U.S. Department of Energy

ARGONNE NATIONAL LABORATORY

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September 26, 1980

Mr. Richard Stark
Licensing Project Manager
Room 130, Phillips Building
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Rich:

The Argonne Staff has completed its acceptance review of the Callaway Plant Environmental Report for the Operating License Stage. No major deficiencies that would justify non-acceptance for a one-unit operating license have been found. Satisfactory responses to the enclosed list of questions are necessary before the ANL staff can complete its assessment. Such responses must be submitted in a timely manner in order for the Argonne staff to be able to adhere to the present schedule.

It is our understanding that the list of questions may be expanded, or otherwise modified, pending developments during the site visit.

It is the intention of the staff to carry through the analyses for aquatic and terrestrial ecology, cultural resources, thermal discharges, noise, cooling towers, water treatment and chemical discharges on the basis of two operating units. The ER will provide enough information to carry through two-unit analyses for these topics if satisfactory responses to the questions are received. If the analyses reveal that all regulatory requirements for these impacts are satisfied for two operating units, it will be a trivial matter to verify that the same is true for a single operating unit.

The socioeconomic, cost-benefit and need for power analyses will be done only for a single unit because Sections 1, 8, 9 and 11 of the ER/OL are acceptable only for a one-unit analysis.

An updated list of agencies and/or individuals from whom members of the team would like to be able to obtain information during the site visit will be sent from here by September 30.

Please contact me if you have any questions.

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Sincerely,

Tom Gilbert

Thomas L. Gilbert, Project Leader
Division of Environmental Impact Studies

TLG:gmb

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Acceptance Review Questions on the Environmental Report for the Operating License Stage of the Callaway Plant

Argonne National Laboratory
Environmental Impact Studies
Division
September 26, 1980

Thermal Discharge

1. Fig. 3.4.4 of the OL-ER states "low water, 30-yr, 1-day elevation is 495 ft MSL." Fig. 3.4.4 of the CP-ER states it is 489 ft MSL. This apparently resulted from new data provided in Fig. 2.4-6 of the OL-ER. However, even though the submergence of the discharge pipe was changed to reflect this new information, the distance above the river bottom appears to still be about the same. Please provide an explanation.

Noise

1. Provide a list of all major operating equipment sound sources at the power plant that can contribute measurably to the sound pressure levels near the site boundary, and indicate whether they are outdoor or indoor sources, and whether they are continuous or intermittent sources. To aid in the preparation of the list, included below is a checklist of most power plant sound sources. For intermittent sources, supply the usage factor.

Power Plant Sound Sources

(1) Main Plant Equipment:

   a. Boilers
   b. Turbine-Generator-Exciter
   c. Turbine Condensers
   d. Transformers

(2) Auxiliary Plant Equipment:

   a. Electric Motors
   b. Boiler and Reactor Feed Pumps
   c. Deaerator Vents
   d. Auxiliary Boilers
   e. Auxiliary Steam Turbines

f. Air Compressors
g. Outdoor P.A. System
h. Precipitator Rappers and Vibrators

(3) Cooling Tower:

a. Mechanical-Draft Cooling Towers
b. Natural-Draft Cooling Towers

(4) Fan Noise Sources:

a. Inlet of Forced-Draft Fans
b. Outlet of Induced-Draft Fans
c. Axial-Flow Fans
d. Ventilating Fans
e. Uninsulated Fan Housings
f. Uninsulated Fan Breechings
g. Casings of Gas Recirculation Fans

(5) Valves, Vents, Piping:

a. High Pressure Vents
b. Steam Leaks
c. Steam Admission Valves
d. Valves
e. Piping

2. Provide overall and A-weighted sound power levels for each sound source listed on (1) from actual measured data or vendor data. Octave band analyses and any directivity effects should be provided for each source, if available.

3. Provide the ground elevation at all sound sources, accurate to within 2 m if possible. All ground elevations should be quoted relative to mean sea level or to the local reference elevation of the site.

4. Locate each sound source on a plant site plan, drawn to scale. Also include location of receptors for any background data that has been measured. Locate sensitive areas at locations near but outside the site boundary. Provide an elevation contour map of the entire area for any changes from Fig. 2.1-34 due to regrading during construction.

5. For major indoor sources, supply a diagram of the enclosing structure (with dimensions). Provide the wall surface weight (kg/m^2 or lb/ft^2). Specify the surface area of any permanent openings to the outside and window surface area for each wall. Provide glass thickness of windows.

6. Provide discussions of all significant barriers (natural or otherwise) to noise propagation and ground cover (such as groves of trees and other vegetation) that could possibly affect sound propagation to offsite areas.

7. What are the anticipated noise levels in dB(A) at the edge of the exclusion area, at the various site boundaries, and at the closest habitation, during operation of Units 1 and 2? Provide a map showing the anticipated isopleths of dB(A) around the plant during operation of units 1 and 2.

Cooling Towers

1. (Section 3.4.3) Provide the flow rates of air through the cooling towers, during both maximum power and 70% operating capacity.

2. (Section 5.1.4.2) Referring to Table 5.1-4, explain/justify the selection of Hanna's data (rather than Slawson's) for use in subsequent calculations.

3. (Section 5.1.4.2) Referring to Table 5.1-5, provide the concentrations of drift droplets within the various impact areas.

4. (Section 5.1.4.2) In addition to the information contained in Table 5.1-6, list deposition rates as a function of distance from the cooling towers.

5. (Section 5.1.4.2) Estimate the effect on ground-level particulate concentrations and deposition rates of drift droplet evaporation during periods of low ambient humidity.

6. (Section 6.1.3.2.2.1) Justify the applicability of data from the Paradise, KY site for validating a cooling tower plume model for use in central Missouri.

Water Treatment and Chemical Discharges

1. The applicant has based estimates of water treatment on the maximum concentrations in the Missouri River shown in Table 3.6-1. By comparison with the EPA STORET data given in Table 2.4-7, the maximum

value of total alkalinity (319 mg/L as $CaCo_3$) appears to be abnormally high. While perfect agreement cannot be expected, the other values given in Table 3.6-1 are reasonably consistent with the EPA data for those parameters which depend on major dissolved inorganic constituents. Please check this maximum alkalinity value and correct if necessary.

2. Referring to Table 3.6-6, footnote (d), how does aereation in the cooling towers affect alkalinity? Does the quoted alkalinity (1182 mg/L) include the effect of sulfuric acid addition?

3. There are inconsistencies between the flow rates given in Tables 3.6-4 and 3.6-5 and those shown in Figure 3.3-1. For example, Figure 3.3-1 gives a blowdown rate (2 towers) of 9355 gpm, which is 13,471,200 gal/day; Table 3.6-4 gives 10,967,000 gal/day. Please provide corrected values.

4. Explain how the proposed quantity of phosphonates was estimated. Provide references and/or quote experience for any information sources that were used in the estimate.

5. Provide information concerning the effect on the B.O.D. and nutrient level and any other known significant environmental effects, of discharging organic phosphonates.

6. Explain how the proposed sulfuric acid treatment level was estimated.

7. The sulfuric acid treatment will liberate CO_2 and increase the dissolved CO_2 concentration, which is an important parameter in determining the solubility of calcium carbonate and will depend on loss of CO_2 in the cooling towers. Please estimate the steady-state dissolved CO_2 concentration in the circulating water during normal operation. Also, please estimate the pH of the circulating water, which depends on alkalinity and dissolved CO_2 concentration.

8. Please resolve the following apparent discrepancies:

   (a) Table 3.6-6 gives the maximum sulfate concentration in the river as 437 mg/L, which, together with the added sulfuric acid, gives a very high sulfate concentration in the discharge and cooling tower drift (>2000 mg/L). The STORET data (Table 2.4-7) gives a maximum sulfate concentration of only 200 mg/L for 82 observations over a longer period of record (1967-1979).

   (b) From Table 3.6-2, the only sources of added sodium are 4900 lb/day of NaOH (57.7% Na) for demineralizer regeneration, and 8400 lb/day of NaCl (39.3% Na) for hypochlorite production. If all this sodium appears in the discharge, the total sodium added will be about 6120 lb/day as compared to 9600 lb/day quoted in Table 3.6-5.

Terrestrial Ecology

No questions

Socioeconomics

1. Update all population estimates and projections using U.S. Bureau of Census data for 1975.

2. Provide a 1980 monthly estimate of the number of users of wildlife management or refuge areas and project yearly averages of the number of area users for the lifetime of the facility.

3. Provide a copy of the Dames & Moore demographic study which is discussed in Section 8.1.2.1.1.

4. Provide an update of Table 8.1.7. Please add to the table for each personal category the approximate number of people who are currently employed by U.E. and have or will be transferred to the Callaway Plant.

5. Provide the full citation for the "State Model" discussed in Section 8.1.2.1.2.

6. Update the numbers in Table 8.1.9 to Table 8.1-15, Table 8.2-6, Table 8.2-7.

7. Provide evidence to verify the statements in paragraphs one and three of Section 8.1.2.4.2.

8. Clarify, in Section 8.2.2.2.1, the number of residences not razed and the number currently rented. Discuss the intended disposition of these residences during the operation of the facility.

Cultural Resource

1. Provide a detailed description of the research design developed for cultural resource site identification on all plant properties and all methods utilized in the field reconnaissance. Describe the kinds of field strategies utilized in areas with different topographic and vegetation settings, and include a discussion of the field conditions at the time of the field work.

2. Provide a detailed description of the criteria used to evaluate the cultural resource sites identified on the plant properties. Describe each of these sites including the sites' structure, function, chronology, cultural affiliation and current condition. Which of these sites still remain on the plant property and what mitigative measures were used for those that do not remain?

3. Describe the natural resources or locations on the plant properties of cultural or religious importance to Native Americans living in or utilizing the nearby area.

4. Provide a detailed description of the settlement-subsistence system for all cultural phases known in the nearby area and a correlation of site type, cultural-phase and environmental setting over time.

5. What are the major research problems for this general region? How do the nearby cultural resource sites relate to these problems? How do the sites located on the plant property relate to these problems and do they provide information contributing to a better understanding of the local culture history? Explain why.

Aquatic Ecology

1. (page 2.2-11) The applicant indicates that only watercress was found in Logan Creek in 1975. The same paragraph states that other hydrophytes have been observed in the past. What is the reason for the apparent "loss" of these other species? Have these species reestablished themselves since 1975?

2. (page 2.2-24) The staff requests additional information on abundance, diversity, spawning, etc. of fishes in the Missouri River (vicinity of Callaway), Logan Creek, and Mollie Dozier Chute. Provide the following references and any additional pertinent information that may be available:

    1) Union Electric Company. 1974a. Callaway Plant Units 1 and 2. Environmental Baseline Inventory. Unpublished report. Union Electric Company. St. Louis, Missouri.

    2) Union Electric Company. 1974b. 1974 Annual summary, Callaway Plant Units 1 and 2. Preconstruction monitoring. Unpublished report.

3. (page 2.4-4) The statement is made, "The average flow at Hermann over a 26 year period of record is 72,000 cfs for regulated flow conditions." In view of the fact that the nearest dam is 696 river miles upstream, how is flow at Callaway "regulated"?

4. (page 3.4-4) It is not clear from the discussion or Fig. 3.4.2 just what the "low velocity fish escape openings" are and how they function. Clarify.

5. (page 3.4-4) It is stated in paragraph 4 that Union Electric maintenance men will visit the intake structure "...frequently to clean and maintain the trash racks and traveling screens." Define "frequently."

6. (page 3.4-4) Sand gates are discussed in paragraph 5. What are sand gates and how would they function if needed? Provide supplemental illustrations if possible.

7. (page 3.4-6) A fish bypass system is referred to in Fig. 3.4-2 shows "fish gates." It is not clear from either the brief discussion or the figure how the fish gates function. Clarify.

8. (page 3.4-6) The discharge velocity is to be approximately 7.0 fps. What measures are to be provided to mitigate scouring of the river bed?

9. (page 3.4-6) What is the projected use of the barge facility located downstream of the discharge.

10. (page 3.4-7) What will the water temperature be of the spray water under winter conditions? What will the water temperatures in the forebays be during winter conditions?

11. (page 3.4-7) What is the applicant's assessment of the potential for cold shock to fishes that may congregate in the intake, exit through the fish escape openings, be subjected to thermal discharges and finally ambient river water temperatures under winter conditions?

12. (page 6.2-1) The applicant states that impingement is to be monitored for a 24-hr period, once per month for a 12-month period. What is the basis for such an abbreviated monitoring program (i.e. only once per month for 24 hours).

13. (page 6.2-2) What is the schedule for the proposed entrainment monitoring program?

14. On page 4-5 of the CP-FES the following applicant commitment appears. "Sediments increases in streams will be minimized by measures to be developed." Chapter 4 of the ER-OL does not address this commitment. What measures were developed?