ENVIRON

AUG 28 1972

Docket No. 50-331

Iowa Electric Light & Power Company
ATTN: Mr. Duane Arnold, President
Security Building
P. O. Box 351
Cedar Rapids, Iowa 52406

Gentlemen:

A visit to the Duane Arnold Energy Center was made on August 9, 1972 by a team from our Directorate of Licensing and the Argonne National Laboratory to review environmental factors related to the construction and operation of the plant. Discussions were held with members of the Iowa Electric Light and Power Company's staff in Cedar Rapids on August 9-10, 1972.

As a result of this visit, it has been determined that additional information will be required to continue our review. Accordingly, please submit the information requested as identified in Enclosure 1 to this letter. Your reply should consist of three signed originals and 297 additional copies as a sequentially numbered supplement to your Environmental Report.

In order to maintain our licensing review schedule we will need a completely adequate response by October 3, 1972. Please inform us within seven days after receipt of this letter of your confirmation of the schedule or the date you will be able to meet. If you cannot meet our specific date or if your reply is not fully responsive to our requests, it is highly likely that the overall schedule for completing the licensing review for this project will have to be extended. Since reassignment of the staff's efforts will require completion of the new assignment prior to returning to this project, the extent of extension will most likely be greater than the extent of delay in your response.

Sincerely,

Original signed by
Daniel R. Muller

Daniel R. Muller, Assistant Director
for Environmental Projects
Directorate of Licensing

OFFICE ▶						
SURNAME ▶						
DATE ▶						

AUG 28 1972

Enclosure:
Request for Additional Information

cc: Lowenstein and Newman
1100 Connecticut Avenue, N.W.
Washington, D. C. 20036

DISTRIBUTION:
AEC PDR
Local PDR
K. Dance, ANL
P. Gustafson, ANL
Docket File (ENVIRON)
RP Reading File
EP-2 Reading File
A. Giambusso, DDRP, L
H. Denton, ADSS, L
D. R. Muller, ADEP, L
R. Boyd, ADBWR's, L
G. K. Dicker, EP-2, L
L. B. Werner, EP-2, L
G. Lear, BWR-1, L
J. Gallo, OGC
R. L. Wade, EP-2, L
RO (3)

OFFICE ▶	EP-2:L	EP-2:L	ADEP:L			
SURNAME ▶	GKD LBWerner:peb for	GKD GKDicker	DRMuller			
DATE ▶	8/25/72	8/26/72	8/28/72			

ENCLOSURE 1

Additional Information Required for Review of

Environmental Impact of

DUANE ARNOLD ENERGY CENTER

Docket No. 50-331

Duane Arnold Energy Genter

2. THE SITE

2.2 DEMOGRAPHY AND LAND USE

1. Confirm that the Village of Palo has no plans to incorporate or otherwise move toward creating a unified water supply and distribution system.
2. Give the degree to which Wickiup Hills Conservation Area and Morgan Creek Park are developed. Outline plans, if any, to further develop these areas.

2.4 GEOLOGY

1. Indicate the type of clay (or clays) in the soils of the site and below the shallow aquifer (e.g. micacious, montmorillontic, kaolinitic).

2.5 HYDROLOGY

1. a Indicate the approximate locations of the 12 low head dams which are on tributaries upstream from the plant. For each dam, give type of construction, year completed, impoundment volume, level regulation device and level management guidelines if other than fixed level overflow, and emergency release measure; if any. If impoundments are made, include names.

1. b Indicate information requested above for all impoundments on or associated with the Cedar River up to 40 miles downstream from the plant.

2. Cite sources of information for the statements "the water quality of the Cedar River in the vicinity of the Duane Arnold Energy Center is largely influenced by runoff from agricultural land..." and "Municipal and industrial waste discharges upstream are of significance, but probably have less environmental effect than do agricultural pollutants." (2.9-1)

2.6 METEOROLOGY

1. Give the correct figures for frequencies of tornadoes.
2. Describe the meteorological study and model which was used to develop the estimates of cooling-Tower effects presented in Section 3.2.3 of the DAEC Environmental Report. Using the model developed and weather data from the Palo site, provide new data on the probability of visible plumes over Palo and Toddville, the increase in fog for Palo and Toddville and the probability of local fogging and icing on the nearest roads. Include data on visible plumes and fogging over Palo broken down by month.

2.7 ECOLOGY

1. Supply lists of specific animals (genus, species and common names) including birds, and plants including trees, as well

as other available ecological data (e.g., habitat characteristics) and data or estimates of abundance, for the following areas:

a) site property; b) Palo Marsh Wildlife Refuge; c) Lewis Game Preserve; d) Wickiup Hills Conservation Area; e) Lewis Bottom Access; f) Chain Lakes Island Park; g) Seminole Valley Park and Campground; h) Morgan Creek Park; i) Ellis Park; j) Twin Pines Park; k) Wildcat Bluff; and l) Benton City - Fry Access. Supply available data of a similar nature on areas between and around these parks and preserves.

2. Supply genus, species (when available) and common name lists and other data (abundance, seasonal variations, etc.) on the biota of the Cedar River in the site region, and about 5 miles upstream and downstream. Include the following aspects based on monthly or seasonal sampling, and give data on methods:

   a. Plankton

      1) phytoplankton

      2) zooplankton

      3) periphyton

      4) bacteria

         a) total coliforms

         b) fecal coliforms

         c) fecal strep

      5) fungi

6) viruses

n) surface samples of microorganisms

b. Benthic biota near the site (5 miles above and 5 miles below the effluent)

c. Fish (some are mentioned in ER p. 2.7-3 and 2.7-8)

d. Amphibia

e. Reptiles

f. Mammals

g. Waterfowl (permanent and transient)

h. Insects (mosquitoes, etc.)

i. Other invertebrates

j. Macrophytes

3. Support the statement that there is an absence of significant numbers of pelagic larval fish. (B-3, Amendment 1)

4. Cite documentation or source of the statements "Most of the elm trees in the area are dead or dying from Dutch Elm disease" and "many foxes have died of mange in this area." Also, please indicate meaning of "most" and "many" in terms of approximate proportions of healthy to affected organisms. (2.7-1)

3. THE STATION

3.3 HEAT DISSIPATION SYSTEM

1. On a copy of Figure 3.3-1 indicate heat loads (in Btu/hr) for plant cooling systems including the main condenser.
2. Provide the cooling tower performance for various atmospheric conditions and water temperatures. Provide annual weather statistics from which the expected monthly cooling tower temperatures could be calculated.
3. Summarize the breakdown of water loss from the cooling towers by vaporization and drift. Indicate limits to tower operation in low temperatures and special operating conditions.
4. Outline details of measurement and control of the mineral content in the circulating water for the range of conditions anticipated.
5. Give a reference for the thermal plume calculations in B-4 of Supplement 1.
6. Describe in detail the trash rack and traveling screen (include construction materials and screen mesh size).
7. On a sketch showing relative locations and distances, indicate depth, width, and flow rate at all points on the inlet and discharge structures at which significant changes occur. Include the maximum approach velocity at the inlet screen. Estimate the quantity of organisms which will be entrained in the inlet water and the average travel time from intake to discharge. At which depths and at what distances from the shoreline will intake from and discharge to the river

occur?

8. Indicate the points at which river temperature will be monitored and how each temperature will be measured and recorded.

9. Describe methods of measurement and disposition of debris, including fish, taken from the intake structure and associated components.

3.5 CHEMICAL AND BIOCIDE SYSTEMS

1. Describe in detail the chlorine addition system used to control fouling. Include a layout showing addition points of chlorine and monitoring points for determining chlorine content. Is the chlorine stored as liquid Cl or HOCl?

2. Outline the procedures to be followed in adding chlorine to the cooling water. What amounts of chlorine will be added, will the chlorine be added in batches or continuously, will monitoring of free available residual chlorine be used in a feedback sense to control the addition of chlorine? What will be the maximum allowed concentrations of free available residual chlorine and combined available residual chlorine (include chloramines), and at what point will these concentrations be measured. Describe the cycle in time of chlorine addition.

3. Comment on alternate schemes of controlling fouling in the condenser and cooling towers, include comments on mechanical defouling of condensers, the addition of ozone in place of chlorine to control fouling, the use of heated water to

control fouling and the use of flow reversal to control fouling.

4. Has the chlorine demand of the Cedar River been determined and used to determine the amount of chlorine to be added?

5. Comment on the statement that "0.3 ppm of free residual chlorine in the cooling tower blowdown water is much too high, 0.05 to 0.1 ppm residual at the exit of the condenser should suffice."

6. Outline holdup or removal systems which might be used to reduce chlorine or chloramine discharges to the Cedar River. Include rough cost estimates for these systems.

7. State what kind of technical specification statements the applicant would propose with regards to chlorine additions or chlorine concentrations (free and combined available residuals).

8. Give the chemical and physical analysis of the sewage effluent before dishcarge into the Cedar River. Include data from construction period and expected data for operational period.

9. List all types and quantities of chemicals used in cleaning the piping system, and describe where they are discharged.

10. Describe how the sodium sulfate, phosphoric acid, and other waste chemicals are to be discharged. If any discharged directly to the river, describe the frequency and concentrations.

11. Name chemicals to be stored "outside," together with their quantities, storage conditions, rates of turnover, etc.

3.6 SANITARY AND OTHER WASTE SYSTEMS

1. Summarize the performance of the package sanitary waste system as a function of input. Where is the sanitary outfall to the river located relative to the plant cooling system intake and discharge? Describe how digested wastes from the sanitary waste treatment system are disposed of during construction and after the Plant is completed. Include details as to quantities, method of removal and location of ultimate disposal.

4. ENVIRONMENTAL EFFECTS OF SITE PREPARATION, AND STATION AND TRANSMISSION LINE CONSTRUCTION

4.1 EFFECT ON LAND USE

1. Provide simple sketches of the design and materials of transmission line poles, a map showing existing and newly acquired rights-of-way and substation locations relative to parks, historic sites, significant wooded area, etc., and to highways and municipalities. Also describe how bluffs, streams, and major highways are spanned (types of poles and distances, methods used, etc.) to preserve esthetic appearances and minimize environmental disturbances. How many acres of new right-of-way were acquired, and what is the breakdown by marshland, wooded or timbered, pasture and hayland, and cultivated cropland?
2. Describe transmission line and substation maintenance commitments from esthetic and environmental preservation points of view. To what extent is joint use of the right-of-way for water pipelines, oil pipelines, etc., permissible and possible in future decades? Put into writing the verbal statements by Iowa Electric personnel that minimum right of way paths will be cut and that no herbicides will be used to eliminate foliage.
3. Indicate locations, widths, lengths, and volumes involved wherever dredging of the river has or will occur in connection with the Plant and the reservoir.

4.3 EFFECTS ON SITE ECOLOGY

1. Cite sources of information or references for the following statements:

   "There are no unique species peculiar to the Palo site." (8.1-21)

   ". . . there are no endangered species associated with Cedar River ecosystems." (8.1-21)

5. ENVIRONMENTAL EFFECTS OF STATION OPERATION

5.2 EFFECTS ON WATER USE

1. Document the source location, amounts, and quality of all water used in Plant systems; also, the treatment and disposition of such water, including discharge procedures and contained chemicals and radioactivity, and boundaries of variations due to natural and Plant conditions.
2. Provide all known evidence and details concerning the recharging of on-site and neighboring off-site wells used for supply water, and concerning the anticipated quantitative effect of on-site pumping on existing off-site wells. What is the history of well water levels in the area?
3. Provide water use figures for the City of Cedar Rapids. What is the total usage of water by wells in the area?
4. Specifically, how will DAEC determine whether claims by owners of wells in the vicinity are justified, should the capacities of their wells diminish after the Plant becomes operational. What reimbursement, corrective and replacement measures will be employed; and how broadly (area and time duration) will DAEC continue to make known that an avenue of friendly recourse is available to them? (B-14 Amendment)

5.5,5.6 RADIOLOGICAL EFFECTS

1. Please provide a cost-benefit analysis for providing clean steam to the gland seals.
2. Please furnish the volume flow rates of off-gas at various stages in the main condensor off gas treatment system.
3. Give the flowrate (steam plus air) through the gland seal exhaust system. Indicate the radiation monitoring on this pathway.
4. Discuss set points and substitute set points for monitors on the gaseous effluent paths (stack, reactor and turbine building vents) in terms of the release limits in the technical specifications. What would be the effect of activity releases at levels just below the set points of these monitors?
5. Give the flow rate through the 100 meter stack.
6. Relative to radiological impact, furnish information regarding the recharge of shallow aquifers from Cedar River. What is the downstream population using these aquifers for domestic water.
7. Identify downstream users of Cedar River water for such uses as potable water, irrigation and livestock watering.
8. Furnish details regarding the shipment of new fuel, spent fuel and radioactive wastes to or from the Plant. Include, where applicable, information about the number of shipments per year, the number of containers per shipment, the number of curies per container and the expected dose rates at the surface of the container and truck. Indicate shipping desti-

nation, routes, and furnish information about population and traffic along these routes.

9. Furnish details about the on-site storage of chlorine and the examination of accidents involving it.

10. Give the distance from the stack to the nearest occupied dwelling in each sector.

8. EVALUATION OF PROPOSED ACTION

8.1 NEED FOR POWER

1. Name any municipalities or other corporate entities within a 50-mile radius of the DAEC Plant which purchase electric power for resale. Name the five largest industries electric power consumers (also listing kind or character of products manufactured or processed) in Cedar Rapids and between the corporate limits of Cedar Rapids and the DAEC site.

11. BENEFIT-COST ANALYSIS

11.1 ALTERNATIVES SELECTED FOR BENEFIT-COST ANALYSIS

1. Intensive studies of Commonwealth Associates, Inc. are used as a basis for both Plant size and site selection (DAEC Environmental Report, p. 4.2-1) and for cost differentials for alternatives (Amendment 1, p. C-2). Furnish information as to the basis assumptions, method, and scope of these studies. Outline the procedure used in the process of chosing the present site, including other studies than the Commonwealth Associates studies. Discuss differences in impact among alternate sites.

11.2 EVALUATION OF BENEFITS

1. Indicate the present economic importance of electric energy for regional commercial and agricultural users, and indicate power-intensive trends, if any.

11.3 EVALUATION OF COSTS

1. In Table C-2, no quantitative estimates are made of the effect on aquatic and terrestrial biota. Supply an order-of-magnitude estimate of effects and discuss the assurance provided by monitoring that any uncertainties in the estimated effects will not go unreported and ignored as part of the company commitment to optimally lower environmental costs.