

FROM: Tennessee Valley Authority Chattanooga, Tenn. 37401 J. E. Gilleland		DATE OF DOC 5-10-74	DATE REC'D 5-14-74	LTR X	MEMO	RPT	OTHER
TO: W. H. Regan		ORIG 3 signed	CC	OTHER	SENT AEC PDR X SENT LOCAL PDR X		
CLASS	UNCLASS XXXX	PROP INFO	INPUT	NO CYS REC'D 43	DOCKET NO: <u>50-438/439</u>		

DESCRIPTION:  
Ltr re our 4-3, 4-19, & 4-30-74 ltrs, trans the following:

**DO NOT REMOVE**

PLANT NAME: Bellefonte Units 1 & 2

ENCLOSURES:  
Comments on the draft enviro statement for Bellefonte Units 1 & 2

**ACKNOWLEDGED**

FOR ACTION/INFORMATION

5-15-74 GC

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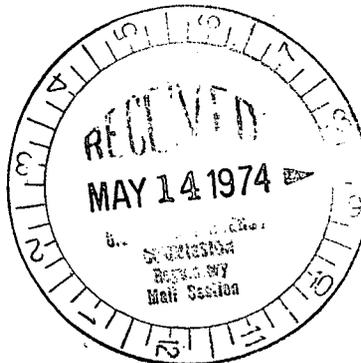
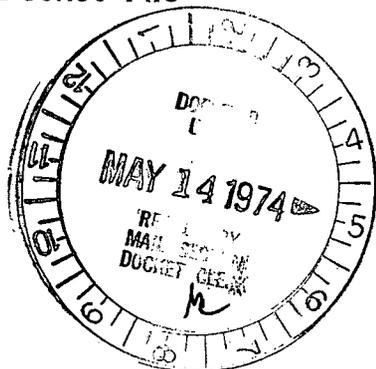
✓ 1 - LOCAL PDR <u>Scottsboro, Ala.</u>	✓ (1) <del>(XXX)</del> NATIONAL LAB'S ANL	1-PDR-SAN/LA/NY
✓ 1 - TIC (ABERNATHY)	1-ASLEP (E/W Bldg, Rm 529)	1-GERALD LELLOUCHE
✓ 1 - NSIC (BUCHANAN)	✓ 1-W. PENNINGTON, Rm E-201 GT	BROOKHAVEN NAT. LAB
1 - ASLE	1-CONSULTANT'S	1-AGMED (Ruth Gussman)
1 - P. R. DAVIS (AEROJET NUCLEAR)	NEWMARK/BLUME/AGBABIAN	RM-B-127, GT.
16 - CYS ACRS HOLDING	1-GERALD ULRIKSON...ORNL	1-RD..MULLER..F-309 GT
	1-B & M SWINEBROAD, Rm E-201 GT	

TENNESSEE VALLEY AUTHORITY  
CHATTANOOGA, TENNESSEE  
37401



Regulatory Docket File

May 10, 1974



50 - 438  
50 - 439

Mr. William H. Regan, Jr., Chief  
Environmental Projects Branch No. 4  
Directorate of Licensing  
U.S. Atomic Energy Commission  
Washington, D.C. 20545

Dear Mr. Regan:

In response to your letters of April 3, April 19, and April 30, 1974, transmitting review comments on the Atomic Energy Commission's draft environmental statement on the Bellefonte Nuclear Plant, we are transmitting TVA's responses to those comments as deemed appropriate.

We hope these responses will be of help to you in preparing your final environmental statement on this project.

Very truly yours,

J. E. Gilleland  
Assistant to the Manager of Power

Enclosure

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The periods for release of radioactive gases from the Bellefonte Nuclear Plant are listed below for systems a-h discussed on pages 2.4-20 through 2.4-23 of the Bellefonte Draft Environmental Statement, Volume 1.

- a. Containment Purge - In the Bellefonte Draft Environmental Statement, it was conservatively assumed that there would be 24 containment purges for the two units per year. A more realistic estimate is 8 containment purges for the two units per year. A purge would be completed in about 8 hours.
- b. Instrument Room Purge - There will be about 50 instrument room purges for the two units per year. A purge would be completed in about two hours.
- c. Release Through Auxiliary Building Ventilation System - Releases from this system are continuous.
- d. Waste Gas Decay Tank Venting - It is assumed that there will be six gaseous decay tank ventings for the two units per year. Venting of gas decay tank would be completed in about 9 hours. It is expected that a period of approximately 7 days following the 60-day holdup period will be available to select optimum meteorological conditions for release of the tank contents.
- e. Steam Leakages - Releases from this source are continuous.
- f. Turbine Gland Sealing System Leakages - Releases from this source are continuous.
- g. Condenser Offgas - Releases from this source are continuous.
- h. Feedwater Leakage - Releases from this source are continuous.

From this listing, it can be seen that some fraction of the annual gaseous discharges is released continuously while the remaining fraction is released at periodic intervals. Applying the average-annual dispersion factor to the periodic releases from the plant has the effect of averaging the concentration of radioactive gases to which an individual may be exposed as a result of several periodic releases. It is our judgment that such averaging is appropriate in preparing a realistic estimate of the impact of operation of a nuclear plant during its projected operating life (35 years for the Bellefonte Nuclear Plant), especially considering the commitment by TVA in the draft environmental statement to conduct periodic releases from the plant during favorable meteorologic conditions.

Comment from Alabama Conservancy (Burns) - page 4-1, last paragraph

Excavation activities during construction may temporarily affect ground water movement in the immediate vicinity of the excavations, but the ground water movement should return to normal after construction is completed. No public or private use of ground water is expected to be affected due to construction or operation of the plant.

Comment from Alabama Conservancy (Burns) - page 4.2, paragraph 1

While the conversion of electricity to gaseous hydrogen was not considered specifically as an alternative means of energy distribution for the Bellefonte plant, TVA has been studying possible uses of hydrogen relevant to supplying consumers with sufficient electrical power. It appears to us that the suggested alternative is neither technically nor economically feasible for any power plant and its service area in the near term.

In order to eliminate the need for electrical transmission lines, it would be necessary to construct a completely new hydrogen distribution system and numerous power-conversion devices (such as fuel cells) to produce electricity at the location where it is used. Power-conversion devices utilizing hydrogen for large-scale application, however, are still very much in the developmental stage and will therefore not be available for use in meeting the power demand for which the Bellefonte plant will be built.

Even if adequate power-conversion devices were available, the suggested alternative would not be economically, or possibly not even environmentally, acceptable. If electricity is transmitted directly, it is necessary to build only enough new transmission lines to connect the Bellefonte plant to the existing electrical transmission system.

Conversion to hydrogen, while it would eliminate these connecting transmission lines, would require construction of a completely new hydrogen transmission and distribution system which would be very expensive and would not be without adverse environmental impact. We are by no means ready to meet all of the safety-related questions to widespread distribution of large quantities of hydrogen gas. Conversion to hydrogen would also result in a lower overall process efficiency because there would be significant losses in useful energy when electricity is converted into hydrogen, and further significant losses when the hydrogen is reconverted to electricity. This would result in the need to build more central generating capacity to meet the consumer's electrical needs and in the mining of more uranium to fuel the additional capacity.

Comment from Alabama Conservancy (Burns) - page 4-2, paragraph 3  
(second part of comment)

Legislation in the State of Alabama allows open burning by permit. TVA's right of way clearing contracts state that "The contractor will comply with all Federal, state, and local burning laws, ordinances, and restrictions.

Comment from Alabama Conservancy (Burns) - page 5-2, paragraph 2

The persons known to be buried in Shipp Cemetery are Alberta Shipp, Tom Shipp, David Stern, and Nancy Ann Stern. It is felt that all of the heirs at law and next of kin of these people have been located. The next of kin of the Sternes descend from three children: Annie Finnell, Mary J. Shipp, and a son who moved away from the area many years ago and is now dead and all of the local owners believe that there are no descendants of this son now living.

The descendants of Mary Jane Shipp are the same persons who own the fee simple title to Shipp Cemetery and are also the next of kin of the Shipp children, Tom Shipp, age 7, and Alberta Shipp, age 18.

A Contract for Purchase and Sale of the Land has been obtained from all of the Shipp heirs and TVA is in the process of closing this acquisition. The deed contains the provision that the grantors specifically convey any and all easement and burial rights they have in Shipp's Cemetery.

Unlike Shipp Cemetery, the title to which was owned in fee simple by the Shipp heirs as set out above, only outstanding burial rights are to be acquired in Finnell Cemetery together with the permission to disinter and reinter the bodies buried therein. Most of the Finnell heirs would be unknowns, with the possible exceptions of the Annie Finnell descendants who have been identified. The interest of persons who are the next of kin of the persons buried in the cemetery together with right to disinter and reinter the bodies will probably be acquired from a court of competent jurisdiction. At the present, the identity of those persons buried in Finnell Cemetery is unknown and cannot be investigated until ownership of the property is obtained.

In the event that additional graves are discovered in Shipp Cemetery, it may be necessary to condemn rights of unknown owners in that cemetery.

Comment from Alabama Conservancy (Burns) - page 5-2, paragraph 4

TVA is now negotiating a contract to have the historic significance of the area investigated. No commitment can be made on historic preservation prior to this investigation.

Comment from Alabama Conservancy (Burns) - page 5-9, paragraph 1

An assessment of the potential radiological impact on aquatic organisms is presented in Appendix H of the TVA draft environmental statement. Doses are estimated for aquatic plants, invertebrates, and fish.

Comment from Alabama Conservancy - page 5-22, paragraph 5.4.1.1.3

The model for estimating plume lengths was developed from correlations of plume length observations at the Paradise site with absolute humidity deficit determinations from temperature and dew point measurements from the National Weather Service Upper Air Section (rawinsonde) in Nashville, Tennessee--about 75 miles south-southeast of Paradise. The vertical temperature and dew point characteristics within the lower 3,000 feet at these two sites are normally comparable as both sites are usually under the influence of the same regional air mass. With respect to the Bellefonte site, about 110 miles southeast of Nashville, the vertical temperature and dew point conditions are generally similar to those of the Nashville area as these two sites are also dominated much of the time by the same regional air mass. Therefore, with these three sites having similar vertical temperature and dew point characteristics from surface to 3,000 feet, the plume length model developed for Paradise can be applied to Bellefonte with reasonable reliability. Because of the river-valley features of the Bellefonte site, there would normally be slightly lower values of the absolute humidity deficit because of the confinement of moisture within the valley; however, this effect on the plume length calculations should not be significant because of the inherent conservatism of the model results. The important meteorological condition which would vary between the Paradise and Bellefonte sites is the low-level wind; however, this variance is accounted for by using the wind data from the TVA Widows Creek Steam Plant meteorological facilities, about 20 miles up river from the Bellefonte site.

Comment from Alabama Conservancy (Burns) - page 5-35, paragraph 3

An estimate of the required separation between the blowdown discharge nozzles was made for a preliminary design which was discussed in TVA's environmental statement. The spacing for this design was estimated to be about 50 feet. Although the final design of the blowdown discharge is not complete, the spacing is not expected to be greatly different from 50 feet; certainly not as great as the reservoir width.

Paragraph 6

TVA is conducting a physical model study of the blowdown discharge. This study will provide detailed information about alternative designs which will be equal to and probably better than the calculations which could be made using available numerical techniques.

Comment from Alabama Conservancy (Burns) - page 5-43, paragraph 5.4.3

We agree with the discussion by the staff. The calculation of the maximum ground-level SO<sub>2</sub> concentrations from elevated releases from this type of building complex is a conservative estimate; particularly when no credit is given for the dilution from the building wake turbulence. Therefore, Turner's nomograms should provide an acceptable method for estimating this type of ground-level concentration. The staff also uses acceptable conditions, i.e., 50-meter effective stack height, unstable lapse rate, 3 mps wind speed, for calculating the maximum concentration. We also do not believe it is necessary to make a "full diffusion simulation" as R. E. Burns recommends since the magnitude of the calculated 24-hour maximum concentration as shown in the table on page 2.5-17 of the TVA Draft Environmental Statement is negligible.

Comment from Alabama Conservancy (Burns) - page 8-3, paragraph 3 and Southern Conference of Concerned Citizens - paragraph 2

The load forecast upon which the need for the Bellefonte Nuclear Plant was based was completed prior to the energy crisis. The forecast reflected the effect of TVA area conservation programs upon historical loads. These conservation programs stressed the prudent, efficient use of electricity through adequate insulation, use of heat pumps, and good building design and layout.

In recent months, the probable effects of the new national urgency of conservation and expanded, vigorous TVA area conservation programs have been roughly estimated; at the same time, preliminary estimates of the substitution effect of severe shortages of gas, oil, and LP gas upon electric usage were prepared. These substitution estimates were conservative and included only a fraction of the potential for additional electric load among residential, commercial and industrial consumers. Comparison of the two estimates indicates that the substitution effect will approximately equal and could exceed the conservation effect. If this tentative conclusion is shown to be in error as events unfold, and the conservation effect exceeds the substitution effect, one or both of the two units could be delayed for some fraction of a year or longer.

Comment from Alabama Conservancy (Burns) - page 9-29, paragraph 9.2.6

In this particular instance, a number of alternatives have been left open principally to take advantage of the best alternative from a benefit cost point of view at the time disposal becomes a requirement. Since tritium recycle is not presently in use at any operating nuclear plant and since actual disposal of tritiated wastes from Bellefonte would not take place before 1987, we believe it best to reevaluate these alternatives at a later date when we may find no disposal is necessary (because buildup in the system is shown to be an insignificant problem) or new technology is available. The alternatives given are all considered to be acceptable options since any would have an insignificant effect on the environment. TVA's response to question 15 contained in Additional TVA Responses to Second Set of AEC Comments on Bellefonte Draft Environmental Statement, dated October 25, 1973, further discusses this subject.

Comment from Alabama Conservancy (Burns) - page 10-6, paragraphs 10.2.4.2 and 10.2.4.3

The listed values of recreation visits were derived using "Senate Document 97 - Policies, Standards, and Procedures in the Formulation, Evaluation, and Review for Use and Development of Water and Related Land Resources - Supp. 1 - Evaluation Standards for Primary Outdoor Recreation Benefits," published by the Ad Hoc Water Resources Council, June 4, 1964. This document was superceded by "Establishment of Principles and Standards for Planning Water and Related Land Resources" published by the Water Resources Council, October 25, 1973. The values listed for recreation visits are also consistent with the guidelines established in this latter document.

The education visits were valued at this same amount because it was judged that these visits would be at least as beneficial to a person as a visit for recreation purposes. Were it not for the difficulty of placing a value on educational experiences, these visits could undoubtedly be valued higher than 75¢.

No admission is charged by TVA for visitation to a facility such as Bellefonte Nuclear Plant. The placing of a dollar value on visitation is an attempt to measure what an individual might be willing to pay if he were charged. It is an estimate of the value he might place on the visit in terms of the benefit he receives during the visit. Assigning such a value is a recognized practice in benefit/cost analysis for Federal projects.

Comment from U.S. Department of the Interior - page 4, Solid Wastes

Ultimate disposition of wastes and related environmental effects are covered under licenses issued to the waste disposal facility by AEC or an AEC agreement state.

Comment from Department of the Interior - pages 4-5, Effects of Cooling Tower Operation

We agree with most of the staff's discussion. There is no reliable method available to evaluate the potential environmental effect of drift as the state-of-the-art is inadequate to precisely quantify the fallout characteristics of drift. However, qualitative deduction may be possible (see reference, Reviewing Environmental Impact Statements - Power Plant Cooling Systems, Engineering Aspects, EPA-660/2-73-016, October 1973, page 33). We would have to agree in part, with the review comment regarding the drift deposition being limited to 1,000 feet from the cooling tower. This may be a reasonable estimate, based on TVA's limited field studies at Paradise; however, they should not imply that such deposition could never extend beyond 1,000 feet. The above reference indicates "that the majority of the drift particles will fall out within 2,000 feet of the cooling tower under normal conditions."

Comment from Department of Interior - page 6, Radiological Monitoring

The terrestrial radiological monitoring program will be expanded to include the sampling of animals in the vicinity of the nuclear plant if a statistically significant increase above the natural background established during the preoperational monitoring program is detected in vegetation samples.

Comment from Southern Conference of Concerned Citizens - Paragraph 3

Comment - There is no indication that the utility has made any efforts to justify its electric generation potential with a projection of population figures for the future.

Response - Population forecasts are used in preparation of TVA load forecast. The current population forecast is presented in TVA Responses to Second Set of AEC Comments on Bellefonte Draft Environmental Statement, October 5, 1973, page 61-42.

Comment from Mr. Garner - Page 3, General Comments

Comment - No breakdown of the amount of electricity sold and produced in each of the seven states is given. Alabama and Kentucky are the major donor states to the TVA power system. Consequently, this plant should be located in either Tennessee, Mississippi, Georgia, or Virginia. (North Carolina is also a donor state.)

Response - TVA decisions concerning selection of plant sites are based upon extensive geological, environmental, water availability, and economic studies as well as the location of load centers.

Comment from State of Alabama, Department of Public Health - Comment No. 2

Rainwater samples will be collected in a container and the samples will be counted directly, with no filter systems involved.

Comment from EPA - page 2, Radioactive Waste Management

Tritiated wastes transported to a waste-disposal facility would not be buried as a liquid but would be solidified onsite prior to burial. See also the response to comment from Alabama Conservancy (Burns) - page 9-29, paragraph 9.2.6.

Comment from EPA - page 3, paragraph 5

An examination of atmospheric data and cooling tower characteristics showed that, during the infrequent periods when the reservoir temperature is 86° F. or more, the temperature of the blowdown can be held to below

86° F. by blowing down only at night. The use of a hold-up pond for blowdown is not justified for the limited number of extended periods of low flow or high reservoir temperatures since blowdown can be withheld and released during the most favorable times by allowing the chemical concentration factor to increase temporarily. On those occasions when the reservoir temperature exceeds 86° F., the situation could prevail for several days. A hold-up pond of the size required for such an extended period is not practical.

Comment from EPA - page 4, paragraph 1

At the present time, TVA feels that operating the cooling system at a concentration factor of two under normal conditions is the best balance between operation and environmental considerations. Even withholding blowdown for short periods of time, this method of operation will allow the system to be operated without additional chemical treatment to prevent scaling in the condenser and cooling towers or to adjust water quality of the effluent returned to the reservoir. Also, this operation ensures that normal chemical discharge concentrations create no significant impacts and results in no significant entrainment losses. Higher concentrations may require chemical treatment, resulting in higher levels of chemical releases.

Comment from EPA - page 5, Comment No. 2

Fuel oil will be stored in two 100,000-gallon tanks located in the yard and in sixteen 18,700-gallon tanks located in the diesel generator building. The tanks in the yard will be diked to contain the oil in the event of rupture. The tanks in the diesel generator building will be embedded in concrete in the building substructure. The building will be a seismic category 1 structure and the tanks will be vented to the atmosphere through nominal six inch diameter flameproof vents. Provisions will be made for collecting any spillage that may occur at locations where tanks are filled from rail cars and tank trucks.

Under normal conditions, there will be no effect on the quality of air due to oil storage. Also, it should be noted that the fuel oil storage tanks will contain No. 2 fuel oil, which is exempt from standards of performance for new stationary sources [see 40 CFR Subpart K, 60.111(b)].

Comment from EPA - page 5, Comment No. 3

The concrete mixing "batch" plant will comply with particulate emission requirements of the Alabama Air Pollution Control Rules and Regulations by the installation of adequate hoods, fans, and ducts to transport dust from cement and fly ash silos and batchers to a dust collector. With these controls, there should be no significant amount of dust emitted to the ambient air.

Comment from EPA - page 5, Comment No. 5

Construction noise should have little effect on local residents. The plant site, being on a peninsula and with most of the construction activity being concentrated within the site such that it is at least one-half mile to private property, plus the groves of trees which help suppress noise, will reduce construction noise to an acceptable level to local residents. Blasting noise during rock excavation will, of course, be heard over a rather wide area. Efforts will be made to minimize this by proper scheduling of this work.

All activities and operations will be in full compliance with the applicable provisions of the Federal Noise Control Bill. The TVA Hazard Control Branch conducts surveillance activities and ensures compliance with applicable noise standards.

Comment from EPA - page 5, Comment No. 6

Secondary treatment processes that are presently available for waste effluents containing complex organic waste, including dissolved and/or suspended solids, nitrogen and/or nitrated compounds, ammonia and/or ammoniated compounds, etc., could require a combination of several processing operations. TVA is studying treatment methods and will provide facilities which will permit compliance with applicable Federal and state regulations.

Comment from EPA - page 5, Comment No. 9

The following parameters were used to design the cooling towers.

Range	- 34° F.
Approach	- 24° F.
Design wet bulb	- 55° F.
Design dry bulb	- 60° F.

The cooling towers have been designed for the annual average meteorological conditions in the area of the plant.

Comment from Donald F. X. Finn, dated March 30, 1974

The basis for TVA's not making an economic analysis of geothermal alternatives is given in "TVA Responses to Second Set of AEC Comments on Bellefonte Draft Environmental Statement," dated October 5, 1973.

Comment from Advisory Council on Historic Preservation

See section 1.2.9 of TVA's draft environmental statement and response to the comment from Alabama Conservancy (Burns) - page 5-2, paragraph 4.