

50-269/276/287

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TO: Mr Rusche

FROM: Duke Power Company  
Charlotte, Nc  
W O Parker Jr

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9-29-76

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## DESCRIPTION

Ltr re their 5-13-76 request for amdt of  
Appendix B tech specs.....furnishing addl  
info concerning chemical effluents.....  
in response to our 8-2-76 ltr.....

## ENCLOSURE

PLANT NAME: Oconee 1-3

## SAFETY

## FOR ACTION/INFORMATION

## ENVIRO

10-7-76

ehf

ASSIGNED AD:

BRANCH CHIEF:

PROJECT MANAGER:

LIC. ASST.:

Schwencer (6)  
Zech  
Sheppard

ASSIGNED AD:

BRANCH CHIEF:

PROJECT MANAGER:

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## INTERNAL DISTRIBUTION

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LA PDR

CONSULTANTS

To LA Sheppard

BROOKHAVEN NAT LAB

ULRIKSON (ORNL)

## CONTROL NUMBER

10146

# DUKE POWER COMPANY

POWER BUILDING

422 SOUTH CHURCH STREET, CHARLOTTE, N. C. 28242

WILLIAM O. PARKER, JR.  
VICE PRESIDENT  
STEAM PRODUCTION

September 29, 1976

TELEPHONE: AREA 704  
373-4083

Mr. Benard C. Rusche, Director  
Nuclear Reactor Regulation  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555

Attention: Mr. A. Schwencer, Chief  
Operating Reactors Branch #1

RE: Oconee Nuclear Station  
Docket Nos. 50-269, -270, -287

Dear Sir:

My letter of May 13, 1976 proposed an amendment to the Oconee Nuclear Station Appendix B Technical Specifications to increase the upper limit of pH in chemical effluents from the station from 8.5 to 9.0. In response, your letter of August 2, 1976, identified and requested additional information required before an evaluation of this proposal could be completed. Pursuant to this request, the following information is herewith submitted:

To evaluate the effect of this revision, a study based on alkalinity was performed to better assess the effect of Oconee chemical effluents on the Keowee receiving waters. A theoretical model was developed for the effluent discharge plume based on eddy diffusion, mixing length, entrainment, and width growth models in turbulent flow. This model does not take into account chemical reaction (buffering or neutralization), and is therefore, highly conservative.

The chemical effluent discharge plume was modeled for two sets of conditions. A worst case condition was considered for which the effluent discharge stream had a maximum alkalinity value of 26.5 mg/l as CaCO<sub>3</sub> equivalent and a maximum effluent flow of 22.8 cfs. Similarly, a normal case condition was considered in which effluent stream alkalinity and flow values were 7.5 mg/l as CaCO<sub>3</sub> equivalent and 7.7 cfs respectively. The above values are consistent with data obtained at Oconee and are likewise consistent with alkalinities of typical Piedmont South Carolina streams as reported in the "U. S. Geological Survey Water-Data Report SC-76-1."

For the worst case, the alkalinity of the effluent discharge would be dispersed to 8.4 mg/l as CaCO<sub>3</sub> equivalent after 250 feet of mixing with the Keowee receiving waters. For the normal case, the effluent alkalinity would be dispersed to 8.5 mg/l as CaCO<sub>3</sub> equivalent after 30 feet of mixing. These values are slightly higher than the average background Keowee River alkalinity of 7.5 mg/l as CaCO<sub>3</sub> equivalent and indicate that mixing of the effluent stream with the Keowee receiving waters will result in no significant change to the pH or the alkalinity of the receiving water with the exception of a very small area near the discharge points.

10146

Mr. Benard C. Rusche

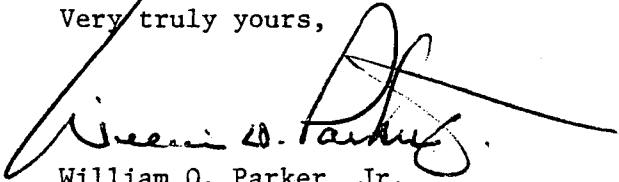
Page 2

September 30, 1976

The above conclusion is supported by data obtained on March 16, 1976, when current technical specification limits were exceeded inadvertently by releasing chemical effluents with a pH of 8.7 and an alkalinity of 23.0 mg/l as  $\text{CaCO}_3$  equivalent. Following this incident, no discernible difference was measured in the alkalinity upstream and approximately 1600 feet downstream of the discharge.

It is concluded that chemical effluents released from Oconee Nuclear Station with a pH of 9.0 would have insufficient alkalinity to affect anything other than a very small localized area near the release point. Therefore, increasing the pH effluent release limit to this value would have no overall effect on any aquatic species.

Very truly yours,



William O. Parker, Jr.

EDB:ge