evidence at Tr. p.615.

Applicant and the attorney for the Intervenors concerning a settlement of the access rail dispute.[11/] The Staff introduced the deposition of Dr. Clyde W. Voigtlander,[12/] a letter dated June 25, 1974, from the Applicant to the Directorate of Licensing concerning a limited work authorization,[13/] the AEC Final Environmental Statement,[14/] and a letter from TVA to Staff counsel dated June 28, 1974 stating TVA's consent to Condition 7(c) in the Staff's Final Environmental Statement concerning construction and maintenance of transmission line rights-of-way.[15/]

10. As discussed more fully in Section VII of these proposed findings, on June 25, 1974, TVA requested a limited work authorization pursuant to 10 CFR § 50.10(e).

11. With respect to its responsibilities under NEPA, and pursuant to the Notice of Hearing in this proceeding, and to § 50.10(e)(2)(i) of 10

11/ App. Ex.4, admitted into evidence at Tr. p.516.

12/ Staff Ex.1, admitted into evidence at Tr. p.252.

13/ Staff Ex.2, admitted into evidence at Tr. pp.285-86.

14/ Staff Ex.3, admitted into evidence at Tr. p.480.

15/ Staff Ex.4, admitted into evidence at Tr. p.528.

CFR Part 50, the Board is required, in accordance with § A.11 of Appendix D of 10 CFR Part 50,[16/] to:

> "(a) determine whether the requirements of 102(2)(C) and (D) of NEPA and Appendix D of 10 CFR Part 50 have been complied with in this proceeding,
>
> (b) independently consider the final balance among conflicting environmental factors contained in the record of the proceeding for the permit with a view to determining appropriate action to be taken, and
>
> (c) determine, after weighing the environmental, economic, technical and other benefits against environmental cost in considering available alternatives, whether the permit should be issued, denied, or appropriately conditioned to protect environmental values."

12. With respect to TVA's request for a limited work authorization, the Board is also required in accordance with 10 CFR § 50.10(e)(2) to determine that:

> "...based upon the available information and review to date, there is reasonable assurance that the proposed site is a suitable location for a nuclear power reactor of the general size and type proposed from the standpoint of radiological health and safety considerations under the Act and Rules and Regulations promulgated by the Commission pursuant thereto."

16/ On August 19, 1974, 10 CFR Part 50, Appendix D was supplanted by 10 CFR Part 51. All environmental findings set forth in these findings, conform to the latest requirements of the Commission, but for purposes of simplicity, since the new section is virtually identical to the old one, the Board has referenced 10 CFR Part 50, Appendix D exclusively in these findings.

II. FINDINGS OF FACT ON ENVIRONMENTAL IMPACTS

A. Environmental Statements

1. When it filed its application, the Applicant submitted, in accordance with Appendix D to 10 CFR Part 50, its Draft Environmental Statement (TVA DES).[1/] TVA's application was docketed with the Commission on June 21, 1973. Based on the information submitted by the Applicant in its TVA DES and independently developed information, the Staff prepared a Draft Environmental Statement (AEC DES) which was issued in February 1974. Copies of the AEC DES, with request for comments, were sent to appropriate Federal, state and local agencies and a Notice of Availability, with requests for comments, was published in the Federal Register on February 1, 1974 (39 F.R. 4127). On May 24, 1974, TVA published and made available to the public its Final Environmental Statement (TVA FES).[2/] The Staff's Final Environmental Statement (AEC FES)[3/] was issued on June 10, 1974 and a Notice of Availability of the Final Environmental Statement was published in the Federal Register on that date (39 F.R. 20410). Comments received from organizations and agencies

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1/ TVA submitted a Draft Environmental Statement in lieu of an Environmental Report since TVA is subject to the requirements of § 102 of the National Environmental Act of 1969.

2/ App. Ex.1.

3/ Staff Ex.3.

in response to the AEC DES were considered in the AEC FES and a discussion of those comments was included therein.[4/]

2. The AEC FES covers in detail the environmental impact of construction and operation of the facility. It contains a detailed description of the site and of the facility with a discussion of the impact of site preparation and transmission line construction. In addition, the AEC FES deals with the environmental effects of plant operation, discusses the environmental monitoring program and the environmental effects of postulated accidents. The AEC FES contains a detailed evaluation of the proposed action including consideration of the need for power, the adverse environmental effects which cannot be avoided, the relationship between local short term uses of man's environment and maintenance and enhancement of long term productivity, and irreversible and irretrievable commitments of resources. It further contains a review of alternative energy sources and sites, of plant design alternatives and finally provides a cost-benefit analysis. The AEC FES concludes that after weighing the environmental, economic, technical and other benefits of the Bellefonte nuclear plant against environmental and other costs and considering available alternatives, that the action called for under the National Environmental Policy Act of 1969 (NEPA) and Appendix D to 10 CFR Part 50 is the issuance of construction permits for

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4/ AEC FES, § 13.

Bellefonte Nuclear Plant, Units 1 and 2 subject to certain conditions for protection of the environment.[5/]

3. The AEC FES, as supplemented by the testimony and other evidence presented in this proceeding, is an adequate and comprehensive review and evaluation of the environmental impact resulting from plant construction and plant operation. The AEC FES, as so supplemented, sets forth an adequate evaluation of all reasonable alternatives to the proposed action.

4. The Board finds that the Staff environmental review pursuant to NEPA, reflected in the AEC FES, as supplemented, has been adequate and that the requirements of NEPA and of Appendix D to 10 CFR Part 50 have been complied with in this proceeding. The Board has made independent findings as set forth below respecting anticipated environmental impacts and alternatives to the proposed facility.

B. Impacts of Construction

5. Of the 1500 acres at the site, less than half will be disturbed by construction activities. Procedures to be used by TVA in the excavation,

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5/ AEC FES, pages iv-v, items 7a-g.

obtaining fill, grading and a final surface conditioning will determine much of the impact caused by these activities. The applicant is committed to measures and controls to limit possible adverse effects from construction as stated in § 4.4 of the AEC FES. The Board concludes that minimum adverse environmental impact from construction will result from TVA's compliance with these commitments which concern tree and brush clearing, land fill, salvagible materials, burning, excavation, erosion, dust, blasting, noise, pesticides and herbicides, yard drainage system, sumps, concrete, chemical clearing, sanitary wastes, dredging, road repairs, and transmission lines. Therefore, we will incorporate condition 7(e)[6/] of the AEC FES, which encompasses these commitments, into the construction permits.

6. The parties were able to reach an agreement under which TVA consented to Condition 7(c) in the AEC FES.[7/] In addition to the extensive commitments with regard to transmission line construction and maintenance made by TVA as set forth in § 4.4 of the AEC FES, TVA consented not to use the broadcast application of herbicides on the rights-of-way covered under the first part of its transmission line construction plan and further agreed to conduct studies which will assess the impacts of various alternative methods of

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6/ AEC FES p.v.

7/ Staff Ex.4.

transmission line construction and maintenance. Prior to any construction of the remainder of its transmission line construction plan, Applicant agreed to submit the results of these studies for Staff evaluation and an updated version of its proposed clearing and maintenance methods for Staff approval. The Board, after reviewing the evidence in this proceeding, concludes that such procedures will assure a minimization of environmental impact relative to transmission line construction and maintenance practices and we will so condition the construction permits.

7. One of the matters in dispute between the Staff and the Applicant concerned the routing of the access road to the facility. The Applicant proposed to construct a new access road with a causeway across Town Creek, thus allowing access to the tip of the peninsula where recreation developments could occur. The Staff presented a cost-benefit analysis of this proposal and of an alternative, which was to upgrade the existing road.[8/] The Staff concluded that although the overall environmental impact of the two roads was about the same, the alternative of upgrading the existing road was the preferred one because it would limit the magnitude of development for recreational purposes of the tip of the peninsula on which the facility would be constructed.[9/] The Staff believed that the development of the peninsula as a

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8/ AEC FES, p.28 et. seq.

9/ AEC FES § 9.2.3.

natural wildlife area was environmentally preferable to unlimited recreational use. During the proceeding, the parties submitted the following proposed condition to the Board for approval:

> "TVA may develop either, but not both, of the two alternative access routes to the plant as the permanent plant access road; provided that TVA agrees that approximately 500 acres of land located on the northeast tip of Bellefonte peninsula will be developed as a "generally dispersed recreation area" as defined in Tennessee Valley Authority's Recreation Plan, Volume 1, Methodology (1973); and that the proposed recreation area will be developed consistent with the maximum "peak hour recreation visits" of approximately 800 visits within a two mile radius of the plant for the life of the facility."[10/]

The Board believes that it is appropriate to prevent unlimited recreational use of the peninsula in order to avoid an undesirable impact on the environment in the vicinity of the facility and we will incorporate the proposed condition in the construction permits.

8. The chief consequence of on-site construction will be the addition to adjacent waters of particulate matter and nutrients which are in excess of the normal load in surface runoff. It is estimated that there will be erosion of 4600 tons of soil from the site during the six year construction period. There will be increases in turbidity and siltation resulting from dredging for the intake, discharge, docking facilities and construction of the causeway.[11/]

10/ Tr. p.602.

11/ AEC FES § 4.2.

TVA proposed construction practices that will limit impact due to siltation and turbidity and has provided the Staff a summary of procedures for a periodic review of construction activities which we believe will minimize adverse biotic impacts. 12/

9. The construction work force will grow from an average of 425 in the first year, 1975, to an average of 2200 during the peak construction year, 1978. Both parties estimated that between 25 and 30% of the construction work force at the Bellefonte plant will be new residents in the area and that Scottsboro and Hollywood will absorb approximately 70% of those new residents. The influx of these construction workers will favorably impact the local economy with a projected annual payroll of $22,000,000 in the peak construction year. It is estimated that the average annual expenditure in the local economy for purchases and special contracts by the Applicant will be $500,000. There will be an increased demand for approximately 170 houses, 170 mobile homes, and 80 apartments or sleeping rooms. 13/

10. The Board inquired as to the current status of the need for agricultural land and the impact of the construction of the Bellefonte facility on that need. Staff witness Boyle testified, based on conversations

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12/ AEC FES § 4.2.

13/ AEC FES pp. 4-7 and 4-8.

with Dr. Melvin L. Cotner of the Natural Resources Economics Division, Economic Research Service of the Department of Agriculture, that the cropland base in the United States appears adequate to meet the overall needs of the population and maintain a modest export to the year 2020.[14/] He stated, on his own knowledge, that the proposed Bellefonte site is not currently being used as cropland, but that a portion is being utilized for grazing (670 acres) while the remainder is woodland (830 acres). Only 300 acres of the 1500 acre site will be required for power plant facilities, auxiliary buildings, roads and miscellaneous facilities while 500 acres on the tip of the peninsula will be used for recreational purposes. The remaining 700 acres will remain essentially undisturbed. Witness Boyle further testified that after construction of the Bellefonte facility, there would still remain 67,128 acres of unharvested cropland in the county.[15/] Dr. Wesley G. Smith, Applicant's witness concluded that the withdrawal of agricultural land at the Bellefonte plant site would have an insignificant effect on food production.[16/] The Board concludes that there will be no significant adverse impact, on the national or regional scale, from the conversion of 800 acres of land at the Bellefonte site from its present use to a non-agricultural use.

14/ P.3, Testimony of Regis R. Boyle following Tr. p.606.

15/ P.7, Testimony of Regis R. Boyle following Tr. p.606.

16/ Testimony of Dr. Wesley G. Smith, following Tr. p.219.

11. The Board has considered the unavoidable impacts of construction of the facility and the associated transmission lines. The Board finds that a control program should be established by the Applicant to provide for a periodic review of all construction activities to assure that those activities conform to the environmental conditions set forth in the construction permits and, therefore, determines that condition 7(f) of the AEC FES will be made part of the construction permits.[17/] In addition, the Board believes it is appropriate that condition 7g of the AEC FES be incorporated into the construction permits in order to assure opportunity for Staff review of the impact of construction as it proceeds.[18/] We conclude that the environmental impact from construction of Bellefonte Nuclear Plant, Units 1 and 2 and associated transmission lines will be small, if the foregoing conditions are observed.

C. Impacts of Operation

12. Impacts on Land Use. The Top of Alabama Regional Council of Governments (TARCOG) has proposed a plan for future land use in the area of the site which visualizes the extension of industrial zoning southwestward from the site along the Guntersville Reservoir shoreline.[19/] No industrial

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17/ Page v.

18/ Id.

19/ AEC FES § 5.1.

or residential development other than the nuclear facility will take place on the Bellefonte peninsula, however. In addition to the use of 1500 acres for the site, right-of-way easements for transmission lines will cover about 1550 acres of land. Of the 1550 acres, 50% is woodland, 25% is in farming and pasture and 25% is uncultivated open land. An attempt will be made by the Applicant to reduce visual impact by grouping the structures of the facility in a diminishing progression of scale from the containment buildings to the office building. Nevertheless, it will present the appearance of an industrial plant dominated by the 500 high, hyperbolic cooling towers, which will become a landmark. The vapor plumes from the cooling towers will also create an esthetic impact on the surrounding towns, as well as for traffic on nearby U.S. Highway 72.[20/] After reviewing the evidence, we conclude that the impact of the facility on land use will be minimal.

13. Impacts on Water Use. All water for the Bellefonte Nuclear Plant will be drawn from Guntersville Reservoir. This Reservoir provides flood control, navigation, generation of electric power, sport and commercial fishing, recreation, and fresh water supplies. The maximum consumptive use of water by the Bellefonte facility will be, as an upper limit, 74 cubic

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[20/] AEC FES § 5.1.

feet per second (48 million gallons per day). Water supplies appear to be adequate to meet all foreseeable requirements in the Guntersville Reservoir area including the facility.[21/] The Bellefonte facility will comply with the "General Water Criteria and Classifications of the State of Alabama", prepared by the State of Alabama and the Environmental Protection Agency (EPA), November 14, 1972 and approved by the EPA January 18, 1973.[22/] We conclude that supplies of water in the region of the facility are such that its operation will not adversely impact upon each consumptive uses in the area.

14. The discharge facilities for the blowdown from the plant are still under study by the Applicant.[23/] The Staff proposed a construction permit condition, which was not opposed by Applicant, that prior to initiating construction of the discharge facility, the Applicant shall provide results of thermal-hydraulic analytical studies and plans for physically modeling experiments to be conducted in support of the final design and location of the plant cooling water discharge.[24/] The Board finds the condition reasonable and will incorporate it in the construction permits.

21/ AEC FES § 5.22.

22/ AEC FES § 5.1. This matter is further discussed in Section IV in these findings.

23/ AEC FES p.9-32.

24/ P.v, AEC FES, Condition 7d.

15. Entrainment of Icthyoplankton. The Staff has proposed two permit conditions relating to the anticipated loss of icthyoplankton through entrainment in the cooling water intake.[25/] In condition 7a of the AEC FES, the Staff suggests a sampling program, in order to obtain data necessary for assessment of the significance of the loss of icthyoplankton through entrainment in the proposed intake while condition 7b provides that (a) a 5% loss of icthyoplankton will be judged by the Staff to be insignificant from an environmental standpoint, (b) estimates ranging between 5% and 25% would be subject to intensive evaluation and decision by the Staff concerning the acceptability of the proposed intake, and (c) a loss of icthyoplankton in excess of 25% will be judged by the Staff as environmentally unacceptable. The Staff, in such an event, would require redesign or relocation of the proposed intake to minimize impact.

16. TVA has noted its disagreement with the Staff's proposal that a 25% loss of icthyoplankton through entrainment would constitute an unacceptable environmental impact, but does not contest the remaining portions of Staff conditions 7a and 7b.[26/]

17. During the course of direct testimony presented by Dr. Clyde W. Voigtlander, the Applicant presented data based on a brief sampling

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25/ AEC FES §§ 7a and 7b, p.iv.

26/ Tr.228.

period. This data[27/] became available to the Applicant shortly before commencement of the hearing.[28/] As noted by Applicant's witness, the whole field of larval fish biology is a very new one and biologists have just scratched the surface with respect to many techniques of handling the data and especially of interpreting the results of any analysis.[29/] He further stated that data was collected only for approximately 7 or 8 weeks and that each percentage of estimated fish loss represents a single point in time estimate.[30/] With regard to a second method of making estimates through the use of computers,[31/] Applicant's witness admitted that it was a crude one but stated it may be a little better than instantaneous point sample estimates where the data show themselves to be highly variable from week to week.[32/] In his deposition taken on June 14, 1974,[33/] Applicant's witness expressed even greater reservations concerning his ability to estimate, on the sampling data available, the percentage loss of icthyoplankton. He stated

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27/ App. Ex.2.

28/ Tr.235.

29/ Tr.232.

30/ Tr.234.

31/ Tr.234.

32/ Tr.234.

33/ Staff Ex.1.

that the purpose of the sampling program was to estimate the percentage of larval fish which would be entrained compared to the total larval fish population being transported past the plant.[34/] In response to an inquiry concerning the results of his sampling program, he answered that the the results to date could best be characterized as being inconclusive with respect to the impact of the proposed intake.[35/] He further stated that he was not able to draw any conclusions from these figures with respect to the proposed intake.[36/] The Board has reviewed the material presented and agrees with Applicant's witness that the estimates regarding the percentage loss of icthyoplankton in the vicinity of the facility are inconclusive.

18. Staff witness Sharma testified that a 25% loss of icthyoplankton should be judged unacceptable and require redesign or relocation of the intake structure to minimize impact.[37/] As noted by Dr. Sharma, the provision concerning the 25% loss of icthyoplankton should not be taken out of context.[38/] He stated that the 25% provision was preceeded by one indicating

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34/ Staff Ex.1, p.6.

35/ Staff Ex.1, p.7.

36/ Staff Ex.1, p.11.

37/ Testimony of Dr. R. K. Sharma on Entrainment of Icthyoplankton, following Tr.530.

38/ Tr.539.

that estimates of loss ranging between 5% and 25% would be subject to intensive Staff evaluation and that a decision concerning intake acceptability would be made on the basis of severity of losses to key species, absolute magnitude of loss, characteristics of entrainment pollution, and other such factors having a bearing on the impact of icthyoplankton loss.[39/] Staff's witness stated that biologists might reasonably disagree concerning the upper percentage limitation.[40/] However, it was his professional opinion that a figure in excess of 25%, under all circumstances, would constitute an unacceptable environmental impact on the ecosystem of Guntersville Lake.[41/]

19. Applicant asserts that setting the 25% limit proposed by the Staff could hinder the gathering of a data base.[42/] TVA witness Voigtlander testified that by choosing a number, "one is setting a standard" and that this would be "counter productive from the fisheries point of view". He stated that the effect would be to stifle research.[43/] Dr. Sharma stated, that the 25% limitation is not intended to apply generally, but only to the

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39/ Tr.539-540.

40/ Tr.540.

41/ Tr.540 and 545.

42/ Tr.244.

43/ Tr.244-245.

Bellefonte facility.[44/] The Board considers Applicant's argument to be unconvincing and after reviewing all the evidence, finds that the proposed Staff conditions are appropriate in order to minimize the effect that the facility may have on the aquatic ecosystem. We have considered those conditions in making our cost-benefit analysis and will condition the construction permits appropriately.

20. Radiological Effects. Routine power generation by the plants will result in the release of small quantities of fission products to the environment. An evaluation by the Staff provided estimates of total releases of radioactive materials and the doses derived therefrom.[45/] These calculations provided a basis for a determination by the Staff that releases of radioactive material to surrounding areas are as low as practicable and in accordance with the limits specified in 10 CFR 20, Appendix B and 10 CFR Part 50.[46/] Estimates were made of radiation doses to man at and beyond the site boundary via several of the most significant pathways and expected nuclide releases in the liquid effluent were calculated for the facility. During normal reactor operations, a fraction of the noble gases produced will be released in the liquid effluent

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44/ Tr.541-2.

45/ AEC FES §§ 3.2.3 and 5.3.2.

46/ AEC FES § 5.3.2.1.

and subsequently discharged into the Guntersville Reservoir. Therefore, the Staff has analyzed the radioactive liquid effluents for noble gas content and it appears that under conditions of highest annual average noble gas concentrations in the discharge water no significant doses would be delivered to human beings.[47/] Radioactive effluents released to the atmosphere from the plant constitute the greatest potential source of radiation exposure to the public. The primary food pathway to man involves the injestion by diary cows of radioiodine deposited onto grazing areas. Consumption of milk from these cows can result in exposure to the human thyroid. Using recognized models, doses to a child's thyroid, which could result from consuming 1 liter of milk daily from a cow grazing 12 months annually at the nearest farm, were calculated to be .13 millirem/year.[48/] The average annual dose from gaseous effluent to persons living within 50 miles of the plant is less than 0.001 millirem per year.[49/] Maximum individual doses due to liquid and gaseous effluent releases are calculated to be less than 6 millirem per year. This is only a few percent of the natural background exposure of 150 millirem per year, is below the normal variation in background dose and represents no measureable radiological impact.[50/] Using conservative

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47/ AEC FES p.5-12 and Table 3.2

48/ AEC FES p.5-12.

49/ AEC FES p.5-14 and Table 5.4 on p.5-16.

50/ AEC FES p.5-20.

assumptions, the total dose, including cumulative population dose within a 50 mile radius, and dosage from transportation of fuel and wastes from all effluent pathways in unrestricted areas would be about 16 man-rem per year. By comparison, an annual total of about 144,000 man-rem is delivered to the same population as a result of the average natural background dose rate of about 150 millirem in the vicinity of the plant. The 900 man-rem estimated as occupation onsite exposure is a small percentage of the annual total of about 144,000 man-rem estimated to be delivered to the 1980 population living within a 50 mile radius of the plant.[51/] In its cost-benefit balance, the Board has also considered the environmental effects of the uranium fuel cycle summarized in Table S-3 of 10 CFR Part 50, Appendix D, Section A.15. We have reviewed the voluminous material presented by the Staff and Applicant[52/] on the estimated radiation doses to individuals and to the population from normal operation of the plant and conclude that the estimated releases of radioactive material in liquid and gaseous effluents are as low as practicable.

21. Nonradiological Effects. Each of the two natural draft cooling towers will be about 500 feet in diameter and about 500 feet high. They will

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51/ AEC FES p.5-20.

52/ AEC FES § 5.3, TVA FES §§ 2.1 and 2.4.

discharge large quantities of water vapor and heat to the atmosphere.[53/] A visual cloud-like plume will be formed, the length of which will be determined by prevailing meteorological conditions. These plumes will be most pronounced during winter. Most of the literature on natural draft cooling towers indicates that they have a potential to cause or to increase the frequency of ground level fog and icing.[54/] Available reports of observations near natural draft towers indicate, however, that the plumes rarely if ever reach the ground. The small fraction of the cooling water that is carried into the plume as "drift" carries with it whatever impurities the cooling water contains. It is estimated that this will be about 0.01% of the circulating water. As the droplets evaporate in the atmosphere, the salts or dissolved solids will concentrate and, if evaporation is complete will remain as a dust-like residue. After a review of the evidence in the record in this proceeding, the Board concludes that there is no indication of a significant adverse environmental impact resulting from salt deposition on terrestrial biota.[55/] The Board further concludes that adverse environmental impacts from the

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53/ AEC FES p.5-22.

54/ AEC FES p.5-22.

55/ AEC FES § 5.4.1.1.7.

maintenance of transmission lines will be minimized by the implementation of Condition 7c suggested by the Staff at page iv of the AEC FES, which we will include as a condition on the construction permits (See "Impacts of Construction", supra).

22. Effects of Postulated Accidents. The radiological effects of postulated accidents on the environment have been assessed by the Staff, using the standard accident assumptions and guidance issued as a proposed annex to Appendix D of 10 CFR Part 50 by the Commission on December 1, 1971 (38 F.R. 22851).[56/] When considered with the probability of occurrence, the Staff concluded that the annual potential radiation exposure of the population from all the postulated accidents will be a very small fraction of the exposure from natural radiation background, and in fact, is well within variations in the natural background.[57/] The Board has reviewed the record on this matter and finds that the environmental risks due to postulated radiological accidents are exceedingly small.

56/ AEC FES § 7.1.

57/ AEC FES § 7.1.

III. ENVIRONMENTAL MONITORING

1. The Applicant and the Staff developed a sampling program to determine the extent of loss of icthyoplankton through entrainment. This program is still in the development stage. Witness Voigtlander stated[1/] that the Staff and TVA recently decided to change the sampling stations set forth in the AEC's FES[2/] to areas from which more reliable information could be extrapolated.[3/]

2. Siltation will be assessed by measuring the depth in area of particulate deposition. Changes in standing crop and species composition of benthic fauna and aquatic macrophytes will be followed before and throughout construction. Zoobenthos will be sampled monthly from March to October and in January or February.[4/] Other biotic groups will be sampled on the same schedule and at the same locations as for zoobenthos.[5/] Water quality parameters will be sampled quarterly at three stations on the Tennessee River, while periodic monitoring for direct construction effects will be conducted in creeks that drain the construction area. These

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1/ Staff Ex.1, p.6.

2/ AEC FES § 6.2.1.1.

3/ Staff Ex.1, p.14.

4/ AEC FES p.6-5.

5/ AEC FES p.6-5.

samples will be collected to coincide with surveys for biotic impact assessment, periods of heavy rainfall, and major changes in construction phases. Monitoring will be coupled with the regulation of construction activities as a feedback which will insure that these activities minimize their erosional and habitat altering potential.[6/] Staff evaluation of Applicant's operational aquatic monitoring program will be performed during the operational license review.

3. The nonradiological terrestrial monitoring program is designed to evaluate: (1) land use changes associated with construction and operation resulting in changes or losses of wildlife, wildlife habitat and forested areas; (2) transmission line construction, operation, and maintenance resulting in changes or losses of wildlife, wildlife habitat and forested areas; (3) operation of the facility resulting in accumulations of toxic materials in plant and animal tissues and soil and (4) operation of the facility which alters moisture regimes of natural ecosystems.[7/] Construction monitoring pertaining to on-site impacts will begin in the winter of 1973-4 and will continue throughout construction until the plant begins operation.[8/]

[6/] AEC FES p.6-5.

[7/] AEC FES p.6-7.

[8/] AEC FES p.6-7.

4. The pre-operational on-site meteorological program began on May 12, 1972, with the operation of a 130 foot tower 2.2 miles north northwest of the plant site. In October 1972, a 33 foot tower erected on the proposed site became operational. This tower will be removed when construction begins. A permanent tower 300 feet high is scheduled to begin operation approximately 6 months after the start of plant construction. Data from the on-site facility from August 1972 to July 1973 were submitted to the Staff in accordance with the Regulatory Guide 1.23.[9/]

A preoperational radiological monitoring program will be initiated at least 2 years prior to operation of the facility.[10/]

9/ AEC FES p.2.5.

10/ AEC FES, p.6-1.

the Tennessee River[3/] and finds that it indicates compliance with these criteria for all thermal, chemical and related discharges from Bellefonte Units 1 and 2.[4/] The Board has further determined, after evaluating the environmental impact of operating the facility at these proposed levels of discharge, that they will not have a significant adverse effect on the environment.

3/ AEC FES, p.5-4 et. seq. and TVA FES pp.2.6-1 and 2.6-15.

4/ Final Environmental Statement (FES), Bellefonte Units 1 and 2 (June 1974); Staff's Brief on Applicability of the Federal Water Pollution Control Act Amendments of 1972 to the Bellefonte facility; Applicant's Memorandum of Law Regarding the Federal Water Pollution Control Act; Tr.185-190; Tr.286-296.

IV. WATER QUALITY CONSIDERATIONS

1. An Applicant for a Federal license for a facility which may result in a discharge into navigable waters is normally required to furnish a certification pursuant to Section 401 of the Federal Water Pollution Control Act Amendments of 1972 ("FWPCA") from the appropriate state or interstate agency.[1/] However, since TVA is a Federal agency within the meaning of Section 401(a)(6) of the FWPCA, TVA is not required to furnish a certification from the State of Alabama pursuant to Section 401 of the FWPCA. Under Section 313 of the FWPCA however, TVA is required to comply with applicable State requirements respecting control and abatement of pollution. The only limitations or other requirements presently promulgated which apply to Bellefonte Units 1 and 2 are the "General Water Quality Criteria and Classifications of the State of Alabama", prepared by the State of Alabama and the EPA, November 14, 1972, and approved by the EPA, pursuant to Section 303(a)(1) of the FWPCA.[2/] The Board has reviewed the record in this proceeding regarding the expected effluents into the Guntersville Reservoir portion of

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1/ See Washington Public Power Supply System (Hanford No. 2), ALAB-113, RAI-73-4, 251 at 251-52 (April 12, 1973).

2/ Letter dated January 18, 1973, from Mr. Jack E. Raven, Regional Administrator, EPA, to Mr. James W. Warr, Acting Chief Administrative Office, Alabama Water Improvement Commission, Appendix A, Staff's Brief on Applicability of the Federal Water Pollution Control Act Amendments of 1972 to the Bellefonte facility.

V. ALTERNATIVES TO THE PROPOSED ACTION

A. Need for Power and Conservation of Energy

1. In the AEC FES, the Staff concluded that the reserve margin of the TVA system with the proposed Bellefonte units will be approximately 17.6% and 19% during fiscal years 1980 and 1981 respectively.[1/] The actual peak load on the TVA system of 18,841 megawatts in February was about 10% below the forecasted peak load of 20,750 megawatts.[2/] Relatively low winter peak load growth generally resulted from (1) conservation of energy by customers, (2) abnormally high temperatures during the past winter in most sections of the service area, (3) noticeable decreases in industrial and commercial activities.[3/] The Staff prepared an analysis[4/] using "very conservative assumptions" such as a) that there would be no substitution effect which would increase peak loads and b) that energy conservation would reduce projected peak loads by 10%. Even with these very conservative assumptions, it was shown that Bellefonte Units 1 and 2 would still be needed within one year of their respective scheduled operation dates in order to permit TVA to

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1/ AEC FES p.8-8, Table 8.2.

2/ P.8, Testimony of Regis R. Boyle following Tr. p.608.

3/ P.5, Testimony of Regis R. Boyle following Tr. p.608.

4/ Table 6, p.13, Testimony of Regis R. Boyle following Tr. p.608.

maintain an adequate reserve margin.[5/] Staff presented an additional table which showed the Applicant's projected peak loads, installed capacity, and reserve margins for 1980-1982 without the "very conservative assumptions" used above.[6/] It was Staff's opinion that this table presented a more realistic appraisal of the power supply of TVA in the early 1980's because it took into account the best available information on projected peak loads, installed capacity and reserve margins. It was the conclusion of the Staff, based on these projections that TVA's reserve margin will be between the 20 to 23.5% needed to provide adequate system reliability in fiscal years 1980, 1981 and 1982. The Staff further concluded that past experiences in schedule slippages, in addition to the inability of the Staff to assess the Hartsville application at this early stage further supported the need to commence construction of the Bellefonte facility at the earliest possible date.[7/]

2. The Applicant and Staff maintain that these conclusions are correct despite rather extensive efforts by TVA in promoting the conservation of electricity.[8/] Applicant stated that the national energy conservation policy

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5/ Pp. 12 and 13, Testimony of Regis R. Boyle following Tr. p.608.

6/ Table 5, p.10, Testimony of Regis R. Boyle following Tr. p.608.

7/ P.13, Testimony of Regis R. Boyle following Tr. p.608.

8/ "Applicant's Responses to the Board's Questions on Energy Conservation following Tr. p.194 and pp.12 and 13, Testimony of Regis R. Boyle following Tr. p.608.

has, in fact, had a significant but indeterminate effect on regional electrical use. The Applicant further testified that TVA has many programs to promote the most efficient uses of electricity including: (1) programs which emphasize the need to install adequate insulation in buildings, especially homes;[9/] (2) an industrial conservation program with information on the use of power factor correction, peak shaving and efficient process heating; and (3) a commercial conservation program with information on conservation of energy in lighting, heating, cooling, and building management.[10/] The Staff testified that TVA initiated an extensive advertising program in 1971 to promote the conservation of electricity.[11/] The Board concludes, based on a review of the evidence presented, that Bellefonte Units 1 and 2 will be needed on schedule despite implementation of conservation of energy measures.

B. Alternatives to Nuclear Power

3. The Board inquired as to the feasibility of utilizing gasified coal as a substitute fuel for electric power generation. TVA and the Staff

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9/ P.2, Applicant's Responses to the Board's Questions on Energy Conservation following Tr. p.194.

10/ P.8, Applicant's Responses to the Board's Questions on Energy Conservation following Tr. p.194.

11/ P.1, Testimony of Regis R. Boyle following Tr. p.608.

concluded and the Board concurs that an environmentally acceptable coal gasification process for electric power generation will not be commercially available by the time that TVA will need additional generating capability.[12/]

4. The Staff and the Applicant also considered other alternative energy sources.[13/] Power purchase is not a viable alternative because neighboring utilities do not have excess generating capacity.[14/] There is limited potential for expansion of hydroelectric generation in the TVA system.[15/] Natural gas is not available in the quantities required.[16/] Oil-fired generation is not desirable because of the high cost and uncertainty of long range fuel supply.[17/]

5. The only remaining feasible alternative source of power is coal. (TVA burns more than 10 percent of all coal that is used in the U.S. for electric power generation[18/]) Staff and Applicant compared cost of

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12/ P.1, Testimony of Regis R. Boyle following Tr. p.610 and p.5, Applicant's Responses to the Board's Questions on Energy Conservation following Tr. p.194.

13/ AEC FES § 9:1.1, TVA FES § 4.1.

14/ AEC FES p.9-1, TVA FES p.4.1-1.

15/ AEC FES p.9-2, TVA FES p.4.1-2.

16/ AEC FES p.9-3, TVA FES p.4.1-2.

17/ AEC FES p.9-4, TVA FES p.4.1-3.

18/ AEC FES p.9-6.

coal-fired and nuclear fueled facilities.[19/] Although they did not agree precisely on the amounts involved, they both concluded that nuclear power is a more economic energy source than coal at this location and time.[20/] Nuclear power was also considered more acceptable environmentally. The radioactive effluents from a nuclear plant would result in doses equivalent to only a small fraction of those from natural background radiation[21/] while significant amounts of pollutants would be released to the air from a coal-fired plant. Based on EPA standards, the Staff estimated these to be 5600 tons of particulates per year, 68,000 tons of sulfur dioxide per year, and 39,000 tons of nitrogen oxides per year.[22/] TVA estimates varied slightly from the Staff's but still demonstrate serious environmental impact.[23/] The Board finds, after considering the various alternative sources of energy discussed above, that nuclear power is the preferred source.

19/ AEC FES, Table 9.2, p.9-7, TVA FES p.4.1-5 et. seq.

20/ AEC FES, p.9-8, TVA FES p.4.1-6.

21/ AEC, FES p.9-10.

22/ AEC FES, p.9-10.

23/ TVA FES, p.4.1-7.

C. Alternative Sites

6. In its Final Environmental Statement, the Staff described the methodology employed by TVA in selecting the Bellefonte site.[24/] On the basis of preliminary studies, 30 potential plant sites were selected. The preliminary studies of the 30 sites indicated that 8, designated sites A though H, warranted further investigation. Four of these sites were located on the Guntersville Reservoir, and one each on the Kentucky, Pickwick, Chicamauga and Watts Bar Reservoirs. Of these eight possible sites, one conflicted with potential urbanization of Scottsboro, another was too near a wildlife sanctuary and a third would require a large amount of excavation and ultimate disposal. Two of the sites were located in areas where seismic conditions were being examined but were not clearly defined at the time.[25/] After a consideration of the information contained in Tables 9.5, 9.6 and 9.7 of the AEC's FES, the Staff concluded that sites designated C (located on the Guntersville Reservoir 6 miles from Grant, Alabama), G (located on the Chickamauga Reservoir 6 miles from Dayton, Tennessee) and Bellefonte were essentially the same from the standpoint of environmental impact, and that development of any one of the three sites would be compatible with projected land uses

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[24/] AEC FES § 9.1.3.

[25/] AEC FES, p.9-13.

in that area.[26/] In addition, it was concluded that impacts on asthetics and recreation would be similar[27/] and that there would be no significant difference in damage to aquatic environment at the three sites.[28/] The economic advantages of the Bellefonte site relative to sites C and G were reviewed by the Staff[29/] and it found that the Bellefonte site, compared with site C, had lower cost access routes including both highway and rail, while, when compared to site G, Bellefonte was preferable due to the almost $9 million difference in transmission costs.[30/] The Board concludes that considering the relative environmental aspects of all the potential sites, the Bellefonte site is the most suitable from an environmental standpoint.

D. Access Rail Spur

7. TVA considered two alternative routes for the construction of the railroad spur to the plant site. The first alternative would intersect the main line of the Southern Railroad at a point about 1 mile southwest of Hollywood while the second route would intersect the Southern Railroad main line about 1 1/2 miles northeast of Hollywood.[31/] The precise route of

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26/ AEC FES § 9-17.

27/ AEC FES § 9-17.

28/ AEC FES § 9-17.

29/ AEC FES, p.9-19.

30/ AEC FES § 9-20.

31/ AEC FES, p.9-33.

each alternative is shown in Figure 9.2 at page 9-34 of the AEC FES. The Staff concluded, after considering the advantages and disadvantages of each spur that "neither alternative rail spur access route offers a significant advantage over the other".[32/] In TVA's Final Environmental Statement at pages 2.96 and 2.97, the two alternatives are compared and a slight preference for the first alternative was indicated. At the evidentiary hearing, letters from Mayor Dutton of Hollywood and Reid of Scottsboro were read into the record, which expressed the opinion that the future development of each of their communities would be best served by locating the access rail spur in accordance with the second alternative.[33/] In response to these letters, Applicant decided to use the second alternative rail spur.[34/] We conclude that the environmental impact of the second alternative access rail spur eventually selected by TVA has an environmental impact comparable to the one previously selected and is acceptable.

32/ AEC FES page 9-35.

33/ Tr., pp.97-98.

34/ Applicant Ex.4, Tr.p.528.

VI. COST-BENEFIT BALANCE

1. The Board has independently considered the costs and benefits of the proposed Bellefonte Nuclear Plant, Units 1 and 2 on the basis of the evidence of record and has arrived at an overall cost benefit balance.

2. The Board finds, on the basis of its independent analysis of the evidence, that the principal environmental costs are as follows:

(1) The consumption of about 400 tons per year of natural uranium (U_3O_8) over the assumed 30 year lifetime of the station;

(2) The use of approximately 400 acres of the Bellefonte site for the plant, 1100 additional acres subject to exclusionary requirements and easements over 1550 acres for transmission line rights-of-way;

(3) Water consumption of 74 cubic feet per second;

(4) Cumulative population dose within a 50 mile radius of two man-rem per year;

(5) 14 man-rem per year from the transportation of fuel and wastes to individuals in unrestricted areas;

(6) Less than one man-rem per year to the general public attributable to the uranium fuel cycle;

(7) The on-site dose to plant personnel of approximately 900 man-rem per year;

(8) Loss of a maximum of 25% of the icthyoplankton floating past the facility through entrainment in the intake structure - a precise measurement of this loss will be obtained from sampling to be conducted by the Applicant over the next year;

(9) Some erosion of the soil on site and on the transmission line rights-of-way. Turbidity and siltation resulting from soil erosion will result in some destruction of aquatic life in Guntersville Reservoir; and

(10) An adverse visual impact created by the two 500 foot natural draft cooling towers.

3. The Board finds that the principle benefit of the proposed facility is the provision of 14 billion kilowatt hours of electricity per year needed by customers in the Applicant's service area. The Board also finds that there will be a significant favorable effect on the local, regional, and state economy but consistent with the Appeal Board's position, we did not include them in the overall balance.[1/]

4. The Applicant and Staff have reviewed alternative designs for the facility and have concluded that the present design is appropriate.[2/] The Board has conducted a cost benefit analysis with respect to these alternatives and after balancing environmental and economic considerations finds that, except for the location of the intake openings, the facility, as designed and selected from all available alternatives is the most desirable. We find that

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1/ Vermont Yankee Nuclear Power Corporation (Vermont Yankee Nuclear Power Station, ALAB-179, RAI-74-2, page 159.

2/ AEC FES § 9.2, TVA FES § 8.3.

adherence to the conditions,[3/] with respect to the intake structure which will be incorporated in the construction permits will assure selection of the most desirable alternative on this matter.

5. Further, the Board finds that the environmental and economic benefits from the construction of the Bellefonte facility, particularly the capability of the Applicant to supply electrical power to meet the need for power within its service area, will be substantially greater than the environmental and economic costs that will necessarily be incurred by reason of the construction of the facility. Therefore, the Board finds that the balance of benefits over costs involved calls for granting the construction permit, as conditioned, for the Bellefonte facility.

3/ See discussion on Entrainment of Icthyoplankton, pp. 19-23.

VII. LIMITED WORK AUTHORIZATION

1. On April 24, 1974, the Atomic Energy Commission promulgated regulations related to "Pre-construction Permit Activities". 10 CFR § 50.10(e)(2) provides, in part, that the Director of Regulation may authorize certain pre-construction activities. Subsection (2) of that regulation states that "Such an authorization shall be granted only after the presiding officer in the proceeding on the construction permit application (i) has made all findings required by paragraph A.11 of Appendix D of Part 50 to be made prior to issuance of the construction permit for the facility, and (ii) has determined that, based on the available information and review to date, there is reasonable assurance that the proposed site is a suitable location for a nuclear power reactor of the general size and type proposed from the standpoint of radiological health and safety considerations under the Act and Rules and Regulations promulgated by the Commission pursuant thereto."

2. On June 25, 1974, TVA wrote a letter to Mr. John F. O'Leary, Director, Directorate of Licensing, Office of Regulation, U.S. Atomic Energy Commission, Washington, D. C. 20545, requesting that a limited work authorization be issued pursuant to 10 CFR § 50.10(e).[1/] This letter requested activities of the nature described in 10 CFR § 50.10(e)(1).[2/]

1/ Staff Ex.2.

2/ Staff Ex.2, pp.1, 2 and 3.

3. The Staff's testimony with regard to site suitability was presented by William P. Gammill, Chief of the Site Analysis Branch, Directorate of Licensing.[3/] The Staff considered the Commission's criteria concerning site suitability as related to radiological health and safety (10 CFR Part 100), including the following factors: population density for present and projected population within the low population zone and beyond, use characteristics of the site environs, and physical characteristics of the site.

4. During the scheduled lifetime of the facility, the nearest population center projected to be more than 25,000 people is the combined towns of Hollywood and Scottsboro, about 4 miles west of the site. Population density within a radius of 30 miles in 1980 would be 43 people per square mile. The minimum exclusion distance is 914 meters and the minimum distance to the boundary of the low population zone is 2 miles. The population center distance of 4 miles is more than 1 1/3 times the low population zone radius required by 10 CFR Part 100. The specified minimum exclusion distance, low population zone and population center distance meet all applicable regulations and are comparable to many sites previously licensed by the Commission. On the basis of the information presented on population in the vicinity of the facility and the calculated radiological consequences

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3/ Tr. p.278.

of design basis accidents, the Board concludes that adequate engineered safety features can be provided to meet the dose guideline values indicated in 10 CFR Part 100 with respect to the exclusion area, low population zone and population center distance.[4/]

5. There are no gas lines, military facilities or significant industries located with 5 miles of the site which might present a hazard to the safe operation of the facility. No publicly owned roads will traverse the site boundary. The Scottsboro Airport, located 4.3 miles west southwest of the proposed facility has one paved runway 4,000 feet in length. Based on a reasonable growth projection for the airport,[5/] the Board finds that the probability of damage to the facility from aircraft impacts is remote.

6. It is recognized that the facility is located in a region where average atmospheric dispersion conditions are less favorable than in most other areas of the country. A complete description of meteorological conditions at the site, including the climatology of the region, local meteorological conditions, and expected severe weather, is presented in section 2.6 of the AEC's FES. The Applicant has taken appropriate measures in

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4/ Pp.2 and 3, Testimony of William P. Gammill following Tr. p.278.

5/ P.4, Testimony of William P. Gammill following Tr. p.278.

the design of the facility to compensate for the poor dispersion characteristics of the site.[6/] Therefore, the Board finds that there are no meteorological characteristics that would render the site unacceptable.

7. There are no geological structures, including faults, in the immediate site vicinity that would tend to localize earthquakes or cause near surface displacement at the site. The foundation bedrock is sound, of high quality, and capable of supporting the plant structures with acceptable margins of safety. There is no significant solutioning nor are there significant zones of deformation beneath the foundations of major structures.[7/] Therefore, we find the site acceptable from a geological and seismological standpoint.

8. Minimum plant elevation for all safety related structures will be at least 629.0 feet above mean sea level. Normal full pool elevation of Guntersville reservoir is 595 feet above mean sel level. The estimated probable maximum flood would reach a maximum still water elevation of 624.7 feet above mean sea level while coincident wind wave activity could

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6/ Pp.11 and 12, Testimony of William P. Gammill following Tr. p.276.

7/ P.12, Testimony of William P. Gammill following Tr. p.278.

raise the lake level to 628.4 feet above mean sea level.[8/] The Board finds that there are no hydrological factors that would render the site unacceptable.

9. In response to a Board question concerning site acceptability with regard to evacuation, Staff witness Donald K. Davis testified that the Staff had reviewed the Bellefonte Nuclear Plant Preliminary Safety Analysis Report and found, after studying the site layout and site location as well as access routes, surrounding population distribution, and land use that an acceptable emergency plan can be developed for the site.[9/] The Board agrees with Staff's analysis and finds, after a review of the resident population in numbers and location within each 45° sector of the low population zone, the existing road network and the land use within and outside the exclusion area boundary that, there is nothing to preclude Applicant from developing an acceptable emergency plan for the site.

10. After reviewing the testimony of the Staff[10/] and TVA,[11/] the Board finds that the site environs present no difficulty with regard to the local transportation of nuclear fuel.

8/ P.12, Testimony of William P. Gammill following Tr. p.278.

9/ P.1, Testimony of Donald K. Davis following Tr. p.279.

10/ Testimony of Gerald F. Dittman following Tr. p.282.

11/ Testimony of R. J. Bowman, Tr. p.261 et. seq.

11. On the basis of the above findings, the Board has determined that, based upon the available information and review to date, there is reasonable assurance that the Bellefonte site is a suitable location for a nuclear power reactor of the general size and type proposed from the standpoint of radiological health and safety considerations under the Atomic Energy Act of 1954, as amended, and Rules and Regulations promulgated by the Commission pursuant thereto.

VIII. CONCLUSIONS OF LAW

The Board has given careful consideration to all of the documentary and oral evidence presented by the parties. Based upon our review of the entire record in this proceeding and the foregoing findings, and in accordance with § 50.10(e) and Appendix D of 10 CFR Part 50 of the Commission's regulations, the Board has concluded as follows:

(1) The requirements of Section 102(2)(C) and (D) of the National Environmental Policy Act of 1969 and Appendix D of 10 CFR Part 50 have been complied with in this proceeding;

(2) The Board has independently considered the final balance among conflicting factors contained in the record of the proceeding and determines that the appropriate action to be taken (if this Board, after hearing the evidence in the radiological health and safety phase of this proceeding, should make affirmative findings on issues 1 - 3 and a negative findings on issue 4 set forth in the Notice of Hearing) is issuance of construction permits for the proposed Bellefonte nuclear plant, subject to the conditions for the protection of the environment recommended by the Staff (FES, pp. iv-v); and

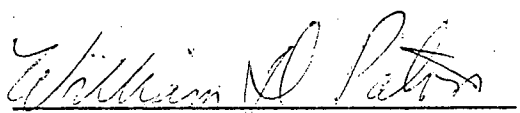
(3) Based upon the available information and review to date, there is reasonable assurance that the Bellefonte site is a suitable location for a nuclear power reactor of the general size and type proposed from the standpoint of radiological health and safety considerations under the Atomic Energy Act of 1954, as amended, and rules and regulations promulgated by the Commission pursuant thereto.

IX. ORDER

Based upon the Board's Findings and Conclusions, IT IS ORDERED THAT: This Partial Initial Decision shall constitute a portion of the Initial Decision to be issued upon completion of the radiological health and safety phase of this proceeding. IT IS FURTHER ORDERED THAT:

In accordance with Sections 2.754, 2.760, 2.762 and 2.764(a) of the Commission's Rules of Practice, 10 CFR Part 2, that this Partial Initial Decision shall be effective immediately and shall constitute the final action of the Commission thirty (30) days after the date of issuance hereof, subject to any review pursuant to the Rules of Practice. Exceptions to this Partial Initial Decision may be filed by any party within seven (7) days after service of this Partial Initial Decision. A brief in support of the exceptions shall be filed within fifteen (15) days thereafter, twenty (20) days in the case of the Regulatory Staff. Within fifteen (15) days after service of the brief of appellant (twenty (20) days in the case of the Regulatory Staff), any other party may file a brief in support of, or in opposition to, the exceptions.

Respectfully submitted,



William D. Paton
Counsel for AEC Regulatory Staff

Dated at Bethesda, Maryland,
this 12th day of August, 1974.

UNITED STATES OF AMERICA
ATOMIC ENERGY COMMISSION

In the Matter of	)	
	)	
TENNESSEE VALLEY AUTHORITY	)	Docket Nos. 50-438
	)	50-439
(Bellefonte Nuclear Plant,	)	
Units 1 and 2)	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of "AEC Regulatory Staff's Proposed Findings of Fact and Conclusions of Law in the Form of a Proposed Partial Initial Decision on Environmental Matters and Site Suitability" and "AEC Regulatory Staff's Proposed Transcript Corrections", both dated August 12, 1974, and both in the captioned matter, have been served on the following by deposit in the United States mail, first class or air mail, this 12th day of August, 1974:

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U.S. Atomic Energy Commission
Washington, D.C. 20545

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