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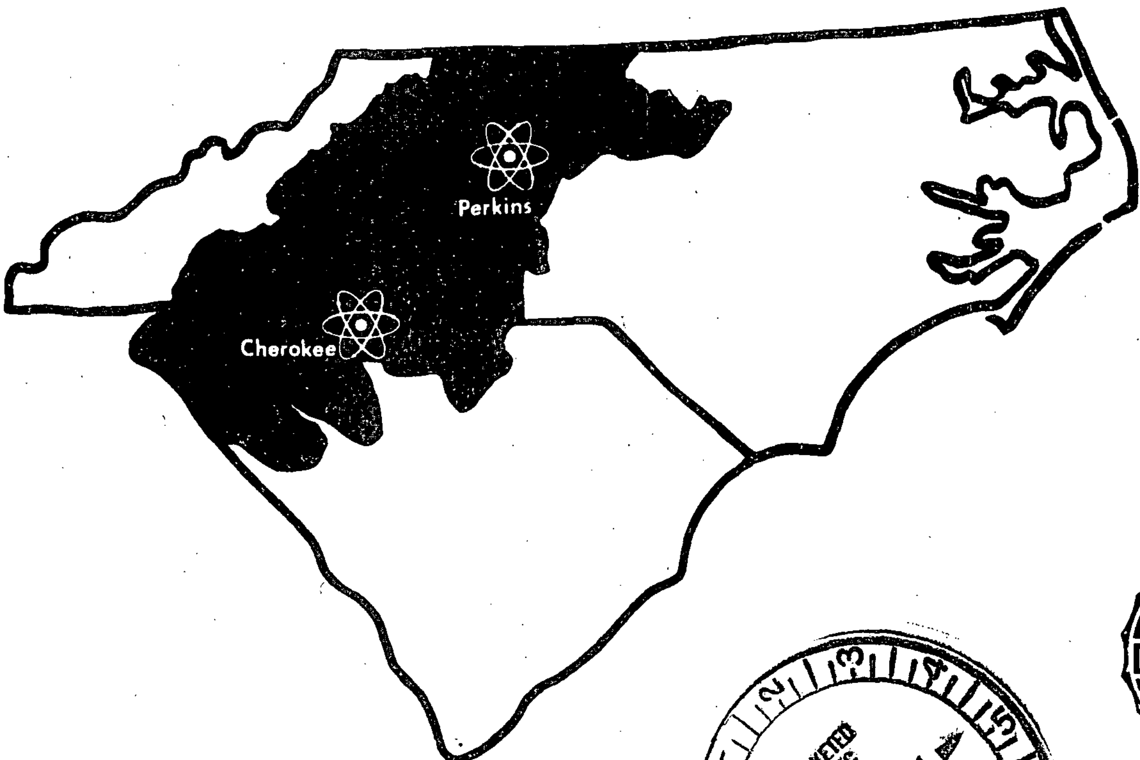
Duke Power Company

PROJECT 81

Cherokee Nuclear Station

Environmental Report

Volume I



CITIZENSHIP
DUKE POWER
SERVICE

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I.0 INTRODUCTION - PURPOSE

This is the Environmental Report, Construction Permit Stage, prepared by the Duke Power Company and submitted as a part of the Construction Permit Application for Project 81. This report is for the Cherokee Nuclear Station, the second of two, three unit facilities.

The purpose of this report is to provide site related information to the United States Atomic Energy Commission regarding the potential environmental impacts of the proposed station and associated facilities, to assure that issuance of a Construction Permit will be consistent with the national environmental goals as set forth by the National Environmental Policy Act of 1969 (Public Law 91-190). In addition to the discussions and evaluations of the environmental implications of Cherokee Nuclear Station presented in this report, more detailed information on other aspects of the station's design and operating characteristics are found in Project 81, Preliminary Safety Analysis Report.

The general format of this report is in keeping with USAEC Regulatory Guide 4.2, Preparation of Environmental Reports for Nuclear Power Plants, March, 1973.

I.1 INTRODUCTION - DUKE POWER COMPANY

Duke Power Company's concern to conserve and improve the quality of the environment dates back to 1923 when Duke's first full-time Environmental Department was established, headed by a public health physician. Additional groups of full-time environmental specialists have subsequently been formed and are continuing to work toward assuring that the Piedmont Carolinas area is indeed an attractive place to live.

Duke's commitment to environmental quality is for two fundamental reasons. First, the type of environment directly affects the quality of life of the people who live in the Company's Service Area, and it is recognized that no electric utility can long succeed serving an area marred by blight. Secondly, man has yet to devise a way to generate the large quantities of electrical energy needed to meet the public demand without involving land, water, and air resources. To minimize adverse impact on the environment and even to enhance its quality wherever possible has been fundamental consideration in the Company's planning of generation facilities for many years. In support of these objectives, the Company has long engaged in environmental research and investigations.

Plans for Cherokee Nuclear Station are supported by a continuing program of environmental monitoring. A baseline information gathering and assessment program was started in August, 1973. This study is furnishing data which, thus far, indicates that Cherokee Nuclear Station, including the use of a closed cycle cooling system, will be environmentally compatible in all significant respects, and will serve to adequately monitor construction activities. Cherokee will fully conform to current environmental quality standards of the cognizant governmental regulatory agencies; and any adverse environmental impact will be minimal when compared to alternate modes of generating electricity.

Cherokee's power generation is essential to meet the power requirements of the Duke Service Area due to population growth coupled with the increased usage per capita. Only with additional energy can there be gains in production, comfort, health care, education, communications, and the economic status of people in the area and even environmental quality. Failure to provide additional generating capacity <u>when needed</u> can have traumatic consequences on human and environmental values.

During the pre-operational and operational periods, studies and monitoring programs associated with Cherokee Nuclear Station will continue. If subtle adverse effects should be identified from these programs, timely appropriate corrective action will be taken.

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1.0 PURPOSE OF THE PROPOSED FACILITY

The purpose of the proposed facility is to meet the projected needs for electric energy of customers in the Duke service area. Although it is difficult to predict what effect energy conservation and other factors may have on future energy requirements, it is projected that the facility will be needed in accordance with the proposed schedule described herein. As other sources of energy become scarce or become increasingly more costly, the shift to greater uses of electric energy becomes likely.

Efforts are being made on the Duke Power Company system to control the demand for electricity during peak periods by means of a load management program, but even so, the peak demand and energy sales are expected to increase steadily. The proposed Cherokee Nuclear Station is planned to augment Duke's generating capacity as a part of the long-range program of system development designed to meet in an optimum manner this anticipated growth of electrical load.

1.1 NEED FOR POWER

Information is presented in this section relative to the need for power on the Duke system based on past and projected load growth, reserve margins, and the reliability of the bulk power supply. Both the Duke system and the other power systems in the same geographic region are considered in the evaluation. Detailed statistical information relative to the Duke system may be found in "Uniform Statistical Report - Year Ended December 31, 1974", a copy of which has been furnished to the NRC. Q 1.1

1.1.1 LOAD CHARACTERISTICS

Table 1.1.1-1 lists the actual territorial peak loads and annual energy requirements for the Duke system from 1964 through 1974, and the forecast values from 1975 through 1988. The corresponding values for the Virginia-Carolinas (VACAR) subregion of the Southeastern Electric REliability Council (SERC), of which Duke is a part, are tabulated in Table 1.1.1-2. The Council and its subregions are described in Section 1.1.2. Q 1.1

A breakdown of annual peaks and energy production for the Duke system by months for the years 1965, 1970, 1973, and 1974 appears in Table 1.1.1-3. Although no specific trend in demand or energy growth is discernible from this table, a comparison of the monthly demand and energy values of 1974 with the corresponding values of 1973 yields a significant indicator. Q 1.1

Comparison of Duke System Monthly Demand and Energy Values

Maximum Hourly Demand - MW

	Month	1972	1973	1973/72 % Inc.	1974	1974/73 % Inc.	
	January		7185.7		7264.7	1.10	
	February		7247.0		7492.0	3.38	
	March		6740.5		7104.3	5.40	
	April		6663.9		6707.7	0.66	
	May		6431.8		7008.3	8.96	
4	June		7238.6		7606.4	5.08	
	July	7449.5	7763.7	4.22	7921.3	2.03	
	August	7177.3	8235.6	14.75	8057.6	-2.16	
	September	6847.5	7601.0	11.00	7567.7	-0.44	
4	October	6447.1	6753.3	4.75	6974.7	3.28	
	November	6829.5	6894.0	0.94	7064.7	2.48	
	December	7258.7	7292.6	0.47	7581.0	3.95	Q 1.1

Territorial Load - GWH

	Month	1972	1973	1973/72 % Inc.	1974	1974/73 % Inc.
4	January		4116.0		3857.8	-6.27
	February		3746.2		3621.9	-3.32
	March		3769.6		3696.5	-1.94
	April		3509.2		3499.9	-0.26
	May		3645.2		3802.4	4.31
	June		3886.0		3746.3	-3.59
4	July	3644.2	4049.8	11.13	4085.0	0.87
	August	3974.1	4318.3	8.66	4156.3	-3.75
	September	3556.8	3882.7	9.16	3637.4	-6.32
	October	3554.6	3800.8	6.93	3691.4	-2.88
	November	3693.6	3691.8	-0.05	3625.4	-1.80
	December	3788.8	3867.3	2.07	3819.8	-1.23

It must be inferred from this comparison that energy conservation measures recently employed in the wake of the Arab oil embargo have had considerable impact on the Duke system load. It will be noticed, however, that although the energy production in 1974 has consistently fallen behind the corresponding values of 1973, the maximum monthly demand figures for 1974 show a consistent increase over the 1973 values. The net effect of energy conservation, therefore, is to reduce the energy consumed over a period of time, but not to reduce materially the demand at time of peak. It is anticipated that any elasticity in the consumption of electric energy with price would bear a similar relationship. It is not possible at this time to determine the long-range impact of energy conservation or rate increases, but the peak demand and annual energy forecasts shown in Table 1.1.1-1 do reflect a decreasing rate of growth as well as a decreasing load factor. The forecast is discussed later in this section. Q 1.1.1g

Prior to June, 1971, Duke Power Company's advertising was directed toward promoting those uses of electricity which tended to improve the load factor of the plant in service, with particular emphasis on the electric heating concept. No promotion of air-conditioning load was made in either regular marketing advertising or Medallion advertising during this time. Q 1.1.1a

In June, 1971, all marketing advertising except Medallion advertising was discontinued. Medallion advertising was retained in an effort to improve the system load factor by offsetting the normal growth in summer load with an increased winter heating load. No new commitments for Medallion advertising were made, however, after October, 1972. Commitments which had already been made were honored through March, 1973, at which time all Medallion advertising was discontinued. This action resulted in a complete cessation of all marketing advertising. Q 1.1.1b

Since March, 1973, all Duke Power advertising has been of an informational (institutional) nature. This advertising has been directed toward acquainting customers with company activities which affect them -- environmental protection, reasons for rate increases, energy conservation, the need for additional generating capability, etc. Public understanding of the company's efforts in these areas is considered essential if the company is to carry out its responsibility to provide reliable electric service to the area it serves.

There are, of course, a number of ways to gauge the intensity of advertising. Total dollar amounts are relative only when applied to the market area in which the advertising is being done. For example, a million-dollar advertising campaign in a single television market would give intensive exposure to the advertising message, while the same amount spent in a regional market would be substantially less intensive. The most accurate yardstick, and the one most often used by electric utilities, is that which relates advertising expenditures to the number of customers the advertising is intended to reach -- advertising cost per customer. Since most of Duke Power advertising has been directed toward residential customers, advertising expenditure for each of the three years, 1971 through 1973, are shown in the following tabulation as "costs per customer".

DUKE POWER COMPANY
Advertising Expenses - $

		Institutional	Medallion	Marketing	Total
1971:	Total cost	471 815	319 771	247 463	1 039 049
	Cost per customer	0.55	0.31	0.24	1.10
1972:	Total cost	478 911	250 277	24 245	753 433
	Cost per customer	0.53	0.28	0.03	0.84
1973:	Total cost	791 441	*141 462	None	932 903
	Cost per customer	0.85	0.15	--	1.00

*Discontinued March 31, 1973

It is pertinent to compare the rates of growth of the various load classifications on the Duke system. The largest single load classification on the Duke system is textiles, comprising 18.4 percent of the total annual energy sales in 1974. This industry, which is highly sensitive to a number of economic factors, has historically grown at an average annual rate of approximately 6.2 percent; all other industry, representing some 15.9 percent of the total energy sales in 1974, has grown at a rate of approximately 11 percent annually.

Residential use, which constituted approximately 31.2 percent of the energy sold in 1974, has been growing at roughly 8.5 percent per year. It should be pointed out, however, that the rate of growth of energy sales to all-electric residences, roughly one half of all residential sales in 1974, has been at better than 12 percent per year. This trend is expected to continue, or possibly to increase, if the cost of fossil fuels to the residential consumer continues to climb, or if he is threatened with possible shortages of fossil fuels for heating his home. Sales to municipal systems and cooperatives, which constitute the major portion of the remaining energy sales on the Duke system, are growing at rates comparable with Duke's residential sales. The regulatory commissions that regulate the retail price of electricity in the Duke service area are the North Carolina Utilities Commission and the South Carolina Public Service Commission.

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Q 1.0.

Q 1.1.1(

The effect of energy conservation measures on various classifications of energy sales in 1973 and 1974 is demonstrated in the following table:

Energy Sales by Load Classifications - MWH

	Residential			Industrial		
Month	1973	1974	% Inc.	1973	1974	% Inc.
January	1065.4	1096.3	2.90	1333.3	1449.6	8.72
February	1045.3	898.9	-14.00	1545.1	1385.1	-10.35
March	922.0	899.7	- 2.42	1509.3	1387.8	- 8.05
April	789.8	856.8	8.48	1537.6	1493.4	- 2.87
May	706.5	720.7	2.00	1568.7	1646.7	4.97
June	694.8	730.3	5.11	1661.3	1601.8	- 3.58
July	835.8	805.0	- 3.69	1520.1	1473.7	- 3.05

Energy Sales by Load Classifications - MWH (cont.)

Month	Residential 1973	Residential 1974	Residential % Inc.	Industrial 1973	Industrial 1974	Industrial % Inc.
August	872.1	864.3	- 0.89	1776.9	1731.1	- 2.58
September	890.1	846.1	- 4.94	1689.7	1572.3	- 6.95
October	725.2	740.1	2.05	1619.3	1506.8	- 6.95
November	740.0	777.5	5.07	1621.8	1435.3	-11.50
December	898.9	1088.9	21.14	1465.1	1197.0	-18.30

Month	General Services 1973	General Services 1974	General Services % Inc.	Resale 1973	Resale 1974	Resale % Inc.
January	585.8	570.9	- 2.54	503.5	569.2	13.05
February	612.0	555.2	- 9.28	558.2	469.1	-15.96
March	575.5	538.8	- 6.38	469.8	446.8	- 4.89
April	555.0	543.1	- 2.14	457.7	465.8	1.77
May	550.8	553.1	0.42	432.9	490.1	13.21
June	581.1	597.2	2.77	468.5	461.7	- 1.45
July	653.7	619.6	- 5.22	521.5	528.8	1.40
August	678.4	648.2	- 4.45	597.3	580.1	- 2.88
September	691.3	655.5	- 5.18	536.2	517.2	- 3.54
October	637.8	585.2	- 8.25	457.8	475.6	3.89
November	595.8	574.5	- 3.58	515.3	526.8	2.23
December	569.9	612.2	7.42	506.7	559.7	10.46

Q 1.1.1g

No maximum monthly demand figures by classification are available, but it is evident that energy consumption was curtailed sharply in all classifications during most of 1974. By the end of the year, however, growth is noted in all classifications except the industrial, which is most sensitive to the economic recession. Also, a number of industrial plants have had considerable success in reducing both the demand and energy consumed in their operations. The forecast shown in Table 1.1.1-1, therefore, is predicated on the assumption that the growth in annual peak demand will not be affected greatly by energy conservation measures, but that growth in energy sales may decline; hence, the load factor projected for future years is below that historically experienced on the Duke System.

Q B-1

It is evident that the reduction in energy consumption occurs in the base load portion of the load curve because there is essentially no change in the shape of the load duration curve itself other than a displacement downward by an amount equivalent to the change in load factor. Hence, the effect of energy conservation is felt equally throughout the year, and does not appear seasonally or solely in the peak.

In making the forecast, two trends are included: that of the base portion of the load, and that of the temperature responsive component of load. The base load portion of the forecast is trended from historical base loads determined by correlating daily peak loads with temperature variables as expressed in the equation

$$y = a + bx_1$$

where y = load at 4 P.M. EST
a = base load
x_1 = 12 noon to 4 P.M. cumulative degree hours (base 67 degrees F)

Summer loads used for correlation were those observed on Mondays through Thursdays for the month of June, July, and August, excluding specific days such as July 4 and industrial vacations, during the years 1962-1972.

The trends of the two expressions in the above equation, the base load component, a, and the temperature sensitive component, bx_1, are determined independently, and the sum of the two components establishes the forecast. The forecast is based on "most probable" weather conditions at the time of the peak; that is, an equal probability of the temperature being greater or less than assumed, based on 20 years' history. The most probable temperature at the time of the summer peak is determined to be 95 degrees F, and the extreme which might be experienced under unusual conditions to be 104 degrees F. A similar procedure is followed in developing a winter peak forecast, using winter parameters rather than summer. The most probable temperature at the time of the winter peak is 19 degrees F, with an extreme of 5 degrees F.

Duke Power Company does not have a rate schedule for interruptible loads as such. It is not feasible, therefore, to consider interruptible loads in the forecast or in generation planning. By agreement with the Badin works of the Aluminum Company of America which has hydro capability approximately equal to its smelting load, during emergencies that plant will drop one or two pot lines for a limited period of time, but Duke must pay for the aluminum production foregone by so doing. This is expensive for Duke, and cannot be considered an interruptible load; it is considered an emergency measure. The total Badin load is 205 MW, with each pot line approximately 90 MW.

Q 1.1.1d

Q 1.1.1e

As an alternative to dropping load, on four occasions during the past five years, the Duke Power Company has reduced the voltage by 5 percent on certain selected distribution stations. It is estimated that when this action was taken, the effect was a net reduction in peak demand of about 85,000 kW. The dates, times, and reasons for the actions are tabulated below:

Duke System Voltage Reductions

FROM Date	FROM Time	TO Date	TO Time	Reason for Action
1/8/70	1700	1/9/70	2000	Temperature dropped to 8 degrees F on 8th, and 4 degrees on 9th. High successive peaks reduced reserve margins to unacceptable level.
1/22/70	0700	1/22/70	2000	Temperature dropped to 5 degrees F on this date. Anticipated high peak precipitated voltage reduction to increase reserve margin.
9/22/70	0920	9/23/70	2000	Lightning came into 100 kV switchyard at Lee Steam Station knocking plant off line and causing considerable damage. Voltage was reduced during plant outage.

Q 1.1.1

Duke System Voltage Reductions (cont.)

FROM Date	Time	TO Date	Time	Reason for Action
6/16/71	1000	6/17/71	0910	Period of hot weather. Marshall No. 4 (630 MW) was out for maintenance; Marshall No. 3 (630 MW) had to be removed from service because of tube leak. Voltage was reduced to provide additional reserve margin.

Q 1.1.1f

No other means of load reduction was undertaken during these periods of reduced voltage.

Duke Power Company has a number of interchange agreements with neighboring systems. These are generally based on capacity only, energy repayment being made "in kind", by cash settlement, or by some other agreed-upon means. The only firm energy purchase made by the Duke system is for 75,000 MWH annually from the South Carolina Electric and Gas Company, the contract for which expires in 1980. Several other energy purchases which total approximately 19,000 MWH annually are obtained from several small hydro projects, the actual annual energy from which is determined by their streamflow. Table 1.1.1-1, therefore, lists as firm energy purchase only the 75,000 MWH from SCE&G and an average of 19,000 MWH from miscellaneous hydro sources, for a total of 94,000 MWH. It will be noticed that capacity (MW) purchased has varied significantly in the past, and represents for the most part short-term power contracted for delivery during the peak periods of the year. No energy commitment was included with these capacity purchases.

Q 1.1.4a

Q 1.1.4b

The contract price for the power and energy purchased from the SCE&G system is 6 mills per kWh with a minimum monthly amount of $12,500, and an annual demand charge of $450,000. Power purchased from SEPA is based on a demand charge of $0.90 per kW per month for dependable capacity (totalling 145,000 kW) and 2.65 mills per kWh for on-peak energy and 2.00 mills per kWh for off-peak and dump energy. The cost of power from the miscellaneous small hydro projects is based solely on an energy charge which varies from 2 mills per kWh for excess energy from the City of Abbeville, S. C., to 5 mills per kWh for energy purchased from the town of Lake Lure, N. C.

The units to be installed under the total concept of Project 81 are staggered in construction between the Perkins and Cherokee sites. By the end of 1988, all of the six units will have been in operation for at least a year. The relationship of the energy produced by the Project 81 units in 1988 to the energy production of the system as a whole is shown in Figure 1.1.1-1. In that figure, the blocks of energy produced by the Project 81 units are plotted on a load duration curve projected for that year. The energy remaining under the load duration curve (i.e., the energy not supplied by the Project 81 units) would ideally be supplied by as much nuclear capacity as possible, coupled with an optimum mix of other types of capacity to yield the lowest total production cost commensurate with an acceptable loss of load probability. Of course, the constraints of forced outages, scheduled maintenance and nuclear unit refueling must be observed, so that during the course of the year a number of units would be in service for periods of time although they would not necessarily be in service at the time of the peak. A dispatch of the total generation for the year 1988, including all the units which contributed to meeting the total system energy requirements, is tabulated in Table 1.1.1-4. In 1988 there will

Q 1.1.13

be 13 nuclear units in service on the Duke system, each requiring four weeks annually for refueling. Refueling alone, therefore, will require the equivalent outage of one nuclear unit continuously throughout the year. The need for the large base-loaded nuclear units is determined, therefore, by the energy requirements under the load curve, and the constraints imposed on the units supplying this energy.

1.1.2 POWER SUPPLY

The installed generating capacity on the Duke system at the time of the 1969 summer peak is listed by units in Table 1.1.2-1. At that time, the total installed capacity on the Duke system was 5623.6 MW, to which was added 598 MW of purchased capacity, giving a load carrying capability of 6221.6 MW for for the 1969 summer peak of 5613.6 MW. This left a reserve margin of 608 MW, or 10.83%.

A summary of the Duke system loads and load-carrying capability from 1969 through 1974, projected through 1988, is shown in Figure 1.1.2-2. The "Adjustment in Hydro Capability" shown in 1974 in that table represents the reduction in firm Catawba River hydro capability caused by operating constraints on drawdown and water release. Although the nameplate capacity of that hydro system is still 867.9 MW, as shown in Table 1.1.2-1, the firm load carrying capability has been reduced by 165.9 MW to 702 MW total. Retirements shown in Table 1.1.2-2 consist of the following:

1974:	Tiger Steam Station (entire plant)	28.6 MW
	Buzzards Roost (steam units 4 and 5)	16.1
	Buck Steam Station (boilers 1 2, 3, 4)	31.0
	Lee Steam Station (combustion turbine 4C)	30.0
	Total retired in 1974	105.7 MW
1975:	Greenwood Steam Station (unit 1)	32.0 MW
	Dan River Steam Station (diesel units)	14.0
	Riverbend Steam Station (boilers 5 and 6)	52.0
	Total retired in 1975	98.0 MW

Q 1.1.5

Historically, Duke has actively pursued a policy of strong interconnections with neighboring systems, and today is a part of a highly interconnected high voltage transmission network which covers the eastern half of the United States. Following the formation of the National Electric Reliability Council(NERC) in 1968, Duke became a member of the Southeastern Electric Reliability Council (SERC) when it was established in January, 1970. The purpose of the SERC Agreement was four-fold: Q 1.1.3

a) encourage the development of reliability agreements among the systems within the region;

b) exchange information with respect to planning and operating matters relating to the reliability of bulk power supplies;

c) review periodically activities within the region on reliability;

d) provide information with respect to matters considered by the Council, where appropriate, to the Federal Power Commission and to other Federal and state agencies concerned with reliability.

Because of the large geographic area included -- the entire southeastern quadrant of the United States -- SERC was divided into four subregions each of which formed a logical geographic entity for the purpose of carrying out the objectives of SERC. The four subregions established were Florida, the Southern Company area, the TVA area, and the Virginia-Carolinas area, of which Duke is a part. The systems comprising SERC are listed by subregions in the following table:

Member Companies of SERC

Florida Subregion:

- Florida Power and Light Company
- Florida Power Corporation
- Jacksonville Electric Authority
- City of Lakeland
- Orlando Utilities Commission
- City of Tallahassee
- Tampa Electric Company

Southern Companies Subregion: Q 1.1.3

- Alabama Electric Cooperative, Inc.
- Alabama Power Company
- Crisp County Power Commission
- Georgia Power Company
- Gulf Power Company
- Mississippi Power Company
- Savannah Electric and Power Company
- Southeastern Power Administration
- South Mississippi Electric Power Association

Tennessee Valley Subregion:

- Big Rivers Rural Electric Cooperative, Inc.
- Henderson Municipal Power and Light
- Nantahala Power and Light Company
- Tapoco, Inc.
- Tennessee Valley Authority

Virginia-Carolinas Subregion:

- Carolina Power & Light Company
- Duke Power Company
- South Carolina Electric and Gas Company
- South Carolina Public Service Authority
- Southeastern Power Administration
- Virginia Electric and Power Company
- Yadkin, Inc.

Detailed maps of the four subregions comprising SERC and other relevant data may be found in the document entitled "Coordinated Bulk Power Supply Program, 1975-1994" dated April 1, 1975, which was filed by SERC in response to Order No. 383-3 of the Federal Power Commission. In view of the size, the document itself is not included as an attachment to this report. Q 1.1.7

A tabulation of loads and generating capacity for the VACAR subregion of SERC from 1969 through 1974, projected through 1984, appears in Table 1.1.2-3. The total installed capacity on the systems comprising the VACAR Subregion at the time of the 1969 peak is shown below:

Carolina Power & Light Company	3076.8 MW
Duke Power Company	5623.6
South Carolina Electric and Gas Company	1439.0
South Carolina Public Service Authority	414.0
Southeastern Power Administration	505.0
Virginia Electric and Power Company	4913.4
Yadkin, Inc.	203.0
Total Capacity	16174.8 MW

Individual units are not listed because of the great number of small units among the various companies. Where differences are noted in the installed capacity totals between the response to FPC Order 383-3 and Table 1.1.2-3, the values in the latter reflect changes in unit schedules made since the response to the FPC Order.

1.1.3 CAPACITY REQUIREMENT

As discussed in Subsection 1.1.1, there is a large block of load on the Duke system which is responsive to the ambient temperature. Peak load forecasts are based on the "most probable" temperature at the time of the peak, but planned reserve capacity must include the possibility of extreme weather as well as unit outages and forecast error. Further, experience shows that at any given time a certain portion of the total generating capacity will be out of service due to reductions in unit capability caused by outages of pumps, fans, mills, etc. All of these factors combine to establish what is considered a necessary minimum reserve requirement. This is illustrated in the following calculation for the year 1983.

<u>Calculation of Reserve Requirement</u>

Forecast 1983 Summer Peak Load	16 124 MW	
Add for Extreme Temperature	721	Q
Add for Loss of Largest Unit on System	1 280	1.1.6
Add for Miscellaneous Capacity Reductions	738	
Total Capacity Required	18 863 MW	
Reserve over forecast peak	2 739 MW	
Reserve expressed as percent	17.0%	

When nuclear units constitute a significant part of the total system capability, Q
nuclear unit refueling will become a major factor in evaluating reserves. A.1
Although nuclear units would not be scheduled for refueling during the peak periods of the year, ideal conditions seldom exist in real life, and there are any number of factors which could totally upset a planned maintenance or refueling Q
program, and force such an outage during the peak period. An outage of two large A.2
units during a peak period would not be unusual. The effect of this additional factor in the computation of minimum reserve requirements is illustrated here, Q
using the year 1983 so that a comparison may be made with the calculation of A.3
reserve requirements shown previously.

<u>Calculation of Reserve Requirement Including the Effect of Nuclear Unit Refueling</u>

Forecast 1983 Summer Peak Load	16 124 MW
Add for Extreme Temperature	721
Add for Loss of Largest Unit on System	1 280
Add for Miscellaneous Capacity Reductions	738
Add for Nuclear Unit Refueling	1 180
Total Capacity Required	20 043 MW
Reserve over forecast peak	3 919 MW
Reserve expressed as percent	24.3%

Referring to Table 1.1.2-2, it is evident that reserve margins in the 1969-74 period were very low, even when the effect of substantial purchases from outside sources is included. Capacity scheduled for immediate future is intended to raise these reserve margins to an acceptable level. As illustrated above, however, when large nuclear units form a major block of Duke's installed capcity, it will be necessary to increase the reserve capacity still further to permit nuclear unit refueling. Q 1.1.6

The reserve percentages shown in Table 1.1.2-2 are lower than those noted by the FPC in the 1970 National Power Survey, Part II, pages 52 through 58. Based on the specific parameters of any given system, the FPC recognizes a reserve margin of 15-25 percent of the anticipated annual peak demand as being reasonable. Due to the high cost of money, however, and difficulty in raising the necessary capital, it has become necessary to accept a reserve margin lower than that deemed prudent. Q A.7

The loss-of-load probability technique is commonly used for establishing reserve margins. That method is not used on the Duke system for several reasons:

1. There is no operating experience relative to the size and type of units Duke is now installing and has scheduled for installation in the future. In the annual Report on Equipment Availability published by the Prime Movers Committee of the Edison Electric Institute (EEI Publication 74-57, issued in December, 1974) a comparison is made between nuclear and fossil unit availability. It is clearly evident in the report that fossil unit experience cannot be extrapolated as representative of nuclear experience (Figure 3, page 13). The report includes no data relating nuclear unit size to forced outage rates although such a comparison is made for fossil units. It must be assumed, therefore, that insufficient data is available for nuclear units. Because the loss-of-load probability technique is totally dependent on the forced outage rates assumed for the units, an inaccurate guess of this parameter would result in invalid results. It should be noted that the EEI report includes 847 fossil units but only 17 nuclear units. Q A.6a

2. Power systems today are highly interconnected at various levels of transmission voltages. Omission of the system's interconnections with neighboring systems as part of the probability computation yields totally erroneous results; inclusion of the interconnections requires inclusion of all source components behind the interconnections, which immediately expands the required input data enormously. Further, the load description for each of the interconnected systems must be on the same basis of forecast. If one system uses a peak forecast with a 20% probability of being exceeded, and another uses a forecast with a 50% probability of being exceeded, the results would be invalid in a combined loss-of-load probability study. The conversion of the load descriptions of several interconnected systems to the same basis as that used on the Duke system could require considerable effort. Q A.6b

3. The representation of tie lines as independent source components presents a major technical problem because of the direction and magnitude of power flows on these lines under normal conditions, and also because of the difficulty in representing a transmission line availability factor on the same basis as generator availability. Work is being done in several organizations in an effort

to establish a mathematically accurate representation of tie lines, but the problem has not been satisfactorily resolved to date.

Duke Power Company has the data and the means to run probability studies for its own system. Studies which have been made indicate that historically the Duke system has had a loss-of-load probability of approximately one day in three years. To reduce the loss-of-load probability to the order of one day in ten years, which is a figure commonly used in the industry, would require a reserve margin of well over 30%, which Duke feels is excessive, or the installation of a large number of small generating units which would be very costly from the standpoint of both capital and operation. The loss-of-load probability of one day in ten years is an arbitrary number, a probability of one day in nine years or one day in eight years would be equally meaningful. Q A.6

The fallacy of using an arbitrary LOLP number can be illustrated in the following way. For the entire United States as a whole, a loss-of-load probability of one day in ten years would be totally unacceptable. So would one day in twenty years, or thirty. For a small system with good interconnections with a large neighbor, a loss-of-load probability of one day in one year would provide adequate reserves because the system could lean on its neighbor in an emergency. A meaningful loss-of-load probability for any given system, therefore, depends on the size of the system with respect to its neighbors, the size of the units with respect to the peak load, the number and capacity of interconnections with neighbors, and the coincidence of that system's peak with respect to its neighbors. No one value can be selected which would be correct for all systems.

The generating capacity scheduled through 1988 consists of a mix of types of units which is designed to provide electric energy at the lowest total cost when all factors are considered. The nuclear capacity scheduled through this period totals 14,959 MW, or 60.0% of the total scheduled system capability, all of which will be dedicated to base-load operation. In addition, there will be four super-critical pressure, coal-fired units in operation: Belews Creek 1 and 2 (1060 MW each) and Marshall 3 and 4 (630 MW each), for a total of 3380 MW. Assuming these units, in addition to the nuclear units, would be operated in base, the total base-load capacity scheduled for 1988 totals 18,339 MW or 73.6% of Duke's total capability. The generation mix scheduled for 1988 will also include 3916 MW of intermediate pressure coal-fired steam capability, 196 MW of combustion turbines, 842 MW of conventional hydro, and 1610 MW of pumped-storage hydro capability, for a total of 6564 MW of load-following capability. The 1610 MW of pumped storage hydro capacity significantly enhances the operation of the base-load thermal units by providing a pumping load during off-peak and valley hours. Operating on a weekly cycle, pumping for approximately six hours each weekday night and during most of Saturdays and Sundays, the pumped storage hydro is capable of providing a block of energy under the load curve comparable with that of intermediate steam, and at a substantially lower cost. Table 1.1.3-1 provides a summary of the annual costs incurred by the three lowest cost alternatives for supplying the necessary capacity: (1) as scheduled; (2) as scheduled except with the Bad Creek pumped storage capacity is replaced with an 800 MW coal-fired cycling unit and two-100 MW combustion turbines; and (3), as scheduled except the nuclear Cherokee units are replaced with equivalent coal-fired units. It is evident from Table 1.1.3-1 that the lower capital cost of the fossil-fueled units is more than offset by their higher production cost. Over the six-year period, 1983-1988, a total saving of $144,681,600 accrues to the generation mix scheduled, when compared with the next lowest cost alternative, and the relative saving in total annual costs observed for the year 1988 can be expected to continue to exist in each succeeding year for the remaining life of the plant.

Q A- Q B- Q B- Q B.

Owing to the high capital cost and low fuel cost of nuclear capacity, there would be no basis whatever for considering nuclear units other than base-load units; the pumped storage hydro capacity not only provides the necessary load-following capacity required under the load curve at a capital cost comparable with alternative means of generation, but it also enhances the operation of the base load component of generation. Conventional hydro has been omitted because there are no conventional hydro sites on the Duke system capable of meeting the load energy requirements. The rate base is only one factor considered by a utilities commission in establishing equitable rates, and no commission would condone installing facilities at a low capital cost if the operating cost of such equipment were high, with every indication of going higher in ensuing years. It is in the best interest of the consumer that the power system serving him be designed to provide energy at the lowest possible net cost, when all factors are considered. Q B.7 Q B.6

The computer program (PROCOS), from which the costs in Table 1.1.3-1 and the dispatch in Table 1.1.1-4 are derived, is based on a probabilistic technique which recognizes, among a number of other factors, the forced outage rates of individual units. The forced outage rate is defined as the percent of the time a unit is unavailable for service, due to unscheduled outages, out of the total time it is scheduled to be in service. Scheduled outages, such as for routine maintenance and refueling of nuclear units, are not included in the forced outage computation. Because forced outages have a significant effect on the energy produced by a given unit, considerable attention is given to this aspect of PROCOS studies in an effort to be as realistic as possible. Actual unit performance data is used for existing units which have been in service long enough to have established such data. If no operating experience is available for a specified unit, then industry-wide experience for that type of unit is generally used. In the EEI Report on Equipment Availability cited earlier (Page ER 1.1-12) statistical data on the availability of units, according to size and type, is listed. Fossil-fueled units in general are shown in the report to have an operating availability dropping from an average of 90% in 1967 to 84% in 1973, while nuclear units have an availability fluctuating from a low of 63% in 1965 to a high of 85% in 1970 (Figure 2, page 13, of report). It is anticipated that as experience is gained in the design and operation of large nuclear units, their availability will continue to improve to the extent that the nuclear units will be consistently more reliable than their high temperature, high pressure counterparts which use fossil fuels. It should be noted, however, that it is not feasible to compare the performance statistics of a large fossil unit with those of a large nuclear unit because they are not similar units. Operating pressures and temperatures are significantly different, and very few components are similar or perform similar functions. Q A.4 Q B.3 Q B.4

In September, 1973, a report was submitted to the Planning Committee of the New England Power Pool (Nepool) entitled "Report to the Nepool Planning Committee on Proposed Equivalent Forced Outage Rates to be Used in Long Range Studies". The study, made by the Generation Task Force of the pool, provided a useful summary of forced outage rates for all types of generating units based on the most recent data available, and reviewed the procedures followed in establishing the data. The PROCOS studies made by the Duke Power Company have used the forced outage data contained in the Nepool report for those units for which Duke had no operating experience.

Studies are being made on the Duke system to determine the feasibility of reducing system peak loads through the use of a load management program. The objectives of the program would be to shift certain types of loads from peak periods of the day to off-peak periods, and to provide incentives for more efficient use of electric energy. If such a program should prove effective, the result would be to reduce the annual growth in peak demand and to increase the annual load factor, both of which would enhance the operation of the planned capacity additions. The load which would be removed from the high cost peaking units would be picked up by more efficient units operating near the base load portion of the load curve. In effect, the base load portion of the load curve. would be increased to a greater percentage of the total load curve. Reduction in the growth of annual peak demand would also increase system reserves which are currently scheduled to be less than desired.

1.1.4 AREA NEED

Load and capacity data for the VACAR Subregion of SERC is shown in Table 1.1.2-3. It is readily apparent in the tabulation that the entire VACAR Subregion has had a deficiency in generating capacity from 1969 to the present. Just as the Duke system has had to accept reserve margins lower than desired due to financial constraints, so it has become necessary for most of the systems comprising the VACAR Subregion to curtail their construction programs, leaving reserves in the entire subregion at a level substantially below that considered prudent.

As noted in Subsection 1.1.2, the purpose of the SERC Agreement is to encourage the development of reliability agreements among the systems in the region, and to exchange information with respect to planning and operating matters relating to the reliability of bulk power supplies. The values shown in Figure 1.1.2-3 do not reflect a specific reserve policy of SERC, therefore, but rather a summation of the policies of the component systems. There is no statement in the SERC Agreement relative to a minimum reserve requirement. It should be noted, also, that the transmission interconnections which have been built between the Duke system and neighboring systems are in keeping with stated SERC objectives, and not intended for the transfer of large blocks of firm power. Additional high voltage interconnections would have to be built should that objective be sought.

Reference has been made in Subsection 1.1.2 to the April, 1975, response by SERC to FPC Order 383-3. That document contains a summary of peak and energy forecasts, and schedules capacity additions for SERC as a whole and for the Subregions within the SERC framework. There is, however, no statement as to any minimum reserve requirement, or reference to the adequacy of reserves within the Council. The rationale upon which this policy is based is found in the Preamble to the SERC response:

> "Caution must be exercised in utilizing the data herein since most peak loads are highly weather sensitive and there is a high probability that peaks in excess of those reported are likely to occur. It is felt normal weather forecasts better suit the purpose of this and other reports, with respect to comparing day-to-day operations and reserves. It is the consensus that an expression of reserves in percent is not necessarily a valid measure of adequacy or reliability of power supply.
>
> "Those using this report should recognize summer and winter ratings of generators are not precise, as actual capability depends upon cooling water temperatures, air temperatures, hydro pond levels, cleanliness of heat transfer devices, quality of fuel, etc. Combustion gas turbine ratings are particularly sensitive to ambient air temperature.
>
> "Since SERC covers such a large geographical area and, in fact, its subregions spread over wide temperature zones, then

a simple summation of load and capability by months and seasons can lead to erroneous conclusions because diversity of peaks is not analyzed in the statistics."

A transmission map of the Duke system as it will appear in 1988 after completion of the Cherokee Nuclear Station is shown in Figure 1.1.4-1. Clearly evident on the map are the numerous high capacity interconnections between the Duke system and neighboring systems on all sides. The reliability studies which have been conducted under the aegis of SERC are designed to establish the extent to which such interconnections can be used effectively during severe contingencies on the Duke system or on other systems within the SERC region. When the contingency consists of a major capacity outage, the interconnected systems are not limited to supplying relacement power from within the SERC area, but have the transmission capability to import the power considerable distances from systems or pools in other geographic regions of the country. The highly interconnected 230 kV grid, of which the Cherokee transmission is a part, along with the overlaying 500 kV network, assure a high degree of system security not only for the Duke system but also for other systems within the reliability council. It should be noted that although the date shown on Figure 1.1.4-1 is 1985, because of the slowdown in construction the transmission system as shown on the map is currently that which is scheduled through 1988. Q 1.1.9

1.2 OTHER OBJECTIVES

There are no objectives in the Cherokee project other than the generation of economic electric energy.

1.3 CONSEQUENCES OF DELAY

It is not possible to predict at this time the long-range effect of energy conservation on load growth, nor the duration of financial constraints on construction. The proposed schedule of capacity additions, therefore, is based on the best information available at present, and, because of the tight money market, represents a minimum capital investment. To delay any unit beyond the proposed schedule would seriously jeopardize service to the system as a whole.

As discussed in Subsection 1.1.1, there are two components of load which must be considered in the forecast, the base-load component and the temperature-sensitive component. These components are not growing at the same rate. The actual summer peaks experienced on the Duke system from 1969 through 1973 grew at an average annual compound rqte of 10.1 percent, although the temperature-sensitive component of those peaks was growing at an average annual compound rate of 14.5 percent. This fact is significant in projecting reserve requirements because in each succeeding year the percentage of reserve which must be included for extreme weather becomes greater, and hence the total reserve requirement becomes greater. The percentage of peak which provided a
3 minimum acceptable level of reserve in the past cannot, therefore, be considered an acceptable level in the future.

It should be emphasized, however, that reserves during the 1970-73 period were below the minimum acceptable level during most of that period because of the delay in putting the Oconee Nuclear Station in service. Several adverse effects resulted from having inadequate reserves:

1. It was necessary to operate old, inefficient, steam generating units during peak periods. For example, during each year from 1970 through 1973, the 28 MW stoker-fired Tiger Steam Station was operated even though its production cost averaged somewhat over 27 mills per kWH. Production from that plant during the four-year period cost a total of $2,423,383 compared with an estimated cost of $503,320 had the energy been produced at the average on-system production cost. Q 1.1.

2. It was necessary to purchase large blocks of energy during the peak periods of the year at a cost substantially higher than if Duke had been able to generate the energy. During the 1970-73 period, Duke paid $80,443,194 for energy from outside sources at an average cost of 11.02 mills per kWH compared with an average on-system production cost of approximately 5.5 mills per kWH. The estimated net increase in production cost due to the purchased energy totals $39,152,684. Q 1.1.

3. It was not possible to use the block of hydro capacity on the Duke system in an optimum manner, and this resulted

3. (continued)

in unavoidable wastage. For example, on September 21 and 22, 1970, it was necessary to run the 360 MW Cowans Ford hydro plant at full load continuously for more than ten hours due to a shortage of base load generating capacity Total energy generated by the Cowans Ford hydro station during that period was 3,679,000 kWH, but of that amount, an estimated 972,000 kWH was spilled at Mountain Island hydro station immediately downstream from Cowans Ford because that pond was unable to contain the large volume of water released from Cowans Ford.

Q 1.1.10

Q 1.1.13

4. It was necessary to reduce voltage 5 percent on four separate occasions during the 1970-73 period due to a capacity shortage. Details of these voltage reductions are given in Section 1.1.1.

Reserve margins which are scheduled for the foreseeable future are based on essentially the same parameters as those planned for the 1970-73 period, but which were not attained because of delays in scheduled capacity additions. Future scheduled reserves may be somewhat higher than those in the past, when expressed as a percent of the forecast peak, but this will result not from changes in the philosophy of reserve requirements, but from changes in the parameters themselves. Part II, Chapter V of the 1970 National Power Survey takes cognizance of the effect of changing parameters on reserve requirements by listing several specific factors on pages II-1-56 and II-1-58:

Q 1.1.13

1) In general, the larger the unit, the higher its forced outage rate.

2) The maturing of a unit to a level forced outage rate may take as long as six years.

3) Generally, the larger a system becomes, the smaller become the reserve benefits that will be realized by pooling.

4) For long-range planning purposes, future reserve allowances are normally increased by 5 to 10 percent of the anticipated peaks as a contingency against unforeseen construction delays or estimating errors.

Two other factors which are important in the scheduling of reserves on the Duke system are the increasingly significant effect of extreme temperatures on the forecast peaks, and the refueling schedules for nuclear units.

Table 1.1.2-3 lists historical load and capacity data for the VACAR Subregion of SERC from 1969 through 1974, and projected load and capacity data from 1975 through 1984. It will be noted that historically the percent reserves in the VACAR Subregion have been quite low, and the values indicated for the future show no significant improvement. However, an evaluation of the adequacy of scheduled reserves on a subregional or regional basis is not attempted by SERC because of the inherent difficulty in making a meaningful evaluation for such a large

Q 1.1.11

Q 1.1.14

geographic area. This is discussed in Section 1.1.4. In general, however, the same considerations must be made on a subregional or regional basis that would be made for an individual system. By 1984, the systems which comprise the VACAR Q
Subregion of SERC will have installed a significant number of large nuclear units, 1.1.1
and any evaluation of reserve capacity for this subregion would have to recognize the high probability of two or more large units being out for maintenance or refueling at any given time in addition to the other normal unscheduled outages.

SERC does not function as a power pool or act in any authoritarian manner other than as a coordinator for reliability studies, and perform certain reporting functions for the power systems which comprise its membership. For that reason, the data shown in Table 1.1.2-3 represents only a composite summary of data for the individual systems within the VACAR Subregion, and any adverse effects noted in the 1970-73 period as a result of inadequate reserve capacity would be reflected in the individual systems rather than for the Subregion as a whole. The adverse effects on the Duke system have been noted previously. Possibly the only direct indicator of the impact of the low reserve margins on the companies within the VACAR Subregion during the 1970-73 period was the amount of power purchased from sources external to the Subregion. Table 1.1.2-3 lists only firm purchases; non-firm purchases Q
during peak period were substantially greater. The total power purchased by all 1.
the companies in the VACAR Subregion, on a firm and non-firm basis are shown in 1.
the following tabulation. 1

VACAR SUBREGION Q
Net Power Purchased-MW 1.
1970-1973 1.
1l

YEAR	COMPOSITE PEAK	Purchased Power FIRM	NON-FIRM	TOTAL	PURCHASE AS % OF PEAK
1970	16 880	368	1283	1651	9.78
1971	17 860	293	790	1083	6.06
1972	20 345	631	1580	2211	10.87
1973	22 618	537	1630	2167	9.58

Just as it was necessary for the Duke system to purchase substantial blocks of power from external sources at a severe economic penalty, so it was necessary for other systems in the VACAR Subregion to do likewise; the total capacity purchased during the 1970-73 period represented approximately ten percent of the composite peak of the Subregion. In addition, it can be implied from the tabulation above that all of the companies in VACAR were pushing their own on-system generating capacity to the fullest extent possible, including old, inefficient units they would have preferred to retire. Production costs associated with those old units, as with the Duke system, were extremely high.

The reserve margins for the foreseeable future which appear in Table 1.1.2-3 represent the composite total of reserves for each of the systems in the VACAR Subregion. Reliability studies conducted within the SERC framework have determined that the transmission network is adequate to utilize fully the installed capacity within the region during an emergency on any of the member systems, but no attempt has been made to specify what the megawatt capacity of the reserves should be or to specify reserves as a percentage of the forecast peak for the subregion or region as a whole.

Duke Power Company, as a member of the VACAR Subregion of SERC, has actively
participated in all of the reliability studies conducted within that Q
organization. The Duke system is not a member of any power pool, as such, 1.1.15
however, and does not participate in any regional generation planning studies.
From a practical standpoint, however, the reliability studies conducted within
the framework of SERC enable the participating companies to determine the
degree of transmission coordination necessary to permit full utilization of all
the generating reserves installed on the systems in the Subregion, and, in that
manner achieve, in fact, a substantial degree of generating capacity coordination.

Because of the delayed construction schedules resulting from difficulty in
raising capital, scheduled reserves on the Duke system, and on all the
companies in SERC, are less than deemed prudent. In 1984, for example,
the scheduled reserve capacity on the Duke system will be 2559 MW at peak. Q
3 If Cherokee 1 were to be delayed, the reserve capability at peak would 1.1.14
drop to 1279 MW which would be insufficient to backstand the loss of any
one of several units on the Duke system in addition to normal outages which
are expected. Dependence upon neighboring systems to supply the necessary
emergency power would not be a viable alternative because the total
scheduled reserve for all the systems in the VACAR Subregion of SERC would
be only 5794 MW, or 11.5% of the peak, if all the other scheduled generating
capacity additions were placed in service on time. The delay of Cherokee,
intentional or otherwise, would jeopardize the reliability not only of the
Duke system, but of all the systems in the VACAR Subregion of SERC.

ER TABLE 1.1.1-1
Cherokee Nuclear Station

Historical and Forecast Load Data - Duke System

	YEAR	Territorial Load MW	Territorial Load MWH	Net Firm Purchase MW	Net Firm Purchase MWH
Actual	1964	3 522.7	20 322 330	148	94 000
	1965	3 826.4	22 648 423	148	94 000
	1966	4 439.7	25 691 578	169	94 000
	1967	4 579.5	28 138 590	201	94 000
	1968	5 364.2	31 032 220	845	94 000
	1969	5 613.6	33 900 973	598	94 000
	1970	6 283.9	36 641 199	443	94 000
	1971	6 622.1	39 575 576	389	94 000
	1972	7 449.5	42 989 614	676	94 000
	1973	8 235.6	46 282 918	813	94 000
	1974	8 057.6	45 240 161	293	94 000
Forecast	1975	8 633	47 734 000	169	94 000
	1976	9 721	52 387 000	169	94 000
	1977	10 512	56 851 000	169	94 000
	1978	11 341	61 346 000	169	94 000
	1979	12 209	65 942 000	169	94 000
	1980	13 119	70 637 000	148	94 000
	1981	14 073	75 699 000	148	94 000
	1982	15 074	81 041 000	148	94 000
	1983	16 124	86 719 000	148	94 000
	1984	17 226	92 746 000	148	94 000
	1985	18 383	98 715 000	148	94 000
	1986	19 598	105 239 000	148	94 000
	1987	20 875	112 096 000	148	94 000
	1988	22 217	119 629 000	148	94 000
1988	January	20 436	9 716 788		
	February	19 988	9 488 715		
	March	19 180	9 839 599		
	April	19 018	9 225 554		
	May	19 232	9 160 392		
	June	21 043	9 235 579		
	July	21 893	10 105 259		
	August	22 217	11 132 824		
	September	20 817	10 508 768		
	October	19 335	10 330 820		
	November	20 845	110 155 386		
	December	21 373	10 729 316		
	Year	22 217	119 629 000		

ER TABLE 1.1.1-2
Cherokee Nuclear Station

Historical and Forecast Load Data - VACAR Subregion of SERC

	Year	Territorial Load MW	Territorial Load MWH	Interruptible Load -MW-	Net Firm Purchase -MW-
Actual	1964	8 983.3	50 337 581	151	7
	1965	9 954.0	55 708 960	155	7
	1966	11 367.1	62 370 818	155	7
	1967	12 068.0	68 334.244	240	60
	1968	14 319.3	77 073 631	245	744
	1969	15 423.8	84 952 779	251	484
	1970	16 880.8	92 632 073	251	368
	1971	17 859.5	99 607 142	251	293
	1972	20 345.3	108 401 680	160	631
	1973	22 617.6	N.A.	201	537
	1974	22 426.0	N.A.	201	328
Forecast	1975	24 688	120 677 000	201	28
	1976	26 715	133 482 000	201	28
	1977	29 377	143 973 000	201	28
	1978	31 834	155 153 000	201	28
	1979	34 468	167 077 000	201	103
	1980	37 247	179 847 000	201	3
	1981	40 216	193 747 000	201	3
	1982	43 390	208 696 000	201	3
	1983	46 782	224 871 000	201	3
	1984	50 398	242 332 000	201	3

ER TABLE 1.1.1-3

Cherokee Nuclear Station

Monthly Peak Demands and Energy

Duke System

Month	1965 MW	1965 MWH	1970 MW	1970 MWH	1973 MW	1973 MWH	1974 MW	1974 MWH
January	3 498.1	1 864 044	6 031.5	3 260 946	7 185.7	4 116 007	7 264.7	3 857 812
February	3 470.4	1 719 482	5 743.7	2 829 286	7 247.0	3 746 230	7 492.0	3 621 858
March	3 370.7	1 883 359	5 460.6	2 953 837	6 740.5	3 769 611	7 104.3	3 696 541
April	3 245.0	1 750 121	5 145.8	2 808 823	6 663.9	3 509 236	6 707.7	3 499 935
May	3 508.2	1 854 272	5 449.8	2 932 494	6 431.8	3 645 187	7 008.3	3 802 388
June	3 605.2	1 855 521	5 998.0	2 997 383	7 238.6	3 886 018	7 606.4	3 746 326
July	3 664.9	1 849 648	*6 283.9	3 240 911	7 763.7	4 049 765	7 921.3	4 084 987
August	*3 826.4	2 017 759	6 225.6	3 281 072	*8 235.6	4 318 279	*8 057.6	4 156 306
September	3 694.4	1 937 428	6 089.2	3 151 262	7 601.0	*3 882 671	7 567.7	3 637 361
4 October	3 487.2	1 930 087	5 319.0	2 995 974	6 753.3	3 800 767	6 974.7	3 691 440
November	3 723.0	1 929 256	6 147.6	3 000 678	6 894.0	3 691 807	7 064.7	3 625 423
December	3 702.1	2 057 446	6 050.5	3 188 533	7 292.6	3 867 340	7 581.0	3 819 784
Total energy put on lines		22 648 423		36 641 199		46 282 918		45 240 161
Annual load factor		67.6%		66.6%		64.2%		64.1%

*Peak for year

Amendment 3
(Entire Page Revised

ER TABLE 1.1.1-4
Cherokee Nuclear Station

Duke System Energy Dispatch for Year 1988

UNIT		UNIT CAPACITY (MW)	UNIT ENERGY (MWH x 1000)
Oconee	1	871	5 985.3
	2	871	6 004.3
	3	871	6 021.1
McGuire	1	1180	6 356.3
	2	1180	6 492.2
Catawba	1	1153	6 591.1
	2	1153	6 767.1
Perkins	1	1280	8 492.4
	2	1280	7 801.7
	3	1280	6 938.7
Cherokee	1	1280	8 310.1
	2	1280	7 742.2
	3	1280	7 074.6
Total Nuclear Energy			90 577.1

Nuclear Energy	90 577.1
Conventional Steam	28 849.8
Hydro, Purchase, Misc.	1 726.6
Total Energy Input	121 153.5
-Pumped Hydro Losses	-1 524.5
Net Load Requirements	119 629.0

UNIT		UNIT CAPACITY (MW)	UNIT ENERGY (MWH x 1000)
Allen	1	165	272.9
	2	165	239.4
	3	265	679.7
	4	265	615.0
	5	254	735.0
Buck	5	128	174.6
	6	128	136.2
Cliffside	3	61	39.4
	4	61	40.9
	5	572	3 341.0
Dan River	1	71	45.8
	2	71	43.4
	3	142	149.4
Lee	1	84	67.3
	2	84	67.3
	3	155	195.1
Marshall	1	385	1 878.2
	2	380	1 814.3
	3	550	2 968.6
	4	550	3 267.8
Riverbend	4	94	78.1
	5	94	74.5
	6	133	120.8
	7	133	120.6
Belews Creek	1	1060	5 775.5
	2	1060	5 909.0
Total Conventional Steam			28 849.8

Amendment 3
(Entire Page Revised)

ER Table 1.1.2-1 (Sheet 1 of 2)
Cherokee Nuclear Station
Capacity Installed on Duke System at Time of 1969 Peak

STATION	Unit No.	Type of Unit	MW Capacity	MW Total Plant Capacity
Allen	1	F	165	
	2	F	165	
	3	F	265	
	4	F	265	
	5	F	280	1140
Buck	1	F	31	
	2	F	31	
	3	F	70	
	4	F	38	
	5	F	128	
	6	F	128	426
Cliffside	1	F	38	
	2	F	38	
	3	F	61	
	4	F	61	198
Dan River	1	F	71	
	2	F	71	
	3	F	142	
	4	CT	30	
	5	CT	30	
	6	CT	25	369
Lee	1	F	84	
	2	F	84	
	3	F	155	
	4	CT	30	
	5	CT	30	
	6	CT	30	413
Marshall	1	F	385	
	2	F	380	
	3	F	630	1395
Urquhart	3	CT	15	
	4	CT	25	40
Riverbend	1	F	52	
	2	F	52	
	3	F	52	
	4	F	94	
	5	F	94	
	6	F	133	
	7	F	133	
	8	Comb.Cycle	30	
	9	Comb.Cycle	30	
	10	Comb.Cycle	30	
	11	Comb.Cycle	30	730

ER Table 1.1.2-1 (Sheet 2 of 2)
Cherokee Nuclear Station
Capacity Installed on Duke System At Time of 1969 Peak

STATION	Unit No.	Type of Unit	MW Capacity	MW Total Plant Capacity
Tiger	1	F	14.3	
	2	F	14.3	28.6
Buzzards Roost	4	F	5.7	
	5	F	10.4	16.1
Hydro:				
Bridgewater	2 units	H	18.6	
Rhodhiss	3	H	27.3	
Oxford	2	H	37.4	
Lookout Shoals	3	H	21.5	
Cowans Ford	4	H	360.0	
Mountain Island	4	H	55.0	
Wylie	4	H	54.0	
Fishing Creek	5	H	42.2	
Great Falls	8	H	24.8	
Dearborn	3	H	35.6	
Rocky Creek	8	H	27.0	
Cedar Creek	3	H	39.5	
Wateree	5	H	71.5	
99 Islands	6	H	19.0	
Gaston Shoals	5	H	8.0	
Turner Shoals	2	H	5.5	
Tuxedo	2	H	5.4	
Buzzards Roost	3	H	13.2	
Miscellaneous			2.4	867.9
		Total All Sources		5623.6

ER TABLE 1.1.2-2

Cherokee Nuclear Station

Duke System Load and Capacity-MW (1969-1988)

UNIT ADDITIONS	CAPACITY OF UNITS	TYPE OF UNITS	FUNCTION OF UNITS	INSTALLED CAPACITY	PURCHASE	TOTAL CAPABILITY	PEAK LOAD	RESERVE	PERCENT RESERVE
1969									
From Table 1.1.2-1				5 623.6	598	6 221.6	5 613.6	608	10.8
1970									
Marshall 4	630	Convent.Coal	Base						
Buck 7, 8, 9	93	Comb. Cycle	Intermed.						
Dan River 7, 8, 9, 10	14	Diesel	Peak	6 360.6	443	6 803.6	6 283.9	519.7	8.3
1971									
Buzzards Roost	196	Comb.Turb.	Peak						
Greenwood	32	Convent.Oil	Intermed						
Keowee 1-2	140	Hydro	Peak	6 728.6	389	7 117.6	6 622.1	495.5	7.5
1972									
Cliffside 5	572	Convent.Coal	Base	7 300.6	676	7 976.6	7 449.5	527.1	7.1
1973									
Oconee 1	871	Nuclear	Base	8 171.6	813	8 984.6	8 235.6	749	9.1
1974									
Jocassee 1, 2	305	Pump.Hydro	Peak						
Belews Creek 1	1 060	Convent.Coal	Base						
Adjust.in hydro	(165.9)	Hydro	Peak						
Retirements	(105.7)	Misc.	Peak	9 265.0	293	9 558.0	8 057.6	1 500.4	18.6
1975									
Oconee 2,3	1 742	Nuclear	Base						
Jocassee 3,4	305	Pump.hydro	Peak						
Retirements	(98)	Misc.	Peak	11 214	169	11 383	8 633	2 750	31.9
1976									
Belews Creek 2	1 060	Convent.Coal	Base	12 274	169	12 443	9 721	2 722	28.0
1977									
None				12 274	169	12 443	10 512	1 931	18.4
1978									
McGuire 1	1 180	Nuclear	Base	13 454	169	13 623	11 341	2 282	20.1
1979									
McGuire 2	1 180	Nuclear	Base	14 634	169	14 803	12 209	2 594	21.2
1980									
None				14 634	148	14 782	13 119	1 663	12.7
1981									
Catawba 1	1 153	Nuclear	Base	15 787	148	15 935	14 073	1 862	13.2
1982									
Catawba 2	1 153	Nuclear	Base	16 940	148	17 088	15 074	2 014	13.4
1983									
Perkins 1	1 280	Nuclear	Base						
Retirements	(135)	Comb.cycle	Peak	18 085	148	18 233	16 124	2 109	13.1
1984									
Cherokee 1	1 280	Nuclear	Base						
Bad Creek 1, 2	500	Pump.hydro	Peak						
Retirements	(228)	Misc.	Peak	19 637	148	19 785	17 226	2 559	14.9
1985									
Perkins 2	1 280	Nuclear	Base						
Bad Creek 3,4	500	Pump.hydro	Peak						
Retirements	(261)	Misc.	Peak	21 156	148	21 304	18 383	2 921	15.9
1986									
Cherokee 2	1 280	Nuclear	Base						
Retirements	(93)	Comb.Turb.	Peak	22 343	148	22 491	19 598	2 893	14.8
1987									
Perkins 3	1 280	Nuclear	Base	23 623	148	23 771	20 875	2 896	13.9
1988									
Cherokee 3	1 280	Nuclear	Base	24 903	148	25 051	22 217	2 834	12.8

ER TABLE 1.1.2-3 (Sheet 1 of 2)

CHEROKEE NUCLEAR STATION

VACAR Load and Capacity-MW (1969-1984)

UNIT ADDITIONS	CAPACITY OF UNITS	TYPE OF UNITS	FUNCTION OF UNITS	OWNERSHIP OF UNITS	INSTALLED CAPACITY	PURCHASE	TOTAL CAPACITY	PEAK LOAD	RESERVE	PERCENT RESERVE
1969										
From VACAR Data					16 174.8	488	16 662.8	15 423.8	1 239.0	8.0
1970										
Weatherspoon 1,2	69	Comb.Turb.	Peak	CP&L						
Buck 7,8,9	93	Comb.cycle	Intermed.	DUKE						
Dan River 7,8,9,10	14	Diesel	Peak	DUKE						
Marshall 4	630	Convent.coal	Base	DUKE						
Urquhart 1	20	Comb.Turb.	Peak	SCE&G						
Parr 1,2	32	Comb.Turb.	Peak	SCE&G						
Jefferies 3,4	320	Convent.coal	Base	SCPSA						
Portsmouth 9,10	48.2	Comb.Turb.	Peak	VEPCO						
Surry 1,2	41.3	Comb.Turb.	Peak	VEPCO	17 442.3	368	17 810.3	16 880	930.3	5.5
1971										
Robinson 2	665	Nuclear	Base	CP&L						
Weatherspoon 3,4	69	Comb.Turb.	Peak	CP&L						
Blewett 1,2,3,4	52	Comb.Turb.	Peak	CP&L						
Asheville 2	194	Convent.coal	Intermed.	CP&L						
Lee 2,3,4	76	Comb.Turb.	Peak	CP&L						
Keowee 1,2	140	Hydro	Peak	DUKE						
Buzzards Roost	196	Comb.Turb.	Peak	DUKE						
Greenwood	32	Convent.Oil	Intermed.	DUKE						
Parr 3,4	38	Comb.Turb.	Peak	SCE&G						
Saluda 5	64	Hydro	Peak	SCE&G						
Wateree 1	385	Convent.coal	Base	SCE&G						
Kitty Hawk 1,2	49	Comb.Turb.	Peak	VEPCO						
Northern Neck 1,2,3,4	70.1	Comb.Turb.	Peak	VEPCO						
Lowmoore1,2,3,4	69.7	Comb.Turb.	Peak	VEPCO	19 542.1	293	19 835.1	17 859.5	1 975.6	11.1
1972										
Sutton 3	351	Convent.Oil	Base	CP&L						
Cliffside 5	572	Convent.Coal	Base	DUKE						
Wateree 2	385	Convent.Coal	Base	SCE&G						
Bushy Park 1,2	60	Comb.Turb.	Peak	SCE&G						
Myrtle Beach 3,4	40	Comb.Turb.	Peak	SCPSA						
Surry 1	708	Nuclear	Base	VEPCO	21 738.1	631	22 369.1	20 345.3	2 023.8	10.0
1973										
Roxboro 3	624	Convent.coal	Base	CP&L						
Oconee 1	871	Nuclear	Base	DUKE						
Williams 1	600	Convent.Oil	Base	SCE&G						
Hilton Head	20	Comb.Turb.	Peak	SCE&G						
Surry 2	788	Nuclear	Base	VEPCO						
Mt.Storm 3	560	Convent.Coal	Base	VEPCO						
Retirements	(28)	Convent.Coal	Peak	VEPCO	25 173.1	537	25 710.1	22 617.6	3 092.5	13.7
1974										
Darlington	468	Comb.Turb.	Peak	CP&L						
Jocassee 1,2	305	Pump.Hydro	Peak	DUKE						
Belews Creek 1	1 060	Convent.Coal	Base	DUKE						
Adjust.in hydro	(165.9)	Hydro	Peak	DUKE						
Retirements	(105.7)	Misc.	Peak	DUKE						
Adjust.in capacity	(146.0)	Misc.	Peak	SCE&G						
Hilton Head	20	Comb.Turb.	Peak	SCPSA						
Myrtle Beach	17.5	Comb.Turb.	Peak	SCPSA						
Yorktown 3	818	Convent.Oil	Base	VEPCO	27 444.0	328	27 772.0	22 426.0	5 346.0	23.8
1975										
Darlington	104	Comb.Turb.	Peak	CP&L						
Brunswick 2	821	Nuclear	Base	CP&L						
Oconee 2,3	1 742	Nuclear	Base	DUKE						
Jocassee 3,4	305	Pump.hydro	Peak	DUKE						
Retirements	(98)	Misc.	Peak	DUKE						
Georgetown 1	280	Convent.Coal	Base	SCPSA						
Myrtle Beach 5	28	Comb.Turb.	Peak	SCPSA						
Possum Point 5	845	Convent.Oil	Base	VEPCO	31 471	328	31 799	24 688	7 111	28.8
1976										
Brunswick 1	820	Nuclear	Base	CP&L						
Belews Creek 2	1 060	Convent.Coal	Base	DUKE	33 351	328	33 679	26 715	6 964	26.1
1977										
Roxboro 3 increase	70	Convent.Coal	Base	CP&L						
Sutton 3 increase	69	Convent.Oil	Base	CP&L						
Fairfield County	240	Pump.Hydro	Peak	SCE&G						
Georgetown 2	280	Convent.Coal	Base	SCPSA						
North Anna	934	Nuclear	Base	VEPCO	34 944	328	35 272	29 377	5 895	20.1

ER TABLE 1.1.2-3 (Sheet 2 of 2)

CHEROKEE NUCLEAR STATION

VACAR Load and Capacity-MW (1969-1984)

1978										
Roxboro 4	720	Convent.Coal	Base	CP&L						
McGuire 1	1 180	Nuclear	Base	DUKE						
Fairfield County	240	Pump.Hydro	Peak	SCE&G						
North Anna	934	Nuclear	Base	VEPCO						
Retirements	(263)				37 755	328	38 083	31 834	6 249	1[illegible]
1979										
McGuire 2	1 180	Nuclear	Base	DUKE						
V. C. Summer 1	900	Nuclear	Base	SCE&G						
Retirements	(90)				39 745	403	40 148	34 468	5 680	1[illegible]
1980										
Georgetown 3	280	Convent.Coal	Base	SCPSA						
North Anna	938	Nuclear	Base	VEPCO						
Retirements	(104)				40 859	303	41 162	37 247	3 915	1[illegible]
1981										
Harris 1	900	Nuclear	Base	CP&L						
Catawba 1	1 153	Nuclear	Base	DUKE						
Unspecified	130	Comb.Turb.	Peak	SCPSA						
North Anna	938	Nuclear	Base	VEPCO						
Bath County	1 500	Pump.Hydro	Peak	VEPCO						
Retirements	(101)				45 379	303	45 682	40 216	5 466	1[illegible]
1982										
Harris 2	900	Nuclear	Base	CP&L						
Catawba 2	1 153	Nuclear	Base	DUKE						
Unspecified	270	Comb.Turb.	Peak	SCPSA						
R. B. Russell	150	Hydro	Peak	SEPA						
Bath County	600	Pump.Hydro	Peak	VEPCO						
Retirements	(421)				48 031	303	48 334	43 390	4 944	[illegible]
1983										
Harris 4	900	Nuclear	Base	CP&L						
Perkins 1	1 280	Nuclear	Base	DUKE						
Unspecified	280	Convent.Coal	Base	SCPSA						
Surry	900	Nuclear	Base	VEPCO						
Retirements	(900)				50 491	303	50 794	46 782	4 012	8
1984										
Harris 3	900	Nuclear	Base	CP&L						
Cherokee 1	1 280	Nuclear	Base	DUKE						
Bad Creek	500	Pump.Hydro	Peak	DUKE						
V. C. Summer 2	900	Nuclear	Base	SCE&G						
Surry	900	Nuclear	Base	VEPCO						
Unspecified	2 400			VEPCO						
Retirements	(202)				57 169	303	57 472	50 398	7 074	14

ER TABLE 1.1.3-1

Cost Comparison of Alternative Sources of Energy

	CAPITAL COSTS-$1000		PRODUCTION COSTS-$1000						ENERGY - GWH						
YEAR	INVESTMENT	FIXED CHARGES	NUCLEAR	COAL	OIL AND PURCHASE	MAINTENANCE	TOTAL PROD. COST	TOTAL ANNUAL COST	NUCLEAR	COAL	HYDRO AND MISC.	PUMPED HYDRO	PUMPED HYDRO INPUT (-)	TOTAL NET ENERGY	UNIT COST MILLS/KWH
As Scheduled															
1983	780 800	135 547	225 269.4	524 245.7	20 431.9	110 677.9	880 624.9	1 016 171.9	53 632.7	31 882.3	1 858.1	1 962.3	(2 616.4)	86 719.0	11.72
1984	999 640	309 084	291 783.9	528 961.1	12 898.8	124 188.6	957 832.4	1 266 916.4	60 979.6	31 255.2	1 670.4	3 477.8	(4 637.1)	92 745.9	13.66
1985	995 800	481 955	370 385.8	514 102.1	10 030.5	140 529.0	1 035 047.4	1 517 002.4	69 720.1	28 934.1	1 591.6	4 592.6	(6 123.5)	98 714.9	15.37
1986	784 640	618 168	438 969.6	528 085.7	10 824.9	159 868.8	1 137 749.0	1 755 917.0	76 774.7	28 392.7	1 597.1	4 576.4	(6 101.9)	105 239.0	16.69
1987	780 800	753 715	517 334.7	542 729.6	14 236.8	181 533.9	1 255 835.0	2 009 550.0	84 652.9	27 304.4	1 666.2	4 582.7	(6 110.3)	112 095.9	17.93
1988	784 640	889 929	579 367.1	597 156.8	18 556.0	206 019.1	1 401 099.0	2 291 028.0	90 577.1	28 849.7	1 726.7	4 573.5	(6 098.0)	119 629.0	19.15
Totals for Period	5 126 320	3 188 398	2 423 110.5	3 235 281.0	86 978.9	922 817.3	6 668 187.7	9 856 585.7	436 337.1	176 618.4	10 110.1	23 765.3	(31 687.2)	615 143.7	16.02
Bad Creek Replaced with 800 MW Coal-Fired Cycling Unit and 2-100 MW Combustion Turbines:															
1983	836 800	145 268	226 260.8	519 494.8	21 118.0	111 350.6	878 224.2	1 023 492.2	53 843.3	31 623.8	1 905.8	1 961.8	(2 615.7)	86 719.0	11.80
1984	1 182 080	350 477	284 428.0	545 099.7	12 227.5	127 143.9	968 899.1	1 319 376.1	59 400.8	32 323.3	1 671.9	1 950.2	(2 600.3)	92 745.9	14.23
1985	780 800	486 024	360 235.2	534 058.1	12 207.1	143 720.6	1 050 221.0	1 536 245.0	67 588.7	30 117.2	1 660.3	1 953.8	(2 605.1)	98 714.9	15.56
1986	784 640	622 238	426 288.6	554 930.2	11 375.1	163 316.1	1 155 910.0	1 778 148.0	74 306.6	29 959.7	1 626.2	1 960.6	(2 614.1)	105 239.0	16.90
1987	780 800	757 784	503 452.1	570 155.7	14 505.3	185 256.9	1 273 370.0	2 031 154.0	82 114.8	28 940.7	1 694.4	1 962.0	(2 616.0)	112 095.9	18.12
1988	784 640	893 998	565 728.7	621 818.1	21 267.3	210 039.9	1 418 854.0	2 312 852.0	88 174.6	30 294.2	1 809.7	1 948.4	(2 597.9)	119 620.0	19.33
Totals for Period	5 149 760	3 255 789	2 366 393.4	3 345 556.6	92 700.3	940 828.0	6 745 478.3	10 001 267.3	425 428.8	183 258.9	10 368.3	11 736.8	(15 649.1)	615 143.7	16.26
As Scheduled Except Cherokee Units are Base-Load Coal-Fired Units:															
1983	780 800	135 547	226 260.5	520 856.5	19 754.6	110 677.9	877 549.5	1 013 096.5	53 843.2	31 688.5	1 841.2	1 961.8	(2 615.7)	86 719.0	11.68
1984	824 280	278 642	257 911.6	629 724.5	13 119.4	118 749.6	1 019 505.1	1 298 147.1	54 291.0	37 940.1	1 677.0	3 486.7	(4 648.9)	92 745.9	14.00
1985	995 800	451 512	334 358.6	613 901.1	7 733.2	134 165.1	1 090 158.0	1 541 670.0	63 213.7	35 497.9	1 536.3	4 598.9	(6 131.9)	98 714.9	15.62
1986	609 280	557 283	365 899.1	725 615.1	6 176.1	147 180.7	1 244 871.0	1 802 154.0	64 315.4	40 962.2	1 490.1	4 586.1	(6 114.8)	105 239.0	17.12
1987	780 800	692 830	432 884.1	764 347.4	8 912.7	167 259.8	1 373 404.0	2 066 234.0	71 299.9	40 770.4	1 551.1	4 576.5	(6 102.0)	112 095.9	18.43
1988	609 280	798 601	443 858.8	951 263.0	15 813.3	183 819.9	1 594 755.0	2 393 356.0	69 919.5	49 566.5	1 668.8	4 577.3	(6 103.1)	119 629.0	20.00
Totals for Period	4 600 240	2 914 415	2 061 172.7	4 205 707.6	71 509.3	861 853.0	7 200 242.6	10 114 657.6	376 882.7	236 425.6	9 764.5	23 787.3	(31 716.4)	615 143.7	16.44
As Scheduled Except Perkins Units are Base-Load Coal-Fired Units:															
1983	601 600	104 438	197 617.2	614 180.8	19 576.6	105 641.8	937 016.4	1 041 454.4	47 508.3	38 027.4	1 837.3	1 962.1	(2 616.1)	86 719.0	12.01
1984	999 640	277 975	257 373.5	633 181.9	13 887.7	118 296.3	1 022 739.4	1 300 714.4	54 196.9	38 013.9	1 695.7	3 481.8	(4 642.4)	92 745.9	14.02
1985	816 600	419 737	295 251.8	725 972.6	8 379.0	128 780.6	1 158 384.0	1 578 121.0	56 108.2	42 587.9	1 551.3	4 597.5	(6 130.0)	98 714.9	15.99
1986	784 640	555 950	357 357.1	754 114.3	9 782.6	146 652.0	1 267 906.0	1 823 856.0	62 882.3	42 301.0	1 574.1	4 555.2	(6 073.6)	105 239.0	17.33
1987	601 600	660 388	380 731.1	905 519.9	9 309.7	160 979.3	1 456 540.0	2 116 928.0	62 967.2	49 097.9	1 560.0	4 587.8	(6 117.0)	112 095.9	18.88
1988	784 640	796 601	448 978.9	937 283.6	13 643.6	183 819.9	1 583 726.0	2 380 327.0	70 761.1	48 768.9	1 629.4	4 591.3	(6 121.7)	119 629.0	19.90
Totals for Period	4 588 720	2 815 089	1 937 309.6	4 570 253.1	74 579.2	844 169.9	7 426 311.8	10 241 400.8	354 424.0	258 797.0	9 847.8	23 775.7	(31 700.8)	615 143.7	16.65

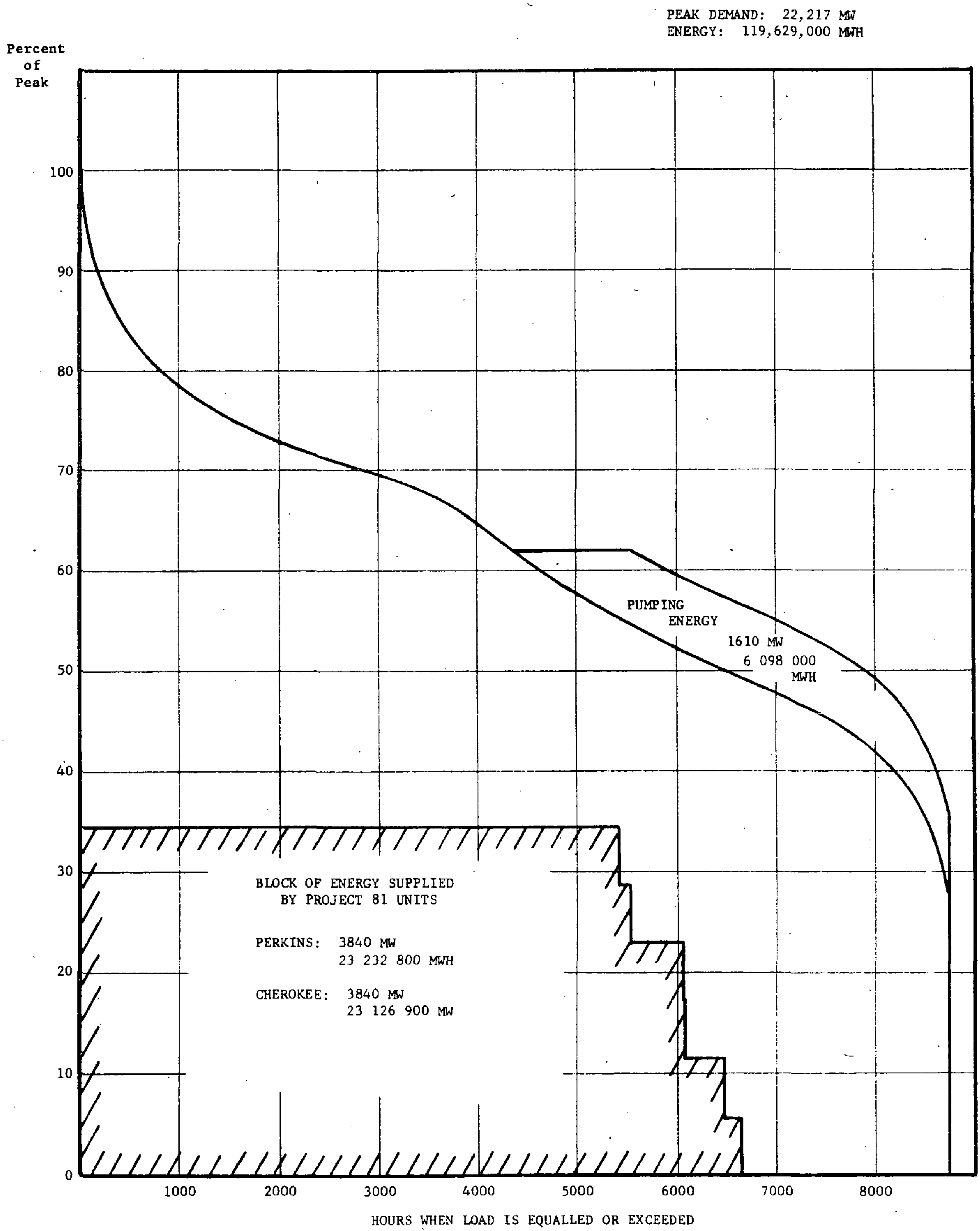
Notes: 1) Capital costs are based on the following (dollars at time of commercial operation):
- Perkins: $610/kW; coal-fired replacement: $470/kW
- Cherokee: $613/kW; coal-fired replacement: $476/kW
- Bad Creek: $430/kW
- 800 MW coal-fired unit: $460/kW
- Combustion turbines: $280/kW

2) Fixed charge rate: 17.36% per year.

ER FIGURE 1.1.1-1

CHEROKEE NUCLEAR STATION

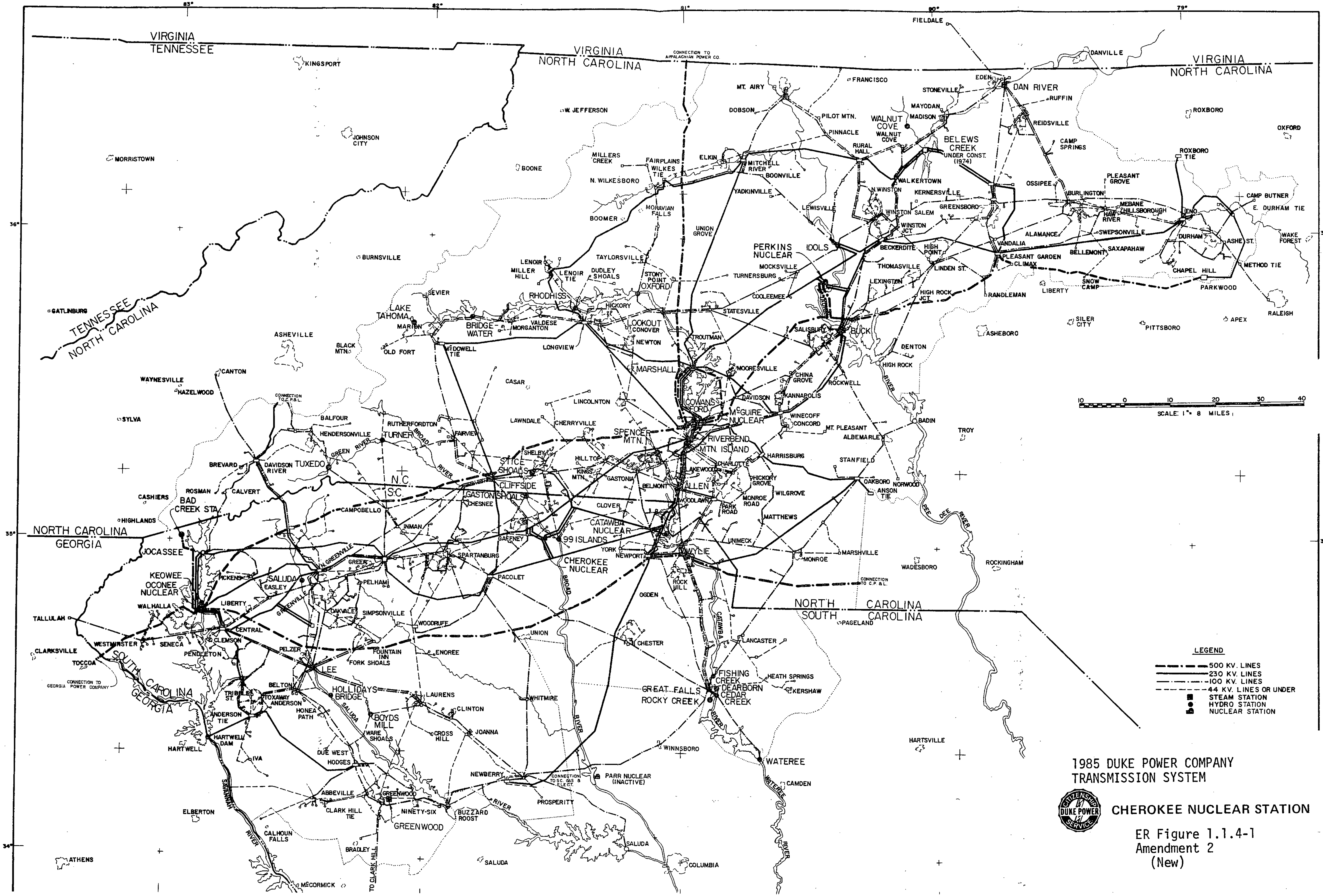
LOAD DURATION CURVE FOR THE YEAR 1988



LOAD DURATION CURVE FOR THE YEAR 1988.

CHEROKEE NUCLEAR STATION

ER Figure 1.1.1-1
Amendment 2
Amendment 3



1985 DUKE POWER COMPANY
TRANSMISSION SYSTEM

CHEROKEE NUCLEAR STATION

ER Figure 1.1.4-1
Amendment 2
(New)

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2.0 THE SITE

In this chapter, information is presented pertaining to the physical, biological, and human characteristics of the area environs affected by Cherokee Nuclear Station. Present and projected information is presented concerning population, land use, water use, and historical significance from an environmental viewpoint.

2.1 SITE LOCATION AND LAYOUT

The Cherokee Nuclear Station is in north central South Carolina in the eastern portion of Cherokee County, approximately 40 miles southwest of Charlotte, North Carolina, and 21 miles east of Spartanburg, South Carolina, as shown on Figure 2.1-1. The station center is located at latitude 35 degrees - 02 minutes - 12 seconds north and longitude 81 degrees - 30 minutes
1 - 43 seconds west. The corresponding Universal Traverse Mercator Grid Coordinates are E 453,301.85 and N 3,877,046.24, Zone 17.

The plant site, approximately 1,000 yards west of the Broad River, is bounded on the north, east and west by Ninety Nine Islands Reservoir and on the south by private property, as shown in Figure 2.1-2.

The Exclusion Area is the area within a 2,500 foot radius centered at the number two Reactor Building. The Low Population Zone is that area within five miles centered at the number two Reactor Building. A security fence will be erected around the immediate station area.

Activities within the Exclusion Area, other than those associated with the nuclear station, will be limited to occasional recreation in the form of boating and fishing on Ninety Nine Islands Reservoir

1 Figure 2.1-4 shows Duke owned property and adjacent properties. Table 2.1.1-1 gives acquisition dates for Duke owned property as of February 15, 1974. Q 1.1.10

Of the property within a two mile radius of the site, approximately six percent is water surface, 26 percent is Duke Power Company Property (as of February 15, 1974), and the remaining 73 percent is privately owned property. Figure 2.1-3 shows existing land use within two miles of the site. An aerial photograph is shown on Figure 2.1-5.

4 Figure 2.1-6 shows the area topography within a 10 mile radius of the plant site. Figure 2.1-7 shows the site topographical features as modified by the plant site. A plot of the maximum topographic elevation versus distance from the center of the plant in each of the 16 22-1/2 degree cardinal compass point sectors, to a distance of 10 miles is shown in Figure 2.1-8. Q3

1 As of May 31, 1974, eminent domain proceedings have not been required for acquisition of property for the site. In order to use condemnation procedures for acquiring land at Cherokee site, Duke is required by law to obtain a Certificate of Convenience and Necessity from the South Carolina Public Utilities Commission. Duke Power Company has not filed for a certificate at this time. It is not known if eminent domain proceedings will be required, as negotiations are in progress for approximately 404 acres belonging to U. S. Plywood Champion Papers west of the site and approximately 60 acres belonging to Dorsey and Little east of the site. These properties will be owned by Duke prior to plant operation. Q 1.1.11 Q 1.1.8

1 There will be 17 families displaced as a result of Duke Power Company acquiring land for the construction and operation of Cherokee Nuclear Station. As of August 19, 1974, 11 families have been displaced as a result of site acquisition. Six families remain to be displaced. The properties of these six families have been acquired by Duke. Figure 2.1-3 shows the residences which will be removed prior to operation of Cherokee Nuclear Station. Q 1.1.12 Q 1.1.9 Q2.2.17

2.2 REGIONAL DEMOGRAPHY, LAND AND WATER USE

The area around Cherokee Nuclear Station is sparsley populated. Relatively larger population densities are found in and around principal cities such as Gaffney and Blacksburg.

Land use is confined mostly to raising cattle. Most industries are located around principal cities within Cherokee County.

Water usage is generally confined to sport fishing by local residents on Ninety Nine Islands Reservoir. Some water intakes are located on the Broad River.

2.2.1 DEMOGRAPHY

Population in Cherokee County is relatively stable. The 1940 census population was 33,290 while the 1970 census reports population of 36,791. York County has had a higher growth rate than Cherokee County. The 1940 population in York County was 58,663 and the 1970 population reports 85,216.

2.2.1.1 Permanent Population

There are 23 counties within 50 miles of Cherokee Nuclear Station (Figure 2.2.1-1). The 1970 census for these counties are shown on Table 2.2.1-1. Figures 2.2.1-2 through 2.2.1-4 show the population by sector within 10 miles of the site for the years 1970, 1984 (plant start-up) and 2024 (end of plant life), respectively. Figures 2.2.1-5 through 2.2.1-7 show distributed population from five to 50 miles from the site for the latest census, year of plant start up and end of plant life. A summary of the population and population distributed for each sector within 50 miles of the site is presented in Table 2.2.1-2. All population and population distribution data are based on the 1970 census, except for the population within the five mile radius in Cherokee County which is based on an actual house count made November 6-9, 1973 and 3.34 persons per household. The population within the five mile radius in York County was based on information secured from the York County Tax Assessor records and 3.33 persons per household.

To disaggregate the 1970 county census division populations into each radial sector, road densities, population accumulations, land usage and general area information were considered.

Future population levels for 1984 and 2024 are based on extrapolations of projections made by Region IV, Environmental Protection Agency.[1] The distribution of the projected populations is based on the ratio of distributed 1970 county populations within each radial sector to the total county populations. This ratio was applied directly to the projected county populations to determine the future population of that portion of the counties that fall within each radial sector.

Population centers within 100 miles of the site are shown on Figure 2.2.1-8.

2.2.1.2 Transient Population

Draytonville Elementary School, located approximately 4.3 miles west of the site, is the only school within five miles of the site. Present enrollment of Draytonville is 221 and 15 staff, which is the capacity of the school.[2] There are no plans for expansion at this time; therefore, the enrollment at the time of start of plant construction, at plant start up, and at the end of plant lifetime is not expected to vary significantly.[3]

There are no hospitals or prisons within the five mile radius.

2.2.2 LAND USE

Most of the land in Cherokee County that is cultivated is concentrated on
the northwest side of U. S. Highway 29 and west of the Broad River. The
type of soils found in this section are well suited for row crops and
orchards. In addition, this area produces the greatest amount of peach
crops within the county. In addition to row crops and orchards, some
1 cattle are raised in this area. Most of the cattle farms, however, are
located in the western two-thirds of the county where suitable topography
and soil exist.[4]

Poultry production has been the largest agricultural income producer in the
area and was concentrated in the eastern part of Cherokee County. However,
as of August, 1974, due to the increased prices of feed and grain to the Q
pountry producers in the area, there is no poultry production within five 2.0.2
miles of the Cherokee Nuclear Station.[7]

There has been a decline in farming south of the transportation corridor,
formed by Interstate 85, Southern Railway, and Transcontinental Gas Pipeline.
This decline is due to several reasons, mainly the terrain in the area is Q
hilly, which has resulted in poor soil conditions, due to erosion, and is 2.2.16
not well suited for the use of farm machinery.

Mule farming has practically ended in the area and most of the older farmers
have retired. Most of the younger people are employed by nearby industries
instead of farming.[7] This area consists of open fields and extensive wood-
lands. Figure 2.2.2-1 (Sheet 1 and Sheet 2), shows the closest school,
church, hospital, dairy, farm, animals producing milk for human consumption, Q
and residence for each sector from 0-5 miles and 5-10 miles, respectively, 2.0.1
4 of Cherokee Nuclear Station. Table 2.2.2-1a shows the distance and direction Q 5
of those facilities from the site.

Figure 2.2.2-1a shows the location of animals producing milk for human Q
consumption within five miles of Cherokee Nuclear Station. Table 2.2.2-1b 2.2.3
shows the direction and distance of those animals from the site.

The portion of the plant area within the site boundary which constitutes the
property "permanently" removed from timber, agriculture, or other productive
land use is shown on Figure 4.1.1-2 as the area to be cleared for construction. Q
The entire site area of the Cherokee Nuclear Station is shown on Figure 2.2.12
2.1-4 as the Site Boundary. The Cherokee Nuclear Station will consist of
approximately 1600 acres of which 46 percent will be removed from productive

land use. Various types of forest communities comprise the land to be removed from productive use. (Refer to Figure 2.7.1-2) Q 2.2.12

2.2.2.1 Agriculture

Figure 2.2.2-2 shows concentrations of major farm products within five miles of Cherokee Nuclear Station. Approximately six percent of the area within five miles of the site is cleared land suitable for pasture or farming. Most of the farming is in the bottom land along creeks and the Broad River. Q 2.2.13

2.2.2.2 Transportation and Industry

Transportation facilities have been the major factor in determining the location of non-agricultural land uses in the area. The heaviest con-
3 centrations of development have occurred in and adjacent to Gaffney, Blacksburg, and the unincorporated village of Cherokee Falls. Adjacent to the Spartanburg County line there is some spill-over of development from the Town of Chesnee.[4]

The Gaffney urban area is the major urban concentration in the county. It is the major shopping and service center of the county, and also located here are the principal public facilities. In addition, many of the industries that make up the county's economic base are located within this city. Consequently, much of the county's growth has occurred in and adjacent to Gaffney.[4]

The unincorporated village of Cherokee Falls is located south of Blacksburg on the Broad River. The development of the village was induced by a textile manufacturing firm, and consists of a cluster of homes around a manufacturing plant.[4]

The pattern throughout Cherokee County is rural area, residential, and commercial development, bordering rural roads and clustering around churches or at road intersections. Geographically, the northwestern two-thirds of the county has more rural area development than does the southeastern section. The more heavily populated northwest is where the major transportation route, the towns, the principal sources of employment, both agricultural and non-agricultural, are located.[4]

Figure 2.2.2-3 shows major transportation facilities and industries within a five mile radius of the site. Table 2.2.2-1 gives details for this figure.

2.2.2.3 Wildlife Preserves

The area around Cherokee Nuclear Station has no Wildlife Game Refuges or Preserves. Figure 2.2.2-4 shows the game management lands within five miles of Cherokee Nuclear Station. These privately owned lands are under lease to the South Carolina Wildlife Commission. The Commission pays the land owners on a pro-rated basis for the amount of land it uses. Q 2.2.15
3 Property owners can, however, remove properties from lease agreement by requesting removal from the Game Management Program prior to June 30th of any year.

There are ten tracts of game management land within five miles of
Cherokee Nuclear Station that total approximately 4,350 acres. The largest
tract, approximately 1,500 acres, is located west of the site and partially
within the Site Boundary and belongs to U. S. Plywood-Champion Paper.
Acquisition of approximately 655 acres of this property is discussed in
Section 2.1. After this property is acquired by Duke Power Company, it will
be removed from the Game Management Program prior to plant construction.
Another tract, which consists of approximately 170 acres, is located
within the Site Boundary and belongs to Duke Power Company. This property,
3 formerly owned by McCluney (refer to Deed No. D-2651 on Figure 2.1-4), was
included in a ten year lease agreement with the South Carolina Wildlife
Commission dated July 10, 1971. This property will be removed from the
Game Management Program prior to construction. The remaining eight tracts
of Game Management Land within five miles belong to private landowners
and are under lease to the South Carolina Wildlife Commission. These
areas are open to the public for hunting, after acquiring a South Carolina
Hunting Permit and a Game Management Area Permit.

Vegetative cover in the area consists of a variety of plant communities
including pine plantations, mixed pine hardwood stands, Virginia pine,
short leaf pine, scrub pine, cut-over commercial timberland, fields, and Q
pasture. Section 2.7 of the Cherokee ER gives a more comprehensive view 2.2.15
of the types of vegetation to be found in the area. Some of the game
species recorded for this area are: Whitetail deer, Red Fox, Gray Fox,
Cottontail Rabbit, Racoon, O'Possum, Squirrel, Bob Cat, Mink, Muskrat,
Otter, Mourning Dove, Bobwhite Quail, Wild Turkey, Woodcock, and water-
fowl such as Wood Duck, Green Wing Teal, and Mallard.[8]
Hunting on other land within the area is done on private land with the
landowner's permission.

2.2.2.4 Zoning

There are no zoning requirements in Cherokee and York Counties within five miles of the site.

2.2.2.5 Water Use

The present groundwater usage within 20 miles of the Cherokee site is shown on Figure 2.2.2-5. Surface water usage within 20 miles of the site and downstream for a distance of 50 miles is shown on Figure 2.2.2-6. Details of the users shown on Figures 2.2.2-5 and 2.2.2-6 are given in Tables 2.2.2-2 and 2.2.2-3, repectively.

Table 2.2.2-3a lists the intake flow data for major water users on the Broad Q
River 50 miles above 99 Islands Reservoir and 50 miles below. Values are 2.2.10
maximum figures except as noted. Figure 2.2.2-6a and Table 2.2.2-3b provides Q
information on water supply for farms and residences on the Broad River 2.2.11
within five miles downstream of the site and the nearest residence to the
site.

Dilution flows for chemical, biocide, and liquid radwaste are detailed on Table 2.2.2-4. The transient time to downstream water intakes has been conservatively estimated by extrapolating a discharge-velocity curve (Figure 2.2.2-7) for the Gaffney gage.

The minimum daily average flow of record of 224 cfs is the mimimum dilution flow and yields the maximum transient time. The maximum daily average flow of record serves as the estimated maximum dilution flow and has the minimum transient time. The mean annual flow at the Gaffney gage, located approximately six miles upstream form the site, is 2,472 cfs. Estimates of the average transit time to downstream water users are shown on Table 2.2.2-5. Q 2.2.3 Q 2.2.5

The Union Water Department intake, the nearest downstream municipal surface water intake is located approximately 25 river miles downstream of the site. Based upon 4,948[5] active residential water meters and 3.34[6] persons per houseold, the calculated population served by the Union intake is 16,526. Q2.2.4 Q2.2.6 Q2.2.2

Figure 2.2.2-8 shows the location of industrial facilities which could release effluents to the Broad River. Q2.2.9

Due to the relatively impermeable nature of the soils and rock at the site, the radius of influence of wells in the immediate vicinity of the site is only a few hundred feet in extent under continuous pumping. Since the wells surrounding the site are used for domestic purposes, it is unlikely that these wells could be subjected to continuous pumping, and thus drawdowns are expected to be small even near the wells and should not induce flow reversals even under extreme conditions. Q2.2.8

The soil permeability field rest results presented in Table 2.5.4-2 indicate the impermeable characteristics of the soil at the site. Tested permeabilities range from a minimum value of less than 1 foot/year to a maximum value of 582 feet/year.

Computations using this maximum measured value of permeability at the site, 582 feet/year, and using the formula:[9]

$$R = C' \ (H-h_w) \quad k$$

indicate that for an average well drawdown of 75 feet the radius of influence for a typical well would be 500 feet. Since average soil permeabilities in the site area are considerably lower than the maximum value, the expected radius of influence of groundwater drawdown is limited to a few hundred feet. No off-site wells are located closer than 5,000 feet to any plant structure. Q2.2.7

2.3 REGIONAL HISTORIC, SCENIC, CULTURAL AND NATURAL LANDMARKS

2.3.1 HISTORIC[1]

Cherokee County contains numerous historical sites which contribute greatly to the general character of the county and provide interesting and educational tourist attractions. Among these, Asbury Chapel, located in the southeastern portion of the County, is one example of the typical meeting houses with bare frame structure and numerous paned windows. The Chapel was dedicated by Bishop Asbury after the Revolution when he established Methodist congregations in the region.

Another historic structure near Thicketty, the Adam Goudelock House was constructed in 1780. The house has a "log core", with hand carved woodwork which are both characteristic of structural techniques of that time.

Limestone College, located in Gaffney, is the State's oldest institution for higher education for women and was founded in 1845 as a Baptist Seminary. Also, located on the campus is Limestone Springs, an early health resort. The Limestone College Cooper Dormitory was constructed in 1835 as a $72,000 hotel for the Limestone Springs Resort.

The Town of Gaffney, the county seat, was originally called Gaffney's Old Field (a horse racing site); and was named for the Irishman Michael Gaffney who settled there in 1804. Among many interesting historical sites within Gaffney is the grave of Colonel James Williams, a hero of the Revolutionary Battle of King's Mountain. A monument dedicated to Williams and two
1 Revolutionary War Cannons, which mark his grave, are located on the Carnegie Library lawn.

Cowpens National Battlefield is located 11 miles northwest of Interstate 85 at Gaffney and two miles southwest of U. S. 221 at Chesnee. The victory of the American Army at Cowpens in 1781 over a Corps of British Regulars was the second victory enjoyed by the patriot forces within three months. Depressed by two years of defeat and persecution, patriot hopes had been raised by the victory at Kings Mountain the previous October. After Cowpens, ardent patriots became more active in their support of the struggle for freedom.

Kings Mountain National Military Park is another historical mark in the Cherokee area. Kings Mountain was an unexpected battle in the foothills of northwestern South Carolina with the fierce attack of American Frontiersmen on October 7, 1780 against Lord Cornwallis' scouting force under Major Patrick Ferguson. This battle resulted from a sudden uprising of hardy southern Appalachian Mountaineers for the protection of their homes from the threat of Tory invasion. Kings Mountain forced Cornwallis to withdraw from North Carolina, placed him on the defensive, and delayed his northward march until January, 1781.

Also of historical-military importance is Fort Thicketty, where General Morgan and Colonel William Washington camped on the eve of the Battle of Cowpens. In addition, Thicketty Mountain, located near Cowpens Battlefield, represents an area containing deserted iron mines that were influencing factors in the early development of the region. This general
1 area is now called the Old Iron District.

The county also contains the site of Blacksburg-Cherokee Falls Railroad. The railroad was originally built from 1880 to 1886 as part of the Charleston, Cincinatti, and Chicago Railroad. By 1890, the track had been constructed from Camden, S. C. to Marion, S. C. Six years later, the railroad company reorganized for financial reasons and became the Ohio River and Charleston Railway Company. This new organization received permission from the South Carolina Legislature to build a spur from Blacksburg to Spartanburg. The track was constructed to Trestle Island on the Broad River, where the
1 railroad developed a resort area.

On the west side of Broad River near the Blacksburg-Cherokee Falls Railroad is the site of the Cherokee Iron Works, which produced iron from the time of the Revolutionary War until just after the Civil War. Of the six known furnaces, three are still standing. The three furnaces at the Iron Works Headquarters are no longer standing. Cherokee county is presently leasing 143 acres from Burlington Industries which includes the site of the Cherokee
1 Iron Works Headquarters.

Possumtrot School is another point of historical interest in Cherokee County. The structure is a one room schoolhouse and is restored to its original design, including a split rail chesnut fence surrounding the building.

The Winnie Davis Hall of History was built as a depository for the historical documents of the confederacy and a School of History. The architect designed the structure as a museum which includes windows on the three sides of each room to take advantage of natural lighting.

In addition, the county contains the Robbs House (1890's), a victorian home with carriage house; Michael Gaffney grave yard, Meadow Brook House (1855); the Adam Goudelock or Dawkins House (1800); J. H. Barnes Telegraph School at Blacksburg (1880-1889); Cherokee Falls Mill (1895); Sarratt's Academy; Austel's Gris Mill; Ellis Gambling House (1830); and the Quinn House (1870) in Blacksburg.

The two sites mentioned in the <u>National Register of Historic Places</u> are The Cowpens National Battlefield near Chesnee, South Carolina and Kings Mountain National Military Park in York County, South Carolina.

2.3.2 SCENIC

There are no places of Scenic value listed in the <u>National Register of Historic Places</u> within five miles of Cherokee Nuclear Station. The area around the site is heavily timbered with rolling hills and has a rugged natural beauty.

2.3.3 CULTURAL

The area within five miles of the site has no significant cultural centers or activities. The nearest curltural center is Limestone College, located 8.1 miles west of the site in Gaffney, South Carolina. Limestone is a fully accredited private four-year liberal arts college. Programs are offered in the liberal arts and sciences leading to the degrees of Bachelor of Arts and Bachelor of Science. The Teacher Education Program is approved by the South Carolina State Department of Education and the Teacher Certification authorities of more than half the states in the United States, including all those adjoining South Carolina. The Music Department provides accredited programs in music education, performance and theory. Pre-professional courses are offered for medical and medical technician students with subsequent professional work credited toward a Bachelor of Science degree from Limestone.[2]

2.3.4 NATURAL LANDMARKS

The only significant natural landmark in the vicinity of Cherokee Nuclear Station is the Broad River located immediately east of the site.

2.3.4.1 Transmission Lines

Historical research was conducted to insure that the proposed transmission line will not pass through any historical site. No historic sites listed or nominated to be listed in the National Register of Historic Places are in the route of the proposed lines.

Section 3.9 gives details of the transmission facilities in the area.

2.4 GEOLOGY

Studies of site and regional geology have been made to identify the various general and specific features underlying the site and the surrounding area.

The site is located in the Kings Mountain Belt, which is one of four northeast trending geologic belts found in the Piedmont Province. As shown in Figure 2.4.0-1 the Piedmont Province is bordered to the east by the Coastal Plain Province and to the west by the Blue Ridge Province and extends from Georgia through Virginia with the width varying from 80 to 120 miles. The site, which is similar to the surrounding area, consists of mostly gentle slopes and northerly trending ridges, however steeper slopes are lithologic rather than structural phenomena. The Kings Mountain Belt is characterized as a complex series of deformed rocks consisting of felsic and mafic schists and gneisses, quartzites, conglomerates, and marble, generally considered to be of Precambrian and early Paleozoic age. A regional geologic map is presented in Figure 2.4.0-2. The geologic history of the area consists of episodes of folding and metamorphism of sedimentary and volcanic rocks. The structure of the King's Mountain Belt is generalized as being a complex fold system, with the difference between the geologic interpretations being the presence or absence of faults and the orientation of interior folds. The last major episode of metamorphism and the last tectonism ended by the Triassic Period. Figure 2.4.0-3 is a regional tectonic map.

Most of the site is underlain by rock classified as felsic gneiss, however, mafic gneiss, felsic schist and varing thickness of quartzite have been located throughout the site. (See Figures 2.4.0-4 and 2.4.0-5). No active faults have been located within the general site, however, published maps and literature inferred several inactive faults (The closest being two miles from the site). A variation of approximately 100 feet in the top of continuous rock elevations is due to the differential weathering patterns created by the joint characteristics found in the rock. This weathering action has created a soil overburden which is classified as being of silt to silty sand composition.

For more detailed discussion, see PSAR Section 2.5.

2.4.1 SOILS Q2.7

2.4.1.1 Landscape Dynamics Q2.7

The environment in the vicinity of the site can be subdivided into three elements: uplands, valley sides, and river bottoms. The topography, geology, soils, vegetation, wildlife habitat, and land use characteristics of each element are distinctive. Table 2.4.1-1 summarizes the physical characteristics (topography, geology, pedology, and geomorphology) of each element.

Geologic processes, primarily degradational in nature, are presently operating on the land surface of the site. Under present conditions, the effects of common denudation phenomena (running water, chemical weathering, mass wastings, etc.) are rather moderate. Any factor contributing to their enhancement or relative effectiveness may result in accelerated erosion of the land surface.

Average annual precipitation and average annual temperature can be used to identify the morphogenetic region in which the site resides.[1] These regions are defined on the basis of the relative significance and severity of various geomorphic processes. Figure 2.4.1-1 shows that the Cherokee site is in the moderate morphogenetic region. Thus, physical weathering, chemical weathering, mass movement, and wind action are all moderately effective agents of erosion. Frost action is insignificant, but running water has its maximum effectiveness in altering landscapes within this morphogenetic region.

Field observations indicate that bedrock, consisting of gneiss and shist, has been severely weathered producing a typical saprolitic soil. Upland soil depth varies from 6 feet to a maximum of 15 feet. Slope soil depth varies from 5 to 50 feet, while bottomland soil depths exceed 100 feet.

Mass movement of regolith is not a major factor in modifying the present landscape. Exposed soil is susceptible to slides and debris flows, especially at times of vadose zone water saturation. Soil creep is the most common type of movement occurring on the steepest slopes. However, soil creep is a relatively slow process and results in barely discernible landscape modification.

The most ubiquitous process occurring at the site is erosion and transport of material by running water. Sheetwash, rill wash, and channel flow are the principal agents of erosion in the area. Regional drainage is to the south, but locally, flow direction is a function of topography. Several areas at the site have been stripped of vegetation, and contain slopes that have permitted sheetwash to produce large areas of gullied land. The entire site lies within a land zone adjacent to the Broad River in which tributary streams have produced a highly dissected topography.

2.4.1.2 Soil Characteristics and Classification

Soils are placed in broad classes for study and comparison of regional trends and characteristics. They are classified more specifically in order to describe their behavior in specific environments. The soil classification used in the United States consists of six hierarchical categories[2]. Beginning with the most inclusive, the six categories are the order, suborder, great soil group, family, series, and type.

The broadest category of soils is divided into three orders: zonal, intrazonal, and azonal. The zonal order consists of soils that have well-developed characteristics which reflect the influence of climate and living organisms (chiefly vegetation). These characteristics are best developed on gently sloping, well-drained uplands. The parent material does not have extreme texture or chemical composition, and it has been in place long enough for biological forces to have had their full influence. Zonal soils have a moderately well developed to a well-developed profile that is in equilibrium with the climate as well as with the other soil-forming factors. Zonal soils in the study area belong to the Red-Yellow Podzolic and Reddish-Brown Lateritic great soil groups[3].

The intrazonal order consists of soils that have more or less well developed characteristics that reflect the dominating influence of some local factor of relief or parent material over the effects of climate or living organisms. Intrazonal soils in the study area belong to the Planosols and Low-Humic Gley great soil groups.

The azonal order consists of soils that lack well-developed profile characterisitcs because of their youth, parent material, or relief. The great soil groups in the azonal order are the Lithosols, Regosols, and Alluvial soils.

The interrelation and interaction of climate, land slope, and composition of parent material (bedrock) determines the type and degree of development of most soils. In this region the warm, humid climate promotes a high rate of rock weathering and decomposition. Much of the local bedrock is igneous or metamorphic rock which is not very resistant to weathering. The degree of slope is quite variable so that erosion and mass wasting (soil creep or downhill sliding) are very effective in removing soil and weathered material in some locations and less so in others. Therefore, soils of this region may be very well developed to depths of several tens of feet. The degree of development of soils on slopes is primarily dependent on the ability of vegetative cover to retard erosion. On slopes, soil profiles are thinner and unweathered bedrock is generally closer to the surface. Where farming or forestry practices have destroyed vegetative cover, many of the slopes in the site vicinity have lost the soil cover completely and consist of gullied subsoil. Along stream banks, material is added by flood deposition so that no distinct soil profile is developed.

Both upland and valley slope soils at the site belong to the Red-Yellow Podzolic great soil group. These soils are identified by the Soil Conservation Service[4] as the Tatum Series, a deep, well-drained, Piedmont soil. Soils of this series developed as a result of weathering of metamorphic rocks. They have a brown to light yellowish-brown silt loam to silty clay loam surface layer and a red silty clay loam upper subsoil. A gravelly silt loam soil type is mapped in places where there is enough gravel to interfere with tillage. The subsoil has a fairly uniform red color and generally a silty clay texture. At a depth of 24 to 56 inches there is a layer of silty clay loam that is distinctly mottled red, reddish yellow, yellowish red, and dark reddish brown. Depth to weathered bedrock ranges from 3 to 30 feet or more. Slopes range from 2 to 25 percent. Tatum soils have moderate permeability, moderately slow infiltration, and a medium available moisture capacity. They have low natural fertility and low content of organic matter. Tatum soils are slightly to moderately acid. Under good management, Tatum soils are suitable for cultivation.

On steeper slopes, a gullied soil has been identified which belongs to the intrazonal order. Gullied land consists mainly of small areas that are very severely eroded. The gullies are moderately deep. Small patches or narrow strips of soil occur between the gullies. In these patches the texture of the surface soil ranges from gravelly sandy loam to clay. The thickness of the subsoil varies. Most of the gullies have been stabilized by trees and honeysuckle. This land has slopes of 10 to 30 percent. The yellow to red subsoil is friable, and exposed parent material is moved easily by runoff.

In the river bottoms two azonal alluvial soils occur near the site. The Chewacla series are deep, somewhat poorly drained to moderately well drained, medium acid soils. These soils were formed under hardwood vegetation in recent alluvium on bottom lands along medium-sized and large streams. Slopes range from 0 to 2 percent. The surface layer of these soils is better drained and more uniformly colored than is the underlying substratum. It is a dark grayish-brown to dark-brown silt loam. The silt loam is 10 to 15 inches thick in most places, but it ranges from 8 to 20 inches in thickness. In these azonal soils, a B horizon has not developed. The substratum is silty clay loam and has a wide range of colors and mottles. Brownish colors dominate to a depth of 25 to 35 inches, grays and yellowish brown below 35 inches. These soils are moderately permeable and contain a medium amount of organic matter. Their moisture-supplying capacity and fertility are moderately high. Though subject to fairly frequent flooding, they are productive soils.

Mixed alluvial soils have been mapped in the river bottoms which are younger and more poorly developed than the Chewacla soils. This soil type consists of deep, poorly-drained to well-drained alluvium derived from many kinds of rocks along streams. It includes areas of gravel, coarse sand, and silt loam. Near the surface the color ranges from light brown to dark brown. The subsurface layer is gray or mottled with gray and brown. Quartz pebbles, cobblestones, and rock fragments are fairly common. The fertility of this soil type is low. Infiltration is moderately rapid and percolation is rapid. Although the water table is high, this land type has a low available moisture capacity. None of this land type is cultivated. Part of it is used for pasture, but most is forested in non-commercial hardwoods. The undergrowth consists of canes, alders, briers, and native grasses.

2.4.1.3 Soil Chemistry

Soil samples were collected from the site during vegetation stand surveys. These samples were analyzed for nutrients and important trace metals[5] using the LaMotte Soil testing system. Table 2.4.1-2 describes the soil chemistry at the site. Individual samples in the table are organized according to their location in the upland, valley sides, or river bottom. The locations from which these samples were collected are shown in ER Figure 6.1.4-2.

These data show that there is little difference between nutrient concentrations in upland and valley slope soils. Concentrations of nitrate increase with depth in these soils, but nitrate concentrations in floodplain soils are greatest at the surface. Upland and valley side soils are slightly acid and floodplain soils generally have a neutral pH. Concentrations of aluminum are greater in upland and valley side soils than in floodplain soils. Other properties show no distinct separation by soil type or location.

2.4.1.4 Erosion Potential

Erosion is defined as the wearing away of the land. An understanding of the processes of erosion is necessary in order to develop mechanical and vegetative control measures and to predict adequately sediment yields from watersheds. Agents of erosion are water, wind, ice, and gravity. To this list might be added human activities such as mining, clearing and excavation for buildings and other structures, highways, and many other functions.

Normal erosion, often referred to as geologic norm, is erosion of land in its natural environment undisturbed by human activity. Under natural conditions, geologic erosion is slow as vegetation affords protection against removal of materials made available for transportation by weathering processes. Disturbance of this cover by man's activity, such as clearing of vegetation and breaking of sod cover for construction purposes, disturbs the natural conditions, and the rate of erosion becomes greatly accelerated. The removal of natural cover from a particular area and subsequent construction activities may increase the erosion rate by a factor of more than one hundred.

Detailed studies have been undertaken on spatial contrasts in the rate of soil loss by sheet erosion from small areas, particularly erosion plots. Data from these studies have led to the development of the Universal Soil Loss Equation (Musgrave, 1974;[6] U. S. Department of Agriculture, 1961;[7] F.A.O., 1965;[8] Mircea, 1970;[9] Pretl, 1970).[10] This equation takes into account the influence of the total rainfall energy for a specific area rather than rainfall amount. This equation incorporates over 10,000 plot years of data from 1200 field plots located at 47 research stations in 24 states, and relates rate of soil loss to several controlling factors through an easily-applied prediction formula, which takes the form:

$$A = (R)(K)(L)(S)(C)(P)$$

where:
- A = average annual soil loss in tons/acre
- R = rainfall erosion factor
- K = soil erodibility factor
- L = length of slope factor
- S = steepness of slope factor
- C = cropping and management factor
- P = supporting conservation practice factor

These controls can be divided into two major types:

1) meteorologic or active influences (R) and
2) local condition or passive influences (K,L,S,C, and P).

The rainfall factor, R, is determined by the relationship, as reported by Wischmeier and Smith (1958):[11]

$$R = \frac{\Sigma EI}{100}$$

Where E is the storm energy in ft-tons/acre-in and I is the maximum 30-minute intensity in in-hr.

The rainfall factor is a measure of the rainfall energy or the capability of the local rainfall to erode soil from an unprotected field. It is derived on a storm basis as the product of the kinetic energy of the storm and its maximum 30-minute intensity. Annual values are obtained by summing the individual values for all storms with rainfall in excess of 0.5 in. Research has shown that this factor alone explains from 72-97 percent of the variation in individual storm soil losses from cultivated fallow soils in several U.S. states (Gregory and Walling, 1973).[12] The annual R values range from less than 50 in the western semiarid plain areas to more than 600 in the southeastern Gulf States.

The soil-erodibility factor K defines the inherent erodibility of the soil. It is expressed as the soil loss in tons per acre for each unit of rainfall-erosion index for the locality and for continuous fallow tillage on a nine percent slope, 75 ft. in length. Numerous factors influence erodibility of cohesive soils including texture, grain size distribution, nature of clay minerals, thickness and permeability of strata, and organic content. Present estimates of soil erodibility must be made on the basis of known erosion characteristics of the soil.

The slope-length-steepness factor, or soil-loss rates, LS, is determined by dividing the existing length and steepness by the standard nine percent slope, 73 ft. in length (Chow, 1964).[13] This ratio from any given slope conditions can be determined by means of a set of curves developed by the U. S. Agricultural Research Service (1961).[7]

The cropping and management factor is a complex one to evaluate, because of the many different cropping and management combinations which might be used in a given area. This is further complicated by the variable distribution of the rainfall-erosion potential during different period of canopy provided by the crop seedbed preparation and growth stages and before and after harvesting. A base value of C = 1 is used for clean-cultivated, fallow, straight-row, and up and downhill cultivation. All other values of C are less than 1.

The application of contour practices reduces soil erosion in varying amounts, depending upon the practices and the length and degree of slope. Where no contour practices have been applied and where the cultivation has been straight-row-up-and downslope, the practice factor P = 1. Application of contour practices reduces the factor to less than 1.

Solution of the equation, A - RKLSCP, for natural conditions at the proposed site indicate an annual yield of 3.2 tons of soil per acre. This value for A is obtained by:

$$
\begin{aligned}
A &= RK(LS)CP \\
&= (250)\ (.32)\ (.47)\ (.086)\ (1) \\
&= 3.2 \text{ tons/A/yr.}
\end{aligned}
$$

The period of greatest actual erosion loss will coincide with the months of maximum runoff as described in Section 2.6.2. Erosion rates will be considerably higher for areas which are void of vegetation or on unusually steep slopes.

2.5 HYDROLOGY

The physical, chemical, and hydrological characteristics of the surface and ground waters surrounding the site are discussed in the following subsections. The four hydrologic provinces discussed are the Broad River, the Ninety Nine Islands Reservoir, the site surface water, and the site groundwater. The current water sampling program is described in Section 6.1. Data collected through this sampling program is presented in 2.5.0-1.

2.5.1 THE BROAD RIVER

The Cherokee Nuclear Station is located on the west bank of the Broad River approximately 91 miles above its confluence with the Saluda River and just upstream of Duke's Ninety Nine Islands Dam and Hydro Station. The Broad River begins in the Eastern foothills of the mountains in Western North Carolina and flows in a southeasterly direction to a point near Gaffney, South Carolina. It then flows in a southerly direction to Columbia, South Carolina where it is joined by the Saluda River to form the Congaree. The Congaree joins the Wateree near Eastover, South Carolina forming the Santee River which flows southeasterly again into the Atlantic Ocean near Georgetown, South Carolina.

The Broad River has a length of approximately 185 mi and a drainage area of approximately 5,240 sq mi. The drainage area at the Ninety Nine Islands Dam approximately one-half river mile downstream from the river intake structure is 1550 sq mi. The drainage basin and a profile of the Broad River are
1 shown in Figure 2.5.1-1. Q2.7.1

The Broad River is generally wide and shallow. This is shown in Figure 2.5.1-2 by the high width/depth ratio at a number of cross sections taken at stations shown on Figures 6.1.1-1 and 6.1.1-2. The river also carries a large bedload comprised chiefly of sand.

During each sampling period, field streamflow measurements are taken as described in Section 6.1. Measurements taken during the months of October, 1973 through March, 1974, at the stations shown in Figures 6.1.1-1 and 6.1.1-2 give an average flow velocity of about 2.5 ft/sec. The average velocity at station 8, which is the first station above Ninety Nine Islands Reservoir, ranged from 2.0 ft/sec to 4.8 ft/sec. The estimated average daily discharge at Station 8 during these months have ranged from approximately 954 to 8588 cfs.

The nature of flow in the Broad River is characterized by the historical records from the three USGS gaging stations described in Table 2.5.1-1. Recorded flows at these stations are used to estimate streamflows at each sampling station where chemical and biological data are collected as described in Section 6.1.

The Gaffney gage (Station 4) is located approximately 5 river miles above the plant site and has approximately 60 square miles less drainage area than the river at the Ninety Nine Islands Reservoir Dam. The mean annual flow at the gage is 2,472 cfs. The maximum flow and month of occurrence for each year of the period 1939-1971 is given in Figure 2.5.1-3. The greatest flows of record have occurred in the months of August, September and October. The maximum discharge of record is 119,000 cfs.

The variations in mean monthly flows for the period from 1950 to 1969 are shown in Figure 2.5.1-4. The average monthly discharge for each month is shown in Figure 2.5.1-5. The months of February through April are times of consistently high flow, while July through November are characterized by the lowest monthly flows of the year. The discharge equalled or exceeded 95% of

the time at the Gaffney gage is 780 cfs. The seven day lowest average flow
2 with a recurrence interval of ten years is 470 cfs. The minimum daily flow Q2.5
of record is 224 cfs while the recorded instantaneous minimum flow is 140 cfs.

The average temperature of the Broad River ranges from approximately 5°C to 28°C. The lowest temperatures occur during January and February, the highest during July and August. Historical variations in temperature are shown in Figure 2.5.1-6, based on measurements from the USGS gages near Carlisle and Gaffney. Temperatures measured during the current sampling program are presented in Table 2.5.0-1. Preliminary data indicate that upstream river and tributary temperatures are slightly cooler than temperatures on the lake or downstream river areas.

During water sample collections a number of field measurements of stream conditions are made in addition to river stage and velocity. At each station water temperature, pH, conductivity, dissolved oxygen, and Secchi depth readings are taken. All these measurements are reported in Table 2.5.0-1. Figure 2.5.1-6 shows variations in temperature, pH, and conductivity measured over a period of several years at the USGS gages at Gaffney and Carlisle.

Temperature shows little or no abnormal fluctuation within the study system during the first six sampling periods of the current study. A high temperature of 25°C was recorded in September, 1973 at station 12 on the surface and a low of 3.3°C in February, 1974 at station 3. Upstream river and tributary stations are generally slightly cooler than stations located on the lake or downstream river areas.

Dissolved oxygen levels range from a low of 0.8 mg/L at station 9 (bottom) in Q2.7
September, 1973 to a high of 13.1 mg/L at station 15 in December, 1973. Oxygen levels fall below 5.0 mg/L at only two points during the September, 1973 sampling period. Both occur at bottom stations in the backwater areas (station 12 bottom, 1.0 mg/L and station 9 bottom, 0.8 mg/L). No other depletions of dissolved oxygen below 5.0 mg/L are recorded. Depletion of dissolved oxygen in backwater bottom areas is directly related to oxidation of organic material in bottom sediments. Saturation and supersaturation of dissolved oxygen occur at a number of stations during the first six sample periods. This is related to turbulence, mixing of water in the river areas, and biological activity in the backwater areas.

Specific conductivity readings within the study area generally range from 30 to 80 micro-mhos. Significant variations are recorded at a few stations during the three sampling periods. Backwater stations 12 and 13 exhibit elevated readings of 300 and 150 micro-mhos, respectively during the October 9 sampling. Station 11 (110 micro-mhos) exhibits slightly higher readings for the October, 1973 sampling. Tributary creek stations 3, 5, and 6 exhibit elevated readings (120 to 215 micro-mhos) during the December, 1973 sampling. Fluctuations in the backwater areas are possibly due to the release of dissolved materials in the bottom sediments, while tributary stream fluctuations are probably attributable to local effluent releases.

Hydrogen ion concentrations range from 6.0 to 8.6, with most readings occurring in the 6 to 7.9 range. Basic readings of 8.1 to 8.6 were recorded at river stations 1, 2, and 17 during the December 4 sampling, but do not appear to be related to any other factors recorded during that sampling period.

2.5.1.1 Bedforms

Bedforms are likely to be scoured in bedrock, formed from sand resulting in migrating dunes, created from alluvial bed material of mixed sizes forming pools and riffles, or produced by a combination of the above. Pools and riffles are by far the most common bedforms. At low flow, riffles are essentially resistant dams for each upstream pool. Energy expenditure over the riffles at low flow is considerably greater than that in adjacent pools. Therefore, little fine sediment such as sand or silt is found on riffles. At high flow the stepped water surface, characteristic of pools and riffles at low flow, tends to disappear and conditions may be exactly opposite to that found at low flow. That is, pools become areas of scour and thus ex-
1 pend considerably more energy than adjacent riffles. Therefore, although Q2.7.1
pools are quiet environments during low flow, they are harsh environments during high flow. The boundry between a pool and riffle is primarily a function of discharge. However, the basic morphology of these forms does not change through exposure to a variety of flow levels. In general, the most distinct break is between a riffle and upstream pool; the deepest part of the pool is likely to be fairly close to the adjacent downstream riffle.

Bedform surveys have been made on the Broad River above and below the proposed site. Between the Gaston Shoals impoundment and Highway 29, the Broad River channel is characterized by pools and riffles. The riffles are bedrock ridges cut in felsic shist, while the bed material in pools and that moving through riffles is entirely composed of a uniform sand.

Between Highway 29 and Cherokee Falls, a resistant outcrop of felsic gneiss forms a long continuous area of shallow riffles in which no pools have developed. From Cherokee Falls to Ninety Nine Islands reservoir, the stream is again characterized by bedrock highs (riffles) formed from shist, alternating with deeper pools in which the substrate material is nearly all sand. Below this reservoir another resistant gneiss bedrock outcrop creates a long, continuous shallow riffle area that gives way downstream to more pools and riffles. Below the Irene bridge, the pools become larger and much longer and the riffles smaller and less conspicuous. This dominance of pools is accompanied by steeper river banks, a diminution of sand beds, and the introduction of silt and mud substrates in the pools.

In summary, alternating pools and riffles cut in bedrock are the dominant bedforms of the Broad River above and below the site. Where bands of resistant gneiss cross the course of the river, they create anomalous shallow riffles. The bedload is mostly coarse sand making scoured rock outcrops and sand beds the two common substrate types.

2.5.1.2 Water Chemistry

The average and maximum values of important water quality parameters are given in Table 3.6.2-1. These values are based on information supplied by the USGS for gaging stations in the site area. Trends in pH, specific conductance, dissolved oxygen and temperature are shown in Figure 2.5.1-6.

Some data exist which reflect the magnitude of dissolved solids in river water and these are displayed in Figure 2.5.1-7. Water quality data collected for the site area are presented in Table 2.5.0-1. Heavy metal concentrations measured to date are presented in Table 2.5.1-5. The current sampling program is described in Section 6.1.

Water chemistry analyses of the Broad River near Parr, South Carolina are given in Table 2.5.1-2 as an indication of the water quality of the river below the site.

2.5.1.3 Sediment Transport

Water samples are collected at selected stations during each sampling period
using a depth integrating sampler to provide an estimate of suspended sed-
1 iment load. Samples are collected and analyzed using methodology described Q2.7.
in Section 6.1. Results from the first several sampling periods are pre-
sented in Table 2.5.1-3 and all suspended sediment concentrations are pro-
vided in Table 2.5.0-1.

Suspended sediment measurements on the Broad River for the first six sampling periods have been extremely variable with measurements ranging from 2 to 1284 mg/L. Sediment concentrations can generally be correlated with river discharge, but due to the number of factors affecting sediment quantity (recent agricultural practices, soil condition, rainfall intensity, etc.), no such correlation is evident in the data collected to date. Sediment concentrations in the late spring and summer should tend to drop off as flow diminishes, but variability of both sediment concentration and discharge demonstrated to date precludes making reliable projections.

2.5.1.4 Identification and Description of Pollution Sources

Municipal, industrial, and private waste discharges into streams have a significant effect upon both the quality of the water and the structure of aquatic communities. Table 2.5.1-4 is a compilation of dischargers into the Broad River and its tributaries from the counties of Spartanburg, Cherokee and York. The source, quantity and quality of discharges are indicated. Locations of all point sources are presented in Figure 2.5.1-8.

2.5.2 LAKE CHARACTERISTICS - NINETY NINE ISLANDS RESERVOIR

Investigations of the hydrology and hydrography of Ninety Nine Islands Reservoir are being conducted seasonally, as described in Section 6.1 This discussion is based on data from two detailed hydrographic surveys conducted in early fall and spring, and supplemented by general information from monthly water quality surveys. In addition to temperature, conductivity, pH and dissolved oxygen profiles, these surveys have included generalized mapping of bathymetry.

The forebay water elevations for the Ninety Nine Islands Reservoir remain at about elevation 510 feet throughout the year. The monthly fluctuation of water elevations from 1964 to 1973 is shown in Figure 2.5.2-1a. The normal change in elevation is about 1 or 2 feet, and the maximum change in elevation is about 6 feet. The area capacity curve on Ninety Nine Islands Q Reservoir is shown in Figure 2.5.2-1b. At elevation 510 feet, the reservoir 2.5.2 area is 325 acres and the corresponding volume is 2000 acre-feet. At elevation 506 feet, corresponding to the maximum drawdown during the past ten years, the reservoir area is 175 acres, and the storage volume is 1500 acre-feet.

Flow through the Ninety Nine Islands Reservoir is dominated by flow through the river channel which divides the reservoir into two backwater regions. The two backwater regions exhibit very little circulation during non-flood periods. Therefore, the average transit time through the reservoir Q is best estimated from the volume of the reservoir along the main channel 2.5.7 excluding the backwater areas. Based on a volume of 570 acre-feet along the main channel from the dam to a point about 0.7 miles upstream and an average flow of about 2570 cfs at the dam. The average transit time for water flowing through the reservoir is approximately three hours.

2.5.2.1 Morphology

Ninety Nine Islands Reservoir is characterized by three distinct hydrographic areas that have developed through time due to sedimentation since emplacement of the reservoir. The reservoir in its present state is a combination of two large backwater areas separated by the river channel and its associated sediment bars, spits, banks and covers. A preliminary bathymetric map prepared from the fall, 1973 hydrographic survey is presented in Figure 2.5.2-1.

Each of the backwater areas can be divided into two hydrographic sections: one paralleling the river-influenced channel areas, being separated from this channel by a spit area of sediment deposition, and the second located at the lower end of each backwater area perpendicular to the main stream flow. The shallow backwater sections parallel to the main channel areas contain large deposits of river-borne sediments and are heavily under the influence of the main river channel area, especially during flooding condition. The areas of backwater perpendicular to the river flow are much less influenced by main channel sediment transport. These sections exhibit deeper waters with shoreline and bathymetric profiles more reflective of local topography and original reservoir characteristics.

Amendment 1
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Amendment 2
(Entire Page Revised)

The river-dominated main channel area is characterized by a shallow sand and gravel bed, extending through the center of the reservoir area between the two major backwaters. Unlike the backwater areas, the main channel portion of the reservoir has a strong current and relatively homogeneous physiochemical characteristics.

River-borne sedimentation has greatly altered the reservoir from the original condition. Dredging in the dam area has been necessary to insure efficient operation of the hydroelectric generating facility. Large areas of the bed of the original reservoir have now been filled in completely and stabilized by heavy vegetational growth. In those backwater areas not already completely filled, observed changes in some water depths in the first six months sampling period illustrate the influence of heavy sedimentation.

2.5.2.2 Circulation and Mixing

Ninety Nine Islands Reservoir is characterized by three distinct hydrographic areas that have developed due to sedimentation patterns since emplacement of the reservoir. The reservoir in it's present state is a combination of two large backwater areas separated by the river channel and its associated sediment bars, spits, banks and coves.

Each of the backwater areas can be divided into two hydrographic sections: one paralleling the river-influenced channel areas, being separated from this channel by a spit of deposited sediments, and the second located at the lower end of each backwater area perpendicular to the main stream flow. The shallow backwater sections parallel to the main channel contain large deposits of river-borne sediments and are under little influence of the main river channel except during flooding conditions. The areas of backwater perpendicular to the river flow are even less influenced by sediment transport in the main river channel. These sections exhibit deeper waters with shoreline and bathymetric profiles reflective of pre-impoundment topography and original reservoir morphology.

Circulation and mixing in Ninety Nine Islands Reservoir are influenced primarily by two factors, discharge and temperature. The central, river-influenced channel is almost completely dominated by river discharge and accounts for the primary circulation pattern of the reservoir during non-flood periods. Currents through this area, while less than those in the river proper, are much stronger than normal for an impounded stream. Temperature and chemical constituents are homogeneous at all depths due to through turbulent mixing.

Backwater areas exhibit a very different flow regime. Little circulation of these waters is evident during non-flood periods with stagnation common during low flow periods. The backwater areas are largely influenced by temperature and tend to stratify during periods of warm weather with accompanying oxygen depletion in bottom waters, even in shallows less than one meter deep.

Wind apparently has little effect upon circulation in these backwater areas, being protected by topographic relief and towering floodplain forests. Lower than normal dissolved oxygen (D.O.) concentrations result from decomposition of organic sediments and poor circulation. Flooding greatly alters normal hydrologic structure. Washover from the river-channel portion of the reservoir during high flow tends to flush waters from the upper backwaters toward the lower reservoir. During these periods, extremely turbid conditions prevail throughout the impoundment due to import of the river-borne sediments and the resuspension of lake sediments.

Inspection of temperature and dissolved oxygen data from Lake Stations 9, 10, 12, and 13 (Table 2.5.2-1) permit one to make sound conclusions regarding the extent and duration of thermal stratification and hypolimnetic oxygen depletion in Ninety Nine Islands Reservoir. Q 2.5.

Thermal stratification breaks down during September. In late fall, winter and spring months, water temperatures are fairly homogeneous throughout the water column. Vertical mixing or longitudinal flushing by the river maintains an adequately mixed water column so that the entirety of both backwater areas is habitable by fish populations throughout this period. However, owing to their greater depth and positioning relative to the flushing direction, backwater areas represented by Stations 10 and 12 are more subject to a pronounced vertical gradient in D.O. than areas parallel to the flushing direction. Thermal stratification and hypolimnetic oxygen depletion reappear at Stations 10 and 12 in spring (late April) much sooner than at Stations 9 and 13 (late May). This condition persists throughout summer, except for minor flushing incidents owing to rises on the river and breaching of the sand bars. Such an occasion appears to have occurred in mid-June but had little or no effect on bottom oxygen concentrations at Stations 10 and 12. Stratification is expected to persist until mid-September or late September, as in the year previous.

2.5.2.3 Summary and Projections

Ninety Nine Islands Reservoir may be expected to conform to those characteristics already outlined for this sytem. The central river-dominated channel area should remain the primary flow area within the reservoir, with backwater areas much less influenced by river inflow. The low water conditions which are expected to predominate during the summer months, along with accompanying high temperatures, should result in extended periods of backwater stagnation and lower dissolved oxygen levels. Anerobic conditions can be expected in deeper backwaters during stagnant periods from oxygen consumption due to decomposition of organic materials. Biological productivity is anticipated to increase in surface waters, being limited by the availability of nutrients. Periods of maximum productivity should occur following episodes of flushing or mixing from temporary storm related heavy discharge. Q 2.7.

2.5.3 SITE SURFACE WATER

The Cherokee Nuclear Station has a Nuclear Service Water (NSW) Pond, Intake Sedimentation Pond, and an Auxiliary Holding Pond constructed on the site. The construction of earth dams, and general clearing and grading required to form these impoundments are shown on Figure 2.1-2.

The Nuclear Service Water Pond formed by a dam which impounds McGowan Creek northwest of the plant buildings. The crest elevation of the dam is 590 ft. The surface area of the pond at its normal elevation of 570 ft. is 173 acres, approximately 11 per cent of the total drainage area of McGowan Creek. The NSW Pond capacity curve is shown in Figure 2.5.3-1. Inflow and Outflow rates for the NSW Pond are presented below:

Inflow	Minimum	Average	Maximum
Natural Drainage, cfs	1	8	22,732 (PMF)
Outflow			
NSW (As Ult. Heat Sink), cfs	117	-	234
Cooling Tower Makeup (NSW), cfs	-	-	4
Seepage and Evaporation, cfs	-	1	4
Flood Discharge (PMF), cfs	-	-	5,363

Q 2.5.3

The intake Sedimentation Basin is located east of the plant site. It is formed by a dam constructed across a backwater arm of the Ninety Nine Islands Reservoir. The crest elevation of the dam is 550 feet. The surface area of the pond at elevation 550 ft is 100 acres. The basin capacity curve is shown in Figure 2.5.3.2. Inflow and Outflow rates for the Intake Sedimentation Basin are presented below:

Inflow	Minimum	Average	Maximum
Natural Drainage, cfs	0.2	2	2,000 (SPF)
River Pumping, cfs	-	90	122
Outflow			
File Protection, cfs	-	-	5
Cooling Tower Makeup (CCW), cfs	-	-	108
Station Service Water, cfs	-	1	5
Flood Discharge (SPF), cfs	-	-	360

Estimates of mean monthly flows of the site creeks are presented in Table 2.5.3-1. Q 2.5.6

The Auxiliary Holding Pond is located directly north of the plant. It is formed by constructing a dam across a backwater arm of Ninety-Nine Islands reservoir. The crest of the dam is at elevation 525 ft.

4 The capacity curve for the Auxiliary Holding Pond is shown in Figure 2.5.3-3.

2.5.4 GROUNDWATER

The Cherokee site lies within a groundwater region which is part of the Piedmont Groundwater Province. Groundwater in this area is derived entirely from local precipitation. The surface materials in many locations are relatively impermeable with the result that only 10 to 15 inches of the average 45 inches of precipitation percolate to the water table. Groundwater is contained in the pores that occur in the weathered material (residual soils) above the relatively unweathered rock and in the features in the igneous and metamorphic rock. Although generally the depth to the water table depends on climate, topography and rock type, in the region around the site the depth depends primarily on topography and rock wethering because there is little variation in the hydrologic properties of rock types within the area. Over the region, the water table varies from ground surface elevation in valleys to more than 100 feet below the surface on sharply rising hills, the groundwater level normally declines during the late spring, summer and early fall months as a result of evaporation and transpiration by plants, and in the fall rainfall is low. The groundwater level rises in the late fall and winter when the evaporation potential is reduced.

Shallow dug wells are supplied by groungwater from residual soils or from the upper decomposed parts of the bedrock. Many drilled wells of moderate depth are supplied by groundwater from joints in the crystalline rocks. The water quality is excellent, generally low in minerals, except in some cases iron. The quantities of water available are generally small.

There are numerous localized perched water tables, restrained by less pervious zones of rock and saprolite, as well as very localized artesian aquifers. These artesian aquifers are generally related to isolated but well developed rock cracks, generally in higher ground.

2.5.4.1 Site Groundwater Hydrology

The occurrence, location and movement of groundwater at the site are controlled by the local topography and permeability. Permeability is controlled by the extent and distribution of fractures in the bedrock, and by the size and distribution of pores in the overlying soil. Gradients are controlled by topography and permeability. Measured depths from the ground surface to the groundwater table on the ridges range from about 40 to 80 feet. The groundwater table is generally at or near the surface in the valleys and draws. Groundwater recharge is from precipitation and is controlled by the permeability of the upper soil horizons and by topography.

2.5.4.2 Permeability

The permeability of a material is a measure of its ability to transmit water. The permeability and porosity, along with the water table gradient, determine the rate of water movement in the soil or weathered rock pores, and in cracked zones in the rock. Table 2.5.4-1 shows the results of 55 rock permeability tests made in 17 borings across the site. Similarily, Table 2.5.4-2 indicates the results of 42 field and 38 laboratory tests of soil permeability.

The effective permeability of the rock mass is found to be low. Test results show the permeability to range from 0.0 to less than 900 feet per year, with an exception observed in borings B-23, B-119, and B-126 where permeabilities of from 1203 to 4314 feet per year were found to exist. These higher permeabilities are measured in a zone of very closely jointed rock. At each of these locations there was a loss of drilling fluid. At Boring B-23 there is a vein of quartz pegmatite intersecting the boring in an interval of high permeability. In general the higher values of permeability are associated with cored sections classified as moderately hard, closely jointed felsic gneiss with weathered zones.

Soil permeability in the vertical direction is measured by laboratory tests while horizontal soil permeability is determined from field tests. The higher values of soil permeability, which range up to 582 feet per year, are measured in residual soils having the texture of a silty fine to medium sand. The lower values are measured in fine to medium sandy silt and partially weathered rock and are less than 1.0 feet per year. The higher values of soil permeability are less than the higher values measured by the packer tests in rock. However, even the larger values of permeability are relatively small when compared with soils such as water deposited sands through which water moves more readily, and the lower values of permeability on this site represent material that is almost impermeable.

2.5.4.3 Well Survey

To determine the general groundwater environment surrounding the proposed site, a survey is made of the wells and springs in the general area of the site providing domestic water. The locations of 39 wells and 4 springs are shown on Figure 2.5.4-1 and the available information on these wells are incomplete because the owner or driller could not be contacted, or the owner or driller did not possess complete information on the wells.

Regional groundwater studies are consulted in order to augment the information on domestic wells in the region.[1, 2] These sources indicated that most domestic wells are not drilled to develop maximum yield, that the wells are generally shallow (less than 150 feet in depth), and have a flow rate of from 3 to 150 gallons per minute with a median flow rate of 7 gallons per minute. The flow values shown in Table 2.5.4-3 appear consistent with these estimates.

Dates on which water table elevations were measured are given in Table 2.5.4-4. Groundwater contours shown in Figure 2.5.4-1 are based on dates and elevations given in Table 2.5.4-5. Groundwater contours shown in Figure 2.5.4-2 are based on groundwater observations made in July, August, and September, 1973.

No information regarding long term groundwater fluctuations in the immediate vicinity of the site has been located. However, Bloxhem[1] presents a well hydrograph of eight years duration for a well located at the Greenville-Spartanburg airport. Fluctuations in this well may be taken to be indicative of water table fluctuations at the site. The above hydrograph indicates that water levels are at a maximum in April or May, decline to a minimum in November, December or January. Average annual fluctuations are on the order of 1 to 2 feet, and the maximum total fluctuation (record maximum minus record minimum) is about 3 feet. Q 2.5.1

LeGrand3 presents a hydrograph for a well in Davie County, North Carolina, which has characteristics similar to the Greenville well, but indications average annual fluctuations of about 6 feet, and a maximum total fluctuation of 13 feet.

The short term data collected at the site thus far indicate water level fluctuations in the order of 2 feet over the period from October, 1973 through April, 1974, and thus, the Greenville well hydrograph seems to illustrate the typical water level fluctuations at the site.

2.5.4.4 Quality of Groundwater

The chemical and bacteriological quality of the groundwater in the vicinity of the site is high. Groundwater from this area is suitable for domestic use without treatment. Chemical and physical tests conducted on water from 13 wells and 6 springs located around and on the site, show the water from both the wells and springs to be low in mineral content. The water from the springs is slightly acidic. The mineral content in the wells and springs is as low or lower than average values found in the surrounding area.

The results of the chemical and physical tests are shown in Table 2.5.4-4. The location of the wells and springs from which the samples are taken are shown on Figure 2.5.4-1 and 2.5.4-2. In addition, Table 2.5.4-4 presents quality tests run on water samples from three borings located on the site. The results of these tests are similar to those from the wells and springs, except for those parameters, such as turbidity, affected by the drilling operation.

2.5.4.5 Groundwater Levels and Movement

Observations of groundwater levels made at about 60 locations in the immediate area of the proposed site are the basis of contour map of the groundwater table shown on Figure 2.5.4-2. The elevation of the groundwater table varies from about 10 to 60 feet below ground surface near the proposed location of the Reactor Buildings and approaches the ground surface in the nearby valleys. Thus, groundwater movement is from the plant area toward the low areas to the north, east, and west of the site. All groundwater movement from the plant area is toward the Broad River, which acts as a groundwater sink to the site and the surrounding area. Two cross sections through the site illustrate the relation between the topography groundwater elevation and rock elevation (see Figure 2.5.4-3).

Flow measurements made downstream of springs 6, 8, and 17 (see Figure 2.5.4-2) during late October and early November, 1973 indicate a flow of 11 gpm below 6, 3 gpm below 8, and 16 gpm below 17. These springs are considered typical of the numerous springs around the site. The Groundwater Contour Map (Figure 2.5.4-2) is used to compute the expected discharge from these springs based upon an average permeability of 200 feet per year. These computations indicate expected discharges of 3 gpm, 2.8 gpm and 1.9 gpm respectively for the three springs. The result for spring 8 agrees closely with the measured value. The discrepancies in computed and observed discharges below springs 6 and 17 are probably due to the existence of rock joints in these areas. It should be noted that the permeabilities required to make measured and computed values agree (about 800 feet per year at spring 6 and about 1700 feet per year at spring 17) and are within the range of permeabilities measured over the site.

The effects of the local uses of groundwater in the area surrounding the site upon the area groundwater depths and gradients are very small. The nearest private residential well in the area continuing in use after the construction of the plant is more than 4000 feet away from the Reactor Buildings. The locations of the wells in the area in relation to the proposed plant site are such that no groundwater flow from the plant toward the wells can be expected, even under extreme conditions.

To confirm the fact that no groundwater flow exists from the site toward groundwater users, several offsite observation wells are installed and water levels in these wells determined. The locations of these wells are shown in Figure 2.5.4-1, and the elevations of the water table in these wells are given in Table 2.5.4-5. Groundwater contours at 50 foot intervals are sketched on Figure 2.5.4-1. These data confirm the fact that no flow occurs from the site toward any present groundwater user.

The proposed elevation of the plant yard is below the present elevation of the groundwater table in the southwest corner of the plant site. The major structures are all below the groundwater table. The lowering of the groundwater table in this area, necessary to accommodate the proposed construction, and the rise in the groundwater table which follows the filling of the NSW and Intake Sedimentation Ponds combine to produce local redirections in the flow of groundwater. Such redirections of flow as occur are limited to the immediate area of the site and do not represent a diversion of groundwater from the Broad River. These local redirections are not expected to cause a flow of groundwater from the site toward any present or future user.

Figure 2.5.4-4 shows readings taken at two borings by water level recorders and the readings of the Ninety Nine Islands precipitation gate. These data show that the maximum groundwater fluctuation from 8/15/73 to 1/1/74 is about one foot at boring B-77 and at boring B-51 is essentially zero. It is not possible to obtain a definite correlation between groundwater fluctuation and rainfall from the data in Figure 2.5.4-4. This fact indicates that the groundwater table at the site responds slowly to precipitation, probably as a result of the relatively impermeable soils and steep ground slopes at the site.

2.5.5 WATER QUALITY STANDARDS

Compliance with all applicable water quality standards and requirements is a criterion for the construction and operation of Cherokee Nuclear Station. Relevant regulations and requirements are contained in Appendix 1. The status of all applications and permits affecting plant construction and operation is discussed in Section 12.1.

The Broad River, which will supply cooling water to Cherokee Nuclear Station, is classified B (Section IV, page 7) pursuant to Water Classification Standards System for the State of South Carolina adopted September 8, 1971. Water Quality Standards applicable to Class B waters are specified for phenolic compounds, pH, dissolved oxygen and fecal coliform. Additionally, general water quality criteria (Section III, p. 3-6) are to be maintained in the State waters. Q 2.5.

A text of these standards is included in Appendix I.

2.6 METEOROLOGY

All analyses which use onsite data are based on one continuous year of data collected from September 11, 1973, through September 11, 1974. The results of this section, therefore, supersede the results of Section 2.6 of the original Cherokee Environmental Report and Section 2.6 of Amendment 1 of the Cherokee Environmental Report.

2.6.1 GENERAL

Synoptic features during winter effect rather frequent alternation between mild and cool periods with occasional outbreaks of cold air. Such intrusions of cold air, however, are modified in the crossing and descent of the Appalachian Mountains. Summers, noted for their greater persistence in flow pattern, experience fairly constant trajectories from the south and southwest with advection of maritime tropical air. Wintertime precipitation occurs primarily in connection with migratory low pressure systems. Recurrence and areal distribution, therefore, are reasonably uniform. Summer rains on the contrary are associated more with showers and thundershowers of the air mass variety, occasioned by intense and uneven heating of the earth's surface. Q 2.6.1

Temperature in the local area is generally mild with monthly averages ranging from about 43° F in January to about 79° F in July. Extremes noted are 5° F and 104° F. Precipitation is fairly uniform from month to month with normal totals for the year of about 47 inches. Record maximum and minimum monthly totals are 12.00 inches and 0.04 inch respectively. Highest 24 hour total is 6.85 inches. Highest snowfalls are 11.8 inches by month and 11.2 inches for 24 hours. Fastest mile of wind is noted at an average speed of 57 mph. In this area of the Southeast, significant local circulations often result during periods of weak synoptic circulation. These effects, usually induced by the local terrain, are responsible for a redistribution of wind directions and speeds from those expected in the absence of local terrain. Therefore, meteorological measurements at any site are expected to differ from the regional airport observations, particularly wind direction observations under weak synoptic conditions. This difference is verified by onsite data collected for this project. Q 2.6.3

Severe weather, although infrequent, is most likely from March-October. During this season wind, water, and hail damage can result from the thunderstorm, tornado, and tropical storm (or hurricane). For the area of North Carolina, South Carolina and their coastal waters, an average of one tropical storm per year and one hurricane every other year has been computed based on a period of record of 63 years.[2] Within this period, seven years were void of any activity while nine years produced a combined total of three storms per year. For the period 1871-1963 a total of 30 tropical cyclones passed within 50 miles of the plant site of which 8 were hurricanes, 13 were tropical storms and 9 were tropical depressions. (Q 2.6.9) The frequency of thunderstorms observed in the site area can be represented as the average number of thunderstorm occurrences by season. These averages are: 11 for spring (March-May), 30 for summer (June-August), 6 for fall (September-November), and 2 for winter (December-February). (Q 2.6.11) A total of 50 tornados were observed in a two degree square (square area about 125 miles by 125 miles) over the site area for the period 1916-1955.[3] To put in terms of probability for the site itself, such a translation predicts a recurrence interval of 4405 years.[4] Ice storms can be expected several times a year; typical accumulations range from one-quarter to one-half inch. No quantitative records are maintained by the government weather service on ice levels from freezing rain. Q 2.6.10

Table 2.6.1-1 depicts normal and extreme values for the following parameters: temperature, rain, sleet and snow, fog, relative humidity, dew point, wind direction and speed.[1] Also in this table the dates and places of occurrence of extreme values are shown, as well as the periods of record for each parameter. Stations included from which data was taken to derive Table 2.6.1-1 were: Spartanburg Airport, 30 miles west-southwest of the site, Greenville Airport, 50 miles west-southwest of the site and Charlotte Airport, 35 miles east-northeast of the site. Q 2.6.2

3 Conditions assumed for design are addressed in the Cherokee PSAR Subsection 3.3.2.1 for tornado loadings and in Subsection 3.8.1.3 for general wind and snow loadings. Criteria for design tornados include a rotational speed of 300 mph, a translational speed of 60 mph and a vacuum pressure differential of 3 psi in 3 seconds. Design speed for general wind loadings is 95 mph (fastest mile). Snow loading for design purposes is 20 lbs per ft^2 (water equivalent, 3.8"). Q 2.6.8

Air pollution over the Carolinas is of greatest potential during the fall. An average of ten episode-days per year has been computed for a period of five years.[5] Q 2.6.12

Climatological data from local airports can be taken as representing long-term conditions at the site with the exception of wind direction and speed which do not reflect the pronounced effects of site topography as it affects the shielding and channelling of winds and the induction of nocturnal drainage flows. The wind and stability characteristics of the site and the relationship of these parameters to the corresponding parameters at the Greenville-Spartanburg Airport are discussed in detail in the following sections. Q 2.6.1

2.6.2 SHORT TERM (ACCIDENT) DIFFUSION ESTIMATES

2.6.2.1 Objectives

Conservative and realistic estimates of atmospheric dispersion factors at the site boundary or exclusion area and at the outer boundary of the low population zone are provided in this section for appropriate time periods to 30 days after an accident. Data collected onsite from September 11, 1973 through September 11, 1974, provides the bases for the dispersion factor (X/Q) estimates for an inadvertent release of radioactive material. This full year of onsite meteorological data is assumed to be a representative data base for X/Q estimates over an extended time period.

2.6.2.2 Results

4 Table 2.6.2-1 (Sheets 1-7) displays the joint frequencies of wind direction and speed by atmospheric stability type as they were observed onsite at the 30 foot level. Calms are defined for this table as wind speeds less than one mile per hour. The recovery of joint wind speed, direction, and stability data for this Q4

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one year period was 93.42 percent of the total possible hourly observations. This distribution is the basis for all onsite X/Q estimates. A more detailed discussion of the wind and stability characteristics observed during the field measurement period follows the presentation of long-term diffusion estimates in Section 2.6.3.

Figures 2.6.2-1 and 2.6.2-2 represent the distributions of hourly dispersion factors at the exclusion area boundary (2500 feet) and the low population zone boundary (26400 feet) respectively for the period of record. The distribution are calculated for the shortest distance between the boundary of interest and the nearest reactor vent; that is, 1960 feet at the exclusion area boundary and 25860 feet at the low population zone boundary. The locations of the vents with respect to the center of the exclusion area boundary is shown on Figure 3.1.0-4. The 95 percentile X/Q value at the exclusion area boundary is noted as 2.5×10^{-3} sec/m^3, and the corresponding 50 percentile X/Q value is noted as 2.2×10^{-4} sec/m^3. At the low population zone boundary the indicated 95 percentile X/Q value is 1.5×10^{-4} sec/m^3, and the 50 percentile X/Q value at this distance is 9.6×10^{-6} sec/m^3.

Estimates of the dispersion factors for intermediate averaging times (greater than hourly but not more than 30 days) at the low population zone boundary are required for the worst value (100 percentile) and the 95 percentile and 50 percentile levels. Table 2.6.2-4 (Sheets 1-4) include the cumulative frequency distributions for averaging times or "windows" of 8 hours, 16 hours, 72 hours, and 624 hours. These distributions correspond to times of 8 hours, 24 hours, 4 days, and 30 days following an accidental release.

The 100, 95, and 50 percentile X/Q values have been extracted from the frequency distributions and summarized in Table 2.6.2-5 for convenience.

2.6.3 LONG TERM (ROUTINE) DIFFUSION ESTIMATES

2.6.3.1 Objectives

Realistic estimates of annual average onsite atmospheric dispersion factors are provided in this section - Three separate analyses comprise this section:

1) A spatial distribution of annual average X/Q values is generated assuming advection and diffusion are the primary plume dispersion and transport processes.

2) A value for Man - X/Q is calculated as a population weighted annual average value within a 50 mile radius of the site.

3) Annual average X/Q values for computing radioiodine dosage through milk and leafy vegetables is produced considering the role of dry deposition in plume depletion in addition to the advection and diffusion of the plume.

Onsite data from September 11, 1973, through September 11, 1974 provides the basis for the dispersion estimates. These estimates are assumed to be representative of long term X/Q values anticipated for an extended time period.

The wind and stability characteristics of the site and the relationship of these parameters to corresponding regional airport parameters are discussed with respect to their effect on the resulting X/Q values.

2.6.3.2 Results

The areal distribution of annual average normalized concentrations is presented in Table 2.6.3-1 (Sheets 1-10) and in Figure 2.6.3-1 (Sheets 1-3). The highest X/Q value occurs at the exclusion area boundary (radius of 600 m) at a receptor located east southeast of the plant (angle - 100°). The X/Q value at this receptor is 2.9 x 10^{-5} sec/m^3.

The Man-X/Q value for the entire area within 50 miles of the Cherokee site is 6.4 x 10^{-8} sec/m^3.

As a basis for estimating the effect of radioiodine through the milk pathway
and the vegetable pathway, annual average dispersion factors were computed for
farms and for cows and goats producing milk for human consumption. The X/Q
3 values for the farm and the dairy animals with the highest expected dosage pot-
ential were computed from a X/Q distribution generated as described above. Farm
locations were determined from Table 2.2.2-1a of the Cherokee Nuclear Station
Environmental Report, and locations of dairy animals being milked were deter-
mined from Table 2.2.2-1b of the same document. The highest farm X/Q value,
referring to the vegetable pathway, is 2.0 x 10^{-7} sec/m^3. The highest cow and
goat X/Q values, referring to the milk pathway, are 1.8 x 10^{-7} sec/m^3 and
1.6 x 10^{-8} sec/m^3, respectively.

The result of each of the above long term dispersion analyses appears in Table 2.6.2-5.

As has been stated distribution of wind direction and wind speed at the site
is affected by site topography. Figure 2.1-1 and the site plot plan indicate Q2.6.7
the large scale topographical features, the existing features of the immediate
plant environs before construction, and proposed excavation and structures
after construction. The existing meteorological towers are approximately
1600 feet from the nearest reactor vent. Because of the proximity of the
existing towers to the reactor site, we expect existing 10 meter wind conditions Q2.6.3
to be similar over the distance between the tower and the reactor vents.

The present towers are located on a gentle slope with a basically southwest-
northeast orientation toward the Broad River. This gentle slope will be
replaced by several plateaus: a uniform 590 feet MSL reactor yard, a two
level 600 feet and 630 feet MSL switch yard complex, and a 610 feet MSL cooling
tower base level. The orientation of the site will remain basically south-
west-northeast with a small ridge rising to 800 feet southwest of the plant and Q2.6.13
the Broad River at an elevation of nearly 510 feet northeast of the site.
The overall orientation of the Broad River in the vicinity of the site is
north-northwest to south-southeast. It is likely that small changes in wind
speed and direction distributions will be experienced due to slight alterations
in local topography. The precise effect of construction on local winds cannot
be predicted. Because of the clear presence of these winds, future wind
measurements both during and after construction will be examined to identify
any alterations due to the presence of the plant.

It is important to identify recurring local meteorological phenomena peculiar to the site. Toward this end, Table 2.6.3-2 (sheets 1-7) shows the joint frequencies of wind direction and speed by atmospheric stability type as they were observed onsite at the 130 foot level. Compared with Table 2.6.2-1 a significant redistribution of direction frequencies is evident particularly in the stable categories. The low tower has significantly more occurrences of winds in the four sectors west-southwest, west, west-northwest, and northwest than the high level tower. Alternatively, the high tower experienced more winds in the three northeast sectors and in the southerly sectors south through southwest. The observations are most evident under G stability and are not observed in the unstable conditions. Table 2.6.3-3 and Table 2.6.3-8 depict the high level and low level wind characteristics at the site by month. Q 2.6.16
The apparent wind shifts at the low level toward the four sectors west-southwest through northwest are evident throughout the year of onsite measurements.

Table 2.6.3-4A is a summary of wind direction and wind speed frequencies for Greenville-Spartanburg Airport during the coincident period based on 3-hourly observations through August, 1974. Wind speed measurements were made with the U. S. Weather Bureau F-420 C anemometer with a starting threshold of 2-3 mph and an accuracy of ± 1.5 mph at 32.4 mph, 62.4 mph, and at 92.5 mph[6] Calms as reported by the National Weather Service are winds with speeds below the anemometer starting threshold.[7] A wind speed of 2 knots (2.5 mph) is occasionally reported but such conditions are usually recorded as calms. Table 2.6.3-5 is a comparison of the Greenville-Spartanburg wind direction frequencies and the low tower site data for all wind directions. The site experienced significantly more winds from the four sectors west-southwest through northwest. In contrast, winds from the northeast sectors and the south through southwest sectors are more frequent at the airport than at Cherokee. It appears that light gradient winds from the south-southwest and neighboring sectors and light gradient winds from the northeast sectors are often accompanied by uncoupled, drainage flows at the lower level.

Q 2.6.6 Q 2.6.4 Q 2.6.5 Q 2.6.15 Q 2.6.3

A careful look at the hourly site data reveals many examples of these local effects. From November 11 through November 13, 1973, the gradient flow was southwest in a weak synoptic circulation. A strong surface based temperature inversion was established each night, and a shift to northwesterly wind was observed even at the high tower. The slowly changing synoptic situation is characterized by the November 13 surface analyses. Data illustrating these points is contained in Table 2.6.3-6 and Figure 2.6.3-2. During February 1 through February 3, 1974, the gradient flow was from the southwest. During the morning of the first, a strong inversion was observed and windshift to the northwest was observed at both levels. The following morning was accompanied by a weaker inversion and a marked northwest wind shift at the low level only. The third morning was accompanied by less stable conditions and no wind shift at either level. Data illustrating these points is contained in Table 2.6.3-7 and Figure 2.6.3-3.

The local influences, as observed above, can be summarized. Local drainage flow from the northwest and west is commonly observed at the low level tower during south to southwest and during northeast gradient flow. This flow was observed during all months and sometimes penetrated the 130 foot level.

To extend the analyses from the onsite data record to a longer time period, it is necessary to assess the representativeness of the observed meteorology for Q 2.6.7

estimating dispersion conditions at the site. Tables 2.6.3-4A, 2.6.3-4B and 2.6.3-4C facilitate such an assessment. Table 2.6.3-4B presents the wind direction and speed frequencies observed at the Greenville-Spartanburg Airport for the five year period 1968-1972 for comparison with the corresponding data for the period September 11, 1973 through August 31, 1974 which appears in Table 2.6.3-4A. Table 2.6.3-4C compares daily cloud cover for the onsite period of record with normal daily cloud cover statistics by month at the Greenville-Spartanburg Airport.

Q 2.6.7

Q 2.6.14

The wind direction distributions show no significant differences for the on-site period as a whole. The relative frequencies by direction are strikingly alike; while several individual months such as September 1973 and January 1974 show minor and random differences. No long term trends were observed, however, which would bias the X/Q estimates. The wind speed estimates show the most pronounced differences with respect to frequency of calms. The fall and summer months were more calm than normal, while the winter and spring months were somewhat less calm. The period averages show only minor differences; and if any effect of these differences is reflected in the X/Q values the calm tendency during the poorest dispersion months would yield conservative X/Q estimates. A comparison of cloud cover as presented in Table 2.6.3-4C reveals only slight deviations from normal. April, July, and October were isolated months with lower than normal cloudiness, while August was more cloudy than normal. The combination of a high frequency of calms with more than normal clear days in July would yield conservative X/Q values, but no other significant differences are noticeable.

These comparisons indicate that the onsite period of record was a representative period for assessing dispersion conditions at the Cherokee site.

2.6.4 SUMMARY OF DIFFUSION ESTIMATES

Table 2.6.2-5 depicts dispersion factors for each type of release at appropriate distances, averaging times, and percentile values. This summary table presents the dispersion factors as derived directly from the one year of onsite data collected at the site. This one year of data is considered a representative data, base for estimating dispersion conditions at the site for an extended time period.

2.7 ECOLOGY

Q2.7.1
Q2.7.2

2.7.1 TERRESTRIAL ECOLOGY

2.7.1.1 Vegetation

In the vicinity of the proposed Cherokee plant site on the Broad River, there are a variety of vegetation types characteristic of the South Carolina Piedmont. The Piedmont is an irregular patchwork of fields and forested areas of all sizes. Timber stands are of several ages, and individual stands are usually even-aged.

2.7.1.1.1 Regional Vegetation Systems

Plant communities belonging to four major North American plant associations are potentially found at the Cherokee site (1). These associations are the Oak-Hickory-Pine Forest, the Appalachian Oak Forest, the Southern Floodplain Forest and the Northeastern Oak-Pine Forest. Table 2.7.1-1 is a list of plant communities which may be expected in the region. Cover types are listed with the corresponding SAF Type Number (5).

In the Forest Atlas of the South[2] three major forest types are listed for the same area: Oak-Hickory, Loblolly-Shortleaf pine, and Oak-Pine. The Oak-Gum-Cypress Forest is listed as occurring on the lower reaches of the Broad-Congaree-Santee River system. In Major Forest Types of North Carolina[3] and Major Forest Types of South Carolina[4], four major forest types are listed for each of these same areas: Oak-Hickory-Scrub Oak, Shortleaf Pine-Virginia Pine-Loblolly Pine, Hardwood-Pine, and Swamp-Bottomland Hardwoods. Table 2.7.1-2 lists the different communities, indicating synonomy of unit names where applicable.

2.7.1.1.2 Plant Communities of the Cherokee site

The plant communities of the Carolina Piedmont Plateau region can be grouped into two broad categories: (1) those in which succession has not been interrupted, and (2) those in which succession is drastically interrupted on a continuous basis by man (6,7). The former category is called a "natural community" and the latter category is called a "man-dominated community."

Within the site boundaries of the Cherokee Nuclear Station, eight major community types are found. The general descriptions of the communities are, for the most part, the same as given by Moore (6,7). These communities are representative both of the site, in particular, and of the Piedmont, in general. The Cattail Marsh community is an example of early primary succession, occurring in backwaters behind 99 Islands Dam. The most unique site community, primarily for aesthetic reasons, is the Hardwood-Mountain Laurel community which occurs on steep, north-facing bluffs and slopes.

Since transitional areas separate communities, many species overlap between communities. These transitional zones increase species diversity within adjacent communities. A vegetation map is presented as ER Figure 2.7.1-1. Q 2.7.19

Plant communities were sampled along transects by plotless techniques. The major community types of the site were then studied by detailed quadrat analysis. Vegetation study methods are described in Section 6.1.4.3.1. No rare or endangered species were found.

Cattail Marsh

This community occupies wet depressions in alluvial areas. The substrate is often covered by shallow standing water, but it may periodically dry to a mud flat. Over time, the marsh will gradually be filled in and become a swamp forest or alluvial forest. The dominant species of this community is the common cattail (Typha latifolia). ER Table 2.7.1-3 depicts the species composition, dominance values and constancy indices for replicate stands of the cattail marsh community.

ER Table 2.7.1-4 presents the relative density, relative frequency, relative dominance and importance values for plant species in cattail marsh Stand No. 24. The marsh proper was comprised of a homogeneous population of cattail (Typha latifolia). No true tree layer was present, but dense growths of black willow (Salix nigra), boxelder (Acer negundo), cottonwood (Populus deltoides), silky dogwood (Cornus ammomum), and elderberry (Sambucus canadensis) lined the periphery of the marsh.

Most herbaceous species occur between the woody and cattail zones with sedges (Carex spp.), spike rush (Eleocharis obtusa), rushes (Juncus effusus), bulrushes (Scirpus validus) and knotweed (Polygonum cespitosum) the most dominant species. Arrowhead (Sagittaria latifolia) is also characteristic of this successional stage. Successional trends in this community type lead to the gradual deposition of soil and colonization by woody trees and shrubs. Boxelder, black willow, cottonwood and river birch (Betula nigra) were well represented in the seedling and sapling layers and these species are rapidly colonizing the drier areas.

Alluvial Forest

The Alluvial Forest is a closed canopy forest situated on sandy silt islands or along tributaries to the major rivers. The high diversity of species and the large size of the trees in the Alluvial Forest are due mainly to the rich alluvial soil and the high availability of water. Since many of the tree species are of little commercial value, only selective cutting has occurred, and many large individual trees remain in these forests. Leaf litter is removed every year by periodic winter and spring floods, allowing little accumulation. Common species include box elders (Acer negundo), river birch (Betula nigra), green ash (Fraxinus pennsylvanica) and sycamore (Platanus occidentalis). ER Table 2.7.1-5 presents the species composition, dominance values and constancy indices for replicate stands of the Alluvial Forest. Two alluvial forest types are found at the Cherokee site: River Birch-Sycamore (SAF Type 61) and Cottonwood (SAF Type 63). The River Birch Forest occurs on sandy flats behind the 99 Islands Dam. In the Cottonwood Forest, the dominant tree species was Acer negundo, while in the River Birch-Sycamore Forest the dominant tree species was Betula nigra.

ER Table 2.7.1-6 presents the relative density, relative frequency, relative dominance and importance values of the plant species found in Alluvial Forest Stand No. 8. The dominant canopy trees are river birch and sycamore. Cottonwood (Populus deltoides), black willow (Salix nigra) and river oak (Quercus nigra) are co-dominant canopy trees. Sugar maple (Acer saccharum ssp. floridanum) is the most prevalent and dominant species in the seedling and sapling layers and would be expected to become dominant in the sub-canopy layer along with river oak and winged elm (Ulmus alata). The pioneer shrubs buttonbush (Cephalanthus occidentalis) and swamp dogwood (Cornus ammomum) are representatives of earlier successional stages and are found in decreasing numbers in later seres. Black willow (Salix nigra), while found in the canopy, is not reproducing and should be replaced by species such as river oak, ash (Fraxinus pennsylvania) and sweet gum (Liquidambar styraciflua). Shrubs, such as blackberry (Rubus spp.) and vines, such as greenbriar (Similax spp.) form dense clumps on the forest floor and in the shrub and subcanopy layers.

Alluvial Thicket

Alluvial thickets are characterized by a dense tangle of shrubs, saplings or vines, and indicate disturbance sites. They may be found on river islands where the continuous removal of larger trees by high water prevents the formation of an alluvial forest. However, they may also result from lumbering of alluvial forests or from natural succession on abandoned flood plain pastures. Common species include black willow (Salix nigra), river birch (Betula nigra), box elder (Acer negundo) and sycamore (Platanus occidentalis). ER Table 2.7.1-7 depicts the species composition, dominance values by stand, and constancy indices for replicates of the alluvial thicket. Alluvial thickets have originated on newly deposited sediment islands behind the dam at the Broad River site. Representative species include Salix nigra, Sambucus canadensis, Chenopodium ambrosioides, Polygonum pennsylvanicum, Xanthium strumarium, and Oenothera biennis. No single species was a clear dominant and the shrub layer was quite rank and almost impenetrable. Trees were so small and well-spaced that none were counted when using the wedge prisms.

Table 2.7.1-8 depicts relative density, relative frequency, relative dominance and importance values for species sampled in an Alluvial Thicket (Stand No. 8). This area was within the Alluvial Forest stand previously described, but while having a well-developed canopy and subcanopy layer, it also contained more open areas that were better classified as Alluvial Thickets. The general appearance was a mosaic of alluvial forest and thicket, which is very typical of the area. The disturbed areas were a result of both severe flooding and logging activities. Dominant trees include box elder, river birch, cottonwood and black willow. All of these species are dominant through different successional stages and the present composition is the result of periodic disturbances, especially selective clearing and logging. Due to this fact, it is difficult to distinguish current developmental changes. Box elder, black willow and cottonwood appear to be maintaining their dominance in the stand. Privet (Ligustrum sinensis) and elderberry (Sambucus canadensis) are co-dominants in the shrub layer and are typically found in great abundance in disturbed areas and waste places. Ash and river birch would be expected to dominate the stand in later successional stages.

Hardwood-Mountain Laurel Forests

The Hardwood-Mountain Laurel Community in the Piedmont region is typically found on steep north facing slopes. The shrub layer is dominated by dense stands of mountain laurel while the herbaceous layer is relatively sparse. This community grows on sites that are unfavorable for timbering, and many large trees remain in the canopy. In the Cherokee site area American beech (Fagus grandifolia) is the dominant canopy species on mesic sites while chestnut oak (Quercus prinus) dominates the drier areas. ER Table 2.7.1-9 presents the species composition, dominance values by stand, and constancy indices for replicates of the Hardwood-Mountain Laurel forest. At the site, this community occurs near the bottom of a steep northwestern slope. Representative species include Quercus prinus, Fagus grandifolia, Mitchella repens, and Epifagus virginiana.

ER Tables 2.7.1-10 and 2.7.1-11 present the relative density, relative frequency, relative dominance and importance values of Mountain Laurel-Hardwood Stands 3 and 14. Stand 14 is an American beech stand occurring in a mesic cove at the bottom of a steep northwest facing slope. As the slope increases in steepness and becomes more xeric there is an abrupt transition from beech to chestnut oak - black oak canopy species (Stand No. 3). In the more mesic site beech is totally dominant with few species in the subcanopy layer. Mountain laurel (Kalmia latifolia) composes the shrub layer. Black oak (Quercus velutina) along with chestnut oak is present in the canopy of the oak stand and the subcanopy is more developed than that of the beech stand. However, the abundant number of seedlings present in the beech stand would indicate that, in time, the subcanopy and canopy will increase in diversity. Nevertheless, beech will remain dominant. Both stands are to be considered climax forests and no further successional stages are to be expected. The mesic conditions of the beech stand support a variety of herbs. Parasitic beech-drops (Epifagus virginiana) are very common.

Mixed Mesophytic Hardwood Forest

The Mixed Mesophytic Hardwood Forest has a closed canopy and occurs on lower slopes and valley sides on well-drained soil. It is frequently adjacent to the Alluvial Forest, but it is never flooded. The presence of pines and cedars distinguishes this forest type from the Climax Mesic Hardwood Forest which does not occur in the project area. The herb layer has a rich assemblage of fern species. Table 2.7.1-12 presents the species composition, dominance values, and constancy indices for replicate stands of the Mixed Mesophytic Hardwood Forest. The species composition and dominance of pines varies in this seral forest, depending on stand age. The younger forests are examples of the Shortleaf Pine-Oak Forest (SAF Type 76) and the older stands, which are dominated by beech and occur in moist, cool slopes, may be examples of a variant of the Beech-Southern Magnolia Forest (SAF Type 90).

ER Table 2.7.1-13 depicts relative density, relative frequency, relative dominance and importance values for species present in a Mixed Mesophytic Hardwood stand. Dominant canopy trees are white oak (Quercus alba), American beech (Fagus grandifolia), hickory (Carya tomentosa) and Tulip poplar (Liriodendron tulipfera). Black oak (Quercus velutina), short-leaf pine (Pinus echinata), sweet gum (Liquidambar styraciflua) and red maple (Acer rubrum) are also important canopy species. Associated with the dominant canopy species in the subcanopy are dogwood (Cornus florida), sourwood (Oxydendron arboreum), red cedar (Juniperus Virginiana) and American holly (Ilex opaca). Bleeding-heart (Euonymus americana) is the most prevalent and dominant shrub in the forest floor. This semi-evergreen species is very ubiquitous and is found in most Piedmont hardwood stands. Hawthorne (Crataegus uniflora) is also dominant in the shrub layer. As is evident from the importance values for the sapling and seedling layers, canopy species, such as the oaks, maples, hickories and American beech have a high reproductive rate and are successfully establishing their dominance. The stand appears to be approaching a stable state in regard to species composition and self-maintenance. A diverse herbaceous layer is typical, and many liana species are also represented. Honeysuckle (Lonicera japonica), Virginia creeper (Parthenocissus quinquifolia), greenbriar (Smilax spp.) and poison ivy (Rhus radicans) are typical vines found in the understory and overstory.

Mesic Pine Forest

The Mesic Pine Forest is a transitional community of uniformly aged trees. It normally occurs on soils of low fertility which have been timbered, cultivated, or burned and then allowed to revert to forest. At the site, the dominant canopy tree, shortleaf pine (Pinus echinata), is usually absent in the subcanopy. Under normal successional patterns, the Mesic Pine Forest will be succeeded by the Mixed Mesophytic Forest. ER Table 2.7.1-14 presents the species composition, dominance values, and constancy indices for replicate stands of the Mesic Pine Forest (SAF Type 75). These are very dense forests whith a heavy accumulation of pine needles in the litter layer. The subcanopy is composed of many hardwood species which will eventually replace the pines. Representative species include Liquidambar styraciflua, Pinus echinata, Prunus serotina, Quercus phellos, Ascyrum hypericoides, Crataegus uniflora, Rhus glabra, and Heterotheca mariana.

ER Table 2.7.1-15 presents the relative density, relative frequency, relative dominance and importance values for Mesic Pine Forest Stand No. 1. Scrub pine (Pinus virginiana) is the most important canopy species. On poorer sites (xeric, low in soil nutrients) scrub pine dominates over shortleaf pine. This stand is fairly young (approximately 20 years in age), since pine is found in both the subcanopy and sapling layers. No pines are present among the seedlings. Shading, and increasingly by acidic soil conditions limit the germination of pine seeds. In the future, hardwoods will dominate in all layers and will eventually replace the pines. Red maple (Acer rubrum), dogwood (Cornus florida), hickory (Carya tomentosa), persimmon (Diospyros virginiana), American holly (Ilex opaca) and sweet gum (Liquidambar styraciflua) are hardwood species that will initially assume dominance over shortleaf and scrub pine in the canopy and subcanopy. The shrub layer is scattered but relatively homogeneous with blueberry (Vaccinium stamineum) the most dominant, in association with typical hardwood forest shrubs such as bleeding-heart

(Euonymus americana), hawthorne (Crataegus uniflora), deciduous holly (Ilex decidua), and Viburnum acerifolium. Greenbriar (Smilax glauca) is the dominant liana. Characteristic herbs include spotted wintergreen (Chimaphila maculata), three awn grass (Aristida dichotoma), bluestem (Andropogon spp.) and rabbit tobacco (Gnaphalium purpureum).

Pine Scrub

The Pine Scrub Community is an open community that is predominantly composed of closely-spaced immature scrub pines (Pinus virginiana). The scrub pines in certain areas reach such a density that most of the herbs are excluded; in others they are wide enough apart to allow the development of grasses. These sites were originally occupied by pine forests or by old fields. Table 2.7.1-16 presents the species composition, dominance values, and constancy indices for replicate stands of the Pine Scrub community. The Broad River pine scrub forests are examples of the Virginia Pine Forest (SAF Type 79). The dominant tree species is scrub pine. In most areas occupied by this community, the A horizon of the soil has been destroyed by sheet and gully erosion. This forest type covers many of the upland areas of the site.

ER Table 2.7.1-17 presents relative density, relative frequency, relative dominance and importance values for Pine Scrub community Stand No. 9. Although it is dominated by scrub pine, this area is rapidly developing into a mixed hardwood stand. Pines are numerous in the seedling and sapling layers, but it should not be presumed that this stand will develop into a homogeneous pine forest. The relatively rapid growth and shade tolerance of the hardwood species allows them to compete effectively with the pines. Pines, however, are able to rapidly occupy any openings that develop in the canopy. The advantage is of short duration and over an extended period of time this stand will develop into a mixed hardwood forest community. Since it occurs in a relatively xeric site, the final climax stage will most probably be the Oak-Hickory community.

Oak-Hickory Forest

The Oak-Hickory Forest is considered to be a climax forest community in the Piedmont area and normally occurs on upland slopes and ridge tops. The soils in these areas are quite thin and well-drained. At the site, the herb layer of the Oak-Hickory community is sparse and a heavy litter layer of oak and hickory leaves is present.

White oak (Quercus alba) and mockernut hickory (Carya tomentosa) are usually the co-dominant species in the tree layer; pines are normally absent. A well-developed shrub layer is absent in this community, giving the stand an open appearance. ER Table 2.7.1-18 presents species composition, dominance values, and constancy indices for replicate stands of the Oak-Hickory Forest. The Oak-Hickory Forest communities presently found at the Cherokee site are examples of Scarlet Oak (SAF Type 41) and White Oak-Red Oak-Hickory (SAF Type 52) communities. The former is found on very dry ridges which have granite outcrops and is dominated by the scarlet oak (Quercus coccinea). In the White Oak-Red Oak-Hickory community white oak and mockernut hickory are co-dominants.

ER Table 2.7.1-19 presents the relative density, relative frequency, relative dominance and importance values of species in Oak-Hickory Stand No. 2 at the Cherokee site. Difficulties are encountered in attempting to typify Oak-Hickory or Mixed Mesophytic Hardwood stands on the site. Both community types are variable in composition with differences due to both disturbance factors and localized edaphic conditions. Both communities merge into each other with large transitional zones of overlapping species. Components of both communities merge to form extensive areas of mixed hardwood woodlands with a mosaic of dominant oaks, hickories and beech (Fagus grandifolia). Oak-Hickory Stand No. 2 has attributes both of "typical" oak-hickory communities and of mixed mesophytic hardwood communities. Hickories (Carya glabra; C. tomentosa) in conjunction with white oak and red oak (Quercus rubra) are the dominant canopy species. Scarlet oak (Quercus coccinea) and southern red oak (Quercus falcata) are of secondary importance in the canopy. Red maple (Acer rubrum) is typically the predominant species in the subcanopy. This stand is somewhat atypical in that there is a well-developed shrub layer. There is no evidence to indicate that past disturbances or subtle edaphic factors such as pH, moisture content, nutrients or soil type account for the variability exhibited by the Oak-Hickory Forest stands. The large canopy trees indicate that the stand is mature and no further significant changes in species composition are likely to occur. All canopy species are well represented in the seedling and sapling layers and the stand appears to be perpetuating itself. The herbaceous layer is generally sparse. Spotted wintergreen (Chimaphila maculata), beggar's lice (Desmodium spp.) and rattlesnake plantain (Goodyera pubescens) are the most dominant herbs.

2.7.1.1.3 Successional Relationships at the Broad River Site

The plant communities of the site have been classified and described in terms of structure in Section 2.7.1.1.2. The description deals with the existing vegetational regime at a particular point in time and cannot be expected to apply to the same area at some time in the future or in the past.

Any community undergoes an orderly process of change. Natural succession is a gradual sequential displacement of one plant community by another until a relatively stable (climax) community dominates the area. Succession is characterized by changes in species composition, organic matter accumulation, soil structure, soil moisture, energy flow, mineral and nutrient cycling, light, and temperature. In part, this environmental metamorphosis is due to the activities of the plants themselves, and certain other processes that operate to some extent independently of the character of the plant cover. As community succession continues, each transitional community will be replaced by a series of more complex and mature communities until equilibrium with local conditions is reached. This final stage is called a climax community which is generally considered to be self-perpetuating and long-lived. In many instances, succession is apparently halted due to continual disturbances by man. Since the communities are not in equilibrium with local environmental conditions, succession continues (or begins again) if the area is abandoned by man. Species composition of the different seral stages has been discussed in Section 2.7.1.1.2. Primary succession for aquatic areas of North Carolina has been discussed to some length by Moore (6,7). Pioneer species of plankton, as they die, settle on the substrate in the shallow back waters of the Broad River, forming a mucky layer of organic material. This layer is soon invaded by rooted aquatics which slow the water currents, bind the sediment, and add significantly to the accumulation of organic matter. The depth of the water decreases as organic material and sediments accumulate, and rooted aquatics with surface-floating leaves invade the area. These may be eliminated if seasonal water level fluctuations expose their roots to the air. The floating aquatics are replaced by erect, stemmed emergent plants with extensive root systems. This seral stage is generally the cattail marsh and is dominated by Typha latifolia. Peltandra virginica and Sagittaria latifolia are common associates. As soil develops in the marsh, drainage improves and greater aeration increases decomposition of the organic sediment. Black willow (Salix nigra) invades from the edges of marsh inward. Cottonwood (Populus deltoides) invades also and eventually forms a closed canopy forest. Box elder (Acer negundo), River birch (Betula nigra) and water oak (Quercus nigra) soon replace cottonwood. On sand bars the successional pattern is similar to that described for aquatics but usually starts at the thicket stage with the invasion of forbs followed by willow and cottonwood.

Succession of old fields in the region of the Cherokee site has been described elsewhere (8,27). The sequence of major plant types is from initial herbaceous pioneers, to mixed pine communities and finally the hardwood climax forests. Shortleaf and scrub pine are independent of the early succession in that they require only bare soil for germination. If all herbaceous species could be eliminated from the early succession, this would not affect colonization by pines. Oaks and other hardwoods, such as hickories, sweet gum (Liquidambar styraciflua), sourwood, tulip poplar (Liriodendron tulipifera), beech (Fagus grandifolia) and elms (Ulmus spp.), by contrast, depend on the soil changes caused by pine litter, so oak seedlings could not become established without the environmental changes produced by pines.

For the site, Oak-Hickory communities are considered typical climax forests for dry ridges and well-drained gentle slopes. On more mesic and on north-facing slopes, mixed mesophytic hardwood communities, dominated by beech (Fagus grandifolia) are the more typical climactic forests.

In the bottomlands, slight variations in topography and drainage have pronounced effects upon moisture conditions at the site. These effects are reflected in the vegetational development which, as a consequence, may have several different expressions in a single flood plain. Well-drained, fairly extensive flood plains almost invariably have been cultivated at the Cherokee site. When abandoned, they are usually occupied by pine stands whose development is comparable to, though more rapid than, upland pine. Hardwoods are favored by sites which are moist or less perfectly drained than the pine sites. Mixed hardwood stands are dominated by several species, such as oak, beech, elm, river birch (Betula nigra), sycamore (Platanus occidentalis) ash (Fraxinus spp.), sweet gum and tulip poplar. The Cherokee site contains large stands of cottonwoods with red maple (Acer rubrum), winged and American elm (Ulmus alata, Ulmus americana) and red and green ash (Fraxinus pennsylvanica, Fraxinus pennsylvanica var. lanceolata) in varying proportions in the understory. Generally the trend is toward sweet gum dominance by middle-age, with or without tulip poplar associated. This phase is being followed by some combination of red maple - elm - ash dominance. Regardless of early successional variations, the maple - elm - ash community type would appear to be the final stage of succession.

Secondary succession may be either retarded or accelerated by various disturbance factors. Some of these factors that have occurred or are occurring on the proposed nuclear plant site are fire, clearing and logging. During dry periods accumulated litter under pine and hardwood stands can constitute a fire hazard. The effects of ground fires are variable depending upon such conditions as age of stand, intensity of burning and time of year. Generally a ground fire does not materially affect the canopy and subcanopy floristics of a pine or hardwood stand. Its effect on succession is merely to reduce the rate without changing the trend. Severe crown fires destroy the stand but the successional patterns after a major burn are fairly predictable. Revegetation is fairly rapid and is largely dependent on the nature of the stand preceding the fire. In pine stands, growth is largely herbaceous during early years and species are characteristic of abandoned field succession. Andropogon (especially Andropogon scoparius) and composites (Aster spp., Erigeron spp., Senecio spp., etc.) are numerous. Also herbs present in the pine understory (Gnaphalium spp.) reappear. Blackberry (Rubus spp.) becomes very abundant forming dense thickets. Normal pine to hardwood succession occurs after severe burns.

In the hardwood stands, many stumps survive and sprout suckers. On the site, the most conspicuous of these would be red maple, sweet gum, dogwood, ash, winged sumac and sassafras. Sweet gum, ash, black cherry, tulip poplar and redbud (Cercis canadensis) grow from seeds. Pines, in spite of the dense herb and hardwood seedling cover, appear and survive. These make rapid growth so that mixed pine - hardwood stands are usually formed after severe burns. On the site, these burned-over hardwood sites revert back to their former hardwood compositions.

Clearing completely destroys a stand and if the cleared area or resultant field is abandoned normal old field secondary succession will proceed to revegetate the area back to its former community type. At the site many cleared areas are planted with pines and succession is arrested in the resulting man-maintained pine plantations. However, partial or selective cutting of canopy species tends to accelerate succession. Understory hardwoods are able to fill the gaps left in the canopy so that successional trend of pure pine stands to pure hardwood stands is favored. Generally, an area from which pine has been removed by fire or cutting will, under natural conditions, come back to hardwoods. A hardwood stand reduced to ground level will likewise produce hardwoods. In both instances the effect will be to bring the resulting stand much nearer to oak - hickory dominance than the parent stand which was destroyed.

2.7.1.1.4 Litter Production and Decomposition at the Broad River Site

Chlorophyll-bearing plants utilize solar energy in the manufacture of carbohydrates, proteins, fats and other complex materials. The average annual world-wide production of organic matter by photosynthetic organisms is approximately 10^{17} grams (8). The energy fixed by primary producers not used in their own metabolism is transferred either to primary consumers that eat living plant material or to primary decomposers that consume dead leaves, wood, etc. In terms of the total amount of energy transferred, the decomposer pathway is by far the more important. Bray (10) found that in a deciduous woodland more than 90% of the net primary production went to decomposers with the principal flow of energy being via the detritus food chain. Communities such as the oak-hickory are characterized by a large standing crop of leaf-litter biomass and a large portion of the total organic litter and available nutrients is found in the litter soil complex. Q 2.7.26

Information on leaf-litter production and decomposition contributes to an accurate description and analysis of forest community trophic levels. Individual community production and decomposition rates can be used to evaluate succession, compare community types and quantify transfer of nutrients between communities or systems. The present study on leaf-litter has been initiated in order to obtain initial data on the nutrient cycling of major plant communities on the site area.

Table 2.7.1-20 shows total leaf-litter dry weights and percent composition of dedicuous and evergreen components in the different plant communities. Total dry weights are a mean of four samples per community. The highest standing crop of leaf-litter (8,239.40 kg/hectare) was found in the mesic Pine Forest. Pine needles are very slow to decompose due to the acidic conditions of the litter itself and of the soil substrate. As a consequence, there is a steady build-up of litter which, in turn, produces an increasingly acidic condition that further retards needle decomposition. The growth of pine seedlings is retarded by the increasing acidity and by the low light conditions of the forest floor. The increasing dry litter build-up also prevents germination of pine seed. Hardwood species are able to establish themselves more successfully under these conditions and start to invade the pine stand. Twnety-seven percent of the pine stand litter was deciduous material, indicating that some invasion by hardwoods is occurring.

The Oak-Hickory community had a litter standing crop of 6,361.8 kg/hectare. Pines are charactrristically absent from the Oak-Hickory community. The evergreen litter (0.6 percent) is composed of American holly leaves. The Mixed Mesophytic Hardwood community contains pine in addition to other evergreen species (e.g. American holly, red cedar) and occupies sites more mesic than those occupied by the Oak-Hickory community. Standing crop of the Mixed Hardwood community is 4,525.80 kg/hectare and evergreen litter comprises 26 percent.

The Hardwood-Laurel community is dominated by large beech trees which contribute to a relatively large litter accumulation. Mountain laurel, although present in dense clumps, accounted for only 4.6 percent of the leaf litter. Total standing crop of leaf litter was 6,789.6 kg/hectare.

The Alluvial Thicket was not a closed canopy forest, and had the lowest standing of litter crop (1,026.0 kg/hectare). Periodic flooding removes litter and transports it out of the system. Alluvial Thicket litter production and decomposition is an important nutrient source for both aquatic and downstream terrestrial communities. The Alluvial Forest community, also because of flooding, has a low standing crop with a dry weight of only 1,736.6 kg/hectare.

Leaf litter decomposition bags were placed in stands of each community type. Each bag contained approximately 20 percent of the total dry weight of a leaf-litter sample from that stand (Table 2.7.1-20).

Tables 2.7.1-21, -22 and -23 show the wet and dry weights of individual species contributions to the litter standing crops of representative forest community stands over periods from October 1973 to January 1974, January to May 1974 and May to August 1974, respectively. Relatively small contributions to litter standing crops were made in the communities dominated by deciduous species during the spring and summer periods compared to the fall period.

Litter decomposition rates were calculated from dry weights of litter in litter bags collected from stands in August 1974 (Table 2.7.1-24). Decomposition rates were lowest in the Mesic Pine Forest and Pine Scrubs due to the resinous, decay resistant nature of pine needle litter, and the relatively acid soil conditions, which are unfavorable for soil bacteria(25).

2.7.1.1.5 Disturbance Factors

Disturbance factors may be defined as those factors which cause alteration to the natural environment. Such factors fall into two broad categories:

(1) Man-dominated (or man-perpetuated) factors

(2) Natural (free of man's influence) factors.

Man-dominated Factors

Evidences of man-dominated disturbances (both past and present) at the Broad River site are related to utility corridors, timbering, agricultural tillage and construction activities.

Construction of utility corridors basically involves the clearcutting of all timber within a narrow strip to be occupied by transmission facilities. This practice breaks up the homogeneity of extensive forest stands and further dissects heterogeneous stands. Maintenance of utility corridors is usually very effective in preventing secondary succession within the corridor.

Logging by local land owners is being conducted in the proposed Cherokee Nuclear Site. Logging may exercise profound effects on forest composition and succession. Depending upon the intensity and pattern of the cut, and upon the species removed from the forest stand, the resulting forest community may be substantially altered from its previous structure. The majority of the logging operations at the site, concerns the selective harvesting of Piedmont pines: scrub pine (Pinus virginiana), short leaf pine (Pinus echinata), a limited amount of loblolly pine (Pinus taeda), and pitch pine (Pinus rigida). Pines for pulp production are harvested from the mixed hardwood and mesic pine woodlands. Clearcutting occurs in even-aged pine plantations and nearly pure mesic pine stands. Clearcutting results either in the invasion of pioneer species, particularly if the mineral soil is exposed by the logging operations, or the formation of hardwood or pine scrub communities. Whether the clearcut area develops into a pine, hardwood or mixed scrub community depends on the seedlings present in the ground layer. In most cases, selective harvesting of pines opens the canopy; removing the overstory and releasing the understory. Mesic Pine, Pine Scrub and Mixed Mesophytic Hardwood communities contain hardwood seedlings and saplings in the understory below the canopy pines. These hardwoods, such as red maple (Acer rubrum), sugar maple (Acer sassharum spp. floridanum), sweet gum (Liquidambar styraciflua), sourwood (Oxydendron arboreum), ironwood (Carpinus caroliniana), beech (Fagus grandifolia), hickory (Carya spp.) and oak (Quercus spp.) will quickly exploit the canopy openings and grow into the overstory. Thus selective harvesting of pines tends to push forest succession forward rather than initiating an earlier stage in the successional process. Heavier degrees of cutting will initiate earlier stages of succession and scrub communities will quickly colonize the logged areas. However, on the Cherokee site most logging is not extensive and tends to favor and accelerate the establishment of hardwood species.

Agricultural tillage increases soil erodibility and changes community structure in much the same fashion as clearcutting does. The effects, however, may be more severe since cropped areas do not generally remain vegetated throughout the year. In fallow periods, bare soil is extremely vulnerable to both wind and water erosion. Faunal representation will be much different in an agricultural area from what it is in adjacent, forested areas. Pasturage of livestock may also be considered a disturbance factor, especially if pastures are overgrazed.

Construction of buildings, test-well drilling sites and roads have been responsible for the removal of some of the natural vegetation at the site. The fundamental difference between agricultural tillage and construction is that structures replace all vegeration on the land areas occupied by them whereas agricultural activity changes community structure and species diversity.

Natural Disturbance Factors

Natural disturbance factors include disease, insect infestations, and severe weather disturbances. Site meteorology is discussed in Section 2.6. Animal diseases, such as rabies and tularemia, are known to occur throughout the Carolina Piedmont. Plant pathogens, such as Endothia parasitica, the cause of American chestnut blight, have had marked effects on plant communities.

The most important forest pest in the general area of the site is the southern pine beetle (Dendroctonus frontalis) which ranks second only to forest fire as the most destructive agent in southeastern forests. Over a million board feet of pine timber were destroyed by the southern pine beetle between 1948 and 1966(13). The southern pine beetle is known to breed in shortleaf pine (Pinus echinata), loblolly (Pinus taeda), scrub (Pinus virginiana) and pitch pine (Pinus rigida), all of which occur at the proposed plant site.

All life stages of the southern pine beetle are found in the bark during the winter. Overwintering adults become active in mid-April, while adults developed from overwintering eggs emerge in June. The needles of an infected tree turn yellow in two to three weeks, reddish brown in four to six weeks, and are eventually dropped. Outbreaks of southern pine beetles are associated with stress such as stand disturbance, drought or previous attack. Salvage cutting is the primary means of controlling the southern pine beetle. No extensive damage from the disease has been observed in the site area. Some timber has been harvested on the site. Removing vegetation affects evapotranspiration rates and the water holding capacity of soil; these changing conditions may produce a water stress on remaining vegetation. Therefore an outbreak of southern pine beetles is possible.

Some other forest pests and pathogens of the area are the Nantucket pine tip moth, Dutch elm disease, annosus root rot, fall webworm and little leaf disease. None are of major economic importance in the site area and at present these pests and pathogens appear to be controlled by natural factors.

2.7.1.1.6 Site Floristics

ER Table 2.7.1-25 is a species list and floristic description (see Section 6.1.4.3.1.5) of plant species identified at the Cherokee site. This list is the master plant list for the Cherokee site. It will aid in any further plant community analysis at the site by furnishing pertinent specific information on individual species present in a particular community.

2.7.1.1.7 Phylogeny

Table 2.7.1-26 is a phylogenetic listing of plant species identified on the proposed Cherokee Nuclear Station site. This list was compiled from data collected during the quadrat analysis studies (see Section 6.1.4.3.1.3) and the floristics survey (see Section 6.1.4.3.1.5). A total of 288 individual plant species representing 80 families and 193 genera were identified at the Cherokee site. No rare or endangered species were found.

2.7.1.1.8 Discussion

Significant developments which occur within vegetation communities are renewed growth, the progression of species' phonological cycles, the appearance of summer, fall and winter annuals and leaf litter accumulation due to autumnal leaf-fall of deciduous trees and shrubs. Seasonal phenological cycles of leafing, flowering and fruiting are important for growth of individual plants and propagation of species. The timing of these events constitutes an adaptation which enables a species to effectively utilize its environment and increase its competitive ability.

During the late spring and summer months, when photosynthesis is most active, primary production is at a maximum in terrestrial ecosystems. However, not all plant communities or species achieve the same degree of efficiency and rate of productivity. Community energy fixation and the production of organic matter is affected by many variables including community composition, age, and structure. Primary productivity is ultimately controlled by local supplies of nutrients and energy and the ability of local communities as a whole to utilize and regenerate materials for continuous use. As succession progresses from pioneer communities to climax communities total biomass increases but net primary production decreases. The more mature woodlands such as the Oak-Hickory and Mixed Mesic Hardwoods communities achieve stability by species complexity, structure and efficient material circulation. Communities represented at the site have a relatively large mass of photosynthetic tissue. The canopy species such as white oak (Quercus alba), blackjack oak (Quercus marilandica), beech, sycamore (Platanus occidentalis), shagbark hickory (Carya ovata) and red ash (Fraxinus pennsylvanica) have a large leaf surface area. Leaf surface area is directly correlated with solar absorption and gaseous exchange and, hence, photosynthetic rates. The upland and the bottomland deciduous communities (Alluvial Forest, Oak-Hickory, Mixed Mesic Hardwood) have large leaf areas ranging from 2.2 to 7.9 hectare per hectare of land surface. Below the canopy there is a gradation in photosynthetic efficiency from sun to shade leaves and to shade-tolerant plants of the ground flora, such as wild ginger (Hexastylis virginica), Christmas fern (Polystichum acrostichoides), pipsissewa (Chimaphila maculata), partridge berry (Mitchella repens) and green-and-gold (Chrysogonum virginianum). The Mesic Pine and Pine Scrub communities have a large biomass of leaves present throughout the year so that positive values (although much reduced) for net photosynthesis are achieved even in the winter period. Deciduous forests tend to produce less organic matter per annum than evergreen pine forests. This difference can be attributed in part to differences in duration of the photosynthetic period. In addition, the mature Oak-Hickory, Mixed Mesic Hardwood, Alluvial and Pine communities absorb relatively more solar radiation than the less structured herbaceous communities (i.e., abandoned fields and thickets).

Fruit and seed production by plant communities at the site provides foods for wildlife. Important fruit and seed producing plant species include: wild cherry (Prunus serotina), dogwood (Cornus florida), beech (Fagus grandifolia), elderberry (Sambucus canadensis), hawthorn (Crataegus spp.), wild grape (Vitis spp.), poison ivy (Rhus radicans), Virginia creeper (Parthenocissus quinquefolia), lespedezas (Lespedeza spp.), goldenrod (Solidago spp.), alfalfa (Medicago sativa), asters (Aster spp.), clovers (Trifolium spp.), ragweed (Ambrosia spp.) and plantains (Plantago spp.).

Production and decomposition of leaf litter is an important phase of the nutrient cycle at the site. Pine communities with a continuous, but relatively small, leaf-fall have the largest litter standing crop. This is due mainly to the slow decomposition of pine needles and consequential build-up of litter. Late fall and early winter flooding removes most of the leaf-litter from the alluvial communities. This transported litter is a valuable nutrient input for downstream terrestrial and aquatic communities. The hardwood communities have a litter standing crop below that of the pine forests. Their annual litter production is the highest of the site communities and this litter has a higher decomposition an d turnover rate. Leaf-litter decomposition rates in all communities are highest during the warm summer and early fall months.

2.7.1.2 Wildlife

2.7.1.2.1 Habitat Description

Zoogeographically, the Piedmont region is situated in the Carolinian Biotic Province (14). This province is characterized by frequent fluctuations in temperature and humidity. The southern portions of this province have a mild climate with infrequent accumulations of snow or ice. Precipitation is usually rather heavy with more falling in the summer than in winter (Section 2.6). The forest communities and man-dominated vegetation areas are described in the preceding section (2.7.1.1).

The existing fauna of the area is primarily a remnant of presettlement animal populations and is a result of man's habitat modifications. The wildlife present in the area today is dominated by species of fields and other disturbed situations, largely replacing organisms typical of the mature forests which were destroyed over two centuries ago.

2.7.1.2.2 Potentially Occurring Species

Potentially occurring species may be defined as those which have ranges which include a general locale but which may or may not be present at any specific location in that general locale. The actual fauna of an area might be quite different from the faunal representation possible for that area. It is only through extensive field studies that the degree of difference between potenial and existing faunal representation can be determined.

Tables 2.7.1-27, -28, and -29 provide lists of potentially occurring mammal, bird, reptile and amphibian species, respectively, for the Cherokee site. The presence of each species as established by onsite observations on a quarterly basis is also tabulated. Habitat use by terrestrial vertebrates is indicated in the census data (section 2.7.1.2.3). Dates on which field observations were made and locations of censused community stands are presented in Table 6.1.4-2 and Figure 6.1.4-2.

2.7.1.2.3 Census Data

Mammals

The first session of small mammal trapping at the Cherokee site began on 10 December 1973 and ended on 11 December 1973. The second session began on 25 April 1974 and ended on 1 May 1974. Population estimates were based on either removal, mark-recapture, or home range techniques (see Section 6.1.4.3.5).

Mammals collected or observed at the site are listed in Table 2.7.1-27. Tables 2.7.1-30 and 2.7.1-31 present the species collected by habitat during December 1973 and March-April 1974, respectively. Population estimates for species trapped in stands representative of the habitats occurring at the site are also presented in these tables.

High densities of rice rats were encounterd in the Cattail Marsh and Alluvial Thicket communities in December but not in April. This shift in population density was probably related to natural reproduction in summer and early fall, coupled with seasonal stress during the winter, which forced rats into dense cover in the alluvial areas. Overwintering mortality coupled with less restrictive conditions in the spring resulted in lower densities in April and May. Small mammal populations in many habitats are subject to dramatic shifts in population density which are influenced by natural environmental conditions (26).

The only larger mammals captured were opossum, cottontail rabbits, domestic dogs, and feral house cats. One white-tailed deer was seen at the site. No aquatic mammals were recorded.

Birds

Bird abundance data for all sampling periods is presented in Tables 2.7.1-32, -33, -34, and -36.

The number of communities in which a species was observed is indicative of its degree of habitat restriction. In other words, a species that is listed as being "abundant", "common" or "moderately common" in several vegetation communities may be considered as being fairly ubiquitous in its habitat requirements. Conversely, a species listed in one of the above categories but observed in only one vegetation community may be generally considered as being somewhat restricted in its habitat requirements.

Species listed as "uncommon" or "rare" usually fall into one of four broad categories:

1. "Holdover" migrants which did not migrate with the bulk of their populations, or "advance" migrants which arrived before the bulk of their populations.

2. Species which, because of habitat destruction or other reasons, do not have high population densities in the area, although they have an established population there.

3. Species which, by chance, were not observed at the particular time of census in their normal degree of abundance.

4. Species which are "accidentals" (i.e., not normally encountered) in the area.

It should be emphasized that, for purposes of ER Tables 2.7.1-32 ff the term "rare" refers to frequency of sighted occurrence and should not be confused with the category "rare and endangered" used elsewhere in this report.

In addition to strip censuses for determination of relative abundance, intensive plot censuses were undertaken in all communities to determine breeding bird densities. These censuses were undertaken in three increments during the spring of 1974 (March - May) to insure recording of all species nesting in the area. Data generated by these studies are presented as ER Table 2.7.1-35.

Amphibians and Reptiles

A census of the reptiles and amphibians in one acre plots within stands representative of each plant community was conducted from 19 through 21 May, 1973 and 12 through 13 August, 1973. The results of these censuses are presented in Tables 2.7.1-37 and 2.7.1-38. All reptiles and amphibians species recorded at the site are listed in Table 2.7.1-29.

2.7.1.3 Rare and Endangered Species

A list of the rare and endangered plant and animal species of potential occurrence at the project site is presented in ER Table 2.7.1-39. This list is based on the Red Data Book (15) prepared by International Union for the Conservation of Nature and Natural Resources, Threatened Wildlife of the United States (16) compiled by the U S Bureau of Sport Fisheries and Wildlife (Department of the Interior), a Preliminary List of Rare and Endangered Plant and Animal Species in North Carolina (17) compiled by the Endangered Species Committee of the Department of Natural and Economic Resources of the State of North Carolina unpublished and statements of the South Carolina Wildlife Resources Department. No official list is available for rare or endangered plant species of the U S although one is now being prepared by the Office of Environmental Sciences of the Smithsonian Institution.

The classification system used in this report is the same as that used by the Bureau of Sport Fisheries and Wildlife and as ammended by the North Carolina Department of Natural and Economic Resources to include those species that are rare or endangered in North Carolina and not the United States as a whole. The eight classes are as follows:

1. Endangered (E^1) - A species or subspecies whose prospects for survival and reproduction in the U S are in jeopardy. Extinction will probably result if protection is not afforded this species.

2. Endangered (E^2) - A species or subspecies endangered in North Carolina.

3. Rare (R^1) - A species or subspecies, although not presently threatened with extenction, that is depleted to such an extent throughout its range in the U S that it may become endangered if its habitat is further infringed upon.

4. Rare (R^2) - A species or subspecies rare in North Carolina.

5. Peripheral (P^1) - A species or subspecies whose occurrence in the U S is at the edge of its natural range and which is rare or endangered in the U S, although not in its range as a whole.

6. Peripheral (P^2) - A species or subspecies rare or endangered in North Carolina, although not in the U S as a whole.

7. Status undetermined (U^1) - A species or subspecies that is possibly rare or endangered in the U S, but more information is needed to ascertain its status.

8. Status undetermined (U^2) - A species or subspecies of undetermined status in North Carolina.

Rare and endangered species recorded at the Cherokee site during field censuses are listed in Table 2.7.1-39.

2.7.1.4 Summary and Projections

Mammals: Most mammalian populations exhibit seasonal fluctuations in size. Population increases are most apparent in those species with high reproductive potentials and with well-defined breeding seasons. Temporary increases in populations of many mammal species (especially rodents) at the project site occur becuase of natural reproduction. These increases are largely offset by natural mortality (including predation) so that overall populations are relatively stable. In addition to and associated with these changes in population levels, there is usually a marked seasonal fluctuation in adult-juvenile ratios. Some mammals may aestivate in the hottest parts of the summer, but this will be of minor importance in the area of the project. Aestivation is more common in warmer climates. Immigration (one way movement into a given area) and emigration (movement out of a given area) will occur at the site during the fall but this will probably not result in any net population change in the area. Twenty of the 42 species of mammal likely to occur at the Cherokee site were recorded in this survey. Golley (28) has summarized the known distribution of South Carolina mammals. The species observed at the Cherokee site are all familiar members of the mammalian fauna of the Piedmont Carolinas. Suitable habitat for all of these species exists within one mile of the site. No rare or endangered species were encountered.

Birds: The most conspicuously changing aspect of summer and early fall resident avian populations is the presence of increased numbers due to the addition of juvenile birds to the population. During late summer and early fall migration into the area from the north will be occurring. This could temporarily increase the number of species of some groups, such as shorebirds, in the project area. Some birds also migrate out of this area southward during the fall. Certain groups of birds, such as herons and egrets, are subject to post-breeding "wanderings" north and west (from coastal areas) of their nesting areas. Therefore, there may be temporary increases in the number of species of wading birds (herons and egrets) in the project area in mid and late summer in some years. Some species, such as red-winged blackbirds, common crows and starlings, exhibit "flocking" behavior in late summer and early fall. This "flocking" behavior can result in large numbers of these birds feeding and roosting together in restricted areas.

Results of annual mid-winter waterfowl surveys conducted by the South Carolina Wildlife and Marine Resources Commission in recent years indicate that use of the Broad River in the vicinity of the Cherokee site by migratory waterfowl is very light. However, since it is not considered an important waterfowl area, relatively little data is collected on the Broad River waterfowl populations. For example, on January 22, 1974, only 7 black ducks, 4 mallards Q
and 8 wood ducks were observed along the Broad in Cherokee County 2.7.24
(W Schrader, personal communication). These species probably make-up the bulk of the waterfowl population on the Broad River. Blue-winged teal are sometimes encountered. Migratory species would probably begin to arrive in the area in late November and leave in March to return to northern breeding grounds. Wood ducks are year-round residents on the Broad River, and are present in moderate to good numbers compared to other areas in the state.

Use of the Broad River by duck hunters was described as "moderately light" by South Carolina Wildlife and Marine Resources Commission personnel (W Schrader, Rock Hill, South Carolina). Other streams in the area such as the Tyger River could provide more waterfowl hunting opportunity than the Broad River. Q 2.7.25

One hundred and four of the 241 species of birds considered likely to occur at the Cherokee site as residents or as migrants were recorded during this survey. Six species appear in the list of rare or endangered species in ER Table 2.7.1-39. However, all of these are species whose current status is undetermined, and none are considered rare or endangered by official agencies. All are widespread and familiar species which are uncommon relative to other bird species. The Cherokee Nuclear site does not provide unique habitats particularly suited to any of these species which are not found nearby in the area.

Reptiles and Amphibians: Most of the breeding activity of amphibians (frogs, toads and salamanders) takes place in the spring with some activity (especially in spadefoot toads) occurring in the summer. Therefore, corresponding increases in amphibian populations occur in the late spring and summer due to the laying, hatching, and development of eggs. Most reptiles breed in the spring with hatching of young beginning in late spring or early summer and continuing into the fall, and a corresponding increase in the population of these animals results. Both amphibians and reptiles are poikilothermic ("cold blooded"). They are most active in the spring and summer, and are generally inconspicuous or apparently absent during fall and winter because of hibernation and mortality.

Thirty-two of the 64 species of reptiles and amphibians likely to occur at the site were recorded in this survey. All of the species recorded are widely occurring species and are considered common throughout their ranges. No rare or endangered species were observed. Construction of the Cherokee Nuclear Station would eliminate upland habitat of reptiles and amphibians, but construction of the service water pond would probably provide suitable habitat for amphibians, especially frogs and toads. Extensive areas of suitable habitat are available within one mile of the site, and construction would not have a detrimental effect on the reptile and amphibian fauna of the general area.

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2.7.2 AQUATIC ECOLOGY

The purpose of the ecological survey conducted on the Broad River was to define conditions presently existing above, at, and below the proposed plant site, and to document the range of seasonal changes occurring in these areas during one twelve month period. This was done by determining, monthly, the taxonomic makeup and important organisms in each major component of the aquatic system (phytoplankton, zooplankton, periphyton, aquatic macrophytes, benthos and fish), describing the probable trophic relationships which exist within and among these components, and, insofar as possible, relating these changes to the physical properties of the river.

It should be emphasized that the division of the river ecosystem into "components" such as phytoplankton, benthos, fish etc. is one of convenience only. It reflects necessary differences in sampling methodologies, and is not meant to imply any special degree of integration within or among the components. For this reason the term "community" has been generally avoided, and "assemblage" substituted.

The sampling sites are shown on maps presented as Figures 6.1.1-1 and 6.1.1-2; they are briefly described in section 6.1.1. The stations may be roughly grouped as follows: upstream (1, 2, 4, 7, and 8); main channel of impoundment (9, 11, 14); backwaters of impoundment (10, 12, 13); downstream (15, 17, 20 and 22); and the tributary stations (3, 5, 6, 16, 18, 21 and 23). ~~After period 8 several of the peripheral stations were eliminated (1, 2, 3,~~ 5, 6, 7, 16, 18, 19, 20 and 21) and effort was concentrated on those most closely connected to the site. Station 4 was retained as an upstream "control" station. Stations 8-15 were kept since all are in the immediate vicinity of the 99 Islands Impoundment; Station 15 is just below the dam in the vicinity of the proposed discharge structure. Station 17 was kept as a downstream "control". Sampling was also continued on the two small site creeks (21 and 23) since they will be flooded by construction of the Nuclear Service Water Pond and related impoundments.

2.7.2.1 Phytoplankton

2.7.2.1.1 Introduction

Phytoplankton are autotrophs and, together with periphyton and aquatic macrophytes, account for the primary production of an aquatic ecosystem. In flowing, turbid rivers such as the Broad, however, their importance as such is limited. The relatively short doubling time of algae under ideal conditions means that their populations may alter rapidly with environmental change, but in rivers and streams they tend to be carried through regions of optimal conditions too quickly for a response to develop fully.

Light, of course, is essential to photosynthesis and algal growth, but Secchi depth on the Broad River in the vicinity of the proposed plant is generally about 0.3 meters (Table 2.5.0-1). Since many species of plankton are inhibited by direct sunlight, there remains only a narrow band, a few inches deep, where light is sufficient for photosynthesis. Q
The adequacy of even this is further reduced by the inability of individual 2.7.14
plankters to maintain themselves in it due to turbulence.

Hynes[1] (and many others) have noted that the principle component of organic matter in rivers is allochthonus rather than autochthonus. In order to test the applicability of this statement to the Broad River, the composition of drift net samples taken at Station 8 (just above the impoundment) during August, 1974, was analyzed quantitatively. Sample material was dispersed in a Sedgwick-Rafter chamber and microscope fields examined were arbitrarely assigned to one of sevel categories: (1) diatoms, (2) other aquatic plant material, whether algal or macrophytic, (3) stem material from terrestrial plants, (4) leaf material from terrestrial plants, (5) whole bodies or fragments of aquatic invertebrates, (6) whole bodies or fragments of terrestrial invertebrates, and (7) unidentifiable organic matter. Large stems and whole leaves which are occassionally present in the samples are not included in the analyses. Several samples were examined and the data pooled.

The percentage of each microscope field covered by each type of organic material was noted for each replicate and then averaged. The sum of these averaged percentages (approximately 34.3%, since nearly two-thirds of the debris was inorganic) was set equal to 100%, and the relative portion of each category of the total organic matter calculated. The results are shown in ER Table 2.7.2-21. Q 2.7.14

78.4% of the total organic matter recovered appeared to come from still-recognizable fragments of terrestrial plants. Less than 10% could be identified as aquatic in origin, and nearly half of that was from benthic invertebrates. Smaller mesh nets would probably have increased the numbers of algae taken, but they would have also increased the percentage of un-identifiable organic matter. Although these data are only semi-quantitative, they do suggest the relative unimportance of stream borne phytoplankton as a source of organic matter in the Broad River.

In addition, diel measurements of oxygen metabolism were made durina the winter, spring, and fall at Stations 10 and 12 (backwaters), 11 (mainchannel), and 21 (site creek). In all instances (ER Figures 2.7.2-3a through 2.7.2-31) community respiration was found to be greater than community production. Since corrections for diffusion, which could be large in flowing water (Stations 11 and 21), were not made, the difference between consumption and production was probably even greater than that shown. Scott[2] and Nelson and Scott[3] have also shown community respiration to be in excess of primary production in North Carolina Piedmont.

2.7.2.1.2 Species Composition

Approximately 300 species and subspecies of phytoplankton and periphyton (many of the latter, expecially diatoms, are subject to scour and appear in the plankton) were identified in samples taken on the Broad River system (ER Table 2.7.2-1). The estimated densities, in numbers per ml, of each species are summarized by station and month in ER Tables 2.7.2-2a and 2.7.2-2m. Data on the percent composition, by numbers and biovolume, are presented in ER Tables 2.7.2-3a and 2.7.2-3m. Q 2.7.3

Upstream of the impoundment the phytoplankton are dominated numerically by diatoms, especially during the winter and early spring, while estimates indicate that as much as 95% of the biovolume is accounted for by bluegreens. For example, 89.6% of the count at Station 4 (main channel, upstream) was attributable diatoms in October, 1973, while bluegreens accounted for only 6.3%. However, when these percentages were calculated based on biovolumes, diatoms accounted for only 3.4% of the total, bluegreens 96.5%. With few exceptions (note the dominance of greens, often in both categories, at most stations in March, 1974 (ER Table 2.7.2-3g) these relationships held throughout the sampling year.

The most common genera of diatoms in the river stations, both upstream and downstream of the impoundment were Melosira, Pinnularia, Synedra, Cymbella, Achnanthes and Navicula. The impoundment and Station 15, which receives waters from it both over the dam and through the hydro, contained large populations of diatoms such as Nitzchea and Gomphonema, as well as smaller species of Melosira, Navicula, and Achnanthes.

The most common greens (Cyanophyta), expecially at lake stations, were Scenedesmus, Chlamydomonas and Ankistrodesmus. The genera of bluegreens which have accounted for most of the biovolume include Anabaena, Merismopedia, and Oscillatoria. Pyrrophyta (Gymnodinium, Glenodinium, Peridinium, and Ceratium)was occassionally important, becoming a numerical dominant (50.5%) at Station 5 in April. Euglenoids were also moderately abundant from time to time, expecially in the impoundment and backwaters in November, 1973, when they accounted for roughly 10% of the algal flora.

2.7.2.1.3 Population Densities

Since phytoplankton populations reflect changes in stream conditions so quickly, great variations in densities and composition are to be expected. In November, for example, phytoplankton densities were very low, apparently reflecting increases in streamflow, suspended load, lower temperatures, and a reduction in light intensity. Estimates of total phytoplankton densities at river stations ranges from about 100 cells per ml in the fall to 500 or so in the spring and summer. Densities in the tributary stations have been even more variable, each responding to its own set of stresses, many of which are man-induced. Density of phytoplankton in the site creeks has been very low, less than 200 cells per ml, with usually only two or three species represented.

Phytoplankton populations in the impoundment were generally much larger. In October, 1973, there were 5,562 cells per ml at Station 13, although counts between 1000 and 3000 were much more common except during the late fall and winter when 500 per ml was common. The intermittent operation of the 99 Islands Hydro Station greatly reduced stability in the impoundment and is responsible for much of the sampling variability observed. Stratification does develop in the spring and summer, and this is reflected in the generally greater density of phytoplankton in surface samples as opposed to bottom samples at the same station. Visible blooms have been observed occassionally in the impoundment by hydro station personnel.

2.7.2.2 Zooplankton

2.7.2.2.1 Introduction

As primary and secondary consumers zooplankton serve as a link between both primary producers and detritus and other consumers. Their temporal and spatial distributions are regulated by both water quality parameters and phytoplankton standing crop. Predaceous zooplankton, of course, depend on the standing crop of herbivores.

In flowing, turbid rivers such as the Broad, however, the significance of zooplankton as a food source for higher trophic levels and a population control mechanism for phytoplankton is limited. Unpredictably fluctuating environmental variables prevent really stable and integrated populations from developing.

In the 99 Islands Impoundment a more stable assemblage, typical of lakes and ponds, has developed. Even this is stressed, however, by the operation of the Hydro Station, which can pass the entire flow of the river through its intakes. The size of this drain, coupled with the unpredictable quantity and composition of replacement organisms carried to the impoundment from upstream, means that predictions about zooplankton in this system must be regarded as very tentative.

2.7.2.2.2 Species Composition

The master list of zooplankton (Table 2.7.2-4) identified on the Broad River system during this one year study indicates that at least 72 species were present. Nematodes, bdelloid rotifers, ostracods, copepodids and several others could not be identified to species. It is very likely that each contained several species in unknown proportions. For this reason diversity indices were considered pointless and are not presented. Q 2.7.18 Q 2.7.8

The best represented groups, both in numbers and variety, were the rotifers (especially on the river proper), cladocerans, and copepods. The most common rotifers were Keratella cochlearis, Kellicottia bostoniensis and the Brachionus complex. Alona spp. and Bosmina longirostris were the dominant cladocerans. Common, identified copepods included Cyclops vernalis, Cyclops varicans rubellus, and Diaptomus spp. However, nauplii and copepodids were abundant throughout the year, and often were the numerical dominants.

2.7.2.2.3 Population Densities

Estimated numerical densities, in numbers per m^3, for all species of zooplankton taken during the past year are given in ER Table 2.7.2-5. In ER Table 2.7.2-6 numerical data and information on biovolumes, taken or estimated from the literature, are summarized for the major taxonomic groups of zooplankton. Q 2.7.3

Despite the amount of data present no really clear pattern emerges for any group at any station. As expected, rotifers appear to be the numerically dominant taxon in the river stations both above and below the impoundment, usually accounting for 70-80% of the zooplankton present. Their contribution to the total biovolume is more variable, depending greatly on the presence or absence of the very large Asplanchna spp. Total density of zooplankton usually ran between 200-600 individuals per m^3. Where exceptions existed, as at Station 19 in April (1174 m^3), the difference was caused by bdelloid rotifers. Very low counts obtained early last fall are most likely attributable to difficulties in sampling and counting procedures.

The zooplankton samples from the tributary stations were highly variable. For example, samples taken at Station 3 in March and April yielded an estimated density of more than 2000 m^3, mostly cladocerans, while almost nothing was present in early January (Period 4). At Station 5 in March total zooplankton ran to over 200,000 per m^3, mostly rotifers and copepods. The following month the estimated numerical density had dropped to 220 per m^3. One reason for this is that the small creeks are much less well buffered against stresses caused by temperature, drought and pollution. When conditions are good, however, they may be counted on to provide the river proper with much of its zooplankton. The site creeks (Stations 21 and 23) had low populations (less than 300/m^3) throughout the year.

Populations of zooplankton in the impoundment and backwater areas were generally much greater than those of the river, and more evenly distributed among cladocerans, copepods and rotifers. Seasonality is discernable too, at least in some instances. At Station 12, which is in a backwater behind the point on which the proposed intake will be sited, densities rose from 172.5 per m^3 in March to nearly 75,000 in June. The decrease which followed may be attributed to exhaustion of resources and predation by small fish.

It should be noted that the 99 Islands Hydro Station has been in operation for 75 years. When all 6 units are running more than 2000 cfs are being drawn from the impoundment at velocities which approach 10 fps. It is not expected that the imposition of the Cherokee Intake structure, which will withdraw 272 cfs at a maximum velocity of 0.5 fps, will have a significant effect on the ability of the plankton populations to maintain themselves in their present state in the 99 Islands Impoundment.

2.7.2.3 Periphyton

2.7.2.3.1 Introduction

Strictly defined, periphyton refers to plant material growing attached to exposed surfaces at or below the water level. Although most attention is directed at algae (principally diatoms), attached higher plants (e.g. mosses), fungi, protozoams, sponges and sessile metazoans (e.g. bryozoans) also grow attached to these substrates. As a practical matter they cannot be separated and, while taxonomic work and estimates of densities concern algae, biomass determinations more properly should be attributed to Aufwuchs.[113]

The distribution of periphyton is determined by several factors, chief among which are the availability of suitable substrates, depth of light penetration, stability of the water level, and amount of scour caused by suspended sediment carried by the current. By these measures the Broad River above and below the 99 Islands Impoundment does not score highly as a favorable environment for the development of elaborate periphyton growth, although riffle and shoal areas, like the one just below the dam (Station 15) do provide adequate substrate. Within the impoundment ample substrate does exist (tree trunks, rip rap and the dam edge) but sudden water level fluctuations caused by operation of the hydro and limited light penetration due to turbidity make conditions far from ideal.

Periphyton was collected on artificial substrates on a staggered monthly schedule (Section 6.1.1.8). Early samples (October and November, 1973) were not positioned well and were lost due to drawdown of the impoundment during operation of the hydro. Vandalism remained a problem throughout the study. Artificial substrates were used, however, to allow data to be treated quantitatively and because changing water levels would have constantly altered the location and possibly the nature of the substrate from which collections could be made. Nevertheless, periodic, qualitative examinations were made of natural substrates. While relative abundances of the species did differ, almost no species were exclusive to either surface.

Q
2.7.10

2.7.2.3.2 Species Composition

The sampling procedure was not designed to gather data on periphyton succession, but rather to note species composition (ER Tables 2.7.2-8 and 2.7.2-9) and estimate production (ER Table 2.7.2-10). Whitford and Schumacher[111] followed successional patterns in a succession of rapids in streams in the North Carolina Piedmont. While several of the same species occur (e.g. Melosia varians), patterns on the Broad River appear to be quite different. Genera common at all stations included Navicula, Achnanthes, Gomphonema, and Synedra.

2.7.2.3.3 Summary

No discernable pattern exists in either numerical or biomass data at any station. One reason which might be suggested is that the suddenness and unpredictability of environmental changes are stronger factors in determining the composition and successional pattern of periphyton than are seasonal and diurnal changes. Low flows generally occur in the late summer and early fall in the Broad River, which means than scour and turbidity are least when temperature and light are greatest. Flows this past August and September were not particularly low, however, and no strong pattern of periphyton growth was apparent.

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2.7.2.4 Aquatic Macrophytes

Q 2.7.15

2.7.2.4.1 Species Composition

Lists of emergent, floating, and submergent aquatic macrophytes encountered at the Cherokee site or known to occur in the Carolina Piedmont are presented in Tables 2.7.2-9 and 2.7.2-10.

The cattail (Typha latifolia) marsh is the major aquatic macrophyte community present in the vicinity of the 99 Islands Impoundment. The most extensive of these is on the east bank, just above the hydroelectric station. The marsh proper is comprised of an almost homogeneous population of cattails. No tree or shrub layer has developed in it, although dense growths of black willows (Salix nigra), boxelders (Acer negundo), cottonwoods (Populus deltoides), silky dogwoods (Cornus amomum), and the elderberry (Sambucus canadensis) line the high ground along the periphery of the marsh. Herbaceous aquatic macrophytes, including the soft rush (Juncus effusus), Fimbristylis spp., flatsedges (Cyperus spp.), spike rush (Eleocharis obtusa) and bulrushes (Scripus spp.) occur between the trees and the marsh itself. Other vascular species include water plantain (Alisma subcordatum), duck potato (Sagitarria sp..), arrow arum (Peltandra virginica), lizard's tail (Saururus cernus) and knotweeds (Polygonum spp.).

The center of the marsh is open water; both soil deposition and plant growth are developing towards the center and will eventually result in the filling in of the open area. Soil deposition stems mainly from the decomposition of plant matter. Sedimentation from river water occurs only during periodic flooding of this area.

Other marshes in the vicinity of the 99 Islands Impoundment have developed on soil deposited during periodic flooding. They are directly adjacent to the Impoundment, not separated from it by an area of high ground. Their species composition is essentially the same as that of the enclosed cattail marsh, although Leptodictyum sp. and Sciaromum sp. were common in the backwater area near Station 21.

2.7.2.4.2 Projections

The growth of attached macroalgae and mosses may become significant on exposed rocks during periods of summer low flows, especially just below the dam. It is unlikely that the 99 Islands Impoundment will develop extensive areas of submergent or floating aquatic macrophytes due to fluctuating water levels resulting from operation of the hydro station. The existing cattail communities can be expected to persist as an early stage in alluvial flood plain succession.

2.7.2.5 Benthos

Twenty-three stations were sampled for benthos from October, 1973 to May 1974 in accordance with the program outlined in Table 6.1.1-1. From June, 1974, however, the number of stations was cut back (Table 6.1.1-4) in order to concentrate more closely on the site area. The initial discussion below covers the full sampling program with the stations grouped by habitat type. These categories are: 1) the Broad River upstream from the 99 Islands Impoundment, 2) the tributary streams of the Broad River, 3) the 99 Islands Impoundment and 4) the Broad River downstream of the impoundment. The results of the sampling conducted from Period 9 until the early autumn of 1974 are discussed in the next section.

At least 140 species of benthic invertebrates were collected during the past year on the Broad River System (ER Table 2.7.2-11). Many of the taxa reported, however, could not be reliably identified to the specis level. For instance,29 genera of chironomids were identified; many of these are probably polyspecific. All the insect orders contained numerous individuals which could not be identified further. Two abundant phyla, the Oligochaeta and Nematoda, were not taken beyond that taxonomic level. For this reason species diversity indices are not presented, since they would reflect only the degree of taxonomic precision in the various samples and not have any real ecologic significance. Q 2.7.18 Q 2.7.8

Estimated densities (in numbers per m^2) for all species (or higher taxa) sampled at each station during the monthly sampling program are presented in ER Table 2.7.2-12. The percent composition of all the major taxa are summarized in ER Table 2.7.2-13 by number and biomass. Q 2.7.3

2.7.2.5.1 Broad River Upstream from 99 Islands Impoundment

Five stations sampled for benthos were located in the Broad River upstream from 99 Islands Impoundment. From upstream to downstream, these included stations 1, 2, 4, 7 and 8 (ER Figure 6.1.1-1). Diptera, Trichoptera and Ephemeroptera comprised nearly 90% of the benthos at these sites from October through March, 1974.

Among the Diptera the Chironomidae predominated, representing 36% of all benthic organisms collected from river sites and, on four occasions, comprising 100% of the organisms collected. Midges were taken in all river samples. Population densities ranged from 6 to 1,184 organisms per m^2 (mean = 420 ± 499). Critical taxonomic examination of all midges collected during October indicated an extremely diverse community; fifteen genera were identified from the river, with Demicryptochironomus the most common genus. Population densities of midges in the river benthos fluctuated greatly during the six-month period of study. Minimum densities were observed during December (43% of the total population) and maximum densities during March (100%). Insufficient data are available to detect seasonal trends in population densities.

Midges typically exhibit bimodal distribution of population density[78] with peaks occurring during September and April. The April peak is composed chiefly of members of the subfamily Orthocladiinae. Since the substrate of the river stations is generally unsuitable for these species, it is not anticipated that a biomodal pattern will be found for midges at river sites.

Rather, densities should peak during late summer and early autumn and then decline rapidly as mature larvae pupate and leave the benthos. Some evidence for this decline was found among the data gathered here (% of midges in benthos: October = 68%, November = 53%, and December = 43%).

The dipteran family Chaoboridae, here represented almost exclusively by Chaoborus punctipennis (Say), is generally associated with standing water habitats. Its presence in the river stations is therefore unusual. In the winter nearly all of these came from station 7, which is located immediately upstream from 99 Islands Impoundment where nearly half the fauna collected were C. punctipennis. Impoundment of the river at this station during winter was apparently sufficient to produce an environment suitable for Chaoborus. Apparently they are adventitious species occurring only when high-water conditions in 99 Islands Impoundment result in temporary impoundment of additional portions of the Broad River.

Trichoptera represented 33% of all organisms taken from river sites. Nearly all specimens came from Station 4 where population densities averaged more than 2,000 individuals per m^2. Among all river sites densities ranged from 0 to 2,744 individuals per m^2 (mean = 392 $\pm$ 878). Cheumatopsyche and Hydropsyche, each apparently represented by a single species, were the predominant genera.

Trichoptera were taken in only 40% of the benthic samples from river sites. They are apparently not widely distributed in the river, but are locally abundant where a suitable environment exists. Insufficient data are available to detect seasonal trends in abundance in the fall and winter. Tebo and Hassler [78], however, observed a single peak extending from June through September. A similar trend is anticipated from these Broad River sites.

Ephemeroptera were consistently taken from Stations 1 and 4, where they represented 38% and 14%, respectively, of the sampled benthos. They contributed 13% of the total number of organisms taken from river stations. Population densities ranged from 0 to 1,114 larvae per m^2 (mean = 155 $\pm$ 316). The predominant genus represented was Stenonema. The genus Ameletus, possibly A. lineatus Traver, was also quite abundant.

Tebo and Hassler[78] observed that Ephemeroptera were the most abundant order of insects in streams in western North Carolina. They found that species of Stenonema were very numerous during September, October and November, but uncommon from December through March. Data gathered in the present study show that mayfly nymphs from Stations 1 and 4 represented 47% of the sample population during October, 27% during November, and only 5% during December. The observations of Tebo and Hassler [78] are apparently comparable to the collecting sites along the Broad River.

The Oligochaeta were conspicuous by their absence in 10 of 17 station-visits to Broad River Sites. Although they generally represent one of the principal groups of benthic invertebrates, here they comprised less than 5% of the total population. Population densities ranged from 0 to 807 organisms per m^2 (mean = 51 $\pm$ 195). Insufficient data are available to detect seasonal trends in oligochaete population densities. Brinkhurst and Jamieson[80] suggest that such trends do not exist.

2.7.2.5.2 Tributary Streams of the Broad River

Five stations (3, 5, 6, 16 and 21) selected for benthic sampling were located in small tributary streams of the Broad River. During the period October 8, 1973 through March 1, 1974, 24 station-visits were made to them. Seventy-six percent of the total fauna collected were Diptera (50.3%) and Oligochaeta (25.8%). Trichoptera represented an additional 15.5% of the collected benthic material.

Within the Diptera, Chironomidae were the predominant organisms, representing approximately 48% of all benthic organisms collected and occurring in most tributary collections. Population densities ranged from 0 to nearly 4,000 larvae per m^2 (mean = 421 $\pm$ 806). Sixteen species were observed at tributary stations during a detailed examination of species present during October 1973. The predominant midges in these collections were _Cricotopus_ and _Rheotanytarsus_. In addition, _Chironomus_, _Polypedilum_ and _Tanytarsus_ were also abundant.

Chironomidae are generally considered to be a bivoltine group with adult emergence peaking in September and in February or March[78]. Members of the Orthocladiinae, however, appear to be univoltine with an emergence peak in the early spring. Both types were represented in the tributary benthos. No overall monthly trend can be observed in the chironomid population density data from October through March. This is due primarily to the mixture of uni-and bivoltine species occurring at each tributary station. Population densities of larvae were low in October collections, presumably an effect of late-summer emergence of adults. The low densities were, however, more likely an artifact of sampling: newly-hatched individuals (1st and 2nd larval instars) are often too small to be retained by sieves used to wash benthic samples. As these individuals grow, population densities appear to increase through November and December. Superimposed upon this increase through the winter months are members of the Orthocladiinae which will pupate and emerge as adults in late winter and early spring. The emergence of these individuals presumably produced the low benthic densities of Chronomidae observed in late January through March.

The population densities of Chironomidae will continue to appear to fluctuate randomly. At the species level however, close inspection of data will reveal a dynamic system based upon the "timing" of the life histories of the various species of midges inhabiting the tributary streams of the Broad River.

The remainder of the Diptera, approximately 2.5% of the total fauna collected, were primarily Tipulidae, Chaoboridae, and Simuliidae. Only rarely did these dipterans exceed 10% of the total population collected during a station-visit.

Species of oligochaetes were moderately abundant in the tributary benthos, comprising approximately 26% of the total organisms collected. Population densities from 8 October 1973 through March, 1974 ranged from 0 to 4,982 per m^2 (mean = 227 $\pm$ 1,013). Only one collection contained more than 90 oligochaetes per m^2: at station 6 in December nearly 5,000 per m^2 were observed. This sample alone would account for the high standard deviation observed for these data. Oligochaetes were reported from 63% of all station-visits, reflecting rather wide distribution. While the oligochaetes data for the tributary stations do not display any particular seasonal trends for the period sampled, this is not considered atypical. Most species characteristic of any particular habitat may be found throughout the year.[80] Thus there does not appear to be the waxing and waning cycle in oligochaetes[80] characteristic of most insect species as discussed above.

The Trichoptera (caddisflies), the next most abundant group represented in the benthos of the Broad River tributary streams, comprised 15.5% of the total fauna collected. Caddisflies were present at 75% of the stations sampled from 8 October 1973 through 1 March 1974.

Hydropsyche, Cheumatopsyche, and Polycentropus were the principal genera of caddisflies observed. Population densities were high during autumn at most tributary stations. From October through mid-December 1973, Trichoptera represented 22% of the tributary benthos. Lowest larval densities (7% of the population) occurred from late December through March. Since larval densities peak in the summer[78], late summer adult emergence is expected to remove mature larvae from the sampled population. Replacement in autumn would be from small newly-hatched early instar larvae. Data gathered in this study agree, in general, with that presented by Tebo and Hassler[78].

Ephemeroptera (Mayfly) nymphs, representing approximately 5% of the total fauna collected at tributary stations, were widely distributed among them. Two-thirds of all station-visits yielded mayfly numphs. In general, mayflies rarely exceeded 30% of the organisms collected at a given station, averaging approximately 10% per station-visit. Predominant genera in autumn were Baetis, Stenonema, and Ameletus and, in winter, Ephemerella and Stenonema. Overall, however, mayfly abundance gradually tapered off from high early autumn densities to low levels through the winter. Tebo and Hassler[78] reported a peak abundance of mayfly numphs during April and a lesser peak during September, with lowest population densities during winter in western North Carolina streams. Their general observations appear to be consistent with collections made in the Broad River tributaries.

Odonata (dragonflies), Coleoptera (beetles) and Plecoptera (stoneflies), were sporadic in occurrence and abundance at Broad River tributary stream sampling sites. No seasonal trends were observed for Odonata and Coleoptera. Plecoptera, however, declined in abundance during January. Both Allocapnia and Taeniopteryx are winter-emerging stoneflies, adults being abundant during January. Their emergence will reduce nymphal populations, In general, however, Plecoptera were not present in the samples in sufficient numbers to establish seasonal trends.

2.7.2.5.3 99 Islands Impoundment

Seven stations were established in 99 Islands Impoundment on the Broad River to sample benthic populations (Stations 9, 10, 11, 12, 13 and 14). During the period October 8, 1973 through March 1, 1974, 39 station-visits were made to these stations. The results of the benthic collections taken at these stations revealed that a very limited fauna existed in the impoundment (Table 2.7.2). Diptera, principally Chaoborus punctipennis and Chironomidae (56.1% and 36.5% of the total fauna collected, respectively), were the chief benthic organisms collected at the lake stations. Oligochaetes, while widely distributed among stations, only represented 3% of the total fauna collected. The approximately 5% of the total fauna remaining was distributed among Trichoptera, Plecoptera, Odonata, Ephemeroptera, and Coleoptera.

As stated above, Chaoborus punctipennis (Say) comprised more than 56% of all benthic organisms taken from lake sites. It was present in nearly 70% of the lake collections, but was relatively uncommon in other habitats within the project area. Population densities of Chaoborus varied from 0 to 4,522 larvae per m^2 (mean - 922 $\pm$ 1,393).

No seasonal trend in population density was observed during the first six-month period of study. Chaoborus adults merge principally during the warm months and often peak during midsummer. This should produce a gradual decline in numbers through summer until the 1974 larval class is recruited into the sampled population.

The Chironomidae comprised nearly 37% of all benthic organisms collected from the 99 Islands Impoundment. They were taken in 90% of the lake samples. Population densities ranged from 0 to more than 2,000 organisms per m^2 (mean - 599 $\pm$ 637). On two station-visits midge larvae were the only benthic organisms taken from the lake.

Intensive study of midges taken from lake sites during October revealed an extremely diverse community: nineteen genera were identified from these samples. The lack of any apparent seasonal trend in the population density of Chironomidae as a group perhaps results from this diversity. Combining population data for a large number of species, each of which may peak at a different time, could produce such relatively stable picture of population density. Continued sampling of the lake sites should reveal midge densities similar to those discussed above, but perhaps slightly higher during summer. The principal group of winter-peaking species, the subfamily Orthocladiinae, is usually not associated with lake habitats.

Oligochaetes were taken from approximately 51% of all collections made at lake stations. Population densities ranged from 0 to 367 per m^2 (mean = 50 $\pm$ 81 m^2). While oligochaetes were widely distributed among lake stations, their distribution and abundance displayed no seasonal trends. For example, at Station 9, oligochaetes were collected in October, December, February and March, but not in November and January; likewise, the population densities reflect random fluctuations (from October through March numbers per m^2 were 77, 0, 144, 0, 10 and 48, respectively). Brinkhurst and Jamieson[80] stated that such random fluctuations appear to be the rule in oligochaete populations.

Of the remaining species of lake benthos, the Ceratopogonidae predominated, expecially the genus Palpomyia. During October the population density exceeded 1,250 per m^2 at one station, 96% of the total benthic fauna sampled that station-visit. Overall, however, the Ceratopogonidae comprised just over 2% of the total lake benthos.

2.7.2.5.4 Broad River Downstream from 99 Islands Impoundment

Three stations in the Broad River downstream from the 99 Islands Impoundment (Stations 15, 17 and 19) were sampled for benthic organisms from November 5, 1973 through January 4, 1974. Diptera, Ephemeroptera, and Trichoptera were the predominant taxa among these samples and included more than 87% of the organisms. Most of those remaining were Oligochaeta or Odonata. The benthic community in this portion of the project area was found to be quite similar to that in the Broad River upstream from the 99 Islands Impoundment. Unfortunately, insufficient data are available to permit discussion of seasonal trends among the taxa present. It is not anticipated that this community will differ substantially from the upstream stations discussed above.

Chironomidae predominated at these downstream sites, being taken in all collections and representing 53% of the total fauna. Population densities ranged from 57 to 1,493 organisms per m^2 (476 ± 590). Demicryptochironomus was the most common genus at these stations.

The insect orders Ephemeroptera, Trichoptera, and Odonata combined represented 27% of all benthic organisms collected from the downstream stations during this study. Stenonema and Cheumatopsyche were the predominant taxa. These results, however, may be misleading. Ninety-seven percent of these organisms were obtained from Station 15 during November. As additional samples become available from the downstream sites, calculated mean population densities for these three orders may be reduced substantially until they ultimately stabilize at a much lower level.

Oligochaetes comprised only 7% of all benthic organisms taken from the downstream sites. Population densities ranged from 10 to 181 organisms per m^2 (mean = 66 ± 75). As discussed above, oligochaete populations in the Broad River System do not exist at densities as high as expected. Environmental conditions in the river are apparently unsuitable for the maintenance of large populations of these typically abundant organisms.

2.7.2.5.5 Spring and Summer Populations

Station 8 was retained as an upstream "control" station for benthos throughout the sampling year. The fauna remained sparse throughout the spring and summer, with densities ranging from 78 to 775 individuals per m^2. With the exception of a few oligochaetes, nearly all the individuals found in the samples were chironomids. The composition of the samples taken at Station 15 (below the dam) was similar, but even less dense, except for that of September, when an estimated density of 464 individuals, mostly chironomids, was observed.

The two site creeks (Stations 21 and 23) also continued to yield low numbers, except for the former in June and again in August when densities were 936 and 320 per m^2, respectively. Station 21 also showed a varied population, with Coleoptera, Plecoptera, Mollusca well represented, as well as Diptera and Oligochaeta.

The remaining stations are on the 99 Islands Impoundment. Station 11, on the main channel, continued to show low densities (10 per m^2 in June, 421 per m^2 in August). Benthos were most dense at Station 10 (backwater) in September (2106 per m^2, 95.4% dipterans). This station had, throughout the year, the largest benthic population, except for June when densities dropped to 77 per m^2.

As noted in the discussion of the first six months data, surprisingly few oligochaetes were present at any of the impoundment stations throughout the spring and summer. The notable exceptions to this were Stations 13 and 14 where fluctuating numbers of oligochaetes accounted for as much as 70% of the benthos (August, Station 14). The only other organism of real significance beside the chironomids was the dipteran Chaoborus punctipennis, which accounted for as much as 97% of the fauna at Station 10 in July and September, and virtually 100% of it in August.

2.7.2.5.6 Benthic Drift | Q 2.7.4

Duplicate drift samples were taken at Station 8 on 14 August 1974 at 1500 and 1900 hours. Number six mesh, 30x45 cm zooplankton nets were held about a foot off the bottom for 15 minutes each time. Remarkably, the afternoon sample yielded only one (1) chironomid larva and the evening sample one (1) chironomid and one (1) Hydropsyche sp. (Trichoptera) for a total of three organisms.

Samples were taken at Station 15, below the dam, at 1830 and 2000 hours the same day. The early evening yielded 26 Chironomids, two (2) Chaoborus punctipennis and one (1) Baetis sp. (Ephemeroptera) naiad. The 2000 sample contained 25 chironomid larvae.

2.7.2.6 Nekton

The purposes of this investigation were:

a) the identification of fish species in the Broad River System above and below the Cherokee Nuclear Station site;

b) the description of seasonal patterns of distribution, abundance, and migration;

c) the determination of important life history and population features (including trophic relations, spawning times, population, age structure and growth) for biologically dominant or economically valuable species; and

d) the correlation of species occurrence with habitat-type and water quality characteristics.

2.7.2.6.1 General Considerations

Because fish are the largest and most mobile organisms present in the aquatic ecosystem, they present the most formidable obstacles to quantitative sampling. Different types of gear must be employed in different habitats and strict replication of sampling effort is generally not practical.

Sampling methods and procedures are discussed in Section 6.1.1.10 and are summarized for each station in Table 2.7.2-13 together with the total numbers of fish collected at these times. The fish collection stations were generally associated with the permenant collection stations. Special requirements, however, often made it necessary to collect fish a short distance from the location of the water quality, benthos and plankton sampling sites. At the river and lake stations (4, 8, 10, 12) shorelines adjacent to the center-channel water quality station were sampled. Smaller streams were electrofished or seined along reaches centered about the water quality sampling station. In addition, a series of special fish inventory stations representing additional types of fish habitat were collected irregularly.

Because of differences in gear or limitations imposed upon sampling by different physical conditions at each station, the effort expended varied between stations. However, at any one station, effort and gear have been standardized as much as possible. The gear used and sampling effort expended are summarized for each station at the bottom of ER Tables 2.7.2-17a and 2.7.2-17m.

2.7.2.6.2 Species Composition

A species list, derived from collections, observations and literature (26, 27) for fish species known to occur near the Cherokee Nuclear Station site is given in Table 2.7.2-18. The table notes introduced species, those actually collected during the study, and those classified as rare or endangered by the North Carolina Wildlife Resources Commission (21). The North Carolina list was used because there is no similar list for South Carolina and the Cherokee Nuclear Station is located only 10 miles from the North Carolina state line.

Scientific and common names are those given by Bailey et al[28]. The fish found in the area are predominately stream species although a typical lake fauna exists in the Ninety-Nine Islands impoundment.

The fish populations of the Piedmont region of the Broad River are not well known, opening the possibility for the existence of undescribed endemic species. Many such species occur in other drainages in the Carolinas[26]. In addition, variable water levels and swift currents combine to make reaches of the Broad River itself both marginal habitat for fish and difficult to sample. For these reasons sampling on the river proper has been relatively unproductive.

The river and stream environments adjacent to the proposed site support large populations of small fish. Bluehead chub (Nocomis leptocephalus) and several species of shiners (Notropis chloristius, N. niveus, N. hudsonius, and Notemigonus crysoleucas were among the most common collected. The pools of deeper creeks (for example, station 6) and the Ninety-Nine Islands Impoundment support populations of larger fish such as the sunfishes (Lepomis spp.), largemouth bass (Micropterus salmoides), catfishes (Ictalurus spp.), shad Dorosoma spp.), carp (Cyprinus carpio), and quillback (Carpiodes cyprinus). Rapid creeks flowing over rocky or gravelly beds (Stations 16 and 1-1) contained the greatest variety and number of fish including darters (Etheostoma thallasinum, E. flabellare, and E. olmstedi), yellowfin shiner (Notropis lutipinnis), rosyside dace (Clinostomus funduloides), madtoms (Notorus insignis), and the bluehead chub (N. leptocephalus).

The very small creeks which drain the site (Stations 21 and 23) do not support large fish populations. Only one species, the creek chub Semotilus atromaculatus, was collected in any numbers at these two stations.

Several species of fish have been introduced into the Broad River system and the extent of their distribution is not known at present. Of these, only the white crappie (Pomoxis annularis) and carp (Cyprinus carpio) have been collected to date. However, the proximity of the state stocked public fishing lake (Lake Cherokee) at Draytonville indicates that other introduced species may be expected.

2.7.2.6.3 Life Histories | Q 2.7.5

General life histories of important fish species are available in the literature, although specific papers pertaining to the Carolinas are scarce. Species found in the vicinity of the Cherokee Nuclear Station site which were reviewed are: Dorosoma cepedianum, Carpiodes cyprinus, Cyprinus carpio, Notemigonus crysoleucas, Notropis chloristius, Notropis scepticus, Nocomis leptocephalus, Ictalurus punctatus, Ictalurus nebulosus, Ictalurus platycephalus, Micropterus salmoides, Lepomis spp., Pomoxis spp., and Etheostoma thallasinum.

Dorsoma cepedianum

The gizzard shad was introduced into the Broad River drainage and has since established itself as a major forage species. The related threadfin shad (D. petenense) was also introduced, but has had to be restocked due to high winter mortality and the heavy losses associated with spawning in this species.[72]

Both species feed primarily on phytoplankton, supplemented with zooplankton and benthos [70,72].

Spawning has been reported as early as March for gizzard shad and April for threadfin shad in the southern U. S.[72]. Ripe male gizzard shad were collected in Ninety-Nine Islands Impoundment during March. Fully ripe females were collected later in the spring. Both species of shad are known to migrate out of lakes and up rivers or creeks to spawn.

<u>Carpiodes</u> <u>cyprinus</u>

The quillback is abundant in lakes and impoundments of the southern Piedmont (59,60) including the Ninety-Nine Islands Impoundment. This species has been collected primarily by means of trammel nets, only a few individuals being taken by electrofishing. Apparently, the quillback is most common (at least during the autumn and winter) in the deeper portions of the lake where electrofishing is not practicable.

Like all catostomids it is a bottom feeder and gut content analyses have indicated that it feeds primarily on chrionomid larvae, detritus, and other organic material (Table 2.7.2-19).

Spawning occurs in the spring as indicated by the increasing maturity of the specimens collected in periods 2 through 6, when a fully ripe (stage 4) female was taken. Other suckers, including species of <u>Moxostoma</u> which are also present in the area, exhibit similar life histories. All require clear, relatively clean water, although the quillback seems to be less particular than the redhorses in this respect. Catostomids generally are early spring spawners. Spawning is preceeded by migrations up creeks and streams.

The life history and ecology of the closely related <u>Carpiodes</u> <u>carpio</u> have been studied by Buckholz[29] and Summerfelt <u>et</u> <u>al</u>.[30]

<u>Cyprinus</u> <u>carpio</u>

The carp is another of the more abundant "rough" fish found in the study area. While young carp provide excellent forage for game fish, the adults are often responsible for the destruction of centarchid (bass and sunfish) nests and are predators upon the eggs and young of many fish species. Spawning occurs over a protracted period from March through late summer and even into the autumn[32,61]. Ripe males and females were found at Station 15 during March.

Summerfelt <u>et</u> <u>al</u>. [31] review the feeding habits of carp. Analysis of stomach contents of seven carp from Ninety-Nine Islands Impoundment basically agrees with their conclusions, showing that carp feed on detritus and benthic insect larvae (chiefly chironomids), although other, unidentifiable insect remains were also present. Rehder [32] provides many essential life history details and Carlander[61] summarizes the extensive literature on this species.

<u>Notemigonus</u> <u>crysoleucas</u>

The golden shiner is found in Ninety-Nine Islands Impoundment and in the larger streams in the study area. Large, sexually mature females were collected from the impoundment in period 6. Gut content analyses (Table 2.7.2-19) indicate that this species feeds on both algae, vascular plants and insects. The species is an important forage fish for game species and is widely used as bait.

<u>Nocomis</u> <u>leptocephalus</u>

The bluehead chub is one of the most abundant fishes in smaller streams of the Carolina Piedmont. In the spring the males construct nests in clear areas of streams and guard the fertilized eggs against intruders. Food items are mainly insect larvae and adults (Table 2.7.2-19). Spawning probably occurs in the small creeks which drain into the Broad River near the Cherokee Nuclear Station Site.

<u>Notropis</u> spp.

Various species of shiners were found throughout the system, but as a group they are characteristic of moving waters. Species in this area are known to be spring spawners; the exact time and habitat for most species is not known. Most shiners are assumed to be carnivorous (they have a relatively short intestine). However, the existence of herbivorous species like <u>N. mekistrocholas</u> (endemic to the Cape Fear River, N. C.) warns against such broad assumptions. Shiners are important forage species for game fish. Raney[33] and Gibbs [34] give life history details of three local species. Three other species of shiners are common in the Broad River: <u>Notropis chloristius</u>, <u>N. niveus</u>, and <u>N. scepticus</u>. <u>N. niveus</u> is found in the Broad River as well as the larger creeks while the other two are more common in medium sized creeks (e.g. Kings Creek). The spot-tail shiner (<u>N. hudsonius</u>) has been collected from creek stations, but is also known to occur in lakes (61, 75). Aside from systematic studies, there is little pertinent literature on these species.

<u>Ictalurus</u> <u>punctatus</u>

The channel catfish inhabits rivers and lakes of the Carolina Piedmont. A popular game species, it is sought by anglers along the Broad River. It is undoubtedly a predator; two of three stomachs examined contained sunfish remains while the third stomach was empty (ER Table 2.7.2-19). Several studies on the food habits of this species are in the literature [35,36,67]. Stevens[35] also indicates a spawning period beginning in March, although no ripe fish were collected that early.

<u>Ictalurus</u> <u>catus</u>

The white catfish was the most common catfish species in the study area. It was predominate during the winter at all lake stations and occured in rivers as well. Stevens[35] reports on the food habits of white catfish from Lake Moultree, S. C. Our results indicate the white catfish are primarily piscivorous. Of twelve stomachs examined, ten contained fish (<u>Dorosoma</u>, <u>Lepomis</u> and unidentified remains); two were empty. This is the principal species of catfish caught by anglers in both river and lake situations.

Ictalurus spp.

Several species of bullheads occur in the study area. I. platycephalus was collected from several stream stations during the fall but disappeared in the winter and was not sampled again until late March. Duke Power Company fishery biologists have found a similar phenomenon in Lake Norman near Charlotte, N. C. where the flat bullhead is a common bullhead catfish. Other catfish includes I. brunneus, and I. nebulsus.

Food items include a variety of materials (algae, fish, invertebrates) although most stomachs examined contained fish.

Micropterus salmoides

Largemouth bass spawn in the spring and early summer. Male fish construct nests in shallow backwater areas and guard the eggs, which number 5-10,000 per nest. The young feed primarily upon zooplankton, insects and minnows at successive stages of growth [37,38,66]. The adults are primarily piscivorous although crayfish may be an important food item in stream habitats.[66] They were taken in backwater areas (Stations 9,10,12 and 13) in fair numbers once the electroshocker boat came into use in January.

Lepomis auritus

The redbreast sunfish or robin is a common and widely distributed gamefish in the Piedmont Carolinas[73]. In the study area it is found in the Ninety-Nine Islands Impoundment and in tributary streams. In North Carolina they have been reported spawning in June at water temperatures of 71-78°F in sheltered areas with sand or gravel bottoms and current velocities of 0.03-0.58 (ave 0.18) m/sec[74].

Food items reported [73,74] include plant materials, detritus and mayfly, dragonfly and bettle larvae; smaller benthic insect larvae (such as caddisflies) are eaten less frequently. This species is expected to move into the shallow site creeks and other low velocity, sandy bottomed areas for spawning in the late spring.

Lepomis gibbosus

The pumpkinseed occurs in Ninety-Nine Islands Impoundment but not in substantial numbers. This is the most northerly distributed of the sunfish and should breed somewhat earlier than most [75]. The species inhabits the lake littoral and moderatley deep areas throughout the winter, moving into shallow, often muddy bottomed backwater areas in the spring where the fish construct their nests. Pumpkinseed feed primarily on the smaller aquatic insect larvae. Large individuals will, however, consume fish, including their own young [75].

Lepomis gulosus

The warmouth is another large-mouthed sunfish which is known to feed upon larger aquatic invertebrates and fishes [75,70]. It was not common in the Broad River study area.

Lepomis macrochirus

The bluegill is one of the most abundant fishes in the study area, occuring in all habitats sampled. Larger fish are generally regarded as sport fish while the smaller individuals serve as food for game fish such as bass and catfish.

Table 2.7.2-19 shows that bluegill from Ninety-Nine Islands Impoundment feed on chironomids, other insect larvae and planktonic crustaceans. Those from rivers and streams feed on caddisfly, mayfly and dragonfly larvae and small crayfish.

Bluegill spawn during the spring in the lake littoral or backwater areas of streams where they seek open sandy or slightly muddy sediments protected by rocks, fallen logs, etc.[38,75]. The wide size range of young-of-the-year bluegill collected indicates a protected spawning period, probably extending well into the summer.

Etheostoma spp.

The darters are small fishes found (in this area) only in clean, rapidly flowing waters with rocky or gravel bottoms (Station 16). All are spring spawners and carnivorous. Darters are among the most sensitive of fishes to environmental stresses and are easily extripated from streams by low dissolved oxygen levels or chemical pollutants. Richards[59] discusses the life history of E. thalassinum.

2.7.2.6.4 Trophic Relationships

Trophic relations, growth and population structure were studied by examining stomach contents of selected fishes and by length-frequency distributions of specimens. The presence of vegetable materials in the stomachs of such carnivorous fish as black crappie (Pomoxis nigromaculatus) or largemouth bass (Micropterus salmoides) may be incidental to prey capture or may result from the stomach contents of partially digested prey being mixed with those of the predator. The digestive process generally made more detailed identifications of prey impossible (ER Table 2.7.2-19).

2.7.2.6.5 Seasonal Changes

Starting with Sampling Period 9 (June), the peripheral sampling stations were dropped in order to concentrate more fully on stations in the site area. An expected increase in the numbers of fish taken in the impoundment as juveniles were recruited to the sampled population through the spring and summer simply is not reflected in the data (ER Table 2.7.2-17). Although marked fluctuations in faunal densities might be expected in a small impoundment, no really acceptable explanation can be offered for these results.

2.7.2.6.6 Age/Sex Composition for Important Fish Species

In ER Table 2.7.2-22 data on average age, length, and weight are presented on each sex for nine important or common fish collected from the Broad River system this past year. For most species females outnumber males by about 2:1, although for the carpsucker (Carpiodes cyprinus) the ratio is 19:1.

With the exception of the creek chub females were also generally older and heavier than the males. It should be noted, however, that this information is based on a biased sample, selected for size, and may not be representative of the fish population generally.

2.7.2.6.7 Breeding Behavior

The breeding behavior of most of the fish species sampled during this study is summarized in ER Table 2.7.2-23. Literature citations on which this information is based are included at the end of the table. Q 2.7.5

2.7.2.6.8 Rare or Endangered Species Q 2.7.1(

Care must be taken in distinguishing truly rare or endangered species from ones which are only locally depleted. No list of rare or endangered species has been compiled for South Carolina and conversations with the S. C. Division of Game and Freshwater Fisheries indicated information for the Broad River has not been collected. Therefore the document "Preliminary List of Endangered Plant and Animal Species in North Carolina" was used as the principle guide. Only one species of rare or endangered fish, the seagreen darter, Etheostoma thallasinum, was encountered in the study area. Several other species collected, while not considered rare or unusual, constitute significant range extensions and should be noted. Construction of Cherokee Nuclear Station is not anticipated to affect the populations of these locally uncommon species since most, like the seagreen darter, reside outside the immediate area of the station.

These species include:

Hybopsis n. sp. The presence of an undescribed species of chub in the Santee River system has long been recognized. Dr. R. E. Jenkins of Salem College, Roanoke, Virginia, is presently studying this species and further clarification of its status should be forthcoming. This species is a large river and stream form seeming to prefer sandy river margins with moderate to strong currents. As such, it should not occur in or immediately below the impoundment where the bottom is mostly exposed bedrock with small patches of sand and other sediment.

Notropis procne. The swallowtail shiner is a common species along the Coastal Plain of North Carolina and Virginia. It is unusual in the Piedmont region and has not been previously reported from the Broad River. Two specimens were collected from Kings Creek (Station 16) site, well away from the site.

Moxostoma robustum. The presence of a large race of the shortfin redhorse in the Piedmont of the Yadkin-Pee Dee and Santee River systems has been recognized for sometime. However, lack of specimens has prevented clarification of the status of this fish which is intermediate in many characteristics between typical M. robustum and M. rupiscartes. This species has been collected frequently at Station 15, just below Ninety-Nine Islands Impoundment, and in the lower reaches of Kings Creek. These specimens have been sent to Dr. E. F. Menhinick, University of North Carolina, Charlotte, for further study.

2.7.2.6.9 Fish Kills

Q2.7.6
Q2.7.11

According to Mr Jefferson Fuller, Director, Division of Game and Freshwater Fisheries, the State of South Carolina has only recently begun a systematic biological survey of its freshwater resources. One such study was begun about two years ago and is expected to be completed sometime in 1976 or 1977. The state's major rivers are scheduled to be the last freshwater bodies surveyed and the Broad River will probably be the last of these. This information was confirmed in phone conversations with Mr Joseph Logan of the Columbia office and Mr Val Nash, State Wildlife Protector, stationed in Rock Hill. Neither was aware of any official reports on the size or economic value of the Broad River Fishery. Mr Nash also stated that, to his knowledge, no fish kills have occurred in the site area in the recent past, and no data on fish kills are available from the state of South Carolina at this time.

A draft report, published in 1973, from the State of North Carolina Department of Natural and Economic Resources, Office of Air and Water Resources, does exist for the Broad River Basin headwaters in North Carolina. The area covered, however, is at least 40 river miles upstream of the site and in a very different environment. It contains only sketchy biological information, and no data at all on fisheries or fish kills.

2.8 BACKGROUND RADIOLOGICAL CHARACTERISTICS

Background radiation and radioactivity levels both from natural and manmade sources throughout the country vary considerably from place to place, even on a local level. This variation occurs not only from place to place, but the levels at a given place vary from time to time as well. The spatial variation is to be expected, when one considers that the terrestrial component of natural background depends upon the geology of the area, and on various mixtures of some 40 naturally-occurring radioactive elements (or some 80 naturally-occurring radionuclides). However, the major portion of the human exposure results from naturally-occurring potassium-40, and from the uranium and thorium series of radionuclides. Since these materials are not distributed uniformly throughout the earth's crust, the resulting radiation levels are not uniform. Also, the cosmic-ray component of the natural background radiation varies directly with altitude above sea level, and also varies with latitude. Average variations in the sum of terrestrial and cosmic-ray background radiation in the United States range from a low of about 75 millirems per year in Louisiana and Texas to a high of about 225 millirems per year in Colorado. The average for the United States is approximately 105 millirems per year; for North Carolina, 120 millirems per year; and for South Carolina, 110 millirems per year from these sources.[1] Tables 2.8.0-1 and 2.8.0-2 contain data on regional (North and South Carolina) and site-specific terrestrial radiation levels for Cherokee Nuclear Station. (Note: Table 2.8.0-1 data is based on population distributions.)

Furthermore, people receive additional dose from the materials used for construction (30-50 millrems per year more from a brick than from a wood frame house, for example), from the air they breathe, from the water they drink, and from the chemical constituents of their bodies (about 21 millirems per year just from the naturally-occurring radioactive materials in the body, resulting from food, water, and air intake.)[2]

Fallout radioactivity from nuclear weapons testing and radioactivity from other nuclear installations contribute an extremely small fraction of the average population dose due to natural background radioactivity (perhaps as much as 0.001 millirem per year is contributed from other nuclear facilities.)[3]

Temporal variations of the naturally-occurring and the manmade components of background dose (consisting of radioactivity in air and water) are to be expected, based on differences in area and local climatology, including windspeed, temperature, barometric pressure, rainfall and runoff conditions, etc. For example, the concentrations of naturally-occurring radioactive radon gas may vary considerably at a given location depending on the weather, with the greater concentration being encountered during inversion conditions.

Table 2.8.0-1 contains regional (North and South Carolina) radiological data for Cherokee Nuclear Station. This data includes both natural background radioactivity levels and results of analyses performed to determine background concentrations of specific radionuclides in surface water and milk.

2.9 OTHER ENVIRONMENTAL FEATURES

An additional environmental feature of the Cherokee Nuclear Station site is its ambient noise.

Ambient sound levels are a measure of the total sound at a given location and are usually comprised of sounds from many sources, both local and distant. The minimum ambient sound levels measured are an indication of the noise during lulls in the transient noise. Identifiable noise sources in the general vicinity of the site include insects, wildlife, and motor traffic.

ER Table 2.1.1-1
Cherokee Nuclear Station

Site Acquisition

Property Identification	Date Purchased	Property Identification	Date Purchased
D-2651	6-18-73	D-2737	11-27-73
D-2681	8-23-73	D-2741	11-27-73
D-2682	8-23-73	D-2800	12-11-73
D-2687	8-22-73	D-2814	3-12-74
D-2688	8-16-73	D-2825	3-14-74
D-2700	9-25-73	D-2829	3-12-74
D-2701	10-2-73	D-2830	3-21-74
D-2702	10-2-73	D-2847	5-30-74
D-2704	10-9-73	T.O. 6480	10-11-74
D-2705	10-9-73	T.O. 6483	Negotiations in progress
D-2706	10-2-73	T.O. 6496	Negotiations in progress
D-2707	10-10-73	T.O. 6497	Negotiations in progress
D-2713	10-11-73	T.O. 6528	To be optioned
D-2720	11-6-73	D-99-(C)	1-17-07
D-2724	10-9-73	D-99-(14)	12-4-05
D-2725	11-12-73	D-99-(17)	11-30-05
D-2736	10-22-73		

ER Table 2.2.1-1
Cherokee Nuclear Station
County Population Within 50 Miles

North Carolina	1970	2024	County Growth/Loss 50 Yr. Period - %	County Area Within 50 Mile Radius - %	County Population Within 50 Mile Radius [1] 1970	2024
Burke	60,364	114,200	83.05	45	46,434	87,846
Cabarrus	76,629	132,000	72.18	1	44	78
Catawba	90,873	206,400	117.88	53	63,458	144,132
Cleveland	72,556	118,500	60.56	100	72,556	118,500
Gaston	148,415	314,200	102.13	100	148,415	314,200
Henderson	42,804	128,000	174.27	5	222	664
Iredell	72,197	140,300	88.37	4	700	1,360
Lincoln	32,682	55,800	66.75	100	32,682	55,800
McDowell	30,648	71,000	128.39	19	6,033	13,976
Mecklenburg	354,656	962,250	153.76	96	349,327	947,791
Polk	11,735	17,250	44.86	100	11,735	17,250
Rutherford	47,337	67,200	40.48	97	47,237	67,058
Union	54,714	101,500	80.94	34	11,573	21,469
Total - North Carolina					790,416	1,790,124
South Carolina						
Cherokee	36,791	77,700	101.13	100	36,791	77,700
Chester	29,811	37,800	24.11	100	29,811	37,800
Fairfield	19,999	35,500	70.00	46	5,152	9,145
Greenville	240,546	605,000	139.03	44	84,640	212,879
Lancaster	43,328	86,200	84.63	43	26,460	52,642
Laurens	49,713	102,800	97.13	63	40,318	83,372
Newberry	29,273	43,600	43.47	37	6,569	9,784
Spartanburg	173,724	407,000	118.73	100	173,724	407,000
Union	29,230	60,500	88.16	100	29,230	60,500
York	85,216	169,000	87.75	100	85,216	169,000
Total - South Carolina					517,911	1,119,822
Total Within 50 Miles					1,308,327	2,909,946

[1] The 1970 and 2024 populations are based on population distribution.

Amendment 1
Amendment 2

ER Table 2.2.1-2 (Sheet 1 of 3)

Cherokee Nuclear Station

1970 Population Distribution for Each Sector by Miles

Sector	0-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50	Total
N	10	60	110	220	241	2,891	26,122	10,573	6,776	46,973	93,976
NNE	0	23	94	53	74	1,100	11,407	15,307	22,317	43,758	94,133
NE	7	70	50	7	100	65	7,394	77,700	17,221	14,630	117,244
ENE	3	40	14	20	97	507	6,923	24,465	151,261	169,739	353,069
E	3	3	14	0	37	439	6,193	14,354	31,222	25,527	77,792
ESE	0	10	10	17	60	320	3,925	28,172	14,440	25,143	72,097
SE	0	13	0	10	10	800	728	13,347	4,349	7,762	27,019
SSE	0	43	10	7	3	320	1,290	2,350	2,222	2,213	8,458
S	0	37	17	7	23	168	2,266	2,560	4,606	3,504	13,188
SSW	3	100	0	14	67	380	3,427	16,500	2,359	18,477	41,327
SW	0	30	37	40	33	240	3,650	3,107	9,141	18,319	34,597
WSW	0	0	50	50	80	500	9,648	63,883	12,806	51,172	138,189
W	0	0	14	23	147	5,503	7,170	30,389	24,081	41,398	108,725
WNW	0	4	20	100	40	13,543	3,804	7,622	6,385	10,516	42,034
NW	0	30	287	120	20	739	3,950	19,742	17,460	5,810	48,158
NNW	0	77	97	150	230	872	7,732	7,552	3,207	18,404	38,321
TOTAL	26	540	824	838	1,262	28,387	105,629	337,623	329,853	503,345	1,308,327

ER Table 2.2.1-2 (Sheet 2 of 3)
Cherokee Nuclear Station
1984 Population Distribution for Each Sector by Miles

Sector	0-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50	Total
N	12	75	137	274	302	3,587	29,882	12,127	8,052	57,111	111,559
NNE	0	29	117	66	92	1,341	13,090	18,396	26,514	55,499	115,144
NE	9	87	62	9	125	80	8,642	94,131	20,805	19,620	143,570
ENE	4	50	17	25	121	621	8,439	29,678	207,719	236,778	483,452
E	4	4	17	0	45	536	7,558	17,659	41,472	34,101	101,396
ESE	0	13	12	21	73	391	4,798	34,356	17,327	29,649	86,632
SE	0	16	0	12	12	976	875	14,184	4,588	8,330	28,993
SSE	0	54	12	9	4	391	1,409	2,479	2,360	2,368	9,086
S	0	46	21	9	29	210	2,592	2,930	5,024	3,720	14,581
SSW	4	125	0	17	84	474	3,947	18,909	2,785	22,217	48,562
SW	0	38	46	50	41	299	4,413	3,858	11,520	22,119	42,384
WSW	0	0	62	62	101	624	12,248	81,268	16,289	67,430	178,084
W	0	0	17	29	184	6,865	9,077	38,659	30,634	54,452	139,917
WNW	0	5	25	125	50	16,896	4,743	9,325	7,456	11,889	50,514
NW	0	37	358	150	25	922	4,536	21,213	18,737	6,780	52,758
NNW	0	96	121	187	287	1,080	8,847	8,446	3,539	22,029	44,632
TOTAL	33	675	1024	1045	1575	35,293	125,088	407,618	424,821	654,092	1,651,264

Amendment 3
(Entire Page Revised)

ER Table 2.2.1-2 (Sheet 3 of 3)
Cherokee Nuclear Station
2024 Population Distribution for Each Sector by Miles

Sector	0-1	1-2	2-3	3-4	4-5	5-10	10-20	20-30	30-40	40-50	Total
N	21	127	232	464	510	6,022	42,663	17,365	12,357	95,181	174,942
NNE	0	49	199	112	155	2,180	18,925	30,843	38,687	98,936	190,086
NE	15	148	106	15	210	136	13,369	164,494	35,211	36,271	249,975
ENE	6	84	30	42	205	1,018	13,851	51,715	399,710	460,493	927,154
E	6	6	28	0	74	871	12,282	29,056	76,267	60,489	179,079
ESE	0	21	20	34	118	635	7,784	55,756	27,437	49,405	141,210
SE	0	27	0	20	20	1,587	1,383	17,371	5,514	11,198	37,120
SSE	0	91	21	14	6	635	1,843	2,981	3,347	3,924	12,862
S	0	77	36	15	49	355	4,593	5,258	7,843	5,332	23,558
SSW	6	211	0	30	142	803	7,101	34,151	4,804	37,882	85,130
SW	0	63	78	85	70	507	8,026	7,073	20,972	37,917	74,791
WSW	0	0	106	106	168	1,056	22,361	149,665	29,996	127,887	331,345
W	0	0	30	49	310	11,622	16,382	71,195	56,416	103,168	259,172
WNW	0	8	42	212	84	28,602	8,047	16,060	11,767	17,490	82,312
NW	0	63	607	253	42	1,561	6,600	28,110	24,786	10,915	72,937
NNW	0	163	205	317	485	1,808	12,636	11,750	4,853	36,056	68,273
TOTAL	54	1,138	1,740	1,768	2,648	59,398	197,846	692,843	759,967	1,192,544	2,909,946

Amendment 3
(Entire Page Revised)

ER Table 2.2.2-1 (Sheet 1 of 2)
Cherokee Nuclear Station
Industries Within 10 Miles

Key Symbol	Name	No. of Employees	Type of Business
M-1) M-2)	Minette Mills	80	Chenille Bed Spreads
M-3	Andrews-Gaddy Ind., Inc.	14	Modular Homes & Apartments
M-4	Catawba Timber Corp.	3	Pulpwood
M-5	Vulcan Materials Co.	57	Lime and Crushed Stone
M-6	Monsanto Textiles Co.	235	Synthetic Yarn Warping
M-7	TNS Mills, Inc.	130	Cotton Yarn
M-8	Broad River Brick Co.	75	Brick
M-9	Broad River Brick Co.	37	Brick
M-10	Deering Milliken Inc.	749	Dyeing & Finishing of Cotton/Polyester & Knit Fabrics
M-11	Spartanburg Concrete Co.	7	Concrete Products & Ready Mixed Concrete
M-12	Dodgeville Finishing Co., Inc.	150	Dyeing & Finishing of Synthetic Fabrics
M-13	Wendell Fabrics Corp.	150	Grille Fabric
M-14	Burton Dixie Corp.	240	Sisal & Cotton Padding Innerspring units, Polyurethane Foam
M-15	Gaftan Sportswear Inc.	38	Dresses, Suits, Skirts, Slacks
M-16	Jupiter Knitting Mills	70	Knitwear
M-17	Burlington Industries	250	Fine Cotton Goods (Gray Goods)

ER Table 2.2.2-1 (Sheet 2 of 2)

Cherokee Nuclear Station
Industries Within 10 Miles

Gaffney Industrial Area	No. of Employees	Type of Business
Armour Company, United Beef Co.	74	Dressed Beef & Veal
Atlantic Tool Co.	12	Cold Headers
Carolina Abrasive & Supply	6	Industrial Abrasives & Supplies
Carolina Apparel Mfg. Co.	650	Ladies Blouses
Cherokee Finishing Co.	505	Textile Finishing
Childer's Sheet Metal Shop	10	Sheet Metal Products
Cresent Mill	5	Animal Feed
DeCamp Publishing Co.	5	Magazine Publishing
Derry Damask Mills	Unknown	Cotton Spreads
Fashion Engravers	45	Engraving
Gaffney Coca-Cola Bottling Co.	37	Soft Drinks
Gaffney Ice Company	4	Ice
Gaffney Ledger, Inc.	30	Newspaper, printing
Gaffney Manufacturing Co.	750	Cotton Print Cloth
Gaffney Monument works	25	Monuments
Gaffney Printing & Office Supply	3	Commercial Job Printing
Hamrick Mills	279	Print Cloth, Shade Cloth & Sheeting
Limestone Concrete Pipe Co.	13	Concrete Pipe, Septic Tanks, Weld Base
Limestone Manufacturing Co.	1000	Polyester/Cotton/Rayon Cloth
Litton Industrial Products, Inc.	120	Twist Drills
A. P. McAuley Co., Inc.	200	Silk Screen Printing
Musgrove Mills	270	Sheetings & Print Cloth
Sanders Brothers, Inc.	22	Sheet Metal Products
Sleep-Easy Mattress, Co.	13	Mattresses & Boxsprings
Southeastern-Kusan Inc.	130	Molded Plastics Products
Southern Loom-Reed Mfg. Co.	34	Loom-Reeds, Combs, Forged wires & Hooks, Quill bags
Victor Cotton Oil	12	Ice Plant
Ware, Inc., J. C.	11	Gutters, Vents, Sheet Metal Products
Lipscomb Concrete Step Co.	6	Concrete Steps & Slabs
Coachman Draperies, Inc.	17	Draperies for Mobile Homes
Piedmont Gloves Manuf. Inc.	43	Industrial Work Gloves

ER Table 2.2.2-1a
Cherokee Nuclear Station
Closest School, Church, Hospital, Dairy, Farm, Residence and Milk Producing Animal
In Each Sector Within 10 Miles

Sector	Distance in Miles (Approximate) From Centerline Number Two Reactor						
	School	Church	Hospital	Dairy	Farm	Residence	Milk Producing Animal[1]
N	5.3	5.1			3.6	.9	4.1
NNE		2.9			3.9	1.3	5.8
NE		2.1			3.9	1.1	1.3
ENE		5.3			3.5	1.1	6.0
E		4.5			1.5	1.1	4.5
ESE	6.7	3.1			1.6	1.2	5.9
SE	6.9	3.7			1.5	3.5	3.5
SSE		7.9			1.2	1.2	2.3
S		1.2			1.2	1.2	1.4
SSW		7.7			1.2	1.1	1.6
SW		8.9			1.2	1.1	1.2
WSW	7.7	2.9			2.1	2.5	2.1
W	4.5	4.6		7.6	3.3	2.1	7.6
WNW	5.8	5.1	7.9		3.4	2.1	3.8
NW		6.4			5.4	1.8	3.8
NNW		3.9				1.3	3.5

1 All milk producing animals indicated are cows that produce milk for human consumption. There are no goats that produce milk for human consumption closer to the site in each sector than the cows located in this table.

ER Table 2.2.2-1b (Sheet 1 of 2)
Cherokee Nuclear Station
Animals Producing Milk for Human Consumption

Identification Number	Direction	Distance from Plant Site (Mi.)	Size of Herd	Number of Cows Being Milked	Remarks
1	NW	3.8	1	1	
2	NNW	3.5	24	1	
3	N	4.0	1	1	
4	NE	1.2	5	0	2 cows, 2 calves, 1 bull
5	NE	2.4	5	0	3 cows, 2 calves
6	NE	2.6	3	1	
7	NE	3.6	1	0	
8	ENE	3.9	2	0	
9	E	4.5	36	0	
10	SE	3.5	14	0	6 cows, 8 heifers
11	SSE	3.8	30	2	16 cows, 14 goats (milks 3 goats)
12	SSE	2.4	2	2	
13	S	1.4	2	1	
14	S	1.6	2	2	
15	S	3.4	1	1	
16	S	4.4	17	1	
17	SSW	1.7	9	2	6 milk cows, 3 beef cows
18	SW	1.6	3	3	

ER Table 2.2.2-1b (Sheet 2 of 2)
Cherokee Nuclear Station
Animals Producing Milk for Human Consumption

Identification Number	Direction	Distance from Plant Site (Mi.)	Size of Herd	Number of Cows Being Milked	Remarks
19	SW	1.2	2	2	
20	SW	1.7	3	3	
21	SW	4.3	4	1	2 milk cows, 2 heifers
22	WSW	3.8	6	Unknown	
23	WSW	2.2	1	1	
24	WNW	3.7	2	0	
25	SSW	5.0	2	2	

ER Table 2.2.2-2 (Sheet 1 of 2)
Cherokee Nuclear Station
Groundwater Supply Intakes

Key Number	Name	Number of Wells	Present Capacity MGD	Type Usage	Population Served (Thousands)
1	Carolina By-Products, Inc.	1	-	Industrial	-
2	Frieda Manuf. Co.	1	-	Industrial	-
3	Frieda Manuf. Co. Village	1	-	Public	-
4	Kings Mountain Manuf. Co.	1	-	Industrial	-
5	Kings Mountain Mica Co.	1	-	Industrial	-
6	Mount Olive Baptist Church	1	-	Public	-
7	State Prison Dept.	1	-	Public	-
8	Harrison & Walker Mill Co.	1	-	Industrial	-
9	Ester Mills Corp.	2	-	Industrial	-
10	Carnation Co.	1	-	Industrial	-
11	Dover Mill Co.	3	-	Industrial	-
12	Pittsburg Plate Glass Co.	3	-	Industrial	-
13	Ora Mill Co.	3	-	Industrial	-
14	Town of Boiling Springs	5	-	Public	3.3
15	Shelby Cotton Mill	3	-	Industrial	-
16	Belmont Mills	1	-	Industrial	-
17	Crest School	3	-	Public	-
18	F. Young	1	-	Public	-
19	Lily Mills Co.	2	-	Industrial	-
20	River Bend Acres	1	-	Public	-
21	Hunt Construction	1	-	Public	-
22	Hunt Construction Co.	7	-	Public	-
23	Trountman Trailer Park	1	.065	Public	.1
24	Earl School	2	-	Public	-
25	Bethware School	2	-	Public	-
26	Pleasant Hill Baptist Ch.	1	-	Public	-
27	Park Grove School	1	-	Public	-
28	Neisler Mills	17	2.0	Industrial	10.5
29	Park Yarn Mills	1	-	Industrial	-
30	Kraftspun Mills	1	-	Industrial	-
31	Mid-Pines Water Co.	2	-	Public	.5

ER Table 2.2.2-2 (Sheet 2 of 2)
Cherokee Nuclear Station
Groundwater Supply Intakes

Key Number	Name	Number of Wells	Present Capacity MGD	Type Usage	Population Served (Thousands)
32	N. C. State Highway Comm.	1	-	Public	-
33	Kings Mountain Mica Co.	1	-	Industrial	-
34	Town of Grover	4	-	Public	.555
35	Minette Mills	8	-	Industrial	-
36	W. C. Sarratt Dairy	1	-	Industrial	-
37	M. Runyans	1	-	Industrial	-
38	Fiber Industries	1	-	Industrial	-
39	Vulcan Materials	2	.002	Industrial	-
40	Burton Dixie Corp.	1	.012	Industrial	-
41	Monsanto Co.	2	.216	Industrial	-
42	Dodgeville Finishing Co., Inc.	3	-	Industrial	-
43	Town of Clover	8	1.0	Public	9.5
44	Duke Power Co.	3	-	Industrial	-
45	Duke Power Co.	4	-	Industrial	-
46	Burlington Industries	5	.03	Industrial	-
47	Screen Prints, Inc.	2	-	Industrial	.10
48	Dan River, Clifton Plant	3	.106	Industrial	-
49	Vulcan Materials Co.	2	.002	Industrial	-
50	J. P. Stevens, Jonesville Plant	4	.024	Industrial	-
51	Township No. 3 School	1	-	Public	-

ER Table 2.2.2-3
Cherokee Nuclear Station
Surface Water Supply Intakes

Key Number	Name	Location	Present Capacity MGD	Type of Usage	Population Served (Thousand)
1	Shelby	First Broad River	8.0	Public	19.0
2	Kings Mountain #2	Buffalo Creek	3.5	Public	10.0
3	Kings Mountain #1	Kings Creek	2.0	Public	10.5
4	Gaffney Water Dept.	Cherokee Creek	4.0	Public	13.2
5	Magnolia Finishing Co.	Buffalo Creek	2.4	Industrial	-
6	Vulcan Materials Co.	Jumping Creek	5.3	Industrial	-
7	York Water Dept.	Turkey Creek	1.3	Public	10.1
8	Dan River, Clifton Plant	Pacolet River	.03	Industrial	-
9	Vulcan Materials Co.	Pacolet River	.58	Industrial	-
10	Jonesville Water Dept.	Mill Creek	.16	Public	3.0
11	Lockhart Mill	Broad River	.636	Industrial	-
12	Union-Buffalo Mills	Buffalo Creek	.16	Industrial	-
13	Union Water Dept.	Broad River	3.5	Public	-
14	Carlisle Finishing Co.	Broad River	3.0	Industrial	-

ER Table 2.2.2-3a

Major Surface Water Users (≥1 cfs) Broad River Basin

Water Users	Capacity: MGD	cfs	Intake Stream or Impoundment
Forest City	2.0	3.1	Second Broad River
Rutherfordton - Spindale - Ruth	7.0	10.9	Cathey's Creek
Cliffside (Cone Mills)	1.5	2.3	Second Broad River
Cliffside Steam Station	210.0*	326*	Broad River
Shelby	10.0	15.5	First Broad
Kings Mountain	5.0	7.8	Buffalo Creek
Tryon	1.0	1.55	Fall Creek
Magnolia Finishing Company	2.9	4.5	Buffalo Creek
Gaffney	4.0	6.2	Cherokee Creek
Cherokee Nuclear Station	62.6**	97**	Broad River
York	1.3	2.0	Ross Branch Reservoir
Spartanburg	20.6	32.0	S. Pacolet River
Carlisle Finishing Company	3.0	4.7	Broad River
Union	8.0	12.4	Broad River
J. P. Stevens - Parker Croup Plant	1.3	2.0	Enoree River
Greer	3.2	5.0	S. Tyger River
Zonolite	3.6	5.6	Warrier Creek Reservoir
Cone Mills Corporation	4.0	6.2	Broad River
Clinton	2.0	3.1	Enoree River
Lyman Printing and Finishing Company	10.0	15.5	Middle Tyger River
Parr Steam Station	8.3	13.0	Broad River

* Average daily intake flow

** Represents a net value (includes consumptive losses)

ER Table 2.2.2-3b
Cherokee Nuclear Station
Summary of Nearest Residential & Downstream Residential Well Survey Data

Well No.	Owner or Description	Diameter In.	Total Depth Ft.	Depth to Water Ft.	Flow Rate GPM	Surface Elevation	Remarks - Driller
1	Owner - Ed Martin Resident - J. Martin					592**	No well, water supplied by spring (nearest residence)
2	Duke Power Co.	2	109	65	4	542**	McCall Drill Company
3	Owner - Erwin Resident - MacKabe	24	44	34		545*	
4	Jesse Peterson	8	147	55	16	601*	Falkner of Kings Creek, S. C.
5	Bob Upchurch	6	85		7	589*	Falkner of Kings Creek, S. C. claims hard water.
6	J. C. Upchurch	6	116	31	12	571*	Artesian water below 105 ft. Falkner of Kings Creek, S. C.
7	Bob & Wade Spear	24	30	27		440**	Hand dug, abandoned house.
8	Joe Hamrick	30	33	30		460**	Hand dug.
9	Joe Hamrick	30	33	29		460**	Hand dug.

* Surface Elevations Estimated from Duke Power Topographic Map Dated September, 1973.
** Surface Elevations Estimated from USGS Topographic Map.
NOTE: For well survey data for wells in site vicinity, see Figure 2.5.4-1 and Table 2.5.4-3.
Residences at well locations 3, 4, 5 and 6 are to be removed and wells closed prior to plant operation.

ER Table 2.2.2-4
Perkins Nuclear Station
Dilution Flows

Dilution Flow Condition	River Flow Condition	Flow in cfs	Velocity in fps
Minimum	Minimum Daily Average	224	1.0
Average	Average of Record	2412	3.0
Maximum	Maximum Daily Average	82500	5.3

All dilution flows are based upon records for USGS Streamgage 02153500, Broad River near Gaffney, S. C.

ER Table 2.2.2-5
Cherokee Nuclear Station
Transient Times

Identification Number[1]	Name	Usage	River Miles From Station	Transient Time (Hours) Minimum	Average	Maximum
11	Lockhart Mill	Industrial	22	6.09	10.76	32.27
13	Union Water Dept.	Municipal	25	6.92	12.22	36.67
14	Carlisle Finishing Co.	Industrial	38.5	10.95	18.82	56.47

[1] From Figure 2.2.2-6 and Table 2.2.2-3

Amendment 1
(New)
Amendment 2

ER Table 2.4.1-1
Cherokee Nuclear Station
Physical Characteristics of Natural
Environmental Units

	Uplands	Valley Sides	River Bottoms
Geology	Ordovician Felsic Gneiss	Ordovician Felsic Gneiss	Recent deposits of stream alluvium
Topography	Rolling to nearly level ridge crests at elevation 650 ft. msl.	Gentle to steep slopes ranging from 6 to 25%	Level floodplain approximately 400 feet wide
Pedology	Tatum soils	Tatum and Gullied soils	Chewacla and mixed alluvial soils
Geomorphology	Sheet wash is the prevalent erosional process	Rill wash and soil creep are prevalent erosional processes. Slumping can occur.	Stream channel flow is the prevalent erosional process. Bank caving occurs.

ER Table 2.4.1-2 (Sheet 1 of 5)
Cherokee Nuclear Station
Soil Chemistry

The results of detailed chemical analysis of soil samples, whose tests (by La Motte Methods) give only qualitative units (low, high, etc.), are presented. The elements (reading from left to right in the table) and their units are listed below:

NO_3^-	=	pounds/acre (lbs./acre)
NO_2^-	=	parts per million (ppm)
NH_C	=	ppm
PO_4^{-3}	=	lbs/acre
SO_4^{-2}	=	lbs/acre
K+	=	lbs/acre
Fe^{+3}	=	ppm
Al^{+3}	=	ppm
Ca^{+2}	=	lbs/acre
Mg^{+2}	=	ppm
pH	=	regular pH units; reciprocal of log base 10 of the ion concentration

ER Table 2.4.1-2 (Sheet 2 of 5)
Cherokee Nuclear Station
Soil Chemistry

Analysis	NO_3^-	NO_2^-	NH_3	PO_4^{---}	SO_4^{--}	K^+	Fe^{+++}	Al^{+++}	Ca^{++}	Mg^{++}	Mn^{++}	pH
Units	lb/acre	ppm	ppm[1]	lb/acre	lb/acre	lb/acre	ppm[2]	ppm[3]	lb/acre	ppm[4]	ppm[5]	
Upland soil												
Stand 2 (6")	10	1	very low	50	50	140	M	very high	150	very low	med. low	4.8
Stand 2 (12")	60	1	very low	200	50	113	S	high	150	low	low	5.2
Stand 2 (18")	60	1	very low	100	50	116	S	very high	150	low	low	5.0
Stand 2 (24")	60	1	very low	200	100	118	S	very high	150	med.	low	5.4
Stand 2 (36")	40	1	very low	200	50	118	S	very high	150	med.	low	5.2
Valley Side Soils												
Stand 1 (6")	10	1	very low	75	50	135	M	high	150	low	med. low	5.0
Stand 1 (12")	10	1	very low	50	50	120	S	high	150	very low	low	5.0
Stand 1 (18")	10	1	very low	100	50	120	S	very high	150	low	low	4.8
Stand 1 (24")	10	1	very low	100	100	120	S	very high	150	high	low	5.4
Stand 1 (36")	10	1	very low	200	100	140	S	very high	350	high	low	5.2
Stand 3 (6")	20	1	very low	150	50	130	M	very high	150	low	med. low	5.4
Stand 3 (12")	40	1	very low	150	50	140	M	very high	150	low	med. low	5.6
Stand 3 (18")	100	1	very low	100	50	140	M	very high	150	low	med. low	5.6

ER Table 2.4.1-2 (Sheet 3 of 5)
Cherokee Nuclear Station
<u>Soil Chemistry</u>

Sample #	NO_3^-	NO_2^-	NH_3	PO_4^{---}	SO_4^{--}	K^+	Fe^{+++}	Al^{+++}	Ca^{++}	Mg^{++}	Mn^{++}	pH
Stand 3 (24")	60	1	very low	200	50	116	S	very high	150	low	med. low	5.6
Stand 3 (36")	60	1	very low	200	50	115	S	very high	150	low	low	5.2
Stand 5 (6")	10	1	very low	75	100	180	S	very high	350	very low	low	5.4
Stand 5 (12")	10	1	very low	75	250	170	S	very high	350	low	low	4.8
Stand 5 (18")	10	1	very low	50	2000	160	S	very high	350	low	low	5.2
Stand 5 (24")	10	1	very low	75	1000	220	S	very high	350	high.	low	5.4
Stand 5B (36")	10	1	very low	150	50	118	S	very high	150	very low	low	5.4
Stand 5B (12")	10	1	very low	150	100	110	S	very high	150	low	low	5.2
Stand 5B (18")	10	1	very low	100	30	110	S	very high	150	low	low	5.2
Stand 5B (24")	10	1	very low	100	50	140	S	very high	150	low	low	5.4
Stand 5B (36")	10	1	very low	150	50	118	S	very high	150	very low	low	5.4
Stand 6 (6")	10	1	very low	75	50	118	M	high	350	very low	med.	5.2
Stand 6 (12")	10	1	very low	150	50	140	S	high	700	very low	med.	6.0
Stand 6 (18")	10	1	very low	150	50	118	S	high	350	very low	low	6.0

Cherokee Nuclear Station
Soil Chemistry

Sample #	NO_3^-	NO_2^-	NH_3	PO_4^{---}	SO_4^{--}	K^+	Fe^{+++}	Al^{+++}	Ca^{++}	Mg^{++}	Mn^{++}	pH
Stand 6 (24")	10	1	very low	150	50	120	S	very high	350	very low	low	5.6
Stand 6 (36")	10	1	very low	150	50	115	S	very high	350	very low	low	6.4
River Bottom Soils												
Stand 4 (6")	100	1	very low	150	50	115	S	low	150	high	low	7.0
Stand 4 (12")	60	1	very low	150	50	118	S	low	350	med.	low	6.6
Stand 4 (18")	60	1	very low	100	50	116	M	med.	350	med.	low	6.6
Stand 4 (24")	10	1	very low	100	2000	116	S	low	150	low	low	7.6
Stand 4 (36")	10	1	very low	150	250	112	S	low	150	high	low	7.6
Stand 7 (6")	10	1	very low	200	0	120	med. large	high	150	high	med. low	6.6
Stand 7 (12")	10	1	very low	200	0		med. large	high	150	high	med. low	6.2
Stand 7 (18")	10	1	very low	100	0	150	med. large	high	150	high	med. low	5.6
Stand 7 (24")	10	1	very low	150	0	130	med. large	high	150	high	med. low	5.6
Stand 7 (36")	10	1	very low	150	0	130	med. large	high	150	high	med. low	5.8

ER Table 2.4.1-2 (Sheet 5 of 5)
Cherokee Nuclear Station
Soil Chemistry

Sample #	NO_3^-	NO_2^-	NH_3	PO_4^{---}	SO_4^{---}	K^+	Fe^{+++}	Al^{+++}	Ca^{++}	Mg^{++}	Mn^{++}	pH
Stand 8 (6")	10	1	very low	75	30	100	S	low	100	low	low	7.0
Stand 8 (12")	10	1	very low	75	0	115	S	low	100	very high	low	6.6
Stand 8 (18")	10	1	very low	100	0	100	S	low	100	high	low	7.2
Stand 8 (24")	10	1	very low	100	0	100	M	very high	100	high	low	6.4
Stand 8 (36")	10	1	very low	75	0	112	L	very high	100	high	low	6.6

[1] NH_3 scale (ppm):

very low	5
low	12
medium	35
high	80
very high	150

[2] Fe^{+++} scale (ppm):

VS-very small	2
S-small	5
M-medium	15
H-high	25
VH-very high	50

[3] Al^{+++} scale (ppm):

very low	5
low	10
medium	40
high	100
very high	200

[4] Mg^{++} scale (ppm):

very low	4
low	20
medium	40
high	80
very high	160

[5] Mn^{++} scale (ppm):

low	5
medium low	12
medium	25
high	40
very high	80

Legend for Table 2.5.0-1

1. Empty blank means sample taken but analysis not complete. These numbers will be supplied later.

2. Asterisk (*) means sample not scheduled for collection or sample lost.

3. Station numbers are for stations described in Section 6.1. S, M and B stand for Surface, Mid-depth, and Bottom. Small letters (a, b, and c) represent replicate samples.

4. BDL represents "Below Detectable Limits".

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data (1)

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)
4a	23	7.6	52	0.4	0.7	7.8	0.8	28	84.0	*	*	*	6.5	0.06	0.01	0.41	0.28	0.27	0.05	4.5	4.5
4b	23	7.3	50	0.4	1.7	7.8	0.8	28	53.0	*	*	*	9.2	0.02	0.00	0.20	0.30	0.29	0.10	3.2	3.3
4c	23	7.4	52	0.4	0.7	7.8	0.8	28	62.0	*	*	*	10.4	0.02	0.00	0.20	0.32	0.26	0.07	4.3	1.3
7a	24	8.6	65	0.5	0.5	7.7	0.7	33	109.1	*	*	*	3.9	0.01	0.01	0.19	0.33	0.28	0.10	4.7	9.0
7b	24	8.7	59	0.5	1.5	7.7	0.5	30	55.5	*	*	*	*	0.02	0.01	0.16	0.35	*	0.04	4.3	2.3
9S	24.5	7.8	65	0.35	2.5	7.7	*	*	*	*	*	*	*	0.02	0.01	0.16	0.39	0.24	0.15	4.7	2.7
9B	23	0.8	70	*	2.5	7.0	*	*	*	*	*	*	41.2	0.17	0.01	0.17	1.19	2.23	0.06	4.7	2.3
11S	24	8.3	62	0.4	7.25	7.2	*	*	*	*	*	*	6.5	0.01	0.01	0.64	0.31	0.25	0.10	2.9	7.5
11B	24	7.7	65	*	7.25	7.0	*	*	*	*	*	*	4.2	0.02	0.00	0.22	0.34	0.26	0.05	4.9	5.1
12S	25	8.2	65	0.4	4.5	7.1	*	*	*	*	*	*	18.4	0.00	0.00	0.14	0.44	0.23	0.10	4.7	6.5
12B	22	1.0	70	*	4.5	7.1	*	*	*	*	*	*	5.5	0.30	*	*	0.54	0.29	0.03	5.2	10.0
14S	24	8.0	65	0.32	6.0	7.1	*	*	*	*	*	*	14.1	0.03	0.00	0.19	0.27	0.24	0.07	4.7	4.1
14B	24	7.2	66	*	6.0	7.0	*	*	*	*	*	*	6.5	0.01	0.01	0.68	0.37	0.26	0.07	4.9	7.5
17a	24	8.4	66	0.35	1.3	7.6	0.4	54	*	*	*	*	7.7	0.01	0.01	0.76	0.55	0.27	0.12	4.9	7.5
17b	24	8.2	66	0.35	1.25	7.6	0.4	54	*	*	*	*	9.5	0.03	0.00	0.14	0.42	0.27	0.12	4.9	7.6
17c	24	8.2	67	0.35	1.5	7.6	0.5	54	*	*	*	*	10.3	0.04	0.01	0.22	0.39	0.25	0.10	5.2	5.0
21	24.5	8.8	83	0.4	0.2	7.6	*	*	*	*	*	*	10.5	0.03	0.00	0.21	0.44	0.38	*	6.2	*

(1) See end of table for legend.

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data (1)

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)
1	20.1	8.5	63	0.5	1.1	8.1	.9	27	75.7	*	*	*	9.0	0.00	*	0.13	*	*	0.00	3.2
2	20.1	8.7	67	0.4	1.9	8.6	.8	37	72.7	*	*	*	7.7	0.00	*	0.26	*	*	*	3.3
3	18.5	9.0	66	0.4	1.2	7.9	.4	6	*	3.9	*	*	*	0.05	*	0.69	*	*	0.86	14.4
4a	20.0	8.6	65	0.4	.8	7.8	.7	28	56	1.3	*	*	11.3	0.00	*	0.26	*	*	0.00	5.2
4b	20.0	8.8	67	0.4	.8	7.8	.7	28	42	0.9	*	*	6.7	0.00	*	0.26	*	*	0.01	4.7
4c	19.5	8.9	67	0.4	.8	7.8	.7	28	70	1.0	*	*	4.3	0.00	*	0.27	*	*	0.01	4.5
5	19.5	8.5	61	0.28	.1	7.7	.6	4	*	1.3	*	*	2.2	0.00	*	0.40	*	*	0.12	8.4
6	19.5	9.0	68	0.5	.8	7.2	.2	10	*	3.7	*	*	17.2	0.05	*	0.32	*	*	0.03	28.0
7	19.0	9.3	60	0.5	*	7.9	*	*	*	1.0	*	*	4.2	0.00	*	0.26	*	*	0.06	4.9
8	20.0	9.0	57	0.5	1.4	8.0	.6	31	135.3	*	*	*	3.1	0.00	*	0.24	*	*	0.01	4.5
9S	22.0	8.8	65	0.5	2.5	7.6	*	*	*	1.6	*	*	31.7	0.02	*	0.16	*	*	0.00	4.7
9B	22.0	6.6	60	*	*	7.0	*	*	*	1.4	*	*	17.2	0.06	*	0.18	*	*	0.00	4.5
10S	22.0	7.6	67	0.5	4.0	7.7	*	*	*	1.6	*	*	21.8	0.01	*	0.16	*	*	0.00	5.2
10B	19.5	6.0	62	*	*	7.5	*	*	*	*	*	*	8.4	0.03	*	0.22	*	*	0.00	4.3
11B	20.0	9.8	60	*	*	7.0	*	*	*	1.4	*	*	*	0.01	*	0.23	*	*	0.01	4.5
12S	21.5	8.1	300	0.5	4.75	7.2	*	*	*	*	*	*	5.4	0.00	*	0.20	*	*	0.00	5.2
12B	19.5	7.6	300	*	*	7.2	*	*	*	1.1	*	*	5.4	0.02	*	0.22	*	*	0.03	7.6
13S	22.5	8.0	150	0.5	2.0	7.5	*	*	*	1.3	*	*	20.6	0.01	*	0.21	*	*	0.02	4.9
13B	20.5	6.2	150	*	*	7.2	*	*	*	1.2	*	*	18.5	0.03	*	0.19	*	*	0.02	4.0
14Sa	20.0	8.6	60	0.5	5.5	7.6	*	*	*	*	*	*	4.3	0.00	*	0.25	*	*	0.02	4.9
14Sb	20.0	8.5	65	0.5	5.5	7.6	*	*	*	*	*	*	4.7	0.00	*	0.21	*	*	0.00	4.3
14Sc	20.0	8.6	61	0.5	5.5	7.6	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Station	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Roron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)
1	*	*	*	*	*	40.95	4200	270	0.0	*	*	*	*	*	*	*
2	*	*	*	*	*	43.55	11500	1900	0.0	*	*	*	*	*	*	*
3	*	*	*	*	*	42.90	9400	2500	0.0	*	*	*	*	*	*	*
4a	*	*	*	*	*	42.25	15200	5900	0.0	*	0.65	1.4	0.06	6.5	2.31	2.50
4b	*	*	*	*	*	43.55	12700	2100	0.0	*	0.06	1.5	0.06	6.1	2.31	2.27
4c	*	*	*	*	*	43.55	12300	5100	0.0	*	0.26	1.4	0.05	6.1	2.09	2.27
5	*	*	*	*	*	36.65	7800	1000	0.0	*	*	*	*	*	*	*
6	*	*	*	*	*	44.20	10200	440	0.0	*	*	*	*	*	*	*
7	*	*	*	*	*	39.00	3300	280	0.0	*	0.42	1.3	BDL	7.4	2.20	3.35
8	*	*	*	*	*	37.05	7600	280	0.0	*	*	*	*	*	*	*
9S	*	*	*	*	*	42.25	530	56	0.0	*	0.86	1.4	0.04	6.1	4.16	2.62
9B	*	*	*	*	*	39.00	410	50	0.0	*	0.82	>2.0	BDL	>10.0	4.74	12.77
10S	*	*	*	*	*	43.55	430	38	0.0	*	*	*	*	*	*	*
10B	*	*	*	*	*	40.30	2000	120	0.0	*	*	*	*	*	*	*
11B	*	*	*	*	*	40.95	5800	260	0.0	*	0.36	1.6	0.08	6.5	13.56	2.38
12S	*	*	*	*	*	195.0	1300	82	0.0	*	0.25	1.4	0.17	6.4	2.20	2.27
12B	*	*	*	*	*	195.0	9100	380	0.0	*	0.04	1.8	0.07	8.1	2.09	2.85
13S	*	*	*	*	*	97.50	1200	36	0.0	*	*	*	*	*	*	*
13B	*	*	*	*	*	97.50	1500	170	0.0	*	*	*	*	*	*	*
14Sa	*	*	*	*	*	39.00	4100	160	0.0	*	0.52	1.4	0.08	7.1	2.65	2.38
14Sb	*	*	*	*	*	42.25	5300	140	0.0	*	9.63	1.3	BDL	5.6	1.99	2.62
14Sc	*	*	*	*	*	*	*	*	0.0	*	*	*	*	*	*	*

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data (1)

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)
14Ma	20.0	8.9	60	*	*	7.6	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	39.0	*	*	*	*	*	*	*	*	*	*
14Mb	20.0	8.8	60	*	*	7.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	39.0	*	*	*	*	*	*	*	*	*	*
14Mc	20.0	8.9	62	*	*	7.6	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	40.3	*	*	*	*	*	*	*	*	*	*
14Ba	20.0	8.8	60	*	*	7.0	*	*	*	1.2	*	*	3.5	0.01	*	0.24	*	*	0.02	4.5	*	*	*	*	*	39.0	1400	60	0.0	*	0.74	1.4	BDL	6.9	3.01	2.73
14Bb	20.0	8.6	62	*	*	7.1	*	*	*	*	*	*	9.4	0.02	*	0.23	*	*	0.02	5.6	*	*	*	*	*	40.3	2400	110	0.0	*	*	*	*	*	*	*
14Bc	20.0	8.8	64	*	*	7.2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	41.6	4600	800	0.0	*	*	*	*	*	*	*
15a	21.5	8.6	60	0.5	1.25	7.5	.5	26	41.4	1.5	*	*	2.9	0.00	*	0.21	*	*	0.02	4.7	*	*	*	*	*	39.0	4000	610	0.0	*	*	*	*	*	*	*
15b	22.0	8.6	63	0.5	1.25	7.7	.5	27	38.[illegible]	1.4	*	*	0.0	0.00	*	0.24	*	*	0.02	4.3	*	*	*	*	*	40.9	3500	810	0.0	*	*	*	*	*	*	*
15c	22.0	8.6	63	0.5	1.25	7.5	.5	26	46.[illegible]	*	*	*	4.3	0.00	*	0.25	*	*	0.07	4.3	*	*	*	*	*	40.9	7000	1700	0.0	*	*	*	*	*	*	*
16	19.5	8.1	67	0.5	.7	7.2	.6	10	*	1.0	*	*	1.0	0.00	*	0.06	*	*	0.00	16.6	*	*	*	*	*	43.5	3000	320	0.0	*	*	*	*	*	*	*
17	21.5	8.5	60	0.5	1.0	7.2	.25	34	136.6	1.3	*	*	4.1	0.00	*	0.23	*	*	0.03	4.9	*	*	*	*	*	39.0	17100	1000	0.0	*	0.48	1.4	BDL	6.0	2.09	2.50
18	21.0	8.5	65	2.0	1.0	7.1	1.1	13	247.[illegible]	1.2	*	*	1.0	0.01	*	0.35	*	*	0.01	3.7	*	*	*	*	*	42.3	7200	300	0.0	*	*	*	*	*	*	*
19	22.0	8.6	61	0.75	0.6	7.5	.8	40	26.[illegible]	1.3	*	*	6.4	0.00	*	0.21	*	*	0.02	4.7	*	*	*	*	*	39.7	1700	80	0.0	*	*	*	*	*	*	*
20	22.0	8.6	60	0.5	2.0	7.6	.1	74	2.[illegible]	1.5	*	*	8.7	0.00	*	0.23	*	*	0.00	3.5	*	*	*	*	*	39.0	*	*	0.0	*	*	*	*	*	*	*
21	21.0	8.0	66	0.4	*	7.2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	42.9	*	*	0.0	*	0.64	1.3	0.04	3.6	1.99	1.41

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data (1)

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)
1	14.0	10.3	44	0.3	1.7	7.9	0.9	29	154.8	1.0	*	*	*	0.02	0.00	0.16	*	*	0.03	4.0	5.2
4a	14.2	10.1	57	0.75	0.8	7.7	0.6	24	141.0	2.0	*	*	6.9	0.01	0.01	0.22	*	*	0.04	9.2	6.2
4b	14.2	10.1	57	0.75	0.8	7.7	0.65	24	91.6	1.6	*	*	4.8	0.02	0.01	0.20	*	*	0.04	9.2	7.2
4c	14.2	10.1	57	0.75	0.8	7.7	0.6	24	45.0	1.6	*	*	3.4	0.02	0.01	0.21	*	*	0.05	*	9.5
7	17.1	11.5	58	0.66	1.5	*	*	*	102.2	1.1	*	*	4.2	0.01	0.01	0.17	*	*	0.07	7.6	30.2
8	15.5	10.8	56	0.6	1.8	*	0.9	80	110.0	1.4	*	*	0.8	0.00	0.01	0.10	*	*	0.04	7.3	5.2
9S	15.5	10.2	54	0.66	2.5	7.2	*	*	90.3	1.0	*	*	21.5	0.01	0.01	0.13	*	*	0.00	8.4	4.5
9B	15.0	7.5	54	*	*	6.9	*	*	*	*	*	*	4.2	0.04	0.00	0.16	*	*	0.00	5.4	8.2
10S	15.5	10.0	54	0.9	5.0	7.5	*	*	*	*	*	*	19.5	0.01	0.00	0.16	*	*	0.02	4.9	2.5
11S	17.5	10.6	110	0.75	1.0	6.8	*	*	*	1.1	*	*	10.1	0.00	0.01	0.12	*	*	0.06	5.7	7.7
11B	17.5	10.0	110	*	*	6.0	*	*	*	1.3	*	*	4.2	0.02	0.01	0.19	*	*	0.05	6.9	4.5
12S	18.0	10.4	60	0.75	5.1	7.0	*	*	*	1.3	*	*	13.5	0.00	0.00	0.19	*	*	0.02	4.7	1.7
12B	15.0	6.8	60	*	*	6.5	*	*	*	1.3	*	*	6.2	0.10	0.00	0.18	*	*	0.03	7.6	4.8
13S	17.0	10.0	130	0.6	2.0	7.1	*	*	*	1.1	*	*	12.1	0.02	0.00	0.11	*	*	0.02	5.2	4.8
13B	15.5	8.6	120	*	*	7.3	*	*	*	1.0	*	*	19.8	0.00	0.00	0.22	*	*	0.03	4.3	2.0
14Sa	17.0	10.0	58	0.75	7.0	7.2	*	*	*	1.2	*	*	8.9	0.01	0.01	0.18	*	*	0.04	5.2	7.2
14Sb	17.0	10.2	60	0.75	7.0	7.1	*	*	*	1.0	*	*	5.5	0.01	0.00	0.18	*	*	0.03	6.0	4.8
14Sc	17.0	10.1	56	0.75	7.0	7.2	*	*	*	1.2	*	*	3.9	0.00	0.01	0.19	*	*	0.02	8.0	4.8
14Ba	16.5	9.9	57	*	*	7.0	*	*	*	1.3	*	*	6.5	0.01	0.00	0.19	*	*	0.04	10.6	6.2
14Bb	16.5	9.5	57	*	*	7.1	*	*	*	1.2	*	*	16.0	0.00	0.00	0.18	*	*	0.03	5.4	5.8
14Bc	16.7	9.7	57	*	*	7.2	*	*	*	1.4	*	*	10.9	0.00	0.00	0.17	*	*	0.03	5.2	5.2
17	18.5	12.6	69	0.66	1.0	7.5	0.5	49	33.2	1.6	*	*	*	0.00	0.00	0.16	*	*	0.04	5.4	6.3

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data (1)

October 24, 1973

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)
21	18.0	10.0	70	0.60	0.2	7.8	*	*	25.6	1.3	*	*	7.4	0.01	0.00	0.14	*	*	0.03	8.0	8.2

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data (1)

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)
1	11.0	9.6	40	0.54	1.5	8.0	.76	37	125.9	1.3	*	1.2	3.3	0.01	0.00	0.06	.18	0.04	0.02	3.2	*	0.0	17.5	0	8	26.0	1200	40	0.0	*	0.14	1.3	0.0	5.4	1.33	1.412
2	12.0	9.3	44	0.7	0.7	7.8	0.45	54	67.5	*	*	1.0	3.1	0.08	0.00	0.10	.26	0.04	0.04	3.5	*	0.0	20.0	0	8	28.6	1900	20	0.0	*	0.18	1.3	0.0	5.5	1.22	1.286
3	13.0	9.2	*	0.6	0.6	*	0.36	1	87.7	1.8	0	1.8	4.4	0.03	0.00	0.13	.62	0.24	0.18	15.0	2.8	0.0	32.5	0	15	*	1100	920	0.0	*	0.61	1.7	0.0	28.0	1.79	3.200
4a	12.5	9.9	46	0.3	1.0	7.6	0.42	49	130.0	1.7	*	1.4	3.3	0.02	0.00	0.13	.37	0.14	0.07	5.4	0.0	0.0	*	*	44	29.9	1400	120	0.0	0.03	0.18	1.3	0.0	8.0	1.36	1.852
4b	14.0	10.2	40	1.0	1.0	7.7	0.60	52	84.1	1.3	*	1.2	4.2	0.02	0.00	0.13	.30	0.14	0.07	5.7	2.4	0.0	23.5	0	39	26.0	1300	40	0.0	*	0.32	1.4	0.0	7.7	1.32	1.507
4c	13.5	10.0	42	0.7	1.0	7.6	0.53	50	54.5	1.2	0.1	1.3	3.5	0.02	0.01	0.12	.18	0.14	0.06	5.2	*	0.0	21.5	0	41	27.3	800	80	0.0	*	0.29	1.3	0.0	7.9	1.36	1.924
5	9.5	9.8	70	0.5	0.5	8.1	0.58	3	43.6	1.8	*	1.7	3.1	0.11	0.01	0.42	.20	0.52	0.52	6.2	*	0.0	50.0	0	5	45.5	600	860	0.0	*	0.28	3.5	0.0	11.0	2.88	3.608
6	11.0	8.9	76	0.75	0.75	8.0	0.22	9	31.5	6.0	1.0	7.0	1.9	0.18	0.03	0.17	1.42	0.76	0.70	*	*	0.0	62.5	0	19	49.4	700	22000	0.0	*	0.76	2.8	0.0	68.0	2.51	5.158
7	12.0	9.5	43	0.5	*	7.5	*	*	36.1	*	*	1.7	2.0	0.01	0.01	0.12	.37	0.12	0.08	6.0	2.0	0.0	15.0	0	17	27.95	2300	40	0.0	*	0.12	1.3	0.0	9.7	1.40	1.658
8	12.5	9.6	49	0.52	1.3	7.6	.6	27	107.3	1.5	1.2	2.7	1.0	0.02	0.01	0.09	.32	0.08	0.06	6.9	0.0	0.0	22.5	0	37	31.85	1400	0	0.0	*	0.18	1.4	0.0	9.4	1.30	2.036
9S	12.2	10.0	44	0.6	*	7.4	*	*	*	1.6	*	1.4	7.7	0.04	0.00	0.11	.39	0.07	0.02	4.5	2.4	0.0	27.5	0	32	28.6	1300	0	0.0	*	0.09	*	0.0	7.7	1.37	2.073
9M	12.0	10.1	46	*	*	7.4	*	*	*	*	*	1.2	14.5	0.04	0.00	0.08	.36	0.07	0.02	*	*	0.0	22.5	0	47	29.9	*	*	0.0	*	*	*	*	*	*	*
9B	11.3	9.6	45	*	*	7.2	*	*	*	1.6	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	29.25	3300	0	*	*	0.18	1.4	0.0	8.3	1.38	1.699
10S	12.2	9.8	52	0.5	*	7.3	*	*	*	2.9	*	1.1	4.5	0.04	0.00	0.08	.35	0.06	0.03	5.7	*	0.0	25.0	0	15	33.8	1000	40	0.0	*	0.26	1.4	0.0	8.8	1.30	1.691
10M	12.0	9.9	46	*	*	7.1	*	*	*	*	*	1.2	*	*	*	*	*	*	*	*	*	*	*	*	*	29.9	*	*	*	*	*	*	*	*	*	*
10B	11.5	9.5	47	*	*	7.0	*	*	*	1.2	*	*	6.0	0.06	0.00	0.08	.45	0.10	0.03	6.0	0.0	0.0	20.0	0	37	30.55	1600	80	0.0	*	0.19	1.4	0.0	8.7	1.45	1.953
11S	12.6	10.0	46	0.54	*	7.5	*	*	*	1.2	*	1.1	1.9	0.02	0.00	0.06	.29	0.08	0.06	6.0	*	0.0	17.5	0	17	29.9	3400	40	0.0	*	*	*	0.0	*	*	*
11M	12.5	9.5	80	*	*	7.4	*	*	*	*	*	1.7	*	*	*	*	*	*	*	*	*	*	*	*	*	52.0	*	*	*	*	*	*	*	*	*	*
11B	11.6	9.0	77	*	*	7.2	*	*	*	1.5	*	*	5.4	0.02	0.00	0.07	.38	0.08	0.07	6.0	*	0.0	22.5	0	18.5	50.05	1500	*	0.0	*	0.24	1.4	0.0	9.7	1.45	2.063
12S	12.4	9.6	75	0.63	*	7.4	*	*	*	*	*	1.2	5.2	0.03	0.00	0.08	.38	0.07	0.04	5.2	4.2	0.0	22.5	0	14	48.75	1900	80	0.0	0.04	0.18	1.5	0.0	8.4	1.42	1.560
12M	12.4	9.4	46	*	*	7.1	*	*	*	*	*	1.2	*	*	*	*	*	*	*	*	*	*	*	*	*	29.9	*	*	*	*	*	*	*	*	*	*
12B	11.9	9.2	44	*	*	7.1	*	*	*	*	*	*	6.2	0.04	0.00	0.08	.38	0.09	0.05	5.4	1.9	0.0	25.0	0	24	28.6	1800	40	0.0	*	0.28	1.5	0.0	9.0	1.44	2.225

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data (1)

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)
13S	12.1	9.9	73	0.5	*	7.0	*	*	*	1.4	0.3	1.7	7.8	0.03	0.00	0.08	.39	0.08	0.04	5.4	3.2	0	25.0	0	17	47.45	900	20	0	*	0.23	1.4	1.4	7.8	1.45	1.726
13M	12.1	9.8	76	*	*	7.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13B	11.7	9.5	70	*	*	6.9	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	0	0	0	*	45.5	5000	100	0	*	0.26	1.4	1.4	8.5	1.40	1.935
14Sa	12.4	9.6	49	0.5	*	7.0	*	*	*	1.1	0.5	1.6	3.3	0.02	0.01	0.08	.38	0.09	0.06	6.2	*	0	*	*	10	31.85	1900	120	0	0.03	0.15	1.5	1.5	9.4	1.43	1.833
14Sb	12.2	10.1	49	0.5	*	7.1	*	*	*	3.8	*	2.2	2.8	0.02	0.01	0.09	.32	0.08	0.06	6.2	1.5	0	32.5	0	13	31.85	1500	100	0	*	0.19	1.5	1.5	9.1	1.40	1.691
14Sc	12.1	9.7	49	0.5	*	7.0	*	*	*	2.1	*	1.4	0	0.02	0.00	0.08	.40	0.08	0.06	5.7	1.3	0	22.5	0	17	31.85	4600	40	0	*	0.20	1.4	1.4	9.9	1.46	1.736
14Ma	12.0	9.7	45	*	*	7.0	*	*	*	*	*	1.5	5.4	0.02	0.00	0.08	.42	0.08	0.06	7.3	0.0	0	25.0	0	13	29.25	5100	80	0	*	0.09	1.4	1.4	9.4	1.33	1.843
14Mb	12.1	9.5	49	*	*	7.2	*	*	*	1.6	*	1.2	6.5	0.02	0.01	0.09	.33	0.08	0.06	6.6	1.2	0	25.0	0	39	31.85	4300	60	0	*	0.24	1.4	1.4	9.2	1.34	1.542
14Mc	11.9	9.6	43	*	*	7.1	*	*	*	*	*	1.7	3.3	0.05	0.01	0.08	.38	0.09	0.06	6.6	1.8	0	22.5	0	8	27.95	4900	100	0	*	0.30	1.5	1.5	9.8	1.37	1.736
14Ba	11.6	9.4	44	*	*	7.0	*	*	*	1.3	*	1.2	6.3	0.01	0.01	0.08	.38	0.09	0.06	6.2	1.3	0	25.0	0	13	28.6	4100	40	0	0.02	0.07	1.4	1.4	8.6	1.36	1.656
14Bb	11.6	9.4	42	*	*	6.8	*	*	*	1.6	*	*	5.4	0.02	0.01	0.07	.34	0.11	0.06	6.2	1.6	0	45.0	0	17.5	27.3	5900	20	0	*	0.23	1.5	1.5	9.5	1.37	1.638
14Bc	11.0	9.0	40	*	*	6.9	*	*	*	1.3	0.6	1.9	3.3	0.01	0.01	0.08	.36	0.11	0.07	6.6	0.0	0	17.5	0	39	26.0	5100	0	0	*	0.20	1.4	1.4	9.6	1.39	1.833
15a	13.0	9.3	52	0.55	1.0	7.4	0.67	49	44.8	1.2	0.6	1.8	9.8	0.02	0.00	0.06	.38	0.09	0.05	6.6	0.0	0	22.5	0	10	33.8	4000	60	0	0.02	0.27	1.4	1.4	9.1	1.37	1.708
15b	12.5	9.5	50	0.55	1.0	7.4	0.50	47	36.3	1.4	0.3	1.7	3.5	0.02	0.00	0.08	.44	0.09	0.05	6.6	0.0	0	22.5	0	13	32.5	2700	20	0	*	0.22	1.4	1.4	9.2	1.40	1.934
15c	12.0	9.4	49	0.55	1.0	7.4	0.71	50	51.1	*	*	*	0	0.03	0.00	0.08	.46	0.09	0.05	6.0	1.8	0	15.0	0	10	31.85	4800	40	0	*	0.20	1.4	1.4	9.7	1.48	1.934
16	9.5	10.6	*	0.5	0.5	*	0.57	13	20.0	1.1	*	*	3.4	0.01	0.00	0.00	.20	0.02	0.01	9.7	*	0	22.5	0	8	*	1300	20	0	*	0.19	4.0	4.0	10.1	3.22	1.681
17	12.5	9.8	53	0.7	0.9	8.0	0.37	60	29.6	1.1	1.6	2.7	9.4	0.02	0.00	0.06	.34	0.12	0.05	5.7	1.2	0	27.5	0	8	34.45	3000	340	0	*	0.11	1.5	1.5	9.4	1.53	1.944
18	11.5	8.9	48	1.5	1.5	7.6	0.04	15	71.2	1.3	*	*	5.2	0.03	0.00	0.12	.44	0.10	0.04	3.9	0.0	0	25.0	0	20	31.2	27000	400	0	*	0.18	1.5	1.5	6.4	1.70	1.788
19	12.9	9.5	52	0.75	3.5	7.8	0.52	74	21.1	*	*	2.0	6.1	0.02	0.00	0.06	*	0.07	0.04	4.7	0.0	0	25.0	0	15	33.8	13000	40	0	*	0.35	1.6	1.6	8.6	1.51	1.852
20	14.0	9.6	56	0.7	*	7.9	*	*	57.6	1.3	0.4	1.7	5.5	0.02	0.00	0.08	.31	0.06	0.03	5.4	1.6	0	42.5	0	15	36.4	2700	0	0	*	*	*	*	*	*	*
22	12.5	10.1	55	0.6	*	7.0	*	*	*	1.7	0.1	1.8	0	0.04	0.00	0.08	.08	0.04	0.04	6.9	2.0	0	32.5	0	9	35.75	20	0	0	*	0.39	1.9	1.9	12.2	1.76	2.110
23	13.0	9.2	40	*	*	7.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	26.0	*	*	*	*	*	*	*	*	*	*

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data (1)

November 21, 1973

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)
1	12.3	9.0	43	*	1.5	7.3	0.5	46	171.1	1.4	*	0.6	4.2	0.01	0.00	0.10	0.54	0.08	0.04	3.9	5.08
4a	14.0	8.9	55	*	.7	6.9	0.54	46	30.4	1.1	0.2	1.3	21.2	0.00	0.00	0.14	0.33	0.07	0.06	5.2	4.34
4b	13.5	9.0	60	*	.7	7.0	0.60	47	22.7	2.2	*	1.1	7.5	0.01	0.00	0.15	0.98	0.10	0.06	5.2	4.30
4c	14.0	9.2	53	*	.7	7.1	0.51	46	27.0	*	*	*	17.7	0.00	0.00	0.17	0.36	0.10	0.06	5.2	2.87
8	13.5	9.8	56	0.66	1.5	7.5	0.78	43	44.6	1.7	*	1.5	7.0	0.00	0.00	0.14	0.43	0.09	0.04	6.2	3.98
9S	12.0	9.6	57	0.6	2.5	7.6	*	*	*	1.3	*	*	2.2	0.03	0.00	0.09	0.35	0.10	0.02	6.9	5.45
9B	11.9	9.3	59	*	*	7.4	*	*	*	1.5	*	*	4.9	0.02	0.00	0.09	*	*	0.02	7.6	5.45
10S	12.0	9.6	57	0.7	*	7.4	*	*	*	1.4	*	1.3	5.5	0.02	0.00	0.12	0.46	0.08	0.03	6.9	5.45
10B	10.0	8.3	65	*	*	7.1	*	*	*	1.6	*	*	5.5	0.06	0.00	0.12	0.30	0.11	0.03	7.6	3.98
11S	16.5	9.8	*	1.0	1.0	7.2	*	*	*	1.6	0	1.6	*	0.61	0.00	0.12	0.25	0.08	0.05	6.0	4.34
11B	12.7	9.2	*	*	*	7.0	*	*	*	1.2	*	*	19.9	0.01	0.00	0.15	*	0.10	0.06	6.0	15.20
12S	12.5	9.0	56	0.66	5.1	7.4	*	*	*	1.5	0	1.9	*	0.01	0.00	0.10	0.97	0.07	0.04	6.9	4.71
12B	10.0	5.9	59	*	*	7.1	*	*	*	1.6	*	*	21.9	0.12	0.00	0.12	0.28	0.16	0.04	7.6	6.31
13S	13.0	8.9	53	0.6	2.0	7.2	*	*	*	2.0	*	1.9	13.3	0.04	0.00	0.11	0.49	0.09	0.04	6.6	9.50
13B	13.5	8.9	60	*	*	7.0	*	*	*	1.6	*	1.3	14.4	0.03	0.02	0.10	0.59	0.14	0.04	7.3	6.74
14Sa	13.1	9.4	60	1.0	7.0	7.2	*	*	*	1.6	0.2	1.3	22.0	0.01	0.00	0.12	0.38	0.09	0.06	6.2	9.50
14Sb	13.0	9.5	62	0.8	7.0	7.2	*	*	*	1.5	*	1.7	*	0.02	0.00	0.13	0.36	0.07	0.06	6.6	11.21
14Sc	13.2	9.5	60	1.0	7.0	7.2	*	*	*	1.2	0.1	1.3	8.6	0.01	0.01	0.08	0.52	0.09	0.05	6.2	5.02
14Ma	14.9	9.3	60	*	*	7.2	*	*	*	1.6	*	*	25.2	0.03	0.00	0.12	0.42	0.10	0.06	6.6	4.71
14Mb	14.5	9.3	60	*	*	7.1	*	*	*	2.0	*	1.2	24.1	0.01	0.00	0.12	4.9	0.09	0.06	6.2	4.53
14Mc	14.7	9.2	65	*	*	7.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14Ba	14.9	9.2	57	*	*	7.0	*	*	*	2.1	*	1.6	0.9	0.03	0.00	0.15	0.36	0.09	0.06	7.3	3.02

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data (1)

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)
14Bb	14,8	9.2	56	*	*	6.9	*	*	*	1.8	*	1.5	*	0.02	0.00	0.00	0.61	0.09	0.05	7.3	6.92
14Bc	14.8	9.2	50	*	*	7.1	*	*	*	1.0	0.6	1.6	2.0	0.01	0.00	0.15	0.50	0.08	0.05	7.3	4.34
15a	14.0	9.2	55	0.66	1.0	*	0.86	35	17.2	1.6	*	1.6	11.9	0.00	0.00	0.12	0.53	0.09	0.06	6.2	5.62
15b	14.0	9.5	57	0.62	1.0	*	0.9	36	20.0	1.6	*	1.3	25.5	0.02	0.00	0.13	0.37	0.09	0.06	6.6	8.76
15c	14.0	9.3	50	0.64	1.0	*	0.81	35	10.1	1.0	*	3.7	23.5	0.00	0.00	0.00	0.54	0.09	0.06	6.6	5.45
17	13.0	9.2	62	0.5	0.8	*	0.37	37	50.7	1.2	*	*	25.5	0.00	0.00	0.11	0.31	0.16	0.04	6.9	7.66
21	14.5	6.6	70	0.5	0.2	7.7	*	*	50.9	1.4	*	0.8	*	0.02	0.00	0.00	5.68	0.08	0.07	3.9	0.00
23	15.0	7.6	60	*	0.3	7.4	*	*	34.2	0.8	0.3	1.1	20.2	0.00	0.00	0.05	0.17	0.06	0.05	3.3	4.26

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data (1)

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Roron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)
1	10.5	*	35	*	1.0	8.6	0.94	54	210.0	1.4	*	*	0.0	0.00	0.00	0.19	.78	.09	0.02	2.9	8.8	0	15.0	0	10	22.75	2400	170	0	*	0.04	1.0	0.09	4.6	2.5	0.79
2	12.0	*	40	0.7	2.0	8.6	0.80	71	102.5	1.0	*	*	4.9	0.02	0.00	0.17	2.54	.07	0.02	2.9	6.6	0	15.5	0	19	26.0	3500	170	0	*	0.13	1.2	0.19	4.6	2.7	1.2
3	11.0	*	120	*	1.3	7.5	0.37	9	25.1	1.5	*	*	3.5	0.01	0.01	0.30	*	.22	0.12	>15.0	5.4	0	23.5	0	13	78.0	5400	1700	0	*	0.47	1.6	0.12	*	3.9	3.2
4a	11.0	*	44	*	0.7	7.6	0.74	29	67.5	1.6	*	*	0.0	0.00	0.00	0.18	.51	.31	0.05	4.5	18	0	15.5	0	7	28.6	1300	790	0	0.02	0.13	1.3	0.25	5.4	2.7	1.5
4b	11.2	*	46	*	0.7	7.6	0.73	29	123.2	1.8	*	*	2.3	0.00	0.00	0.18	.49	.12	0.04	4.5	10.2	0	16.0	0	7	29.0	1700	230	0	*	0.18	1.3	BDL	6.0	2.7	1.2
4c	11.0	*	44	*	0.7	7.6	0.75	29	41.0	0.9	*	*	46.0	0.00	0.00	0.20	.59	.10	0.04	5.2	6.6	0	17.0	0	10	28.6	3500	490	0	*	0.19	1.3	0.01	5.6	2.7	0.98
5	12.0	*	120	*	0.25	8.0	0.40	5	*	1.2	*	*	0.0	0.03	0.01	1.03	*	.43	0.38	8.8	10.2	0	40.5	0	8	78.0	16000	16000	0	*	0.00	>4.0	BDL	9.8	>6.0	2.8
6	13.5	*	215	*	0.7	7.6	0.19	8	*	6.8	*	*	5.5	0.05	0.02	0.15	*	2.53	2.87	5.4	11.7	0	62.0	0	24	139.75	>24000	5400	0	*	0.71	3.4	BDL	>10	>6.0	>6.0
7	10.2	10.2	45	1.1	1.5	7.1	*	*	*	0.5	*	*	0.58	0.03	0.00	0.16	*	.15	0.12	6.0	*	0	18.5	0	8	29.25	1100	700	0	*	0.22	1.4	BDL	7.5	2.9	1.4
8	10.5	9.9	49	1.0	1.5	6.5	*	43	135.6	1.1	*	*	0.0	0.00	0.00	0.18	.44	.11	0.04	5.7	9.5	0	16.0	0	8	31.85	9200	1700	0	*	0.28	1.3	0.28	7.6	2.7	1.6
9S	11.9	7.7	44	0.67	2.4	6.95	*	*	*	1.6	*	*	9.9	0.03	0.00	0.14	.43	.10	0.02	5.2	38.2	0	17.5	0	7	29.25	2400	330	0	*	0.16	1.4	0.31	6.8	2.9	1.4
9B	10.0	6.3	56	*	*	7.0	*	*	*	1.3	*	*	13.9	0.06	0.00	0.14	.68	.14	0.00	6.6	7.3	0	15.5	0	39	36.4	2400	220	0	*	0.12	1.2	BDL	6.4	2.9	1.1
10S	11.1	8.4	50	0.67	3.7	6.85	*	*	*	1.4	*	*	14.9	0.02	0.00	0.14	*	.09	0.01	6.2	5.1	0	18.5	0	15	32.5	1900	490	0	*	0.20	1.2	0.26	7.0	2.7	1.2
10B	9.9	5.9	50	*	*	7.1	*	*	*	1.4	20.0	.43	.11	0.01	0.00	0.16	12.1	0	0.03	6.6	12.1	0	16.0	0	17	32.5	1100	490	0	*	0.18	1.2	0.10	6.8	2.8	1.1
11S	10.5	10.5	49	0.75	1.8	7.15	*	*	*	1.6	*	*	5.7	0.00	0.00	0.19	.67	.10	0.04	5.7	18.7	0	18.0	0	27	31.85	16000	280	0	*	0.27	1.3	BDL	6.9	2.8	1.2
11B	10.1	10.4	49	*	*	7.15	*	*	*	1.3	*	*	0.0	0.01	0.00	0.19	*	.11	0.05	5.7	4.0	0	17.0	0	13	31.85	2200	390	0	*	0.40	1.4	0.08	7.4	3.0	1.3
12S	11.1	9.35	49	0.75	3.6	7.1	*	*	*	1.0	*	*	5.2	0.01	0.00	0.15	.46	*	0.03	6.2	5.1	0	17.5	0	15	31.85	2800	480	0	0.03	0.16	1.3	BDL	6.9	2.9	1.4
12B	9.1	8.0	49	*	*	7.55	*	*	*	3.3	*	*	5.4	0.04	0.00	0.16	.45	.13	0.04	4.7	*	0	16.5	0	22	31.85	3500	490	0	*	0.19	1.4	0.13	6.6	2.8	1.4
14Sa	10.5	9.9	46	0.16	4.6	7.05	*	*	*	1.2	*	*	0.0	0.07	0.00	0.18	.70	.27	0.03	5.2	8.0	0	16.0	0	82	29.9	3500	1700	0	*	0.09	1.4	0.21	7.4	3.1	1.5
14Sb	10.0	10.0	48	0.2	4.5	7.0	*	*	*	1.9	*	*	7.4	0.09	0.00	0.18	*	.24	0.03	5.7	4.7	0	16.0	0	99	31.2	2200	790	0	0.02	0.33	1.0	0.13	7.2	3.9	1.5
14Sc	10.0	9.8	50	0.25	4.6	7.0	*	*	*	1.8	*	*	2.2	0.10	0.00	0.20	.69	.27	0.02	5.7	10.6	0	16.5	0	88	32.5	5400	350	0	*	0.26	1.0	0.08	6.7	4.3	1.4
14Ma	10.1	9.5	49	*	*	6.95	*	*	*	1.5	*	*	10.8	0.11	0.00	0.19	*	.29	0.03	6.2	3.6	0	17.5	0	62	31.85	3500	1300	0	*	0.23	1.4	0.12	7.2	3.1	1.5

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data (1)

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/T)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)
14Mb	10.0	9.6	48	*	*	7.0	*	*	*	1.1	*	*	5.5-	0.08	0.00	0.20	0.69
14Mc	9.9	9.6	47	*	*	6.9	*	*	*	1.5	*	*	0.0	0.08	0.00	0.18	*
14Ba	10.1	9.4	55	*	*	7.08	*	*	*	1.1	*	*	1.5	0.12	0.01	0.18	*
14Bb	10.2	9.4	56	*	*	7.15	*	*	*	1.0	*	*	0.0	0.09	0.00	0.19	0.54
14Bc	10.1	9.4	60	*	*	7.1	*	*	*	1.0	*	*	10.0	0.05	0.01	0.18	0.61
15a	12.0	*	55	0.03	1.2	7.5	0.52	54	26.3	1.3	*	*	3.2	0.12	0.00	0.18	0.54
15b	12.0	*	56	0.1	1.2	7.5	0.65	55	45.7	*	*	*	0.1	0.11	0.00	0.18	1.56
15c	12.0	*	60	0.06	1.2	7.5	0.57	54	39.1	1.2	*	*	1.0	0.09	0.00	0.19	0.63
16	11.8	11.5	95	*	0.3	7.7	0.19	19	72.1	0.8	*	*	0.0	0.01	0.00	0.02	*
17	13.1	10.6	55	0.32	0.8	8.1	0.31	71	105.2	1.0	*	*	1.0	0.01	0.00	0.16	0.49
18	13.5	8.7	55	0.16	0.3	7.6	1.26	23	54.3	1.4	*	*	2.0	0.02	0.01	0.17	*
19	14.0	9.8	55	*	0.5	7.5	0.75	43	66.1	1.3	*	*	4.3	0.00	0.00	0.18	0.67
20	13.5	10.4	60	1.2	3.0	7.3	0.04	71	70.0	1.3	*	*	3.5	0.03	0.01	0.16	0.49
21	13.0	*	46	*	0.3	7.7	0.20	1	*	1.9	*	*	0.0	0.00	0.00	0.00	3.06
22	13.5	10.5	70	*	*	6.7	0.77	103	82.5	1.4	*	*	2.0	0.01	0.00	0.18	0.41
23	13.0	*	50	*	0.25	7.2	0.25	1	*	1.0	*	*	0.0	0.00	0.00	0.00	

Station	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Roron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)
14Mb	.28	0.03	5.4	8.4	0	16.0	0	88	24.0	3500	2400	0	*	0.08	1.4	BDL	7.0	3.1	1.5
14Mc	.26	0.02	6.2	5.4	0	18.5	0	65	30.55	9200	350	0	*	0.04	1.4	0.11	7.7	2.9	1.4
14Ba	.22	0.02	6.0	9.5	0	18.0	0	78	35.75	2800	460	0	0.05	0.46	1.3	0.46	7.5	3.3	1.6
14Bb	.30	0.03	6.2	8.8	0	16.0	0	103	36.4	>24000	1100	0	*	0.71	1.4	0.44	7.0	3.2	1.5
14Bc	.30	0.03	5.2	10.6	0	13.5	0	113	39.0	9200	1100	0	*	0.05	*	BDL	6.8	3.4	1.4
15a	.35	0.02	6.6	6.6	0	16.0	0	125	35.75	3500	940	0	0.02	0.88	1.3	0.05	6.8	2.5	1.0
15b	.35	0.02	6.2	12.8	0	16.0	0	136.	36.4	940	230	0	*	0.59	1.4	BDL	7.0	2.4	1.2
15c	.35	0.03	5.2	12.4	0	33.5	0	145	39.0	5400	1600	0	*	0.74	1.4	0.03	7.0	2.5	1.5
16	.05	0.01	11.8	31.9	0	38	0	5	61.75	230	130	0	*	0.12	>4.0	0.19	9.9	>6.0	1.5
17	.10	0.03	6.0	8.8	0	16.5	0	41	35.75	3500	1100	0	*	0.10	>4.0	0.14	6.8	3.3	1.6
18	.16	0.04	5.4	8.7	0	17.5	0	81	35.75	790	1100	0	*	0.30	1.4	0.08	7.2	2.8	1.3
19	.14	0.05	5.2	12.1	0	18.0	0	7	35.75	>24000	>24000	0	*	0.25	1.5	0.20	5.7	3.9	1.5
20	.24	0.02	6.0	14.3	0	17.5	0	13	39.0	9200	2400	0	*	0.31	1.6	0.19	6.7	4.2	1.4
21	.12	0.08	3.9	2.9	0	33.0	0	3	29.9	3500	2400	0	*	0.00	1.8	0.19	7.2	4.5	0.9
22	.11	0.04	7.3	9.1	0	25.5	0	15	45.5	1700	110	0	*	0.33	1.7	0.20	9.4	3.8	1.9
23	.08	0.04	2.4	2.9	0	26	0	5	32.5	940	630	0	*	0.04	1.7	BDL	5.5	4.3	0.66

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data (1)

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)
1	5.2	11.4	33	0.75	1.0	6.5	0.70	*	55.0	*	*	0.9	*	0.01	0.01	0.06	0.53	0.09	0.05	2.9	0.0
4Aa	4.9	12.5	54	1.0	1.5	6.9	0.84	*	57.0	*	*	0.9	4.2	0.05	0.00	0.12	0.57	0.15	0.08	5.4	0.0
4b	5.0	12.0	55	1.0	1.5	7.0	0.87	*	69.2	*	*	3.8	0.7	0.11	0.00	0.11	0.55	0.16	0.08	5.7	10.6
4c	4.9	12.3	57	1.0	1.5	6.9	0.85	*	50.1	*	*	0.9	2.0	0.04	0.01	*	0.07	0.14	0.08	5.7	2.9
8	5.0	13.0	54	0.8	2.25	7.2	0.92	*	27.2	*	*	1.2	6.6	0.06	0.01	0.10	0.74	0.11	0.03	7.6	0.0
9S	5.0	12.6	50	0.9	4.5	7.1	*	*	*	*	*	1.3	0.6	0.08	0.00	0.12	0.47	0.08	0.03	5.7	0.0
9B	5.0	11.9	55	*	*	7.0	*	*	*	*	*	1.6	4.2	0.08	0.00	0.11	0.13	0.16	0.05	5.7	1.2
10S	5.2	12.6	49	0.9	5.5	*	*	*	*	*	*	1.9	6.0	0.06	0.00	0.12	0.56	0.10	0.03	5.7	0.0
10B	5.0	12.0	60	*	*	*	*	*	*	*	*	2.9	3.8	0.05	0.01	0.12	0.12	0.17	0.02	6.0	1.5
11S	5.0	12.3	50	0.8	2.0	7.0	*	*	*	*	*	3.1	5.2	0.05	0.01	0.13	0.37	0.11	0.13	6.6	1.8
11B	5.0	12.1	54	*	*	6.7	*	*	*	*	*	0.3	2.8	0.05	0.00	0.10	*	0.11	0.03	6.2	0.0
12S	5.0	12.6	55	0.8	4.5	7.1	*	*	*	*	*	1.2	2.3	0.02	0.00	0.11	0.72	0.14	0.03	5.2	2.0
12B	5.0	12.1	50	*	*	7.1	*	*	*	*	*	1.2	1.0	0.08	0.01	0.11	0.22	0.16	0.07	5.4	1.2
13S	5.0	12.2	52	0.8	2.0	7.3	*	*	*	*	*	1.1	*	0.09	0.00	0.14	0.43	0.12	0.04	5.2	1.2
13B	5.0	12.9	50	*	*	7.0	*	*	*	*	*	1.9	8.6	0.07	0.00	0.11	0.41	0.33	0.03	5.4	1.8
14Sa	5.0	*	54	0.8	11.0	7.0	*	*	*	*	*	1.1	1.2	0.06	0.00	0.13	0.37	0.14	0.04	6.6	2.0
14Sb	5.0	*	55	0.8	10.0	7.0	*	*	*	*	*	1.3	4.3	0.09	0.00	0.12	0.44	0.12	0.04	6.2	0.0
14Sc	5.0	*	55	0.8	12.0	7.0	*	*	*	*	*	1.2	0.0	0.05	0.00	0.10	*	0.12	0.04	6.2	0.0
14Ma	5.0	*	53	*	*	6.9	*	*	*	*	*	*	2.2	0.07	0.01	0.12	0.39	0.14	0.08	6.6	2.0
14Mb	5.0	*	53	*	*	6.8	*	*	*	*	*	2.8	4.5	0.07	0.00	0.12	*	0.14	0.05	6.2	1.5
14Mc	5.1	*	53	*	*	6.9	*	*	*	*	*	1.2	4.0	0.09	0.00	0.12	*	0.14	0.06	6.0	3.1
14Ba	5.2	*	55	*	*	6.5	*	*	*	*	*	1.2	4.3	0.07	0.01	0.12	*	0.14	0.06	6.6	2.0

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data (1)

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)
14Bb	5.1	*	57	*	*	6.5	*	*	*	*	*	3.8	1.1	0.09	0.00	0.13	.415	0.14	0.06	6.2	2.0
14Bc	5.2	*	57	*	*	6.2	*	*	*	*	*	1.0	0.0	0.07	0.00	0.13	.113	0.13	0.05	6.2	1.2
15a	5.0	13.0	54	1.0	1.2	7.2	*	*	33.1	*	*	1.1	5.6	0.09	0.01	0.12	.626	0.16	0.08	6.2	0.0
15b	5.0	12.8	50	1.0	*	7.1	*	*	40.2	*	*	2.9	2.8	0.07	0.00	0.13	.355	0.15	0.05	5.4	1.2
15c	5.0	13.1	52	1.0	*	7.2	*	*	47.9	*	*	1.0	5.2	0.06	0.01	0.12	.408	0.14	0.05	5.4	2.0
17	5.0	12.1	55	*	0.8	7.5	*	*	65.2	*	*	1.1	5.2	0.04	0.01	0.11	.676	0.13	0.05	5.2	5.0
21	6.0	11.6	53	*	0.2	7.6	*	*	55.5	*	*	2.3	0.0	0.02	0.00	0.00	.185	0.13	0.05	2.6	2.0
23	6.0	11.8	45	*	0.2	6.5	0.35	*	20.3	*	*	2.5	0.0	0.02	0.00	0.01	.225	0.08	0.03	2.7	0.0

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data (1)

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)
1	8.0	12.0	16	0.25	1.5	7.6	1.24	125	54	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	10.4	3300	440	0	*	0.2	0.7	0.02	2.9	1.7	0.8
2	8.0	11.6	30	0.2	1.5	7.5	.55	102	59	*	*	2.0	5.5	.06	.01	0.25	.38	.12	.02	5.2	8.8	0	10.5	0	59	19.5	6900	960	0	*	0.6	1.1	0.03	3.1	1.3	1.2
3	7.5	12.2	72	0.2	1.0	7.5	.55	16	75	*	*	2.2	*	.04	.01	1.19	.82	.08	.01	*	31.9	0	15.5	5	68	45.8	6300	880	0	*	0.2	1.4	0.0	8.3	1.1	2.3
4a	8.0	12.0	35	0.2	1.3	7.4	1.5	*	66	*	*	1.6	*	.08	.01	.29	.39	.10	.03	4.5	10.2	0	10.0	0	56	22.7	5000	180	0	0.04	0.4	1.1	0.02	3.2	1.2	1.3
4b	8.0	11.9	40	0.2	1.3	7.4	1.2	*	61	*	*	1.1	5.2	.09	.01	.29	.31	.12	.05	3.7	9.5	0	7.5	0	48	25.0	5600	320	0	*	0.5	2.2	0.0	10.5	1.5	1.6
4c	8.0	12.1	39	0.2	1.3	7.4	1.36		59	*	*	1.7	3.2	.05	.01	.31	.33	.15	.00	*	5.4	0	11.0	0	48	25.3	5300	820	0	*	0.5	1.0	0.05	3.3	0.6	1.2
5	8.0	10.9	70	0.2	.3	8.0	1.0		40	*	*	1.7	7.4	.28	.01	.32	.63	.16	.04	3.3	4.0	0	15.0	0	42	45.5	8100	380	0	*	0.3	2.3	0.0	6.9	1.1	2.1
6	7.0	11.0	120	0.1	0.1	8.2	0.27	*	39	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	73.0	*	*	*	*	*	*	*	*	*	*
7	8.0	12	28	0.3	1.5	7.3	*	*	*	*	*	1.4	5.2	.46	.01	.51	.42	.14	.05	5.7	8.7	0	10.5	0	56	18.2	7100	340	0	*	0.5	1.0	0.08	3.2	1.3	1.3
8	8.0	12.6	33	0.2	2.0	7.4	1.5	243	*	*	*	*	4.4	.04	.01	.28	.32	.17	.00	4.0	5.1	0	12.0	0	45	21.4	2800	414	0	*	0.7	0.9	0.08	4.2	0.5	1.3
9S	8.2	11.8	33	0.2	3.5	7.3	*	*	*	*	*	2.1	3.1	.06	.01	.29	.32	.12	.05	4.7	5.4	0	10.5	0	25	21.4	6800	1087	0	*	0.2	1.3	0.13	3.6	2.2	1.6
9B	8.5	10.8	38	*	*	7.2	*	*	*	*	*	3.3	3.2	.08	.02	.37	.04	.20	.06	4.5	3.6	0	9.0	0	145	24.7	6900	900	0	*	1.2	1.2	0.08	3.4	1.4	1.6
10S	8.0	10.6	35	0.2	4	7.4	*	*	*	*	*	*	7.5	.08	.01	.25	.37	.17	.01	4.5	4.7	0	12.0	0	118	22.7	6400	1216	0	*	1.2	1.4	0.09	3.8	3.1	1.6
10B	8.0	8.4	37	*	*	7.1	*	*	*	*	*	2.0	7.4	.06	.01	.26	.37	.16	.05	3.7	2.9	0	11.0	0	99	24.0	3900	801	0	*	0.2	1.1	0.07	3.5	1.0	1.5
11S	8.0	11.8	31	0.2	2.3	7.3	0.83	*	58	*	*	1.4	5.6	.03	.01	.28	.28	.16	.05	4.3	2.9	0	11.0	0	62	20.1	3400	429	0	*	1.4	1.0	0.06	3.5	1.0	1.4
11B	8.0	10.6	32	*	*	7.3	*	*	*	*	*	2.0	*	.05	.01	.24	*	.19	.00	4.0	6.6	0	10.5	0	65	20.8	3300	443	0	*	0.5	1.3	0.14	3.7	1.7	1.4
12S	8.0	10.5	30	0.2	5.5	7.3	*	*	*	*	*	2.1	5.2	.09	.02	.24	.03	.21	.06	3.3	12.8	0	12.0	0	145	19.5	10800	1140	0	0.03	0.5	1.1	0.11	3.1	1.2	1.6
12B	8.1	7.6	31	*	*	7.0	*	*	*	*	*	2.1	2.9	.11	.02	.23	.73	.21	.08	3.8	7.3	0	11.5	0	167	20.1	9500	800	0	*	1.1	1.2	0.11	3.4	2.4	1.6
13S	7.9	10.6	29	0.2	2.5	7.4	*	*	*	*	*	1.8	5.8	.06	.01	.78	.43	.18	.01	3.9	18.7	0	11.0	0	122	16.8	7500	672	0	*	0.3	1.1	0.12	3.0	0.8	1.5
13B	7.9	7.5	38	*	*	7.3	*	*	*	*	*	1.8	4.2	.06	.01	.26	.71	.23	.06	4.3	6.6	0	11.0	0	167	19.5	7400	760	0	*	1.7	1.2	0.10	3.0	1.4	1.5
14Sa	8.0	12.8	30	0.3	11.0	7.3	*	*	*	*	*	1.2	6.4	.03	.01	.25	.30	.17	.04	4.0	6.6	0	9.5	0	72	24.7	5300	440	0	0.03	0.6	1.2	0.12	3.6	2.2	1.4
14Sb	8.0	11.6	30	0.3	11.0	7.3	*	*	*	*	*	1.3	2.0	*	*	*	.33	.18	*	*	8.8	0	10.5	0	89	19.5	4600	486	0	*	0.0	1.1	0.12	3.6	0.7	1.4

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data (1)

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)
14Sc	8.0	12	30	0.3	11.0	7.3	*	*	*	*	*	*	3.2	.02	.01	.26	.35		.00	4.0	8.0	0	12.0	0	72	19.5	4900	472	0	*	0.0	0.9	.10	3.7	0.5	1.3
14Ma	8.0	11.4	32	*	*	7.0	*	*	*	*	*	1.2	2.0	.05	.01	.28	*	.16	.03	4.3	8.4	0	12.0	0	62	20.8	3300	329	0	*	0.4	1.0	.12	3.6	1.0	1.3
14Mb	8.0	11.6	31	*	*	7.1	*	*	*	*	*	1.3	7.3	.08	.01	.27	*	.19	.03	4.0	10.6	0	11.5	0	81	20.1	5200	272	0	0.03	0.1	1.1	.11	3.7	1.7	1.4
14Mc	8.0	11.2	30	*	*	7.0	*	*	*	*	*	1.3	4.0	.05	.01	.26	*	1.9	.03	3.7	12.4	0	10.5	0	82	19.5	4200	286	0	*	0.3	1.0	.12	4.3	0.6	1.3
14Ba	8.0	9.0	30	*	*	7.0	*	*	*	*	*	2.3	4.4	.06	.01	.26	2.3	.15	.02	4.3	9.1	0	10.0	0	72	19.5	4800	229	0	*	0.0	1.2	.12	3.7	1.8	1.3
14Bb	8.0	9.6	33	*	*	6.7	*	*	*	*	*	*	4.5	.05	.01	.27	.01	.19	.02	3.7	8.8	0	11.0	0	72	21.4	4800	429	0	*	0.4	1.2	.15	3.7	3.7	1.3
14Bc	8.0	9.2	30	*	*	6.5	*	*	*	*	*	*	3.3	.08	.01	.30	.02	.17	.05	4.3	5.1	0	12.0	0	82	19.5	4200	3.5	0	*	0.3	1.1	.15	4.3	1.5	1.3
15a	8.5	12.0	100	0.2	0.7	7.5	1.2	*	74	*	*	1.3	1.0	.07	.01	.28	.32	.16	.01	3.9	88.2	0	11.5	0	78	65.0	5100	580	0	0.03	0.2	1.1	.14	3.5	1.2	1.2
15b	8.4	12.5	92	0.2	0.7	7.6	1.2	*	58	*	*	1.4	7.1	.05	.01	.28	*	.18	.01	4.0	11.7	0	*	0	78	59.8	3700	860	0	*	0.2	1.1	.16	3.5	0.6	1.3
15c	8.4	12.2	107	0.2	0.7	7.6	1.3	*	73	*	*	*	5.4	.04	.01	.27	.33	.01	.04	4.0	14.7	0	37.0	0	29	0.5	5700	660	0	*	0.2	1.1	.16	3.8	1.0	1.5
18	8.0	11.8	100	0.4	0.5	7.8	1.43	*	25	*	*	*	6.4	.06	.00	.16	.04	.08	.00	15.0	10.6	0	12.0	0	82	65.0	1066	300	0	*	0.2	72.3	.07	7.8	2.2	1.5
17	8.5	11.6	35	0.2	2.0	7.8	1.6	220	72	*	*	*	7.4	.04	.01	.27	.48	.21	.02	3.5	9.5	0	12.0	0	103	22.7	4600	744	0	*	0.7	0.9	.10	3.4	0.7	1.1
18	8.9	10.8	34	0.2	1.8	7.6	1.0	*	86	*	*	1.6	8.4	.04	.01	.34	.03	.27	.04	3.3	12.1	0	13.0	0	89	22.1	*	*	0	*	0.2	1.2	.25	4.5	1.8	1.7
19	8.9	11.2	33	0.2	5.5	7.5	0.9	*	84	*	*	9.6	2.2	.04	.01	.29	*	.30	.03	4.0	*	0	12.0	0	82	21.4	13700	2020	0	*	1.1	1.1	.08	3.4	0.8	1.3
20	9.2	12.0	35	0.2	1.5	7.6	1.14	351	96	*	*	2.0	6.6	.05	.01	.27	.39	.20	.04	4.5	18.0	0	13.0	0	133	22.7	11600	1280	0	*	1.4	1.1	.19	3.6	0.6	1.5
21	9.0	*	57	*	0.1	7.4	0.25	*	18	*	*	0.7	5.4	.04	.00	.02	.11	.24	.03	4.0	8.8	0	17.0	0	9	37.0	266	0	0	*	0.1	1.1	.07	5.5	0.6	0.5
22	10.0	11.6	37	0.2	1.7	7.4	1.33	*	130	*	*	3.5	*	.07	.02	.27	.52	.32	.08	*	12.1	0	11.5	0	225	24.0	13800	1630	0	*	0.6	1.3	.28	3.7	1.4	2.0
23	9.5	*	50	*	0.25	7.4	0.2	*	12	*	*	*	*	.01	.00	.03	.72	.17	.05	*	10.2	0	25.0	0	29	32.5	633	0	0	*	0.0	1.2	.07	4.2	0.8	0.6

Amendment 1

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data (1)

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S
1	9.5	9.6	30	0.5	1.0	6.0	0.84	62	20	*	*	*	1.2	.03	.06	.21	.14	.12	0.0	2.1	0	0	10.0	0	*	19.5
4a	8.8	11.3	41	0.7	0.75	6.0	0.56	*	12	1.47	*	*	6.1	.05	.01	.32	1.06	.15	.04	5.2	0	0	15.0	0	*	26.6
4b	8.8	10.9	45	0.7	0.75	6.1	0.62	*	20	1.65	*	*	2.0	.04	.01	.33	.48	.17	.04	4.7	9.6	0	18.0	0	*	29.2
4c	8.9	11.7	40	0.8	0.75	6.0	0.55	*	12	1.23	*	*	0.0	.03	.01	.31	.37	.17	.05	5.2	0	0	18.6	0	*	26.0
8	10.0	9.3	42	0.4	2.5	6.4	0.99	200	28	1.61	*	*	2.6	.09	.01	.31	.40	.17	.04	5.7	0	0	16.0	0	*	27.3
9S	9.0	9.7	27	0.5	3.5	6.0	*	*	*	*	*	*	2.0	.07	.01	.29	.52	.15	.01	4.3	0	0	14.0	0	*	17.5
9M	8.5	9.8	26	*	*	6.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	16.9
9B	8.0	9.4	26	*	*	6.0	*	*	*	1.65	*	*	0.0	.17	.00	.28	.53	.16	.01	4.3	0	0	13.0	0	*	16.9
10S	10	8.9	35	0.5	6.0	6.2	*	*	*	1.65	*	*	7.3	.10	.01	.27	.53	.16	.02	4.3	0	0	13.0	0	*	22.7
10M	8.5	8.5	35	*	*	6.2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	22.7
10B	8.0	8.3	35	*	*	6.2	*	*	*	1.44	*	*	5.1	.08	.01	.29	.42	.23	.02	4.3	0	0	18.0	0	*	22.7
11S	10	9.7	42	0.5	3.0	6.0	*	*	*	1.47	*	*	6.0	.05	.01	.30	.57	.15	.03	4.7	0	0	18.0	0	*	27.3
11M	10	9.7	37	*	*	6.2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	24.0
11B	10	9.7	37	*	*	6.0	*	*	*	1.42	*	*	0.0	.07	.01	.32	.44	.15	.07	4.7	0	0	14.3	0	*	24.0
12S	9.0	9.6	35	0.5	6.0	6.0	*	*	*	1.29	*	*	3.5	.06	.01	.27	.53	.15	.03	3.7	0	0	17.0	0	*	22.7
12M	8.5	9.6	37	*	*	6.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	24.0
12B	8.0	9.0	37	*	*	6.0	*	*	*	1.04	*	*	6.1	.07	.01	.25	.33	.22	.02	3.5	0	0	18.9	0	*	24.0
13S	10.0	9.8	37	0.6	2.0	6.0	*	*	*	1.22	*	*	3.3	.07	.01	.31	.50	.14	.03	4.7	0	0	14.0	0	*	24.0
13M	8.5	9.8	38	*	*	6.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	24.7
13B	8.0	9.7	49	*	*	*	*	*	*	1.34	*	*	4.3	.11	.01	.30	.54	.35	.03	4.0	0	0	13.0	0	*	31.9
14Sa	10.0	9.8	43	0.5	6.0	6.0	*	*	*	1.39	*	*	18.8	.05	.01	.29	.45	.15	.03	4.5	0	0	15.0	0	*	28.0

Amendment 1
(New)

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data (1)

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S
14Sb	10.0	9.5	45	0.5	6.0	6.0	*	*	*	*	*	*	15.5	.05	.01	.31	.30	.15	.01	4.5	0	0	17.0	0	*	29.3
14Sc	10.0	10.4	45	0.5	6.0	6.0	*	*	*	1.73	*	*	3.8	.06	.01	.30	.55	.15	.03	4.9	0	0	15.6	0	*	29.3
14Ma	10.0	9.8	43	*	*	6.0	*	*	*	1.28	*	*	2.1	.04	.01	.30	.54	.17	.03	4.7	0	0	14.0	0	*	28.3
14Mb	10.0	9.8	43	*	*	6.0	*	*	*	1.42	*	*	4.2	.04	.01	.31	.49	.15	.02	4.7	0	0	16.0	0	*	28.0
14Mc	10.0	9.8	43	*	*	6.0	*	*	*	1.98	*	*	3.1	.04	.01	.32	.40	.15	.02	4.4	0	0	16.0	0	*	28.0
14Ba	10.0	9.5	40	*	*	6.0	*	*	*	1.32	*	*	5.1	.06	.01	.31	.49	.15	.02	4.3	0	0	16.7	0	*	26.0
14Bb	10.0	9.5	40	*	*	6.0	*	*	*	1.22	*	*	7.3	.05	.01	.30	.34	.16	.03	4.5	0	0	17.0	0	*	26.0
14Bc	10.0	9.5	40	*	*	6.0	*	*	*	1.28	*	*	6.2	.03	.01	.32	.54	.16	.02	4.5	0	0	9.0	0	*	26.0
15a	12	10.4	46	0.5	1.0	6.0	0.61	*	26	1.89	*	*	0.0	.05	.01	.32	.83	.16	.02	4.7	0	0	18.0	0	*	29.9
15b	11.8	10.3	44	0.5	1.0	6.0	0.65	*	18	1.96	*	*	6.2	.05	.01	.30	1.50	.16	.02	4.5	0	0	15.0	0	*	28.6
15c	12.1	10.6	47	0.5	1.0	6.0	0.58	*	18	2.11	*	*	1.7	.04	.01	.32	2.42	.16	.02	5.7	0	0	18.0	0	*	30.6
17	12.0	14.0	48	0.5	2.0	6.0	0.75	103	18	2.07	*	*	3.9	.03	.01	.29	1.30	.13	.05	4.9	0	0	18.0	0	*	31.2
20	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
21	9.8	10.1	53	*	0.2	6.0	0.2	*	4	1.90	*	*	0.0	.01	.00	.02	.52	.17	.05	3.3	0	0	28.0	0	*	34.5
23	10	9.8	49	*	0.2	6.4	0.5	*	11	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	31.9

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data (1)

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (mg/l)	Zinc (mg/l)	Silica (mg/l)
1	12.0	10.2	32	0.1	1.0	6.0	1.13	87	132	2.02	1.57	3.59	5.2	0.03	0.00	0.03	.64	.25	*	1.7	7.32	0	8.0	0	96	20.8	21,700	3,020	0	*	0.3	1.1	.12	3.9	2.3	1.2	*	*	*	*	6.64
2	12.2	10.5	36	0.1	2.0	6.0	0.98	141	86	1.84	7.9	9.74	6.9	0.06	0.00	*	1.03	.01	0.00	2.7	4.80	0		0	56	23.4	20,100	*	0	*	0.3	1.2	.12	3.9	2.2	1.5	*	*	*	*	5.51
3	12.5	9.3	69	0.1	1.5	6.0	1.62	40	242	*	*	6.42	0.0	0.21	0.01	0.12	1.01	.36	0.01	9.7	6.48	0	12.0	0	219	44.8	10,400	*	0	*	0.7	1.7	.23	7.7	2.1	2.7	*	*	*	*	6.28
4a	12.5	10.2	42	0.1	1.0	6.0	1.00	*	84	2.14	0.96	3.10	5.2	0.14	0.00	0.14	.58	.09	0.02	4.9	4.52	0	12.0	0	89	27.3	19,000	2,520	0	0.03	1.0	1.2	.09	3.9	0.8	1.4	0.0	0.0		0.32	5.45
4b	12.5	10.1	40	0.1	1.0	6.0	1.00	*	87	*	*	*	1.7	0.00	0.00	0.15	.70	.19	0.01	3.7	4.24	0	12.0	0	125	26.0	17,400	2,440	0	*	0.7	1.2	.09	3.6	1.5	1.2	*	*	*	*	5.16
4c	12.5	10.3	43	0.1	1.0	6.0	1.00	*	83	1.90	0.56	2.46	2.3	0.01	0.01	0.16	.74	.15	0.04	*	21.88	0	8.0	0	114	27.9	19,000	1,980	0	*	0.2	1.2	.12	4.2	2.0	1.4	*	*	*	*	5.51
5	12.9	9.6	56	*	0.25	6.2	0.60	*	42	1.54	2.45	2.99	19.5	0.04	0.01	0.21	1.05	.15	0.07	4.3	6.84	0	14.0	0	114	36.4	*	343	0	*	0.4	2.0	.11	4.0	2.9	2.2	*	*	*	*	4.87
6	13.9	9.5	105	0.5	0.75	6.0	0.44	*	22	3.40	*	2.46	0.0	0.28	0.03	0.21	.71	.36	0.24	9.2	23.00	0	18.0	0	29	68.2	*	1,800	0	*	1.1	>2.4	.11	>10.0	2.3	2.1	*	*	*	*	7.00
7	12.1	9.8	32	0.3	2.0	6.2	0.80	*	86	1.79	0.78	2.57	0.0	0.05	0.01	0.14	.24	.14	0.11	11.0	12.36	0	8.0	0	130	20.8	~		0	*	0.8	1.1	.05	3.9	1.1	1.2	*	*	*	*	5.37
8	12.2	9.9	41	0.3	2.5	6.0	1.2	243	80	1.69	2.11	3.80	5.2	0.04	0.02	0.15	.33	.06	0.12	5.4	15.16	0	12.0	0	150	26.6	16,400	2,260	0	*	0.4	1.2	.09	3.8	1.5	1.4	*	*	*	*	5.43
9S	12.8	9.7	41	0.3	3.0	6.0	*	*	*	1.39	0.48	1.87	7.5	0.16	0.01	0.00	.43	.07	0.08	4.0	9.84	0	10.0	0	65	26.6	9,700	168	0	*	0.5	1.2	.08	4.0	1.8	1.4	*	*	*	*	5.67
9M	12.5	9.3	41	*	*	6.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	26.6	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
9B	12.5	8.9	41	*	*	6.0	*	*	*	1.69	0.43	2.12	0	0.06	0.01	0.00	.19	.13	0.09	4.3	10.96	0	10.0	0	102	26.6	*	*	0	*	0.7	1.2	.13	5.3	0.7	1.6	*	*	*	*	6.12
10S	13.0	9.2	44	0.3	4.0	6.0	*	*	*	1.93	0.17	2.10	7.4	0.10	0.01	0.00	.42	.05	0.04	4.7	10.96	0	16.0	0	75	28.6	3,530	14	0	*	0.6	1.2	.10	4.3	1.8	1.5	*	*	*	*	5.67
10M	11.9	8.3	43	*	*	6.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	27.9	*	*	*	*	*		*	*	*	*	*	*	*	*	*
10B	10.9	7.9	55	*	*	6.0	*	*	*	1.06	1.64	2.70	7.6	0.08	0.01	0.00	.31	.07	0.09	4.7	11.10	0	10.0	0	92	35.7	3,963	91	0	*	0.5	1.4	.10	4.3	1.7	1.5	*	*	*	*	5.53
11S	12.5	9.9	40	0.3	2.5	6.0	1.2	*	72	1.37	1.67	3.04	4.5	0.02	0.01	0.00	.40	.18	0.11	4.3	14.04	0	10.0	0	125	26.0	14,300	2,680	0	*	0.4	1.2	.09	3.8	1.9	1.4	*	*	*	*	5.77
11M	12.5	9.8	40	*	*	6.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	26.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11B	12.5	9.8	40	*	*	6.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	26.0	*	*	0	*	*	*	*	*	*	*	*	*	*	*	5.53
12S	13.1	9.5	41	0.4	6.0	6.0	*	*	*	1.28	0.54	1.82	0.0	0.07	0.01	0.03	.45	.03	0.08	3.5	10.68	0	12.0	0	89	26.6	7,400	84	0	0.04	0.4	1.2	.09	3.7	1.5	1.4	0.0	0.0		0.32	4.95
12M	12.5	9.0	39	*	*	6.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	25.3	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12B	11.0	6.8	45	*	*	6.0	*	*	*	2.25	0.45	2.70	0.0	0.23	0.03	0.03	.56	.18	0.24	3.9	38.40	0	12.0	0	206	29.2	4,400	126	0	*	1.7	1.2	.24	3.6	0.8	1.8	*	*	*	*	5.29

ER Table 2.5.01
Cherokee Nuclear Station
Water Quality Data (1)

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)
13S	13.0	9.5	40	0.4	2.5	6.0	*	*	*	2.33	0	2.07	7.6	0.06	0.01	0.03	.32	.11	0.08	3.5
13M	12.8	9.5	39	*	*	6.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13B	12.5	9.6	39	*	*	6.0	*	*	*	1.52	0.78	2.30	2.8	0.06	0.01	0.25	.36	.12	0.08	*
14Sa	12.5	10.3	39	0.3	9.0	6.0	0.5	*	*	1.73	1.67	3.40	*	0.02	0.01	0.13	.36	.12	0.11	4.5
14Sb	12.5	10.4	37	0.3	9.0	6.0	0.4	*	*	1.77	1.10	2.87	0	0.02	0.02	0.22	.38	.25	0.13	3.9
14Sc	12.5	10.3	38	0.3	9.0	6.0	0.7	*	*	1.13	1.86	2.99	7.1	0.05	0.01	0.21	.44	.16	0.10	4.0
14Ma	12.5	10.4	39	*	*	6.0	*	*	*	1.69	1.09	2.78	3.1	0.07	0.01	0.12	.39	.25	0.10	4.3
14Mb	12.5	10.5	38	*	*	6.0	*	*	*	*	*	2.60	8.0	0.04	0.01	0.12	.44	.17	0.09	3.9
14Mc	12.5	10.3	39	*	*	6.0	*	*	*	1.45	1.17	2.62	0	0.07	0.01	0.20	.33	.20	0.09	3.5
14Ba	12.5	10.4	39	*	*	6.0	*	*	*	1.54	1.29	2.83	3.9	0.10	0.01	0.12	.37	.22	0.26	3.5
14Bb	12.5	10.3	37	*	*	6.0	*	*	*	*	*	2.92	2.0	0.04	0.01	0.24	.54	.16	0.10	3.5
14Bc	12.5	10.4	38	*	*	6.0	*	*	*	1.23	1.93	3.16	5.4	0.03	0.01	0.18	.58	.18	0.09	3.9
15a	13.3	10.3	41	0.1	1.5	6.0	1.2	*	216	1.88	1.59	3.47	6.7	0.03	0.01	0.21	.21	.11	0.08	3.5
15b	13.3	10.1	40	0.1	1.5	6.0	1.4	*	220	1.97	0.78	2.75	5.0	.03	.01	.19	.60	.21	.07	3.7
15c	13.3	10.3	39	0.1	1.5	6.0	1.3	*	211	1.75	2.71	4.46	0	0.02	0.01	0.05	.31	.10	0.04	3.9
16	15.5	7.9	100	0.2	0.5	6.0	1.09	*	44	*	*	2.32	3.4	0.00	0.01	0.12	.40	.11	0.00	9.7
17	13.1	10.7	45	0.1	2.5	6.0	1.28	220	112	*	*	3.39	6.4	0.03	0.01	0.22	.40	.17	0.07	3.9
18	14.2	9.6	43	0.1	1.5	6.0	1.29	*	76	*	*	2.60	0	0.02	0.01	0.17	.49	.11	0.05	3.9
19	13.5	8.8	45	0.1	2.5	6.2	1.28	*	76	2.14	0.38	2.52	7.2	0.01	0.01	0.19	.49	.15	0.01	3.5
20	14.0	10.0	50	*	3.0	6.0	1.24	166	80	2.70	0.37	3.07	7.2	0.01	0.02	0.20	.45	.13	0.04	3.5
21	15.0	10.6	52	*	0.1	6.0	0.1	*	18	*	*	1.32	0	0.01	0.00	*	.13	.06	0.01	2.5
22	14.5	9.6	55	*	2.5	6.0	0.77	*	82	*	*	4.62	4.0	0.01	0.02	0.10	.41	.10	0.03	4.3
23	16.0	9.8	50	*	0.1	6.0	5.0	*	8	1.37	0.12	1.49	2.9	0.01	0.01	0.01	.20	.05	0.02	2.5

Station	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (mg/l)	Zinc (mg/l)	Silica (mg/l)
13S	8.72	0	12.0	0	106	26.0	*	*	0	*	0.4	1.2	.11	3.6	0.9	1.4	*	*	*	*	5.77
13M	*	*	*	*	*	25.4	*	*	0	*	*	*	*	*	*	*	*	*	*	*	*
13B	12.08	0	10.0	0	107	25.4	13,900	1,420	0	*	0.1	1.5	.88	3.3	2.4	1.4	*	*	*	*	5.77
14Sa	9.28	0	10.0	0	107	25.4	*	2,100	0	0.03	0.3	1.2	.09	3.8	3.0	1.4	0.0	0.0		0.35	5.77
14Sb	9.28	0	12.0	0	168	24.1	17,000	2,020	0	0.03	0.4	1.1	.09	3.9	0.7	1.4	0.0	0.0		0.35	5.77
14Sc	9.87	0	10.0	0	166	24.7	*	2,360	0	*	0.7	1.1	.11	3.7	0.7	1.3	*	*	*	*	5.53
14Ma	8.72	0	12.0	0	133	25.4	20,600	1,800	0	*	0.7	1.1	.18	3.5	0.6	1.3	*	*	*	*	5.77
14Mb	8.72	0	10.0	0	184	24.7	18,800	2,100	0	*	0.3	1.1	.11	3.7	0.7	1.3	*	*	*	*	5.53
14Mc	12.92	0	10.0	0	220	25.4	*	2,100	0	*	0.4	1.2	.10	3.6	2.0	1.3	*	*	*	*	5.59
14Ba	22.44	0	12.0	0	145	25.4	15,400	2,420	0	0.04	0.4	1.1	.10	3.7	1.7	1.3	0.0	0.0		0.52	5.75
14Bb	9.28	0	8.0	0	215	24.1	17,700	2,220	0	*	0.6	1.2	.10	3.6	1.3	1.3	*	*	*	*	5.75
14Bc	49.60	0	12.0	0	142	24.7	16,900	1,560	0	*	0.4	1.2	.11	3.7	1.4	1.3	*	*	*	*	5.75
15a	14.60	0	12.0	0	130	26.7	23,900	2,320	0	0.03	0.7	1.1	.10	3.5	1.4	1.3	0.0	0.0		0.78	5.75
15b	13.8	0	10.0	0	148	26.0	*	*	0	*	*	*	*	*	*	*	*	*	*	*	*
15c	13.98	0	12.0	0	96	25.4	*	2,240	0	*	1.4	1.1	.09	3.5	0.6	1.3	*	*	*	*	5.32
16	15.72	0	14.0	0	103	65.0	1,898	427	0	*	0.5	>2.4	.22	6.0	5.7	1.5	*	*	*	*	5.61
17	12.64	0	12.0	0	107	29.3	*	2,280	0	*	0.9	1.2	.10	4.0	1.1	1.3	*	*	*	*	5.45
18	17.68	0	10.0	0	89	28.0	*	*	0	*	0.3	1.2	.10	3.5	1.7	1.3	*	*	*	*	5.61
19	46.24	0	12.0	0	82	29.3	22,100	1,360	0	*	0.3	1.3	.10	3.6	1.2	1.2	*	*	*	*	5.61
20	15.16	0	14.0	0	82	32.5	21,200	620	0	*	0.3	1.5	.13	4.0	0.8	1.2	*	*	*	*	6.36
21	4.28	0	22.0	0	32	33.8	766	0	0	*	0.9	1.1	.05	5.1	0.8	0.7	*	*	*	*	11.92
22	18.24	0	14.0	0	133	35.8	15,800	700	0	*	0.9	1.6	.14	4.2	1.2	1.4	*	*	*	*	6.49
23	9.28	0	18.0	0	17	32.5	5,700	2,060	0	*	0.3	1.2	.07	4.1	0.9	0.6	*	*	*	*	11.15

Amendment 1
(New)

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S
1	5.5	11.7	26	0.4	1.5	6.0	1.15	*	18	1.35	*	*	0.00	.03	.00	.21	.37	.09	.01	2.2	2.2	0	8.0	0	24	16.9
4a	5.5	12.6	34	0.6	1.0	6.3	1.0	*	16	1.41	0.66	2.07	0.00	.04	.01	.32	.46	.12	.02	3.2	2.2	0	12.0	0	27	22.1
4b	5.5	12.4	33	0.5	1.0	6.3	1.3	*	*	1.35	0.81	2.16	0.00	.03	.01	.29	.43	.12	.04	3.3	4.0	0	10.0	0	17	21.4
4c	5.5	12.7	34	0.6	1.0	6.3	1.15	*	*	1.28	0.50	1.78	0.00	.06	.01	.30	.52	.12	.02	3.2	1.9	0	12.0	0	17	22.1
8	6.8	11.4	30	0.5	2.5	6.1	1.11	202	20	1.37	1.19	2.56	0.00	.01	.01	.29	.50	.09	.02	3.2	2.5	0	12.0	0	20	19.5
9S	7.9	10.7	37	0.4	2.5	6.2	*	*	*	1.71	0.59	2.30	0.00	.08	.01	.25	.51	.10	.02	3.0	2.8	0	12.0	0	32	24.0
9M	6.5	10.7	36	*	2.5	6.3	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	23.4
9B	6.0	10.7	37	*	2.5	6.2	*	*	*	*	*	4.60	0.00	.08	.01	.29	.53	.23	.01	3.2	1.6	0	10.0	0	82	24.0
10S	8.0	10.2	40	0.4	2.5	6.2	*	*	*	*	*	*	3.31	.09	.01	.23	.55	.11	.02	3.5	2.2	0	12.0	0	42	26.0
10M	7.5	10.2	40	*	2.5	6.3	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	26.0
10B	7.5	9.9	39	*	2.5	6.2	*	*	*	2.27	0.75	3.02	0.00	.10	.01	.28	.55	.16	.02	3.5	1.6	0	10.0	0	69	25.3
11S	6.9	11.4	37	0.4	2.0	6.1	0.88	*	*	1.35	1.16	2.51	0.00	.02	.00	.29	.48	.12	.01	3.3	1.3	0	12.0	0	27	24.0
11M	6.8	11.6	36	*	2.0	6.2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	23.4
11B	6.8	11.5	37	*	2.0	6.2	*	*	*	1.79	0.13	1.92	0.00	.03	.01	.30	.46	.12	.01	3.7	1.6	0	10.0	0	22	24.0
12S	7.2	10.8	37	0.4	3.5	6.3	*	*	*	1.80	1.24	3.04	0.00	.09	.01	.22	.46	.13	.03	3.2	2.5	0	12.0	0	54	24.0
12M	7.0	10.7	36	*	3.5	6.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	23.4
12B	6.5	10.3	35	*	3.5	6.2	*	*	*	1.85	*	*	0.00	.11	.01	.18	.57	.14	.02	3.3	1.6	0	18.0	0	54	22.7
13S	*	*	*	*	3.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13M	*	*	*	*	3.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13B	*	*	*	*	3.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14Sa	7.2	11.5	37	0.3	10.0	6.3	*	*	*	*	*	7.49	0.00	.14	.01	.28	.73	.09	.01	3.9	1.9	0	10.0	0	125	24.0
14Sb	7.2	11.4	37	0.3	10.0	6.3	*	*	*	*	*	6.25	0.00	.15	.01	.26	.64	.29	.01	3.7	1.6	0	10.0	0	89	24.0

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data (1)

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S
14Sc	7.2	11.5	37	0.3	10.0	6.3	*	*	*	*	*	5.53	0.00	.16	.01	.25	.66	.29	.02	3.5	1.3	0	12.0	0	95	24.0
14Ma	*	*	*	*	10.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14Mb	*	*	*	*	10.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14Mc	*	*	*	*	10.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14Ba	*	*	*	*	10.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14Bb	*	*	*	*	10.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
14Bc	*	*	*	*	10.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
15a	7.3	10.8	40	0.3	2.5	6.1	*	*	200	1.18	*	*	0.00	.12	.01	.32	.35	.23	.02	3.7	1.3	0	12.0	0	82	26.0
15b	7.3	10.6	42	0.3	2.5	6.1	*	*	*	1.35	1.84	3.19	0.00	.11	.01	.23	.59	.23	.01	3.7	0	0	12.0	0	78	27.3
15c	7.3	10.9	40	0.3	2.5	6.1	*	*	*	1.16	3.14	4.30	2.45	.11	.01	.32	.44	.23	.01	3.7	1.3	0	12.0	0	89	26.0
17	7.0	12.4	42	0.5	2.0	6.3	0.40	110	*	*	*	*	0.00	.04	.01	.27	.28	.03	.01	4.0	0.0	0	16.0	0	29	27.3
21	4.5	12.6	34	a	0.3	6.2	0.3	*	3.5	1.64	0	1.37	3.35	.03	.00	.00	.10	.00	.04	2.7	1.9	0	28.0	0	9	22.1
23	4.5	12.5	37	a	0.3	6.2	0.50	*	3.7	1.12	0	0.98	0.00	.02	.00	.04	.09	.03	.01	2.6	1.9	0	18.0	0	11	24.0

a = greater than depth

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data (1)

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)
1	7.8	10.6	24	0.3	1.0	8.1	1.0		26	1.42	0.09	1.51	0.00	.02	.00	.01	*	.10	.02	2.5	1.8
2	5.5	11.6	30	0.3	1.0	7.65	0.7		34	1.58	0.25	1.83	*	.03	.00	.05	.34	.10	.02	14.5	2.6
3	3.3	12.6	73	0.4	1.5	7.7	1.4		42	1.88	0.35	2.23	0.00	.07	.00	.23	.62	.12	.04	14.2	5.5
4a	6.2	13.3	34	0.3	2.0	7.6	1.0		24	1.32	1.25	2.57	11.24	.04	.00	.24	.41	.12	.04	4.3	2.8
4b	5.5	12.8	34	0.3	2.0	7.6	1.0		28	1.58	0.67	2.25	11.90	.03	.00	.26	.39	.12	.04	4.3	2.6
4c	6.0	13.0	34	0.3	2.0	7.6	1.0		24	1.40	0.44	1.84	0.00	.04	.00	.25	*	.10	.04	4.5	2.6
5	5.5	12.0	48	0.2	0.75	8.4	0.7		414	1.89	*	*	6.37	.21	.00	.46	.71	.16	.06	4.9	4.2
6	4.8	12.0	100	a	0.6	8.4	0.4		6	2.94	0.06	3.00	3.30	.92	.03	.36	.50	.50	.48	10.2	20.0
7	6.3	11.6	33	0.4	2.0	7.3	1.0		36	*	*	1.73	4.07	.05	.00	.22	.41	.12	.01	5.7	2.1
8	6.4	11.0	35	0.4	0.2	7.3	0.8		38	1.18	0.80	1.98	2.87	.03	.00	.24	.46	.11	.04	4.5	2.6
9S	7.0	10.1	31	0.3	2.8	7.2	*	*	*	1.58	0.55	2.13	6.08	.05	.01	.00	.44	.11	.03	6.0	0.0
9M	7.1	9.8	31	*	2.8	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
9B	7.1	8.2	34	*	2.8	7.1	*	*	*	1.82	1.26	3.08	*	.05	.01	.03	.44	.13	.02	4.0	0.0
10S	7.9	9.9	35	0.3	3.25	7.05	*	*	*	2.04	0.28	2.32	6.51	1.38	.01	.21	.51	.14	.03	4.0	0.0
10M	8.1	9.8	37	*	3.25	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10B	7.5	10.2	35	*	3.25	7.0	*	*	*	1.82	0.96	2.78	6.52	.04	.01	.19	.50	.12	.03	3.9	0.0
11S	6.8	11.1	33	0.3	2.3	7.0	0.8		36	1.42	0.44	1.86	3.77	.03	.00	.21	.48	.12	.03	4.0	0.0
11M	7.0	11.0	34	*	2.3	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11B	7.0	10.8	34	*	2.3	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12S	9.0	10.3	34	0.3	5.5	7.2	*	*	*	1.46	0	1.14	5.96	.05	.00	.19	.39	.16	.01	9.7	0.0
12M	8.0	10.3	33	*	5.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Station	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (mg/l)	Zinc (mg/l)	Silica (mg/l)
1	0	8.0	0	37	15.6	2,300	0	0	*	0.14	1.3	.07	3.0	1.2	1.0	*	*	*	*	4.6
2	0	8.0	0	27	19.5	>4,000	0	0	*	0.14	1.8	.05	4.8	1.4	1.4	*	*	*	*	5.0
3	0	18.0	0	17	47.5	>19,000	67	0	*	0.5	2.0	.02	17.9	3.0	1.8	*	*	*	*	6.5
4a	0	8.0	0	40	22.1	7,100	0	0	.10	0.3	2.0	.08	5.4	6.1	1.4	0	0			5.0
4b	0	11.0	0	40	22.1	6,000	0	0	*	0.2	1.7	.08	5.4	8.1	1.4	*	*	*	*	5.0
4c	0	11.0	0	37	22.1	5,400	40	*	*	*	*	*	*	*	*	*	*	*	*	*
5	0	15.0	0	59	31.2	34,000	20	0	*	0.2	2.2	.15	4.1	2.4	2.2	*	*	*	*	4.3
6	0	40.0	0	13	65.0	43,000	0	0	*	0.1	1.6	.01	20.0	4.2	2.0	*	*	*	*	6.2
7	0	11.0	0	69	21.5	4,200	60	0	*	0.3	1.5	.06	5.5	1.4	1.4	*	*	*	*	5.1
8	0	15.0	0	62	22.8	3,700	20	0	*	0.2	1.5	.06	5.6	3.5	1.4	*	*	*	*	4.7
9S	0	13.0	0	125	20.2	3,900	0	0	*	0.2	1.5	.07	3.8	2.1	1.3	*	*	*	*	4.8
9M	*	*	*	*	20.2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
9B	0	11.0	0	110	22.1	6,000	460	0	*	0.2	1.7	1.05	3.9	1.5	1.3	*	*	*	*	4.8
10S	0	14.0	0	89	22.8	2,600	100	0	*	0.1	1.7	.11	4.9	2.4	1.7	*	*	*	*	4.9
10M	*	*	*	*	24.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10B	0	13.0	0	133	22.8	5,300	80	0	*	0.5	1.7	.16	4.6	1.4	1.4	*	*	*	*	5.1
11S	0	11.0	0	59	21.5	3,100	60	*	*	*	*	*	*	*	*	*	*	*	*	*
11M	*	*	*	*	22.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11B	*	*	*	*	22.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12S	0	12.0	0	103	22.1	2,000	40	*	.10	*	*	*	*	*	*	0	0			*
12M	*	*	*	*	21.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

a = greater than depth

Amendment 1
(New)

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data (1)

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)
12B	7.8	8.2	36	*	5.5	6.9	*	*	*	1.52	0.51	2.03	3.92	.05	.01	.18	.59	.21	.02	4.0	1.3
13S	7.4	9.7	34	0.3	2.0	7.1	*	*	*	1.40	0.72	2.12	7.25	.08	.01	.19	.53	.21	.03	3.9	0.0
13M	7.4	9.3	34	*	2.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13B	7.2	8.4	37	*	2.0	7.05	*	*	*	1.67	2.48	4.15	5.25	.06	.01	.22	.47	.22	.03	3.7	1.5
14Sa	6.8	10.8	34	0.3	4.5	6.90	*	*	*	1.16	0.87	2.03	2.90	.05	.00	.21	.45	.17	.03	3.9	57.0
14Sb	6.8	10.7	34	*	4.5	6.90	*	*	*	1.37	0.33	1.70	*	.03	.01	.04	.29	.17	.03	3.9	0.0
14Sc	6.8	10.6	34	*	4.5	6.90	*	*	*	*	*	2.74	1.87	.03	.00	.17	.25	.15	.03	4.3	1.3
14Ma	7.0	10.6	35	*	4.5	6.95	*	*	*	1.28	2.78	4.06	*	.03	.00	.17	.30	.17	.02	4.0	1.5
14Mb	7.0	10.58	35	*	4.5	6.90	*	*	*	1.37	0.66	2.03	7.67	.04	.00	.19	.35	.12	.02	4.0	3.1
14Mc	7.0	10.59	34	*	4.5	6.90	*	*	*	1.54	0.43	1.97	7.83	.05	.00	.00	.09	.12	.03	4.3	0.0
14Ba	7.0	10.4	35	*	4.5	6.95	*	*	*	*	*	3.94	*	.04	.01	.21	.41	.09	.03	3.9	1.8
14Bb	7.0	10.4	35	*	4.5	6.95	*	*	*	1.28	0.73	2.01	*	.03	.00	.09	.25	.15	.03	5.2	1.6
14Bc	7.0	10.41	35	*	4.5	6.90	*	*	*	1.46	*	*	3.20	.04	.01	.21	.29	.09	.03	3.9	0.0
15a	8.5	12.0	38	0.3	1.5	7.60	0.75		30	1.10	1.69	2.79	1.90	.04	.00	.15	.19	.15	.03	4.0	0.0
15b	9.8	11.9	35	0.3	1.5	7.65	0.75		1,112	1.65	1.11	2.76	2.19	.07	.00	.04	.30	.10	.03	3.9	0.0
15c	8.3	12.0	35	0.3	1.5	7.60	0.75		370	1.88	*	0.54	1.03	.04	.00	.20	.40	.14	.03	3.7	0.0
16	7.2	12.5	85	a	0.25	7.5	0.5		248	*	*	1.50	1.03	.04	.00	.06	.30	.00	.02	7.6	9.4
17	7.5	11.8	35	0.4	2.0	6.95	0.6		1,284	1.67	1.11	2.78	1.86	.89	.00	.21	.31	.00	.03	3.6	29.8
18	8.0	11.4	35	0.3	0.7	6.9	0.8		464	1.73	0.54	2.27	1.00	.08	.01	.13	.41	.15	.04	3.2	0.0
19	7.2	10.7	36	0.4	6.0	6.9	1.0		816	1.49	*	*	4.06	.03	.00	.20	.39	.12	.03	3.3	0.0
20	8.5	10.8	37	0.3	0.5	6.9	1.0		1,224	1.46	*	*	*	.20	.01	.21	.46	.09	.03	3.3	0.0

Station	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (mg/l)	Zinc (mg/l)	Silica (mg/l)
12B	0	14.0	0	156	23.4	3,500	0	0	*	0.5	1.9	.13	3.9	3.3	1.3	*	*	*	*	4.7
13S	0	10.0	0	78	22.1	2,700	140	0	*	0.4	1.6	.11	3.8	5.3	1.3	*	*	*	*	4.8
13M	*	*	*	*	22.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13B	0	13.0	0	114	24.1	3,000	100	0	*	0.1	1.8	.18	3.7	2.6	1.5	*	*	*	*	4.8
14Sa	0	11.0	0	69	22.1	4,200	40	0	.02	0.2	1.5	.05	4.8	2.0	1.5	0	0			4.6
14Sb	0	10.0	0	62	22.1	4,400	0	0	*	0.2	1.5	.07	4.2	1.4	1.3	*	*	*	*	4.8
14Sc	0	8.0	0	51	22.1	3,100	20	0	*	0.2	1.4	.06	4.1	2.4	1.3	*	*	*	*	5.1
14Ma	0	10.0	0	62	22.8	2,600	0	0	*	0.3	1.6	.07	4.0	2.9	1.3	*	*	*	*	4.8
14Mb	0	10.0	0	59	22.8	3,700	20	0	*	0.3	1.7	.07	4.0	1.5	1.3	*	*	*	*	5.3
14Mc	0	10.0	0	62	22.1	2,100	40	*	*	*	*	*	*	*	*	*	*	*	*	*
14Ba	0	10.0	0	59	22.8	3,100	0	0	.12	0.4	1.8	.08	4.1	1.3	1.3	0	0			5.0
14Bb	0	8.0	0	69	22.8	3,100	0	0	*	0.1	1.7	.06	4.2	2.9	1.3	*	*	*	*	5.0
14Bc	0	6.0	0	56	22.8	3,900	60	0	*	0.4	1.7	.30	4.1	1.3	1.4	*	*	*	*	5.2
15a	0	6.0	0	56	24.7	3,400	0	*	*	*	*	*	*	*	*	*	*	*	*	*
15b	0	6.0	0	51	22.8	2,800	0	0	.01	0.1	1.6	.06	4.1	1.8	1.3	0	0			4.9
15c	0	6.0	0	65	22.8	4,100	0	0	*	0.1	1.5	.05	4.0	1.2	1.3	*	*	*	*	4.9
16	0	30.0	0	11	55.3	100	0	0	*	0.0	10.0	.00	7.9	4.0	1.1	*	*	*	*	6.1
17	0	8.0	0	40	22.8	2,300	0	0	*	0.1	1.6	.07	4.3	1.4	1.3	*	*	*	*	4.8
18	0	12.0	0	34	22.8	b	b	0	*	0.1	1.5	.08	3.8	2.5	1.4	*	*	*	*	5.4
19	0	12.0	0	45	23.4	b	60	0	*	0.4	1.7	.04	3.9	1.6	1.3	*	*	*	*	5.1
20	0	12.0	0	51	24.1	33,000	0	0	*	0.4	1.9	.07	3.8	1.5	1.3	*	*	*	*	5.3

a = greater than depth   b = too numerous to count

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data (1)

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)
21	5.4	11.4	50	a	0.1	7.8	0.1		860	2.11	*	1.41	*	.16	.00	.00	.43	.00	.05	3.3
22	8.5	10.8	40	0.3	1.5	6.9	1.2		916	1.65	*	*	*	.16	.01	.00	.37	.12	.04	3.7
23	11.8	7.0	42	a	0.2	7.8	0.25		18	1.50	1.82	3.32	0.00	.08	.00	.01	.46	.00	.04	3.2

Station	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (mg/l)	Zinc (mg/l)	Silica (mg/l)
21	1.3	0	26.0	0	5	32.5	600	20	0	*	0.1	2.0	.07	8.0	1.4	1.0	*	*	*	*	11.5
22	0.0	0	14.0	0	51	26.0	b	0	0	*	0.2	1.9	.04	4.7	1.5	1.4	*	*	*	*	4.9
23	0.0	0	20.0	0	7	27.3	600	0	0	*	0.3	1.7	.04	4.8	1.5	0.8	*	*	*	*	8.4

a= greater than depth

b= too numerous to count

Amendment 1
(New)

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data

March 13, 1974

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (mg/l)	Zinc (mg/l)
1	12.0	10.2	30	0.3	2.0	7.2	1.0		14.9	1.928	0	1.875	1.8	.05	.00	.14	.38	.06	.02	3.2	0.00	[illegible]	8	0	18	19.5														
4a	11.0	9.8	42	0.3	2.0	6.8	0.8			2.357	*	*	1.1	.05	.00	.23	.40	.09	.04	6.0	1.30	0	10	0	18	27.3														
4b	11.0	9.6	44	0.3	2.0	6.9	0.8		15.7	2.154	1.81	3.964	0.9	.02	.00	.24	.36	.16	.04	6.0	1.30	0	12	0	22	28.6														
4c	11.0	9.8	43	0.3	2.0	6.8	0.8		16.6	*	*	1.757	1.3	.66	.00	.23	.47	.12	.04	5.2	0.00	0	10	0	22	28.0														
8	13.5	10.4	25	0.4	2.0	7.2	1.2		34.0	2.036	*	*	3.5	.02	.00	.22	.20	.12	.01	4.7	0.00	[illegible]	12	0	29	16.3														
9S	14.0	10.2	44	0.5	2.0	6.9	0	*	*	2.132	*	*	4.9	.05	.00	.21	.44	.07	.02	4.3	0.00	0	12	0	27	28.6														
9M	14.0	9.8	44	*	2.0	6.9	0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	28.6														
9B	13.5	9.8	45	*	2.0	6.8	0	*	*	2.389	0	2.057	5.0	.11	.00	.21	.57	.17	.03	4.5	0.00	0	14	0	39	29.3														
10S	14.5	9.8	47	0.5	4.0	6.9	0	*	*	2.089	0	1.736	3.8	.05	.00	.22	.44	.13	.02	4.3	1.30	0	15	0	20	30.6														
10M	14.0	9.6	45	*	4.0	6.8	0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	29.3														
10B	13.5	9.6	45	*	4.0	6.5	0	*	*	1.854	2.442	4.296	2.7	.21	.00	.22	.55	.17	.02	3.9	1.30	0	12	0	62	29.3														
11S	13.0	10.5	42	0.4	2.5	7.2	0.8		*	1.682	0.247	1.929	1.8	.02	.00	.22	.41	.15	.03	4.0	0.00	0	10	0	22	27.3														
11M	13.0	10.3	40	*	2.5	7.1	0.8		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	26.0														
11B	13.0	10.1	36	*	2.5	7.1	0.8		*	1.607	0.322	1.929	0.4	.07	.00	.23	.49	.15	.03	4.0	1.30	0	11	0	20	23.4														
12S	14.5	10.2	46	0.7	5.0	7.6	0	*	*	3.428	*	2.389	5.5	.08	.00	.21	.42	.14	.02	4.5	0.00	0	13	0	22	29.9														
12M	14.0	9.2	100	*	5.0	7.2	0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	65.0														
12B	13.5	8.0	145	*	5.0	6.7	0	*	*	5.678	*	2.089	*	.13	.00	.18	.59	.14	.02	4.0	1.60	0	12	0	32	94.3														
13S	14.5	9.8	45	0.6	1.5	7.3	0	*	*	3.911	*	1.350	4.4	.03	.00	.22	.53	.14	.03	4.7	1.60	0	12	0	20	29.3														

a = greater than depth   b = too numerous to count

Amendment 2
(new)

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data

March 13, 1974

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S
13M	14.0	9.6	55	*	1.5	7.3	0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	35.8
13B	14.0	9.6	84	*	1.5	7.3	0	*	*	1.618	0.182	1.800	6.6	.05	.00	.22	.47	.14	.03	4.7	0.00	0	12	0	22	54.6
14Sa	13.0	10.4	41	0.6	7.0	7.2	0.5	*	*	1.296	1.811	3.107	1.9	.05	.00	.24	.40	.16	.03	4.0	1.60	0	10	0	22	26.7
14Sb	13.0	10.3	43	0.6	7.0	7.2	0.5	*	*	1.661	0.675	2.336	2.0	.07	.00	.25	*	.13	.03	4.3	1.30	0	12	0	20	28.0
14Sc	13.0	10.4	43	0.6	7.0	7.2	0.5	*	*	1.607	0.107	1.714	2.0	.03	.00	.26	.51	.17	.02	4.3	1.60	0	11	0	22	28.0
14Ma	13.0	10.2	42	*	7.0	7.2	0.5	*	*	1.821	0.043	1.864	2.0	.06	.00	.20	.43	.15	.03	4.7	1.30	0	10	0	22	27.3
14Mb	13.0	10.2	43	*	7.0	7.2	0.5	*	*	1.779	0.15	1.929	2.0	.02	.00	.26	.52	.14	.03	4.3	1.60	0	10	0	20	28.0
14Mc	13.0	10.3	44	*	7.0	7.2	0.5	*	*	1.950	0	1.553	1.8	.02	.00	.25	.44	.17	.03	4.3	1.60	0	11	0	20	28.6
14Ba	13.0	10.0	43	*	7.0	7.2	0.5	*	*	1.586	0.428	2.014	2.1	.01	.00	.27	*	.14	.03	4.0	0.00	0	10	0	22	28.0
14Bb	13.0	9.9	45	*	7.0	7.2	0.5	*	*	2.014	*	*	1.5	.01	.00	.25	.53	.14	.03	4.5	1.90	0	12	0	15	29.3
14Bc	13.0	10.2	45	*	7.0	7.2	0.5	*	*	1.618	1.071	2.689	2.1	.01	.00	.27	.52	.15	.03	4.7	1.30	0	10	0	20	29.3
15a	11.0	9.8	42	0.5	2.0	7.2	1.0		19.5	2.389	0	1.929	2.2	.01	.00	.27	*	.15	.03	4.9	1.30	0	10	0	18	27.3
15b	11.0	9.6	44	0.5	2.0	7.1	1.0		13.7	2.143	*	1.521	1.7	.01	.00	.25	.58	.16	.04	4.3	0.00	0	10	0	18	28.6
15c	11.0	9.6	62	0.5	2.0	7.2	1.0		46.5	2.571	*	1.618	2.0	.06	.00	.25	.48	.17	.03	4.0	1.60	0	10	0	20	40.3
17	14.5	10.4	36	0.4	2.5	7.3	0.6		25.0	2.507	*	1.264	2.1	0.7	.00	.63	.56	.13	.04	4.5	1.60	0	12	0	22	23.4
21	9.5	11.0	50	a	0.3	7.2	0.33		5.2	1.393	0.632	2.025	0.2	.01	.00	.00	*	.14	.08	3.6	0.00	0	27	0	3	32.5
23	8.5	10.4	32	a	0.3	6.9	0.4		4.0	1.393	0	1.232	0.2	.01	.00	.04	.12	.09	.04	2.9	1.60	0	23	0	7	20.8

a = greater than depth   b = too numerous to count

Station	(MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (mg/l)	Zinc (mg/l)
13M														
13B														
14Sa														
14Sb														
14Sc														
14Ma														
14Mb														
14Mc														
14Ba														
14Bb														
14Bc														
15a														
15b														
15c														
17														
21														
23														

Amendment 2
(New)

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (mg/l)	Zinc (mg/l)	Silica (mg/l)
1	12.0	10.8	*	0.3	2.0	7.4	0.8		*	1.961	0	1.639	0.9	.06	0.0	.15	.30	.05	.01	2.9	3.8	0	8	0	13	*	900	45	0	*	.2	1.1	0	3.0	2.4	1.1	*	*	*	*	6.1
2	11.0	9.4	*	0.3	1.5	6.0	1.2		19.5	2.036	0	1.671	0.6	.10	0.0	.24	.37	.05	.02	3.7	2.5	0	6	0	15	*	2000	130	0	*	.3	1.4	.06	4.2	1.2	1.5	*	*	*	*	5.4
3	10.0	10.8	*	0.2	2.0	6.0	0.5		41.3	*	*	3.107	1.7	.11	0.0	.23	.44	.11	.06	15.0	8.1	0	21	0	17	*	97000	1860	0	*	.3	1.9	0	20.0	1.6	2.3	*	*	*	*	6.7
4a	11.0	10.6	*	0.3	2.0	6.1	0.6		16.4	2.775	1.361	4.136	0.9	.07	0.0	.29	.66	.09	.04	4.7	2.1	0	3	0	20	*	8100	160	0	.02	.1	1.5	0	5.3	1.2	1.5	0	0			5.5
4b	11.0	10.8	*	0.3	2.0	7.3	0.6		*	2.218	0	2.079	0.6	.04	0.0	.25	.47	.09	.04	4.3	1.8	0	6	0	17	*	7100	120	0	*	.2	1.6	0	5.4	2.6	1.6	*	*	*	*	5.4
4c	11.0	10.5	*	0.3	2.0	6.1	0.6		18.1	2.293	0	1.875	1.1	.07	0.0	.28	.56	.09	.04	3.6	2.1	0	14	0	15	*	6200	215	0	*	.3	1.5	.02	5.3	3.0	1.4	*	*	*	*	5.6
5	10.5	9.4	*	0.3	0.5	7.6	0.3		*	*	*	3.193	3.8	.04	0.0	.38	.82	.24	.09	4.9	1.8	0	12	0	17	*	72000	335	0	*	.1	2.3	.02	4.4	2.3	2.2	*	*	*	*	5.3
6	11.0	8.8	*	a	0.8	7.0	0.2		*	4.489	0.118	4.607	0.5	.14	.06	.83	1.54	.85	.81	9.2	45.2	0	37	0	20	*	47000	415	0	*	1.2	9.1	.03	21.0	3.3	2.6	*	*	*	*	6.2
7	11.0	9.9	42	0.9	1.0	6.5	0.8		77.0	*	*	1.789	0.9	.05	0.0	.30	.56	.34	.05	5.2	2.1	0	13	0	13	27.3	11700	195	0	*	.1	1.4	.02	5.5	1.2	1.4	*	*	*	*	5.8
8	11.0	10.4	47	0.9	1.5	7.0	0.7		20.7	2.336	4.435	6.771	1.1	.04	0.0	.23	.49	.10	.02	3.0	13.5	0	3	0	13	30.6	5100	115	0	*	.2	1.4	.02	7.3	1.4	1.4	*	*	*	*	5.6
9S	11.0	10.1	40	0.8	2.0	6.5	*	*	*	2.271	0	1.843	0.8	.07	0.0	.23	.43	.29	.02	5.4	2.8	0	15	0	17	26.0	2700	140	0	*	.4	1.4	.02	4.7	1.2	1.5	*	*	*	*	5.8
9M	10.5	9.7	40	*	2.0		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
9B	10.4	9.2	40	*	2.0	6.7	*	*	*	2.036	0	1.554	1.0	.07	0.0	.22	.47	.05	.02	4.9	1.8	0	12	0	20	26.0	2900	210	0	*	.4	1.4	.02	4.6	1.1	1.4	*	*	*	*	5.5
10S	11.5	8.8	41	0.8	4.0	7.0	*	*	*	2.164	0	1.757	2.4	.07	0.0	.15	.58	.03	.01	4.7	2.5	0	14	0	24	26.7	1300	115	0	*	0	1.4	.43	5.1	1.1	1.3	*	*	*	*	6.2
10M	10.7	7.95	40	*	4.0		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10B	10.4	7.7	39	*	4.0	6.8	*	*	*	1.789	0.461	2.250	1.1	.07	0.0	.24	.61	.09	.02	4.7	1.8	0	14	0	37	25.4	2300	145	0	*	.3	1.4	.06	5.1	1.6	1.6	*	*	*	*	5.9
11S	11.0	10.2	40	0.8	1.5	6.5	0.6		*	2.218	0	1.806	1.5	.05	0.0	.21	.54	.09	.02	4.0	6.5	0	14	0	24	26.0	4800	55	0	*	.3	1.4	.06	4.9	1.1	1.4	*	*	*	*	5.5
11M	11.0	9.9	40	*	1.5		*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
11B	11.0	9.8	41	*	1.5		*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	26.7	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12S	11.8	10.3	37	0.7	6.0	6.3	*	*	*	*	*	1.350	2.1	.07	0.0	.15	.73	.00	.02	4.9	1.8	0	12	0	24	24.1	700	85	0	.02	.3	1.4	.09	4.5	1.3	1.3	0	0			6.0
12M	10.5	9.6	40	*	6.0		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	26.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

a = greater than depth
b = too numerous to count

Amendment 2
(New)

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (mg/l)	Zinc (mg/l)	Silica (mg/l)
12B	10.1	9.1	40	*	6.0	6.8	*	*	*	*	*	2.700	0.6	0.6	0.0	.17	.88	.23	.01	4.7	0	0	4	0	122	26.0	1600	195	0	*	.3	1.4	.05	4.8	1.1	1.4	*	*	*	*	5.8
13S	11.5	10.4	40	0.7	1.8	6.1	*	*	*	3.214	*	*	3.5	.10	0.0	.24	1.09	.08	.02	4.7	0	0	10	0	24	26.0	1700	130	0	*	.4	1.6	.05	5.7	1.9	1.6	*	*	*	*	5.8
13M	11.5	10.3	40	*	1.8		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	26.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13B	11.5	10.3	40	*	1.8	5.3	*	*	*	2.711	0.128	2.839	1.0	.05	0.0	.26	.71	.13	.02	4.5	0	0	13	0	47	26.0	2000	140	0	*	.5	1.4	.03	4.8	1.2	1.4	*	*	*	*	5.7
14Sa	11.0	10.6	44	0.9	8.5	6.8	0.6	*	*	2.475	*	1.639	1.1	.03	0.0	.23	.56	.08	.03	4.9	2.5	0	11	0	24	28.6	4600	90	0	.02	.4	1.4	.02	5.3	1.1	1.3	0	0			5.5
14Sb	11.0	10.5	44	*	8.5	6.6	*	*	*	2.421	*	1.725	0.9	.04	0.0	.23	.53	.20	.03	5.2	3.5	0	12	0	13	28.6	3700	105	0	*	.3	1.4	.02	5.1	2.6	1.4	*	*	*	*	5.8
14Sc	11.0	10.6	44	*	8.5	6.6	*	*	*	*	*	2.604	1.5	.04	0.0	.26	.62	.08	.03	5.2	1.8	0	10	0	22	28.6	4400	95	0	*	.2	1.4	.02	5.1	1.2	1.4	*	*	*	*	5.6
14Ma	11.0	10.3	44	*	8.5	5.9	*	*	*	2.775	*	1.789	1.1	.06	.01	.24	.55	.10	.03	5.2	1.8	0	10	0	22	28.6	5800	105	0	*	.2	1.4	.02	5.2	2.0	1.5	*	*	*	*	5.7
14Mb	11.0	10.2	43	*	8.5	6.6	*	*	*	2.025	0	1.586	1.1	.04	0.0	.27	.52	.13	.03	5.2	0	0	9	0	20	28.0	5000	105	0	*	.2	1.4	.02	5.2	1.1	1.3	*	*	*	*	5.7
14Mc	11.0	10.2	44	*	8.5	6.8	*	*	*	1.543	0	1.286	0.9	.04	0.0	.26	.47	.10	.04	5.4	2.5	0	9	0	20	28.6	4200	100	0	*	.2	1.4	.02	5.1	1.3	1.4	*	*	*	*	5.6
14Ba	11.0	9.6	42	*	8.5	6.3	*	*	*	*	*	1.661	0.8	.06	.01	.26	.51	.10	.03	5.2	2.5	0	11	0	17	27.3	3900	125	0	.01	.1	1.3	.02	5.0	1.2	1.3	0	0			5.8
14Bb	11.0	9.7	42	*	8.5	5.9	*	*	*	1.746	*	*	0.9	.03	0.0	.23	.41	.10	.03	5.4	1.8	0	12	0	24	27.3	3900	110	0	*	.1	1.4	.01	5.1	1.4	1.3	*	*	*	*	6.0
14Bc	11.0	9.65	43	*	8.5	5.5	*	*	*	2.196	*	1.554	1.4	.03	0.0	.28	.45	.25	.03	2.9	1.8	0	12	0	20	28.0	4100	135	0	*	.4	1.4	.04	5.2	1.2	1.4	*	*	*	*	5.8
15a	11.0	10.2	*	0.3	2.0	7.1	1.0		18.6	1.800	0	1.661	1.3	.04	0.0	.30	.68	.35	.03	8.0	1.8	0	12	0	17	*	5600	90	0	0	.4	1.4	.04	5.5	1.2	1.6	0	0			6.0
15b	11.0	10.4	*	0.3	2.0	7.2	1.0		15.8	1.886	5.828	7.714	1.2	.05	0.0	.23	.72	.10	.03	6.6	2.8	0	10	0	15	*	5600	120	0	*	.4	1.4	.03	5.4	1.2	1.4	*	*	*	*	6.3
15c	11.0	10.0	*	0.3	2.0	7.1	1.0		25.2	2.100	*	1.329	1.1	.04	0.0	.24	.51	.05	.03	6.0	1.8	0	12	0	17	*	6800	140	0	*	.3	1.4	.03	5.3	1.4	1.4	*	*	*	*	5.8
16	12.0	9.6	*	a	0.5	7.4	0.6		5.2	1.961	*	1.243	1.9	.02	0.0	.02	.31	.01	.01	15.0	16.9	0	30	0	5	*	500	25	0	*	0	10.4	.02	10.0	3.0	1.8	*	*	*	*	5.6
17	11.4	9.1	44	0.9	1.0	6.6	0.8		33.3	2.325	*	1.693	*	.01	0.0	.24	.48	.06	.03	8.0	2.1	0	10	0	22	28.6	8000	65	0	*	.3	1.6	.02	5.4	1.4	1.4	*	*	*	*	5.7
18	12.0	9.1	40	0.8	0.3	6.5	1.0		32.9	3.011	*	2.143	1.7	.04	0.0	.37	.44	.06	.04	8.4	1.8	0	12	0	24	26.0	*	360	0	*	.3	1.5	0	4.2	1.3	1.4	*	*	*	*	5.7
19	12.0	9.6	[illegible]	1.6	5.0	6.7	0.8		33.9	3.343	*	1.457	0.9	.00	0.0	.28	.51	.09	.03	10.4	2.1	0	16	0	20	26.0	86000	45	0	*	.1	1.9	.03	5.0	1.6	1.5	*	*	*	*	7.0
20	11.5	9.6	45	1.6	1.5	6.4	1.0		29.6	2.036	*	*	0.9	.00	.01	.25	.50	.10	.02	6.2	2.1	0	12	0	22	29.9	25000	90	0	*	.2	1.8	.03	4.7	1.4	1.4	*	*	*	*	6.4

a = greater than depth   b = too numerous to count

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data

March 27, 1974

[illegible]	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)
13.0	9.6	*	a	0.2	6.8	0.1		11.2	1.296	*	*	*	.00	0.0	.00	.15	*	.06	4.3	2.8
31.5	9.2	60	0.5	1.0	6.5	1.0		13.2	*	*	1.618	0.4	.00	0.0	.33	.54	.12	.02	6.0	2.8
12.0	9.6	*	a	0.3	6.7	0.2		3.9	3.161	*	*	*	.12	0.0	.01	.32	.90	.04	3.7	1.8

[illegible]	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (mg/l)	Zinc (mg/l)	Silica (mg/l)
13.0	0	25	0	7	*	1700	35	0	*	.2	1.9	.01	7.5	1.0	.9	*	*	*	*	13.4
31.5	0	15	0	15	39.0	2200	15	*	*	*	*	*	*	*	*	*	*	*	*	*
12.0	0	19	0	5	*	2500	400	0	*	.1	1.8	.01	5.1	1.5	.9	*	*	*	*	10.5

reater than depth b = too numerous to count

Amendment 2
(New)

	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (mg/l)	Zinc (mg/l)
1	10.0	10.3	80	0.2	1.0	6.9	0.5		12.9	1.47	0	1.45	1.5	.05	.00	.13	.18	.09	.00	3.7	2.5	0	8	0	29	52.0														
4a	14.1	10.2	45	0.2	0.75	7.1	1.0		52.3	*	*	*	0.9	.07	.01	.09	.40	.19	.03	4.9	0	0	12	0	34	29.3														
4b	14.5	9.8	45	0.2	0.75	6.9	1.0		47.1	1.72	0.96	2.68	1.3	.05	.01	.04	.42	.17	.03	5.2	3.5	0	9	0	48	29.3														
4c	14.5	10.2	42	0.2	0.75	7.0	1.0		40.5	1.81	*	*	1.2	.13	.01	.09	.56	.17	.03	7.6	0	0	11	0	56	27.3														
8	12.5	10.2	28	0.2	1.0	8.1	1.0		77.6	1.85	0.23	2.08	1.5	.04	.01	.20	.52	.16	.03	4.7	2.8	0	12	0	51	18.2														
9S	12.8	9.2	44	0.3	2.5	8.1	*	*	*	2.01	0.25	2.26	1.1	.09	.01	.24	.61	.13	.02	8.0	0	0	12	0	69	28.6														
[illegible]	12.5	9.0	44	*	2.5	8.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	28.6														
[illegible]B	13.5	8.9	45	*	2.5	8.1	*	*	*	2.12	0.09	2.21	1.7	.05	.01	.23	.51	.15	.02	4.7	2.8	0	12	0	72	29.3														
[illegible]S	13.0	7.2	39	0.2	4.5	7.8	*	*	*	1.94	0.85	2.79	1.1	.13	.02	.24	.28	.26	.05	3.9	2.1	0	8	0	142	25.4														
[illegible]M	13.0	7.5	39	*	4.5	7.8	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	25.4														
[illegible]	12.5	7.8	39	*	4.5	7.8	*	*	*	*	*	3.96	0.9	.12	.02	.20	.52	.32	.03	4.5	0	0	13	0	145	25.4														
[illegible]	12.5	10.8	40	0.3	2.5	8.1	0.8			3.91	*	*	0.9	.05	.01	.23	.53	.16	.02	4.9	3.8	0	13	0	54	26.0														
[illegible]	12.0	10.6	37	*	2.5	8.0	0.8	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	24.1														
	12.0	10.6	35	*	2.5	7.9	0.8			1.67	*	*	1.4	.07	.01	.19	.19	.16	.02	4.7	1.8	0	12	0	56	22.8														
	14.0	8.5	40	0.2	5.0	7.6	*	*	*	2.00	1.54	3.54	1.1	.12	.01	.06	.25	.17	.03	4.3	2.5	0	10	0	82	26.0														
	13.0	8.4	32	*	5.0	7.6	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	20.8														
	13.0	8.2	33	*	5.0	7.7	*	*	*	2.31	1.65	3.96	1.6	.21	.02	.05	.25	.21	.04	3.6	0	0	12	0	129	21.5														
	13.5	8.7	38	0.2	2.0	7.6	*	*	*	1.26	1.23	2.54	1.5	.12	.01	.11	.50	.16	.03	4.0	0	0	11	0	75	24.7														
	13.0	8.6	38	*	2.0	7.6	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	24.7														
	12.5	8.4	37	*	2.0	7.6	*	*	*	1.93	1.11	3.04	1.1	.09	.01	.20	.49	.25	.03	4.3	4.5	0	12	0	149	24.1														
	13.0	8.5	40	0.3	5.0	7.6	0.5	*	*	1.53	0.74	2.27	2.6	.10	.01	.23	.56	.18	.03	4.3	2.8	0	12	0	48	26.0														

greather than depth   b = too numerous to count

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T.D.S.	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (mg/l)	Zinc (mg/l)
14Sb	13.0	8.5	41	0.3	5.0	7.7	0.5	*	*	1.27	1.34	2.61	1.3	.09	.01	.21	.55	.15	.03	4.5	4.5	0	13	0	42	27.7														
14Sc	13.0	8.6	41	0.3	5.0	7.7	0.5	*	*	1.10	1.59	2.69	2.1	.05	.01	.28	.69	.16	.03	4.5	2.5	0	14	0	56	26.7														
14Ma	12.5	8.6	41	*	5.0	7.7	0.5	*	*	1.40	*	*	*	.05	.01	.24	.44	.16	.03	4.3	4.5	0	13	0	51	26.7														
14Mb	12.5	8.6	40	*	5.0	7.8	0.5	*	*	1.55	1.14	2.69	1.3	.05	.01	.26	.25	.19	.02	4.7	4.2	0	13	0	42	26.0														
14Mc	12.5	8.6	40	*	5.0	7.7	0.5	*	*	*	*	2.22	0.9	.07	.01	.21	.51	.16	.03	5.4	2.5	0	14	0	42	26.0														
14Ba	12.5	8.7	41	*	5.0	7.8	0.5	*	*	2.68	*	1.84	1.0	.04	.01	.06	.29	.18	.03	4.7	0	0	13	0	45	26.7														
14Bb	12.5	8.7	42	*	5.0	7.9	0.5	*	*	1.89	0.78	2.67	1.2	.06	.01	.07	.26	.19	.03	4.7	3.2	0	12	0	59	27.3														
14Bc	12.5	8.6	41	*	5.0	7.8	0.5	*	*	1.77	0.38	2.15	1.7	.06	.01	.15	.27	.19	.03	4.7	3.8	0	13	0	56	26.7														
15a	14.0	8.7	42	0.3	2.0	7.5	0.9		82.8	1.69	0.92	2.61	1.3	.08	.01	.24	.41	.21	.02	4.7	0	0	12	0	62	27.3														
15b	14.0	8.7	42	0.3	2.0	7.4	0.9		89.7	2.12	0.47	2.59	1.4	.09	.01	.23	.43	.21	.02	4.5	0	0	12	0	66	27.3														
15c	14.0	8.8	42	0.3	2.0	7.4	0.9			1.62	1.14	2.76	1.3	.11	.01	.23	*	.19	.02	4.5	0	0	11	0	69	27.3														
17	12.0	9.2	48	0.2	1.0	7.1	0.75			1.74	0.79	2.63	1.3	.07	.01	.26	.50	.17	.02	4.7	2.1	0	13	0	37	31.2														
21	13.0	10.1	60	a	0.1	7.2	0.1		4.3	*	*	2.63	0.9	.03	.00	.01	.13	.22	.05	4.0	2.1	0	23	0	15	33.0														
23	12.0	9.5	46	a	0.1	7.2	0.1		8.9	*	*	*	0.6	.08	.00	.02	.20	.14	.03	3.6	1.8	0	22	0	11	29.9														

a = greater than depth b = too numerous to count

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (mg/l)	Zinc (mg/l)
1	17.5	7.8	50	0.5	1.0	7.5	0.8		51.0	1.45	*	*	13.7	.03	.00	.10	.36	.33	.00	6.2	3.2	0	*	0	25	32.5	1273	700												
2	14.0	8.4	48	0.3	1.0	7.6	0.8		53.0	1.23	*	*	10.7	.08	.00	.06	.60	.45	.02	12.5	2.8	0	14	0	56	31.2	5300	370												
3	14.0	10.2	48	0.4	0.5	7.6	0.5		38.7	1.36	1.65	3.01	16.3	.08	.01	.07	.73	.16	.05	15.0	4.5	0	16	0	39	31.2	4700	150												
4a	16.5	8.4	50	0.2	1.0	7.4	0.8		54.9	1.44	1.20	2.64	10.7	.08	.00	.12	.31	.14	.03	13.7	0	0	14	0	32	32.5	8700	330												
4b	16.5	8.4	50	0.2	1.0	7.5	0.8		113.2	1.39	1.68	3.07	16.9	.03	.00	.11	.49	.41	.03	15.0	0	0	10	0	39	32.5	6500	340												
4c	17.0	8.6	50	0.2	1.0	7.4	0.8		62.5	1.06	1.47	2.53	19.3	.04	.01	.25	.26	.31	.03	13.0	0	0	12	0	42	32.5	8400	330												
5	14.0	8.5	50	0.2	0.3	7.8	0.4		24.9	1.64	1.25	2.89	51.8	.07	.01	.14	.39	.31	.09	15.0	5.8	0	20	0	29	32.5	9900	450												
6	15.0	9.2	50	0.3	0.3	7.8	0.2		31.8	5.30	1.00	6.30	24.1	.09	.01	.40	.77	1.16	1.04	15.0	8.8	0	40	0	22	32.5	97000	1600												
7	16.8	10.0	50	0.6	1.5	7.4	0.8		79.2	1.22	2.98	4.20	24.1	.12	.00	.54	.43	.21	.03	11.2	93.0	0	12	0	37	32.5	11400	250												
8	16.8	10.1	50	0.6	1.8	7.1	1.1		83.3	1.40	*	*	29.1	.06	.01	.23	.53	.14	.01	7.6	2.8	0	12	0	45	32.5	8100	340												
9S	17.0	9.4	46	0.7	2.0	7.3	*	*	*	1.32	0.47	1.79	22.8	.05	.01	.16	.33	.14	.01	4.9	2.1	0	12	0	29	29.9	1727	50												
9M	17.2	8.8	50	*	2.0	7.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	32.5	*	*												
9B	16.8	7.45	50	*	2.0	6.85	*	*	*	1.39	0.31	1.70	18.7	.03	.01	.06	.57	.11	.01	4.5	2.1	0	12	0	29	32.5	1626	60												
10S	17.5	9.9	50	0.7	4.2	7.7	*	*	*	1.29	0.64	1.93	42.8	.05	.00	.12	.43	.11	.01	4.9	3.8	0	10	0	29	32.5	1545	*												
10M	17.0	8.6	51	*	4.2	7.3	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	33.2	*	*												
10B	13.8	1.8	46	*	4.2	7.15	*	*	*	1.61	0.10	1.71	40.5	.08	.00	.04	.40	.11	.01	4.7	1.8	0	14	0	29	29.9	1091	50												
11S	16.9	9.2	48	0.6	2.0	6.9	0.8		242.1	1.35	0.79	2.14	15.6	.13	.01	.09	.44	.10	.00	4.7	2.1	0	12	0	45	31.2	6400	300												
11M	16.9	9.2	48	*	2.0	6.9	0.7	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	31.2	*	*												
11B	16.9	9.2	48	*	2.0	6.9	0.7	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	31.2	*	*												
12S	18.0	9.7	50	0.7	6.0	7.6	*	*	*	1.33	0.29	1.62	38.9	.13	.00	.09	.23	.10	.01	4.5	1.8	0	12	0	22	32.5	*	*												
12M	17.5	8.9	50	*	6.0	7.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	32.5	*	*												

a = greater than depth   b = too numerous to count

Amendment 2
(New)

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)
12B	14.0	1.7	55	*	6.0	7.5	*	*	*	1.46	0.01	1.47	22.3	.19	.00
13S	17.0	9.35	48	0.7	2.1	7.6	*	*	*	*	*	2.22	31.4	.05	.00
13M	17.2	8.7	49	*	2.1	7.45	*	*	*	*	*	*	*	*	*
13B	17.1	7.0	50	*	2.1	7.3	*	*	*	1.96	8.04	>10.0	45.7	.05	.01
14Sa	16.8	9.25	50	0.7	8.2	7.5	*	*	*	1.70	*	*	18.7	.04	.00
14Sb	16.8	9.3	50	0.7	8.2	7.5	*	*	*	1.37	3.99	5.36	17.5	.02	.00
14Sc	16.8	9.2	50	0.7	8.2	7.55	*	*	*	1.30	0.90	2.20	12.8	.03	.00
14Ma	17.0	8.6	51	*	8.2	7.3	*	*	*	*	*	2.07	13.2	.04	.00
14Mb	17.0	8.5	50	*	8.2	7.3	*	*	*	1.81	0.72	2.53	18.7	.04	.01
14Mc	17.0	8.6	51	*	8.2	7.25	*	*	*	1.66	0.64	2.30	13.7	.04	.01
14Ba	17.0	8.6	51	*	8.2	7.2	*	*	*	1.70	0.45	2.15	15.8	.04	.01
14Bb	17.0	8.6	51	*	8.2	7.2	*	*	*	1.41	1.28	2.69	19.1	.05	.01
14Bc	17.0	8.6	51	*	8.2	7.25	*	*	*	1.34	*	*	15.5	.05	.01
15a	22.0	9.3	50	0.4	1.0	7.4	1.0		49.5	1.66	1.74	3.40	21.9	.04	.01
15b	22.0	9.25	50	0.4	1.0	7.4	1.0		73.1	1.50	1.07	2.57	18.2	.02	.00
15c	22.0	9.3	50	0.4	1.0	7.35	1.0		80.0	*	*	*	16.4	.04	.01
16	18.0	10.2	110	a	0.3	8.3	0.8		14.1	1.38	1.57	2.95	5.1	.03	.00
17	17.5	9.7	52	0.2	1.0	7.65	0.8		650.0	1.96	*	*	18.2	.04	.01
18	17.8	9.8	54	0.5	0.5	7.5	0.8		30.3	1.96	0.12	2.08	10.9	05	.01
19	17.5	9.3	50	0.4	15.2	7.55	0.8		61.2	1.47	1.37	2.84	13.7	.03	.00
20	18.0	[illegible]	[illegible]	0.5	0.8	7.7	0.9			1.83	1.51	3.34	23.7	.01	.00

Station	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (mg/l)	Zinc (mg/l)
12B	.13	.39	.09	.01	4.5	0	0	10	0	29	35.8	2500	100												
13S	.17	.35	.09	.01	4.5	6.2	0	12	0	51	31.2	3900	160												
13M	*	*	*	*	*	*	*	*	*	*	31.9	*	*												
13B	.15	.27	.10	.01	4.7	0	0	12	0	32	32.5	*	*												
14Sa	.23	.31	.09	.02	4.7	0	0	10	0	37	32.5	6300	350												
14Sb	.20	.37	.11	.02	4.9	2.8	0	12	0	34	32.5	5700	470												
14Sc	.25	.68	.22	.02	4.7	3.2	0	12	0	39	32.5	5100	250												
14Ma	.20	.37	.14	.02	4.9	0	0	12	0	42	33.2	5300	210												
14Mb	.10	.43	.44	.02	4.7	0	0	14	0	54	32.5	6300	550												
14Mc	.22	.49	.69	.02	6.0	2.5	0	12	0	72	33.2	6900	310												
14Ba	.09	.59	.11	.02	5.2	2.8	0	10	0	45	33.2	6200	450												
14Bb	.09	.53	.11	.02	5.2	2.1	0	10	0	42	33.2	7600	360												
14Bc	.09	.34	.11	.02	4.9	3.2	0	12	0	37	33.2	7400	270												
15a	.14	.39	.11	.02	5.4	3.2	0	10	0	37	32.5	7000	180												
15b	.19	.25	.11	.02	5.2	5.8	0	12	0	29	32.5	7900	180												
15c	.17	.26	.12	.02	4.9	17.2	0	14	0	42	32.5	5700	340												
16	.19	.16	.11	.01	12.5	4.2	0	30	0	7	71.5	300	0												
17	.01	.30	.16	.02	5.4	6.5	0	12	0	42	33.8	4600	240												
18	.21	.62	.14	.02	4.5	2.5	0	10	0	17	35.1	83000	b												
19	.36	.32	.13	.01	4.7	2.8	0	12	0	22	32.5	10300	620												
20	.12	.42	.24	.01	4.9	5.8	0	14	0	22	35.8	5000	130												

a = greater than depth   b = too numerous to count

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (mg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (mg/l)	Zinc (mg/l)
21	16.0	10.6	55	a	0.2	7.4	0.1		8.6	*	*	3.32	5.1	.04	.00	.06	.21	.23	.05	4.0	2.8	0	26	0	13	35.8	100	0												
22	18.0	8.6	60	0.4	0.6	8.1	0.7		*	*	*	3.03	10.7	.05	.00	.12	.39	.25	.02	5.4	2.5	0	18	0	25	39.0	800	*												
23	17.0	9.6	48	a	0.2	7.6	0.2		4.1	0.89	0.53	1.42	1.3	.01	.00	.02	.13	.15	.07	3.7	2.8	0	22	0	7	31.2	3200	480												

a = greater than depth b = too numerous to count

Amendment 2
(New)

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data

May 9, 1974

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (μg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (mg/l)	Zinc (mg/l)
1	18.0	9.3	*	0.2	0.5	7.1	1.0	85		1.77	*	*	17.3	.04	.01	.10	.28	.05	.03	4.0	1.5	0	8.0	0	200	*														
4a	17.5	9.3	*	0.2	0.6	7.1	1.0	*		*	*	3.35	17.8	.07	.01	.09	.33	.05	.04	5.2	5.8	0	14.0	0	75	*														
4b	17.5	9.35	*	0.2	0.6	7.1	1.0	*		2.32	0.79	3.11	19.1	.06	.01	.10	.42	.03	.04	8.8	12.5	0	14.0	0	99	*														
4c	17.5	9.4	*	0.2	0.6	7.1	1.0	*		1.98	*	*	19.6	.04	.01	.12	.35	.02	.04	6.2	2.8	0	14.0	0	56	*														
8	19.0	9.6	*	0.4	2.0	7.3	1.0	211		1.82	1.02	2.84	12.7	.03	.00	.10	.48	.00	.03	4.9	14.3	0	13.0	0	34	*														
9S	19.9	8.8	*	0.6	2.3	7.3	*	*	*	1.79	0	1.61	29.1	.05	.00	.13	.33	.00	.01	6.2	11.5	0	11.0	0	22	*														
9M	17.8	9.6	*	*	2.3	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*														
9B	17.0	9.1	*	*	2.3	7.2	*	*	*	2.10	*	1.45	18.2	.07	.00	.09	.44	.08	.02	6.6	2.5	0	12.0	0	34	*														
10S	20.5	9.1	*	0.8	3.0	7.3	*	*	*	*	*	1.59	58.6	.08	.00	.09	.47	.05	.01	6.9	3.2	0	14.0	0	13	*														
10M	18.5	9.95	*	*	3.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*														
10B	15.0	1.1	*	*	3.0	7.2	*	*	*	1.77	0.84	2.61	32.8	.09	.00	.12	.54	.05	.01	5.7	2.5	0	14.0	0	17	*														
11	19.0	9.2	*	0.6	2.5	7.2	0.8	*		2.04	0.83	2.87	16.8	.03	.00	.14	.38	.08	.04	4.9	5.5	0	10.0	0	37	*														
12S	20.5	9.8	*	0.5	5.5	7.2	*	*	*	*	*	1.82	60.8	.05	.00	.09	.27	.06	.01	3.9	1.5	0	12.0	0	11	*														
12M	18.0	8.7	*	*	5.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*														
12B	16.1	4.1	*	*	5.5	7.1	*	*	*	1.75	0.04	1.79	27.3	.05	.00	.09	.46	.08	.02	3.9	3.5	0	14.0	0	22	*														
13S	22.0	9.2	*	0.4	2.0	7.15	*	*	*	*	*	2.49	72.1	.12	.01	.11	.45	.07	.01	4.0	2.2	0	14.0	0	65	*														
13M	22.0	9.6	*	*	2.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*														
13B	20.0	9.0	*	*	2.0	7.2	*	*	*	*	*	3.80	63.1	.12	.01	.07	.46	.11	.02	3.7	2.8	0	14.0	0	54	*														
14Sa	19.0	9.7	*	0.4	6.0	7.2	*	*	*	1.87	0.27	2.14	22.8	.04	.01	.13	.33	.08	.04	4.3	3.5	0	13.0	0	30	*														
14Sb	19.0	9.7	*	0.4	6.0	7.2	*	*	*	1.89	0.02	1.91	22.3	.03	.01	.14	.37	.09	.04	3.9	3.5	0	13.0	0	37	*														
14Sc	19.0	9.75	*	0.4	6.0	7.1	*	*	*	*	*	2.30	21.4	.03	.01	.12	.56	.07	.04	4.0	2.8	0	12.0	0	30	*														
14Ma	19.0	9.6	*	*	6.0	7.1	*	*	*	1.87	>8.13	>10.0	27.3	.04	.00	.24	.37	.07	.04	4.3	3.2	0	12.0	0	32	*														
14Mb	19.0	9.65	*	*	6.0	7.2	*	*	*	1.92	0.95	2.87	27.7	.04	.00	.12	.48	.09	.04	4.3	5.2	0	14.0	0	30	*														

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (µg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (mg/l)	Zinc (mg/l)
14Mc	19.0	9.6	*	*	6.0	7.1	*	*	*	1.82	0.12	1.94	24.1	.03	.00	.20	.51	.07	.04	4.0	1.5	0	14.0	0	27	*														
14Ba	19.0	9.05	*	*	6.0	7.2	*	*	*	1.89	*	*	24.1	.09	.01	.20	.60	.35	.04	4.0	3.2	0	14.0	0	39	*														
14Bb	19.0	9.1	*	*	6.0	7.2	*	*	*	1.39	0.81	2.20	28.2	.05	.01	.23	.44	.11	.04	3.7	9.2	0	12.0	0	37	*														
14Bc	19.0	9.1	*	*	6.0	7.2	*	*	*	1.84	0.68	2.52	15.5	.03	.01	.18	.44	.10	.04	3.9	3.5	0	14.0	0	34	*														
15a	19.5	8.9	*	.03	1.0	7.2	0.9	*		1.85	2.44	4.29	29.6	.04	.01	.13	.44	.12	.04	3.9	6.5	0	12.0	0	54	*														
15b	19.5	9.0	*	.03	1.0	7.2	0.9	*		2.23	*	*	25.0	.07	.01	.17	.44	.10	.04	3.7	4.5	0	12.0	0	37	*														
15c	19.5	8.9	*	.03	1.0	7.2	0.9	*		2.29	*	*	26.9	.04	.01	.11	.40	.11	.04	4.0	29.8	0	12.0	0	34	*														
17	19.0	9.1	*	.03	1.0	7.1	0.8	148		1.92	*	*	18.7	.03	.00	.12	.35	.09	.04	4.7	3.5	0	12.0	0	30	*														
21	17.5	9.0	*	a	0.1	7.1	0.2	*		1.79	*	*	4.1	.02	.01	.01	.14	.09	.06	3.0	5.2	0	22.0	0	13	*														
23	17.5	8.1	*	a	0.2	7.1	0.2	*		3.86	*	*	6.0	.04	.02	.03	.24	.09	.06	3.9	6.8	0	17.0	0	105	*														

a = greater than depth.

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data

May 22, 1974

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (µg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Roron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (mg/l)	Zinc (mg/l)	Silica (mg/l)
4a	20.4	7.8	41	0.4	1.0	*	1.0	*	58.4	1.93	0	1.53	18.7	.02	.00	.16	.42	.09	.03	10.0	2.2	0	8.0	0	42	26.7	3200	b	0	0	0.8	1.3	0.13	8.6	4.4	3.1	0	0		0.05	5.6
4b	20.4	7.7	40	0.4	1.0	*	1.0	*	47.2	1.65	0.93	2.58	13.7	.03	.00	.13	.38	.09	.04	12.5	1.5	0	12.0	0	45	26.0	6100	b	0	*	0.3	1.1	0	8.2	3.3	2.8	*	*	*	*	5.2
4c	20.4	7.8	42	0.4	1.0	*	1.0	*	62.0	1.59	*	*	10.3	.04	.00	.16	.36	.09	.04	13.0	1.5	0	10.0	0	34	27.3	5000	b	0	*	0.7	1.4	0.05	9.0	4.5	2.9	*	*	*	*	5.1
8	21.0	9.2	35	0.2	2.0	*	1.1	172		1.35	1.11	2.46	14.3	.03	.00	.19	.46	.08	.03	11.2	2.2	0	10.0	0	39	22.8	6400	b	0	*	0.6	1.4	0.05	8.5	68.8	2.9	*	*	*	*	5.4
9S	22.5	8.9	37	0.2	2.0	*	*	*	*	1.45	0.07	1.52	22.3	.04	.00	.09	.40	.06	.01	11.7	1.5	0	13.0	0	37	24.1	2900	510	0	*	0.8	1.4	0.05	8.2	79.8	2.9	*	*	*	*	6.0
9M	21.5	8.1	*	*	2.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
9B	20.5	3.9	37	*	2.0	*	*	*	*	1.65	0.39	2.04	20.0	.08	.00	.17	.54	.09	.02	9.7	1.5	0	11.0	0	63	24.1	2400	620	0	*	1.2	1.3	0.18	8.4	33.4	3.0	*	*	*	*	5.4
10S	23.0	8.4	39	0.3	4.0	*	*	*	*	1.66	0.11	1.77	14.3	.04	.00	.09	.38	.05	.00	11.2	1.5	0	12.0	0	30	25.4	1181	43	0	*	0.5	1.2	0.10	8.3	3.7	3.0	*	*	*	*	4.9
10M	21.5	6.1	*	*	4.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10B	15.0	0.8	49.5	*	4.0	*	*	*	*	3.05	1.51	4.56	45.1	.84	.01	.01	.74	.17	.01	11.2	1.5	0	31.0	0	137	32.2	1000	63	0	*	8.3	2.3	1.96	8.2	8.8	4.3	*	*	*	*	4.7
11S	21.0	9.0	36	0.2	2.0	*	1.1	*	.	*	*	2.15	26.9	.05	.00	.24	.51	.05	.02	11.2	2.2	0	10.0	0	51	23.4	4100	640	0	*	0.7	1.4	0.09	8.2	3.5	2.8	*	*	*	*	5.1
12S	23.5	9.9	39	0.3	5.0	*	*	*	*	1.77	0.59	2.36	36.0	.03	.00	.15	.51	.07	.00	13.0	2.5	0	*	0	30	25.4	300	63	0	0	0.7	1.3	0.09	8.6	3.9	3.1	0	0		0.85	4.9
12M	22.0	7.8	39	*	5.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	25.4	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12B	17.5	0.6	39	*	5.0	*	*	*	*	1.61	0.35	1.96	39.2	.12	.01	.13	.47	.06	.02	3.6	2.2	0	12.0	0	42	25.4	900	100	0	*	0.9	1.3	0.19	8.2	4.0	3.2	*	*	*	*	5.0
13S	24.0	8.6	40	0.2	2.0	*	*	*	*	1.84	1.11	2.95	137.4	.08	.00	.08	.52	.09	.01	6.0	2.2	0	12.0	0	51	26.0	1400	70	0	*	0.6	1.3	0.22	8.2	3.4	3.2	*	*	*	*	5.0
13M	23.5	7.7	41	*	2.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	26.7	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13B	23.0	0.4	41.5	*	2.0	*	*	*	*	1.98	2.95	4.93	150.9	.08	.00	.09	.53	.20		3.6	2.2	0	14.0	0	137	27.0	1545	150	0	*	1.5	1.3	0.31	8.8	3.9	3.2	*	*	*	*	5.1
14Sa	21.5	8.8	36.5	0.3	5.0	*	*	*	*	1.80	1.15	2.95	23.2	.02	.00	.19	.42	.09	.03	3.2	2.5	0	10.0	0	48	23.8	3400	b	0	0	0	0.8	0.06	8.5	1.5	1.9	0	0		0.13	5.5
14Sb	21.5	8.7	36.5	0.3	5.0	*	*	*	*	1.63	1.32	2.95	26.0	.03	.00	.14	.40	.07	.03	3.2	2.2	0	10.0	0	48	23.8	4200	b	0	*	0.9	1.2	0.09	8.5	3.2	2.8	*	*	*	*	4.9
14Sc	21.5	8.8	36.5	0.3	5.0	*	*	*	*	*	*	2.30	22.3	.04	.00	.27	.51	.06	.03	3.2	2.5	0	9.0	0	45	23.8	4900	b	0	*	1.2	1.2	0.15	8.4	3.2	2.8	*	*	*	*	5.3
14Ma	21.5	9.0	39.0	*	5.0	*	*	*	*	2.13	0	1.96	22.3	.04	.01	.16	.58	.09	.01	3.0	2.2	0	10.0	0	51	25.4	4200	b	0	*	1.1	1.2	0.11	8.3	2.3	2.8	*	*	*	*	5.1
14Mb	21.5	9.1	39.0	*	5.0	*	*	*	*	1.86	1.26	3.12	15.0	.04	.00	.25	.41	.06	.02	7.3	1.5	0	*	0	51	25.4	4600	*	9	*	1.3	1.3	0.11	8.6	3.6	2.9	*	*			5.8
14Mc	21.5	9.0	39.0	*	5.0	*	*	*	*	2.58	0.83	3.41	121.6	.02	.00	.26	.51	.09	.02	3.7	1.5	0	11.0	0	54	25.4	6000	b	0	*	1.2	1.7	0.10	9.0	80.0	3.2	*	*			5.1

Amendment 2
(New)

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (µg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)
14Bc	21.5	8.9	37.5	*	5.0	*	*	*	*	1.65	1,76	3,41	260	.02	.00	.14	.38	.12	.03	3.3	1.5
15a	22.5	8.9	38.5	0.2	2.0	*		*	77.3	1.87	0.98	2.85	33.7	.02	.00	.16	.39	.11	.02	3.3	1.5
15b	22.5	9.0	38.0	0.2	2.0	*		*	151.6	2.09	*	*	3.60	.02	.00	.18	.41	.10	.02	3.3	1.5
15c	22.5	9.0	38.0	0.2	2.0	*		*	67.3	*	*	*	27.0	.02	.00	.16	.29	.11	.02	3.3	1.5
17	23.5	9.1	40.5	0.2	2.0	*		88	43.7	1.45	1.38	2.83	17.3	.01	.00	.25	.30	.11	.02	3.2	1.5
19	24.0	9.1	38.5	0.2	3.0	*		*	77.6	*	*	3.20	17.8	.02	.01	.18	.37	.14	.02	3.3	1.5
21	17.6	8.6	49	a	0.2	*		*	10.8	1.40	0.58	1.98	78.8	.02	.00	.04	.13	.10	.06	3.2	1.8
23	17.5	8.9	57	a	0.2	*		*		1.07	0.58	1.65	2.8	.01	.00	.06	.11	.06	.03	2.6	1.8

Station	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Roron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (mg/l)	Zinc (mg/l)	Silica (mg/l)
14Bc	0	11.0	0	56	24.4	5300	b	0	*	0	1.0	0.11	10.1	2.3	1.8	*	*	*	*	5.3
15a	0	11.0	0	48	25.1	3800	b	0	0	0.8	1.3	0.13	10.9	3.3	3.3	0	0	1.7	1.37	5.3
15b	0	10.0	0	48	24.7	4200	b	0	*	1.0	1.3	0.13	11.2	3.6	3.6	*	*	*	*	5.6
15c	0	10.0	0	54	24.7	5400	b	0	*	1.2	1.2	0.13	11.1	3.3	3.5	*	*	*	*	5.5
17	0	12.0	0	54	26.4	3700	>20	0	*	0.8	1.5	0.13	13.1	3.3	6.3	*	*	*	*	5.9
19	0	12.0	0	48	25.1	3400	b	0	*	1.1	1.3	0.13	10.7	4.2	3.4	*	*	*	*	5.8
21	0	28.0	0	5	31.9	2500	16	0	*	0.7	2.7	0.12	16.9	38.4	2.6	*	*	*	*	13.0
23	0	22.0	0	3	37.1	1300	470	*	*	*	*	*	*	*	*	*	*	*	*	*

a = greater than depth
b = too numerous to count

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data

Station	Temp. (c)	D.O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (μg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S
4a	22.0	7.6	45	0.5	2.0	6.5	0.8	*	23.5	2.14	0.38	2.52	13.7	.07	.00	.15	.18	.01	.03	6.6	2.5	0	18.0	0	20	29.3
4b	22.0	7.7	45.5	0.5	2.0	6.6	0.8	*	23.7	1.47	1.13	2.60	15.0	.05	.00	.16	.24	.01	.03	6.9	1.8	0	14.0	0	24	29.6
4c	22.0	7.6	45.5	0.5	2.0	6.6	0.8	*	32.7	2.14	*	1.48	1.8	.05	.00	.01	.05	.01	.04	3.6	1.8	0	32.0	0	11	29.6
8	23.0	7.35	45	0.4	3.0	7.1	1.0	218	45.5	1.80	0.93	2.73	16.1	.03	.00	.18	.26	.01	.01	5.4	1.8	0	12.6	0	27	29.3
9S	24.1	7.8	45	0.8	3.0	7.0	*	*	*	1.66	0.80	2.46	60.8	.03	.00	.08	.19	.01	.00	5.4	1.8	0	14.0	0	15	29.3
9M	22.8	5.25	45	*	3.0	7.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	29.3
9B	21.5	3.3	46	*	3.0	7.0	*	*	*	2.41	0	2.39	35.0	.07	.00	.21	.39	.01	.00	5.4	1.5	0	16.0	0	24	29.9
10S	23.5	8.5	43	0.8	5.0	7.0	*	*	*	*	*	3.94	35.5	.02	.00	.03	.18	.01	.00	4.7	1.5	0	26.0	0	20	28.0
10M	22.0	4.6	43	*	5.0	6.8	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	28.0
10B	16.4	0.7	44	*	5.0	7.0	*	*	*	2.44	0	2.43	42.8	.05	.00	.17	.39	.01	.00	5.2	1.8	0	16.0	0	22	28.6
11S	23.0	7.1	47	0.4	3.0	7.0	0.6	*	46.5	2.25	0.27	2.52	17.5	.01	.00	.19	.26	.01	.03	6.0	1.8	0	14.0	0	24	30.6
12S	24.8	8.1	48	0.8	5.0	7.0	*	*	*	2.37	0	2.30	57.4	.01	.00	.07	.22	.01	.00	5.4	1.5	0	15.0	0	37	31.2
12M	22.8	6.25	*	*	5.0	7.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12B	18.1	0.4	*	*	5.0	7.0	*	*	*	0.91	*	*	27.3	.02	.00	.14	.20	.01	.02	5.4	1.5	0	21.0	0	32	*
13S	25.0	8.5	45.5	0.8	2.1	7.1	*	*	*	*	*	2.85	72.1	.01	.00	.08	.20	.01	.00	4.9	1.8	0	12.0	0	37	29.6
13M	23.5	5.3	47	*	2.1	6.8	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	30.6
13B	23.0	4.1	49.0	*	2.1	7.0	*	*	*	2.00	*	*	87.9	.02	.00	.07	.26	.01	.00	4.0	1.5	0	13.0	0	30	31.9
14Sa	23.1	7.0	51.5	0.6	6.2	7.1	*	*	*	1.75	2.69	4.44	19.6	.01	.00	.17	.26	.01	.03	4.9	1.5	0	11.0	0	32	33.5
14Sb	23.1	7.0	51.0	0.6	6.2	7.0	*	*	*	*	*	4.41	16.8	.01	.00	.16	.30	.02	.04	4.5	1.5	0	11.0	0	32	33.2
14Sc	23.1	7.1	51.5	0.6	6.2	7.2	*	*	*	1.96	0.26	2.22	19.1	.03	.00	.26	.41	.01	.04	5.2	1.5	0	12.0	0	17	33.5
14Ma	23.1	7.1	52.0	*	6.2	6.8	*	*	*	1.66	2.78	4.44	14.1	.00	.00	.15	.38	.01	.04	5.4	1.5	0	12.0	0	30	33.8
14Mb	23.1	7.1	52.5	*	6.2	6.9	*	*	*	*	*	2.48	15.0	.02	.00	.24	.43	.01	.05	5.4	1.5	0	12.0	0	22	34.2
14Mc	23.1	7.1	52.0	*	6.2	7.0	*	*	*	1.93	1.36	3.29	13.2	.03	.00	.22	.37	.02	.04	5.2	2.8	0	12.0	0	24	33.8

Station	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Roron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (mg/l)	Zinc (mg/l)
4a														
4b														
4c														
8														
9S														
9M														
9B														
10S														
10M														
10B														
11S														
12S														
12M														
12B														
13S														
13M														
13B														
14Sa														
14Sb														
14Sc														
14Ma														
14Mb														
14Mc														

Amendment 2
(New)

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (µg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (mg/l)	Zinc (mg/l)
14Ba	23.1	7.1	53.0	*	6.2	6.8	*	*	*	1.63	1.49	3.12	20.5	.01	.00	.26	.48	.01	.05	5.4	2.2	0	10.0	0	22	34.5														
14Bb	23.1	7.1	53.0	*	6.2	7.1	*	*	*	2.09	2.91	5.00	18.2	.03	.00	.17	.23	.02	.05	5.7	2.2	0	12.0	0	32	34.5														
14Bc	23.1	7.1	53.0	*	6.2	7.0	*	*	*	1.58	1.27	2.85	15.9	.03	.00	.18	.29	.02	.04	5.7	2.5	0	10.0	0	34	34.5														
15a	24.0	7.1	90	0.3	1.0	7.1	0.8	*	46.4	3.03	0.05	3.08	21.4	.03	.00	.17	.26	.02	.03	5.7	1.5	0	13.0	0	24	58.5														
15b	24.0	7.1	95	0.3	1.0	*	0.8	*		*	*	*	28.2	.01	.00	.18	.24	.02	.03	6.9	1.5	0	11.0	0	32	61.8														
15c	24.0	7.1	90	0.3	1.0	*	0.8	*	35.7	*	*	2.85	16.8	.02	.00	.16	.24	.02	.03	6.2	1.8	0	12.0	0	27	58.5														
17	23.0	7.2	150	0.3	2.5	6.9	0.7	162	27.8	1.95	*	*	21.9	.03	.00	.25	.30	.02	.03	6.2	1.5	0	12.0	0	30	97.5														
21	18.0	6.9	44.5	a	0.2	6.8	0.2	*	67.3	2.23	0.98	3.21	12.0	.02	.00	.16	.25	.02	.06	5.2	2.8	0	12.0	0	20	29.0														
23	17.5	7.1	53	a	0.3	6.9	0.2	*	8.0	1.62	0	1.43	3.5	.01	.00	.04	.10	.02	.05	3.0	2.5	0	20.0	0	9	34.5														

a = greater than depth

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data

June 19, 1974

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (µg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)
4a	21.0	9.8	43	0.1	0.67	*	1.0	*	37.8	3.53	0	3.41	12.4	*	.01	.30	.51	.11	.04	4.9
4b	21.0	9.9	42	0.1	0.67	*	1.0	*	94.4	2.00	2.21	4.21	19.0	*	.01	.32	.61	.09	.05	6.9
4c	21.0	9.8	43	0.1	0.67	*	1.0	*		*	*	*	17.1	.05	.01	.32	.61	.11	.05	7.3
8	22.0	8.1	48	0.3	2.5	7.4	1.0	104		1.86	1.78	3.64	16.4	.06	.01	.32	.59	.27	.04	5.7
9S	22.5	7.6	42	0.3	4.0	7.1	*	*	*	2.14	*	*	50.6	.01	.01	.24	.51	.06	.01	4.5
9M	21.5	6.8	43	*	4.0	7.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
9B	21.3	6.8	44	*	4.0	7.4	*	*	*	1.98	*	*	24.3	.05	.01	.27	.62	.09	.02	6.0
10S	22.0	7.4	40	0.4	4.1	7.0	*	*	*	2.01	*	*	69.8	.01	.01	.19	.54	.08	.01	5.7
10M	21.5	5.9	41	*	4.1	7.1	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10B	16.2	0.4	42	*	4.1	7.3	*	*	*	3.04	*	*	30.1	.08	.01	.25	.47	.07	.02	5.7
11S	21.8	7.9	46	0.3	2.2	7.5	0.6	*	94.2	2.46	0.94	3.40	15.0	.07	.01	.42	.61	.10	.02	5.2
12S	24.1	7.9	44	0.4	6.0	7.4	*	*	*	3.12	0.43	3.55	64.2	.01	.01	.20	.59	.07	.02	3.7
12M	22.0	5.7	44	*	6.0	7.3	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12B	19.0	0.7	46	*	6.0	7.2	*	*	*	4.49	*	3.67	23.2	.10	.01	.28	.52	.12	.01	5.7
13S	23.0	8.0	44	0.3	2.1	7.7	*	*	*	2.20	*	*	27.8	.00	.01	.25	.49	.10	.01	7.6
13M	22.0	7.7	44	*	2.1	7.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13B	21.7	6.45	44	*	2.1	7.4	*	*	*	*	*	*	57.4	.00	.01	.25	.50	.12	.03	4.5
14Sa	22.2	7.4	46	0.3	8.0	7.5	*	*	*	*	*	3.46	10.5	.08	.01	.31	.60	.07	.03	5.7
14Sb	22.2	7.5	46	0.3	8.0	7.4	*	*	*	*	*	3.41	18.6	.05	.01	.42	.50	.07	.03	4.3
14Sc	22.2	7.45	46	0.3	8.0	7.4	*	*	*	*	*	3.88	31.0	.04	.01	.31	.52	.15	.03	5.2
14Ma	22.0	8.0	50	*	8.0	7.3	*	*	*	*	*	3.64	16.8	.03	.01	.32	.56	.14	.03	6.9

Station	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (mg/l)	Zinc (mg/l)	Silica (mg/l)
4a	1.8	0	.5	0	86	28.0	5000	700	0	0	0.5	3.8	0.11	5.0	1.5	1.8	0	0		2.4	5.3
4b	1.7	0	8	0	45	27.3	4500	640	0	*	0.4	3.3	0.10	4.9	1.4	1.7	*	*	*	*	6.1
4c	1.7	0	10	0	72	28.0	4300	840	0	*	0.9	2.5	0.10	4.8	2.2	2.0	*	*	*	*	5.8
8	1.5	0	10	0	65	31.2	7900	840	0	*	1.5	1.6	0.09	6.3	2.9	1.9	*	*	*	*	6.5
9S	1.7	0	24	0	27	27.3	2300	400	0	*	0.5	1.4	0.09	4.6	1.5	1.8	*	*	*	*	5.8
9M	*	*	*	*	*	28.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
9B	1.5	0	8	0	68	28.6	3800	110	0	*	0.6	1.4	0.09	4.6	1.5	1.8	*	*	*	*	5.8
10S	1.8	0	10	0	42	26.0	1600	220	0	*	0.4	1.4	0.09	4.2	4.6	1.9	*	*	*	*	6.0
10M	*	*	*	*	*	26.7	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10B	2.2	0	0	0	48	27.3	3200	520	0	*	0.5	2.2	0.09	4.1	1.4	1.8	*	*	*	*	5.7
11S	1.5	0	8	0	51	29.9	4900	620	0	*	1.5	2.9	0.09	4.9	1.3	1.7	*	*	*	*	6.0
12S	1.5	0	16	0	59	28.6	1800	360	0	0	0.6	1.5	0.09	4.1	1.4	1.8	0	0		0.3	5.6
12M	*	*	*	*	*	28.6	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12B	1.5	0	8	0	54	29.9	3400	620	[illegible]	*	0.6	1.4	0.23	4.2	1.5	2.0	*	*	*	*	5.7
13S	1.5	0	10	0	56	28.6	3900	420	[illegible]	*	0.7	1.4	0.08	4.2	5.8	1.7	*	*	*	*	5.9
13M	*	*	*	*	*	28.6	*	*	[illegible]	*	*	*	*	*	*	*	*	*	*	*	*
13B	1.5	0	6	0	65	28.6	3100	400	[illegible]	*	1.0	1.5	0.09	4.3	9.8	2.0	*	*	*	*	5.9
14Sa	2.3	0	10	0	65	29.9	5000	760	[illegible]	0	0.8	1.3	0.08	4.8	1.4	1.6	0	0		0.1	5.6
14Sb	2.5	0	8	0	59	29.9	5500	700	0	*	0.7	1.9	0.08	4.9	1.4	1.8	*	*	*	*	5.6
14Sc	1.5	0	10	0	45	29.9	6600	660	0	*	0.6	1.8	0.07	4.8	1.4	1.8	*	*	*	*	7.4
14Ma	1.5	0	8	0	56	32.5	6500	1020	0	*	0.8	1.4	0.07	4.8	1.4	1.6	*	*	*	*	5.7

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (μg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (mg/l)	Zinc (mg/l)	Silica (mg/l)
14Mb	22.0	8.0	50	*	8.0	7.2	*	*	*	*	*	4.17	19.1	.05	.01	.31	.58	.08	.03	5.2	1.5	0	8	0	39	32.5	4900	570	0	*	1.0	1.4	0.07	5.0	1.4	1.6	*	*	*	*	6.0
14Mc	22.0	8.0	50	*	8.0	7.1	*	*	*	4.19	1.52	5.71	26.0	.03	.01	.31	.67	.07	.03	4.3	1.8	0	10	0	51	32.5	6600	360	0	*	0.7	1.3	0.06	4.9	1.4	1.6	*	*	*	*	5.8
14Ba	22.0	7.95	53	*	8.0	7.0	*	*	*	3.86	*	*	21.4	.03	.01	.32	.54	.14	.02	7.3	1.5	0	10	0	59	34.5	5800	900	0	0	0.9	1.4	0.08	4.9	7.4	1.8	0	0		0.3	5.7
14Bb	22.0	8.0	53	*	8.0	7.1	*	*	*	4.36	*	3.84	*	.09	.01	.31	.58	.08	.02	4.9	2.0	0	28	0	34	34.5	6700	1040	0	*	0.8	1.3	0.07	4.9	1.4	2.0	*	*	*	*	*
14Bc	22.0	7.9	53	*	8.0	7.3	*	*	*	*	*	*	*	.06	.01	.30	.62	.13	.02	6.9	1.5	0	8	0	59	34.5	5700	1200	0	*	0.9	2.5	0.07	5.0	2.2	2.1	*	*	*	*	6.1
15a	*	*	*	*	*	*	*	*	97.1	4.15	*	*	7.5	.08	.01	.30	.65	.13	.03	4.9	1.7	0	6	0	48	*	5500	680	0	0	0.9	2.5	0.07	4.9	3.4	1.9	0	0		0.3	6.1
15b	*	*	*	*	*	*	*	*	79.3	2.71	*	*	17.5	.05	.01	.32	.53	.15	.03	5.7	1.7	0	12	0	45	*	5400	760	0	*	0.8	2.1	0.07	4.8	5.1	1.7	*	*	*	*	5.9
15c	*	*	*	*	*	*	*	*	77.9	2.61	1.23	3.84	21.4	.06	.01	.30	.60	.14	.03	5.2	1.5	0	6	0	39	*	4300	620	0	*	1.0	1.5	0.07	4.9	1.5	1.9	*	*	*	*	5.9
17	23.0	9.1	49	0.2	1.0	*	0.4	65	109.0	2.14	2.46	4.60	27.3	.03	.01	.31	.53	.07	.03	4.9	1.5	0	8	0	39	31.9	3800	560	0	*	0.6	1.5	0.07	4.8	4.2	1.7	*	*	*	*	5.5
19	24.0	8.4	50	0.2	15.2	*	0.7	*	52.8	*	*	2.95	21.9	*	.01	.34	.61	.08	*	10.0	1.5	0	6	0	54	32.5	7700	720	0	*	0.5	1.4	0.07	4.4	1.6	1.8	*	*	*	*	5.8
21	18.0	9.7	59	a	0.3	*	0.03	*	13.6	*	*	2.28	4.5	.00	.00	.03	.19	.08	.09	4.9	*	0	20	0	5	38.4	700	60	0	*	0.4	2.0	0.09	7.0	2.1	1.0	*	*	*	*	15.1
23	18.5	9.1	50	a	0.3	*	0.3	*	26.0	2.12	*	1.46	2.1	.01	.00	.04	.21	.06	.05	3.3	2.0	0	18	0	3	32.5	660	290													

a = greater than depth

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (µg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (mg/l)	Zinc (mg/l)
4a	22.0	7.6	42	0.1	1.2	*	0.6	*	399.9	*	*	*	29.7	.22	.01	.27	.67	.38	.02	>15	1.8	0	16	0	122	27.3														
4b	22.0	7.8	42	0.1	1.2	*	0.6	*	337.6	*	*	6.85	34.0	.20	.00	.24	.70	.32	.02	13.7	0	0	18	0	133	27.3														
4c	22.0	7.8	41	0.1	1.2	*	0.6	*		1.28	3.88	5.16	38.3	.16	.01	.28	.70	.32	.01	>15	0	0	14	0	122	26.7														
8	17.0	8.2	50	0.1	2.0	*	0.5	119	281.9	1.54	*	*	36.3	.17	.01	.20	.62	.29	.00	15	1.5	0	12	0	145	32.5														
9S	22.0	8.0	47	0.15	3.0	*	*	*	*	2.02	1.47	3.49	23.4	.17	.01	.20	.58	.34	.04	>15	1.5	0	13	0	113	30.6														
9M	20.0	6.5	*	*	3.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*														
9B	20.0	2.2	45	*	3.0	*	*	*	*	1.98	1.59	3.57	81.8	.21	.01	.15	.82	.16	.02	>15	1.5	0	11	0	95	29.3														
10S	24.0	8.5	46	0.15	4.0	*	*	*	*	1.87	1.87	3.74	126.3	.08	.01	.26	.76	.23	.03	>15	0	0	10	0	92	29.9														
10M	20.0	4.2	*	*	4.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*														
10B	16.0	1.5	78	*	4.0	*	*	*	*	*	*	7.60	42.1	1.41	.03	.05	1.00	.32	.07	>15	0	0	35	0	157	50.7														
11S	24.0	8.1	46	0.1	2.0	*	0.7	*		*	*	4.86	31.9	.14	.01	.31	.79	.32	.01	>15	0	0	11	0	185	29.9														
12S	24.0	8.6	45	0.15	5.75	*	*	*	*	1.95	1.31	3.26	47.4	.14	.01	.25	.88	.18	.03	>15	0	0	10	0	106	29.3														
12M	22.0	6.6	*	*	5.75	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*														
12B	20.0	1.8	44	*	5.75	*	*	*	*	*	*	*	50.0	.29	.02	.28	.79	.23	.07	5.4	1.8	0	10	0	125	28.6														
13S	24.0	8.1	48	1.5	3.0	*	*	*	*	*	*	*	115.8	.15	.01	.27	.62	.20	.02	*	1.5	0	9	0	99	31.2														
13M	23.0	7.0	*	*	3.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*														
13B	22.0	4.2	45	*	3.0	*	*	*	*	1.95	1.78	3.73	27.6	.29	.01	.29	.73	.25	.03	4.5	1.5	0	10	0	106	29.3														
14Sa	24.0	8.3	45	1.5	5.0	*	*	*	*	*	*	3.82	23.4	.16	.01	.23	.76	.25	.04	*	*	0	12	0	103	29.3														
14Sb	24.0	8.4	46	1.5	5.0	*	*	*	*	*	*	2.57	31.9	.45	.01	.28	.79	.14	.02	4.3	1.3	0	8	0	89	29.9														
14Sc	24.0	8.3	45	1.5	5.0	*	*	*	*	*	*	*	34.0	.23	.01	.27	.76	.25	.02	3.7	*	0	10	0	89	29.3														
14Ma	24.0	8.3	45	*	5.0	*	*	*	*	*	*	*	31.9	.19	.01	.25	.79	.27	.02	3.7	1.3	0	10	0	157	29.3														
14Mb	24.0	8.4	45	*	5.0	*	0.3			*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	29.3														

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (µg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (mg/l)	Zinc (mg/l)
14Mc	24.0	8.3	45	*	5.0	*	0.3	*		*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	29.3														
14Ba	24.0	7.7	45	*	5.0	*	*	*	*	2.90	2.5	5.40	34.0	.21	.01	.25	.88	.56	.02	3.9	0	0	10	0	106	29.3														
14Bb	24.0	7.5	44	*	5.0	*	*	*	*	1.74	2.91	4.65	29.7	.18	.01	.28	.76	.36	.02	3.7	1.3	0	10	0	165	28.6														
14Bc	24.0	7.6	44	*	5.0	*	*	*	*	*	*	6.63	36.2	.18	.01	.23	.62	.14	.03	3.6	0	0	11	0	125	28.6														
15a	18.0	8.0	44	0.1	1.0	*	1.25	*	180.5	1.86	2.21	4.07	21.3	.25	.01	.27	.70	.25	.03	3.2	0	0	9	0	118	28.6														
15b	19.0	7.8	43	0.1	1.0	*	1.00	*	175.4	*	*	4.65	19.1	.24	.01	.07	.76	.52	.03	*	1.8	0	10	0	125	28.0														
15c	19.0	7.7	44	0.1	1.0	*	1.25	*	159.4	2.29	1.45	3.74	25.5	.24	.01	.29	.76	.34	.03	3.2	1.3	0	9	0	122	28.6														
17	26.0	7.5	50	0.1	1.5	*	0.6	77	220.0	1.63	2.97	4.60	23.4	.21	.01	.30	.79	.58	.02	3.3	1.5	0	10	0	86	32.5														
21	19.5	8.2	58	a	0.3	*	0	*	1.0	1.72	*	*	3.2	.01	.00	.08	.17	.13	.08	2.4	1.3	0	8	0	5	37.7														
23	19.5	8.3	55	a	0.2	*	0.2	*	44.1	*	*	*	6.6	.03	.00	.04	.12	.16	.63	2.1	1.5	0	23	0	9	35.8														

a = greater than depth

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data

July 17, 1974

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (µg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (µg/l)	Zinc (mg/l)	Silica (mg/l)
2	*	*	*	*	*	*	*	28	*	1.34	.64	1.98	0.2	*	0	.05	.32	.07	.06	12.5	0	0	10	0	7	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
4a	26.0	6.5	67	0.33	1.0	*	0.5	*	*	2.22	.51	2.73	21.3	.15	0	.29	.59	.09	.07	8.0	28.1	0	10	0	22	43.6	2300	140	0	0	0.6	6.9	0.06	6.0	1.9	1.9	0	0	<0.1	2.1	6.6
4b	26.0	6.5	67	0.33	1.0	*	0.5	*	22.7	1.87	*	*	21.3	.03	0	.27	.59	.07	.07	6.2	7.6	0	0	0	13	43.6	2600	120	0	*	1.1	6.9	0.03	6.0	1.9	1.9	*	*	*	*	7.1
4c	26.0	6.7	67	0.33	1.0	*	0.5	*	*	1.77	7.00	8.77	21.3	.03	0	.25	.59	.07	.07	6.9	3.5	0	0	0	17	43.6	2200	160	0	*	0.7	4.0	0.05	6.2	4.2	2.1	*	*	*	*	6.8
8	26.5	7.2	54	0.4	1.0	7.8	0.6	108	*	1.82	1.17	2.99	21.3	.03	0	.24	.50	.04	.03	8.0	1.5	0	0	0	15	35.1	1500	220	0	*	0.7	1.9	0.04	5.5	6.7	1.8	*	*	*	*	6.6
9S	27.8	8.4	52	0.6	3.0	7.5	*	*	*	2.25	.99	3.24	72.7	.06	0	.07	.44	.04	.01	9.2	0	0	10	0	13	33.8	0	53	0	*	0.6	1.8	0.04	5.8	7.4	2.0	*	*	*	*	6.4
9M	25.0	3.3	52	*	3.0	7.6	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
9B	24.0	0.7	53	*	3.0	7.3	*	*	*	2.57	3.96	6.53	84.2	.05	0	.13	.52	.07	.01	6.2	0	0	10	0	17	34.5	454	33	0	*	0.9	1.8	0.04	5.6	1.6	1.9	*	*	*	*	6.7
10S	27.0	8.4	51	0.8	4.1	7.5	*	*	*	*	*	3.42	63.6	.04	0	.11	.47	.04	.01	9.7	0	0	10	0	15	33.2	666	160	0	*	0.4	1.6	0.04	5.4	5.8	1.9	*	*	*	*	6.5
10M	26.0	6.1	57	*	3.0	7.4	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10B	17.8	0.4	61	*	4.1	7.2	*	*	*	2.33	1.01	3.34	50.0	.41	0	.07	.85	.04	.01	4.5	6.5	0	12	0	42	39.7	181	130	0	*	0.6	3.9	0.18	4.6	6.6	1.8	*	*	*	*	6.5
11S	26.5	7.3	52	0.4	1.5	7.3	0.4	*	19.5	*	*	*	29.8	.03	0	.22	.50	.09	.04	3.2	4.6	0	10	0	24	33.8	866	195	0	*	0.7	3.9	0.03	4.7	1.6	1.6	*	*	*	*	6.7
12S	28.5	7.7	53	0.8	6.0	7.6	*	*	*	*	*	*	72.7	.03	0	.13	.59	.07	.02	4.3	3.2	0	8	0	32	34.5	363	6	0	0	0.4	2.0	0.03	4.6	1.6	1.6	0	0	<0.1	0.3	7.9
12M	26.5	6.2	52	*	6.0	7.4	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12B	22.0	0.3	52	*	6.0	7.5	*	*	*	3.29	3.50	6.79	29.8	.14	.01	.20	.53	.07	*	2.7	0	0	6	0	30	33.8	727	66	0	*	0.4	1.5	0.04	4.3	4.6	1.6	*	*	*	*	6.0
13S	28.0	7.6	52	0.7	2.0	7.3	*	*	*	2.51	*	1.69	77.3	.05	0	.14	.59	.09	.02	2.0	5.2	0	10	0	39	33.8	545	110	0	*	0.6	1.5	0.06	4.5	1.7	1.6	*	*	*	*	6.3
13M	27.5	6.4	53	*	2.0	7.4	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13B	26.2	5.0	53	*	2.0	7.3	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	545	33	0	*	0.3	1.6	0.05	4.6	5.4	1.6	*	*	*	*	6.3
14Sa	27.0	7.25	54	0.4	5.5	7.4	*	*	*	3.85	*	3.12	45.4	.15	0	.18	.41	.09	.02	2.9	0	0	8	0	15	35.1	1700	b	0	0	0.5	1.5	0.05	4.8	5.8	1.6	0	0	<0.1	0.08	6.2
14Sb	27.0	7.3	54	0.4	5.5	7.3	*	*	*	2.70	*	*	29.8	.05	0	.22	.44	.09	.04	2.7	8.8	0	8	0	34	35.1	2100	210	0	*	0.4	2.8	0.05	4.8	1.6	1.6	*	*	*	*	6.2
14Sc	27.0	7.2	54	0.4	5.5	7.4	*	*	*	*	*	*	31.9	.04	0	.19	.47	.07	.04	3.0	1.5	0	10	0	20	35.1	1600	220	0	*	0.3	2.2	0.05	4.7	1.6	1.6	*	*	*	*	6.3
14Ma	27.0	7.15	53	*	5.5	7.5	*	*	*	*	*	*	29.8	.25	0	.23	.64	.07	.11	2.9	0	0	4	0	27	34.5	1366	1000	0	*	0.4	1.8	0.05	4.6	1.6	1.6	*	*	*	*	6.0

Amendment 2
(New)

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (µg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)
14Mb	27.0	7.2	54	*	5.5	7.3	*	*	*	*	*	8.82	34.0	.07	0	.23	.56	.04	.04	2.6
14Mc	27.0	7.1	54	*	5.5	7.4	*	*	*	2.92	.16	3.08	29.8	.06	0	.21	.53	.09	.04	2.5
14Ba	26.8	7.1	53	*	5.5	7.35	*	*	*	3.72	*	2.73	29.8	40	0	.19	.50	.07	.02	4.0
14Bb	26.8	7.1	53	*	5.5	7.4	*	*	*	1.55	7.17	8.72	38.3	42	.01	.22	.53	.09	.04	2.5
14Bc	26.8	7.15	54	*	5.5	7.4	*	*	*	2.11	.73	2.84	29.8	.03	0	.21	.47	.07	.04	2.6
15a	26.0	7.2	*	0.2	0.67	*	0.67	*	*	2.73	*	2.17	45.4	.04	0	.20	.47	.04	.04	2.9
15b	26.0	7.4	*	0.2	0.67	*	0.67	*	*	2.09	.37	2.46	31.9	.04	0	.20	.41	.07	.03	2.7
15c	26.0	7.2	*	0.2	0.67	*	0.67	*	67.0	*	*	2.14	21.3	.14	.01	.022	.41	.04	.04	2.2
17	26.0	7.8	60	0.2	1.0	*	0.5	56	65.0	2.86	.67	3.53	0.2	.04	0	.16	.50	.07	.04	2.6
19	27.0	7.8	64	0.03	18.3	*	0.3	*	73.0	*	*	2.92	7.3	.00	0	.04	.50	.07	.02	2.5
21	20.0	7.6	72	a	0.2	*	0.1	*	*	5.35	.40	5.75	5.6	.00	0	.22	.32	.20	.09	2.0
23	*	*	*	*	*	*	*	*	366.8	*	*	*	*	*	*	*	*	*	*	*

Station	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Roron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (µg/l)	Zinc (mg/l)	Silica (mg/l)
14Mb	0	0	10	0	30	35.1	1200	130	0	*	0.5	1.5	0.05	4.7	6.6	1.6	*	*	*	*	6.5
14Mc	0	0	14	0	20	35.1	1600	86	0	*	0.5	1.5	0.05	4.7	14.1	1.7	*	*	*	*	6.4
14Ba	0	0	.8	0	17	34.5	2100	110	0	0	0.5	1.5	0.05	0.05	4.4	1.6	0	0	*	0.1	6.1
14Bb	0	0	16	0	22	34.5	1100	b	0	*	0.5	1.4	0.08	4.7	1.7	1.6	*	*	*	*	6.6
14Bc	0	0	6	0	17	35.1	1900	120	0	*	0.6	2.8	0.08	4.8	1.6	1.7	*	*	*	*	6.8
15a	0	0	10	0	15	*	2200	210	0	0	0.6	2.1	0.08	4.9	1.7	1.7	0	0	*	0.1	6.3
15b	0	0	10	0	30	*	1900	220	0	*	0.6	1.7	0.08	4.6	1.7	1.6	*	*	*	*	6.6
15c	0	0	8	0	13	*	545	180	0	*	0.5	1.4	0.07	4.8	1.7	1.7	*	*	*	*	6.6
17	0	0	10	0	32	39.0	2400	250	0	*	0.4	1.4	0.07	4.9	1.8	1.7	*	*	*	*	6.5
19	1.5	0	10	0	32	41.6	3500	b	0	*	0.4	1.6	0.08	4.8	2.4	1.8	*	*	*	*	6.3
21	0	0	20	0	15	46.8	75	60	0	*	1.2	2.2	0.20	7.1	3.3	1.0	*	*	*	*	17.0
23	*	*	*	*	*	*	1366	400	0	*	0.4	1.6	0.06	4.6	2.3	0.9	*	*	*	*	12.0

a = greater than depth

b = too numerous to count

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (µg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (µg/l)	Zinc (mg/l)
4a	25.5	6.7	58	0.2	1.0	7.25	1.0	*	*	3.58	.02	3.6	.01	.04	.01	.25	.40	.14	.09	*	1.3	0	8.0	0	89	37.7														
4b	25.5	6.5	58	0.2	1.0	7.3	1.0	*	*	*	*	4.2	.01	.03	.01	.29	.47	.16	.09	*	0	0	8.0	0	95	37.7														
4c	25.5	6.5	58	0.2	1.0	7.25	1.0	*	*	7.06	*	*	.02	.03	.01	.30	.46	.12	.08	*	1.3	0	12.0	0	72	37.7														
8	26.8	7.2	58	0.2	2.0	7.15	1.0	.04	*	5.06	*	4.3	.02	.01	.01	.25	.46	.12	.06	*	0	0	14.0	0	110	37.7														
9S	27.1	7.1	60	0.3	4.1	7.2	*	*	*	4.71	*	3.7	.04	.01	.01	.25	.41	.08	.04	*	1.6	0	12.0	0	89	39.0														
9M	25.1	4.3	58	*	4.1	7.2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	37.7														
9B	23.9	1.7	61	*	4.1	7.2	*	*	*	6.42	2.28	8.7	.04	.06	.01	.08	.44	.09	.04	*	0	0	12.0	0	113	39.7														
10S	26.5	7.6	58	0.5	4.0	7.7	*	*	*	6.96	*	4.2	.07	.02	.01	.11	.47	.06	.03	*	1.3	0	14.0	0	37	37.7														
10M	24.8	3.8	56	*	4.0	7.5	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	36.4														
10B	20.5	1.4	58	*	4.0	7.3	*	*	*	4.73	*	4.5	.05	.06	.01	.09	.57	.10	.04	*	0	0	12.0	0	65	37.7														
11	26.1	6.7	55	0.2	2.0	7.1	0.4	*	*	*	*	7.0	.00	.02	.01	.20	.46	.22	.07	*	1.3	0	12.0	0	113	35.8														
12S	27.5	7.9	58	0.3	6.1	3.2	*	*	*	9.09	*	5.3	.04	.02	.01	.21	.56	.10	.04	*	1.3	0	12.0	0	95	37.7														
12M	25.5	5.6	57	*	6.1	3.25	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	37.1														
12B	22.0	1.1	55	*	6.1	3.3	*	*	*	9.89	*	5.0	.06	.02	.01	.14	.48	.06	.05	*	1.3	0	14.0	0	82	35.8														
13S	27.1	7.2	57	0.2	3.8	3.0	*	*	*	6.21	*	4.5	.08	.02	.01	.20	.57	.09	.04	*	1.6	0	10.0	0	89	37.1														
13M	26.8	7.1	55	*	3.8	3.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	35.8														
13B	25.5	6.7	56	*	3.8	3.1	*	*	*	4.41	.59	5.0	.06	.01	.01	.16	.48	.06	.06	*	1.6	0	16.0	0	113	36.4														
14Sa	26.5	6.8	57	0.2	6.3	7.4	*	*	*	*	*	5.1	.02	.03	.01	.21	.47	.18	.07	*	1.3	0	10.0	0	122	37.1														
14Sb	26.5	6.7	57	0.2	6.3	7.35	*	*	*	3.80	1.20	5.0	.02	.03	.01	.21	.50	.07	.08	*	0	0	10.0	0	113	37.1														
14Sc	26.5	6.8	57	0.2	6.3	7.4	*	*	*	4.01	1.99	6.6	.02	.04	.01	.22	.55	.06	.07	*	1.6	0	10.0	0	103	37.1														
14Ma	26.2	6.2	56	*	6.3	7.05	*	*	*	5.94	*	5.8	.02	.02	.01	.24	.52	.09	.08	*	1.3	0	12.0	0	68	36.4														
14Mb	26.2	6.2	57	*	6.3	7.1	*	*	*	3.80	1.30	5.1	.01	.05	.01	.27	.60	.07	.08	*	1.6	0	12.0	0	125	37.1														

Amendment 2
(New)

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (µg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (µg/l)	Zinc (mg/l)
14Mc	26.2	6.2	57	*	6.3	7.05	*	*	*	*	*	3.7	.02	.04	.01	.17	.50	.09	.07	*	0	0	10.0	0	129	37.1														
14Ba	26.2	4.8	57	*	6.3	7.1	*	*	*	4.92	.28	5.2	.02	.06	.01	.24	.50	.05	.07	*	0	0	10.0	0	103	37.1														
14Bb	26.2	4.8	57	*	6.3	7.15	*	*	*	3.93	1.37	5.3	.02	.03	.01	.25	.50	.10	.06	*	1.6	0	12.0	0	122	37.1														
14Bc	26.2	4.7	57	*	6.3	7.1	*	*	*	5.67	*	4.5	.02	.03	.01	.25	.54	*	.06	*	1.6	0	8.0	0	118	37.1														
15a	26.5	6.6	57	0.2	1.0	7.3	0.8	*	*	4.39	*	*	.02	.02	.01	.24	.57	.08	.06	*	1.6	0	12.0	0	110	37.1														
15b	26.5	6.5	57	0.2	1.0	7.3	0.8	*	*	5.94	*	4.3	.02	.04	.01	.22	.58	.14	.07	*	1.6	0	10.0	0	106	37.1														
15c	26.5	6.6	57	0.2	1.0	7.35	0.8	*	*	5.14	*	3.4	.02	.04	.02	.27	.42	.08	.08	*	0	0	12.0	0	129	37.1														
17	27.0	6.3	58	0.2	1.0	7.2	0.5	53	*	8.08	*	4.4	.00	.04	.00	.03	.19	.08	.11	*	1.6	0	10.0	0	145	37.7														
21	20.0	7.4	60	a	0.1	7.9	0.1	*	*	5.27	*	4.3	.00	.02	.00	.04	.18	.03	.07	*	1.6	0	26.0	0	7	39.0														
23	19.5	7.6	58	a	0.1	4.7	0.2	*	*	5.06	*	3.0	*	*	*	*	*	*	*	*	*	0	10.0	0	9	37.7														

Amendment 2
(New)

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data

August 13, 1974

Amendment 2
(New)

Station	Temp. (c)	D.O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (µg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)
4a	22.5	7.9	*	0.1	1.5	6.5	0.8	*	79.3	1.87	2.30	4.17	*	.06	.01	.19	.39	.23	.04	*
4b	22.5	8.0	*	0.1	1.5	6.6	0.7	*	97.9	2.25	2.40	4.65	*	.05	.01	.20	.45	.18	.04	*
4c	22.5	8.0	*	0.1	1.5	6.6	0.8	*	56.5	*	*	*	*	.05	.01	.18	.46	.20	.04	*
8	23.5	7.3	*	0.2	2.0	7.7	0.7	207	78.4	*	*	*	*	.03	.01	.21	.42	.18	.04	*
9S	26.5	7.5	*	0.2	3.0	7.1	0	*	*	*	*	2.97	*	.03	.01	.13	.46	.15	.03	*
9M	24.0	7.2	*	*	3.0	6.9	0	*	*	*	*	*	*	*	*	*	*	*	*	*
9B	23.5	6.3	*	*	3.0	6.9	0	*	*	2.46	2.68	5.14	*	.05	.01	.18	.51	.22	.03	*
10S	25.0	7.6	*	0.3	5.0	7.0	*	*	*	2.46	5.37	8.83	*	.04	.01	.08	.45	.12	.03	*
10M	23.5	4.7	*	*	5.0	7.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10B	22.5	2.1	*	*	5.0	7.0	*	*	*	*	*	*	*	.35	.01	.08	.46	.17	.03	*
11	23.5	7.2	*	0.2	2.0	7.4	0.5	*	85.3	2.22	*	*	*	.02	.01	.20	.50	.18	.03	*
12S	26.0	8.2	*	0.2	4.5	7.4	0	*	*	2.78	*	*	*	.02	.01	.04	.49	.14	.02	*
12M	23.0	6.3	*	*	4.5	7.4	0	*	*	*	*	*	*	*	*	*	*	*	*	*
12B	22.0	3.3	*	*	4.5	7.4	0	*	*	2.43	*	*	*	.26	.02	.15	.53	.20	.06	*
13S	27.5	9.1	*	0.2	1.5	7.7	*	*	*	2.17	3.07	5.24	*	.04	.01	.08	.53	.17	.02	*
13M	25.0	7.5	*	*	1.5	7.7	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13B	23.5	6.1	*	*	1.5	7.7	*	*	*	2.03	*	*	*	.03	.01	.14	.53	.25	.02	*
14Sa	24.0	7.0	*	0.2	6.0	8.0	0.4	*	*	2.25	.74	2.99	*	.01	.01	.22	.44	.22	.03	*
14Sb	24.0	7.1	*	0.2	6.0	8.1	0.4	*	*	1.71	*	.75	*	.00	.01	.21	.39	.19	.03	*
14Sc	24.0	7.0	*	0.2	6.0	8.0	0.4	*	*	3.91	*	*	*	.01	.01	.16	.33	.17	.03	*
14Ma	23.5	7.3	*	*	6.0	8.1	*	*	*	1.61	*	.94	*	.01	.01	.21	.41	.20	.03	*
14Mb	23.5	7.2	*	*	6.0	8.2	*	*	*	1.96	1.49	3.45	*	.04	.01	.20	.45	.20	.03	*

Station	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (µg/l)	Zinc (mg/l)	Silica (mg/l)
4a	0	0	12	0	59	*	2600	440	0	0	.1	1.2	0	4.6	1.5	1.7	0	0	*	.05	6.1
4b	0	0	14	0	89	*	3000	540	0	*	0	1.2	0	4.3	1.5	1.6	*	*	*	*	6.0
4c	0	0	13	0	95	*	2100	380	0	*	.3	1.2	0	4.3	1.5	1.6	*	*	*	*	6.3
8	3.8	0	13	0	51	*	2000	270	0	*	.4	1.3	.1	6.2	1.8	1.9	*	*	*	*	5.8
9S	6.3	0	14	0	72	*	454	20	0	*	.1	1.2	.1	5.2	1.6	2.0	*	*	*	*	5.3
9M	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
9B	0	0	14	0	99	*	818	53	0	*	.5	1.3	.1	5.6	1.7	2.0	*	*	*	*	5.4
10S	0	0	18	0	59	*	1500	130	0	*	1.7	2.3	0	6.2	3.6	2.6	*	*	*	*	6.9
10M	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10B	0	0	11	0	89	*	636	170	*	*	*	*	*	*	*	*	*	*	*	*	*
11	2.1	0	12	0	56	*	1000	140	0	*	1.1	1.3	.1	5.0	1.6	1.8	*	*	*	*	5.8
12S	1.6	0	14	0	51	*	272	33	0	0	.4	1.2	0	4.3	1.6	1.8	0	0	<0.1	.03	5.7
12M	*	*	*	*	**	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12B	0	0	13	0	220	*	181	20	0	*	.6	1.4	.8	3.8	2.1	2.0	*	*	*	*	4.7
13S	0	0	13	0	75	*	2000	20	0	*	.3	1.1	.1	4.1	1.6	1.7	*	*	*	*	5.0
13M	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13B	0	0	9	0	75	*	1500	26	0	*	1.5	1.3	.3	4.3	1.8	2.0	*	*	*	*	6.0
14Sa	0	0	17	0	51	*	1600	210	0	0	.4	1.2	.1	4.6	1.6	1.7	0	0	<0.1	.2	5.6
14Sb	10.0	0	12	0	65	*	2200	230	0	*	.5	1.2	.1	4.8	1.8	2.1	*	*	*	*	5.6
14Sc	0	0	12	0	56	*	2400	190	0	*	.5	1.2	.1	4.5	1.6	1.6	*	*	*	*	5.8
14Ma	0	0	12	0	56	*	2100	160	0	*	.2	1.0	0	4.5	1.3	1.6	*	*	*	*	6.2
14Mb	0	0	14	0	63	*	1800	130	0	*	.6	1.2	0	4.5	1.7	1.8	*	*	*	*	5.7

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (µg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (µg/l)	Zinc (mg/l)	Silica (mg/l)
14Mc	23.5	7.2	*	*	6.0	8.2	*	*	*	*	*	*	*	.04	.01	.21	.51	.18	.03	*	0	0	14	0	42	*	3000	73	0	*	.4	1.2	0	4.4	1.7	1.6	*	*	*	*	7.2
14Ba	23.0	7.1	*	*	6.0	8.2	*	*	*	*	*	*	*	.03	.01	.22	.46	.18	.03	*	0	0	12	0	51	*	1600	170	0	0	0.6	1.2	0	4.5	1.8	1.7	0	0	<0.1	.08	5.5
14Bb	23.0	7.2	*	*	6.0	8.2	*	*	*	2.30	*	3.64	*	*	*	*	.48	.18	*	*	*	0	11	0	56	*	1200	20	0	*	0.6	1.2	0	4.4	1.6	1.7	*	*	*	*	5.8
14Bc	23.0	7.2	*	*	6.0	8.1	*	*	*	*	*	2.65	*	*	*	*	.44	.18	*	*	*	0	12	0	48	*	2000	180	0	*	0.3	1.2	*	4.4	1.6	1.6	*	*	*	*	6.0
15a	25.0	7.0	*	0.3	1.5	7.1	1.3	*	93.9	*	*	*	*	*	*	*	.45	.17	*	*	*	0	13	0	48	*	2500	200	0	0	1.0	1.2	0	4.5	1.5	1.6	0	0	<0.1	.1	7.3
15b	25.0	6.9	*	0.3	1.5	7.0	1.3	*	79.0	*	*	*	*	*	*	*	.41	.16	*	*	*	0	12	0	51	*	1272	150	0	*	0.3	1.2	0	4.7	1.6	1.6	*	*	*	*	5.8
15c	25.0	7.0	*	0.3	1.5	7.1	1.3	*	76.4	*	*	*	*	*	*	*	.48	.19	*	*	*	0	11	0	56	*	545	120	0	*	0.4	1.2	0	4.5	1.6	1.6	*	*	*	*	5.8
17	24.5	7.1	*	0.3	2.0	7.1	0.6	144	120.9	*	*	5.11	*	*	*	*	.58	.22	*	*	*	0	12	0	82	*	3000	*	0	*	0.6	1.2	0	4.4	1.5	1.7	*	*	*	*	6.6
19	24.0	6.9	*	0.2	2.0	7.8	0.9	*	*	*	*	5.75	*	*	*	*	.44	.30	*	*	*	0	15	0	110	*	4500	250	0	*	0.1	1.3	0	4.8	1.6	1.6	*	*	*	*	5.9
21	22.5	7.3	*	a	0.2	7.1	0.05	*	13.5	*	*	4.98	*	*	*	*	.19	.09	*	*	*	0	40	0	5	*	50	400	0	*	0.3	1.8	.1	7.1	2.1	1.1	*	*	*	*	13.6
23	22.0	7.4	*	a	0.3	6.9	0.1	*	16.9	*	*	*	*	*	*	*	*	.11	*	*	*	0	13	0	5	*	1233	*	0	*	0.1	1.6	.1	5.5	2.1	1.1	*	*	*	*	10.8

Amendment 2
(New)

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data

August 27, 1974
Page 1 of 2

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (µg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (mg/l)	Zinc (mg/l)
4a	26.8	7.5	*	0.2	1.0	7.8	1.0	*	42.2	*	*	3.26	.01	.06	.01	.22	*	.09	.04	4.5	0	0	13	0	29	*														
4b	26.8	7.5	*	0.2	1.0	7.9	1.0	*	43.2	*	*	1.60	.01	.06	.00	.23	*	.08	.04	2.5	1.5	0	15	0	17	*														
4c	26.8	7.45	*	0.2	1.0	7.8	1.0	*	37.9	*	*	1.63	.01	.06	.00	.23	*	.09	.03	2.5	1.5	0	14	0	27	*														
8	27.5	7.65	*	0.2	2.0	7.7	1.0	113	24.3	*	*	1.77	.01	.04	.00	.16	*	.15	.03	2.4	*	0	16	0	42	*														
9S	28.5	8.95	*	0.5	3.0	8.2	*	*	*	*	*	2.00	.01	.21	.00	.22	*	.09	.50	2.0	1.5	0	16	0	5	*														
9M	26.0	7.4	*	*	3.0	7.9	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*														
9B	24.5	0.9	*	*	3.0	7.8	*	*	*	*	*	*	.02	.05	.00	.21	*	.10	.03	2.5	3.2	0	15	0	9	*														
10S	27.5	9.5	*	0.6	6.0	8.2	*	*	*	*	*	2.22	.01	.05	.00	.22	*	.05	.04	3.4	0	0	16	0	11	*														
10M	25.0	6.4	*	*	6.0	8.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*														
10B	23.0	0.3	*	*	6.0	7.8	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*														
11	27.0	7.7	*	0.3	1.5	7.7	0.8	*	48.6	*	*	2.60	.02	.04	.00	.21	*	.11	.06	2.0	1.3	0	15	0	9	*														
12S	28.2	8.2	*	0.6	6.0	8.1	*	*	*	*	*	3.85	.01	.04	.00	.21	*	.07	.13	2.0	0	0	16	0	7	*														
12M	25.9	5.5	*	*	6.0	7.9	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*														
12B	23.0	0.4	*	*	6.0	8.0	*	*	*	*	*	2.57	.01	.05	.00	.22	*	.14	.04	1.5	0	0	18	0	42	*														
13S	30.0	8.3	*	0.5	2.0	8.2	*	*	*	*	*	1.93	.03	.14	.00	.08	*	.11	.08	1.4	0	0	15	0	9	*														
13M	27.0	7.1	*	*	2.0	8.0	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*														
13B	26.0	5.95	*	*	2.0	7.8	*	*	*	*	*	2.01	.04	.12	.00	.05	*	.27	.09	1.5	0	0	16	0	45	*														
14Sa	27.0	7.6	*	0.3	6.0	8.0	*	*	*	*	*	*	.03	.40	.01	.17	*	.12	.09	1.4	1.5	0	15	0	30	*														
14Sb	27.0	7.6	*	0.3	6.0	8.0	*	*	*	*	*	2.94	.02	.11	.01	.06	*	.11	.11	1.4	0	0	14	0	30	*														
14Sc	27.0	7.55	*	0.3	6.0	8.1	*	*	*	*	*	1.66	.01	.07	.00	.20	*	.11	.11	2.0	1.5	0	14	0	20	*														
14Ma	26.9	7.5	*	*	6.0	7.9	*	*	*	*	*	1.77	.01	.17	.00	.04	*	.11	.11	2.0	1.5	0	14	0	34	*														
14Mb	26.9	7.6	*	*	6.0	7.8	*	*	*	*	*	2.70	.02	.06	.00	.16	*	.14	.02	2.0	0	0	16	0	22	*														
14Mc	26.9	7.6	*	*	6.0	7.9	*	*	*	*	*	1.58	.02	.13	.00	.03	*	.06	.02	1.5	1.5	0	14	0	11	*														

Amendment 2
(New)

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data

August 27, 1974

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (µg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (mg/l)	Zinc (mg/l)
14Ba	26.8	7.7	*	*	6.0	7.7	*	*	*	*	*	1.61	.02	.02	.01	.22	*	.08	.16	1.6	1.5	0	14	0	13	*														
14Bb	26.8	7.6	*	*	6.0	7.8	*	*	*	*	*	2.35	.01	.19	.01	.24	*	.08	.35	2.0	0	0	14	0	13	*														
14Bc	26.8	7.6	*	*	6.0	7.8	*	*	*	*	*	1.86	.01	.02	.00	*	*	.12	.15	2.0	0	0	14	0	30	*														
15a	25.5	7.5	*	0.3	1.0	7.8	0.8	*	35.0	*	*	2.01	.01	.06	.00	.24	*	.10	.06	1.5	0	0	15	0	32	*														
15b	25.5	7.34	*	0.3	1.0	7.8	0.8	*	37.8	*	*	3.77	.01	.07	.00	.24	*	.10	.04	2.0	0	0	15	0	30	*														
15c	25.5	7.6	*	0.3	1.0	7.8	0.8	*	38.8	*	*	4.12	.01	.23	.00	.20	*	.06	.03	1.6	0	0	14	0	22	*														
17	28.0	7.4	*	0.3	1.0	7.6	*	72	37.9	*	*	1.66	.01	.03	.00	.20	*	.08	.04	1.6	0	0	15	0	24	*														
21	24.8	7.0	*	a	0.2	8.1	0.2	*	510.7	*	*	2.08	.04	.22	.00	.01	*	.17	.01	2.5	0	0	16	0	24	*														
23	25.0	6.9	*	a	0.2	8.4	0.2	*	9.5	*	*	*	0	.03	.00	.04	*	.10	.07	2.0	1.5	0	25	0	9	*														

a = greater than depth

b = too numerous to count.

Amendment 2
(New)

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data

September 11, 1974

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (µg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (µg/l)	Zinc (mg/l)	Silica (mg/l)
4a	26.0	5.9	76.5	0.3	1.0	6.2	1.0	*	29.8	3.34	*	3.10	0	.05	.01	.27	.66	.13	.05	5.3	1.8	0	16	0	39	49.7	*	*	.23	.02	.56	.93	.19	3.46	1.22	1.98	0	.010	<0.1	.028	19.0
4b	26.0	5.8	72.0	0.3	1.0	6.3	1.0	*	26.5	3.34	*	2.49	0	.05	.01	.26	.61	.11	.05	5.7	0	0	14	0	39	46.8	*	*	.40	0	.56	.96	0	2.94	1.24	1.76	0	.013	*	.032	19.5
4c	26.0	5.9	74.0	0.3	1.0	6.2	1.0	*	24.9	6.42	*	2.30	.01	.03	.01	.26	.64	.11	.05	5.7	0	0	15	0	42	48.1	*	*	.57	0	.56	.97	.10	4.50	1.35	1.61	0	.022	*	.020	19.3
8	23.0	7.5	72.0	0.3	1.0	7.4	0.8	88	32.1	3.69	*	3.56	.01	.06	.00	.26	.53	.11	.05	4.3	2.1	0	17	0	30	46.8	*	*	.40	*	.75	.95	.07	3.46	1.41	1.70	*	*	*	*	19.2
9S	22.3	7.6	72.0	0.4	2.0	8.3	*	*	*	2.68	*	2.65	.02	.09	.00	.14	.60	.09	.02	5.1	1.8	0	15	0	37	46.8	*	*	.23	*	.88	.86	0	4.67	1.15	1.65	*	*	*	*	18.3
9M	21.1	6.5	*	*	2.0	7.8	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
9B	20.5	5.4	75.0	*	2.0	7.7	*	*	*	*	*	3.88	.03	*	*	*	.64	.28	*	7.1	*	0	16	0	165	48.8	*	*	0	*	1.14	.80	0	4.49	.94	1.64	*	*	*	*	19.2
10S	22.5	7.25	78.0	0.5	4.1	8.3	*	*	*	*	*	*	.01	*	*	*	.73	.06	*	6.9	*	0	15	0	27	50.7	*	*	0	*	.62	.89	.02	4.50	1.20	1.73	*	*	*	*	18.3
10M	21.0	4.3	*	*	4.1	7.9	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
10B	20.4	0.3	76.5	*	4.1	7.8	*	*	*	3.85	*	2.65	.01	.27	.01	.11	.66	.14	.02	7.3	0	0	16	0	122	49.7	*	*	.26	*	1.01	.88	.37	4.50	1.20	1.69	*	*	*	*	18.6
11	22.6	7.4	76.5	0.2	2.0	7.4	0.5	*	32.6	2.43	.70	3.13	.01	.05	.00	.24	.64	.10	.05	5.5	1.6	0	16	0	37	49.7	*	*	.29	*	.49	.97	.05	4.15	1.32	1.63	*	*	*	*	19.0
12S	25.0	8.35	77.0	0.4	6.0	7.95	*	*	*	7.94	*	2.30	.02	.12	.00	.09	.62	.09	.02	6.2	0	0	15	0	27	50.1	*	*	.26	0	.49	.82	.21	3.63	1.05	1.66	0	.013	<0.1	.040	18.7
12M	21.4	5.7	*	*	6.0	7.8	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
12B	20.6	3.6	79.0	*	6.0	7.6	*	*	*	7.12	*	4.17	.01	.24	.01	.17	.69	.13	.03	5.1	1.6	0	17	0	82	51.4	*	*	.26	0	.62	.85	0	4.84	1.07	1.70	0	0	*	.040	19.1
13S	23.5	7.4	78.0	0.3	2.0	7.9	*	*	*	5.56	*	2.86	.01	.14	.00	.08	.67	.08	.03	4.9	1.6	0	16	0	42	50.7	*	*	0	*	.49	.86	.09	4.73	1.18	1.60	*	*	*	*	18.1
13M	23.2	7.5	*	*	2.0	7.9	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
13B	22.1	6.5	81.0	*	2.0	7.8	*	*	*	*	*	3.61	.02	*	*	*	.63	.12	*	5.2	*	0	16	0	56	52.7	*	*	2.26	*	.56	.92	0	3.46	1.11	1.58	*	*	*	*	18.6
14Sa	22.5	7.2	78.0	0.2	2.5	7.4	0.2	*	*	*	*	5.46	.01	*	*	.23	.63	.12	*	5.9	*	0	16	0	32	50.7	*	*	.60	0	.49	.93	.07	4.15	1.28	1.72	0	0	<0.1	.032	19.2
14Sb	22.6	7.3	81.0	0.2	2.5	7.4	0.2	*	*	6.79	3.10	9.89	.01	.05	.00	.24	.65	.13	.05	5.7	0	0	16	0	30	52.7	*	*	.54	0	.56	.93	.02	4.84	1.26	1.72	0	.015	*	.032	17.0
14Sc	22.6	7.25	*	0.2	2.5	7.4	0.2	*	*	3.72	*	2.30	.01	.06	.00	.25	.61	.12	.06	*	0	00	16	0	34	*	*	*	0	0	.62	.90	.03	5.53	1.22	1.80	0	0	*	.048	19.3
14Ma	22.5	7.3	*	*	2.5	7.4	*	*	*	*	*	3.08	.01	.05	.00	.24	.63	.11	.05	*	2.1	0	16	0	48	*	*	*	0	*	1.27	.87	.13	5.53	.81	1.76	*	*	*	*	21.0
14Mb	22.5	7.3	78.0	*	2.5	7.3	*	*	*	2.70	*	2.51	0	.05	.00	.25	.58	.12	.06	6.6	0	0	16	0	30	50.7	*	*	0	*	.56	.88	.19	4.15	1.05	1.86	*	*	*	*	19.6

Amendment 2
(New)

ER Table 2.5.0-1
Cherokee Nuclear Station
Water Quality Data

September 11, 1974

Station	Temp. (c)	D. O. (mg/l)	Spec. cond. (umhos)	Secchi depth (m)	Total depth (m)	pH	Current (m/sec)	Discharge (m^3/sec.)	Suspended sediments (mg/l)	D O C (mg/l)	P O C (mg/l)	T O C (mg/l)	Chlorophyll a (µg/l)	Ammonia (mg/l)	Nitrite (mg/l)	Nitrate (mg/l)	Total nitrogen (mg/l)	Total phosphate (mg/l)	Reactive phosphate (mg/l)	Chloride (mg/l)	Sulphate (mg/l)
14Mc	22.5	7.2	78.0	*	2.5	7.4	*	*	*	*	*	3.30	.01	*	*	*	.73	.11	*	6.3	*
14Ba	22.5	7.1	76.5	*	2.5	7.45	*	*	*	*	*	4.09	.01	*	*	*	.71	.11	*	7.0	*
14Bb	22.5	7.15	77.0	*	2.5	7.3	*	*	*	*	*	2.86	.01	*	*	*	.75	.10	*	7.0	*
14Bc	22.5	7.1	54.0	*	2.5	7.4	*	*	*	3.75	*	2.81	.01	.05	.00	.24	.74	.12	.05	4.6	0
15a	23.3	6.6	74.0	0.2	0.3	6.2	0.5	*	34.9	4.04	*	3.88	0	.06	.00	*	.80	.09	.04	4.6	0
15b	23.3	6.6	*	0.2	0.3	6.3	0.5	*	*	2.38	*	*	.01	.06	.00	.22	*	*	.04	*	0
15c	23.3	6.7	63.0	0.2	0.3	6.2	0.5	*	*	2.99	*	*	.01	.06	.00	.24	1.08	.09	.04	6.4	0
17	24.0	7.9	79.0	0.2	1.0	7.3	0.4	46	*	2.78	*	1.74	.02	.05	.00	.22	1.06	.09	.03	6.3	0
19	24.2	8.1	33.0	0.2	1.5	7.4	0.3	*	40.4	2.70	*	2.25	*	.04	.00	.23	1.00	.09	.03	4.9	0
21	21.7	6.0	79.0	a	0.2	6.2	0.25	*	10.0	*	*	1.69	.01	*	*	*	.91	.13	*	3.4	*
23	21.5	6.5	72.0	a	0.2	6.2	0.25	*	15.3	1.85	1.49	3.34	0	.03	.00	.08	.69	.12	.10	3.1	0

Station	Phenolphthalein alkalinity (mg/l)	Total alkalinity (mg/l)	Carbonate alkalinity (mg/l)	Turbidity (ppm as SiO_2)	T D S	Total coliforms (MPN/100 ml)	Fecal coliforms (MPN/100 ml)	Boron (mg/l)	Copper (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Manganese (mg/l)	Sodium (mg/l)	Calcium (mg/l)	Potassium (mg/l)	Cadmium (mg/l)	Chromium (mg/l)	Mercury (µg/l)	Zinc (mg/l)	Silica (mg/l)
14Mc	0	18	0	37	49.7	*	*	0	0	.75	.94	.02	4.84	1.11	2.00	0	*	*	*	19.1
14Ba	0	16	0	56	49.7	*	*	.11	0	1.01	.86	.19	4.15	.88	2.72	0	.033	0.1	.056	20.4
14Bb	0	18	0	54	50.1	*	*	.11	0	.56	.90	.15	5.19	1.15	1.67	0	.020	*	.040	17.6
14Bc	0	16	0	45	35.1	*	*	.97	0	.23	.56	.08	5.19	.88	1.64	0	.022	*	.028	18.1
15a	0	16	0	34	48.1	*	*	.69	0	.56	.98	0	3.80	1.35	1.64	0	.022	0.1	.036	18.6
15b	*	*	*	*	*	*	*	0	0	.69	.96	.17	5.01	1.20	1.85	0	0	*	.028	19.1
15c	0	14	0	34	41.0	*	*	.54	*	.62	.96	.09	4.84	1.22	2.08	0	0	*	.028	18.8
17	0	22	0	37	51.4	*	*	.26	*	.43	.98	.17	3.80	1.45	1.60	*	*	*	*	18.8
19	0	18	0	32	21.5	*	*	1.26	*	0	.57	0	4.67	.83	1.51	*	*	*	*	19.4
21	0	42	0	17	51.4	*	*	1.09	*	.56	1.03	0	7.61	2.24	1.63	*	*	*	*	46.3
23	0	24	0	15	46.8	*	*	.51	*	.17	.92	0	4.65	2.88	.91	*	*	*	*	36.0

Amendment 2
(New)

ER Table 2.5.1-1
Cherokee Nuclear Station
Description and site location of U.S.G.S.
gaging stations on the Broad River

1. Broad River near Boiling Springs, N. C.

Location - Latitude 35°12'35", longitude 81°41'50", on right bank half a mile upstream from Sandy Run Creek, 3 miles downstream from Second Broad River, and 3 1/2 miles southwest of Boiling Springs, Cleveland County.

Drainage area - 864 square miles

2. Broad River near Gaffney, S. C.

Location - Water-stage recorder, latitude 35°05'20", longitude 81°34'20", at bridge on U. S. Highway 29, 0.3 mile upstream from Cherokee Creek, 4.4 miles downstream from Gaston Shoals dam, and 4.5 miles east-northeast of Gaffney, Cherokee County.

Drainage area - 1,490 square miles

3. Broad River near Carlisle, S. C.

Location - Water-stage recorder, latitude 34°36', longitude 81°25', at bridge on State Highway 72, 2 miles upstream from Sandy River, 2 miles downstream from Seaboard Railway bridge, and 2 1/2 miles east of Carlisle, Union County.

Drainage area - 2,790 square miles

ER Table 2.5.1-2
Cherokee Nuclear Station
Chemical analyses of the Broad River, Parr, South Carolina

	Average	Minimum	Maximum
Total Dissolved Solids	71 ppm	36	178
Conductivity	62 µmhos	43	92
Total Alkalinity	24 ppm	15	33
Total Hardness	17 ppm	12	24
Calcium Hardness	12 ppm	6	18
Magnesium Hardness	5 ppm	2	8
Chlorides	6 ppm	4	9
Sulfates	4 ppm	2	13
Soluble SiO_2	12 ppm	7	24
Nitrates	0.8 ppm	0.55	1.0
phosphate	Trace	Trace	Trace
Chemical Oxygen Demand	16.8 ppm	1.9	46.9

* From SCE&G Broad River Sampling Program; mean of 21 samples from 8 June 1971 to 8 August 1972.

ER Table 2.5.1-3
Cherokee Nuclear Station
Suspended sediment concentrations, Broad River

Sampling Station Numbers

Sampling Period	UPSTREAM					DOWNSTREAM					TRIBUTARY						
	1	2	4	7	8	15	17	19	20	22	3	5	6	16	18	21	23
1 FSS	75	72	56		135	41	136	26	2						247		
2 SSS	154		92	102		18	33									25	
2 FSS	126	68	90	86	107	44	30	21	58		88	44	81	20	71		
3 SSS	171		27		44	17	50									51	34

FSS - Full Sampling Schedule
SSS - Short Sampling Schedule

* all concentrations in mg/liter

ER Table 2.5.1-4 Sheet 1 of 3
Cherokee Nuclear Station
Description of point pollution sources in Spartanburg, Cherokee and York Counties

Map No.	County	Facility Name	Type Facility	Volume of Discharge (mgd)	Receiving Stream
1	Spartanburg	Cowpens Truck Stop			
2		Jim's Trailer Park	Oxidation pond	0.01	Little Thickety Creek
3		S & J, Inc (Label Weaving)	oxidation pond	0.0025	Little Thickety Creek
4		Cowpens-Little Thickety Creek	oxidation pond	0.225	Little Thickety Creek
5	Cherokee	I-85 Rest Stations	extended aeration, chlorination	0.01	Thickety Creek
6		I-85 Rest Station	extended aeration, chlorination	0.01	Thickety Creek
7		Timken Company	oil removal, vacuum filtration sludge burial, holding pond	0.144	Beaverdam Creek
8		Gaffney	two-stage high rate trickling filter	1.0	Beaverdam Creek
9		Gaffney, Limestone Creek Plant	activated sludge	0.25	Limestone Creek
10		Gaffney	mechanical aerobic digestion, sludge holding tank, drying beds	0.5	Providence Creek

Cherokee Nuclear Station
Description of point pollution sources in Spartanburg, Cherokee and York Counties

Map No.	County	Facility Name	Type Facility	Volume of Discharge (mgd)	Receiving Stream
21		I-85 Filling Station & Restaurant	oxidation pond	0.0092	Tributary of Jumping Creek
22		Campbell Limestone Company	settling pond for quarry wash	0.288	Jumping Creek Kings Creek
23		Industrial Minerals, Inc.	settling pond	0.36	Manning Branch to Kings Creek
24	York	G & W Packing Company	mechanical aeration, oxidation pond	0.009	Beaverdam Creek
25		Hickory Grove Laund.			Bullocks Creek
26		Oxford Manufacturing Company	oxidation pond	0.006	

Source: South Carolina Department of Health and Environmental Control

ER Table 2.5.1-4 Sheet 2 of 3
Cherokee Nuclear Station
Description of point pollution sources in Spartanburg, Cherokee and York Counties

Map No.	County	Facility Name	Type Facility	Volume of Discharge (mgd)	Receiving Stream
11		Gaffney Board of Public Works	extended aeration, Clarifiers sludge return	3.0	People's Creek
12		Briarcreek S/D	extended aeration, chlorination	0.2208	Gilkey Creek
13		Round Man's Truck Stop			Buffalo Creek
14	Cherokee (contd)	Deering Milliken Magnolia Finishing Plant	Neutralization, 2 extended aeration lagoons, 2 clarifiers, sludge return, sludge holding lagoon	3.5	Buffalo Creek
15		Colonial Pipeline Company	heat exchanger, trap basin	40.0	Broad River
16		Stuckeys Pecan Shop	sub-surface sand filter followed by oxidation pond	0.0005	Tributary of Buffalo Creek
17		Blacksburg	aerated, lagoon, polishing pond	0.5	Canoe Creek
18		I-85 Welcome Station	extended aeration, chlorination	0.012	Tributary of Buffalo Creek
19		Monsanto Company Sanitary Sewage Plant	stabilization pond		Tributary of Buffalo Creek
20		Blacksburg	aerated lagoon	0.145	Doolittle Creek

ER Table 2.5.1-5
Cherokee Nuclear Station
Heavy Metal Concentrations Measured at Broad River Stations

Station	Heavy metal concentration (mg/l) Cu	Cd	Cr	Hg (x 10^{-3})	Zn
Period 1 - October 8, 1973					
4b	*	*	*	1.0	*
12b	*	*	*	1.3	*
14Ba	*	*	*	1.0	*
15a	*	*	*	1.1	*
Period 2 - November 6, 1973					
4a	0.03	0.0	0.0	1.4	0.03
12S	0.04	0.0	0.0	1.4	0.01
14Sa	0.03	0.0	0.0	1.4	0.01
14Ba	0.02	0.0	0.0	1.8	0.01
15a	0.02	0.0	0.0	1.3	0.01
Period 3 - December 4, 1973					
4a	0.02	0.0	0.0	1.0	0.04
12S	0.03	0.0	0.0	0.9	0.10
14Sa	0.02	0.0	0.0	1.4	0.03
14Ba	0.05	0.0	0.0	1.1	0.33
14Bb	*	*	*	1.0	*
15a	0.02	0.0	0.0	1.0	0.03
Period 4 - January 3, 1974					
4	0.04	0.0	0.0		0.22
12	0.03	0.0	0.0		0.28
14S	0.03	0.0	0.0		0.19
14B	0.03	0.0	0.0		0.18
15	0.03	0.0	0.0		0.25
Period 5 - January 29, 1974					
4	0.03	0.0	0.0		0.32
12	0.04	0.0	0.0		0.32
14S	0.03	0.0	0.0		0.35
14B	0.04	0.0	0.0		0.52
15	0.03	0.0	0.0		0.78

* Collection not intended or sample destroyed.

ER Table 2.5.2-1
Cherokee Nuclear Station
Temperature and Disolved Oxygen Data

STATIONS

Date		9			10			12			13		
		S	M	B	S	M	B	S	M	B	S	M	B
26 Sept. 73													
	Temp.	24.5		23.0				25.0		22.0	24.0		24.0
	D. O.	7.8		0.8				8.2		1.0	7.6		2.0
8 Oct. 73													
	Temp.	22.0		22.0	22.0		19.5	21.5		19.5	22.5		20.5
	D. O.	8.8		6.6	7.6		6.0	8.1		7.6	8.0		6.2
24 Oct. 73													
	Temp.	15.5		15.0	15.5		15.0	18.0		15.0	17.0		15.5
	D. O.	10.2		7.5	10.0		8.6	10.4		6.8	10.0		8.6
6 Nov. 73													
	Temp.	12.2	12.0	11.3	12.2	12.0	11.5	12.4	12.4	11.9	12.1	12.1	11.7
	D. O.	10.0	10.1	9.6	9.8	9.9	9.5	9.6	9.4	9.2	9.9	9.8	9.5
21 Nov. 73													
	Temp.	12.0	12.0	11.9	12.0	11.5	10.0	2.5	11.6	10.0	13.0	13.1	13.5
	D. O.	9.6	9.5	9.3	9.6	9.4	8.3	9.0	8.1	5.9	8.9	8.8	8.9
4 Dec. 73													
	Temp.	11.9	10.5	10.0	11.1	9.9	9.9	11.1	9.9	9.1			
	D. O.	7.7	7.4	6.3	8.4	6.6	5.9	9.35	9.1	8.0			
20 Dec. 73													
	Temp.	5.0	5.0	5.0	5.2	5.1	5.0	5.0	5.0	5.0	5.0	5.0	5.0
	D. O.	12.6	12.2	11.9	12.6	12.0	12.0	12.6	12.6	12.1	12.2	12.0	12.9
3 Jan. 74													
	Temp.	8.2	8.5	8.5	8.0	8.0	8.0	8.0	8.0	8.1	7.9	7.9	7.9
	D. O.	11.8	11.7	10.8	10.6	8.6	8.4	10.5	8.7	7.6	10.6	8.1	7.5

ER Table 2.5.2-1
Cherokee Nuclear Station
Temperature and Disolved Oxygen Data

STATIONS

		9			10					12		13	
Date		S	M	B	S	M	B	S	M	B	S	M	B
16 Jan. 74													
	Temp.	9.0	8.5	8.0	10.0	8.5	8.0	9.0	8.5	8.0	10.0	8.5	8.0
	D. O.	9.7	9.8	9.4	8.9	8.5	8.3	9.6	9.6	9.0	9.8	9.8	9.7
29 Jan. 74													
	Temp.	12.8	12.5	12.5	13.0	11.9	10.9	13.1	12.5	11.0	13.0	12.8	12.5
	D. O.	9.7	9.3	8.9	9.2	8.3	7.9	9.5	9.0	6.8	9.5	9.5	9.6
12 Feb. 74													
	Temp.	7.9	6.5	6.0	8.0	7.5	7.5	7.2	7.0	6.5			
	D. O.	10.7	10.7	10.7	10.2	10.2	9.9	10.8	10.7	10.3			
26 Feb. 74													
	Temp.	7.0	7.1	7.1	7.9	8.1	7.5	9.0	8.0	7.8	7.4	7.4	7.2
	D. O.	10.1	9.8	8.2	9.9	9.8	10.2	10.3	10.3	8.2	9.7	9.3	8.4
13 Mar. 74													
	Temp.	14.0	14.0	13.5	14.5	14.0	13.5	14.5	14.0	13.5	14.5	14.0	14.0
	D. O.	10.2	9.8	9.8	9.8	9.6	9.6	10.2	9.2	8.0	9.8	9.6	9.6
27 Mar. 74													
	Temp.	11.0	10.5	10.4	11.5	10.7	10.4	11.8	10.5	10.1	11.5	11.5	11.5
	D. O.	10.1	9.7	9.2	8.8	7.95	7.7	10.3	9.6	9.1	10.4	10.3	10.3
11 Apr. 74													
	Temp.	12.8	12.5	13.5	13.0	13.0	12.5	14.0	13.0	13.0	13.5	13.0	12.5
	D. O.	9.2	9.0	8.9	7.2	7.5	7.8	8.5	8.4	8.2	8.7	8.6	8.4

ER Table 2.5.2-1
Cherokee Nuclear Station
Temperature and Disolved Oxygen Data

STATIONS

Date		9 S	9 M	9 B	10 S	10 M	10 B	12 S	12 M	12 B	13 S	13 M	13 B
24 Apr. 74													
	Temp.	17.0	17.2	16.8	17.5	17.0	13.8	18.0	17.5	14.0	17.0	17.2	17.1
	D. O.	9.4	8.8	7.45	9.9	8.6	1.8	9.7	8.9	1.7	9.35	8.7	7.0
9 May 74													
	Temp.	19.9	17.8	17.0	20.5	18.5	15.0	20.5	18.0	16.1	22.0	22.0	20.0
	D. O.	8.8	9.6	9.1	9.1	9.95	1.1	9.8	8.7	4.1	9.2	9.6	9.0
22 May 74													
	Temp.	22.5		20.5	23.0		15.0	23.5		17.5	24.0		23.0
	D. O.	8.9		3.9	8.4		0.8	9.9		10.6	8.6		0.4
7 June 74													
	Temp.	24.1		21.5	23.5		16.4	24.8		18.1	25.0		23.0
	D. O.	7.8		3.3	8.5		0.7	8.1		0.4	8.5		4.1
19 June 74													
	Temp.	22.5		21.3	22.0		16.2	24.1		19.0	23.0		21.7
	D. O.	7.6		6.8	7.4		0.4	7.9		0.7	8.0		6.45
2 July 74													
	Temp.	22.0	20.0	20.0	24.0	20.0	16.0	24.0	22.0	20.0	24.0	23.0	22.0
	D. O.	8.0	6.5	2.2	8.5	4.2	1.5	8.6	6.6	1.8	8.1	7.0	4.2
17 July 74													
	Temp.	27.8		24.0	27.0		17.8	28.5		22.0	28.0		
	D. O.	8.4		0.7	8.4		0.4	7.7		0.3	7.6		

ER Table 2.5.3-1
Cherokee Nuclear Station
Estimates of Mean Monthly Flows of Site Creeks

Month	Mean Monthly Flow of Broad River at Gaffney (cfs/sq. mi.)	McGowans Creek (D.A. 2.4 sq. mi.) (cfs)	Site Creek into Sedimentation Basin (D.A. .4 sq. mi.) (cfs)
Jan.	1.8	4.3	.7
Feb.	2.3	5.5	.9
Mar.	2.6	6.2	1.0
Apr.	2.4	5.8	1.0
May	1.6	3.8	.6
Jun.	1.5	3.6	.6
Jul.	1.2	2.9	.5
Aug.	1.2	2.9	.5
Sep.	1.1	2.6	.4
Oct.	1.4	3.4	.6
Nov.	1.2	2.9	.5
Dec.	1.6	3.8	.6

ER Table 2.5.4-1 (Sheet 1 of 2)
Cherokee Nuclear Station
Rock Permeability Test Results

Boring Number	Depth of Test Section (Ft)		Head (Ft)	Flow Rate (GPM)	K_h (1) (Ft/Yr)
B-11	92.8	104	139	9.2	304
	119.2	130.4	171	4.2	113
B-23	45.2	56.2	37	9.7	1203
	56.2	67.3	29.2	11.0	1728
	67.3	78.3	30.4	10.8	1630
	78.3	89.3	72	.3	19
B-45	139.0	150.2	182	1.2	30
	150.2	161.4	181	.05	1
	161.4	172.6	133	.08	3
	161.4	172.6	180	.04	1
B-49	66.5	77.7	165	No Measurable Flow	
B-51	62.6	73.8	142	9.6	310
	73.8	85.0	141	9.7	316
B-64	43.9	55.1	121	16.2	614
	55.1	66.3	79	15.4	894
	66.1	77.3	188	1.8	44
	77.3	88.5	209	1.5	33
	88.1	99.3	186	.6	15
	99.7	110.9	207	.2	5
B-70	54.0	65.0	58	.8	60
	61.7	72.7	51	1.0	90
	72.7	83.8	51	1.5	136
	83.8	94.8	51	.05	4
	94.8	105.8	51	No Measurable Flow	
B-95P	39.8	50.8	58	1.0	76
	48.7	59.7	56	.7	58
	58.7	69.8	80	No Measurable Flow	
	69.8	80.9	92	.03	2
	80.9	91.9	103	.1	5
	91.9	103.0	105	No Measurable Flow	
B-105	52.8	63.8	67	No Measurable Flow	
B-115	61.2	72.2	31	4.53	667
	63.2	74.3	48	2.18	210
	63.2	74.3	32	1.62	235

(1) Horizontal Permeability

ER Table 2.5.4-1 (Sheet 2 of 2)
Cherokee Nuclear Station
Rock Permeability Test Results

Boring Numer	Depth of Test Section (Ft)		Head (Ft)	Flow Rate (GPM)	K_h(1) (Ft/Yr)
B-117	23.5	34.5	32	No Measurable Flow	
B-119	64.5	76.5	35	9.6	1258
	90.5	101.5	49	0.45	42
B-121	38.8	50.0	45	5.2	535
	48.6	59.8	42	6.7	732
	58.7	69.8	49	3.3	306
	68.6	79.7	45	0.7	72
B-122	71.2	82.8	57	0.007	<1
	81.2	92.4	57	0.02	2
B-126	18.6	29.7	13	12.6	4314
	22.8	33.8	17	12.2	3372
	33.7	44.8	47	0.34	33
B-129P	74.0	85.0	36	1.3	168
	86.4	97.4	36	No Measurable Flow	
	97.4	108.5	38	No Measurable Flow	
	108.5	119.5	36	No Measurable Flow	
B-144P	61.1	72.2	35	1.17	155
	71.5	82.6	34	0.9	121
	81.5	92.6	34	0.12	17
	92.5	103.7	34	No Measurable Flow	
	103.7	114.7	34	No Measurable Flow	

(1) Horizontal Permeability

ER TABLE 2.5.4-2 (Sheet 1 of 4)

SOIL PERMEABILITY TEST RESULTS
CONSTANT HEAD FIELD TESTS
CHEROKEE NUCLEAR STATION

Boring Number	Depth of Test Section (Ft)	Total Head (Ft)	Q (GPM) (1)	K_h(Ft/Yr) (2)	Soil and Rock Type
BP-11	0.0 3.0	(3)		<1	
	15.0 35.0	18	.8	125	Sandy Silt
	42.0 60.0	18	.00067	<1	Sandy Silt, Silty Sand
B-49	0.0 3.0	(3)		34	Sandy Silt
	10.0 23.5	(3)		<1	Sandy Silt
	22.0 33.5	22	1.14	233	Sandy Silt
	35.0 54.5	22	0.000058	<1	Sandy Silt, Silty Sand
B-51	0.0 2.9	(3)		3	Sandy Silt
	5.0 15.0	13	.4	169	Sandy Silt, Silty Sand
	25.0 35.0	33	.4	66	Sandy Silt, Silty Sand
	38.1 53.1	36	.003	<1	Silty Sand
B-64	0.0 3.0	(3)		1	Clayey Silt
	7.0 17.0	12	.0004	<1	Sandy Silt
	20.0 35.0	28	.0009	<1	Silty Sand
	36.0 56.0	32	.02	2	Silty Sand, Felsic Gneiss
B-70	0.0 5.8	(3)		<1	Sandy Silt
	11.5 20.0	15	0.014	5	Silty Sand
	21.4 32.5	27	0.185	31	Silty Sand
	31.4 47.6	28	0.0002	<1	Silty Sand
B-105	0.0 5.7	(3)		2	Clayey Silt and Silt
	8.0 28.0	18	0.85	131	Silt
	28.2 48.0	(3)		<1	Silt, Sandy Silt, Mafic Gneiss

(1) Q=flow rate into piezometer

(2) K_h=horizontal permeability

(3) Variable head test

ER TABLE 2.5.4-2 (Sheet 2 of 4)

SOIL PERMEABILITY TEST RESULTS
CONSTANT HEAD FIELD TESTS
CHEROKEE NUCLEAR STATION

Boring Number	Depth of Test Section (Ft)		Total Head (Ft)	Q (GPM)(1)	K_h(Ft/Yr)(2)	Soil and Rock Type
B-115	26.8	35.0	2.7	0.079	166	Silty Sand, Silt, Sandy Silt
	34.8	39.5	(3)		<1	Sandy Silt, Silty Sand
	48.0	51.5	(3)		<1	Silty Sand, Sandy Silt
B-119	7.0	12.0	11	0.16	111	Sandy Silt
	22.0	27.0	(3)		<1	Sandy Silt
	27.0	35.0	(3)		<1	Silty Sand
B-121	0.0	6.0	(3)		<1	Sandy Silt
	7.0	19.0	13	1.83	582	Silty Sand, Sandy Silt
	10.0	30.0	15	0.16	29	Silty Sand, Sandy Silt
	30.0	33.0	(3)		<1	Sandy Silt
B-122	0.0	6.0	(3)		45	Sandy Silt
	10.0	25.0	18	0.32	66	Sandy Silt
	25.0	35.0	(3)		<1	Sandy Silt
	35.0	45.0	37	0.1	13	Sandy Silt
	52.0	66.0	(3)		<1	Silty Sand
B-126	0.0	6.0	(3)		<1	Silt
B-129P	0.0	5.3	(3)		<1	Clayey Silt
	11.0	21.0	8	0.104	61	Clayey Silt, Sandy Silt
	21.0	42.0	8	0.000056	<1	Sandy Silt
	60.0	69.4	8	0.000068	<1	Sandy Silt, Silty Sand

(1) Q=flow rate into piezometer

(2) K_h=horizontal permeability

(3) Variable head test

ER Table 2.5.4-2 (Sheet 3 of 4)
Cherokee Nuclear Station
Soil Permeability Test Results
Laboratory Tests on Remolded Samples
Compacted to 95% of Standard Proctor Wet of Optimum

Test Pit	Depth of Test Section (Ft)	Permeability cm/sec	Permeability[1] ft/yr
BTP-1	2.0-3.0	3.5×10^{-8}	0.0365
BTP-1	10.0	4.6×10^{-7}	0.473
BTP-2	5.0-7.0	8.3×10^{-7}	0.855
BTP-4	3.0	1.5×10^{-7}	0.150
BTP-4	8.0	2.5×10^{-6}	2.54
BTP-5	2.0	3.2×10^{-7}	0.332
BTP-6	2.0-2.5	1.3×10^{-7}	0.139
BTP-6	9.0	4.4×10^{-7}	0.454
BTP-9	2.0	2.5×10^{-8}	0.0254
BTP-9	5.5	1.3×10^{-6}	1.34
BTP-11	6.5	1.8×10^{-7}	0.189
BTP-12	2.5	2.9×10^{-8}	0.0304
BTP-12	8.0	8.1×10^{-7}	0.843
BTP-13	1.5	2.9×10^{-8}	0.0297
BTP-13	6.0	1.2×10^{-6}	1.28
BTP-14	2.0	2.6×10^{-8}	0.0272
BTP-14	7.5	1.7×10^{-6}	1.80
BTP-15	6.0	2.0×10^{-7}	0.204
BTP-18	3.0	2.8×10^{-8}	0.0288
BTP-27	7.0	6.3×10^{-7}	0.655

(1) Vertical Permeability

ER Table 2.5.4-2 (Sheet 4 of 4)
Cherokee Nuclear Station
Soil Permeability Test Results
Laboratory Tests

Boring Number	Depth of Test Section (Ft.)		Unified Soil Classification	K_V (Ft/Yr) (1)
B-18	8.7	10.7	ML	123
B-18	28.7	30.2	ML	73
B-18	52.5	54.2	ML	122
B-18	65.2	67.5	ML	33
B-25	18.2	19.1	SM	42
B-37	12.7	13.7	SM	5
B-38	22.3	23.2	SM	73
B-38	32.6	34.0	SM	264
B-40	0.0	1.4	SM	5
B-40	22.0	23.1	SM	49
B-47	7.5	9.7	ML	73
B-48	37.9	39.8	ML	28
B-49	17.3	17.9	ML	35
B-49	27.5	29.1	ML	77
B-50	7.5	9.5	MH	54
B-50	17.5	18.8	ML	117
B-50	27.5	29.3	ML	49
B-51	30.0	32.0	SM	191

(1) K_V=vertical permeability

ER Table 2.5.4-3 (Sheet 1 of 5)
Cherokee Nuclear Station
Summary of Residential Well Survey Data

Well Number	Owner or Description	Diameter In.	Total Depth Ft	Depth to Water Ft	Flow Rate GPM	Surface* Elevation	Remarks-Driller
A	Smith Davis	24	48	34		691	Hand Dug
B	Wayne E. Stepp	24	47	34		688	Hand Dug
C	R. B. Peterson					680	
D	Danny Cain	24	65	38		650	Arnold Drill Company
E	William T. Mullinx	24	48	28		661	
F	Al Mullinx	24	47	40		661	Hand Dug
G	Pat McKown	24	36	25		681	Rented House-Hand Dug
H	Pat McKown	24	62	42		730	Well is Not Used-City Water
I	Annie McAbee	6				723	
J	Boyce McAbee	24	32	28		721	Well not Used-Spring Used
K	Jack Orr	8	145	45	4	650	Arnold Drill Company

*Note: Surface Elevations Estimated from Duke Power Company Topographic Map Dated September, 1973.

ER Table 2.5.4-3 (Sheet 2 of 5)
Cherokee Nuclear Station
Summary of Residential Well Survey Data

Well Number	Owner or Description	Diameter In.	Total Depth Ft	Depth to Water Ft	Flow Rate GPM	Surface* Elevation	Remarks-Driller
1	Pearl Peterson					671	No Well, Water Supplied by Spring
2	David Peterson	24	100	67		688	Spangler of Shelby, N. C.
3	Brent Upchurch	24	80	58		689	Man Owens
4	J. D. Upchurch	24	47	37		691	Falkner of Kings Creek, S. C.
5	Boyce Sellars	24	49	42		685	
6	Larry Hughey	24	63	39		672	
7	Larry Hughey	26	33	25		670	Abandoned House
8	McKowns Mt. Church	24	65	41		661	
9	Ralph Mosley	24	55	40		662	
10	Lamar Mullinx	24	75	55		655	Lower Capacity Well
11	Lewis F. Moss	24	75	55		653	Higher Capacity Well
12	Vacant House	24	51	51		665	
13	Dean Upchurch					538	No Well, Water Supplied by Spring
14	Bonnie Sellars	24	33	25		680	

* Note: Surface Elevations Estimated from Duke Power Company Topographic Map Dated September, 1973.

ER Table 2.5.4-3 (Sheet 3 of 5)
Cherokee Nuclear Station
Summary of Residential Well Survey Data

Well Number	Owner or Description	Diameter In.	Total Depth Ft	Depth to Water Ft	Flow Rate GPM	Surface* Elevation	Remarks-Driller
15	Dobson Mullinx	24	29	14		660	
16	Margaret Peeler	24	76	33		652	
17	Marvin Mullinx	24	60	32		668	
18	J. Cash	24	65	35		646	
19	Wilton Stroupe	6-1/2	149	15	25	648	House Removed, Well Filled with Rocks
20	Minnie Stroupe	6-1/2	150	17	25	660	
21	Noal Lawson	24	59	41		651	
22	Milles Mullinx	8	55	38		635	
23	Stroupe	24	61	37		645	
24	Rose Spencer	24	62	36		639	

* Note: Surface Elevations Estimated from Duke Power Company Topographic Map Dated September, 1973.

ER Table 2.5.4-3 (Sheet 4 of 5)
Cherokee Nuclear Station
Summary of Residential Well Survey Data

Well Number	Owner or Description	Diameter In.	Total Depth Ft	Depth to Water Ft	Flow Rate GPM	Surface* Elevation	Remarks-Driller
25	Sam Erwin	24	56	37		635	House Removed
26	J. R. Stroupe	6	250	110	7-10	640	Falkner of Kings Creek, S. C.
27	Nancy Huey Owens	24	52	41		620	
28	Lamar Mullinx	24	96	72		630	
29	Owner-Junior Erwin Resident-Richard Sellars	24	79	57		605	
30	Junior Erwin	24	74	64		600	House Removed
31	Owner-Erwin Resident-Mackabe	24	44	34		545	
32	Jesse Peterson	8	147	55	16	601	Falkner of Kings Creek, S. C.
33	Bob Upchurch	6	85		7	589	Falkner of Kings Creek, S. C. Claims Hard Water
34	J. C. Upchurch	6	116	31	12	571	Artesian Water Below 105 ft. Falkner of Kings Creek, S. C.
35	Albert Hughey	24	40	30		633	

* Note: Surface Elevations Estimated from Duke Power Company Topographic Map Dated September, 1973.

ER Table 2.5.4-3 (Sheet 5 of 5)
Cherokee Nuclear Station
Summary of Residential Well Survey Data

Well Number	Owner or Description	Diameter In.	Total Depth Ft	Depth to Water Ft	Flow Rate GPM	Surface* Elevation	Remarks-Drilled
36	Nesbitt Stroupe	18	65	49		654	White Scale in Well
37	Boyd Childers		10			520	Spring Dug Out
38	Roy Parker	24	73	32		520	Roebucks
39	C. R. Davis		44	32		520	Old Well
		24	61	32		520	Well in Use
40	Wilton Stroupe	6-1/2	165	28	12	520	
41	Emma Upchurch	24	83	75		715	
42	Effie Mullinx	24	51	39		709	

*Note: Surface Elevations Estimated from Duke Power Company Topographic Map Dated September, 1973.

ER Table 2.5.4-4 (Sheet 1 of 2)
Cherokee Nuclear Station
Results of Physical and Chemical Tests on Groundwater

	SPRING NUMBER (SEE DRAWING 2B-2)						DOMESTIC WELL NUMBER				
	4A,B 5A,B	8,9	11A,B 10,12	18	19,20	26	2	6	7	11	13
pH	5.90	6.20	6.50	6.20	6.55	6.20	7.00	7.75	7.35	7.25	6.65
Dissolved Solids	65.6	56.0	56.0	36.0	60.0	24.0	88	152	488	116	68
Alkalinity Bicarbonate AS $CaCo_3$	12	32	32	24	36	12	56	108	256	60	48
Total Hardness	17.8	21.4	21.4	14.2	17.8	7.1	42.73	96.15	299.14	56.98	28.49
Silica	6.75	5.80	6.50	9.00	5.80	10.50	6.75	4.00	20.00	2.25	5.75
Iron	<0.05	0.10	<0.05	<0.05	0.10	0.20	<0.05	<0.05	<0.05	<0.05	<0.05
Calcium	0.4	5.7	5.7	2.9	4.3	1.4	9.98	21.39	88.41	12.83	2.85
Magnesium	0.2	1.7	1.7	1.7	1.7	0.9	4.26	10.21	18.73	5.96	5.11
Chloride	0.9	2.8	4.0	1.1	1.7	4.6	0.04	0.32	0.60	0.04	0.32
Sulfate	6.0	1.9	1.2	1.9	1.9	6.0	0.24	1.36	4.36	0.30	0.68
Turbidity	8	4	4	4	4	8	2	4	4	4	8
Specific Conductance (Micromhos)	82.0	70.0	70.0	45.0	75.0	30.0	100	190	610	145	85

Note: All results in parts per million except pH, Turbidity and Specific Conductance

ER Table 2.5.4-4 (Sheet 2 of 2)
Cherokee Nuclear Station
Results of Physical and Chemical Tests on Groundwater

	DOMESTIC WELL NUMBER								BORING NUMBER		
	21	24	26	31	32	33	36	39	B-52	B-65	B-68
pH	6.40	7.65	6.80	7.80	6.45	7.15	7.00	6.95	6.05	5.80	6.10
Dissolved Solids	56	160	64	224	40	48	48	248	63	40	52
Alkalinity Bicarbonate AS $CaCO_3$	36	104	44	128	28	32	32	80	36	24	32
Total Hardness	39.17	106.84	32.05	142.45	10.68	17.81	28.49	96.15	24.93	14.24	21.37
Silica	14.50	20.00	16.00	10.50	12.00	12.75	12.75	13.25	5.50	4.50	9.50
Iron	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.10	0.10	1.25	1.05	1.30
Calcium	8.56	34.22	4.28	47.06	0.71	2.14	4.99	24.24	4.28	0.71	2.14
Magnesium	4.26	5.11	5.11	5.96	2.13	2.98	3.83	8.51	3.40	2.98	3.83
Chloride	0.32	0.32	0.88	0.60	0.60	1.00	0.60	5.12	0.88	1.68	1.68
Sulfate	0.54	0.30	0.24	0.18	0.18	0.18	0.30	0.50	0.50	1.50	0.54
Turbidity	6	0	8	6	12	4	0	10	42	39	30
Specific Conductance (Micromhos)	70	200	80	280	50	60	60	310	78	50	65

Note: All results in parts per million except pH, Turbidity and Specific Conductance

ER TABLE 2.5.4-5

GROUNDWATER LEVELS
IN OFFSITE OBSERVATION WELLS
CHEROKEE NUCLEAR STATION

	BORING NUMBER	GROUND SURFACE ELEVATION	WATER SURFACE ELEVATION	DATE MEASURED
	BW-1	646.4	599	10-2-73
	BW-2	621.5	597	10-2-73
	BW-3	556.3	531	10-23-73
	BW-4	578.7	550	10-23-73
	BW-5	572.8	553	10-23-73
	BW-6	606.9	558	10-23-73
	BW-7	605.9	565	10-23-73
	BW-8	622.5	575	10-23-73
	BW-9	624.5	567	10-23-73
	BW-10	599.5	566	10-23-73
	BW-11	573.9	546	10-23-73
2	BW-12	586.1	556	10-23-73
	BW-13	546.0	541	10-23-73
	BW-14	584.8	545	10-23-73
	BW-15	551.0	545	10-23-73
	BW-16	569.5	543	10-23-73
	BW-17	585.3	555	10-23-73
	BW-18	574	524	11-9-73
	BW-19	672	628	11-9-73
	BW-20	578	527	11-16-73

ER TABLE 2.5.4-5 (CONT'D.)
GROUNDWATER LEVELS
IN OFFSITE OBSERVATION WELLS
CHEROKEE NUCLEAR STATION

	BORING NUMBER	GROUND SURFACE ELEVATION	WATER SURFACE ELEVATION	DATE MEASURED
	BW-21	676	639	11-9-73
	BW-22	684	635	11-9-73
	BW-23	664	633	11-9-73
	BW-24	634	574	12-6-73
	BW-25	607	562	11-9-73
	BW-26	587	552	11-9-73
	BW-27	586	546	11-9-73
	BW-28	619	584	11-9-73
	BW-29	667	641	11-9-73
2	BW-30	657	633	11-9-73
	BW-31	634	586	11-9-73
	BW-32	605	558	11-9-73
	BW-33	629	588	11-9-73
	BW-34	587	577	11-9-73
	BW-35	559	521	12-14-73
	BW-36	567	517	12-14-73
	BW-37	622	572	12-6-73
	BW-38	640	603	12-6-73

ER Table 2.6.1 -1
Cherokee Nuclear Station
Vicinity Climatology

Month	Temperature: Daily Maximum	Temperature: Daily Minimum	Temperature: Monthly	Temperature: Record Highest	Temperature: Record Lowest	Precipitation: Normal Monthly	Precipitation: Maximum Monthly	Precipitation: Minimum Monthly	Precipitation: Maximum 24 Hour	Snow-Sleet: Normal Monthly	Snow-Sleet: Maximum Monthly	Snow-Sleet: Maximum 24 Hour	Fog: Mean Number of Days*	Humidity: Mean Relative Humidity	Humidity: Mean Dew Point	Wind: Mean Speed	Wind: Prevailing Direction	Wind: Mean Resultant	Wind: Record Speed**	Wind: Record Direction
January	52.1	34.7	43.4	80	5	4.51	12.00	1.40	3.50	1.0	7.0	5.0	3	72	32	7.4	SSW	WNW/3	73	NE
February	55.0	35.8	45.4	78	9	4.23	8.80	1.06	3.11	0.9	7.1	7.1	3	68	32	7.7	NE	----	56	NE
March	62.1	41.3	51.7	87	14	4.49	10.83	2.02	3.34	0.3	5.8	5.8	2	63	37	8.2	SW	----	63	NW
April	71.4	49.5	60.5	90	28	3.55	10.00	0.98	4.27	0.0	0.0	0.0	1	62	45	7.9	SW	SW/3	66	NW
May	79.7	57.9	68.8	98	39	3.45	7.46	0.04	4.05	0.0	0.0	0.0	1	68	57	6.7	SW	----	65	SW
June	87.7	66.7	77.2	104	51	3.00	5.98	1.14	2.46	0.0	0.0	0.0	+	68	63	6.2	SW	----	52	N
July	88.7	69.1	78.9	103	55	4.70	9.84	1.55	3.28	0.0	0.0	0.0	+	75	67	5.9	SW	SSW/2	60	N
August	87.1	68.2	77.7	101	55	4.69	8.92	0.89	5.03	0.0	0.0	0.0	1	78	67	5.9	NNE	----	70	SE
September	82.8	63.5	73.2	101	41	3.68	9.43	0.13	5.50	0.0	0.0	0.0	1	78	62	6.2	NE	----	47	NE
October	72.8	51.5	62.2	95	29	3.40	10.59	0.22	6.85	T	T	T	1	70	50	6.5	NNE	NNE/4	79	N
November	61.1	41.3	51.2	83	11	2.97	9.17	0.56	3.41	T	0.4	0.4	3	69	38	6.8	SW	----	52	SW
December	52.5	35.2	43.9	78	9	3.99	10.00	0.69	4.14	0.8	11.8	11.2	4	72	31	7.0	SW	----	50	SW
Year	71.1	51.2	61.2	104	5	46.66	12.00	0.04	6.85	3.0	11.8	11.2	20	68	48	6.9	SW	----	79	N

Key * Number of days of heavy fog (visibility equal to or less than 1/4 mile)
** Speed based on fastest mile of air
+ Less than 1/2 day

Note Temperature and dew point in °F, precipitation and snow-sleet in inches (T indicates trace of precipitation), relative humidity in %, wind speed in miles hour.

Amendment 3
(Entire Table Revised)

Vicinity Climatology (cont'd)

Extreme Value Station: Spartanburg

Extreme Value: Record Highest Temperature

Date Occurred:	J	F	M	A	M	J	J	A	S	O	N	D
	1949	1938	1935	1946	1941	1954	1952	1956	1939	1954	1946	1955

Period of Record: 27 years

ER Table 2.6.1-1

Vicinity Climatology (cont'd) Q 2.6.2

Extreme Value Station: Spartanburg

Extreme Value: Record Lowest Temperature

Date Occurred:	J	F	M	A	M	J	J	A	S	O	N	D
	1940	1936	1943	1944	1940	1956	1933	1942	1947	1952	1950	1957

Period of Record: 27 years

Vicinity Climatology (cont'd)

Extreme Value Station: Spartanburg

Extreme Value: Maximum Monthly Precipitation

Date Occurred:	J	F	M	A	M	J	J	A	S	O	N	D
	1936	1956	1952	1936	1938	1934	1941	1949	1945	1936	1948	1931

Period of Record: 27 years

ER Table 2.6.1-1

Vicinity Climatology (cont'd)

1 Q 2.6.2

Extreme Value Station: Spartanburg

Extreme Value: Minimum Monthly Precipitation

Date Occurred:	J	F	M	A	M	J	J	A	S	O	N	D
	1956	1947	1949	1942	1936	1954	1932	1954	1954	1954	1942	1955

Period of Record: 27 years

ER Table 2.6.1-1

Vicinity Climatology (cont'd)

Extreme Value Station: Spartanburg

Extreme Value: Maximum 24 Hour Precipitation

Date Occurred:	J	F	M	A	M	J	J	A	S	O	N	D
	1943	1955	1944	1936	1938	1949	1945	1940	1956	1949	1948	1931

Period of Record: 27 years

1 ER Table 2.6.1-1

Vicinity Climatology (cont'd) Q 2.6.2

Extreme Value Station: Spartanburg

Extreme Value: Maximum Monthly Sleet, Snow

Date Occurred:	J	F	M	AA	M	J	J	A	S	O	N	D
	1940	1948	1942	0	0	0	0	0	0	1937	1951	1935

Period of Record: 27 years

ER Table 2.6.1-1

Vicinity Climatology (cont'd)

Extreme Value Station: Spartanburg

Extreme Value: Maximum 24 Hour Sleet, Snow

Date Occurred:	J	F	M	A	M	J	J	A	S	O	N	D
	1940	1948	1942	0	0	0	0	0	0	1937	1951	1935

Period of Record: 27 years

ER Table 2.6.1-1

Vicinity Climatology (cont'd)

1

Extreme Value Station: Greenville Q 2.6.2

Extreme Value: Record Wind Speed, Fastest Mile

Date Occurred:	J	F	M	A	M	J	J	A	S	O	N	D
	1948	1948	1955	1942	1952	1953	1951	1954	1950	1946	1947	1957

Period of Record: 14 years

ER Table 2.6.2-1
Cherokee Nuclear Station
Low Level Tower Meteorological Survey

CHEROKEE METEOROLOGY SURVEY LOW LEVEL TOWER DATA — FOR PERIOD SEPT 11 1973 - SEPT 11 1974

SUMMARY OF PASQUILL A — WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR,PERCENT)

DATE OF REPORT 10-22-74

WIND SECTOR	ITEM	SECTOR TOTAL	WIND SPEED CLASS 1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.6 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH >9.5 M/S
360.0	NO	51	10	17	22	2	0	0	0	0	0	0
-N-	PCT	0.62	0.12	0.21	0.27	0.02	0.00	0.00	0.00	0.00	0.00	0.00
22.5	NO	35	8	16	7	4	0	0	0	0	0	0
-NNE-	PCT	0.43	0.10	0.20	0.09	0.05	0.00	0.00	0.00	0.00	0.00	0.00
45.0	NO	68	4	46	16	2	0	0	0	0	0	0
-NE-	PCT	0.83	0.05	0.56	0.20	0.02	0.00	0.00	0.00	0.00	0.00	0.00
67.5	NO	74	4	36	32	2	0	0	0	0	0	0
-ENE-	PCT	0.90	0.05	0.44	0.39	0.02	0.00	0.00	0.00	0.00	0.00	0.00
90.0	NO	51	1	36	14	0	0	0	0	0	0	0
-E-	PCT	0.62	0.01	0.44	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112.5	NO	25	4	19	2	0	0	0	0	0	0	0
-ESE-	PCT	0.31	0.05	0.23	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	28	5	18	5	0	0	0	0	0	0	0
-SE-	PCT	0.34	0.06	0.22	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
157.5	NO	11	0	9	2	0	0	0	0	0	0	0
-SSE-	PCT	0.13	0.00	0.11	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180.0	NO	31	1	23	7	0	0	0	0	0	0	0
-S-	PCT	0.38	0.01	0.28	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00
202.5	NO	26	0	17	9	0	0	0	0	0	0	0
-SSW-	PCT	0.32	0.00	0.21	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
225.0	NO	108	8	50	41	9	0	0	0	0	0	0
-SW-	PCT	1.32	0.10	0.61	0.50	0.11	0.00	0.00	0.00	0.00	0.00	0.00
247.5	NO	131	5	58	51	12	2	3	0	0	0	0
-WSW-	PCT	1.60	0.06	0.71	0.62	0.15	0.02	0.04	0.00	0.00	0.00	0.00
270.0	NO	97	15	45	24	6	5	1	1	0	0	0
-W-	PCT	1.19	0.18	0.55	0.29	0.07	0.06	0.01	0.01	0.00	0.00	0.00
292.5	NO	37	5	14	8	3	5	2	0	0	0	0
-WNW-	PCT	0.45	0.06	0.17	0.10	0.04	0.06	0.02	0.00	0.00	0.00	0.00
315.0	NO	66	7	29	13	10	6	1	0	0	0	0
-NW-	PCT	0.81	0.09	0.35	0.16	0.12	0.07	0.01	0.00	0.00	0.00	0.00
337.5	NO	35	7	18	8	2	0	0	0	0	0	0
-NNW-	PCT	0.43	0.09	0.22	0.10	0.02	0.00	0.00	0.00	0.00	0.00	0.00
CALM	NO	5										
	PCT	0.06	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	874	84	451	261	52	18	7	1	0	0	0
	PCT	10.68	1.03	5.51	3.19	0.64	0.22	0.09	0.01	0.00	0.00	0.00

AVERAGE WIND SPEED 5.70 — TOTAL VALID OBSERVATIONS 8184 — TOTAL OBSERVATIONS 8760

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

CHEROKEE METEOROLOGY SURVEY LOW LEVEL TOWER DATA FOR PERIOD SEPT 11 1973 - SEPT 11 1974

SUMMARY OF PASQUILL C WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR,PERCENT)

DATE OF REPORT 10-22-74

WIND SECTOR	ITEM	SECTOR TOTAL	WIND SPEED CLASS 1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH >9.5 M/S
360.0	NO	37	12	20	5	0	0	0	0	0	0	0
-N-	PCT	0.45	0.15	0.24	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22.5	NO	51	11	24	16	0	0	0	0	0	0	0
-NNE-	PCT	0.62	0.13	0.29	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45.0	NO	104	17	44	32	10	1	0	0	0	0	0
-NE-	PCT	1.27	0.21	0.54	0.39	0.12	0.01	0.00	0.00	0.00	0.00	0.00
67.5	NO	81	16	33	30	1	1	0	0	0	0	0
-ENE-	PCT	0.99	0.20	0.40	0.37	0.01	0.01	0.00	0.00	0.00	0.00	0.00
90.0	NO	61	15	36	9	1	0	0	0	0	0	0
-E-	PCT	0.74	0.18	0.44	0.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00
112.5	NO	28	11	15	2	0	0	0	0	0	0	0
-ESE-	PCT	0.34	0.13	0.18	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	45	11	28	6	0	0	0	0	0	0	0
-SE-	PCT	0.55	0.13	0.34	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
157.5	NO	13	5	7	1	0	0	0	0	0	0	0
-SSE-	PCT	0.16	0.06	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180.0	NO	28	6	19	3	0	0	0	0	0	0	0
-S-	PCT	0.34	0.07	0.23	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
202.5	NO	40	5	26	9	0	0	0	0	0	0	0
-SSW-	PCT	0.49	0.06	0.32	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
225.0	NO	118	13	52	43	6	3	0	1	0	0	0
-SW-	PCT	1.44	0.16	0.63	0.52	0.07	0.04	0.00	0.01	0.00	0.00	0.00
247.5	NO	120	15	39	41	13	8	0	2	2	0	0
-WSW-	PCT	1.46	0.18	0.48	0.50	0.16	0.10	0.00	0.02	0.02	0.00	0.00
270.0	NO	75	19	31	19	3	3	0	0	0	0	0
-W-	PCT	0.92	0.23	0.38	0.23	0.04	0.04	0.00	0.00	0.00	0.00	0.00
292.5	NO	53	16	22	11	4	0	0	0	0	0	0
-WNW-	PCT	0.65	0.20	0.27	0.13	0.05	0.00	0.00	0.00	0.00	0.00	0.00
315.0	NO	82	13	27	19	16	7	0	0	0	0	0
-NW-	PCT	1.00	0.16	0.33	0.23	0.20	0.09	0.00	0.00	0.00	0.00	0.00
337.5	NO	49	14	27	4	3	1	0	0	0	0	0
-NNW-	PCT	0.60	0.17	0.33	0.05	0.04	0.01	0.00	0.00	0.00	0.00	0.00
CALM	NO	0										
	PCT	0.00	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	985	199	450	250	57	24	0	3	2	0	0
	PCT	12.03	2.43	5.50	3.05	0.70	0.29	0.00	0.04	0.02	0.00	0.00

AVERAGE WIND SPEED 5.01 TOTAL VALID OBSERVATIONS 8184 TOTAL OBSERVATIONS 8760

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

ER Table 2.6.2-1
Cherokee Nuclear Station
Low Level Tower Meteorological Survey (Page 3 of 7)

CHEROKEE METEOROLOGY SURVEY LOW LEVEL TOWER DATA FOR PERIOD SEPT 11 1973 - SEPT 11 1974

SUMMARY OF PASQUILL D WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR,PERCENT)

DATE OF REPORT 10-22-74

WIND SECTOR	ITEM	SECTOR TOTAL	WIND SPEED CLASS 1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH S9.5 M/S
360.0	NO	90	45	37	6	2	0	0	0	0	0	0
-N-	PCT	1.10	0.55	0.45	0.07	0.02	0.00	0.00	0.00	0.00	0.00	0.00
22.5	NO	120	25	73	21	1	0	0	0	0	0	0
-NNE-	PCT	1.46	0.31	0.89	0.26	0.01	0.00	0.00	0.00	0.00	0.00	0.00
45.0	NO	166	36	64	52	12	2	0	0	0	0	0
-NE-	PCT	2.03	0.44	0.78	0.63	0.15	0.02	0.00	0.00	0.00	0.00	0.00
67.5	NO	111	36	40	32	2	1	0	0	0	0	0
-ENE-	PCT	1.35	0.44	0.49	0.39	0.02	0.01	0.00	0.00	0.00	0.00	0.00
90.0	NO	72	22	40	7	3	0	0	0	0	0	0
-E-	PCT	0.88	0.27	0.49	0.09	0.04	0.00	0.00	0.00	0.00	0.00	0.00
112.5	NO	42	16	23	2	1	0	0	0	0	0	0
-ESE-	PCT	0.51	0.20	0.28	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	75	35	33	6	0	1	0	0	0	0	0
-SE-	PCT	0.92	0.43	0.40	0.07	0.00	0.01	0.00	0.00	0.00	0.00	0.00
157.5	NO	33	16	12	3	2	0	0	0	0	0	0
-SSE-	PCT	0.40	0.20	0.15	0.04	0.02	0.00	0.00	0.00	0.00	0.00	0.00
180.0	NO	49	23	22	3	1	0	0	0	0	0	0
-S-	PCT	0.60	0.28	0.27	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00
202.5	NO	78	38	32	8	0	0	0	0	0	0	0
-SSW-	PCT	0.95	0.46	0.39	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
225.0	NO	153	43	67	30	10	3	0	0	0	0	0
-SW-	PCT	1.87	0.52	0.82	0.37	0.12	0.04	0.00	0.00	0.00	0.00	0.00
247.5	NO	120	26	37	26	16	9	5	1	1	0	0
-WSW-	PCT	1.46	0.32	0.45	0.32	0.20	0.10	0.06	0.01	0.01	0.00	0.00
270.0	NO	61	29	19	10	1	0	2	0	0	0	0
-W-	PCT	0.74	0.35	0.23	0.12	0.01	0.00	0.02	0.00	0.00	0.00	0.00
292.5	NO	55	24	18	8	1	4	0	0	0	0	0
-WNW-	PCT	0.67	0.29	0.22	0.10	0.01	0.05	0.00	0.00	0.00	0.00	0.00
315.0	NO	99	40	29	22	6	2	0	0	0	0	0
-NW-	PCT	1.21	0.49	0.35	0.27	0.07	0.02	0.00	0.00	0.00	0.00	0.00
337.5	NO	73	35	22	12	4	0	0	0	0	0	0
-NNW-	PCT	0.89	0.43	0.27	0.15	0.05	0.00	0.00	0.00	0.00	0.00	0.00
CALM	NO	10										
	PCT	0.12	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	1397	489	568	248	62	21	7	1	1	0	0
	PCT	17.07	5.97	6.94	3.03	0.76	0.26	0.09	0.01	0.01	0.00	0.00

AVERAGE WIND SPEED 4.29 TOTAL VALID OBSERVATIONS 8184 TOTAL OBSERVATIONS 8760

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

ER Table 2.6.2-1
Cherokee Nuclear Station
Low Level Tower Meteorological Survey (Page 4 of 7)

CHEROKEE METEOROLOGY SURVEY LOW LEVEL TOWER DATA FOR PERIOD SEPT 11 1973 - SEPT 11 1974
SUMMARY OF PASQUILL F WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURE, PERCENT)
DATE OF REPORT 10-22-74

WIND SECTOR	ITEM	SECTOR TOTAL	1.0-3.2 MPH / .45-1.49 M/S	3.3-5.5 MPH / 1.5-2.49 M/S	5.6-7.8 MPH / 2.5-3.49 M/S	7.9-10.1 MPH / 3.5-4.49 M/S	10.1-12.3 MPH / 4.5-5.49 M/S	12.4-14.5 MPH / 5.5-6.49 M/S	14.6-16.7 MPH / 6.5-7.49 M/S	16.8-19.0 MPH / 7.5-8.49 M/S	19.1-21.2 MPH / 8.5-9.49 M/S	>21.2 MPH / S9.5 M/S
360.0	NO	157	64	66	22	4	0	1	0	0	0	0
-N-	PCT	1.92	0.78	0.81	0.27	0.05	0.00	0.01	0.00	0.00	0.00	0.00
22.5	NO	175	61	84	24	4	1	0	1	0	0	0
-NNE-	PCT	2.14	0.74	1.03	0.29	0.05	0.01	0.00	0.01	0.00	0.00	0.00
45.0	NO	184	51	86	35	11	1	0	0	0	0	0
-NE-	PCT	2.25	0.62	1.05	0.43	0.13	0.01	0.00	0.00	0.00	0.00	0.00
67.5	NO	95	43	41	9	2	0	0	0	0	0	0
-ENE-	PCT	1.16	0.52	0.50	0.11	0.02	0.00	0.00	0.00	0.00	0.00	0.00
90.0	NO	59	36	19	4	0	0	0	0	0	0	0
-E-	PCT	0.72	0.44	0.23	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112.5	NO	42	26	15	1	0	0	0	0	0	0	0
-ESE-	PCT	0.51	0.32	0.18	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	65	40	18	7	0	0	0	0	0	0	0
-SE-	PCT	0.79	0.49	0.22	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00
157.5	NO	41	29	9	1	2	0	0	0	0	0	0
-SSE-	PCT	0.50	0.35	0.11	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00
180.0	NO	84	44	31	8	1	0	0	0	0	0	0
-S-	PCT	1.03	0.54	0.38	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00
202.5	NO	119	59	44	15	0	1	0	0	0	0	0
-SSW-	PCT	1.45	0.72	0.54	0.18	0.00	0.01	0.00	0.00	0.00	0.00	0.00
225.0	NO	329	112	126	62	19	10	0	0	0	0	0
-SW-	PCT	4.02	1.37	1.54	0.76	0.23	0.12	0.00	0.00	0.00	0.00	0.00
247.5	NO	217	66	77	53	16	5	0	0	0	0	0
-WSW-	PCT	2.65	0.81	0.94	0.65	0.20	0.06	0.00	0.00	0.00	0.00	0.00
270.0	NO	154	71	43	29	8	3	0	0	0	0	0
-W-	PCT	1.88	0.87	0.52	0.35	0.10	0.04	0.00	0.00	0.00	0.00	0.00
292.5	NO	145	87	31	24	1	2	0	0	0	0	0
-WNW-	PCT	1.77	1.06	0.38	0.29	0.01	0.02	0.00	0.00	0.00	0.00	0.00
315.0	NO	192	98	53	28	7	5	1	0	0	0	0
-NW-	PCT	2.35	1.20	0.65	0.34	0.09	0.06	0.01	0.00	0.00	0.00	0.00
337.5	NO	98	45	39	12	2	0	0	0	0	0	0
-NNW-	PCT	1.20	0.55	0.48	0.15	0.02	0.00	0.00	0.00	0.00	0.00	0.00
CALM	NO	45										
	PCT	0.55	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	2156	932	782	334	77	28	2	1	0	0	0
	PCT	26.34	11.39	9.56	4.08	0.94	0.34	0.02	0.01	0.00	0.00	0.00

AVERAGE WIND SPEED [illegible] TOTAL VALID OBSERVATIONS 8184 TOTAL OBSERVATIONS 8760

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

ER Table 2.6.2-1
Cherokee Nuclear Station
Low Level Tower Meteorological Survey (Page 5 of 7)

CHEROKEE METEOROLOGY SURVEY LOW LEVEL TOWER DATA FOR PERIOD SEPT 11 1973 - SEPT 11 1974
SUMMARY OF PASQUILL F WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURS,PERCENT)
DATE OF REPORT 10-22-74

WIND SECTOR	ITEM	SECTOR TOTAL	1.0-3.2 (.45-1.49)	3.2-5.5 (1.5-2.49)	5.6-7.9 (2.5-3.49)	7.9-10.0 (3.5-4.49)	10.1-12.3 (4.5-5.49)	12.4-14.5 (5.5-6.49)	14.6-16.7 (6.5-7.49)	16.8-19.0 (7.5-8.49)	19.1-21.2 (8.5-9.49)	>21.2 MPH (>9.5 M/S)
360.0	NO	69	53	15	1	0	0	0	0	0	0	0
-N-	PCT	0.84	0.65	0.18	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22.5	NO	26	22	1	3	0	0	0	0	0	0	0
-NNE-	PCT	0.32	0.27	0.01	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45.0	NO	32	23	9	0	0	0	0	0	0	0	0
-NE-	PCT	0.39	0.28	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
67.5	NO	12	6	4	1	1	0	0	0	0	0	0
-ENE-	PCT	0.15	0.07	0.05	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
90.0	NO	22	21	1	0	0	0	0	0	0	0	0
-E-	PCT	0.27	0.26	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112.5	NO	10	10	0	0	0	0	0	0	0	0	0
-ESE-	PCT	0.12	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	27	26	1	0	0	0	0	0	0	0	0
-SE-	PCT	0.33	0.32	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
157.5	NO	18	18	0	0	0	0	0	0	0	0	0
-SSE-	PCT	0.22	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180.0	NO	36	33	1	2	0	0	0	0	0	0	0
-S-	PCT	0.44	0.40	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
202.5	NO	50	36	11	2	1	0	0	0	0	0	0
-SSW-	PCT	0.61	0.44	0.13	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00
225.0	NO	148	81	52	14	1	0	0	0	0	0	0
-SW-	PCT	1.81	0.99	0.64	0.17	0.01	0.00	0.00	0.00	0.00	0.00	0.00
247.5	NO	96	59	26	9	2	0	0	0	0	0	0
-WSW-	PCT	1.17	0.72	0.32	0.11	0.02	0.00	0.00	0.00	0.00	0.00	0.00
270.0	NO	86	69	16	1	0	0	0	0	0	0	0
-W-	PCT	1.05	0.84	0.20	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
292.5	NO	95	81	14	0	0	0	0	0	0	0	0
-WNW-	PCT	1.16	0.99	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
315.0	NO	183	159	23	0	1	0	0	0	0	0	0
-NW-	PCT	2.24	1.94	0.28	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
337.5	NO	69	57	11	1	0	0	0	0	0	0	0
-NNW-	PCT	0.84	0.70	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	NO	62										
	PCT	[illegible]										
TOTAL	NO	979	754	185	34	6	0	0	0	0	0	0
	PCT	11.96	9.21	2.26	0.42	0.07	0.00	0.00	0.00	0.00	0.00	0.00

AVERAGE WIND SPEED [illegible].37 TOTAL VALID OBSERVATIONS 8184 TOTAL OBSERVATIONS 8760

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

ER Table 2.6.2-1
Cherokee Nuclear Station
Low Level Tower Meteorological Survey (Page 6 of 7)

CHEROKEE METEOROLOGY SURVEY LOW LEVEL TOWER DATA FOR PERIOD SEPT 11 1973 - SEPT 11 1974
SUMMARY OF PASQUILL G WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURS,PERCENT)
DATE OF REPORT 10-22-74

WIND SECTOR	ITEM	SECTOR TOTAL	WIND SPEED CLASS 0.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH >9.5 M/S
360.0	NO	62	54	8	0	0	0	0	0	0	0	0
-N-	PCT	0.76	0.66	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22.5	NO	27	23	4	0	0	0	0	0	0	0	0
-NNE-	PCT	0.33	0.28	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45.0	NO	19	18	1	0	0	0	0	0	0	0	0
-NE-	PCT	0.23	0.22	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
67.5	NO	28	28	0	0	0	0	0	0	0	0	0
-ENE-	PCT	0.34	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90.0	NO	25	24	1	0	0	0	0	0	0	0	0
-E-	PCT	0.31	0.29	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112.5	NO	17	17	0	0	0	0	0	0	0	0	0
-ESE-	PCT	0.21	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	23	23	0	0	0	0	0	0	0	0	0
-SE-	PCT	0.28	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
157.5	NO	21	21	0	0	0	0	0	0	0	0	0
-SSE-	PCT	0.26	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180.0	NO	36	36	0	0	0	0	0	0	0	0	0
-S-	PCT	0.44	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
202.5	NO	44	41	3	0	0	0	0	0	0	0	0
-SSW-	PCT	0.54	0.50	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
225.0	NO	120	108	12	0	0	0	0	0	0	0	0
-SW-	PCT	1.46	1.32	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
247.5	NO	111	109	0	2	0	0	0	0	0	0	0
-WSW-	PCT	1.35	1.33	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
270.0	NO	197	196	1	0	0	0	0	0	0	0	0
-W-	PCT	2.41	2.39	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
292.5	NO	231	227	4	0	0	0	0	0	0	0	0
-WNW-	PCT	2.82	2.77	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
315.0	NO	280	256	22	2	0	0	0	0	0	0	0
-NW-	PCT	3.42	3.13	0.27	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
337.5	NO	103	88	14	1	0	0	0	0	0	0	0
-NNW-	PCT	1.26	1.07	0.17	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	NO	239										
	PCT	2.92	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	1344	1269	70	5	0	0	0	0	0	0	0
	PCT	16.42	15.50	0.85	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00

AVERAGE WIND SPEED [illegible] TOTAL VALID OBSERVATIONS 8184 TOTAL OBSERVATIONS 8760

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

ER Table 2.6.2-1
Cherokee Nuclear Station
Low-Level Tower Meteorological Survey (Page 7 of 7)

CHEROKEE METEOROLOGY SURVEY LOW LEVEL TOWER DATA FOR PERIOD SEPT 11 1973 - SEPT 11 1974

SUMMARY OF PASQUILL A+C+D+E+F+G WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR,PERCENT)

DATE OF REPORT 10-22-74

WIND SECTOR	ITEM	SECTOR TOTAL	WIND SPEED CLASS 1.0-3.2 / .45-1.49	3.3-5.5 / 1.5-2.49	5.6-7.8 / 2.5-3.49	7.9-10.0 / 3.5-4.49	10.1-12.3 / 4.5-5.49	12.4-14.5 / 5.5-6.49	14.6-16.7 / 6.5-7.49	16.8-19.0 / 7.5-8.49	19.1-21.2 / 8.5-9.49	>21.2 MPH / >9.5 M/S
360.0	NO	466	238	163	56	8	0	1	0	0	0	0
-N-	PCT	5.69	2.91	1.99	0.68	0.10	0.00	0.01	0.00	0.00	0.00	0.00
22.5	NO	434	150	202	71	9	1	0	1	0	0	0
-NNE-	PCT	5.30	1.83	2.47	0.87	0.11	0.01	0.00	0.01	0.00	0.00	0.00
45.0	NO	573	149	250	135	35	4	0	0	0	0	0
-NE-	PCT	7.00	1.82	3.05	1.65	0.43	0.05	0.00	0.00	0.00	0.00	0.00
67.5	NO	401	133	154	104	8	2	0	0	0	0	0
-ENE-	PCT	4.90	1.63	1.88	1.27	0.10	0.02	0.00	0.00	0.00	0.00	0.00
90.0	NO	290	119	133	34	4	0	0	0	0	0	0
-E-	PCT	3.54	1.45	1.63	0.42	0.05	0.00	0.00	0.00	0.00	0.00	0.00
112.5	NO	164	84	72	7	1	0	0	0	0	0	0
-ESE-	PCT	2.00	1.03	0.88	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	263	140	98	24	0	1	0	0	0	0	0
-SE-	PCT	3.21	1.71	1.20	0.29	0.00	0.01	0.00	0.00	0.00	0.00	0.00
157.5	NO	137	89	37	7	4	0	0	0	0	0	0
-SSE-	PCT	1.67	1.09	0.45	0.09	0.05	0.00	0.00	0.00	0.00	0.00	0.00
180.0	NO	264	143	96	23	2	0	0	0	0	0	0
-S-	PCT	3.23	1.75	1.17	0.28	0.02	0.00	0.00	0.00	0.00	0.00	0.00
202.5	NO	357	179	133	43	1	1	0	0	0	0	0
-SSW-	PCT	4.36	2.19	1.63	0.52	0.01	0.01	0.00	0.00	0.00	0.00	0.00
225.0	NO	976	365	359	190	45	16	0	1	0	0	0
-SW-	PCT	11.92	4.46	4.39	2.32	0.55	0.20	0.00	0.01	0.00	0.00	0.00
247.5	NO	795	280	237	182	59	23	8	3	3	0	0
-WSW-	PCT	9.71	3.42	2.89	2.22	0.72	0.28	0.10	0.04	0.04	0.00	0.00
270.0	NO	670	399	155	83	18	11	3	1	0	0	0
-W-	PCT	8.19	4.88	1.89	1.01	0.22	0.13	0.04	0.01	0.00	0.00	0.00
292.5	NO	616	440	103	51	9	11	2	0	0	0	0
-WNW-	PCT	7.53	5.38	1.26	0.62	0.11	0.13	0.02	0.00	0.00	0.00	0.00
315.0	NO	902	573	183	84	40	20	2	0	0	0	0
-NW-	PCT	11.02	7.00	2.24	1.03	0.49	0.24	0.02	0.00	0.00	0.00	0.00
337.5	NO	427	246	131	38	11	1	0	0	0	0	0
-NNW-	PCT	5.22	3.00	1.60	0.46	0.13	0.01	0.00	0.00	0.00	0.00	0.00
CALM	NO	449										
	PCT	5.49										
TOTAL	NO	7735	3727	2506	1132	254	91	16	6	3	0	0
	PCT	94.51	45.54	30.62	13.83	3.10	1.11	0.20	0.07	0.04	0.00	0.00

AVERAGE WIND SPEED 3.59 TOTAL VALID OBSERVATIONS 8184 TOTAL OBSERVATIONS 8760

Amendment 1 (New)
Amendment 2 (Entire Table Revised)

DELETED

TABLE 2.6.2-2

DELETED

TABLE 2.6.2-3

ER Table 2.6.2-4
Cherokee Nuclear Station
Cumulative Frequency Distributions for Worst X/Q Values to 30 Days After an Accident

0-8 Hour Period

THE FOLLOWING IS A PERCENTILE DISTRIBUTION OF THE WORST VALUES FOR THE WINDOW COMPUTATIONS

PERCENT	RELATIVE CONCENTRATION	PERCENT	RELATIVE CONCENTRATION
100	7.9428719E-05		
99	4.0149869E-05	49	4.8390921E-06
98	4.0148880E-05	48	4.5565102E-06
97	3.6803627E-05	47	4.2695910E-06
96	3.5516307E-05	46	4.0481773E-06
95	3.2620956E-05	45	3.7680138E-06
94	2.9275223E-05	44	3.5680165E-06
93	2.7881164E-05	43	3.4156637E-06
92	2.5767557E-05	42	3.3241204E-06
91	2.3554283E-05	41	3.1970294E-06
90	2.1605709E-05	40	3.0497004E-06
89	2.0295905E-05	39	2.9445573E-06
88	2.0159860E-05	38	2.7700999E-06
87	2.0079649E-05	37	2.5914503E-06
86	2.0074935E-05	36	2.5115178E-06
85	2.0074847E-05	35	2.4019437E-06
84	2.0074454E-05	34	2.3530874E-06
83	2.0074440E-05	33	2.2594813E-06
82	2.0074440E-05	32	2.1903152E-06
81	2.0074440E-05	31	2.0775751E-06
80	2.0074440E-05	30	1.9662975E-06
79	2.0074440E-05	29	1.8647970E-06
78	2.0074440E-05	28	1.8255141E-06
77	1.9124258E-05	27	1.7331977E-06
76	1.8249484E-05	26	1.6620597E-06
75	1.7041486E-05	25	1.5836258E-06
74	1.6728693E-05	24	1.5537337E-06
73	1.6721693E-05	23	1.4768539E-06
72	1.5442114E-05	22	1.3939743E-06
71	1.5107747E-05	21	1.3365125E-06
70	1.4338886E-05	20	1.2905184E-06
69	1.3999081E-05	19	1.2331157E-06
68	1.3383210E-05	18	1.1992324E-06
67	1.2767407E-05	17	1.1539405E-06
66	1.2546525E-05	16	1.0863432E-06
65	1.1667777E-05	15	1.0368085E-06
64	1.1038632E-05	14	9.8625424E-07
63	1.0565494E-05	13	9.1706050E-07
62	1.0037220E-05	12	8.4333931E-07
61	9.1552929E-06	11	7.8133780E-07
60	8.7282178E-06	10	7.1896443E-07
59	8.5391612E-06	9	6.4958454E-07
58	8.5391612E-06	8	5.9514252E-07
57	7.7628738E-06	7	5.0025034E-07
56	7.4041191E-06	6	4.0649610E-07
55	7.1159675E-06	5	2.7357783E-07
54	6.5797003E-06	4	1.6287851E-07
53	6.1776391E-06	3	1.2064828E-07
52	5.8820860E-06	2	9.3168239E-08
51	5.6927738E-06	1	5.9053793E-08
50	5.1468214E-06	0	4.2690546E-11

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

Cumulative Frequency Distributions for Worst X/Q Values to 30 Days After an Accident

8-24 Hour Period

THE FOLLOWING IS A PERCENTILE DISTRIBUTION OF THE WORST VALUES FOR THE WINDOW COMPUTATIONS

PERCENT	RELATIVE CONCENTRATION	PERCENT	RELATIVE CONCENTRATION
100	3.9764622E-05		
99	2.8439186E-05	49	6.2732624E-06
98	2.3537708E-05	48	5.9042468E-06
97	2.0260035E-05	47	5.5762330E-06
96	2.0077423E-05	46	5.4567654E-06
95	2.0074571E-05	45	5.2826227E-06
94	2.0074440E-05	44	5.0406453E-06
93	1.9162166E-05	43	4.6519608E-06
92	1.8401814E-05	42	4.4671733E-06
91	1.7759041E-05	41	4.3114933E-06
90	1.7464099E-05	40	4.2695801E-06
89	1.6635795E-05	39	4.0818732E-06
88	1.6310660E-05	38	3.8604665E-06
87	1.5533791E-05	37	3.7086364E-06
86	1.4650946E-05	36	3.5579833E-06
85	1.4412418E-05	35	3.3247707E-06
84	1.3994566E-05	34	3.2029129E-06
83	1.3595203E-05	33	3.0582376E-06
82	1.2964646E-05	32	2.9431349E-06
81	1.2745929E-05	31	2.7421092E-06
80	1.1990627E-05	30	2.5260588E-06
79	1.1471462E-05	29	2.4316542E-06
78	1.0923251E-05	28	2.2903323E-06
77	1.0555654E-05	27	2.2253380E-06
76	1.0310211E-05	26	2.0614907E-06
75	1.0195414E-05	25	1.9416521E-06
74	1.0138088E-05	24	1.8702804E-06
73	1.0093756E-05	23	1.7936673E-06
72	1.0077019E-05	22	1.7301354E-06
71	1.0059085E-05	21	1.6625354E-06
70	1.0040231E-05	20	1.6340337E-06
69	1.0037471E-05	19	1.5593705E-06
68	1.0037428E-05	18	1.5088117E-06
67	1.0037233E-05	17	1.4306415E-06
66	1.0037220E-05	16	1.3453127E-06
65	1.0037220E-05	15	1.2869332E-06
64	1.0037220E-05	14	1.2491437E-06
63	1.0037220E-05	13	1.1886242E-06
62	9.5756724E-06	12	1.1502671E-06
61	9.1246594E-06	11	1.1080401E-06
60	8.8694387E-06	10	1.0673948E-06
59	8.4183739E-06	9	1.0027716E-06
58	8.3643499E-06	8	9.4503253E-07
57	8.0006266E-06	7	8.7704984E-07
56	7.7306496E-06	6	8.2555073E-07
55	7.6649603E-06	5	7.7672695E-07
54	7.2223614E-06	4	6.8514635E-07
53	7.1694431E-06	3	6.1557785E-07
52	6.7793335E-06	2	5.1940293E-07
51	6.6914799E-06	1	3.9725666E-07
50	6.3675843E-06	0	2.2616024E-10

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

ER Table 2.6.2-4
Cherokee Nuclear Station
Cumulative Frequency Distributions for Worst X/Q Values to 30 Days After an Accident

1-4 Day Period

THE FOLLOWING IS A PERCENTILE DISTRIBUTION OF THE WORST VALUES FOR THE WINDOW COMPUTATIONS

PERCENT	RELATIVE CONCENTRATION	PERCENT	RELATIVE CONCENTRATION
100	1.4451291E-05		
99	1.0640632E-05	49	4.1036419E-06
98	8.8591046E-06	48	3.9663164E-06
97	8.7623636E-06	47	3.9470397E-06
96	8.4270887E-06	46	3.9103443E-06
95	8.0112064E-06	45	3.8802473E-06
94	7.5052212E-06	44	3.8237331E-06
93	7.4172222E-06	43	3.7094269E-06
92	7.1014811E-06	42	3.6531364E-06
91	6.8654447E-06	41	3.5917992E-06
90	6.7276676E-06	40	3.5284938E-06
89	6.6917219E-06	39	3.4757622E-06
88	6.6129929E-06	38	3.4101158E-06
87	6.4367632E-06	37	3.2943299E-06
86	6.3155260E-06	36	3.2628104E-06
85	6.1915621E-06	35	3.2411408E-06
84	6.1774901E-06	34	3.1793143E-06
83	5.9973941E-06	33	3.1203999E-06
82	5.9316019E-06	32	3.0760139E-06
81	5.7041452E-06	31	3.0183282E-06
80	5.6452553E-06	30	2.8814375E-06
79	5.5977735E-06	29	2.8424183E-06
78	5.5483542E-06	28	2.8075619E-06
77	5.5116035E-06	27	2.6945099E-06
76	5.3191743E-06	26	2.6099488E-06
75	5.2243356E-06	25	2.5180270E-06
74	5.1733623E-06	24	2.4428300E-06
73	5.1272518E-06	23	2.4076008E-06
72	5.1115959E-06	22	2.3967623E-06
71	5.0754049E-06	21	2.3335460E-06
70	5.0334920E-06	20	2.2817248E-06
69	5.0015524E-06	19	2.2579061E-06
68	4.9444543E-06	18	2.2444920E-06
67	4.9061706E-06	17	2.2352388E-06
66	4.8513159E-06	16	2.1954111E-06
65	4.7220847E-06	15	1.9465988E-06
64	4.6927062E-06	14	1.8587589E-06
63	4.6306514E-06	13	1.7615093E-06
62	4.6006026E-06	12	1.6633803E-06
61	4.5274401E-06	11	1.5968608E-06
60	4.4857570E-06	10	1.5130699E-06
59	4.4781274E-06	9	1.4917405E-06
58	4.4613886E-06	8	1.4381276E-06
57	4.4076594E-06	7	1.2746123E-06
56	4.3526067E-06	6	1.1400043E-06
55	4.2741403E-06	5	9.3890441E-07
54	4.2661376E-06	4	8.1294087E-07
53	4.2275111E-06	3	7.3528645E-07
52	4.1853260E-06	2	6.5419141E-07
51	4.1555845E-06	1	5.6817868E-07
50	4.1459965E-06	0	3.2322833E-07

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

ER Table 2.6.2-4
Cherokee Nuclear Station
Cumulative Frequency Distributions for Worst X/Q Values to 30 Days After An Accident

THE FOLLOWING IS A PERCENTILE DISTRIBUTION OF THE WORST VALUES FOR THE WINDOW COMPUTATIONS

PERCENT	RELATIVE CONCENTRATION	PERCENT	RELATIVE CONCENTRATION
100	4.3519540E-06		
99	4.3491809E-06	49	1.9315830E-06
98	3.9300157E-06	48	1.8773644E-06
97	3.9172801E-06	47	1.8656046E-06
96	3.8096441E-06	46	1.8472028E-06
95	3.7633145E-06	45	1.8021500E-06
94	3.7160207E-06	44	1.7736311E-06
93	3.6725096E-06	43	1.7712200E-06
92	3.6473130E-06	42	1.7706037E-06
91	3.5092953E-06	41	1.7619623E-06
90	3.5043295E-06	40	1.7550193E-06
89	3.4875538E-06	39	1.7325747E-06
88	3.4393097E-06	38	1.7233200E-06
87	3.3710458E-06	37	1.7209358E-06
86	3.1952686E-06	36	1.7126293E-06
85	3.1819208E-06	35	1.7031924E-06
84	3.1367144E-06	34	1.7009497E-06
83	3.0496612E-06	33	1.6933045E-06
82	3.0032670E-06	32	1.6437411E-06
81	2.9507096E-06	31	1.6366557E-06
80	2.8794766E-06	30	1.6285971E-06
79	2.8395534E-06	29	1.6152971E-06
78	2.8282138E-06	28	1.6042277E-06
77	2.8266948E-06	27	1.5923320E-06
76	2.8151308E-06	26	1.5878713E-06
75	2.7675942E-06	25	1.5773637E-06
74	2.7259302E-06	24	1.5662536E-06
73	2.6321859E-06	23	1.5512005E-06
72	2.5891122E-06	22	1.5375845E-06
71	2.5696127E-06	21	1.5263242E-06
70	2.5132340E-06	20	1.5246759E-06
69	2.4959454E-06	19	1.5210002E-06
68	2.4793799E-06	18	1.5113046E-06
67	2.4425945E-06	17	1.5046735E-06
66	2.3805942E-06	16	1.4957937E-06
65	2.3773200E-06	15	1.4716772E-06
64	2.3551829E-06	14	1.4504639E-06
63	2.3402963E-06	13	1.4226982E-06
62	2.3157081E-06	12	1.4092480E-06
61	2.2736704E-06	11	1.4032360E-06
60	2.2453041E-06	10	1.3997305E-06
59	2.1987244E-06	9	1.3933430E-06
58	2.1131227E-06	8	1.3821240E-06
57	2.1090550E-06	7	1.3314006E-06
56	2.0943480E-06	6	1.2940330E-06
55	2.0839334E-06	5	1.2644930E-06
54	2.0671487E-06	4	1.2412261E-06
53	2.0211210E-06	3	1.1856055E-06
52	2.0103053E-06	2	1.1371603E-06
51	1.9654617E-06	1	1.0324232E-06
50	1.9331192E-06	0	9.7115571E-07

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

ER Table 2.6.2-5
Cherokee Nuclear Station
Dilution Factors
for Accident and Routine Releases

Type of Release	Distance to Receptor (m)	Dilution Factor (X/Q sec m^{-3})	Percentile Value
0-2 hr	762	2.5×10^{-3}	95
0-2 hr	762	2.2×10^{-4}	50
0-2 hr	8048	1.5×10^{-4}	95
0-2 hr	8048	9.6×10^{-6}	50
0-8 hr	8048	7.9×10^{-5}	100
0-8 hr	8048	3.3×10^{-5}	95
0-8 hr	8048	5.1×10^{-6}	50
8-24 hr	8048	4.0×10^{-5}	100
8-24 hr	8048	2.0×10^{-5}	95
8-24 hr	8048	6.4×10^{-6}	50
1-4 days	8048	1.4×10^{-5}	100
1-4 days	8048	8.0×10^{-6}	95
1-4 days	8048	4.1×10^{-6}	50
4-30 days	8048	4.4×10^{-6}	100
4-30 days	8048	3.8×10^{-6}	95
4-30 days	8048	1.9×10^{-6}	50
1 year	762 (100°)	2.9×10^{-5}	100
1 year (cow)	1930 (SW)	1.8×10^{-7}	100
1 year (goat)	6120 (SSE)	1.6×10^{-8}	100
3 1 year (farm)	2410 (SE)	2.0×10^{-7}	100

Exclusion Area Boundary	762 m
Low Population Zone Boundary	8048 m
Distance to Highest Dosage Milked Cow	1930 m
Distance to Highest Dosage Milked Goat	6120 m
Distance to Highest Dosage Farm	2410 m

Mean Annual Average X/Q for Total Population to 50 Miles
(based on 1980 population estimates) - 6.4×10^{-8} sec/m^3.

ER Table 2.6.3-1
Cherokee Nuclear Station
Areal Distribution of Average Relative
Concentration for Long Term (Routine) Releases

RADIUS	ANGLE	RELATIVE CONCENTRATION	RADIUS	ANGLE	RELATIVE CONCENTRATION
600	5	2.403357E-06	600	185	8.647771E-06
600	10	5.204350E-06	600	190	5.682043E-06
600	15	4.697060E-06	600	195	7.405411E-06
600	20	4.697348E-06	600	200	5.359550E-06
600	25	7.334605E-06	600	205	6.733472E-06
600	30	9.828850E-06	600	210	5.583353E-06
600	35	9.702972E-06	600	215	6.250383E-06
600	40	1.343818E-05	600	220	5.435452E-06
600	45	1.227410E-05	600	225	4.678601E-06
600	50	1.539160E-05	600	230	5.913927E-06
600	55	1.313925E-05	600	235	4.515535E-06
600	60	1.569217E-05	600	240	5.749368E-06
600	65	1.363589E-05	600	245	4.770640E-06
600	70	1.801195E-05	600	250	5.523292E-06
600	75	1.631519E-05	600	255	4.264726E-06
600	80	1.631185E-05	600	260	4.671127E-06
600	85	1.870759E-05	600	265	3.690443E-06
600	90	1.762831E-05	600	270	3.303901E-06
600	95	2.327243E-05	600	275	5.011203E-06
600	100	2.925340E-05	600	280	3.396302E-06
600	105	2.644028E-05	600	285	3.132795E-06
600	110	2.612550E-05	600	290	2.123779E-06
600	115	2.262673E-05	600	295	2.473502E-06
600	120	2.727470E-05	600	300	3.259104E-06
600	125	2.726263E-05	600	305	4.816749E-06
600	130	2.150335E-05	600	310	3.865315E-06
600	135	2.002768E-05	600	315	3.210241E-06
600	140	1.822774E-05	600	320	4.001874E-06
600	145	1.517035E-05	600	325	3.091716E-06
600	150	1.345664E-05	600	330	3.988946E-06
600	155	1.078771E-05	600	335	3.437154E-06
600	160	1.052367E-05	600	340	3.031583E-06
600	165	1.115682E-05	600	345	2.233122E-06
600	170	8.773207E-06	600	350	2.512874E-06
600	175	7.442556E-06	600	355	4.460489E-06
600	180	6.092947E-06	600	360	4.994624E-06

THE TOTAL AT THIS RADIUS IS 7.010479E-04

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

ER Table 2.6.3-1
Cherokee Nuclear Station
Areal Distribution of Average Relative
Concentration for Long Term (Routine) Releases

RADIUS	ANGLE	RELATIVE CONCENTRATION	RADIUS	ANGLE	RELATIVE CONCENTRATION
2413	5	4.233963E-07	2413	185	1.617261E-06
2413	10	1.001025E-06	2413	190	9.359677E-07
2413	15	8.057142E-07	2413	195	1.292493E-06
2413	20	7.789803E-07	2413	200	5.010750E-07
2413	25	1.271708E-06	2413	205	1.120641E-06
2413	30	1.735560E-06	2413	210	8.517637E-07
2413	35	1.573489E-06	2413	215	1.053032E-06
2413	40	2.520453E-06	2413	220	8.412673E-07
2413	45	2.118008E-06	2413	225	6.576130E-07
2413	50	2.925486E-06	2413	230	9.734904E-07
2413	55	2.307346E-06	2413	235	6.263738E-07
2413	60	2.985056E-06	2413	240	9.320770E-07
2413	65	2.525400E-06	2413	245	7.206760E-07
2413	70	2.513957E-06	2413	250	9.499727E-07
2413	75	3.137840E-06	2413	255	6.657292E-07
2413	80	3.150169E-06	2413	260	8.090506E-07
2413	85	3.839242E-06	2413	265	5.922517E-07
2413	90	3.518532E-06	2413	270	5.359512E-07
2413	95	4.860983E-06	2413	275	9.624364E-07
2413	100	5.176690E-06	2413	280	6.111932E-07
2413	105	5.501211E-06	2413	285	5.540954E-07
2413	110	5.394339E-06	2413	290	3.437025E-07
2413	115	4.597233E-06	2413	295	3.989864E-07
2413	120	5.509143E-06	2413	300	5.646370E-07
2413	125	5.657771E-06	2413	305	5.959075E-07
2413	130	4.325922E-06	2413	310	6.627004E-07
2413	135	4.006817E-06	2413	315	5.378719E-07
2413	140	3.627954E-06	2413	320	7.035437E-07
2413	145	3.050419E-06	2413	325	5.179068E-07
2413	150	2.616111E-06	2413	330	7.186403E-07
2413	155	2.098654E-06	2413	335	6.045974E-07
2413	160	2.025552E-06	2413	340	5.399944E-07
2413	165	2.158957E-06	2413	345	3.860929E-07
2413	170	1.588462E-06	2413	350	4.057915E-07
2413	175	1.349695E-06	2413	355	8.613877E-07
2413	180	1.045200E-06	2413	360	9.995201E-07

THE TOTAL AT THIS RADIUS IS 1.332561E-04

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

ER Table 2.6.3-1
Cherokee Nuclear Station
Areal Distribution of Average Relative
Concentration for Long Term (Routine) Releases

RADIUS	ANGLE	RELATIVE CONCENTRATION	RADIUS	ANGLE	RELATIVE CONCENTRATION
4022	5	2.255849E-07	4022	185	8.881084E-07
4022	10	5.550573E-07	4022	190	4.777962E-07
4022	15	4.346490E-07	4022	195	6.982722E-07
4022	20	4.002143E-07	4022	200	4.011958E-07
4022	25	6.725265E-07	4022	205	5.865941E-07
4022	30	9.609939E-07	4022	210	4.277343E-07
4022	35	8.829692E-07	4022	215	5.470529E-07
4022	40	1.375699E-06	4022	220	4.266960E-07
4022	45	1.132287E-06	4022	225	3.200296E-07
4022	50	1.590325E-06	4022	230	5.059547E-07
4022	55	1.272622E-06	4022	235	3.035167E-07
4022	60	1.639754E-06	4022	240	4.832334E-07
4022	65	1.380068E-06	4022	245	3.678587E-07
4022	70	1.975159E-06	4022	250	5.121869E-07
4022	75	1.777126E-06	4022	255	3.455316E-07
4022	80	1.755764E-06	4022	260	4.248977E-07
4022	85	2.162617E-06	4022	265	3.065426E-07
4022	90	1.907869E-06	4022	270	2.818525E-07
4022	95	2.737151E-06	4022	275	5.355018E-07
4022	100	2.549801E-06	4022	280	3.304092E-07
4022	105	3.142623E-06	4022	285	3.008201E-07
4022	110	2.076456E-06	4022	290	1.777738E-07
4022	115	2.596123E-06	4022	295	2.111663E-07
4022	120	3.174853E-06	4022	300	3.019452E-07
4022	125	3.205697E-06	4022	305	4.918233E-07
4022	130	2.429035E-06	4022	310	3.538504E-07
4022	135	2.250135E-06	4022	315	2.790120E-07
4022	140	2.024635E-06	4022	320	3.773514E-07
4022	145	1.633067E-06	4022	325	2.643963E-07
4022	150	1.460160E-06	4022	330	3.864705E-07
4022	155	1.164404E-06	4022	335	3.256364E-07
4022	160	1.123609E-06	4022	340	2.900775E-07
4022	165	1.202541E-06	4022	345	1.998495E-07
4022	170	8.642150E-07	4022	350	2.106143E-07
4022	175	7.165910E-07	4022	355	4.650473E-07
4022	180	5.434753E-07	4022	360	5.508457E-07

THE TOTAL AT THIS RADIUS IS 7.343830E-05

ER Table 2.6.3-1
Cherokee Nuclear Station
Areal Distribution of Average Relative
Concentration for Long Term (Routine) Releases

RADIUS	ANGLE	RELATIVE CONCENTRATION	RADIUS	ANGLE	RELATIVE CONCENTRATION
5631	5	1.476086E-07	5631	185	5.889424E-07
5631	10	3.698265E-07	5631	190	3.062165E-07
5631	15	2.858199E-07	5631	195	4.499167E-07
5631	20	2.571763E-07	5631	200	2.542322E-07
5631	25	4.382498E-07	5631	205	3.902676E-07
5631	30	6.314547E-07	5631	210	2.715668E-07
5631	35	5.748254E-07	5631	215	3.533193E-07
5631	40	9.094896E-07	5631	220	2.722519E-07
5631	45	7.417702E-07	5631	225	1.997298E-07
5631	50	1.050504E-06	5631	230	3.268253E-07
5631	55	8.075290E-07	5631	235	1.888484E-07
5631	60	1.087793E-06	5631	240	3.117455E-07
5631	65	9.138808E-07	5631	245	2.354517E-07
5631	70	1.324137E-06	5631	250	3.366999E-07
5631	75	1.137480E-06	5631	255	2.231493E-07
5631	80	1.172943E-06	5631	260	2.759876E-07
5631	85	1.451568E-06	5631	265	1.976949E-07
5631	90	1.345659E-06	5631	270	1.831170E-07
5631	95	1.835048E-06	5631	275	3.574526E-07
5631	100	2.403326E-06	5631	280	2.175921E-07
5631	105	2.122254E-06	5631	285	1.985141E-07
5631	110	2.075949E-06	5631	290	1.146344E-07
5631	115	1.744696E-06	5631	295	1.375619E-07
5631	120	2.139663E-06	5631	300	1.978761E-07
5631	125	2.157301E-06	5631	305	3.261185E-07
5631	130	1.528420E-06	5631	310	2.316770E-07
5631	135	1.508341E-06	5631	315	1.801288E-07
5631	140	1.353608E-06	5631	320	2.475328E-07
5631	145	1.124301E-06	5631	325	1.693659E-07
5631	150	9.761170E-07	5631	330	2.538863E-07
5631	155	7.763886E-07	5631	335	2.140985E-07
5631	160	7.488252E-07	5631	340	1.904675E-07
5631	165	8.031448E-07	5631	345	1.289651E-07
5631	170	5.706897E-07	5631	350	1.360246E-07
5631	175	4.680936E-07	5631	355	3.061524E-07
5631	180	3.514864E-07	5631	360	3.662673E-07

THE TOTAL AT THIS RADIUS IS 4.886431E-05

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

ER Table 2.6.3-1
Cherokee Nuclear Station
Areal Distribution of Average Relative
Concentration for Long Term (Routine) Releases

RADIUS	ANGLE	RELATIVE CONCENTRATION	RADIUS	ANGLE	RELATIVE CONCENTRATION
7241	5	1.074555E-07	7241	185	4.321162E-07
7241	10	2.721217E-07	7241	190	2.201277E-07
7241	15	2.085796E-07	7241	195	3.272388E-07
7241	20	1.851387E-07	7241	200	1.812677E-07
7241	25	3.181822E-07	7241	205	2.751387E-07
7241	30	4.608509E-07	7241	210	1.939362E-07
7241	35	4.171335E-07	7241	215	2.551034E-07
7241	40	6.662551E-07	7241	220	1.950201E-07
7241	45	5.402377E-07	7241	225	1.410015E-07
7241	50	7.692722E-07	7241	230	2.359554E-07
7241	55	5.882632E-07	7241	235	1.330365E-07
7241	60	7.935481E-07	7241	240	2.248490E-07
7241	65	6.700868E-07	7241	245	1.689411E-07
7241	70	9.776732E-07	7241	250	2.456570E-07
7241	75	8.754179E-07	7241	255	1.610799E-07
7241	80	8.645492E-07	7241	260	1.999922E-07
7241	85	1.073191E-06	7241	265	1.426055E-07
7241	90	9.955906E-07	7241	270	1.326524E-07
7241	95	1.399363E-06	7241	275	2.633507E-07
7241	100	1.735246E-06	7241	280	1.589927E-07
7241	105	1.574167E-06	7241	285	1.452276E-07
7241	110	1.539089E-06	7241	290	8.269086E-08
7241	115	1.290611E-06	7241	295	9.979163E-08
7241	120	1.534081E-06	7241	300	1.441560E-07
7241	125	1.547195E-06	7241	305	2.392352E-07
7241	130	1.202923E-06	7241	310	1.686703E-07
7241	135	1.114114E-06	7241	315	1.300356E-07
7241	140	9.983396E-07	7241	320	1.804304E-07
7241	145	3.274861E-07	7241	325	1.216985E-07
7241	150	7.197664E-07	7241	330	1.852485E-07
7241	155	5.716699E-07	7241	335	1.562871E-07
7241	160	5.510516E-07	7241	340	1.389331E-07
7241	165	5.918591E-07	7241	345	9.312646E-08
7241	170	4.176327E-07	7241	350	9.823242E-08
7241	175	3.404952E-07	7241	355	2.237517E-07
7241	180	2.541303E-07	7241	360	2.693277E-07

THE TOTAL AT THIS RADIUS IS 5.691350E-05

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

ER Table 2.6.3-1
Cherokee Nuclear Station
Areal Distribution of Average Relative
Concentration for Long Term (Routine) Releases

RADIUS	ANGLE	RELATIVE CONCENTRATION	RADIUS	ANGLE	RELATIVE CONCENTRATION
12067	5	5.686753E-08	12067	185	2.315410E-07
12067	10	1.464480E-07	12067	190	1.141793E-07
12067	15	1.106965E-07	12067	195	1.728375E-07
12067	20	9.621306E-08	12067	200	9.250147E-08
12067	25	1.676225E-07	12067	205	1.440225E-07
12067	30	2.449258E-07	12067	210	9.933291E-08
12067	35	2.196424E-07	12067	215	1.331673E-07
12067	40	3.563334E-07	12067	220	1.003766E-07
12067	45	2.860385E-07	12067	225	7.070668E-08
12067	50	4.112108E-07	12067	230	1.230896E-07
12067	55	3.117439E-07	12067	235	6.645394E-08
12067	60	4.234483E-07	12067	240	1.170344E-07
12067	65	3.588329E-07	12067	245	8.711697E-08
12067	70	5.292912E-07	12067	250	1.303112E-07
12067	75	4.727562E-07	12067	255	8.399974E-08
12067	80	4.667341E-07	12067	260	1.050361E-07
12067	85	5.822576E-07	12067	265	7.431129E-08
12067	90	5.419590E-07	12067	270	6.956577E-08
12067	95	7.638689E-07	12067	275	1.420772E-07
12067	100	9.755313E-07	12067	280	8.463314E-08
12067	105	8.582948E-07	12067	285	7.743972E-08
12067	110	8.385187E-07	12067	290	4.309568E-08
12067	115	7.008950E-07	12067	295	5.242342E-08
12067	120	8.618551E-07	12067	300	7.634810E-08
12067	125	9.686426E-07	12067	305	1.280874E-07
12067	130	6.518334E-07	12067	310	8.922530E-08
12067	135	6.036797E-07	12067	315	6.787656E-08
12067	140	5.396802E-07	12067	320	9.565582E-08
12067	145	4.460367E-07	12067	325	6.307090E-08
12067	150	3.839192E-07	12067	330	9.839573E-08
12067	155	3.082365E-07	12067	335	8.305932E-08
12067	160	2.966656E-07	12067	340	7.376235E-08
12067	165	3.194049E-07	12067	345	4.870501E-08
12067	170	2.227841E-07	12067	350	5.134236E-08
12067	175	1.801083E-07	12067	355	1.192759E-07
12067	180	1.331428E-07	12067	360	1.449905E-07

THE TOTAL AT THIS RADIUS IS 1.930085E-05

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

ER Table 2.6.3-1
Cherokee Nuclear Station
Areal Distribution of Average Relative
Concentration for Long Term (Routine) Releases

RADIUS	ANGLE	RELATIVE CONCENTRATION	RADIUS	ANGLE	RELATIVE CONCENTRATION
24135	5	2.488318E-08	24135	185	1.026115E-07
24135	10	6.512340E-08	24135	190	4.899609E-08
24135	15	4.852082E-08	24135	195	7.543798E-08
24135	20	4.135036E-08	24135	200	3.887688E-08
24135	25	7.301293E-08	24135	205	6.223098E-08
24135	30	1.076846E-07	24135	210	4.197468E-08
24135	35	9.570385E-08	24135	215	5.746871E-08
24135	40	1.577210E-07	24135	220	4.261202E-08
24135	45	1.252599E-07	24135	225	2.912065E-08
24135	50	1.819424E-07	24135	230	5.302201E-08
24135	55	1.367389E-07	24135	235	2.724965E-08
24135	60	1.902318E-07	24135	240	5.022468E-08
24135	65	1.589956E-07	24135	245	3.698203E-08
24135	70	2.367858E-07	24135	250	5.706581E-08
24135	75	2.111576E-07	24135	255	3.616695E-08
24135	80	2.084213E-07	24135	260	4.560122E-08
24135	85	2.613211E-07	24135	265	3.199102E-08
24135	90	2.436561E-07	24135	270	3.012846E-08
24135	95	3.445970E-07	24135	275	6.338269E-08
24135	100	4.405475E-07	24135	280	3.725624E-08
24135	105	3.868307E-07	24135	285	3.413015E-08
24135	110	3.776305E-07	24135	290	1.855127E-08
24135	115	3.143192E-07	24135	295	2.272248E-08
24135	120	3.877250E-07	24135	300	3.340827E-08
24135	125	3.907355E-07	24135	305	5.664915E-08
24135	130	2.922188E-07	24135	310	3.899897E-08
24135	135	2.706084E-07	24135	315	2.929213E-08
24135	140	2.414344E-07	24135	320	4.192945E-08
24135	145	1.991067E-07	24135	325	2.703461E-08
24135	150	1.738902E-07	24135	330	4.322343E-08
24135	155	1.375295E-07	24135	335	3.649991E-08
24135	160	1.320585E-07	24135	340	3.239226E-08
24135	165	1.425142E-07	24135	345	2.111005E-08
24135	170	9.824169E-08	24135	350	2.223344E-08
24135	175	7.888212E-08	24135	355	5.266815E-08
24135	180	5.790541E-08	24135	360	6.461778E-08

THE TOTAL AT THIS RADIUS IS 6.579524E-06

ER Table 2.6.3-1
Cherokee Nuclear Station
Areal Distribution of Average Relative
Concentration for Long Term (Routine) Releases

RADIUS	ANGLE	RELATIVE CONCENTRATION	RADIUS	ANGLE	RELATIVE CONCENTRATION
40225	5	1.404819E-08	40225	185	5.837963E-08
40225	10	3.708627E-08	40225	190	2.736513E-08
40225	15	2.741704E-08	40225	195	4.253036E-08
40225	20	2.311782E-08	40225	200	2.143165E-08
40225	25	4.112276E-08	40225	205	3.485876E-08
40225	30	6.098099E-08	40225	210	2.322205E-08
40225	35	5.395112E-08	40225	215	3.220031E-08
40225	40	8.966157E-08	40225	220	2.362662E-08
40225	45	7.079751E-08	40225	225	1.583979E-08
40225	50	1.034142E-07	40225	230	2.965582E-08
40225	55	7.737140E-08	40225	235	1.478872E-08
40225	60	1.083368E-07	40225	240	2.800051E-08
40225	65	9.044544E-08	40225	245	2.047993E-08
40225	70	1.353517E-07	40225	250	3.221551E-08
40225	75	1.206188E-07	40225	255	2.022281E-08
40225	80	1.190641E-07	40225	260	2.562714E-08
40225	85	1.496806E-07	40225	265	1.789027E-08
40225	90	1.396784E-07	40225	270	1.691040E-08
40225	95	1.978774E-07	40225	275	3.617200E-08
40225	100	2.531075E-07	40225	280	2.111122E-08
40225	105	2.220300E-07	40225	285	1.934331E-08
40225	110	2.166658E-07	40225	290	1.037129E-08
40225	115	1.804037E-07	40225	295	1.275620E-08
40225	120	2.223616E-07	40225	300	1.885144E-08
40225	125	2.240811E-07	40225	305	3.216038E-08
40225	130	1.673066E-07	40225	310	2.199653E-08
40225	135	1.549167E-07	40225	315	1.641102E-08
40225	140	1.380732E-07	40225	320	2.369794E-08
40225	145	1.137627E-07	40225	325	1.508793E-08
40225	150	9.941698E-08	40225	330	2.446066E-08
40225	155	7.852958E-08	40225	335	2.065982E-08
40225	160	7.529104E-08	40225	340	1.833199E-08
40225	165	8.133287E-08	40225	345	1.186921E-08
40225	170	5.572165E-08	40225	350	1.250268E-08
40225	175	4.458565E-08	40225	355	2.991543E-08
40225	180	3.253479E-08	40225	360	3.686408E-08

THE TOTAL AT THIS RADIUS IS 4.887928E-06

ER Table 2.6.3-1
Cherokee Nuclear Station
Areal Distribution of Average Relative
Concentration for Long Term (Routine) Releases

RADIUS	ANGLE	RELATIVE CONCENTRATION	RADIUS	ANGLE	RELATIVE CONCENTRATION
56315	5	5.830007E-09	56315	185	4.103198E-08
56315	10	2.606799E-08	56315	190	1.903612E-08
56315	15	1.919684E-08	56315	195	2.973882E-08
56315	20	1.609380E-08	56315	200	1.480391E-08
56315	25	2.873969E-08	56315	205	2.428235E-08
56315	30	4.274472E-08	56315	210	1.607136E-08
56315	35	3.773572E-08	56315	215	2.244481E-08
56315	40	6.298609E-08	56315	220	1.636705E-08
56315	45	4.958891E-08	56315	225	1.085179E-08
56315	50	7.263594E-09	56315	230	2.064475E-08
56315	55	5.422540E-08	56315	235	1.012201E-08
56315	60	7.617922E-08	56315	240	1.944813E-08
56315	65	6.356061E-08	56315	245	1.417076E-08
56315	70	9.535199E-08	56315	250	2.254199E-08
56315	75	8.494567E-08	56315	255	1.407485E-08
56315	80	8.395905E-08	56315	260	1.788686E-08
56315	85	1.055639E-07	56315	265	1.245267E-08
56315	90	9.855319E-08	56315	270	1.179785E-08
56315	95	1.397341E-07	56215	275	2.545604E-08
56315	100	1.787758E-07	56315	280	1.480456E-08
56315	105	1.567529E-07	56315	285	1.356249E-08
56315	110	1.529385E-07	56315	290	7.216659E-09
56315	115	1.272641E-07	56315	295	8.900592E-09
56315	120	1.569309E-07	56315	300	1.318415E-08
56315	125	1.531359E-07	56315	305	2.256904E-08
56315	130	1.179784E-07	56315	310	1.538221E-08
56315	135	1.092309E-07	56315	315	1.143638E-08
56315	140	9.730161E-08	56315	320	1.659338E-08
56315	145	8.013984E-08	56315	325	1.049069E-08
56315	150	7.005087E-08	56315	330	1.713958E-08
56315	155	5.529410E-08	56315	335	1.447785E-08
56315	160	5.297204E-08	56315	340	1.284683E-08
56315	165	5.723977E-08	56315	345	8.289621E-09
56315	170	3.909473E-08	56315	350	8.736787E-09
56315	175	3.121972E-08	56315	355	2.100844E-08
56315	180	2.273843E-08	56315	360	2.593641E-08

THE TOTAL AT THIS RADIUS IS 3.437428E-06

ER Table 2.6.3-1
Cherokee Nuclear Station
Areal Distribution of Average Relative
Concentration for Long Term (Routine) Releases

(Page 10 of 10)

RADIUS	ANGLE	RELATIVE CONCENTRATION	RADIUS	ANGLE	RELATIVE CONCENTRATION
72405	5	7.608463E-09	72405	185	3.185539E-08
72405	10	2.023418E-08	72405	190	1.467705E-08
72405	15	1.486648E-08	72405	195	2.300879E-08
72405	20	1.241677E-08	72405	200	1.136441E-08
72405	25	2.222765E-08	72405	205	1.873827E-08
72405	30	3.312302E-08	72405	210	1.235148E-08
72405	35	2.920567E-08	72405	215	1.733164E-08
72405	40	4.887815E-08	72405	220	1.258501E-08
72405	45	3.841268E-08	72405	225	8.282274E-09
72405	50	5.636165E-08	72405	230	1.592610E-08
72405	55	4.201904E-08	72405	235	7.722072E-09
72405	60	5.915533E-08	72405	240	1.497692E-08
72405	65	4.933705E-08	72405	245	1.088548E-08
72405	70	7.412763E-08	72405	250	1.744882E-08
72405	75	6.602374E-08	72405	255	1.085556E-08
72405	80	6.518701E-08	72405	260	1.382162E-08
72405	85	8.212470E-08	72405	265	9.605003E-09
72405	90	7.669263E-08	72405	270	9.115610E-09
72405	95	1.087940E-07	72405	275	1.977478E-08
72405	100	1.392073E-07	72405	280	1.147627E-08
72405	105	1.220270E-07	72405	285	1.051071E-08
72405	110	1.190442E-07	72405	290	5.564686E-09
72405	115	9.902300E-08	72405	295	6.877880E-09
72405	120	1.221421E-07	72405	300	1.019985E-08
72405	125	1.230708E-07	72405	305	1.750081E-08
72405	130	9.177927E-08	72405	310	1.190062E-08
72405	135	8.496505E-08	72405	315	8.828636E-09
72405	140	7.566075E-08	72405	320	1.284953E-08
72405	145	6.230471E-08	72405	325	8.085717E-09
72405	150	5.447034E-08	72405	330	1.327858E-08
72405	155	4.297108E-08	72405	335	1.121706E-08
72405	160	4.114638E-08	72405	340	9.954100E-09
72405	165	4.446424E-08	72405	345	6.409053E-09
72405	170	3.031544E-08	72405	350	6.758825E-09
72405	175	2.417484E-08	72405	355	1.630078E-08
72405	180	1.758930E-08	72405	360	2.014272E-08

THE TOTAL AT THIS RADIUS IS 2.669308E-06

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

ER Table 2.6.3-2
Cherokee Nuclear Station
High Level Tower Meteorological Survey (Page 1 of 7)

CHEROKEE METEOROLOGY SURVEY HIGH LEVEL TOWER DATA FOR PERIOD SEPT 11 1973 - SEPT 11 1974

SUMMARY OF PASQUILL A WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR, PERCENT)

DATE OF REPORT 10-22-74

WIND SECTOR	ITEM	SECTOR TOTAL	1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH >9.5 M/S
360.0	NO	53	2	17	15	8	11	0	0	0	0	0
-N-	PCT	0.65	0.02	0.21	0.18	0.10	0.14	0.00	0.00	0.00	0.00	0.00
22.5	NO	50	5	12	17	10	5	1	0	0	0	0
-NNE-	PCT	0.62	0.06	0.15	0.21	0.12	0.06	0.01	0.00	0.00	0.00	0.00
45.0	NO	76	3	22	34	11	5	1	0	0	0	0
-NE-	PCT	0.94	0.04	0.27	0.42	0.14	0.06	0.01	0.00	0.00	0.00	0.00
67.5	NO	46	4	18	14	6	3	1	0	0	0	0
-ENE-	PCT	0.57	0.05	0.22	0.17	0.07	0.04	0.01	0.00	0.00	0.00	0.00
90.0	NO	43	4	23	15	1	0	0	0	0	0	0
-E-	PCT	0.53	0.05	0.28	0.18	0.01	0.00	0.00	0.00	0.00	0.00	0.00
112.5	NO	18	1	9	7	1	0	0	0	0	0	0
-ESE-	PCT	0.22	0.01	0.11	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	33	3	14	7	7	2	0	0	0	0	0
-SE-	PCT	0.41	0.04	0.17	0.09	0.09	0.02	0.00	0.00	0.00	0.00	0.00
157.5	NO	25	1	8	5	7	1	3	0	0	0	0
-SSE-	PCT	0.31	0.01	0.10	0.06	0.09	0.01	0.04	0.00	0.00	0.00	0.00
180.0	NO	39	2	18	12	4	2	1	0	0	0	0
-S-	PCT	0.48	0.02	0.22	0.15	0.05	0.02	0.01	0.00	0.00	0.00	0.00
202.5	NO	58	0	13	15	13	13	4	0	0	0	0
-SSW-	PCT	0.72	0.00	0.16	0.18	0.16	0.16	0.05	0.00	0.00	0.00	0.00
225.0	NO	144	4	34	42	32	18	10	0	1	1	2
-SW-	PCT	1.78	0.05	0.42	0.52	0.40	0.22	0.12	0.00	0.01	0.01	0.02
247.5	NO	91	3	20	21	23	12	6	4	1	0	1
-WSW-	PCT	1.12	0.04	0.25	0.26	0.28	0.15	0.07	0.05	0.01	0.00	0.01
270.0	NO	65	4	20	17	9	7	3	3	2	0	0
-W-	PCT	0.80	0.05	0.25	0.21	0.11	0.09	0.04	0.04	0.02	0.00	0.00
292.5	NO	52	2	13	5	6	7	7	8	3	1	0
-WNW-	PCT	0.64	0.02	0.16	0.06	0.07	0.09	0.09	0.10	0.04	0.01	0.00
315.0	NO	42	3	20	9	2	4	1	2	1	0	0
-NW-	PCT	0.52	0.04	0.25	0.11	0.02	0.05	0.01	0.02	0.01	0.00	0.00
337.5	NO	45	4	15	18	5	1	2	0	0	0	0
-NNW-	PCT	0.56	0.05	0.18	0.22	0.06	0.01	0.02	0.00	0.00	0.00	0.00
CALM	NO	0										
	PCT	0.00	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	880	45	276	253	145	91	40	17	8	2	3
	PCT	10.89	0.56	3.41	3.13	1.79	1.12	0.49	0.21	0.10	0.02	0.04

AVERAGE WIND SPEED 7.24 TOTAL VALID OBSERVATIONS 8084 TOTAL OBSERVATIONS 8760

Amendment 1 (New)
Amendment 2 (Entire Table Revised)

ER Table 2.6.3-2
Cherokee Nuclear Station
High Level Tower Meteorological Survey (Page 2 of 7)

CHEROKEE METEOROLOGY SURVEY HIGH LEVEL TOWER DATA FOR PERIOD SEPT 11 1973 - SEPT 11 1974
SUMMARY OF PASQUILL C WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR,PERCENT)
DATE OF REPORT 10-22-74

WIND SECTOR	ITEM	SECTOR TOTAL	WIND SPEED CLASS 1.0-3.2 MPH .45-1.49 M/S	3.3-5.5 MPH 1.5-2.49 M/S	5.6-7.8 MPH 2.5-3.49 M/S	7.9-10.0 MPH 3.5-4.49 M/S	10.1-12.3 MPH 4.5-5.49 M/S	12.4-14.5 MPH 5.5-6.49 M/S	14.6-16.7 MPH 6.5-7.49 M/S	16.8-19.0 MPH 7.5-8.49 M/S	19.1-21.2 MPH 8.5-9.49 M/S	>21.2 MPH >9.5 M/S
360.0	NO	37	7	6	11	9	5	0	0	0	0	0
-N-	PCT	0.46	0.09	0.07	0.14	0.10	0.06	0.00	0.00	0.00	0.00	0.00
22.5	NO	71	3	13	29	16	8	2	0	0	0	0
-NNE-	PCT	0.88	0.04	0.16	0.36	0.20	0.10	0.02	0.00	0.00	0.00	0.00
45.0	NO	85	7	24	16	27	9	2	0	0	0	0
-NE-	PCT	1.05	0.09	0.30	0.20	0.33	0.11	0.02	0.00	0.00	0.00	0.00
67.5	NO	57	6	13	17	11	5	4	1	0	0	0
-ENE-	PCT	0.70	0.07	0.16	0.21	0.14	0.06	0.05	0.01	0.00	0.00	0.00
90.0	NO	47	11	18	9	6	3	0	0	0	0	0
-E-	PCT	0.58	0.14	0.22	0.11	0.07	0.04	0.00	0.00	0.00	0.00	0.00
112.5	NO	25	7	11	3	1	3	0	0	0	0	0
-ESE-	PCT	0.31	0.09	0.14	0.04	0.01	0.04	0.00	0.00	0.00	0.00	0.00
135.0	NO	37	8	12	3	12	2	0	0	0	0	0
-SE-	PCT	0.46	0.10	0.15	0.04	0.15	0.02	0.00	0.00	0.00	0.00	0.00
157.5	NO	28	3	9	9	5	2	0	0	0	0	0
-SSE-	PCT	0.34	0.04	0.11	0.11	0.06	0.02	0.00	0.00	0.00	0.00	0.00
180.0	NO	34	5	14	9	5	1	0	0	0	0	0
-S-	PCT	0.42	0.06	0.17	0.11	0.06	0.01	0.00	0.00	0.00	0.00	0.00
202.5	NO	72	3	25	17	14	8	5	0	0	0	0
-SSW-	PCT	0.89	0.04	0.31	0.21	0.17	0.10	0.06	0.00	0.00	0.00	0.00
225.0	NO	151	5	20	45	34	25	8	7	2	4	1
-SW-	PCT	1.87	0.06	0.25	0.56	0.42	0.31	0.10	0.09	0.02	0.05	0.01
247.5	NO	87	7	16	18	12	14	7	6	4	2	1
-WSW-	PCT	1.08	0.09	0.20	0.22	0.15	0.17	0.09	0.07	0.05	0.02	0.01
270.0	NO	60	6	18	15	10	8	2	1	0	0	0
-W-	PCT	0.74	0.07	0.22	0.19	0.12	0.10	0.02	0.01	0.00	0.00	0.00
292.5	NO	58	4	15	13	13	7	3	2	1	0	0
-WNW-	PCT	0.72	0.05	0.18	0.16	0.16	0.09	0.04	0.02	0.01	0.00	0.00
315.0	NO	76	3	25	12	9	9	5	10	2	1	0
-NW-	PCT	0.94	0.04	0.31	0.15	0.11	0.11	0.06	0.12	0.02	0.01	0.00
337.5	NO	45	7	19	14	3	1	1	0	0	0	0
-NNW-	PCT	0.56	0.09	0.23	0.17	0.04	0.01	0.01	0.00	0.00	0.00	0.00
CALM	NO	0										
	PCT	0.00	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	970	92	258	240	186	110	39	27	9	7	2
	PCT	12.00	1.14	3.19	2.97	2.30	1.36	0.48	0.33	0.11	0.09	0.02

AVERAGE WIND SPEED 7.34 TOTAL VALID OBSERVATIONS 8084 TOTAL OBSERVATIONS 8760

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

ER Table 2.6.3-2
Cherokee Nuclear Station
High Level Tower Meteorological Survey (Page 3 of 7)

CHEROKEE METEOROLOGY SURVEY HIGH LEVEL TOWER DATA FOR PERIOD SEPT 11 1973 - SEPT 11 1974

SUMMARY OF PASQUILL D WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR,PERCENT)

DATE OF REPORT 10-22-74

WIND SECTOR	ITEM	SECTOR TOTAL	WIND SPEED CLASS 1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH 9.5 M/S
360.0	NO	110	10	30	44	20	5	1	0	0	0	0
-N-	PCT	1.36	0.12	0.37	0.54	0.25	0.06	0.01	0.00	0.00	0.00	0.00
22.5	NO	115	8	34	34	25	12	2	0	0	0	0
-NNE-	PCT	1.42	0.10	0.42	0.42	0.31	0.15	0.02	0.00	0.00	0.00	0.00
45.0	NO	135	10	35	39	32	14	4	1	0	0	0
-NE-	PCT	1.67	0.12	0.43	0.48	0.40	0.17	0.05	0.01	0.00	0.00	0.00
67.5	NO	97	14	25	28	14	13	3	0	0	0	0
-ENE-	PCT	1.20	0.17	0.31	0.34	0.17	0.16	0.04	0.00	0.00	0.00	0.00
90.0	NO	80	14	31	17	9	6	2	1	0	0	0
-E-	PCT	0.99	0.17	0.38	0.21	0.11	0.07	0.02	0.01	0.00	0.00	0.00
112.5	NO	42	8	22	4	8	0	0	0	0	0	0
-ESE-	PCT	0.52	0.10	0.27	0.05	0.10	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	71	14	26	13	12	4	1	1	0	0	0
-SE-	PCT	0.88	0.17	0.32	0.16	0.15	0.05	0.01	0.01	0.00	0.00	0.00
157.5	NO	59	13	20	5	5	8	5	2	1	0	0
-SSE-	PCT	0.73	0.16	0.25	0.06	0.06	0.10	0.06	0.02	0.01	0.00	0.00
180.0	NO	76	14	17	26	11	6	2	0	0	0	0
-S-	PCT	0.94	0.17	0.21	0.32	0.14	0.07	0.02	0.00	0.00	0.00	0.00
202.5	NO	120	18	36	29	15	16	4	1	1	0	0
-SSW-	PCT	1.48	0.22	0.44	0.36	0.18	0.20	0.05	0.01	0.01	0.00	0.00
225.0	NO	153	11	30	35	29	16	17	10	4	1	0
-SW-	PCT	1.89	0.14	0.37	0.43	0.36	0.20	0.21	0.12	0.05	0.01	0.00
247.5	NO	83	6	15	17	23	8	5	4	2	2	1
-WSW-	PCT	1.03	0.07	0.18	0.21	0.28	0.10	0.06	0.05	0.02	0.02	0.01
270.0	NO	47	5	19	9	5	5	1	1	0	2	0
-W-	PCT	0.58	0.06	0.23	0.11	0.06	0.06	0.01	0.01	0.00	0.02	0.00
292.5	NO	57	12	11	11	8	9	2	1	3	0	0
-WNW-	PCT	0.70	0.15	0.14	0.14	0.10	0.11	0.02	0.01	0.04	0.00	0.00
315.0	NO	83	12	22	18	12	8	6	3	1	1	0
-NW-	PCT	1.03	0.15	0.27	0.22	0.15	0.10	0.07	0.04	0.01	0.01	0.00
337.5	NO	75	12	25	21	9	4	4	0	0	0	0
-NNW-	PCT	0.93	0.15	0.31	0.26	0.11	0.05	0.05	0.00	0.00	0.00	0.00
CALM	NO	5										
	PCT	0.06	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	1403	181	398	350	237	134	59	25	12	6	1
	PCT	17.35	2.24	4.92	4.33	2.93	1.66	0.73	0.31	0.15	0.07	0.01

AVERAGE WIND SPEED 6.85 TOTAL VALID OBSERVATIONS 8084 TOTAL OBSERVATIONS 8760

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

CHEROKEE METEOROLOGY SURVEY HIGH LEVEL TOWER DATA FOR PERIOD SEPT 11 1973 - SEPT 11 1974

SUMMARY OF PASQUILL E WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURS, PERCENT)

DATE OF REPORT 10-22-74

WIND SECTOR	ITEM	SECTOR TOTAL	1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH >9.5 M/S
360.0	NO	126	12	35	45	24	6	2	1	0	1	0
-N-	PCT	1.56	0.15	0.43	0.56	0.30	0.07	0.02	0.01	0.00	0.01	0.00
22.5	NO	158	14	34	54	40	11	4	0	0	1	0
-NNE-	PCT	1.95	0.17	0.42	0.67	0.49	0.14	0.05	0.00	0.00	0.01	0.00
45.0	NO	181	24	36	59	37	18	6	0	1	0	0
-NE-	PCT	2.24	0.30	0.44	0.73	0.46	0.22	0.07	0.00	0.01	0.00	0.00
67.5	NO	75	15	26	15	11	6	2	0	0	0	0
-ENE-	PCT	0.93	0.19	0.32	0.18	0.14	0.07	0.02	0.00	0.00	0.00	0.00
90.0	NO	50	11	23	11	3	2	0	0	0	0	0
-E-	PCT	0.62	0.14	0.28	0.14	0.04	0.02	0.00	0.00	0.00	0.00	0.00
112.5	NO	60	22	21	13	4	0	0	0	0	0	0
-ESE-	PCT	0.74	0.27	0.26	0.16	0.05	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	81	27	27	13	8	4	1	1	0	0	0
-SE-	PCT	1.00	0.33	0.33	0.16	0.10	0.05	0.01	0.01	0.00	0.00	0.00
157.5	NO	82	20	29	15	8	7	3	0	0	0	0
-SSE-	PCT	1.01	0.25	0.36	0.18	0.10	0.09	0.04	0.00	0.00	0.00	0.00
180.0	NO	125	18	28	35	22	15	4	0	3	0	0
-S-	PCT	1.55	0.22	0.34	0.43	0.27	0.18	0.05	0.00	0.04	0.00	0.00
202.5	NO	213	22	49	55	40	38	9	0	0	0	0
-SSW-	PCT	2.63	0.27	0.61	0.68	0.49	0.47	0.11	0.00	0.00	0.00	0.00
225.0	NO	312	23	37	69	72	55	32	14	9	1	0
-SW-	PCT	3.86	0.28	0.46	0.85	0.89	0.68	0.40	0.17	0.11	0.01	0.00
247.5	NO	165	15	21	36	35	35	16	6	1	0	0
-WSW-	PCT	2.04	0.19	0.26	0.44	0.43	0.43	0.20	0.07	0.01	0.00	0.00
270.0	NO	103	15	25	22	20	16	2	2	1	0	0
-W-	PCT	1.27	0.18	0.31	0.27	0.25	0.20	0.02	0.02	0.01	0.00	0.00
292.5	NO	110	13	21	26	23	17	6	1	1	1	1
-WNW-	PCT	1.36	0.16	0.26	0.32	0.28	0.21	0.07	0.01	0.01	0.01	0.01
315.0	NO	150	15	34	36	27	22	7	8	1	0	0
-NW-	PCT	1.86	0.19	0.42	0.44	0.33	0.27	0.09	0.10	0.01	0.00	0.00
337.5	NO	103	12	27	29	20	14	1	0	0	0	0
-NNW-	PCT	1.27	0.15	0.33	0.36	0.25	0.17	0.01	0.00	0.00	0.00	0.00
CALM	NO	5										
	PCT	0.06	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	2094	278	473	533	394	266	95	33	17	4	1
	PCT	25.90	3.44	5.85	6.59	4.87	3.29	1.17	0.41	0.21	0.05	0.01

AVERAGE WIND SPEED 7.13 TOTAL VALID OBSERVATIONS 8084 TOTAL OBSERVATIONS 8760

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

ER Table 2.6.3-2
Cherokee Nuclear Station
High Level Tower Meteorological Survey (Page 5 of 7)

CHEROKEE METEOROLOGY SURVEY HIGH LEVEL TOWER DATA FOR PERIOD SEPT 11 1973 - SEPT 11 1974

SUMMARY OF PASQUILL F

WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR,PERCENT)

DATE OF REPORT 10-22-74

WIND SECTOR	ITEM	SECTOR TOTAL	WIND SPEED CLASS 1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH S9.5 M/S
360.0	NO	77	14	23	30	7	3	0	0	0	0	0
-N-	PCT	0.95	0.17	0.28	0.37	0.09	0.04	0.00	0.00	0.00	0.00	0.00
22.5	NO	53	12	14	15	10	1	1	0	0	0	0
-NNE-	PCT	0.65	0.15	0.17	0.18	0.12	0.01	0.01	0.00	0.00	0.00	0.00
45.0	NO	76	17	30	21	5	3	0	0	0	0	0
-NE-	PCT	0.94	0.21	0.37	0.26	0.06	0.04	0.00	0.00	0.00	0.00	0.00
67.5	NO	35	10	18	2	3	1	1	0	0	0	0
-ENE-	PCT	0.43	0.12	0.22	0.02	0.04	0.01	0.01	0.00	0.00	0.00	0.00
90.0	NO	30	10	15	3	1	1	0	0	0	0	0
-E-	PCT	0.37	0.12	0.18	0.04	0.01	0.01	0.00	0.00	0.00	0.00	0.00
112.5	NO	28	15	10	3	0	0	0	0	0	0	0
-ESE-	PCT	0.34	0.18	0.12	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	40	9	20	8	3	0	0	0	0	0	0
-SE-	PCT	0.49	0.11	0.25	0.10	0.04	0.00	0.00	0.00	0.00	0.00	0.00
157.5	NO	40	15	17	7	1	0	0	0	0	0	0
-SSE-	PCT	0.49	0.19	0.21	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00
180.0	NO	64	12	23	21	6	0	2	0	0	0	0
-S-	PCT	0.79	0.15	0.28	0.26	0.07	0.00	0.02	0.00	0.00	0.00	0.00
202.5	NO	88	7	23	24	23	7	3	1	0	0	0
-SSW-	PCT	1.09	0.09	0.28	0.30	0.28	0.09	0.04	0.01	0.00	0.00	0.00
225.0	NO	158	9	25	32	43	36	12	1	0	0	0
-SW-	PCT	1.95	0.11	0.31	0.40	0.53	0.44	0.15	0.01	0.00	0.00	0.00
247.5	NO	49	5	10	13	15	4	1	0	0	0	0
-WSW-	PCT	0.59	0.06	0.12	0.16	0.18	0.05	0.01	0.00	0.00	0.00	0.00
270.0	NO	35	7	10	11	3	2	1	1	0	0	0
-W-	PCT	0.43	0.09	0.12	0.14	0.04	0.02	0.01	0.01	0.00	0.00	0.00
292.5	NO	47	9	13	14	9	3	0	0	0	0	0
-WNW-	PCT	0.58	0.10	0.16	0.17	0.11	0.04	0.00	0.00	0.00	0.00	0.00
315.0	NO	134	21	40	48	22	3	0	0	0	0	0
-NW-	PCT	1.66	0.26	0.49	0.59	0.27	0.04	0.00	0.00	0.00	0.00	0.00
337.5	NO	77	10	36	19	7	5	0	0	0	0	0
-NNW-	PCT	0.95	0.12	0.44	0.23	0.09	0.06	0.00	0.00	0.00	0.00	0.00
CALM	NO	3										
	PCT	0.04	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	1030	181	327	271	158	69	21	3	0	0	0
	PCT	12.74	2.24	4.04	3.35	1.95	0.85	0.26	0.04	0.00	0.00	0.00

AVERAGE WIND SPEED 5.94 TOTAL VALID OBSERVATIONS 8084 TOTAL OBSERVATIONS 8760

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

CHEROKEE METEOROLOGY SURVEY HIGH LEVEL TOWER DATA FOR PERIOD SEPT 11 1973 - SEPT 11 1974

SUMMARY OF PASQUILL G WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURS, PERCENT)

DATE OF REPORT 10-22-74

WIND SECTOR	ITEM	SECTOR TOTAL	1.0-3.2 MPH .45-1.49 M/S	3.3-5.5 MPH 1.5-2.49 M/S	5.6-7.8 MPH 2.5-3.49 M/S	7.9-10.0 MPH 3.5-4.49 M/S	10.1-12.3 MPH 4.5-5.49 M/S	12.4-14.5 MPH 5.5-6.49 M/S	14.6-16.7 MPH 6.5-7.49 M/S	16.8-19.0 MPH 7.5-8.49 M/S	19.1-21.2 MPH 8.5-9.49 M/S	>21.2 MPH >9.5 M/S
360.0	NO	176	38	61	47	22	8	0	0	0	0	0
-N-	PCT	2.18	0.47	0.75	0.58	0.27	0.10	0.00	0.00	0.00	0.00	0.00
22.5	NO	126	37	46	26	14	3	0	0	0	0	0
-NNE-	PCT	1.56	0.46	0.57	0.32	0.17	0.04	0.00	0.00	0.00	0.00	0.00
45.0	NO	130	43	63	15	8	1	0	0	0	0	0
-NE-	PCT	1.61	0.53	0.78	0.18	0.10	0.01	0.00	0.00	0.00	0.00	0.00
67.5	NO	68	20	32	5	11	0	0	0	0	0	0
-ENE-	PCT	0.84	0.25	0.40	0.06	0.14	0.00	0.00	0.00	0.00	0.00	0.00
90.0	NO	69	25	33	6	4	1	0	0	0	0	0
-E-	PCT	0.85	0.31	0.41	0.07	0.05	0.01	0.00	0.00	0.00	0.00	0.00
112.5	NO	63	25	29	9	0	0	0	0	0	0	0
-ESE-	PCT	0.78	0.31	0.36	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	67	31	31	5	0	0	0	0	0	0	0
-SE-	PCT	0.83	0.38	0.38	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
157.5	NO	88	35	41	11	1	0	0	0	0	0	0
-SSE-	PCT	1.09	0.43	0.51	0.14	0.01	0.00	0.00	0.00	0.00	0.00	0.00
180.0	NO	119	29	58	26	5	1	0	0	0	0	0
-S-	PCT	1.47	0.36	0.72	0.32	0.06	0.01	0.00	0.00	0.00	0.00	0.00
202.5	NO	127	18	47	45	15	2	0	0	0	0	0
-SSW-	PCT	1.57	0.22	0.58	0.56	0.18	0.02	0.00	0.00	0.00	0.00	0.00
225.0	NO	158	30	41	54	29	3	1	0	0	0	0
-SW-	PCT	1.95	0.37	0.51	0.67	0.36	0.04	0.01	0.00	0.00	0.00	0.00
247.5	NO	53	14	22	12	4	1	0	0	0	0	0
-WSW-	PCT	0.65	0.17	0.27	0.15	0.05	0.01	0.00	0.00	0.00	0.00	0.00
270.0	NO	61	23	25	10	2	1	0	0	0	0	0
-W-	PCT	0.75	0.28	0.31	0.12	0.02	0.01	0.00	0.00	0.00	0.00	0.00
292.5	NO	67	23	32	4	5	3	0	0	0	0	0
-WNW-	PCT	0.83	0.28	0.40	0.05	0.06	0.04	0.00	0.00	0.00	0.00	0.00
315.0	NO	178	24	62	66	19	7	0	0	0	0	0
-NW-	PCT	2.20	0.30	0.77	0.82	0.23	0.09	0.00	0.00	0.00	0.00	0.00
337.5	NO	140	23	53	39	19	6	0	0	0	0	0
-NNW-	PCT	1.73	0.28	0.65	0.48	0.23	0.07	0.00	0.00	0.00	0.00	0.00
CALM	NO	4										
	PCT	0.05										
TOTAL	NO	1690	438	676	380	158	37	1	0	0	0	0
	PCT	20.90	5.42	8.36	4.70	1.95	0.46	0.01	0.00	0.00	0.00	0.00

AVERAGE WIND SPEED 4.88 TOTAL VALID OBSERVATIONS 8084 TOTAL OBSERVATIONS 8760

Amendment 1 (New)
Amendment 2 (Entire Table Revised)

En Table 2.6.3-2
Cherokee Nuclear Station
High Level Tower Meteorological Survey (Page 7 of 7)

CHEROKEE METEOROLOGY SURVEY HIGH LEVEL TOWER DATA FOR PERIOD SEPT 11 1973 - SEPT 11 1974
SUMMARY OF PASQUILL A+C+D+E+F+G WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURS, PERCENT)
DATE OF REPORT 10-22-74

WIND SECTOR	ITEM	SECTOR TOTAL	WIND SPEED CLASS 1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH >9.5 M/S
360.0	NO	579	83	172	192	89	38	3	1	0	1	0
-N-	PCT	7.16	1.03	2.13	2.37	1.10	0.47	0.04	0.01	0.00	0.01	0.00
22.5	NO	573	79	153	175	115	40	10	0	0	1	0
-NNE-	PCT	7.09	0.98	1.89	2.16	1.42	0.49	0.12	0.00	0.00	0.01	0.00
45.0	NO	683	104	210	184	120	50	13	1	1	0	0
-NE-	PCT	8.45	1.29	2.60	2.28	1.48	0.62	0.16	0.01	0.01	0.00	0.00
67.5	NO	378	69	132	81	56	28	11	1	0	0	0
-ENE-	PCT	4.68	0.85	1.63	1.00	0.69	0.34	0.14	0.01	0.00	0.00	0.00
90.0	NO	319	75	143	61	24	13	2	1	0	0	0
-E-	PCT	3.95	0.93	1.77	0.75	0.30	0.16	0.02	0.01	0.00	0.00	0.00
112.5	NO	236	78	102	39	14	3	0	0	0	0	0
-ESE-	PCT	2.92	0.96	1.26	0.48	0.17	0.04	0.00	0.00	0.00	0.00	0.00
135.0	NO	329	92	130	49	42	12	2	2	0	0	0
-SE-	PCT	4.07	1.14	1.61	0.61	0.52	0.15	0.02	0.02	0.00	0.00	0.00
157.5	NO	322	87	124	52	27	18	11	2	1	0	0
-SSE-	PCT	3.98	1.08	1.53	0.64	0.33	0.22	0.14	0.02	0.01	0.00	0.00
180.0	NO	457	80	158	129	53	25	9	0	3	0	0
-S-	PCT	5.65	0.99	1.95	1.59	0.65	0.31	0.11	0.00	0.04	0.00	0.00
202.5	NO	678	68	193	185	120	84	25	2	1	0	0
-SSW-	PCT	8.39	0.84	2.39	2.29	1.48	1.04	0.31	0.02	0.01	0.00	0.00
225.0	NO	1076	82	187	277	239	153	80	32	16	7	3
-SW-	PCT	13.31	1.01	2.31	3.43	2.96	1.89	0.99	0.40	0.20	0.09	0.04
247.5	NO	527	50	104	117	112	74	35	20	8	4	3
-WSW-	PCT	6.52	0.62	1.29	1.45	1.38	0.91	0.43	0.25	0.10	0.05	0.04
270.0	NO	371	60	117	84	49	39	9	8	3	2	0
-W-	PCT	4.59	0.74	1.45	1.04	0.61	0.48	0.11	0.10	0.04	0.02	0.00
292.5	NO	391	62	105	73	64	46	18	12	8	2	1
-WNW-	PCT	4.84	0.77	1.30	0.90	0.79	0.57	0.22	0.15	0.10	0.02	0.01
315.0	NO	663	78	203	189	91	53	19	23	5	2	0
-NW-	PCT	8.20	0.96	2.51	2.34	1.12	0.65	0.23	0.28	0.06	0.02	0.00
337.5	NO	485	68	175	140	63	31	8	0	0	0	0
-NNW-	PCT	6.00	0.84	2.16	1.73	0.78	0.38	0.10	0.00	0.00	0.00	0.00
CALM	NO	17										
	PCT	0.21										
TOTAL	NO	8067	1215	2408	2027	1278	707	255	105	46	19	7
	PCT	99.79	15.03	29.79	25.07	15.81	8.74	3.15	1.30	0.57	0.23	0.09

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

AVERAGE WIND SPEED 6.50 TOTAL VALID OBSERVATIONS 8084 TOTAL OBSERVATIONS 8760

Table 2.6.3-3
Cherokee Nuclear Station
Low Level Tower Meteorological Survey - Monthly Summaries (Sheet 1 of 12)

CHEROKEE METEOROLOGY SURVEY LOW LEVEL TOWER DATA FOR PERIOD OF SEPT 11 1973 THROUGH SEPT 30 1973
SUMMARY OF PASQUILL A+C+D+E+F+G WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR,PERCENT)

WIND SECTOR	ITEM	SECTOR TOTAL	WIND SPEED CLASS 1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH S9.5 M/S
360.0	NO	26	18	7	1	0	0	0	0	0	0	0
-N-	PCT	5.62	3.89	1.51	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22.5	NO	34	7	19	5	2	1	0	0	0	0	0
-NNE-	PCT	7.34	1.51	4.10	1.08	0.43	0.22	0.00	0.00	0.00	0.00	0.00
45.0	NO	63	11	25	15	10	2	0	0	0	0	0
-NE-	PCT	13.61	2.38	5.40	3.24	2.16	0.43	0.00	0.00	0.00	0.00	0.00
67.5	NO	43	10	24	6	1	2	0	0	0	0	0
-ENE-	PCT	9.29	2.16	5.18	1.30	0.22	0.43	0.00	0.00	0.00	0.00	0.00
90.0	NO	24	6	13	2	3	0	0	0	0	0	0
-E-	PCT	5.18	1.30	2.81	0.43	0.65	0.00	0.00	0.00	0.00	0.00	0.00
112.5	NO	19	4	13	2	0	0	0	0	0	0	0
-ESE-	PCT	4.10	0.86	2.81	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	21	5	13	2	0	1	0	0	0	0	0
-SE-	PCT	4.53	1.08	2.81	0.43	0.00	0.22	0.00	0.00	0.00	0.00	0.00
157.5	NO	1	1	0	0	0	0	0	0	0	0	0
-SSE-	PCT	0.22	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180.0	NO	3	3	0	0	0	0	0	0	0	0	0
-S-	PCT	0.65	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
202.5	NO	1	1	0	0	0	0	0	0	0	0	0
-SSW-	PCT	0.22	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
225.0	NO	20	15	3	2	0	0	0	0	0	0	0
-SW-	PCT	4.32	3.24	0.65	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00
247.5	NO	38	24	6	8	0	0	0	0	0	0	0
-WSW-	PCT	8.21	5.18	1.30	1.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00
270.0	NO	44	27	10	7	0	0	0	0	0	0	0
-W-	PCT	9.50	5.83	2.16	1.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00
292.5	NO	36	32	4	0	0	0	0	0	0	0	0
-WNW-	PCT	7.77	6.91	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
315.0	NO	53	42	10	1	0	0	0	0	0	0	0
-NW-	PCT	11.45	9.07	2.16	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00
337.5	NO	27	22	5	0	0	0	0	0	0	0	0
-NNW-	PCT	5.83	4.75	1.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	NO	10										
	PCT	2.16	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	453	228	152	51	16	6	0	0	0	0	0
	PCT	97.84	49.24	32.83	11.01	3.45	1.30	0.00	0.00	0.00	0.00	0.00

AVERAGE WIND SPEED 3.56 TOTAL VALID OBSERVATIONS 463 TOTAL OBSERVATIONS 464

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

CHEROKEE METEOROLOGY SURVEY LOW LEVEL TOWER DATA FOR PERIOD OF OCTOBER 1973

SUMMARY OF PASQUILL A+C+D+E+F+G WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR,PERCENT)

WIND SECTOR	ITEM	SECTOR TOTAL	WIND SPEED CLASS 1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH S9.5 M/S
360.0	NO	64	38	23	3	0	0	0	0	0	0	0
-N-	PCT	9.51	5.65	3.42	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22.5	NO	42	11	26	5	0	0	0	0	0	0	0
-NNE-	PCT	6.24	1.63	3.86	0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45.0	NO	55	17	23	13	2	0	0	0	0	0	0
-NE-	PCT	8.17	2.53	3.42	1.93	0.30	0.00	0.00	0.00	0.00	0.00	0.00
67.5	NO	28	13	6	8	1	0	0	0	0	0	0
-ENE-	PCT	4.16	1.93	0.89	1.19	0.15	0.00	0.00	0.00	0.00	0.00	0.00
90.0	NO	27	16	10	1	0	0	0	0	0	0	0
-E-	PCT	4.01	2.38	1.48	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112.5	NO	11	5	6	0	0	0	0	0	0	0	0
-ESE-	PCT	1.63	0.74	0.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	24	14	8	2	0	0	0	0	0	0	0
-SE-	PCT	3.57	2.08	1.19	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
157.5	NO	13	8	5	0	0	0	0	0	0	0	0
-SSE-	PCT	1.93	1.19	0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180.0	NO	7	6	1	0	0	0	0	0	0	0	0
-S-	PCT	1.04	0.89	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
202.5	NO	14	11	3	0	0	0	0	0	0	0	0
-SSW-	PCT	2.08	1.63	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
225.0	NO	38	18	11	9	0	0	0	0	0	0	0
-SW-	PCT	5.65	2.67	1.63	1.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00
247.5	NO	46	14	15	16	1	0	0	0	0	0	0
-WSW-	PCT	6.83	2.08	2.23	2.38	0.15	0.00	0.00	0.00	0.00	0.00	0.00
270.0	NO	53	35	7	8	0	3	0	0	0	0	0
-W-	PCT	7.88	5.20	1.04	1.19	0.00	0.45	0.00	0.00	0.00	0.00	0.00
292.5	NO	56	50	4	2	0	0	0	0	0	0	0
-WNW-	PCT	8.32	7.43	0.59	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
315.0	NO	111	82	23	4	1	1	0	0	0	0	0
-NW-	PCT	16.49	12.18	3.42	0.59	0.15	0.15	0.00	0.00	0.00	0.00	0.00
337.5	NO	44	30	14	0	0	0	0	0	0	0	0
-NNW-	PCT	6.54	4.46	2.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	NO	40										
	PCT	5.94	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	633	368	185	71	5	4	0	0	0	0	0
	PCT	94.06	54.68	27.49	10.55	0.74	0.59	0.00	0.00	0.00	0.00	0.00

AVERAGE WIND SPEED 3.05 TOTAL VALID OBSERVATIONS 673 TOTAL OBSERVATIONS 744

Amendment 1 (New)
Amendment 2 (Entire Table Revised)

ER Table 2.6.3-3
Cherokee Nuclear Station
Low Level Tower Meteorological Survey - Monthly Summaries (Sheet 3 of 12)

CHEROKEE METEOROLOGY SURVEY LOW LEVEL TOWER DATA FOR PERIOD OF NOVEMBER 1973
SUMMARY OF PASQUILL A+C+D+E+F+G WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR,PERCENT)

WIND SECTOR	ITEM	SECTOR TOTAL	WIND SPEED CLASS 1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH S9.5 M/S
360.0	NO	49	25	18	5	1	0	0	0	0	0	0
-N-	PCT	6.91	3.52	2.54	0.70	0.14	0.00	0.00	0.00	0.00	0.00	0.00
22.5	NO	22	14	6	2	0	0	0	0	0	0	0
-NNE-	PCT	3.10	1.97	0.85	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45.0	NO	27	13	8	6	0	0	0	0	0	0	0
-NE-	PCT	3.81	1.83	1.13	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00
67.5	NO	17	13	4	0	0	0	0	0	0	0	0
-ENE-	PCT	2.40	1.83	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90.0	NO	24	17	7	0	0	0	0	0	0	0	0
-E-	PCT	3.38	2.40	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112.5	NO	13	8	5	0	0	0	0	0	0	0	0
-ESE-	PCT	1.83	1.13	0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	27	15	6	6	0	0	0	0	0	0	0
-SE-	PCT	3.81	2.11	0.85	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00
157.5	NO	8	8	0	0	0	0	0	0	0	0	0
-SSE-	PCT	1.13	1.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180.0	NO	25	14	8	2	1	0	0	0	0	0	0
-S-	PCT	3.52	1.97	1.13	0.28	0.14	0.00	0.00	0.00	0.00	0.00	0.00
202.5	NO	27	13	11	3	0	0	0	0	0	0	0
-SSW-	PCT	3.81	1.83	1.55	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00
225.0	NO	100	34	43	19	4	0	0	0	0	0	0
-SW-	PCT	14.10	4.79	6.06	2.68	0.56	0.00	0.00	0.00	0.00	0.00	0.00
247.5	NO	73	22	19	14	9	5	3	1	0	0	0
-WSW-	PCT	10.30	3.10	2.68	1.97	1.27	0.70	0.42	0.14	0.00	0.00	0.00
270.0	NO	43	23	13	6	0	0	1	0	0	0	0
-W-	PCT	6.06	3.24	1.83	0.85	0.00	0.00	0.14	0.00	0.00	0.00	0.00
292.5	NO	60	43	9	6	1	1	0	0	0	0	0
-WNW-	PCT	8.46	6.06	1.27	0.85	0.14	0.14	0.00	0.00	0.00	0.00	0.00
315.0	NO	88	53	8	8	11	7	1	0	0	0	0
-NW-	PCT	12.41	7.48	1.13	1.13	1.55	0.99	0.14	0.00	0.00	0.00	0.00
337.5	NO	48	31	13	2	1	1	0	0	0	0	0
-NNW-	PCT	6.77	4.37	1.83	0.28	0.14	0.14	0.00	0.00	0.00	0.00	0.00
CALM	NO	58										
	PCT	8.18	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	651	346	178	79	28	14	5	1	0	0	0
	PCT	91.82	48.80	25.11	11.14	3.95	1.97	0.70	0.14	0.00	0.00	0.00

AVERAGE WIND SPEED 3.48 TOTAL VALID OBSERVATIONS 709 TOTAL OBSERVATIONS 720

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

ER Table 2.6.3-3
Cherokee Nuclear Station
Low Level Tower Meteorological Survey - Monthly Summaries (Sheet 4 of 12)

CHEROKEE METEOROLOGY SURVEY LOW LEVEL TOWER DATA FOR PERIOD OF DECEMBER 1973

SUMMARY OF PASQUILL A+C+D+E+F+G WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR,PERCENT)

WIND SECTOR	ITEM	SECTOR TOTAL	WIND SPEED CLASS 1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH S9.5 M/S
360.0	NO	40	14	22	4	0	0	0	0	0	0	0
-N-	PCT	6.80	2.38	3.74	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22.5	NO	60	11	34	14	1	0	0	0	0	0	0
-NNE-	PCT	10.20	1.87	5.78	2.38	0.17	0.00	0.00	0.00	0.00	0.00	0.00
45.0	NO	63	12	19	24	8	0	0	0	0	0	0
-NE-	PCT	10.71	2.04	3.23	4.08	1.36	0.00	0.00	0.00	0.00	0.00	0.00
67.5	NO	22	10	6	6	0	0	0	0	0	0	0
-ENE-	PCT	3.74	1.70	1.02	1.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90.0	NO	21	10	8	3	0	0	0	0	0	0	0
-E-	PCT	3.57	1.70	1.36	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112.5	NO	4	1	3	0	0	0	0	0	0	0	0
-ESE-	PCT	0.68	0.17	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	11	9	1	1	0	0	0	0	0	0	0
-SE-	PCT	1.87	1.53	0.17	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00
157.5	NO	6	6	0	0	0	0	0	0	0	0	0
-SSE-	PCT	1.02	1.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180.0	NO	25	12	7	6	0	0	0	0	0	0	0
-S-	PCT	4.25	2.04	1.19	1.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
202.5	NO	27	15	8	4	0	0	0	0	0	0	0
-SSW-	PCT	4.59	2.55	1.36	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00
225.0	NO	46	13	23	10	0	0	0	0	0	0	0
-SW-	PCT	7.82	2.21	3.91	1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
247.5	NO	37	11	10	10	6	0	0	0	0	0	0
-WSW-	PCT	6.29	1.87	1.70	1.70	1.02	0.00	0.00	0.00	0.00	0.00	0.00
270.0	NO	28	15	6	6	1	0	0	0	0	0	0
-W-	PCT	4.76	2.55	1.02	1.02	0.17	0.00	0.00	0.00	0.00	0.00	0.00
292.5	NO	38	14	12	10	2	0	0	0	0	0	0
-WNW-	PCT	6.46	2.38	2.04	1.70	0.34	0.00	0.00	0.00	0.00	0.00	0.00
315.0	NO	89	43	31	13	2	0	0	0	0	0	0
-NW-	PCT	15.14	7.31	5.27	2.21	0.34	0.00	0.00	0.00	0.00	0.00	0.00
337.5	NO	36	8	22	5	1	0	0	0	0	0	0
-NNW-	PCT	6.12	1.36	3.74	0.85	0.17	0.00	0.00	0.00	0.00	0.00	0.00
CALM	NO	35										
	PCT	5.95	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	553	204	212	116	21	0	0	0	0	0	0
	PCT	94.05	34.69	36.05	19.73	3.57	0.00	0.00	0.00	0.00	0.00	0.00

AVERAGE WIND SPEED 3.90 TOTAL VALID OBSERVATIONS 588 TOTAL OBSERVATIONS 744

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

CHEROKEE

CHEROKEE METEOROLOGY SURVEY LOW LEVEL TOWER DATA FOR PERIOD OF JANUARY 1974
SUMMARY OF PASQUILL A+C+D+E+F+G WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR,PERCENT)

WIND SECTOR	ITEM	SECTOR TOTAL	1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH S9.5 M/S
360.0	NO	30	21	9	0	0	0	0	0	0	0	0
-N-	PCT	4.06	2.84	1.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22.5	NO	32	11	20	1	0	0	0	0	0	0	0
-NNE-	PCT	4.33	1.49	2.71	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45.0	NO	78	26	38	14	0	0	0	0	0	0	0
-NE-	PCT	10.55	3.52	5.14	1.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00
67.5	NO	43	16	20	7	0	0	0	0	0	0	0
-ENE-	PCT	5.82	2.16	2.71	0.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90.0	NO	21	15	4	2	0	0	0	0	0	0	0
-E-	PCT	2.84	2.03	0.54	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112.5	NO	19	15	4	0	0	0	0	0	0	0	0
-ESE-	PCT	2.57	2.03	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	20	19	1	0	0	0	0	0	0	0	0
-SE-	PCT	2.71	2.57	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
157.5	NO	14	13	1	0	0	0	0	0	0	0	0
-SSE-	PCT	1.89	1.76	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180.0	NO	26	17	9	0	0	0	0	0	0	0	0
-S-	PCT	3.52	2.30	1.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
202.5	NO	44	24	19	1	0	0	0	0	0	0	0
-SSW-	PCT	5.95	3.25	2.57	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
225.0	NO	122	49	44	22	7	0	0	0	0	0	0
-SW-	PCT	16.51	6.63	5.95	2.98	0.95	0.00	0.00	0.00	0.00	0.00	0.00
247.5	NO	98	28	34	30	6	0	0	0	0	0	0
-WSW-	PCT	13.26	3.79	4.60	4.06	0.81	0.00	0.00	0.00	0.00	0.00	0.00
270.0	NO	47	18	16	11	2	0	0	0	0	0	0
-W-	PCT	6.36	2.44	2.16	1.49	0.27	0.00	0.00	0.00	0.00	0.00	0.00
292.5	NO	37	30	5	2	0	0	0	0	0	0	0
-WNW-	PCT	5.01	4.06	0.68	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00
315.0	NO	48	32	12	3	1	0	0	0	0	0	0
-NW-	PCT	6.49	4.33	1.62	0.41	0.13	0.00	0.00	0.00	0.00	0.00	0.00
337.5	NO	24	17	3	2	2	0	0	0	0	0	0
-NNW-	PCT	3.25	2.30	0.41	0.27	0.27	0.00	0.00	0.00	0.00	0.00	0.00
CALM	NO	36										
	PCT	4.87	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	703	351	239	95	18	0	0	0	0	0	0
	PCT	95.13	47.50	32.34	12.85	2.44	0.00	0.00	0.00	0.00	0.00	0.00

AVERAGE WIND SPEED 3.45 TOTAL VALID OBSERVATIONS 739 TOTAL OBSERVATIONS 744

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

CHEROKEE METEOROLOGY SURVEY LOW LEVEL TOWER DATA FOR PERIOD OF FEBRUARY 1974

SUMMARY OF PASQUILL A+C+D+E+F+G WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR,PERCENT)

WIND SECTOR	ITEM	SECTOR TOTAL	WIND SPEED CLASS 1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH S9.5 M/S
360.0	NO	34	12	12	7	3	0	0	0	0	0	0
-N-	PCT	5.10	1.80	1.80	1.05	0.45	0.00	0.00	0.00	0.00	0.00	0.00
22.5	NO	27	13	6	6	2	0	0	0	0	0	0
-NNE-	PCT	4.05	1.95	0.90	0.90	0.30	0.00	0.00	0.00	0.00	0.00	0.00
45.0	NO	16	4	5	7	0	0	0	0	0	0	0
-NE-	PCT	2.40	0.60	0.75	1.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
67.5	NO	21	9	5	7	0	0	0	0	0	0	0
-ENE-	PCT	3.15	1.35	0.75	1.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90.0	NO	22	10	9	3	0	0	0	0	0	0	0
-E-	PCT	3.30	1.50	1.35	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112.5	NO	5	2	3	0	0	0	0	0	0	0	0
-ESE-	PCT	0.75	0.30	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	22	9	9	4	0	0	0	0	0	0	0
-SE-	PCT	3.30	1.35	1.35	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
157.5	NO	16	11	1	1	3	0	0	0	0	0	0
-SSE-	PCT	2.40	1.65	0.15	0.15	0.45	0.00	0.00	0.00	0.00	0.00	0.00
180.0	NO	27	18	6	2	1	0	0	0	0	0	0
-S-	PCT	4.05	2.70	0.90	0.30	0.15	0.00	0.00	0.00	0.00	0.00	0.00
202.5	NO	37	13	12	11	0	1	0	0	0	0	0
-SSW-	PCT	5.55	1.95	1.80	1.65	0.00	0.15	0.00	0.00	0.00	0.00	0.00
225.0	NO	81	28	23	14	8	7	0	1	0	0	0
-SW-	PCT	12.14	4.20	3.45	2.10	1.20	1.05	0.00	0.15	0.00	0.00	0.00
247.5	NO	56	10	14	12	7	6	2	2	3	0	0
-WSW-	PCT	8.40	1.50	2.10	1.80	1.05	0.90	0.30	0.30	0.45	0.00	0.00
270.0	NO	54	25	13	8	6	2	0	0	0	0	0
-W-	PCT	8.09	3.75	1.95	1.20	0.90	0.30	0.00	0.00	0.00	0.00	0.00
292.5	NO	71	41	10	13	2	4	1	0	0	0	0
-WNW-	PCT	10.64	6.15	1.50	1.95	0.30	0.60	0.15	0.00	0.00	0.00	0.00
315.0	NO	95	47	21	14	8	4	1	0	0	0	0
-NW-	PCT	14.24	7.04	3.15	2.10	1.20	0.60	0.15	0.00	0.00	0.00	0.00
337.5	NO	39	22	10	5	2	0	0	0	0	0	0
-NNW-	PCT	5.85	3.30	1.50	0.75	0.30	0.00	0.00	0.00	0.00	0.00	0.00
CALM	NO	44										
	PCT	6.60	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	623	274	159	114	42	24	4	3	3	0	0
	PCT	93.40	41.08	23.84	17.09	6.30	3.60	0.60	0.45	0.45	0.00	0.00

AVERAGE WIND SPEED 4.22 TOTAL VALID OBSERVATIONS 667. TOTAL OBSERVATIONS 672

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

CHEROKEE METEOROLOGY SURVEY LOW LEVEL TOWER DATA FOR PERIOD OF MARCH 1974

SUMMARY OF PASQUILL A+C+D+E+F+G WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR,PERCENT)

WIND SECTOR	ITEM	SECTOR TOTAL	WIND SPEED CLASS 1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH >9.5 M/S
360.0	NO	22	10	3	6	2	0	1	0	0	0	0
-N-	PCT	3.89	1.77	0.53	1.06	0.35	0.00	0.18	0.00	0.00	0.00	0.00
22.5	NO	32	10	10	11	0	0	0	1	0	0	0
-NNE-	PCT	5.65	1.77	1.77	1.94	0.00	0.00	0.00	0.18	0.00	0.00	0.00
45.0	NO	50	6	22	12	8	2	0	0	0	0	0
-NE-	PCT	8.83	1.06	3.89	2.12	1.41	0.35	0.00	0.00	0.00	0.00	0.00
67.5	NO	34	9	12	12	1	0	0	0	0	0	0
-ENE-	PCT	6.01	1.59	2.12	2.12	0.18	0.00	0.00	0.00	0.00	0.00	0.00
90.0	NO	7	4	2	1	0	0	0	0	0	0	0
-E-	PCT	1.24	0.71	0.35	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112.5	NO	15	10	4	1	0	0	0	0	0	0	0
-ESE-	PCT	2.65	1.77	0.71	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	13	9	4	0	0	0	0	0	0	0	0
-SE-	PCT	2.30	1.59	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
157.5	NO	10	6	4	0	0	0	0	0	0	0	0
-SSE-	PCT	1.77	1.06	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180.0	NO	18	15	3	0	0	0	0	0	0	0	0
-S-	PCT	3.18	2.65	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
202.5	NO	37	15	16	5	1	0	0	0	0	0	0
-SSW-	PCT	6.54	2.65	2.83	0.88	0.18	0.00	0.00	0.00	0.00	0.00	0.00
225.0	NO	100	17	43	23	11	6	0	0	0	0	0
-SW-	PCT	17.67	3.00	7.60	4.06	1.94	1.06	0.00	0.00	0.00	0.00	0.00
247.5	NO	71	15	19	17	12	8	0	0	0	0	0
-WSW-	PCT	12.54	2.65	3.36	3.00	2.12	1.41	0.00	0.00	0.00	0.00	0.00
270.0	NO	38	13	9	8	3	2	2	1	0	0	0
-W-	PCT	6.71	2.30	1.59	1.41	0.53	0.35	0.35	0.18	0.00	0.00	0.00
292.5	NO	26	11	4	4	1	5	1	0	0	0	0
-WNW-	PCT	4.59	1.94	0.71	0.71	0.18	0.88	0.18	0.00	0.00	0.00	0.00
315.0	NO	42	24	6	8	3	1	0	0	0	0	0
-NW-	PCT	7.42	4.24	1.06	1.41	0.53	0.18	0.00	0.00	0.00	0.00	0.00
337.5	NO	23	11	5	5	2	0	0	0	0	0	0
-NNW-	PCT	4.06	1.94	0.88	0.88	0.35	0.00	0.00	0.00	0.00	0.00	0.00
CALM	NO	28										
	PCT	4.95	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	538	185	166	113	44	24	4	2	0	0	0
	PCT	95.05	32.68	29.33	19.96	7.77	4.24	0.71	0.35	0.00	0.00	0.00

AVERAGE WIND SPEED 4.59 TOTAL VALID OBSERVATIONS 566 TOTAL OBSERVATIONS 744

Amendment 1
(New)

Amendment 2
(Entire Table Revised)

ER Table 2.6.3-3
Cherokee Nuclear Station
Low Level Tower Meteorological Survey - Monthly Summaries (Sheet 8 of 12)

CHEROKEE METEOROLOGY SURVEY LOW LEVEL TOWER DATA FOR PERIOD OF APRIL 1974
SUMMARY OF PASQUILL A+C+D+E+F+G WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR,PERCENT)

WIND SECTOR	ITEM	SECTOR TOTAL	WIND SPEED CLASS 1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH S9.5 M/S
360.0	NO	34	9	10	13	2	0	0	0	0	0	0
-N-	PCT	4.73	1.25	1.39	1.81	0.28	0.00	0.00	0.00	0.00	0.00	0.00
22.5	NO	22	8	5	6	3	0	0	0	0	0	0
-NNE-	PCT	3.06	1.11	0.70	0.83	0.42	0.00	0.00	0.00	0.00	0.00	0.00
45.0	NO	16	5	9	2	0	0	0	0	0	0	0
-NE-	PCT	2.23	0.70	1.25	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00
67.5	NO	11	5	5	1	0	0	0	0	0	0	0
-ENE-	PCT	1.53	0.70	0.70	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90.0	NO	16	8	4	3	1	0	0	0	0	0	0
-E-	PCT	2.23	1.11	0.56	0.42	0.14	0.00	0.00	0.00	0.00	0.00	0.00
112.5	NO	9	5	1	3	0	0	0	0	0	0	0
-ESE-	PCT	1.25	0.70	0.14	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	29	13	12	4	0	0	0	0	0	0	0
-SE-	PCT	4.04	1.81	1.67	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00
157.5	NO	17	6	7	3	1	0	0	0	0	0	0
-SSE-	PCT	2.37	0.83	0.97	0.42	0.14	0.00	0.00	0.00	0.00	0.00	0.00
180.0	NO	42	18	16	8	0	0	0	0	0	0	0
-S-	PCT	5.85	2.51	2.23	1.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
202.5	NO	36	19	11	6	0	0	0	0	0	0	0
-SSW-	PCT	5.01	2.65	1.53	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00
225.0	NO	119	33	32	45	7	2	0	0	0	0	0
-SW-	PCT	16.57	4.60	4.46	6.27	0.97	0.28	0.00	0.00	0.00	0.00	0.00
247.5	NO	77	15	20	25	12	2	3	0	0	0	0
-WSW-	PCT	10.72	2.09	2.78	3.48	1.67	0.28	0.42	0.00	0.00	0.00	0.00
270.0	NO	71	38	14	9	6	4	0	0	0	0	0
-W-	PCT	9.89	5.29	1.95	1.25	0.83	0.56	0.00	0.00	0.00	0.00	0.00
292.5	NO	57	29	16	9	2	1	0	0	0	0	0
-WNW-	PCT	7.94	4.04	2.23	1.25	0.28	0.14	0.00	0.00	0.00	0.00	0.00
315.0	NO	88	38	16	17	11	6	0	0	0	0	0
-NW-	PCT	12.26	5.29	2.23	2.37	1.53	0.83	0.00	0.00	0.00	0.00	0.00
337.5	NO	32	10	11	9	2	0	0	0	0	0	0
-NNW-	PCT	4.46	1.39	1.53	1.25	0.28	0.00	0.00	0.00	0.00	0.00	0.00
CALM	NO	42										
	PCT	5.85	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	676	259	189	163	47	15	3	0	0	0	0
	PCT	94.15	36.07	26.32	22.70	6.54	2.09	0.42	0.00	0.00	0.00	0.00

AVERAGE WIND SPEED 4.26 TOTAL VALID OBSERVATIONS 718 TOTAL OBSERVATIONS 720

CHEROKEE

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

ER Table 2.6.3-3
Cherokee Nuclear Station
Low Level Tower Meteorological Survey - Monthly Summaries (Sheet 9 of 12)

CHEROKEE METEOROLOGY SURVEY LOW LEVEL TOWER DATA FOR PERIOD OF MAY 1974

SUMMARY OF PASQUILL A+C+D+E+F+G WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCUR, PERCENT)

DATE OF REPORT 10-22-74

WIND SECTOR	ITEM	SECTOR TOTAL	1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH >9.5 M/S
360.0	NO	46	15	20	11	0	0	0	0	0	0	0
-N-	PCT	6.21	2.03	2.70	1.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22.5	NO	49	18	21	10	0	0	0	0	0	0	0
-NNE-	PCT	6.62	2.43	2.84	1.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45.0	NO	44	12	18	12	2	0	0	0	0	0	0
-NE-	PCT	5.94	1.62	2.43	1.62	0.27	0.00	0.00	0.00	0.00	0.00	0.00
67.5	NO	44	10	17	16	1	0	0	0	0	0	0
-ENE-	PCT	5.94	1.35	2.30	2.16	0.13	0.00	0.00	0.00	0.00	0.00	0.00
90.0	NO	22	5	16	1	0	0	0	0	0	0	0
-E-	PCT	2.97	0.67	2.16	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112.5	NO	16	9	7	0	0	0	0	0	0	0	0
-ESE-	PCT	2.16	1.22	0.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	29	15	11	3	0	0	0	0	0	0	0
-SE-	PCT	3.92	2.03	1.49	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
157.5	NO	15	9	4	2	0	0	0	0	0	0	0
-SSE-	PCT	2.03	1.22	0.54	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180.0	NO	26	13	10	3	0	0	0	0	0	0	0
-S-	PCT	3.51	1.76	1.35	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
202.5	NO	26	13	10	3	0	0	0	0	0	0	0
-SSW-	PCT	3.51	1.76	1.35	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
225.0	NO	83	44	32	7	0	0	0	0	0	0	0
-SW-	PCT	11.22	5.94	4.32	0.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00
247.5	NO	83	31	29	18	3	2	0	0	0	0	0
-WSW-	PCT	11.22	4.19	3.92	2.43	0.40	0.27	0.00	0.00	0.00	0.00	0.00
270.0	NO	86	52	24	10	0	0	0	0	0	0	0
-W-	PCT	11.62	7.03	3.24	1.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
292.5	NO	54	34	16	3	1	0	0	0	0	0	0
-WNW-	PCT	7.30	4.59	2.16	0.40	0.13	0.00	0.00	0.00	0.00	0.00	0.00
315.0	NO	64	42	14	5	2	1	0	0	0	0	0
-NW-	PCT	8.65	5.67	1.89	0.67	0.27	0.13	0.00	0.00	0.00	0.00	0.00
337.5	NO	33	19	12	2	0	0	0	0	0	0	0
-NNW-	PCT	4.46	2.57	1.62	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	NO	20										
	PCT	2.70	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	720	341	261	106	9	3	0	0	0	0	0
	PCT	97.30	46.08	35.27	14.32	1.22	0.40	0.00	0.00	0.00	0.00	0.00

AVERAGE WIND SPEED 3.62 TOTAL VALID OBSERVATIONS 740 TOTAL OBSERVATIONS 744

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

ER Table 2.6.3-3
Cherokee Nuclear Station
Low Level Tower Meteorological Survey - Monthly Summaries (Sheet 10 of 12)

CHEROKEE METEOROLOGICAL SURVEY LOW LEVEL TOWER DATA FOR PERIOD OF JUNE 1974
SUMMARY OF PASQUILL A+C+[illegible] OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR,PERCENT)
DATE OF REPORT 10-24-74

WIND SECTOR	ITEM	SECTOR TOTAL	1.0-3.4 .45-1.49	3.5-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH S9.5 M/S
360.0	NO	33	20	9	4	0	0	0	0	0	0	0
-N-	PCT	4.92	2.99	1.34	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22.5	NO	24	9	8	[illegible]	1	0	0	0	0	0	0
-NNE-	PCT	3.58	1.34	1.19	[illegible]	0.15	0.00	0.00	0.00	0.00	0.00	0.00
45.0	NO	44	7	23	12	2	0	0	0	0	0	0
-NE-	PCT	6.57	1.04	3.43	1.79	0.30	0.00	0.00	0.00	0.00	0.00	0.00
67.5	NO	43	13	22	7	1	0	0	0	0	0	0
-ENE-	PCT	6.42	1.94	3.28	1.04	0.15	0.00	0.00	0.00	0.00	0.00	0.00
90.0	NO	31	7	21	3	0	0	0	0	0	0	0
-E-	PCT	4.63	1.04	3.13	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112.5	NO	16	4	11	0	1	0	0	0	0	0	0
-ESE-	PCT	2.39	0.60	1.64	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	13	5	6	2	0	0	0	0	0	0	0
-SE-	PCT	1.94	0.75	0.89	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
157.5	NO	6	4	2	[illegible]	0	0	0	0	0	0	0
-SSE-	PCT	0.89	0.60	0.30	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180.0	NO	13	[illegible]	7	[illegible]	0	0	0	0	0	0	0
-S-	PCT	1.94	[illegible]	1.04	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
202.5	NO	19	10	8	1	0	0	0	0	0	0	0
-SSW-	PCT	2.84	1.49	1.19	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
225.0	NO	71	21	35	13	1	1	0	0	0	0	0
-SW-	PCT	10.60	3.13	5.22	1.94	0.15	0.15	0.00	0.00	0.00	0.00	0.00
247.5	NO	73	26	32	15	0	0	0	0	0	0	0
-WSW-	PCT	10.89	3.88	4.78	2.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00
270.0	NO	55	32	16	7	0	0	0	0	0	0	0
-W-	PCT	8.21	4.78	2.39	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
292.5	NO	58	44	12	2	0	0	0	0	0	0	0
-WNW-	PCT	8.66	6.57	1.79	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
315.0	NO	70	46	13	10	1	0	0	0	0	0	0
-NW-	PCT	10.45	6.86	1.94	1.49	0.15	0.00	0.00	0.00	0.00	0.00	0.00
337.5	NO	52	31	13	7	1	0	0	0	0	0	0
-NNW-	PCT	7.76	4.63	1.94	1.04	0.15	0.00	0.00	0.00	0.00	0.00	0.00
CALM	NO	49										
	PCT	7.31	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	621	285	238	[illegible]	8	1	0	0	0	0	0
	PCT	92.69	42.54	35.52	[illegible]	1.19	0.15	0.00	0.00	0.00	0.00	0.00

AVERAGE WIND SPEED [illegible] TOTAL VALID OBSERVATIONS 670 TOTAL OBSERVATIONS 720

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

ER Table 2.6.3-3
Cherokee Nuclear Station
Low Level Tower Meteorological Survey - Monthly Summaries (Sheet 11 of 12)

CHEROKEE METEOROLOGY SURVEY LOW LEVEL TOWER DATA FOR PERIOD OF JULY 1974
SUMMARY OF PASQUILL A+C+D+E+F+G FREQ OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR, PERCENT)
DATE OF REPORT 10-24-74

WIND SECTOR	ITEM	SECTOR TOTAL	1.0-3.2 / .45-1.49	3.3-5.5 / 1.5-2.49	5.6-7.8 / 2.5-3.49	7.9-10.0 / 3.5-4.49	10.1-12.3 / 4.5-5.49	12.4-14.5 / 5.5-6.49	14.6-16.7 / 6.5-7.49	16.8-19.0 / 7.5-8.49	19.1-21.2 / 8.5-9.49	>21.2 MPH / S9.5 M/S
360.0	NO	33	26	7	0	0	0	0	0	0	0	0
-N-	PCT	4.45	3.51	0.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22.5	NO	29	17	12	0	0	0	0	0	0	0	0
-NNE-	PCT	3.91	2.29	1.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45.0	NO	47	13	28	6	0	0	0	0	0	0	0
-NE-	PCT	6.34	1.75	3.78	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00
67.5	NO	42	11	16	14	1	0	0	0	0	0	0
-ENE-	PCT	5.67	1.48	2.16	1.89	0.13	0.00	0.00	0.00	0.00	0.00	0.00
90.0	NO	31	10	19	2	0	0	0	0	0	0	0
-E-	PCT	4.18	1.35	2.56	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112.5	NO	20	11	9	0	0	0	0	0	0	0	0
-ESE-	PCT	2.70	1.48	1.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	27	14	13	0	0	0	0	0	0	0	0
-SE-	PCT	3.64	1.89	1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
157.5	NO	11	6	5	0	0	0	0	0	0	0	0
-SSE-	PCT	1.48	0.81	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180.0	NO	36	13	21	2	0	0	0	0	0	0	0
-S-	PCT	4.86	1.75	2.83	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00
202.5	NO	52	26	[illegible]	[illegible]	0	0	0	0	0	0	0
-SSW-	PCT	7.02	3.51	[illegible]	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
225.0	NO	73	37	33	3	0	0	0	0	0	0	0
-SW-	PCT	9.85	4.99	4.45	0.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
247.5	NO	51	33	16	2	0	0	0	0	0	0	0
-WSW-	PCT	6.88	4.45	2.16	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00
270.0	NO	67	45	17	1	0	0	0	0	0	0	0
-W-	PCT	9.04	[illegible]	2.29	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
292.5	NO	64	59	5	[illegible]	0	0	0	0	0	0	0
-WNW-	PCT	8.64	7.96	0.67	[illegible]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
315.0	NO	75	53	22	0	0	0	0	0	0	0	0
-NW-	PCT	10.12	7.15	2.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
337.5	NO	36	19	16	1	0	0	0	0	0	0	0
-NNW-	PCT	4.86	2.56	2.16	.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	NO	47										
	PCT	6.34	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	694	397	259	37	1	0	0	0	0	0	0
	PCT	93.66	53.58	34.95	4.99	0.13	0.00	0.00	0.00	0.00	0.00	0.00

AVERAGE WIND SPEED 2.27 TOTAL VALID OBSERVATIONS 741 TOTAL OBSERVATIONS 744

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

CHEROKEE METEOROLOGY SURVEY LOW LEVEL TOWER DATA FOR PERIOD OF AUGUST 1974

SUMMARY OF PASQUILL A+C+D+E+F+G WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR.PERCENT)

DATE OF REPORT 10-24-74

WIND SECTOR	ITEM	SECTOR TOTAL	WIND SPEED CLASS 1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH S9.5 M/S
360.0	NO	29	18	10	1	0	0	0	0	0	0	0
-N-	PCT	4.39	2.72	1.51	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22.5	NO	20	12	8	0	0	0	0	0	0	0	0
-NNE-	PCT	3.02	1.81	1.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45.0	NO	26	16	7	3	0	0	0	0	0	0	0
-NE-	PCT	3.93	2.42	1.06	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00
67.5	NO	43	13	12	16	2	0	0	0	0	0	0
-ENE-	PCT	6.50	1.97	1.81	2.42	0.30	0.00	0.00	0.00	0.00	0.00	0.00
90.0	NO	40	8	19	13	0	0	0	0	0	0	0
-E-	PCT	6.05	1.21	2.87	1.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112.5	NO	12	6	5	1	0	0	0	0	0	0	0
-ESE-	PCT	1.81	0.91	0.76	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	20	10	10	0	0	0	0	0	0	0	0
-SE-	PCT	3.02	1.51	1.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
157.5	NO	17	9	7	1	0	0	0	0	0	0	0
-SSE-	PCT	2.57	1.36	1.06	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180.0	NO	13	6	7	0	0	0	0	0	0	0	0
-S-	PCT	1.97	0.91	1.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
202.5	NO	27	14	11	2	0	0	0	0	0	0	0
-SSW-	PCT	4.08	2.12	1.66	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
225.0	NO	91	43	27	15	6	0	0	0	0	0	0
-SW-	PCT	13.77	6.50	4.08	2.27	0.91	0.00	0.00	0.00	0.00	0.00	0.00
247.5	NO	77	46	18	10	3	0	0	0	0	0	0
-WSW-	PCT	11.65	6.96	2.72	1.51	0.45	0.00	0.00	0.00	0.00	0.00	0.00
270.0	NO	71	59	10	2	0	0	0	0	0	0	0
-W-	PCT	10.74	8.92	1.51	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
292.5	NO	48	44	4	0	0	0	0	0	0	0	0
-WNW-	PCT	7.26	6.66	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
315.0	NO	67	60	6	1	0	0	0	0	0	0	0
-NW-	PCT	10.13	9.08	0.91	.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
337.5	NO	27	20	7	0	0	0	0	0	0	0	0
-NNW-	PCT	4.08	3.02	1.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	NO	33										
	PCT	4.99	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	628	384	168	65	11	0	0	0	0	0	0
	PCT	95.01	58.09	25.42	9.83	1.66	0.00	0.00	0.00	0.00	0.00	0.00

AVERAGE WIND SPEED 3.02   TOTAL VALID OBSERVATIONS 661   TOTAL OBSERVATIONS 744

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

DELETED

TABLE 2.6.3-4

ER Table 2.6.3-4A
Cherokee Nuclear Station
Greenville-Spartanburg Airport Monthly Wind
Direction Distributions
Period of record: September 11, 1973-August 31, 1974 (Sheet 1 of 2)

Frequency in percent

Wind Direction	Sept 11-30	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Total
N	11.0	12.9	12.9	11.7	6.0	13.4	5.6	12.1	12.9	11.7	10.1	7.3	10.6
NNE	12.3	16.1	7.9	12.1	8.5	3.1	5.2	2.9	11.7	5.8	4.8	10.1	8.3
NE	14.9	8.9	6.2	12.9	11.7	4.0	9.7	2.1	6.0	3.8	3.6	5.2	7.2
ENE	6.5	2.4	2.5	3.2	4.0	3.6	4.4	1.2	2.0	6.7	6.0	2.0	3.6
E	5.8	4.8	3.3	1.2	4.8	4.5	4.4	2.5	4.4	1.7	1.2	6.4	3.7
ESE	1.3	3.2	0.0	1.6	0.4	1.8	0.4	1.2	2.0	1.7	1.2	1.2	1.3
SE	2.6	2.4	0.4	1.6	2.0	2.2	1.6	3.3	3.6	4.2	4.4	3.2	2.6
SSE	1.3	0.4	1.7	0.8	2.4	1.3	1.2	3.8	2.8	3.3	11.7	2.0	2.8
S	3.9	2.4	5.4	7.7	5.2	7.2	4.4	12.5	8.5	4.2	3.6	8.1	6.1
SSW	0.6	2.8	5.0	7.7	6.9	6.7	7.7	11.7	3.6	14.2	8.1	3.6	6.7
SW	2.6	8.1	17.9	13.3	21.4	15.6	19.8	15.0	15.3	9.6	3.2	8.5	12.8
WSW	10.4	5.6	10.8	5.2	13.7	7.6	13.3	9.2	6.5	6.7	4.0	7.3	8.3
W	4.6	3.2	5.0	2.8	6.9	10.3	8.9	6.7	6.4	3.3	4.0	4.0	5.6
WNW	3.9	1.6	0.8	1.6	0.4	1.8	2.0	0.8	1.6	2.1	2.4	0.4	1.5
NW	1.3	4.0	1.2	3.2	0.4	4.9	2.0	3.8	3.2	1.2	2.4	0	2.3
NNW	0.6	2.4	3.3	7.3	1.2	5.8	2.0	6.7	4.4	18.3	7.7	1.6	5.2
Calm	16.2	18.6	15.4	6.0	6.8	6.2	7.3	4.6	4.8	1.7	21.4	29.0	11.4

ER Table 2.6.3-4A
Cherokee Nuclear Station
Greenville-Spartanburg Airport Monthly Wind
Speed Distribution
Period of Record: September 11, 1973 - August 31, 1974

Frequency in Percent

Wind Speed (mph)	Sept. 11-30	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Total
1. Calm	16.2	18.6	15.4	6.0	4.0	6.2	7.3	4.6	4.8	1.7	21.4	29.0	11.2
2. 1.0-3.2	0	0	0	0	0	0	0	0	0	0	0.4	0	0.0
3. 3.3-5.5	37.7	41.9	29.6	27.8	25.4	24.1	19.0	20.8	23.4	22.5	37.1	28.2	27.9
4. 5.6-7.8	20.8	20.6	30.0	18.6	29.8	19.2	19.4	23.3	33.5	34.6	26.6	19.8	24.9
5. 7.9-10.0	18.2	12.5	10.4	22.2	22.6	18.8	17.7	20.8	21.8	20.4	8.5	12.5	17.2
6. 10.1-12.3	4.5	4.0	6.2	12.9	7.7	14.3	15.3	11.7	10.1	12.1	4.4	6.0	9.2
7. 12.4-14.5	2.6	1.6	6.2	6.8	6.0	8.0	8.5	7.1	4.8	6.7	0.8	4.4	5.3
8. 14.6-16.7	0	0.8	1.7	4.8	4.4	3.6	7.7	7.9	1.6	1.7	0.8	0	3.0
9. 16.8-19.0	0	0	0.4	0.4	0	2.7	3.2	2.1	0	0.4	0	0	0.8
10. 19.1-21.2	0	0	-	0.4	0	1.3	1.2	1.2	0	0	0	0	0.3
11. > 21.2	0	0	0	0.4	0	1.8	0.8	0.4	0	0	0	0	0.3

ER Table 2.[illegible]3-4B
Cherokee Nuclear Station
Greenville-Spartanburg Airport Monthly Wind
Direction Distribution
Period of Record: January 1, 1968 - December 31, 1972 (Sheet 1 of 2)

Frequency in Percent

Wind Direction	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Total
N	14.7	14.4	12.6	9.4	13.1	11.7	10.9	8.8	9.0	8.7	9.0	10.7	11.1
NNE	16.8	17.7	11.7	8.1	8.9	8.9	7.1	6.9	9.2	7.9	8.6	12.0	10.3
NE	14.0	16.7	8.9	11.9	11.4	11.4	6.2	8.6	9.4	7.6	7.2	11.7	10.4
ENE	5.1	6.2	3.4	3.4	4.8	4.9	2.0	3.7	4.8	3.8	2.8	5.7	4.2
E	4.7	4.5	2.3	2.0	1.7	2.8	1.6	3.9	4.2	4.7	2.8	5.5	3.4
ESE	2.3	3.0	1.7	1.2	1.5	2.0	1.9	1.7	2.9	2.7	3.7	2.9	2.3
SE	2.0	1.6	1.7	0.6	1.6	1.6	1.9	1.6	2.3	2.8	3.3	3.1	2.0
SSE	2.0	1.4	1.0	0.2	0.9	1.3	2.3	2.3	2.5	2.7	2.3	2.3	1.8
S	5.0	2.7	4.0	4.4	4.2	4.0	6.0	7.2	7.3	7.8	6.7	4.8	5.4
SSW	2.4	1.9	4.2	3.3	4.4	4.1	6.0	5.7	5.6	5.1	4.8	3.1	4.2
SW	5.0	4.6	10.2	15.5	11.6	12.2	11.7	14.8	10.2	9.8	12.7	6.6	10.4
WSW	4.2	4.9	10.5	13.0	9.8	10.1	12.0	11.3	8.2	9.9	10.0	6.7	9.2
W	3.0	2.7	4.84	4.9	5.2	6.2	7.7	4.9	5.6	7.3	6.1	4.4	5.2
WNW	2.2	1.6	3.0	2.3	2.9	3.2	4.4	2.6	3.1	4.2	3.8	3.3	3.0
NW	2.1	2.9	3.2	3.9	2.9	5.9	4.6	3.3	2.3	2.6	2.7	2.7	3.2
NNW	2.8	3.9	4.6	3.9	3.7	5.1	4.4	3.2	3.1	2.6	2.2	2.7	3.5
Calm	11.7	9.3	12.3	12.1	11.4	4.5	9.0	9.6	10.5	9.9	11.2	11.8	10.3

ER Table 2.6.3-4B
Cherokee Nuclear Station
Greenville-Spartanburg Airport Monthly Wind
Speed Distribution
Period of Record: January 1, 1968 - December 31, 1972 (Sheet 2 of 2)

	Frequency in Percent												
Wind Speed (mph)	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Total
1. Calm	11.7	9.3	12.3	12.1	11.4	4.5	9.0	9.6	10.5	9.9	11.2	11.8	10.3
2. 1.0-3.2	1.3	0.6	0.8	0.2	0.8	0.5	1.3	0.9	0.7	1.3	1.0	1.4	0.9
3. 3.3-5.5	31.8	25.2	26.3	23.0	24.2	23.6	18.1	21.9	26.2	28.8	29.4	30.6	25.8
4. 5.6-7.8	28.2	28.6	23.6	20.6	23.9	25.7	24.0	23.2	24.3	31.8	28.1	29.3	25.9
5. 7.9-10.0	15.0	17.9	17.8	16.0	17.4	19.9	16.7	18.2	17.2	15.4	17.3	16.4	17.1
6. 10.1-12.3	7.5	9.8	8.3	11.6	10.1	9.8	11.0	12.8	10.2	7.6	8.7	6.5	9.5
7. 12.4-14.5	3.6	4.9	5.8	7.3	5.3	6.3	8.7	6.7	5.7	3.1	2.7	2.8	5.2
8. 14.6-16.7	0.7	2.7	3.1	5.9	3.1	5.4	6.5	3.7	3.3	1.2	0.9	1.0	3.1
9. 16.8-19.0	0.2	0.9	1.5	2.2	2.7	2.9	3.2	1.8	1.0	0.6	0.3	0.2	1.4
10. 19.1-21.2	0	0.2	0.3	0.9	0.6	1.1	1.2	0.8	0.6	0.3	0.3	0	0.5
11. > 21.2	0	0	0.2	0.2	0.6	0.3	0.3	0.4	0.3	0.1	0	0	0.2

Amendment 2
(New)

ER Table 2.6.3-4c
Cherokee Nuclear Station
Cloud Cover for Greenville-Spartanburg Airport

Number of Days

	Clear		Partly Cloudy		Cloudy	
	Normal	Sept 11 '73-Sept 11 '74	Normal	Sept 11 '73-Sept 11 '74	Normal	Sept 11 '73-Sept 11 '74
January	10	6	5	7	16	18
February	10	11	6	7	12	10
March	11	7	8	14	12	10
April	9	16	9	5	12	9
May	9	4	9	12	13	15
June	8	7	10	12	12	11
July	5	9	13	12	13	10
August	8	4	12	12	11	15
Sept	9	7	10	11	11	12
October	14	18	7	7	10	6
November	13	15	7	6	10	9
December	11	13	5	7	15	11
Year	117	117	101	112	147	136

Note: Cloud cover designation based on observations from sunrise to sunset.

Normals computed from a period of record of 11 years.

Clear, 0-3 tenths; partly cloudy, 4-7 tenths; cloudy, 8-10 tenths.

ER Table 2.6.3-5
Cherokee Nuclear Station
Comparison of Wind Direction Frequencies at
Greenville-Spartanburg Airport and at the Cherokee Site
During Onsite Period of Record
Period of Record: September 11, 1973 - August 3, 1974

(Upper numbers are site data - lower numbers are airport data)

Wind Direction	Sept 11-30	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Total*
	5.6	9.5	6.9	6.8	4.1	5.1	3.9	4.7	6.2	4.9	4.4	4.4	5.7
N	11.0	12.9	12.9	11.7	6.0	13.4	5.6	12.1	12.9	11.7	10.1	7.3	10.6
	7.3	6.2	3.1	10.2	4.3	4.0	5.6	3.1	6.6	3.6	3.9	3.0	5.3
NNE	12.3	16.1	7.9	12.1	8.5	3.1	5.2	2.9	11.7	5.8	4.8	10.1	8.3
	13.6	8.2	3.8	10.7	10.6	2.4	8.8	2.2	5.9	6.6	6.3	3.9	7.0
NE	14.9	8.9	6.2	12.9	11.7	4.0	9.7	2.1	6.0	3.8	3.6	5.2	7.2
	9.3	4.2	2.4	3.7	5.8	3.2	6.0	1.5	5.9	6.4	5.7	6.5	4.9
ENE	6.5	2.4	2.5	3.2	4.0	3.6	4.4	1.2	2.0	6.7	6.0	2.0	3.6
	5.2	4.0	3.4	3.6	2.8	3.3	1.2	2.2	3.0	4.6	4.2	6.0	3.5
E	5.8	4.8	3.3	1.2	4.8	4.5	4.4	2.5	4.4	1.7	1.2	6.4	3.7
	4.1	1.6	1.8	0.7	2.6	0.8	2.6	1.2	2.2	2.4	2.7	1.8	2.0
ESE	1.3	3.2	0.0	1.6	0.4	1.8	0.4	1.2	2.0	1.7	1.2	1.2	1.3
	4.5	3.6	3.8	1.9	2.7	3.3	2.3	4.0	3.9	1.9	3.6	3.0	3.2
SE	2.6	2.4	0.4	1.6	2.0	2.2	1.6	3.3	3.6	4.2	4.4	3.2	2.6
	0.2	1.9	1.1	1.0	1.9	2.4	1.8	2.4	2.0	0.9	1.5	2.6	1.7
SSE	1.3	0.4	1.7	0.8	2.4	1.3	1.2	3.8	2.8	3.3	11.7	2.0	2.8
	0.6	1.0	3.5	4.2	3.5	4.0	3.2	5.8	3.5	1.9	4.9	2.0	3.2
S	3.9	2.4	5.4	7.7	5.2	7.2	4.4	12.5	8.5	4.2	3.6	8.1	6.1
	0.2	2.1	3.8	4.6	6.0	5.6	6.5	5.0	3.5	2.8	7.0	4.1	4.4
SSW	0.6	2.8	5.0	7.7	6.9	6.7	7.7	11.7	3.6	14.2	8.1	3.6	6.7
	4.3	5.6	14.1	7.8	16.5	12.1	17.7	16.6	11.2	10.6	9.8	13.8	11.9
SW	2.6	8.1	17.9	13.3	21.4	15.6	19.8	15.0	15.3	9.6	3.2	8.5	12.8
	8.2	6.8	10.3	6.3	13.3	8.4	12.5	10.7	11.2	10.9	6.9	11.6	9.7
WSW	10.4	5.6	10.8	5.2	13.7	7.6	13.5	9.2	6.5	6.7	4.0	7.3	8.3
	9.5	7.9	6.1	4.8	6.4	8.1	6.7	9.9	11.6	8.2	9.0	10.7	8.2
W	6.4	3.2	5.0	2.8	6.9	10.3	8.9	6.7	6.4	3.3	4.0	4.0	5.6
	7.8	8.3	8.5	6.5	5.0	10.6	4.6	7.9	7.3	8.7	8.6	7.3	7.5
WNW	3.9	1.6	0.8	1.6	0.4	1.8	2.0	0.8	1.6	2.1	2.4	0.4	1.5
	11.4	16.5	12.4	15.1	5.5	14.2	7.4	12.3	8.6	10.4	10.1	10.1	11.0
NW	1.3	4.0	1.2	3.2	0.4	4.9	2.0	3.8	3.2	1.2	2.4	0	2.3
	5.8	6.5	6.8	6.1	3.2	5.8	4.1	4.5	4.5	7.8	4.9	4.1	5.2
NNW	0.6	2.4	3.3	7.3	1.2	5.8	2.0	6.7	4.4	18.3	7.7	1.6	5.2
	2.2	5.9	8.2	6.0	4.9	6.6	5.0	5.8	2.7	7.3	6.3	5.0	5.5
Calm	16.2	18.6	15.4	6.0	6.8	6.2	7.3	4.6	4.8	1.7	21.4	29.0	11.4

* Site data in this column is through September 10, 1974.

Amendment 1
(New)
Amendment 2
(Entire Table Revised)

DUKE POWER COMPANY
CHEROKEE METEOROLOGICAL SURVEY
HIGH LEVEL TOWER DATA

DATE M	D	Y	HOUR	WIND DIR. DEG.	RANGE DEG.	MEND. DEG.	SPEED MPH	TEMP. INV. DEG-F	PREC. IN.	SURF. TEMP. DEG-F	REL. HUM.	DEW POINT DEG-F	REMARKS
11	10	75	7	145	50		7.2	1.0	0.0	29.0		19.0	BH
11	10	75	8	45	40		5.9	0.0	0.0	30.5		18.5	BH
11	10	75	9	[illegible]	55		[illegible]	- 1.0	0.0	33.0		16.0	BH
11	10	75	10	40	75		10.0	- 1.0	0.0	36.5		17.0	BH
11	10	75	11	25	50		10.0	- 1.0	0.0	38.5		17.0	BH
11	10	75	12	20	85		9.5	- 1.0	0.0	40.0		15.5	BH
11	10	75	13	15	125		6.5	- 1.0	0.0	42.5		17.5	BH
11	10	75	14	25	155		8.0	- 1.0	0.0	44.0		17.5	BH
11	10	75	15	345	260		5.5	- 1.0	0.0	45.0		17.5	BH
11	10	75	16	200	305		5.6	- 1.0	0.0	46.0		[illegible]	BH
11	10	75	17	140	425		3.3	1.0	0.0	44.5		18.5	BH
11	10	75	18	100	20		3.5	5.5	0.0	39.0		19.0	BH
11	10	75	19	125	150		1.8	7.5	0.0	35.0		20.0	BH
11	10	75	20	55	170		2.6	6.0	0.0	31.5		24.0	BH
11	10	75	21	250	65		2.5	9.5	0.0	30.0		23.0	BH
11	10	75	22	20	25		6.4	6.0	0.0	31.0		22.0	BH
11	10	75	23	50	30		5.0	6.5	0.0	29.5		22.0	BH
11	10	75	24	30	30		4.1	5.5	0.0	28.0		20.0	BH
11	11	75	1	40	30		4.5	6.0	0.0	26.5		22.0	BH
11	11	75	2	2	25		5.2	5.0	0.0	25.5		22.0	BH
11	11	75	3	10	25		5.5	5.0	0.0	24.5		22.0	BH
11	11	75	4	355	20		6.5	5.0	0.0	24.0		22.0	BH
11	11	75	5	340	20		7.0	4.0	0.0	24.0		21.5	BH
11	11	75	6	5	15		7.5	2.5	0.0	24.0		21.0	BH
11	11	75	7	360	15		7.9	3.5	0.0	24.0		20.5	BH
11	11	75	8	360	20		6.5	1.5	0.0	26.5		21.0	BH
11	11	75	9	5	105		4.3	- 0.5	0.0	31.5		21.0	BH
11	11	75	10	70	120		4.4	- 0.5	0.0	35.5		20.5	BH
11	11	75	11	75	220		3.5	- 0.5	0.0	36.5		19.5	BH
11	11	75	12	55	250		4.0	- 0.5	0.0	40.5		20.5	BH
11	11	75	13	75	420		3.1	- 0.5	0.0	42.5		20.0	BH
11	11	75	14	75	250		4.5	- 0.5	0.0	44.5		21.0	BH
11	11	75	15	70	205		3.5	- 0.5	0.0	46.0		20.0	BH
11	11	75	16	145	125		4.0	- 0.5	0.0	46.0		19.5	BH
11	11	75	17	220	135		2.0	0.0	0.0	45.5		20.0	BH
11	11	75	18	220	15		3.2	3.0	0.0	40.5		21.0	BH
11	11	75	19	200	50		2.0	7.0	0.0	35.5		22.0	BH
11	11	75	20	215	210		1.1	3.5	0.0	32.0		22.0	BH
11	11	75	21	50	55		3.0	6.5	0.0	30.0		25.5	BH
11	11	75	22	230	605		1.5	7.0	0.0	29.0		25.5	BH
11	11	75	23	20	60		1.9	7.5	0.0	28.0		25.5	BH
11	11	75	24	220	15		3.0	5.0	0.0	27.0		27.5	BH
11	12	75	1	350	35		3.5	4.0	0.0	26.5		26.5	BH
11	12	75	2	320	10		3.0	6.0	0.0	25.5		25.5	BH

Table 2.6.3-6
Meteorological Survey - Data Sample

DUKE POWER COMPANY
CHEROKEE METEOROLOGICAL SURVEY
HIGH LEVEL TOWER DATA

DATE M	D	Y	HOUR	WIND DIR. DEG.	WIND RANGE DEG.	WIND MENG. DEG.	WIND SPEED MPH	TEMP. INV. DEG-F	PREC. IN.	SURF. TEMP. DEG-F	REL. HUM.	DEW POINT DEG-F	REMARKS
11	12	73	3	310	[illegible]		2.3	3.5	0.0	[illegible]		25.5	BH
11	12	73	4	330	45		3.0	3.5	0.0	25.0		25.0	BH
11	12	73	5	20	120		2.0	2.5	0.0	24.0		25.0	BH
11	12	73	6	35	45		2.3	2.5	0.0	24.0		24.0	BH
11	12	73	7	295	405		1.4	4.0	0.0	23.0		24.0	BH
11	12	73	8	[illegible]	120		1.5	2.0	0.0	25.5		25.0	BH
11	12	73	9	330	145		1.5	0.5	0.0	31.5		29.0	BH
11	12	73	10	125	175		2.4	0.0	0.0	39.0		30.5	BH
11	12	73	11	200	160		6.6	- 1.0	0.0	47.5		24.5	BH
11	12	73	12	225	130		6.0	- 1.0	0.0	50.5		25.5	BH
11	12	73	13	225	110		5.0	- 1.0	0.0	53.5		27.0	BH
11	12	73	14	195	75		6.6	- 1.0	0.0	56.0		26.5	BH
11	12	73	15	195	100		6.4	- 1.0	0.0	57.5		26.5	BH
11	12	73	16	210	55		7.5	- 0.5	0.0	58.0		26.5	BH
11	12	73	17	210	55		5.5	0.0	0.0	57.0		26.0	BH
11	12	73	18	195	15		50.0	2.5	0.0	54.0		27.0	BH
11	12	73	19	205	5		6.5	7.0	0.0	45.0		29.5	BH
11	12	73	20	200	10		4.3	7.5	0.0	44.5		31.0	BH
11	12	73	21	190	30		3.0	8.0	0.0	41.5		31.0	BH
11	12	73	22	150	[illegible]		3.5	[illegible]	0.0	39.0		31.5	BH
11	12	73	23	160	75		2.5	1.5	0.0	36.5		31.5	BH
11	12	73	24	155	145		2.5	5.0	0.0	35.0		33.0	BH
11	13	73	1	120	145		2.5	6.5	0.0	33.5		32.5	BH
11	13	73	2	55	45		2.5	8.5	0.0	32.0		31.0	BH
11	13	73	3	115	145		2.0	9.0	0.0	31.5		31.0	BH
11	13	73	4	100	175		1.5	5.0	0.0	31.0		30.0	BH
11	13	73	5	260	140		1.6	7.0	0.0	30.0		29.5	BH
11	13	73	6	330	30		6.2	4.5	0.0	31.0		30.0	BH
11	13	73	7	300	30		4.5	2.5	0.0	31.5		30.0	BH
11	13	73	8	320	20		6.0	3.0	0.0	33.0		30.5	BH
11	13	73	9	205	95		2.0	1.0	0.0	37.0		32.0	BH
11	13	73	10	300	210		2.0	0.0	0.0	46.5		33.0	BH
11	13	73	11	125	75		2.5	0.0	0.0	52.5		35.5	BH
11	13	73	12	335	320		4.5	- 0.5	0.0	60.0		34.0	BH
11	13	73	13	235	105		5.5	- 1.0	0.0	64.5		34.0	BH
11	13	73	14	235	115		6.5	- 1.0	0.0	66.0		36.0	BH
11	13	73	15	225	65		5.5	- 1.0	0.0	67.5		36.0	BH
11	13	73	16	225	65		8.5	- 0.5	0.0	67.5		33.0	BH
11	13	73	17	230	40		6.0	1.5	0.0	65.0		29.5	BH
11	13	73	18	215	20		6.5	7.0	0.0	58.0		31.0	BH
11	13	73	19	225	40		6.0	9.0	0.0	55.0		33.0	BH
11	13	73	20	235	25		8.1	12.5	0.0	48.5		36.5	BH
11	13	73	21	220	25		6.0	12.5	0.0	44.5		37.5	BH
11	13	73	22	220	20		7.2	12.5	0.0	43.0		37.0	BH
11	13	73	23	240	20		9.5	14.0	0.0	41.5		37.5	BH
11	13	73	24	245	35		10.0	13.5	0.0	42.0		37.0	BH

DUKE POWER COMPANY
CHEROKEE METEOROLOGICAL SURVEY
LOW LEVEL TOWER DATA

DATE M	DATE D	DATE Y	HOUR	WIND DIR. DEG.	WIND RANGE DEG.	WIND ANEMO. REC.	WIND SPEED MPH	TEMP. INV. DEG-F	PREC. IN.	SURF. TEMP. DEG-F	REL. HUM.	DEW POINT DEG-F	REMARKS
11	[illegible]	75	7	55	55		3.9	1.0	0.0	[illegible]9.0		19.0	BL
11	[illegible]	7[illegible]	8	45	65		2.6	0.5	0.0	30.5		18.5	BL
11	[illegible]	7	9	50	65		5.7	- 1.0	0.0	33.0		18.0	BL
11	[illegible]	[illegible]	10	[illegible]	100		6.6	- 1.0	0.0	35.5		17.0	BL
11	[illegible]	[illegible]	11	30	100		7.5	- 1.0	0.0	38.5		17.0	BL
11	[illegible]	7[illegible]	12	25	100		6.7	- 1.0	0.0	40.0		15.5	BL
11	[illegible]	7[illegible]	13	20	140		5.9	- 1.0	0.0	42.5		17.5	BL
11	[illegible]	7	14	[illegible]	120		5.8	- 1.0	0.0	44.0		17.5	BL
11	[illegible]	[illegible]	15	40	145		4.5	- 1.0	0.0	41.0		17.5	BL
11	[illegible]	7[illegible]	16	240	[illegible]		3.7	- 1.0	0.0	46.0		17.0	BL
11	[illegible]	75	17	5	240		7.3	1.0	0.0	44.5		1[illegible].5	BL
11	[illegible]	7[illegible]	18	200	10		1.4	5.5	0.0	39.0		19.0	BL
11	[illegible]	7[illegible]	19	215	195		1.3	7.5	0.0	35.0		20.0	BL
11	[illegible]	75	20	175	[illegible]		1.7	6.0	0.0	31.5		24.0	BL
11	[illegible]	7[illegible]	21	295	1[illegible]		1.7	9.0	0.0	30.0		23.0	BL
11	[illegible]	7[illegible]	22	320	65		2.3	6.[illegible]	0.0	31.5		22.0	BL
11	[illegible]	75	23	270	200		1.1	6.[illegible]	0.0	29.5		22.0	BL
11	[illegible]	7	24	[illegible]	110		1.3	5.5	0.0	[illegible].0		20.0	BL
11	11	7[illegible]	1	225	45		1.9	6.5	0.0	[illegible]		22.0	BL
11	11	7[illegible]	2	220	60		2.4	[illegible].0	0.0	2[illegible]		22.0	BL
11	11	75	3	305	25		2.0	5.0	0.0	24.5		22.0	BL
11	11	7[illegible]	4	300	40		2.1	5.0	0.0	24.0		22.0	BL
11	11	75	5	315	30		2.4	4.0	0.0	24.0		21.5	BL
11	11	7	6	340	40		2.6	3.5	0.0	24.0		21.0	BL
11	11	7[illegible]	7	355	45		2.8	2.5	0.0	24.0		20.5	BL
11	11	7[illegible]	8	340	60		2.7	1.5	0.0	26.[illegible]		21.0	BL
11	11	7[illegible]	9	10	115		2.8	- 0.5	0.0	31.5		21.0	BL
11	11	7[illegible]	10	70	170		3.2	- 0.5	0.0	35.5		20.5	BL
11	11	7[illegible]	11	[illegible]	80		3.6	- 0.5	0.0	38.5		19.5	BL
11	11	7[illegible]	12	355	355		3.9	- 0.5	0.0	40.5		20.5	EL
11	11	7[illegible]	13	[illegible]	21[illegible]		3.3	- 0.5	0.0	42.5		20.0	EL
11	11	7[illegible]	14	140	245		3.5	- 0.5	0.0	44.5		21.0	BL
11	11	75	15	10	165		3.8	- 0.5	0.0	46.0		20.0	BL
11	11	7[illegible]	16	130	170		2.9	- 0.5	0.0	45.0		19.5	BL
11	11	7[illegible]	17	[illegible]	175		1.4	0.0	0.0	45.5		20.0	BL
11	11	75	[illegible]	250	70		1.[illegible]	5.0	0.0	40.[illegible]		21.0	BL
11	11	75	19	2[illegible]	70		0.4	7.0	0.0	35.[illegible]		22.0	BL
11	11	75	20	235	150		0.5	8.5	0.0	32.0		22.0	BL
11	11	7[illegible]	21	245	250		0.[illegible]	6.5	0.0	30.0		25.5	BL
11	11	7[illegible]	22	250	70		1.4	7.0	0.0	29.0		25.5	BL
11	11	7[illegible]	23	295	55		1.0	7.5	0.0	28.0		25.5	BL
11	1[illegible]	75	24	315	65		1.1	5.0	0.0	27.0		27.5	BL
11	[illegible]	75	1	330	35		1.2	4.0	0.0	26.5		26.5	BL
11	[illegible]	75	2	335	75		0.8	2.0	0.0	27.5		25.5	BL

Table 2.6.3-6
Meteorological Survey - Data Sample

DUKE POWER COMPANY
CHEROKEE METEOROLOGICAL SURVEY
LOW LEVEL TOWER DATA

DATE M	D	Y	HOUR	WIND DIR. DEG.	WIND RANGE DEG.	WIND PERS. DEG.	WIND SPEED MPH	TEMP. INV. DEG-F	PREC. IN.	SURF. TEMP. DEG-F	REL. HUM.	DEW POINT DEG-F	REMARKS
11	12	73	3	300	50		1.0	5.5	0.0	25.0		25.5	BL
11	12	73	4	220	95		0.5	3.5	0.0	25.0		25.0	BL
11	12	73	5	310	155		0.8	2.5	0.0	24.0		25.0	BL
11	12	73	6	320	105		1.1	2.5	0.0	24.0		24.0	BL
11	12	73	7	265	80		0.9	4.0	0.0	23.0		24.0	BL
11	12	73	8	305	45		1.0	2.0	0.0	25.5		25.0	BL
11	12	73	9	65	85		1.4	6.5	0.0	31.5		29.0	BL
11	12	73	10	45	125		2.5	0.0	0.0	39.0		30.5	BL
11	12	73	11	255	145		4.7	- 1.0	0.0	47.5		24.5	BL
11	12	73	12	235	125		4.5	- 1.0	0.0	50.5		25.5	BL
11	12	73	13	260	230		4.1	- 1.0	0.0	53.5		27.0	BL
11	12	73	14	260	90		4.5	- 1.0	0.0	56.0		26.5	BL
11	12	73	15	205	155		4.2	- 1.0	0.0	57.5		26.5	BL
11	12	73	16	215	75		4.6	- 0.5	0.0	[illegible]		26.5	BL
11	12	73	17	205	55		3.2	0.0	0.0	57.0		26.0	BL
11	12	73	18	205	50		1.7	2.5	0.0	54.0		27.0	BL
11	12	73	19	[illegible]	90		1.3	7.0	0.0	[illegible]		29.5	BL
11	12	73	20	30	240		0.7	7.5	0.0	44.5		31.0	BL
11	12	73	21	250	135		0.6	6.0	0.0	41.5		31.0	BL
11	12	73	22	300	300		0.7	6.0	0.0	39.0		31.5	BL
11	12	73	23	240	100		0.5	6.5	0.0	36.5		31.5	BL
11	12	73	24	245	75		0.6	6.0	0.0	35.0		33.0	BL
11	13	73	1	305	125		1.2	6.5	0.0	33.5		32.5	BL
11	13	73	2	285	120		0.5	6.5	0.0	32.0		31.0	BL
11	13	73	3	100	265		1.0	4.0	0.0	31.5		31.0	BL
11	13	73	4	155	410		1.1	6.0	0.0	31.0		30.0	BL
11	13	73	5	320	90		1.4	7.0	0.0	30.0		29.5	BL
11	13	73	6	300	95		1.7	4.5	0.0	31.0		30.0	BL
11	13	73	7	305	150		1.4	2.5	0.0	31.5		30.0	BL
11	13	73	8	320	155		1.7	3.0	0.0	35.0		30.5	BL
11	13	73	9	60	220		0.9	1.0	0.0	37.0		32.0	BL
11	13	73	10	15	200		2.0	0.0	0.0	46.5		33.0	BL
11	13	73	11	45	45		2.8	0.0	0.0	52.5		35.5	BL
11	13	73	12	145	295		3.4	0.5	0.0	60.0		34.0	BL
11	13	73	13	240	135		4.2	- 1.0	0.0	64.5		34.0	BL/
11	13	73	14	245	135		4.6	- 1.0	0.0	66.0		36.0	BL
11	13	73	15	250	120		5.1	- 1.0	0.0	67.5		36.0	BL
11	13	73	16	225	40		5.5	- 0.5	0.0	67.5		33.0	BL
11	13	73	17	250	65		3.1	1.5	0.0	65.0		29.5	BL
11	13	73	18	220	40		1.5	7.0	0.0	[illegible]		31.0	BL
11	13	73	19	150	310		1.1	9.0	0.0	53.0		33.0	BL
11	13	73	20	155	225		1.3	12.5	0.0	46.5		36.5	BL
11	13	73	21	15	215		0.9	12.5	0.0	44.5		37.5	BL
11	13	73	22	55	245		1.0	12.5	0.0	43.0		37.0	BL
11	13	73	23	130	165		2.0	14.0	0.0	41.5		37.5	BL
11	13	73	24	175	170		2.4	13.5	0.0	42.0		37.0	BL

Table 2.6.3-7
Meteorological Survey - Data Sample

DUKE POWER COMPANY
CHEROKEE METEOROLOGICAL SURVEY
HIGH LEVEL TOWER DATA

DATE M D Y	HOUR	WIND DIR. DEG.	WIND RANGE DEG.	WIND MEND. DEG.	WIND SPEED MPH	TEMP. INV. DEG-F	PREC. IN.	SURF. TEMP. DEG-F	REL. HUM.	DEW POINT DEG-F	REMARKS
02 01 74	1	270	155		5.7	9.0	0.0	42.0		X.X	EQUIPT MAL BH
02 01 74	2	310	[illegible]		4.3	9.5	0.0	41.0		X.X	EQUIPT MAL BH
02 01 74	3	220	25		5.4	10.0	0.0	38.5		X.X	EQUIPT MAL BH
02 01 74	4	290	160		2.4	9.5	0.0	36.5		X.X	EQUIPT MAL BH
02 01 74	5	325	235		2.8	10.5	0.0	36.0		X.X	EQUIPT MAL BH
02 01 74	6	35	20		4.6	11.0	0.0	34.5		X.X	EQUIPT MAL BH
02 01 74	7	340	70		3.4	8.5	0.0	35.5		X.X	EQUIPT MAL BH
02 01 74	8	[illegible]	95		1.4	9.5	0.0	32.5		X.X	EQUIPT MAL BH
02 01 74	9	260	210		1.3	5.0	0.0	33.5		X.X	EQUIPT MAL BH
02 01 74	10	225	25		4.4	4.0	0.0	41.0		X.X	EQUIPT MAL BH
02 01 74	11	X	X		1.4	0.5	0.0	49.5		X.X	EQUIPT MAL BH
02 01 74	12	135	160		X.X	- 0.5	0.0	56.5		X.X	EQUIPT MAL BH
02 01 74	13	140	75		6.9	- 0.5	0.0	61.5		37.5	BH
02 01 74	14	195	65		9.3	- 1.0	0.0	64.5		38.0	BH
02 01 74	15	200	55		9.4	- 1.0	0.0	66.0		37.5	BH
02 01 74	16	205	60		5.9	- 1.0	0.0	67.5		36.5	BH
02 01 74	17	205	60		8.0	- 0.5	0.0	67.5		37.0	BH
02 01 74	18	205	55		7.8	0.0	0.0	66.5		37.5	BH
02 01 74	19	195	25		5.7	1.5	0.0	63.5		38.5	BH
02 01 74	20	190	10		7.9	4.5	0.0	59.5		40.0	BH
02 01 74	21	175	20		4.9	6.0	0.0	55.0		41.0	BH
02 01 74	22	165	30		4.0	5.5	0.0	53.5		41.0	BH
02 01 74	23	165	30		5.3	5.0	0.0	52.5		41.5	BH
02 01 74	24	175	15		4.2	6.0	0.0	49.5		42.5	BH
02 02 74	1	155	100		4.9	4.5	0.0	50.0		44.0	BH
02 02 74	2	275	125		2.5	4.0	0.0	49.0		47.0	BH
02 02 74	3	130	280		4.0	1.0	0.13	49.0		48.5	BH
02 02 74	4	200	205		6.8	0.5	0.02	49.0		49.0	BH
02 02 74	5	275	225		3.5	0.5	0.19	49.5		50.0	BH
02 02 74	6	210	45		2.1	0.5	0.06	49.0		50.0	BH
02 02 74	7	265	60		3.4	0.5	0.04	49.5		50.0	BH
02 02 74	8	230	280		2.5	0.0	0.17	49.5		50.0	BH
02 02 74	9	250	250		1.5	0.0	0.02	49.5		50.0	BH
02 02 74	10	190	100		5.3	0.0	0.02	51.0		51.0	BH
02 02 74	11	210	65		3.3	0.0	0.0	52.5		53.0	BH
02 02 74	12	205	45		3.4	0.0	0.0	55.0		55.0	BH
02 02 74	13	215	55		10.6	0.0	0.0	60.0		58.0	BH
02 02 74	14	230	60		12.7	- 1.5	0.0	65.5		59.5	BH
02 02 74	15	245	65		12.8	- 0.5	0.0	70.0		58.0	BH
02 02 74	16	240	45		12.9	- 0.5	0.03	71.0		57.0	BH
02 02 74	17	220	50		10.0	0.0	0.07	69.0		59.0	BH
02 02 74	18	250	60		7.8	0.5	0.05	65.0		60.5	BH
02 02 74	19	310	75		6.7	0.0	0.05	62.5		56.5	BH
02 02 74	20	245	210		3.4	0.0	0.02	58.0		58.5	BH
02 02 74	21	195	55		5.5	0.0	0.03	58.5		57.0	BH
02 02 74	22	[illegible]	115		1.5	0.0	0.05	56.0		57.0	BH

Table 2.6.3-7
Meteorological Survey - Data Sample

DUKE POWER COMPANY
CHEROKEE METEOROLOGICAL SURVEY
HIGH LEVEL TOWER DATA

DATE M D Y	HOUR	WIND DIR. DEG.	WIND RANGE DEG.	WIND SPEC. DEG.	WIND SPEED MPH	TEMP. INV. DEG-F	PREC. IN.	SURF. TEMP. DEG-F	REL. HUM.	DEW POINT DEG-F	REMARKS
02 02 74	23	195	45		5.8	0.0	0.04	56.0		57.0	BH
02 02 74	24	50	45		1.9	0.0	0.0	56.0		56.5	BH
02 03 74	1	115	90		2.1	0.0	0.0	54.5		55.5	BH
02 03 74	2	160	45		2.5	1.0	0.0	53.0		55.0	BH
02 03 74	3	240	45		3.4	1.0	0.0	54.0		55.0	BH
02 03 74	4	275	160		1.4	1.0	0.0	54.0		55.0	BH
02 03 74	5	270	40		3.9	0.0	0.0	55.5		57.0	BH
02 03 74	6	220	65		2.7	0.0	0.0	56.0		57.5	BH
02 03 74	7	195	75		2.3	0.0	0.0	56.0		57.0	BH
02 03 74	8	225	50		6.0	0.0	0.0	56.5		58.0	BH
02 03 74	9	220	50		6.5	0.0	0.0	57.0		58.0	BH
02 03 74	10	245	70		3.4	0.0	0.0	57.5		58.0	BH
02 03 74	11	225	65		5.8	0.0	0.11	58.0		58.5	BH
02 03 74	12	270	70		4.4	0.0	0.05	58.5		59.0	BH
02 03 74	13	215	125		2.3	0.5	0.0	59.5		59.5	BH
02 03 74	14	245	100		5.3	0.5	0.0	61.5		58.5	BH
02 03 74	15	250	90		6.8	0.5	0.0	65.0		58.0	BH
02 03 74	16	240	75		5.5	- 1.5	0.0	67.5		56.5	BH
02 03 74	17	295	55		10.7	- 1.0	0.0	68.0		54.5	BH
02 03 74	18	325	50		12.5	0.0	0.0	67.0		54.0	BH
02 03 74	19	310	75		11.0	0.0	0.0	64.0		50.5	BH
02 03 74	20	340	50		9.9	0.0	0.0	59.0		47.0	BH
02 03 74	21	340	45		10.4	0.0	0.0	55.0		42.0	BH
02 03 74	22	330	50		9.5	- 0.5	0.0	51.5		38.0	BH
02 03 74	23	345	50		7.9	0.0	0.0	49.0		38.0	BH
02 03 74	24	5	50		7.4	0.0	0.0	46.5		36.5	BH
02 04 74	1	350	50		8.3	0.0	0.0	46.0		34.5	BH
02 04 74	2	15	60		8.3	0.0	0.0	45.0		36.5	BH
02 04 74	3	5	70		5.4	0.0	0.0	43.5		35.5	BH
02 04 74	4	335	40		5.9	0.0	0.0	42.0		35.0	BH
02 04 74	5	320	20		5.5	0.5	0.0	39.5		33.5	BH
02 04 74	6	320	20		4.2	1.0	0.0	38.0		32.0	BH
02 04 74	7	305	55		5.9	1.5	0.0	38.5		30.5	BH
02 04 74	8	290	20		5.7	1.0	0.0	37.0		28.5	BH
02 04 74	9	275	30		5.9	1.5	0.0	36.5		27.0	BH
02 04 74	10	285	60		5.8	- 0.5	0.0	37.5		25.5	BH
02 04 74	11	300	75		9.0	- 1.0	0.0	40.5		23.5	BH
02 04 74	12	305	60		8.8	- 1.0	0.0	43.0		22.0	BH
02 04 74	13	305	55		15.3	- 1.0	0.0	45.0		19.0	BH
02 04 74	14	300	50		16.5	- 1.5	0.0	46.0		21.0	BH
02 04 74	15	315	65		16.4	- 1.0	0.0	46.0		21.0	BH
02 04 74	16	310	65		16.5	- 1.0	0.0	46.5		20.0	BH
02 04 74	17	315	65		14.4	- 1.0	0.0	46.5		16.5	BH
02 04 74	18	335	55		16.4	- 0.5	0.0	46.0		15.5	BH

Table 2.6.3-7

Meteorological Survey - Data Sample

DUKE POWER COMPANY
CHEROKEE METEOROLOGICAL SURVEY
LOW LEVEL TOWER DATA

DATE M D Y	HOUR	WIND DIR. DEG.	WIND RANGE DEG.	WIND MINC. DEC.	WIND SPEED MPH	TEMP. INV. DEG-F	PREC. IN.	SURF. TEMP. DEG-F	REL. HUM.	DEW POINT DEG-F	REMARKS
02 01 74	1	175	360		1.9	9.0	0.0	47.0		X.X	EQUIPT MAL BL
02 01 74	2	245	40		1.3	9.5	0.0	41.0		X.X	EQUIPT MAL BL
02 01 74	3	320	155		0.9	10.5	0.0	35.5		X.X	EQUIPT MAL BL
02 01 74	4	220	365		1.2	9.5	0.0	36.5		X.X	EQUIPT MAL BL
02 01 74	5	210	75		1.8	10.5	0.0	36.0		X.X	EQUIPT MAL BL
02 01 74	6	220	340		1.6	11.0	0.0	34.5		X.X	EQUIPT MAL BL
02 01 74	7	315	65		0.7	[illegible]	0.0	33.5		X.X	EQUIPT MAL BL
02 01 74	8	220	125		1.0	6.5	0.0	37.5		X.X	EQUIPT MAL BL
02 01 74	9	330	65		1.7	2.0	0.0	33.5		X.X	EQUIPT MAL BL
02 01 74	10	345	110		0.9	4.0	0.0	41.0		X.X	EQUIPT MAL BL
02 01 74	11	45	120		0.9	0.5	0.0	49.5		X.X	EQUIPT MAL BL
02 01 74	12	90	299		2.4	- 0.5	0.0	56.5		X.X	EQUIPT MAL BL
02 01 74	13	125	155		4.6	- 0.5	0.0	61.5		37.5	BL
02 01 74	14	190	100		6.7	- 1.0	0.0	64.5		28.0	BL
02 01 74	15	180	115		6.7	- 1.0	0.0	66.0		37.5	BL
02 01 74	16	210	120		6.5	- 1.0	0.0	67.5		33.5	BL
02 01 74	17	215	95		5.3	- 0.5	0.0	67.5		37.0	BL
02 01 74	18	205	110		4.6	0.0	0.0	66.5		37.5	BL
02 01 74	19	205	65		2.4	1.5	0.0	63.5		38.5	BL
02 01 74	20	[illegible]	135		2.1	4.5	0.0	59.0		40.0	BL
02 01 74	21	190	140		0.9	4.5	0.0	55.0		41.0	BL
02 01 74	22	195	165		1.1	5.5	0.0	54.5		41.0	BL
02 01 74	23	210	120		1.7	5.0	0.0	52.5		41.5	BL
02 01 74	24	265	125		1.0	6.0	0.0	49.5		42.5	BL
02 02 74	1	300	75		2.8	4.5	0.0	50.0		44.0	BL
02 02 74	2	270	135		1.7	4.0	0.0	49.0		47.0	BL
02 02 74	3	210	265		2.0	1.0	0.13	49.5		45.5	BL
02 02 74	4	45	270		4.1	0.5	0.02	49.0		49.0	BL
02 02 74	5	275	180		2.4	0.5	0.19	49.5		50.0	BL
02 02 74	6	260	150		2.2	0.5	0.06	49.0		50.0	BL
02 02 74	7	215	335		1.9	0.0	0.04	49.5		50.0	BL
02 02 74	8	345	270		2.3	0.0	0.17	49.5		50.0	BL
02 02 74	9	305	335		1.9	0.0	0.02	49.5		50.0	BL
02 02 74	10	170	200		2.6	0.0	0.02	51.0		51.0	BL
02 02 74	11	230	120		2.5	0.0	0.0	52.5		53.0	BL
02 02 74	12	205	95		2.8	0.0	0.0	55.0		55.0	BL
02 02 74	13	220	50		5.7	0.0	0.0	60.0		58.0	BL
02 02 74	14	225	120		7.0	- 1.5	0.0	65.5		59.5	BL
02 02 74	15	255	110		8.3	- 0.5	0.0	70.0		58.0	BL
02 02 74	16	250	100		7.3	- 0.5	0.03	71.0		57.0	BL
02 02 74	17	225	115		6.2	0.0	0.07	69.0		59.0	BL
02 02 74	18	270	90		3.9	0.5	0.05	65.0		60.5	BL
02 02 74	19	315	100		4.2	0.0	0.05	62.5		58.5	BL
02 02 74	20	245	310		2.8	0.0	0.02	57.0		58.5	BL
02 02 74	21	110	125		2.6	0.0	0.03	56.5		57.0	BL
02 02 74	22	350	115		1.2	0.0	0.05	56.0		57.0	BL

Table 2.6.3-7

Meteorological Survey - Data Sample

DUKE POWER COMPANY

CHEROKEE METEOROLOGICAL SURVEY

LOW LEVEL TOWER DATA

DATE M D Y	HOUR	WIND DIR. DEG.	WIND RANGE DEG.	WIND MEND. DEG.	WIND SPEED MPH	TEMP. INV. DEG-F	PRECIP. IN.	SURF. TEMP. DEG-F	REL. HUM.	DEW POINT DEG-F	REMARKS
02 02 74	23	220	165		2.4	0.0	0.04	56.0		57.0	BL
02 02 74	24	205	355		1.6	0.0	0.0	56.0		56.5	BL
02 03 74	1	265	280		1.5	0.0	0.0	54.5		55.5	BL
02 03 74	2	175	425		1.0	1.0	0.0	55.0		55.0	BL
02 03 74	3	220	195		1.5	1.0	0.0	54.0		55.0	BL
02 03 74	4	165	490		1.1	1.0	0.0	54.0		55.0	BL
02 03 74	5	295	170		1.6	0.0	0.0	55.5		57.0	BL
02 03 74	6	235	145		1.7	0.0	0.0	56.0		57.5	BL
02 03 74	7	245	325		1.4	0.0	0.0	56.0		57.0	BL
02 03 74	8	255	100		3.4	0.0	0.0	56.5		58.0	BL
02 03 74	9	245	120		4.2	0.0	0.0	57.0		58.0	BL
02 03 74	10	265	130		2.4	0.0	0.0	57.5		58.0	BL
02 03 74	11	240	375		4.3	0.0	0.11	58.0		58.5	BL
02 03 74	12	290	115		3.0	0.0	0.05	58.5		59.0	BL
02 03 74	13	250	215		2.4	0.5	0.0	59.5		59.5	BL
02 03 74	14	265	115		3.7	0.5	0.0	61.5		59.5	BL
02 03 74	15	230	130		5.2	0.5	0.0	65.0		59.0	BL
02 03 74	16	225	475		3.6	- 1.5	0.0	67.5		56.5	BL
02 03 74	17	245	70		7.2	- 1.0	0.0	66.0		54.5	BL
02 03 74	18	230	60		7.3	0.0	0.0	67.0		54.0	BL
02 03 74	19	210	50		6.7	0.0	0.0	64.0		50.5	BL
02 03 74	20	350	70		6.3	0.0	0.0	59.0		47.0	BL
02 03 74	21	345	50		7.2	0.0	0.0	55.0		42.0	BL
02 03 74	22	355	60		6.4	- 0.5	0.0	51.5		38.0	BL
02 03 74	23	355	50		4.6	0.0	0.0	49.0		38.0	BL
02 03 74	24	360	65		5.0	0.0	0.0	46.5		36.5	BL
02 04 74	1	360	75		5.3	0.0	0.0	46.0		34.5	BL
02 04 74	2	15	60		4.5	0.0	0.0	45.0		36.5	BL
02 04 74	3	360	65		3.6	0.0	0.0	43.5		35.5	BL
02 04 74	4	345	80		3.0	0.0	0.0	42.0		35.0	BL
02 04 74	5	310	35		2.9	0.5	0.0	39.5		33.5	BL
02 04 74	6	235	415		1.7	1.0	0.0	36.0		32.0	BL
02 04 74	7	295	60		2.5	1.5	0.0	36.5		30.5	BL
02 04 74	8	290	35		2.5	1.0	0.0	37.0		28.5	BL
02 04 74	9	285	35		2.9	1.5	0.0	36.5		27.0	BL
02 04 74	10	240	90		3.8	- 0.5	0.0	37.5		25.5	BL
02 04 74	11	310	40		6.7	- 1.0	0.0	40.5		23.5	BL
02 04 74	12	295	105		8.8	- 1.0	0.0	43.0		22.0	BL
02 04 74	13	315	90		9.6	- 1.0	0.0	45.0		19.0	BL
02 04 74	14	335	75		9.9	- 1.5	0.0	46.0		21.0	BL
02 04 74	15	320	65		8.8	- 1.0	0.0	46.0		21.0	BL
02 04 74	16	315	60		10.4	- 1.0	0.0	46.5		20.0	BL
02 04 74	17	315	60		9.7	- 1.0	0.0	46.5		15.5	BL
02 04 74	18	315	75		10.8	- 0.5	0.0	46.0		15.5	BL

ER Table 2.6.3-8
Cherokee Nuclear Station
High Level Tower Meteorological Survey - Monthly Summaries (Sheet 1 of 12)

FOR PERIOD OF SEPT 11 1973 THROUGH SEPT 30 1973 CHEROKEE METEOROLOGY SURVEY HIGH TOWER DATA
SUMMARY OF PASQUILL A+C+D+E+F+G WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR,PERCENT)
DATE OF REPORT 7-22-74

WIND SECTOR	ITEM	SECTOR TOTAL	WIND SPEED CLASS 1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH S9.5 M/S
360.0	NO	19	2	1	1	8	7	0	0	0	0	0
-N-	PCT	6.40	0.67	0.34	0.34	2.69	2.36	0.00	0.00	0.00	0.00	0.00
22.5	NO	24	2	2	0	12	8	0	0	0	0	0
-NNE-	PCT	8.08	0.67	0.67	0.00	4.04	2.69	0.00	0.00	0.00	0.00	0.00
45.0	NO	50	0	2	10	19	18	1	0	0	0	0
-NE-	PCT	16.83	0.00	0.67	3.37	6.40	6.06	0.34	0.00	0.00	0.00	0.00
67.5	NO	31	0	0	2	19	4	6	0	0	0	0
-ENE-	PCT	10.44	0.00	0.00	0.67	6.40	1.35	2.02	0.00	0.00	0.00	0.00
90.0	NO	28	4	1	2	13	7	1	0	0	0	0
-E-	PCT	9.43	1.35	0.34	0.67	4.38	2.36	0.34	0.00	0.00	0.00	0.00
112.5	NO	12	0	1	3	5	3	0	0	0	0	0
-ESE-	PCT	4.04	0.00	0.34	1.01	1.68	1.01	0.00	0.00	0.00	0.00	0.00
135.0	NO	10	1	0	1	7	1	0	0	0	0	0
-SE-	PCT	3.37	0.34	0.00	0.34	2.36	0.34	0.00	0.00	0.00	0.00	0.00
157.5	NO	11	2	0	0	0	4	4	1	0	0	0
-SSE-	PCT	3.70	0.67	0.00	0.00	0.00	1.35	1.35	0.34	0.00	0.00	0.00
180.0	NO	2	0	0	0	1	1	0	0	0	0	0
-S-	PCT	0.67	0.00	0.00	0.00	0.34	0.34	0.00	0.00	0.00	0.00	0.00
202.5	NO	3	0	1	0	1	0	1	0	0	0	0
-SSW-	PCT	1.01	0.00	0.34	0.00	0.34	0.00	0.34	0.00	0.00	0.00	0.00
225.0	NO	20	1	6	5	7	0	1	0	0	0	0
-SW-	PCT	6.73	0.34	2.02	1.68	2.36	0.00	0.34	0.00	0.00	0.00	0.00
247.5	NO	19	0	1	1	12	3	2	0	0	0	0
-WSW-	PCT	6.40	0.00	0.34	0.34	4.04	1.01	0.67	0.00	0.00	0.00	0.00
270.0	NO	13	1	0	0	8	2	2	0	0	0	0
-W-	PCT	4.38	0.34	0.00	0.00	2.69	0.67	0.67	0.00	0.00	0.00	0.00
292.5	NO	4	0	1	1	2	0	0	0	0	0	0
-WNW-	PCT	1.35	0.00	0.34	0.34	0.67	0.00	0.00	0.00	0.00	0.00	0.00
315.0	NO	21	3	2	0	7	9	0	0	0	0	0
-NW-	PCT	7.07	1.01	0.67	0.00	2.36	3.03	0.00	0.00	0.00	0.00	0.00
337.5	NO	30	1	5	0	12	12	0	0	0	0	0
-NNW-	PCT	10.10	0.34	1.68	0.00	4.04	4.04	0.00	0.00	0.00	0.00	0.00
CALM	NO	0										
	PCT	0.00	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	297	17	23	26	133	79	18	1	0	0	0
	PCT	100.00	5.72	7.74	8.75	44.78	26.60	6.06	0.34	0.00	0.00	0.00

AVERAGE WIND SPEED 8.91 TOTAL VALID OBSERVATIONS 297 TOTAL OBSERVATIONS 464

Amendment 2
(New)

ER Table 2.6.3-8
Cherokee Nuclear Station
High Level Tower Meteorological Survey - Monthly Summaries (Sheet 2 of 12)

CHEROKEE METEOROLOGY SURVEY HIGH LEVEL TOWER DATA FOR PERIOD OF OCTOBER 1973
SUMMARY OF PASQUILL A+C+D+E+F+G WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR,PERCENT)
DATE OF REPORT 8-01-74

WIND SECTOR	ITEM	SECTOR TOTAL	1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH S9.5 M/S
360.0	NO	89	20	24	23	19	3	0	0	0	0	0
-N-	PCT	13.13	2.95	3.54	3.39	2.80	0.44	0.00	0.00	0.00	0.00	0.00
22.5	NO	79	14	16	23	21	4	1	0	0	0	0
-NNE-	PCT	11.65	2.06	2.36	3.39	3.10	0.59	0.15	0.00	0.00	0.00	0.00
45.0	NO	66	9	25	21	9	2	0	0	0	0	0
-NE-	PCT	9.73	1.33	3.69	3.10	1.33	0.29	0.00	0.00	0.00	0.00	0.00
67.5	NO	31	5	17	5	2	2	0	0	0	0	0
-ENE-	PCT	4.57	0.74	2.51	0.74	0.29	0.29	0.00	0.00	0.00	0.00	0.00
90.0	NO	26	5	16	5	0	0	0	0	0	0	0
-E-	PCT	3.83	0.74	2.36	0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112.5	NO	10	3	5	1	1	0	0	0	0	0	0
-ESE-	PCT	1.47	0.44	0.74	0.15	0.15	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	14	6	8	0	0	0	0	0	0	0	0
-SE-	PCT	2.06	0.88	1.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
157.5	NO	8	2	6	0	0	0	0	0	0	0	0
-SSE-	PCT	1.18	0.29	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180.0	NO	13	1	9	3	0	0	0	0	0	0	0
-S-	PCT	1.92	0.15	1.33	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
202.5	NO	15	1	9	4	0	1	0	0	0	0	0
-SSW-	PCT	2.21	0.15	1.33	0.59	0.00	0.15	0.00	0.00	0.00	0.00	0.00
225.0	NO	62	6	17	21	10	4	3	1	0	0	0
-SW-	PCT	9.14	0.88	2.51	3.10	1.47	0.59	0.44	0.15	0.00	0.00	0.00
247.5	NO	40	2	5	11	7	10	4	0	1	0	0
-WSW-	PCT	5.90	0.29	0.74	1.62	1.03	1.47	0.59	0.00	0.15	0.00	0.00
270.0	NO	35	8	14	5	1	5	0	2	0	0	0
-W-	PCT	5.16	1.18	2.06	0.74	0.15	0.74	0.00	0.29	0.00	0.00	0.00
292.5	NO	27	8	9	2	4	3	0	0	1	0	0
-WNW-	PCT	3.98	1.18	1.33	0.29	0.59	0.44	0.00	0.00	0.15	0.00	0.00
315.0	NO	88	11	35	29	8	3	0	1	0	1	0
-NW-	PCT	12.98	1.62	5.16	4.28	1.18	0.44	0.00	0.15	0.00	0.15	0.00
337.5	NO	75	14	30	22	8	1	0	0	0	0	0
-NNW-	PCT	11.06	2.06	4.42	3.24	1.18	0.15	0.00	0.00	0.00	0.00	0.00
CALM	NO	0										
	PCT	0.00	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	678	115	245	175	90	38	8	4	2	1	0
	PCT	100.00	16.96	36.13	25.81	13.27	5.60	1.18	0.59	0.29	0.15	0.00

AVERAGE WIND SPEED 5.87 TOTAL VALID OBSERVATIONS 678 TOTAL OBSERVATIONS 744

Amendment 2
(New)

ER Table 2.6.3-8
Cherokee Nuclear Station
High Level Tower Meteorological Survey - Monthly Summaries (Sheet 3 of 12)

CHEROKEE METEOROLOGY SURVEY HIGH LEVEL TOWER DATA FOR PERIOD OF NOVEMBER 1973
SUMMARY OF PASQUILL A+C+D+E+F+G WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR,PERCENT)
DATE OF REPORT 8-01-74

WIND SECTOR	ITEM	SECTOR TOTAL	WIND SPEED CLASS 1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH ≥9.5 M/S
360.0	NO	61	10	21	23	3	2	2	0	0	0	0
-N-	PCT	8.48	1.39	2.92	3.20	0.42	0.28	0.28	0.00	0.00	0.00	0.00
22.5	NO	30	7	8	9	5	1	0	0	0	0	0
-NNE-	PCT	4.17	0.97	1.11	1.25	0.69	0.14	0.00	0.00	0.00	0.00	0.00
45.0	NO	51	13	25	8	4	1	0	0	0	0	0
-NE-	PCT	7.09	1.81	3.48	1.11	0.56	0.14	0.00	0.00	0.00	0.00	0.00
67.5	NO	31	8	20	3	0	0	0	0	0	0	0
-ENE-	PCT	4.31	1.11	2.78	0.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90.0	NO	13	4	8	1	0	0	0	0	0	0	0
-E-	PCT	1.81	0.56	1.11	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112.5	NO	23	9	7	4	3	0	0	0	0	0	0
-ESE-	PCT	3.20	1.25	0.97	0.56	0.42	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	26	11	7	2	1	4	0	1	0	0	0
-SE-	PCT	3.61	1.53	0.97	0.28	0.14	0.56	0.00	0.14	0.00	0.00	0.00
157.5	NO	16	9	6	0	0	0	0	1	0	0	0
-SSE-	PCT	2.22	1.25	0.83	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00
180.0	NO	38	8	11	10	4	5	0	0	0	0	0
-S-	PCT	5.28	1.11	1.53	1.39	0.56	0.69	0.00	0.00	0.00	0.00	0.00
202.5	NO	59	8	21	18	4	5	3	0	0	0	0
-SSW-	PCT	8.20	1.11	2.92	2.50	0.56	0.69	0.42	0.00	0.00	0.00	0.00
225.0	NO	133	8	12	35	29	32	8	5	3	0	1
-SW-	PCT	18.50	1.11	1.67	4.87	4.03	4.45	1.11	0.69	0.42	0.00	0.14
247.5	NO	53	4	6	11	16	4	5	4	2	1	0
-WSW-	PCT	7.37	0.56	0.83	1.53	2.22	0.56	0.69	0.56	0.28	0.14	0.00
270.0	NO	34	5	8	12	5	2	1	1	0	0	0
-W-	PCT	4.73	0.69	1.11	1.67	0.69	0.28	0.14	0.14	0.00	0.00	0.00
292.5	NO	48	15	7	5	7	12	1	0	0	0	1
-WNW-	PCT	6.68	2.09	0.97	0.69	0.97	1.67	0.14	0.00	0.00	0.00	0.14
315.0	NO	66	17	9	15	4	7	4	8	2	0	0
-NW-	PCT	9.18	2.36	1.25	2.09	0.56	0.97	0.56	1.11	0.28	0.00	0.00
337.5	NO	34	5	11	11	2	4	1	0	0	0	0
-NNW-	PCT	4.73	0.69	1.53	1.53	0.28	0.56	0.14	0.00	0.00	0.00	0.00
CALM	NO	3										
	PCT	0.42	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	716	141	187	167	87	79	25	20	7	1	2
	PCT	99.58	19.61	26.01	23.23	12.10	10.99	3.48	2.78	0.97	0.14	0.28

AVERAGE WIND SPEED 6.59 TOTAL VALID OBSERVATIONS 719 TOTAL OBSERVATIONS 720

Amendment 2
(New)

ER Table 2.6.3-8
Cherokee Nuclear Station
High Level Tower Meteorological Survey - Monthly Summaries (Sheet 4 of 12)

CHEROKEE METEOROLOGY SURVEY HIGH LEVEL TOWER DATA FOR PERIOD OF DECEMBER 1973
SUMMARY OF PASQUILL A+C+D+E+F+G WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR,PERCENT)

DATE OF REPORT 7-22-74

WIND SECTOR	ITEM	SECTOR TOTAL	WIND SPEED CLASS 1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH S9.5 M/S
360.0	NO	55	7	20	16	10	2	0	0	0	0	0
-N-	PCT	7.45	0.95	2.71	2.17	1.35	0.27	0.00	0.00	0.00	0.00	0.00
22.5	NO	95	9	17	32	25	9	3	0	0	0	0
-NNE-	PCT	12.87	1.22	2.30	4.34	3.39	1.22	0.41	0.00	0.00	0.00	0.00
45.0	NO	60	8	15	18	12	4	2	1	0	0	0
-NE-	PCT	8.13	1.08	2.03	2.44	1.63	0.54	0.27	0.13	0.00	0.00	0.00
67.5	NO	32	4	11	9	6	0	2	0	0	0	0
-ENE-	PCT	4.34	0.54	1.49	1.22	0.81	0.00	0.27	0.00	0.00	0.00	0.00
90.0	NO	36	7	15	12	1	1	0	0	0	0	0
-E-	PCT	4.88	0.95	2.03	1.63	0.13	0.13	0.00	0.00	0.00	0.00	0.00
112.5	NO	13	5	7	1	0	0	0	0	0	0	0
-ESE-	PCT	1.76	0.68	0.95	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	15	5	8	1	1	0	0	0	0	0	0
-SE-	PCT	2.03	0.68	1.08	0.13	0.13	0.00	0.00	0.00	0.00	0.00	0.00
157.5	NO	14	1	7	2	2	1	1	0	0	0	0
-SSE-	PCT	1.90	0.13	0.95	0.27	0.27	0.13	0.13	0.00	0.00	0.00	0.00
180.0	NO	60	8	15	17	9	5	6	0	0	0	0
-S-	PCT	8.13	1.08	2.03	2.30	1.22	0.68	0.81	0.00	0.00	0.00	0.00
202.5	NO	60	1	19	9	10	14	6	0	1	0	0
-SSW-	PCT	8.13	0.13	2.57	1.22	1.35	1.90	0.81	0.00	0.13	0.00	0.00
225.0	NO	72	6	15	19	13	10	7	2	0	0	0
-SW-	PCT	9.75	0.81	2.03	2.57	1.76	1.35	0.95	0.27	0.00	0.00	0.00
247.5	NO	27	1	2	3	5	10	5	1	0	0	0
-WSW-	PCT	3.66	0.13	0.27	0.41	0.68	1.35	0.68	0.13	0.00	0.00	0.00
270.0	NO	30	2	10	6	6	6	0	0	0	0	0
-W-	PCT	4.06	0.27	1.35	0.81	0.81	0.81	0.00	0.00	0.00	0.00	0.00
292.5	NO	41	5	5	9	11	7	3	1	0	0	0
-WNW-	PCT	5.55	0.68	0.68	1.22	1.49	0.95	0.41	0.13	0.00	0.00	0.00
315.0	NO	79	5	17	18	25	11	2	1	0	0	0
-NW-	PCT	10.70	0.68	2.30	2.44	3.39	1.49	0.27	0.13	0.00	0.00	0.00
337.5	NO	49	5	21	16	6	1	0	0	0	0	0
-NNW-	PCT	6.64	0.68	2.84	2.17	0.81	0.13	0.00	0.00	0.00	0.00	0.00
CALM	NO	0										
	PCT	0.00	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	738	79	204	188	142	81	37	6	1	0	0
	PCT	100.00	10.70	27.64	25.47	19.24	10.97	5.01	0.81	0.13	0.00	0.00

AVERAGE WIND SPEED 6.95 TOTAL VALID OBSERVATIONS 738 TOTAL OBSERVATIONS 744

Amendment 2
(New)

ER Table 2.6.3-8
Cherokee Nuclear Station
High Level Tower Meteorological Survey - Monthly Summaries (Sheet 5 of 12)

CHEROKEE METEOROLOGY SURVEY HIGH LEVEL TOWER DATA FOR PERIOD OF JANUARY 1974

SUMMARY OF PASQUILL A+C+D+E+F+G WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR.PERCENT)

DATE OF REPORT 7-22-74

WIND SECTOR	ITEM	SECTOR TOTAL	WIND SPEED CLASS 1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH S9.5 M/S
360.0	NO	26	1	8	14	2	1	0	0	0	0	0
-N-	PCT	4.17	0.16	1.28	2.25	0.32	0.16	0.00	0.00	0.00	0.00	0.00
22.5	NO	40	4	17	13	6	0	0	0	0	0	0
-NNE-	PCT	6.42	0.64	2.73	2.09	0.96	0.00	0.00	0.00	0.00	0.00	0.00
45.0	NO	73	4	25	22	21	1	0	0	0	0	0
-NE-	PCT	11.72	0.64	4.01	3.53	3.37	0.16	0.00	0.00	0.00	0.00	0.00
67.5	NO	35	5	12	12	3	3	0	0	0	0	0
-ENE-	PCT	5.62	0.80	1.93	1.93	0.48	0.48	0.00	0.00	0.00	0.00	0.00
90.0	NO	13	2	9	2	0	0	0	0	0	0	0
-E-	PCT	2.09	0.32	1.44	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112.5	NO	13	4	6	3	0	0	0	0	0	0	0
-ESE-	PCT	2.09	0.64	0.96	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	20	8	8	4	0	0	0	0	0	0	0
-SE-	PCT	3.21	1.28	1.28	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00
157.5	NO	26	16	8	2	0	0	0	0	0	0	0
-SSE-	PCT	4.17	2.57	1.28	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180.0	NO	33	11	12	8	2	0	0	0	0	0	0
-S-	PCT	5.30	1.77	1.93	1.28	0.32	0.00	0.00	0.00	0.00	0.00	0.00
202.5	NO	74	14	29	12	9	7	3	0	0	0	0
-SSW-	PCT	11.88	2.25	4.65	1.93	1.44	1.12	0.48	0.00	0.00	0.00	0.00
225.0	NO	119	7	22	23	34	17	14	1	1	0	0
-SW-	PCT	19.10	1.12	3.53	3.69	5.46	2.73	2.25	0.16	0.16	0.00	0.00
247.5	NO	57	3	8	16	17	9	4	0	0	0	0
-WSW-	PCT	9.15	0.48	1.28	2.57	2.73	1.44	0.64	0.00	0.00	0.00	0.00
270.0	NO	21	1	11	6	2	0	1	0	0	0	0
-W-	PCT	3.37	0.16	1.77	0.96	0.32	0.00	0.16	0.00	0.00	0.00	0.00
292.5	NO	16	4	7	2	2	1	0	0	0	0	0
-WNW-	PCT	2.57	0.64	1.12	0.32	0.32	0.16	0.00	0.00	0.00	0.00	0.00
315.0	NO	29	2	6	11	7	1	2	0	0	0	0
-NW-	PCT	4.65	0.32	0.96	1.77	1.12	0.16	0.32	0.00	0.00	0.00	0.00
337.5	NO	23	6	9	4	4	0	0	0	0	0	0
-NNW-	PCT	3.69	0.96	1.44	0.64	0.64	0.00	0.00	0.00	0.00	0.00	0.00
CALM	NO	5										
	PCT	0.80	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	618	92	197	154	109	40	24	1	1	0	0
	PCT	99.20	14.77	31.62	24.72	17.50	6.42	3.85	0.16	0.16	0.00	0.00

AVERAGE WIND SPEED 6.23 TOTAL VALID OBSERVATIONS 623 TOTAL OBSERVATIONS 744

ER Table 2.6.3-8
Cherokee Nuclear Station
High Level Tower Meteorological Survey - Monthly Summaries (Sheet 6 of 12)

CHEROKEE METEOROLOGY SURVEY HIGH TOWER DATA FOR PERIOD OF FEBRUARY 1974

SUMMARY OF PASQUILL A+C+D+E+F+G WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR, PERCENT)

DATE OF REPORT 7-25-74

WIND SECTOR	ITEM	SECTOR TOTAL	WIND SPEED CLASS 1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH S9.5 M/S
360.0	NO	22	3	9	6	2	2	0	0	0	0	0
-N-	PCT	3.29	0.45	1.35	0.90	0.30	0.30	0.00	0.00	0.00	0.00	0.00
22.5	NO	27	6	4	6	7	3	1	0	0	0	0
-NNE-	PCT	4.04	0.90	0.60	0.90	1.05	0.45	0.15	0.00	0.00	0.00	0.00
45.0	NO	31	10	10	3	4	3	1	0	0	0	0
-NE-	PCT	4.64	1.50	1.50	0.45	0.60	0.45	0.15	0.00	0.00	0.00	0.00
67.5	NO	15	2	2	6	1	4	0	0	0	0	0
-ENE-	PCT	2.24	0.30	0.30	0.90	0.15	0.60	0.00	0.00	0.00	0.00	0.00
90.0	NO	18	3	2	5	4	3	1	0	0	0	0
-E-	PCT	2.69	0.45	0.30	0.75	0.60	0.45	0.15	0.00	0.00	0.00	0.00
112.5	NO	10	5	3	1	1	0	0	0	0	0	0
-ESE-	PCT	1.50	0.75	0.45	0.15	0.15	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	30	2	7	8	11	0	1	1	0	0	0
-SE-	PCT	4.49	0.30	1.05	1.20	1.65	0.00	0.15	0.15	0.00	0.00	0.00
157.5	NO	25	4	12	5	1	1	1	0	1	0	0
-SSE-	PCT	3.74	0.60	1.80	0.75	0.15	0.15	0.15	0.00	0.15	0.00	0.00
180.0	NO	30	4	10	9	4	0	0	0	3	0	0
-S-	PCT	4.49	0.60	1.50	1.35	0.60	0.00	0.00	0.00	0.45	0.00	0.00
202.5	NO	63	5	11	24	16	6	1	0	0	0	0
-SSW-	PCT	9.43	0.75	1.65	3.59	2.39	0.90	0.15	0.00	0.00	0.00	0.00
225.0	NO	109	9	13	26	22	14	11	5	5	4	0
-SW-	PCT	16.32	1.35	1.95	3.89	3.29	2.10	1.65	0.75	0.75	0.60	0.00
247.5	NO	56	8	16	6	4	4	6	6	1	3	2
-WSW-	PCT	8.38	1.20	2.39	0.90	0.60	0.60	0.90	0.90	0.15	0.45	0.30
270.0	NO	55	10	15	15	6	7	1	1	0	0	0
-W-	PCT	8.23	1.50	2.24	2.24	0.90	1.05	0.15	0.15	0.00	0.00	0.00
292.5	NO	65	4	10	16	11	10	7	5	2	0	0
-WNW-	PCT	9.73	0.60	1.50	2.39	1.65	1.50	1.05	0.75	0.30	0.00	0.00
315.0	NO	77	7	25	22	9	8	2	4	0	0	0
-NW-	PCT	11.53	1.05	3.74	3.29	1.35	1.20	0.30	0.60	0.00	0.00	0.00
337.5	NO	32	4	8	11	7	2	0	0	0	0	0
-NNW-	PCT	4.79	0.60	1.20	1.65	1.05	0.30	0.00	0.00	0.00	0.00	0.00
CALM	NO	3										
	PCT	0.45	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	665	86	157	169	110	67	33	22	12	7	2
	PCT	99.55	12.87	23.50	25.30	16.47	10.03	4.94	3.29	1.80	1.05	0.30

AVERAGE WIND SPEED 7.35 TOTAL VALID OBSERVATIONS 668 TOTAL OBSERVATIONS 672

Amendment 2
(New)

ER Table 2.6.3-8
Cherokee Nuclear Station
High Level Tower Meteorological Survey - Monthly Summaries (Sheet 7 of 12)

CHEROKEE METEOROLOGY SURVEY HIGH LEVEL TOWER DATA FOR PERIOD OF MARCH 1974
SUMMARY OF PASQUILL A+C+D+E+F+G WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR,PERCENT)
DATE OF REPORT 7-25-74

WIND SECTOR	ITEM	SECTOR TOTAL	1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH >9.5 M/S
360.0	NO	23	4	6	7	3	1	0	1	0	1	0
-N-	PCT	4.10	0.71	1.07	1.25	0.53	0.18	0.00	0.18	0.00	0.18	0.00
22.5	NO	27	4	7	5	8	2	0	0	0	1	0
-NNE-	PCT	4.81	0.71	1.25	0.89	1.43	0.36	0.00	0.00	0.00	0.18	0.00
45.0	NO	60	7	8	19	12	8	5	0	1	0	0
-NE-	PCT	10.69	1.25	1.43	3.39	2.14	1.43	0.89	0.00	0.18	0.00	0.00
67.5	NO	33	3	7	8	9	5	0	1	0	0	0
-ENE-	PCT	5.88	0.53	1.25	1.43	1.60	0.89	0.00	0.18	0.00	0.00	0.00
90.0	NO	21	7	11	3	0	0	0	0	0	0	0
-E-	PCT	3.74	1.25	1.96	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00
112.5	NO	23	4	12	7	0	0	0	0	0	0	0
-ESE-	PCT	4.10	0.71	2.14	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	13	3	8	2	0	0	0	0	0	0	0
-SE-	PCT	2.32	0.53	1.43	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00
157.5	NO	9	2	5	2	0	0	0	0	0	0	0
-SSE-	PCT	1.60	0.36	0.89	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180.0	NO	16	2	8	5	1	0	0	0	0	0	0
-S-	PCT	2.85	0.36	1.43	0.89	0.18	0.00	0.00	0.00	0.00	0.00	0.00
202.5	NO	47	6	4	17	12	5	2	1	0	0	0
-SSW-	PCT	8.38	1.07	0.71	3.03	2.14	0.89	0.36	0.18	0.00	0.00	0.00
225.0	NO	140	3	13	29	30	28	17	13	6	1	0
-SW-	PCT	24.95	0.53	2.32	5.17	5.35	4.99	3.03	2.32	1.07	0.18	0.00
247.5	NO	54	3	5	12	16	7	3	3	4	0	1
-WSW-	PCT	9.63	0.53	0.89	2.14	2.85	1.25	0.53	0.53	0.71	0.00	0.18
270.0	NO	28	5	6	3	3	3	2	2	2	2	0
-W-	PCT	4.99	0.89	1.07	0.53	0.53	0.53	0.36	0.36	0.36	0.36	0.00
292.5	NO	23	4	5	5	1	3	0	2	1	2	0
-WNW-	PCT	4.10	0.71	0.89	0.89	0.18	0.53	0.00	0.36	0.18	0.36	0.00
315.0	NO	30	1	5	10	4	4	3	2	1	0	0
-NW-	PCT	5.35	0.18	0.89	1.78	0.71	0.71	0.53	0.36	0.18	0.00	0.00
337.5	NO	13	0	3	3	2	4	1	0	0	0	0
-NNW-	PCT	2.32	0.00	0.53	0.53	0.36	0.71	0.18	0.00	0.00	0.00	0.00
CALM	NO	1										
	PCT	0.18	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	560	58	113	137	101	70	33	25	15	7	1
	PCT	99.82	10.34	20.14	24.42	18.00	12.48	5.88	4.46	2.67	1.25	0.18

AVERAGE WIND SPEED 8.05 TOTAL VALID OBSERVATIONS 561 TOTAL OBSERVATIONS 744

Amendment 2
(New)

ER Table 2.6.3-8
Cherokee Nuclear Station
High Level Tower Meteorological Survey - Monthly Summaries (Sheet 8 of 12)

CHEROKEE METEOROLOGY SURVEY HIGH LEVEL TOWER DATA FOR PERIOD OF APRIL 1974
SUMMARY OF PASQUILL A+C+D+E+F+G WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR,PERCENT)

DATE OF REPORT 7-25-74

WIND SECTOR	ITEM	SECTOR TOTAL	WIND SPEED CLASS 1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH >9.5 M/S
360.0	NO	32	5	5	11	4	6	1	0	0	0	0
-N-	PCT	4.61	0.72	0.72	1.58	0.58	0.86	0.14	0.00	0.00	0.00	0.00
22.5	NO	27	6	7	10	2	1	1	0	0	0	0
-NNE-	PCT	3.89	0.86	1.01	1.44	0.29	0.14	0.14	0.00	0.00	0.00	0.00
45.0	NO	16	3	5	6	2	0	0	0	0	0	0
-NE-	PCT	2.30	0.43	0.72	0.86	0.29	0.00	0.00	0.00	0.00	0.00	0.00
67.5	NO	12	6	4	0	1	1	0	0	0	0	0
-ENE-	PCT	1.73	0.86	0.58	0.00	0.14	0.14	0.00	0.00	0.00	0.00	0.00
90.0	NO	17	4	7	4	2	0	0	0	0	0	0
-E-	PCT	2.45	0.58	1.01	0.58	0.29	0.00	0.00	0.00	0.00	0.00	0.00
112.5	NO	16	4	7	5	0	0	0	0	0	0	0
-ESE-	PCT	2.30	0.58	1.01	0.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	38	7	17	5	6	3	0	0	0	0	0
-SE-	PCT	5.47	1.01	2.45	0.72	0.86	0.43	0.00	0.00	0.00	0.00	0.00
157.5	NO	43	5	15	13	6	4	0	0	0	0	0
-SSE-	PCT	6.20	0.72	2.16	1.87	0.86	0.58	0.00	0.00	0.00	0.00	0.00
180.0	NO	80	9	15	28	14	11	3	0	0	0	0
-S-	PCT	11.53	1.30	2.16	4.03	2.02	1.58	0.43	0.00	0.00	0.00	0.00
202.5	NO	91	0	18	24	21	21	6	1	0	0	0
-SSW-	PCT	13.11	0.00	2.59	3.46	3.03	3.03	0.86	0.14	0.00	0.00	0.00
225.0	NO	89	3	3	15	23	24	11	5	1	2	2
-SW-	PCT	12.82	0.43	0.43	2.16	3.31	3.46	1.58	0.72	0.14	0.29	0.29
247.5	NO	51	2	6	9	13	13	4	4	0	0	0
-WSW-	PCT	7.35	0.29	0.86	1.30	1.87	1.87	0.58	0.58	0.00	0.00	0.00
270.0	NO	31	3	5	4	9	6	1	2	1	0	0
-W-	PCT	4.47	0.43	0.72	0.58	1.30	0.86	0.14	0.29	0.14	0.00	0.00
292.5	NO	48	2	5	7	15	6	7	4	2	0	0
-WNW-	PCT	6.92	0.29	0.72	1.01	2.16	0.86	1.01	0.58	0.29	0.00	0.00
315.0	NO	65	2	19	20	8	4	5	6	1	0	0
-NW-	PCT	9.37	0.29	2.74	2.88	1.15	0.58	0.72	0.86	0.14	0.00	0.00
337.5	NO	38	4	11	11	6	3	3	0	0	0	0
-NNW-	PCT	5.47	0.58	1.58	1.58	0.86	0.43	0.43	0.00	0.00	0.00	0.00
CALM	NO	0										
	PCT	0.00	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	694	65	149	172	132	103	42	22	5	2	2
	PCT	100.00	9.37	21.47	24.78	19.02	14.84	6.05	3.17	0.72	0.29	0.29

AVERAGE WIND SPEED 7.72 TOTAL VALID OBSERVATIONS 694 TOTAL OBSERVATIONS 720

Amendment 2
(New)

ER Table 2.6.3-8
Cherokee Nuclear Station
High Level Tower Meteorological Survey - Monthly Summaries (Sheet 9 of 12)

CHEROKEE METEOROLOGY SURVEY HIGH LEVEL TOWER DATA FOR PERIOD OF MAY 1974

SUMMARY OF PASQUILL A+C+D+E+F+G WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR, PERCENT)

DATE OF REPORT 10-22-74

WIND SECTOR	ITEM	SECTOR TOTAL	WIND SPEED CLASS 1.0-3.2 / .45-1.49	3.3-5.5 / 1.5-2.49	5.6-7.8 / 2.5-3.49	7.9-10.0 / 3.5-4.49	10.1-12.3 / 4.5-5.49	12.4-14.5 / 5.5-6.49	14.6-16.7 / 6.5-7.49	16.8-19.0 / 7.5-8.49	19.1-21.2 / 8.5-9.49	>21.2 MPH / 9.5 M/S
360.0	NO	58	2	17	22	12	5	0	0	0	0	0
-N-	PCT	7.86	0.27	2.30	2.98	1.63	0.68	0.00	0.00	0.00	0.00	0.00
22.5	NO	60	7	18	21	7	6	1	0	0	0	0
-NNE-	PCT	8.13	0.95	2.44	2.84	0.95	0.81	0.13	0.00	0.00	0.00	0.00
45.0	NO	68	10	20	20	12	5	1	0	0	0	0
-NE-	PCT	9.21	1.35	2.71	2.71	1.63	0.68	0.13	0.00	0.00	0.00	0.00
67.5	NO	40	5	16	6	9	2	2	0	0	0	0
-ENE-	PCT	5.42	0.68	2.17	0.81	1.22	0.27	0.27	0.00	0.00	0.00	0.00
90.0	NO	25	6	15	3	1	0	0	0	0	0	0
-E-	PCT	3.39	0.81	2.03	0.41	0.13	0.00	0.00	0.00	0.00	0.00	0.00
112.5	NO	21	7	14	0	0	0	0	0	0	0	0
-ESE-	PCT	2.84	0.95	1.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	22	2	7	6	4	2	1	0	0	0	0
-SE-	PCT	2.98	0.27	0.95	0.81	0.54	0.27	0.13	0.00	0.00	0.00	0.00
157.5	NO	48	10	13	10	9	4	2	0	0	0	0
-SSE-	PCT	6.50	1.35	1.76	1.35	1.22	0.54	0.27	0.00	0.00	0.00	0.00
180.0	NO	46	6	16	17	7	0	0	0	0	0	0
-S-	PCT	6.23	0.81	2.17	2.30	0.95	0.00	0.00	0.00	0.00	0.00	0.00
202.5	NO	55	5	16	24	9	1	0	0	0	0	0
-SSW-	PCT	7.45	0.68	2.17	3.25	1.22	0.13	0.00	0.00	0.00	0.00	0.00
225.0	NO	107	9	27	40	23	5	3	0	0	0	0
-SW-	PCT	14.50	1.22	3.66	5.42	3.12	0.68	0.41	0.00	0.00	0.00	0.00
247.5	NO	47	3	12	13	7	9	1	2	0	0	0
-WSW-	PCT	6.37	0.41	1.63	1.76	0.95	1.22	0.13	0.27	0.00	0.00	0.00
270.0	NO	41	5	16	11	4	4	1	0	0	0	0
-W-	PCT	5.55	0.68	2.17	1.49	0.54	0.54	0.13	0.00	0.00	0.00	0.00
292.5	NO	26	3	9	5	5	2	0	0	2	0	0
-WNW-	PCT	3.52	0.41	1.22	0.68	0.68	0.27	0.00	0.00	0.27	0.00	0.00
315.0	NO	40	3	11	18	2	2	1	1	1	1	0
-NW-	PCT	5.42	0.41	1.49	2.44	0.27	0.27	0.13	0.13	0.13	0.13	0.00
337.5	NO	33	2	13	12	5	1	0	0	0	0	0
-NNW-	PCT	4.47	0.27	1.76	1.63	0.68	0.13	0.00	0.00	0.00	0.00	0.00
CALM	NO	1										
	PCT	0.13	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	737	85	240	228	116	48	13	3	3	1	0
	PCT	99.86	11.52	32.52	30.89	15.72	6.50	1.76	0.41	0.41	0.13	0.00

AVERAGE WIND SPEED 6.35 TOTAL VALID OBSERVATIONS 738 TOTAL OBSERVATIONS 744

Amendment 2
(New)

ER Table 2.6.3-8
Cherokee Nuclear Station
High Level Tower Meteorological Survey - Monthly Summaries (Sheet 10 of 12)

CHEROKEE METEOROLOGY SURVEY HIGH LEVEL TOWER DATA FOR PERIOD OF JUNE 1974
SUMMARY OF PASQUILL A+C+D+E+F+G WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR,PERCENT)
DATE OF REPORT 10-24-74

WIND SECTOR	ITEM	SECTOR TOTAL	WIND SPEED CLASS 1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH S9.5 M/S
360.0	NO	50	5	23	16	4	2	0	0	0	0	0
-N-	PCT	7.86	0.79	3.62	2.51	0.63	0.31	0.00	0.00	0.00	0.00	0.00
22.5	NO	48	7	12	16	9	3	1	0	0	0	0
-NNE-	PCT	7.55	1.10	1.89	2.51	1.41	0.47	0.16	0.00	0.00	0.00	0.00
45.0	NO	59	6	19	24	6	3	1	0	0	0	0
-NE-	PCT	9.28	0.94	2.99	3.77	0.94	0.47	0.16	0.00	0.00	0.00	0.00
67.5	NO	38	4	16	12	4	2	0	0	0	0	0
-ENE-	PCT	5.97	0.63	2.51	1.89	0.63	0.31	0.00	0.00	0.00	0.00	0.00
90.0	NO	32	2	11	17	1	0	0	1	0	0	0
-E-	PCT	5.03	0.31	1.73	2.67	0.16	0.00	0.00	0.16	0.00	0.00	0.00
112.5	NO	29	7	13	7	2	0	0	0	0	0	0
-ESE-	PCT	4.56	1.10	2.04	1.10	0.31	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	25	6	9	7	3	0	0	0	0	0	0
-SE-	PCT	3.93	0.94	1.41	1.10	0.47	0.00	0.00	0.00	0.00	0.00	0.00
157.5	NO	10	5	4	1	0	0	0	0	0	0	0
-SSE-	PCT	1.57	0.79	0.63	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00
180.0	NO	27	6	11	5	5	0	0	0	0	0	0
-S-	PCT	4.24	0.94	1.73	0.79	0.79	0.00	0.00	0.00	0.00	0.00	0.00
202.5	NO	37	5	6	16	8	2	0	0	0	0	0
-SSW-	PCT	5.82	0.79	0.94	2.51	1.26	0.31	0.00	0.00	0.00	0.00	0.00
225.0	NO	75	5	13	17	24	12	4	0	0	0	0
-SW-	PCT	11.79	0.79	2.04	2.67	3.77	1.89	0.63	0.00	0.00	0.00	0.00
247.5	NO	47	3	9	17	12	5	1	0	0	0	0
-WSW-	PCT	7.39	0.47	1.41	2.67	1.89	0.79	0.16	0.00	0.00	0.00	0.00
270.0	NO	37	6	13	10	5	3	0	0	0	0	0
-W-	PCT	5.82	0.94	2.04	1.57	0.79	0.47	0.00	0.00	0.00	0.00	0.00
292.5	NO	18	7	5	6	0	0	0	0	0	0	0
-WNW-	PCT	2.83	1.10	0.79	0.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00
315.0	NO	52	6	15	15	12	4	0	0	0	0	0
-NW-	PCT	8.18	0.94	2.36	2.36	1.89	0.63	0.00	0.00	0.00	0.00	0.00
337.5	NO	49	6	15	17	5	3	3	0	0	0	0
-NNW-	PCT	7.70	0.94	2.36	2.67	0.79	0.47	0.47	0.00	0.00	0.00	0.00
CALM	NO	3										
	PCT	0.47	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	633	86	194	203	100	39	10	1	0	0	0
	PCT	99.53	13.52	30.50	31.92	15.72	6.13	1.57	0.16	0.00	0.00	0.00

AVERAGE WIND SPEED = 6.04 TOTAL VALID OBSERVATIONS 636 TOTAL OBSERVATIONS 720

Amendment 2
(New)

ER Table 2.6.3-8
Cherokee Nuclear Station
High Level Tower Meteorological Survey - Monthly Summaries (Sheet 11 of [illegible])

CHEROKEE METEOROLOGY SURVEY HIGH LEVEL TOWER DATA FOR PERIOD OF JULY 1974
SUMMARY OF PASQUILL A+C+D+E+F+G WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR, PERCENT)

DATE OF REPORT 10-24-74

WIND SECTOR	ITEM	SECTOR TOTAL	WIND SPEED CLASS 1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH S9.5 M/S
360.0	NO	45	15	13	17	0	0	0	0	0	0	0
-N-	PCT	6.07	2.02	1.75	2.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22.5	NO	37	5	15	13	4	0	0	0	0	0	0
-NNE-	PCT	4.99	0.67	2.02	1.75	0.54	0.00	0.00	0.00	0.00	0.00	0.00
45.0	NO	54	15	24	11	3	1	0	0	0	0	0
-NE-	PCT	7.29	2.02	3.24	1.48	0.40	0.13	0.00	0.00	0.00	0.00	0.00
67.5	NO	40	11	16	7	1	4	1	0	0	0	0
-ENE-	PCT	5.40	1.48	2.16	0.94	0.13	0.54	0.13	0.00	0.00	0.00	0.00
90.0	NO	42	12	23	4	2	1	0	0	0	0	0
-E-	PCT	5.67	1.62	3.10	0.54	0.27	0.13	0.00	0.00	0.00	0.00	0.00
112.5	NO	31	15	12	3	1	0	0	0	0	0	0
-ESE-	PCT	4.18	2.02	1.62	0.40	0.13	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	55	24	22	5	3	1	0	0	0	0	0
-SE-	PCT	7.42	3.24	2.97	0.67	0.40	0.13	0.00	0.00	0.00	0.00	0.00
157.5	NO	43	9	23	8	2	1	0	0	0	0	0
-SSE-	PCT	5.80	1.21	3.10	1.08	0.27	0.13	0.00	0.00	0.00	0.00	0.00
180.0	NO	59	14	23	18	4	0	0	0	0	0	0
-S-	PCT	7.96	1.89	3.10	2.43	0.54	0.00	0.00	0.00	0.00	0.00	0.00
202.5	NO	73	9	27	23	8	5	1	0	0	0	0
-SSW-	PCT	9.85	1.21	3.64	3.10	1.08	0.67	0.13	0.00	0.00	0.00	0.00
225.0	NO	67	9	25	22	11	0	0	0	0	0	0
-SW-	PCT	9.04	1.21	3.37	2.97	1.48	0.00	0.00	0.00	0.00	0.00	0.00
247.5	NO	39	9	15	13	2	0	0	0	0	0	0
-WSW-	PCT	5.26	1.21	2.02	1.75	0.27	0.00	0.00	0.00	0.00	0.00	0.00
270.0	NO	22	5	11	6	0	0	0	0	0	0	0
-W-	PCT	2.97	0.67	1.48	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00
292.5	NO	28	3	14	5	4	2	0	0	0	0	0
-WNW-	PCT	3.78	0.40	1.89	0.67	0.54	0.27	0.00	0.00	0.00	0.00	0.00
315.0	NO	60	7	31	18	4	0	0	0	0	0	0
-NW-	PCT	8.10	0.94	4.18	2.43	0.54	0.00	0.00	0.00	0.00	0.00	0.00
337.5	NO	45	7	27	9	2	0	0	0	0	0	0
-NNW-	PCT	6.07	0.94	3.64	1.21	0.27	0.00	0.00	0.00	0.00	0.00	0.00
CALM	NO	1										
	PCT	0.13	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	740	169	321	182	51	15	2	0	0	0	0
	PCT	99.86	22.81	43.32	24.56	6.88	2.02	0.27	0.00	0.00	0.00	0.00

AVERAGE WIND SPEED 4.54 TOTAL VALID OBSERVATIONS 741 TOTAL OBSERVATIONS 744

Amendment 2
(New)

CHEROKEE METEOROLOGY SURVEY HIGH LEVEL TOWER DATA FOR PERIOD OF AUGUST 1974

SUMMARY OF PASQUILL A+C+D+E+F+G WIND OCCURRENCES BY SECTOR + SPEED CLASS (NO. OCCURR.PERCENT)

DATE OF REPORT 10-24-74

WIND SECTOR	ITEM	SECTOR TOTAL	WIND SPEED CLASS 1.0-3.2 .45-1.49	3.3-5.5 1.5-2.49	5.6-7.8 2.5-3.49	7.9-10.0 3.5-4.49	10.1-12.3 4.5-5.49	12.4-14.5 5.5-6.49	14.6-16.7 6.5-7.49	16.8-19.0 7.5-8.49	19.1-21.2 8.5-9.49	>21.2 MPH S9.5 M/S
360.0	NO	37	8	15	11	3	0	0	0	0	0	0
-N-	PCT	4.99	1.08	2.02	1.48	0.40	0.00	0.00	0.00	0.00	0.00	0.00
22.5	NO	45	7	23	8	5	1	1	0	0	0	0
-NNE-	PCT	6.07	0.94	3.10	1.08	0.67	0.13	0.13	0.00	0.00	0.00	0.00
45.0	NO	75	18	25	16	13	2	1	0	0	0	0
-NE-	PCT	10.12	2.43	3.37	2.16	1.75	0.27	0.13	0.00	0.00	0.00	0.00
67.5	NO	35	13	9	11	1	1	0	0	0	0	0
-ENE-	PCT	4.72	1.75	1.21	1.48	0.13	0.13	0.00	0.00	0.00	0.00	0.00
90.0	NO	41	15	22	3	0	1	0	0	0	0	0
-E-	PCT	5.53	2.02	2.97	0.40	0.00	0.13	0.00	0.00	0.00	0.00	0.00
112.5	NO	29	11	13	4	1	0	0	0	0	0	0
-ESE-	PCT	3.91	1.48	1.75	0.54	0.13	0.00	0.00	0.00	0.00	0.00	0.00
135.0	NO	56	14	27	8	6	1	0	0	0	0	0
-SE-	PCT	7.56	1.89	3.64	1.08	0.81	0.13	0.00	0.00	0.00	0.00	0.00
157.5	NO	52	20	16	6	5	2	3	0	0	0	0
-SSE-	PCT	7.02	2.70	2.16	0.81	0.67	0.27	0.40	0.00	0.00	0.00	0.00
180.0	NO	42	9	22	7	1	3	0	0	0	0	0
-S-	PCT	5.67	1.21	2.97	0.94	0.13	0.40	0.00	0.00	0.00	0.00	0.00
202.5	NO	71	12	24	8	14	12	1	0	0	0	0
-SSW-	PCT	9.58	1.62	3.24	1.08	1.89	1.62	0.13	0.00	0.00	0.00	0.00
225.0	NO	64	12	17	19	10	5	1	0	0	0	0
-SW-	PCT	8.64	1.62	2.29	2.56	1.35	0.67	0.13	0.00	0.00	0.00	0.00
247.5	NO	33	12	17	3	1	0	0	0	0	0	0
-WSW-	PCT	4.45	1.62	2.29	0.40	0.13	0.00	0.00	0.00	0.00	0.00	0.00
270.0	NO	19	6	8	4	0	1	0	0	0	0	0
-W-	PCT	2.56	0.81	1.08	0.54	0.00	0.13	0.00	0.00	0.00	0.00	0.00
292.5	NO	45	7	26	10	2	0	0	0	0	0	0
-WNW-	PCT	6.07	0.94	3.51	1.35	0.27	0.00	0.00	0.00	0.00	0.00	0.00
315.0	NO	51	13	26	11	1	0	0	0	0	0	0
-NW-	PCT	6.88	1.75	3.51	1.48	0.13	0.00	0.00	0.00	0.00	0.00	0.00
337.5	NO	46	13	17	16	0	0	0	0	0	0	0
-NNW-	PCT	6.21	1.75	2.29	2.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CALM	NO	0										
	PCT	0.00	------	------	------	------	------	------	------	------	------	------
TOTAL	NO	741	190	307	145	63	29	7	0	0	0	0
	PCT	100.00	25.64	41.43	19.57	8.50	3.91	0.94	0.00	0.00	0.00	0.00

AVERAGE WIND SPEED 5.61 TOTAL VALID OBSERVATIONS 741 TOTAL OBSERVATIONS 744

Amendment 2
(New)

Tables for Section 2.7

All Tables for Section 2.7
<u>ECOLOGY</u>
are in Volume III of the

DUKE POWER COMPANY
CHEROKEE NUCLEAR STATION
ENVIRONMENTAL REPORT

ER Table 2.8.0-1

Cherokee Nuclear Station

Regional Background Radiological Data

Terrestrial & Cosmic Radiation Dose Equivalents
Based on Population Concentrations(1)

Location	Cosmic DE mrem/yr	Terrestrial DE mrem/yr	Total DE mrem/yr
Asheville, N. C.	50.7	45.6	96.3
Charlotte, N. C.	43.3	45.6	88.9
Durham, N. C.	42.2	45.6	87.8
High Point, N. C.	44.2	45.6	89.8
Greensboro, N. C.	43.8	45.6	89.4
Raleigh, N. C.	42.0	45.6	87.6
Winston-Salem, N. C.	43.8	45.6	89.4
North Carolina (Rural & Urban)	43.8	38.5	82.4
Augusta, S. C.	41.3	42.8	84.1
Charleston, S. C.	40.9	22.8	63.7
Columbia, S. C.	41.6	68.3	109.9
Greenville, S. C.	44.3	22.8	67.1
South Carolina (Rural & Urban)	42.3	36.6	78.9

(1) Donald T. Oakley, "Natural Radiation Exposure in the United States," June 1972, Surveillance and Inspection Division, Office of Radiation Programs, U. S. Environmental Protection Agency.

Cherokee Nuclear Station

Regional Background Radiological Data

Surface Water Activities for Potable Water Supplies for North Carolina[(1)]

Location	River Basin	Date	Raw Water Gross Beta pCi/l	Treated Water Gross Beta pCi/l
Asheville	French-Broad	1968	< 3.0	< 3.0
		1969	< 3.0	< 3.0
		1970	< 3.0	< 3.0
		1971	< 3.0	< 3.0
		1972	< 3.0	< 3.0
Hickory	Catawba	1968	3.81	< 3.0
		1969	< 3.0	< 3.0
		1970	< 3.0	< 3.0
		1971	< 3.0	< 3.0
		1972	< 3.0	< 3.0
Charlotte	Catawba	1968	3.12	< 3.0
		1969	< 3.0	< 3.0
		1970	< 3.0	< 3.0
		1971	< 3.0	< 3.0
		1972	< 3.0	< 3.0
Winston-Salem	Yadkin	1968	< 3.0	< 3.0
		1969	3.12	< 3.0
		1970	3.16	3.0
		1971	5.16	3.52
		1972	3.4	< 3.0
Wilmington	Cape Fear	1968	5.40	3.96
		1969	4.63	< 3.0
		1970	5.20	3.49
		1971	7.01	3.58
		1972	4.84	3.03

(1) North Carolina Division of Health Services, Survey and Consultation Section.

ER Table 2.8.0-1

Cherokee Nuclear Station

Regional Background Radiological Data

Milk Data

Location	Date	^{90}Sr pCi/l	^{137}Cs pCi/l
(1) Asheville, N. C.	1968	13.8	18.13
	1969	11.29	15.58
	1970	< 10	14.91
	1971	< 10	< 17.45
	1972	< 10	< 8.83
(1) Charlotte, N. C.	1968	16.15	15.93
	1969	14.27	14.59
	1970	10.72	13.83
	1971	< 10	< 17.42
	1972	< 10.11	9.04
(1) Wilmington, N. C.	1968	14.08	26.17
	1969	11.96	23.77
	1970	< 10	17.96
	1971	< 10.6	< 21.68
	1972	< 10.11	13.95
(2) Charleston, S. C.	1968	14	25
	1969	10	23
	1970	10	18
	1971	9	15
	1972	6	11

(1) North Carolina Division of Health Services, Survey and Consultation Section.

(2) Radiological Health Data and Reports, 10:254
11:290
12:258

Radiation Data and Reports, 13:352
14:362

NOTE: ^{131}I results for regional milk samples generally indicate concentrations less than the limit of detectability which is 10 pCi/l as given in the EPA's Radiological Data and Reports.

Cherokee Nuclear Station

Regional Background Radiological Data

Surface Water Activities for Potable Water Supplies for South Carolina[(1)]

Location	River Basin	Date	Treated Gross Beta pCi/l	Tritium pCi/l
Columbia	Broad	1964	6.3	NA*
		1965	5.4	NA
		1966	3.8	NA
		1967	4.0	NA
		1972	4.5	613
Spartanburg	S. Pacolet (Broad)	1968	5.0	NA
		1969	1.3	NA
		1970	1.2	NA
		1971	2.5	NA
		1972	3.6	NA
Greenville	Saluda	1968	1.9	NA
		1969	1.1	NA
		1970	1.8	NA
		1971	3.5	NA
		1972	0.9	NA
Rock Hill	Catawba	1968	NA	NA
		1969	NA	NA
		1970	4.9	NA
		1971	6.8	NA
		1972	2.6	562
Charleston	Edisto	1968	NA	NA
		1969	2.8	NA
		1970	2.4	NA
		1971	3.0	NA
		1972	4.1	677

(1) South Carolina State Board of Health, Division of Radiological Health.

* NA - No Analysis

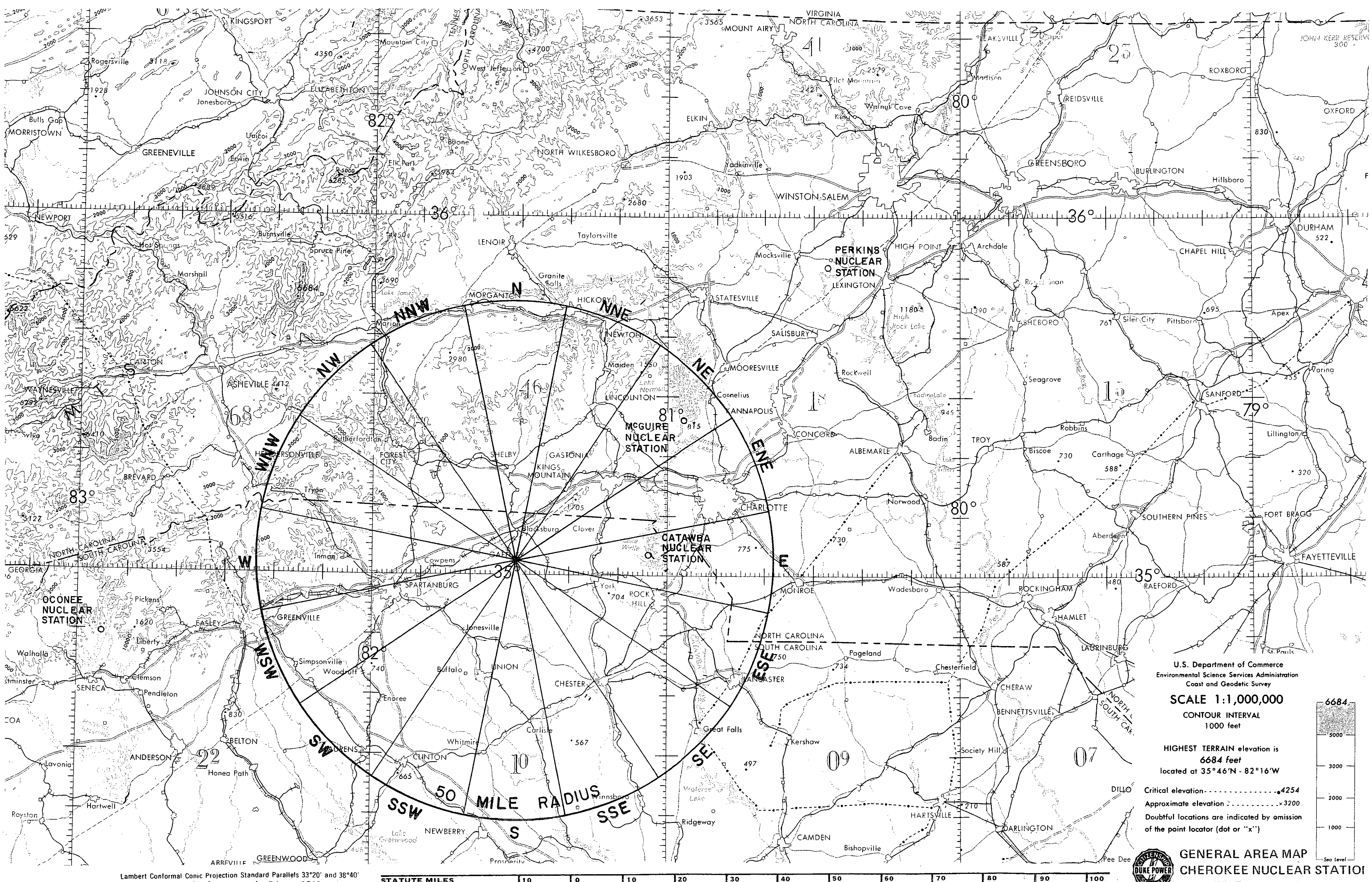
ER Table 2.8.0-2

Cherokee Nuclear Station

Background Radiological Data

The average of terrestrial gamma background measurements made at the Cherokee Nuclear Station.

Location	Distance from Site	Calculated Whole Body gamma dose, mrem/year
Within Site and Exclusion Area		44
Hwy 119	1.2 miles NNE	61
Blacksburg	6.0 miles N	61
Hwy 44 & Walker's Grove	2.7 miles NE	35
King's Creek	5.0 miles ENE	35
Smyrna	6.2 miles E	35
Ninety Nine Islands Hydro	1.5 miles ESE	44
Hickory Grove	7.0 miles SE	35
Hwy 17 & Hwy 13	1.3 miles SSE	44
Hwy 17 & Hwy 69	2.2 miles SSE	26
Hwy 17	2.0 miles SSW	44
Hwy 30	1.0 miles W	53
Hwy 52 & Hwy 132	3.6 miles W	53
Gaffney	7.0 miles W	61
Cherokee Falls	2.5 miles NW	70



Lambert Conformal Conic Projection Standard Parallels 33°20' and 38°40'
Topographic data corrected to February 1968

GENERAL AREA MAP
CHEROKEE NUCLEAR STATION
ER Figure 2.1-1

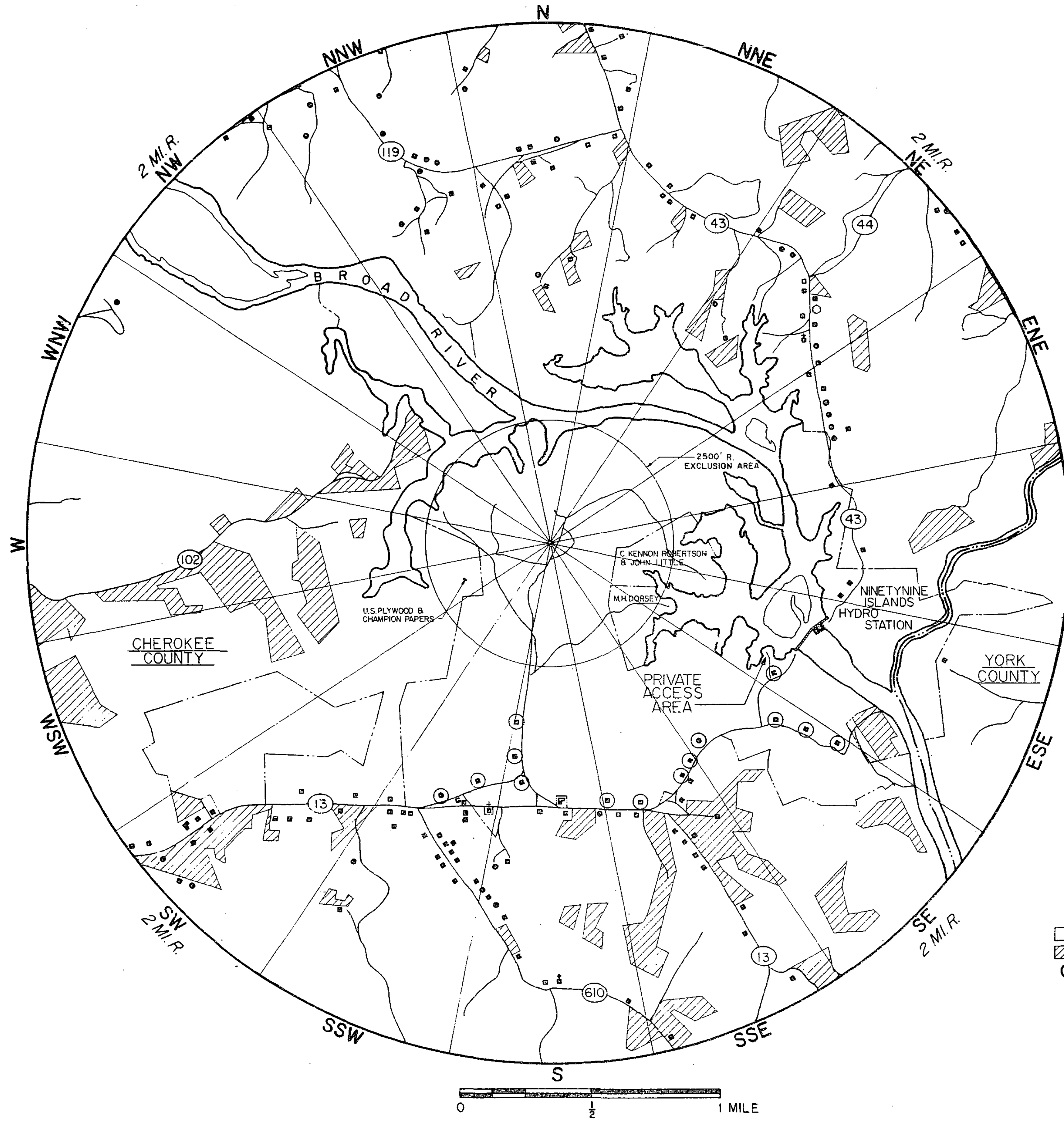
PLANT SITE AREA
CONTROLLED ACCESS AREA

PLOT PLAN AND SITE BOUNDARY

DUKE POWER

CHEROKEE NUCLEAR STATION

ER Figure 2.1-2
Amendment 2
Amendment 3

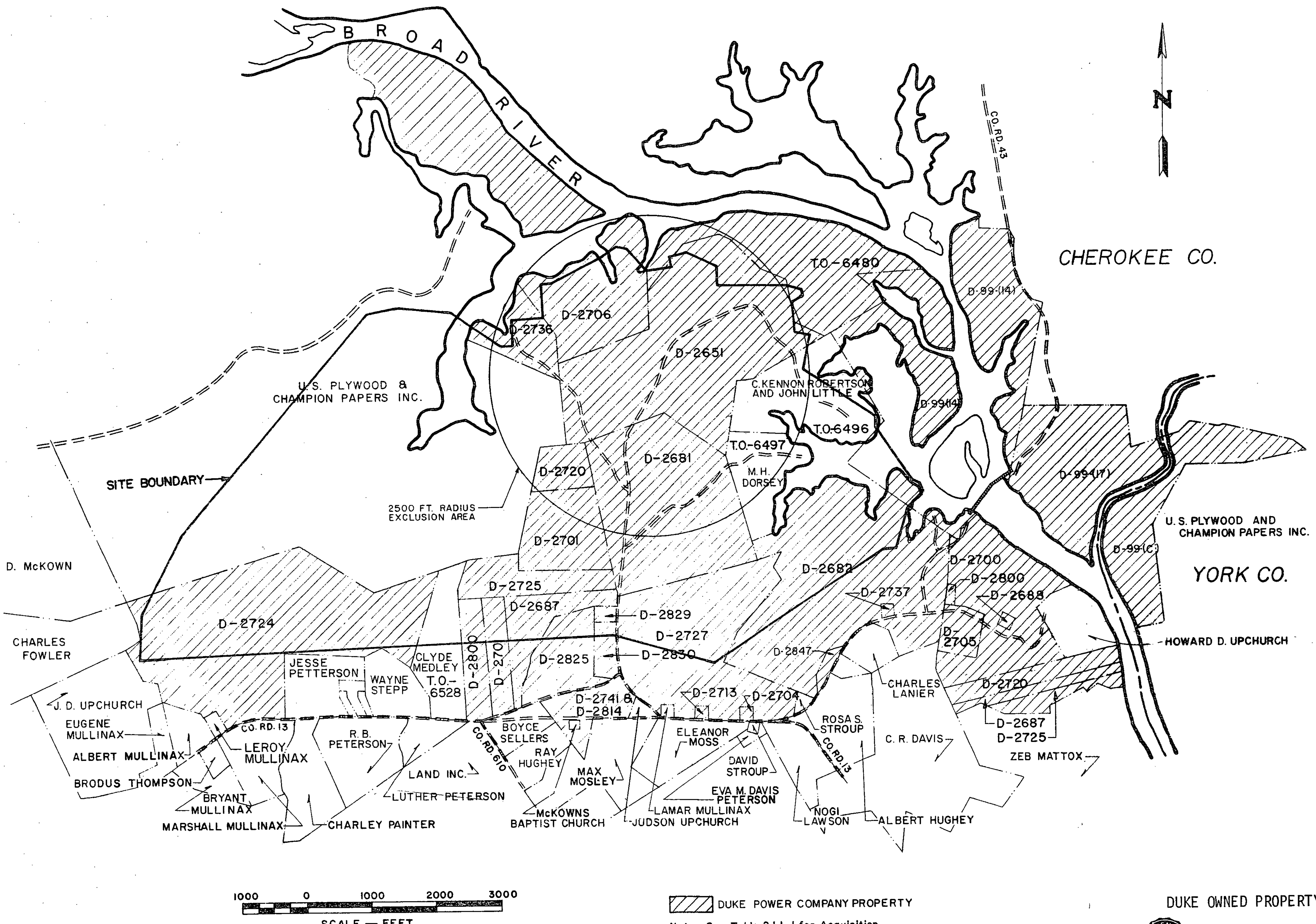


SECTOR	APPROX. AREA OF CLEARED FARM LAND (ACRES)
N	16.9
NNE	21.9
NE	30.1
ENE	13.2
E	9.9
ESE	9.5
SE	37.6
SSE	86.7
S	28.9
SSW	2.8
SW	48.3
WSW	57.8
W	61.1
WNW	9.5
NW	5.7
NNW	1.2
TOTAL	441.1

LEGEND
- PERMENANT HOMES
- MOBILE HOMES
- RECREATION HOMES
- CHURCHES
- SERVICE STATIONS
- DUKE OWNED PROPERTY
- CLEARED FARM LAND
- RESIDENCES TO BE REMOVED

EXISTING LAND USE WITHIN TWO MILES

CHEROKEE NUCLEAR STATION
ER Figure 2.1-3
Amendment 2



DUKE POWER COMPANY PROPERTY

Note: See Table 2.1.1-1 for Acquisition Dates for Duke Owned Property

DUKE OWNED PROPERTY

CHEROKEE NUCLEAR STATION
ER Figure 2.1-4
Amendment 2

THIS PAGE IS AN OVERSIZED DRAWING OR FIGURE,

THAT CAN BE VIEWED AT THE RECORD TITLED:

"AERIAL PHOTOGRAPH 0-2 MILES, ER Figure 2.1-5"

WITHIN THIS PACKAGE... OR BY SEARCHING USING THE

D-01

THIS PAGE IS AN OVERSIZED DRAWING OR FIGURE,

THAT CAN BE VIEWED AT THE RECORD TITLED:
"TEN MILE TOPOGRAPHY, ER Figure 2.1-6."

WITHIN THIS PACKAGE... OR BY SEARCHING USING THE

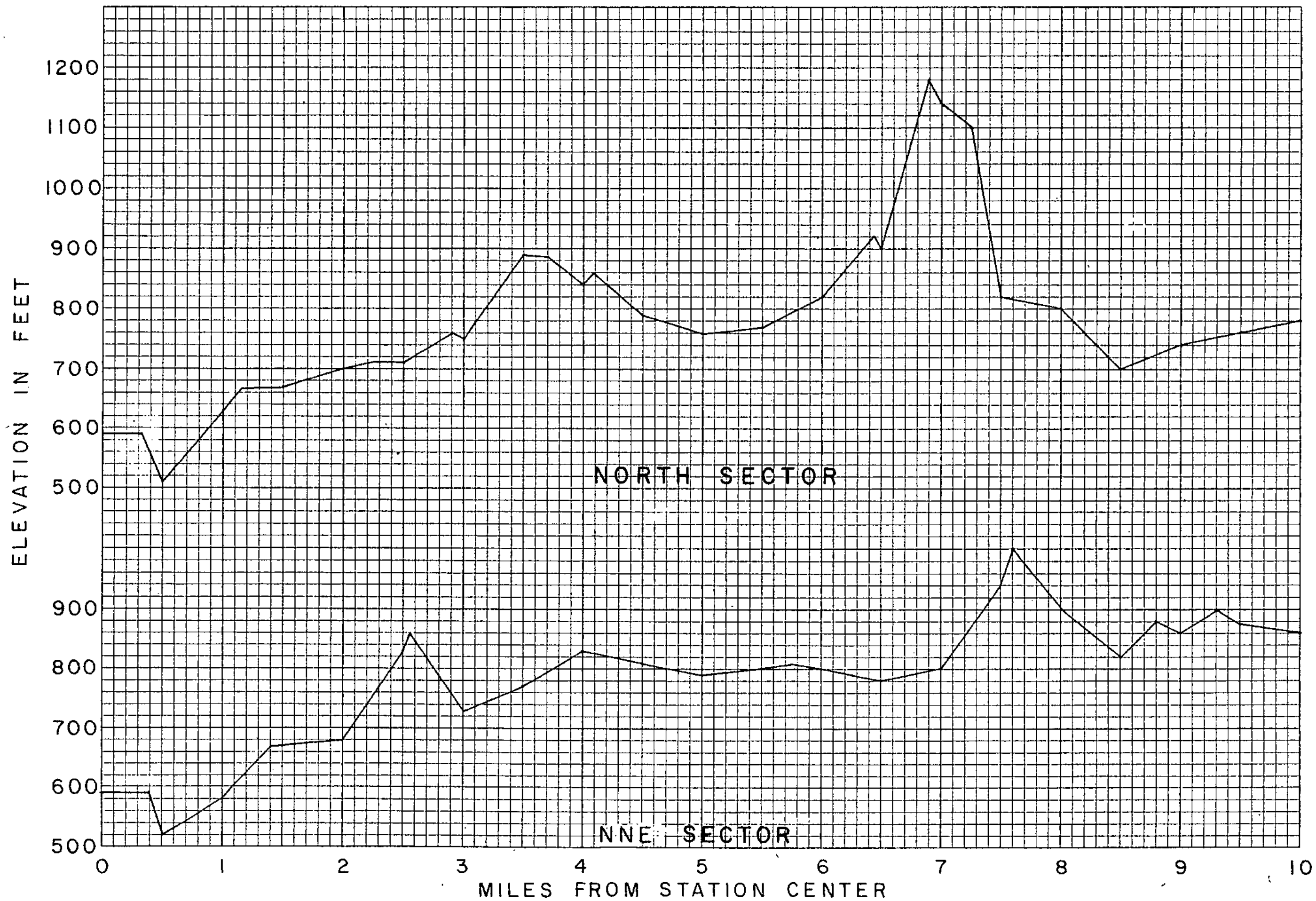
D-02

THIS PAGE IS AN OVERSIZED DRAWING OR FIGURE,

THAT CAN BE VIEWED AT THE RECORD TITLED:
"TOPOGRAPHIC MAP-SITE AREA, ER Figure 2.1-7"

WITHIN THIS PACKAGE... OR BY SEARCHING USING THE

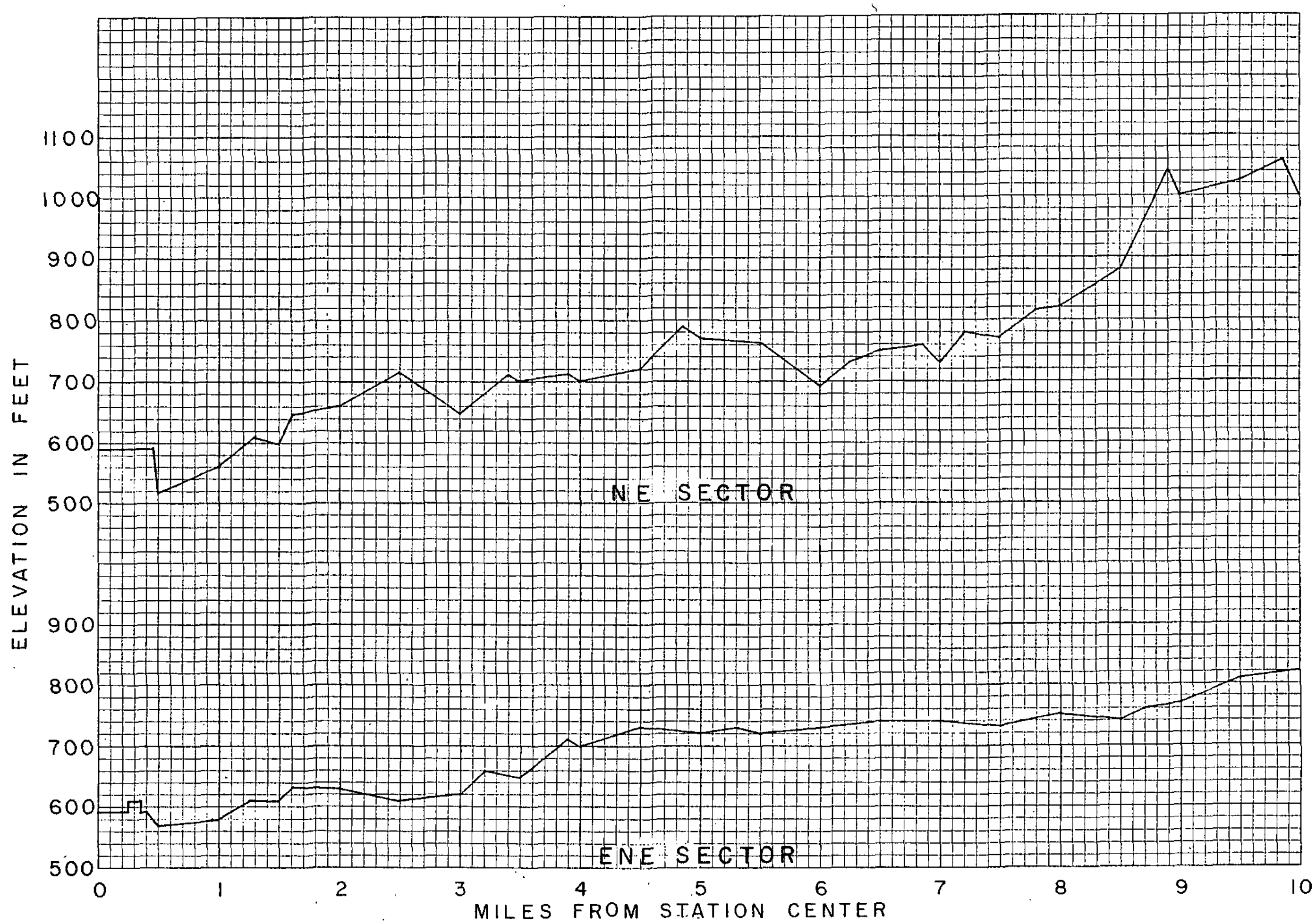
D-03



MAXIMUM TOPOGRAPHIC ELEVATION
VERSUS DISTANCE

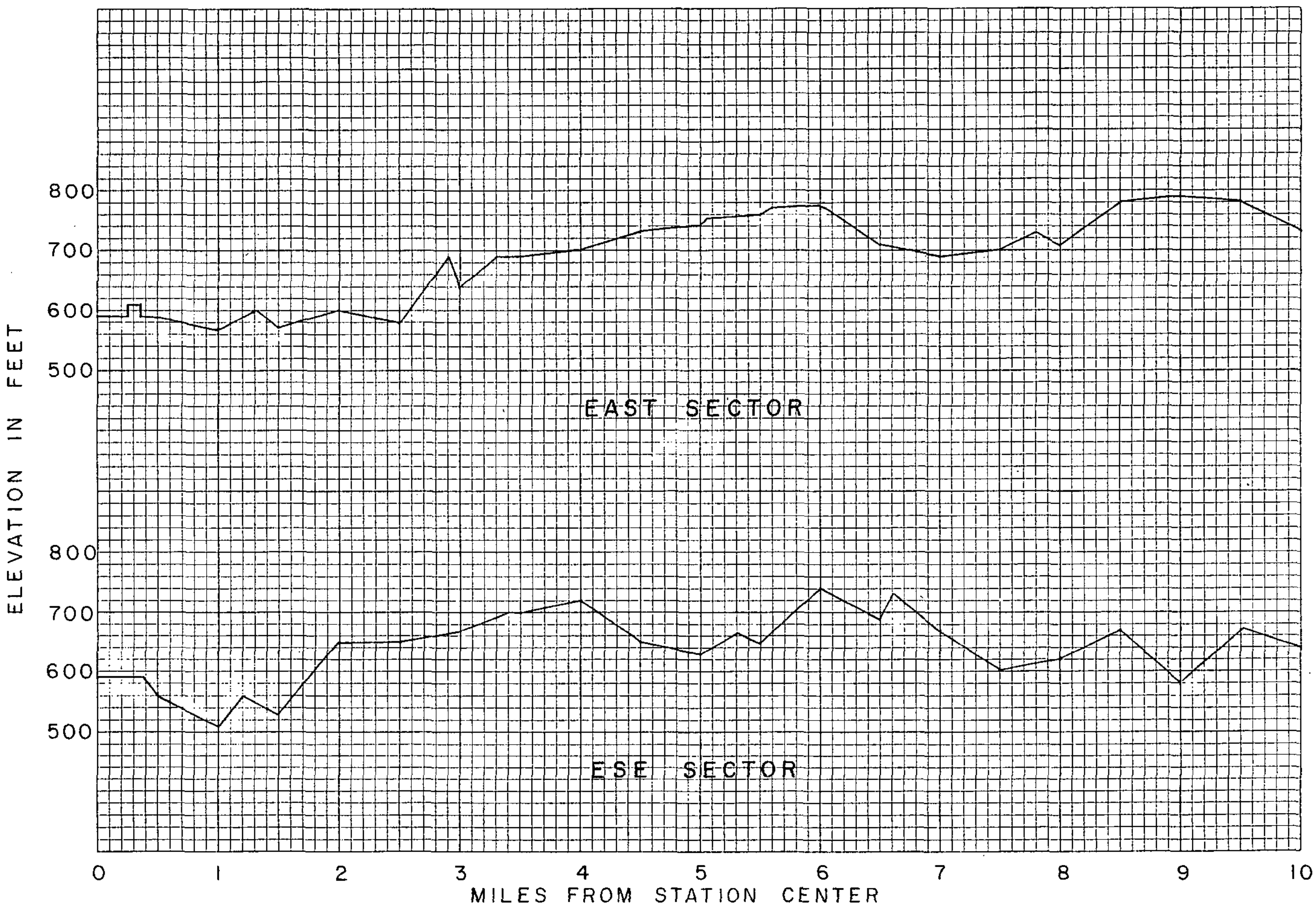
DUKE POWER

CHEROKEE NUCLEAR STATION
ER Figure 2.1-8 (1of 7)
Amendment 4
(New)



MAXIMUM TOPOGRAPHIC ELEVATION
VERSUS DISTANCE

CHEROKEE NUCLEAR STATION
ER Figure 2.1-8 (2 OF 7)
Amendment 4
(New)



MAXIMUM TOPOGRAPHIC ELEVATION
VERSUS DISTANCE

CHEROKEE NUCLEAR STATION

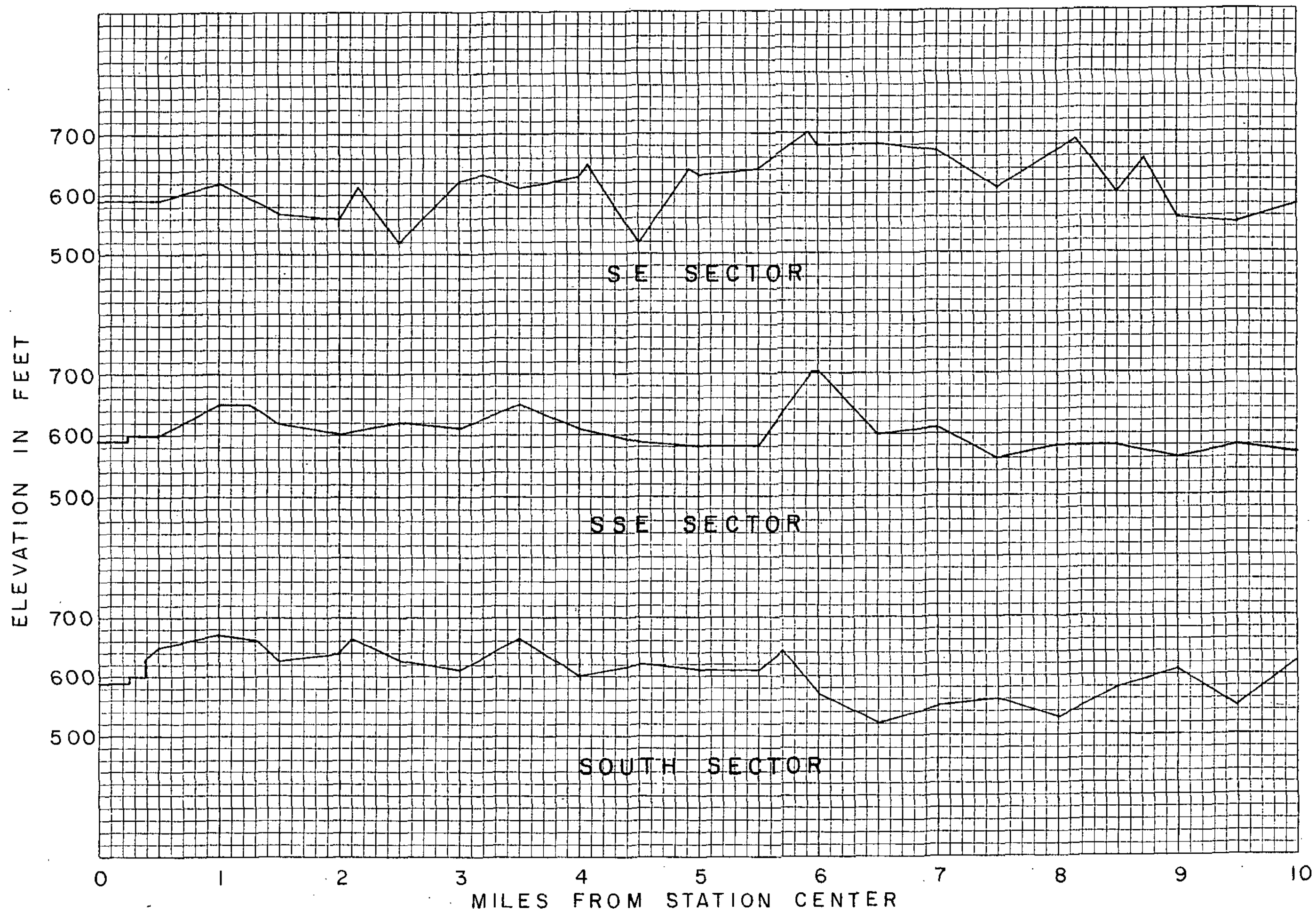
ER Figure 2.1-8 (3 of 7)

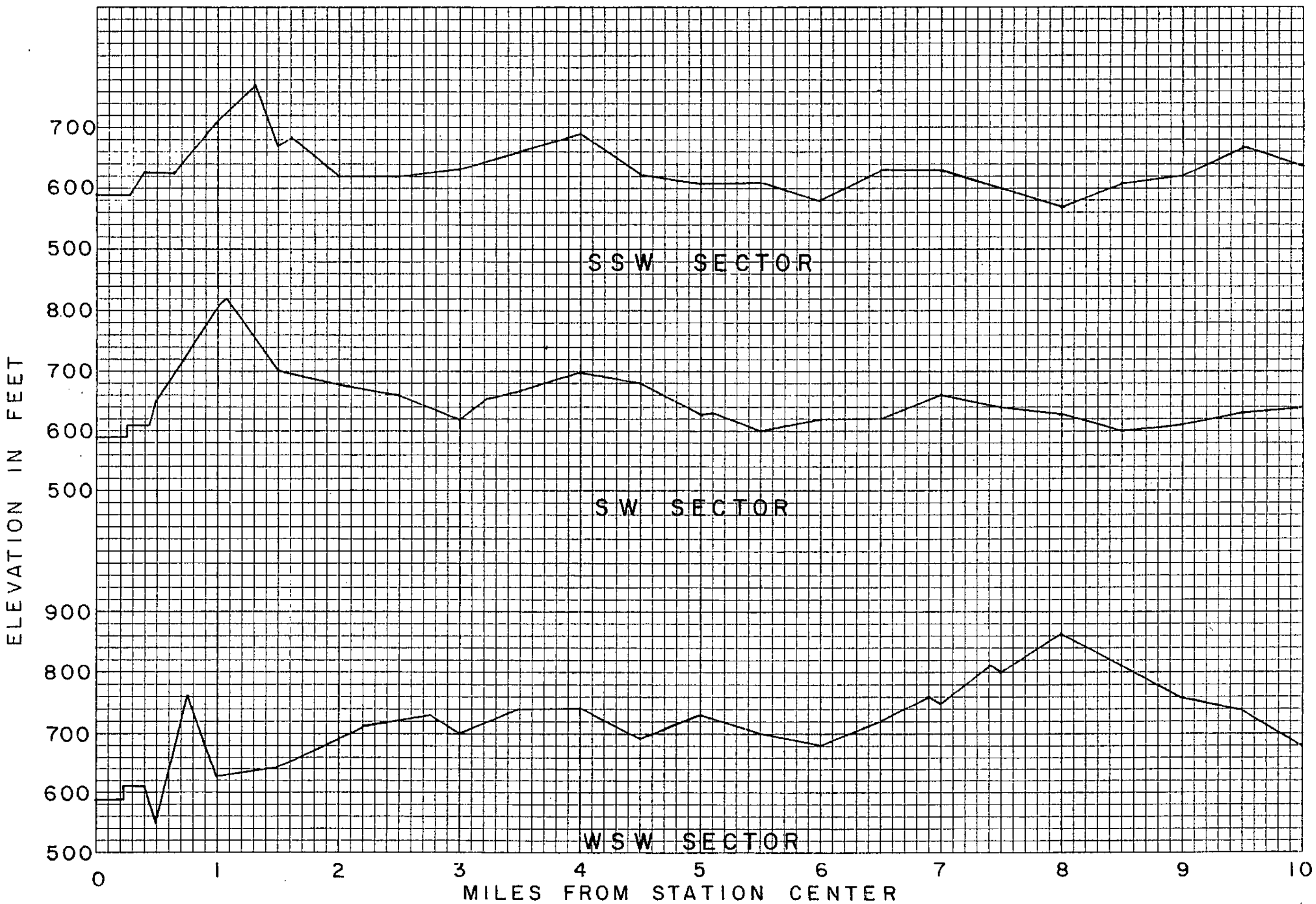
Amendment 4

(New)

MAXIMUM TOPOGRAPHIC ELEVATION
VERSUS DISTANCE

CHEROKEE NUCLEAR STATION
ER Figure 2.1-8 (4 of 7)
Amendment 4
(New)





MAXIMUM TOPOGRAPHIC ELEVATION VERSUS DISTANCE

CHEROKEE NUCLEAR STATION

ER Figure 2.1-8 (5 OF 7)

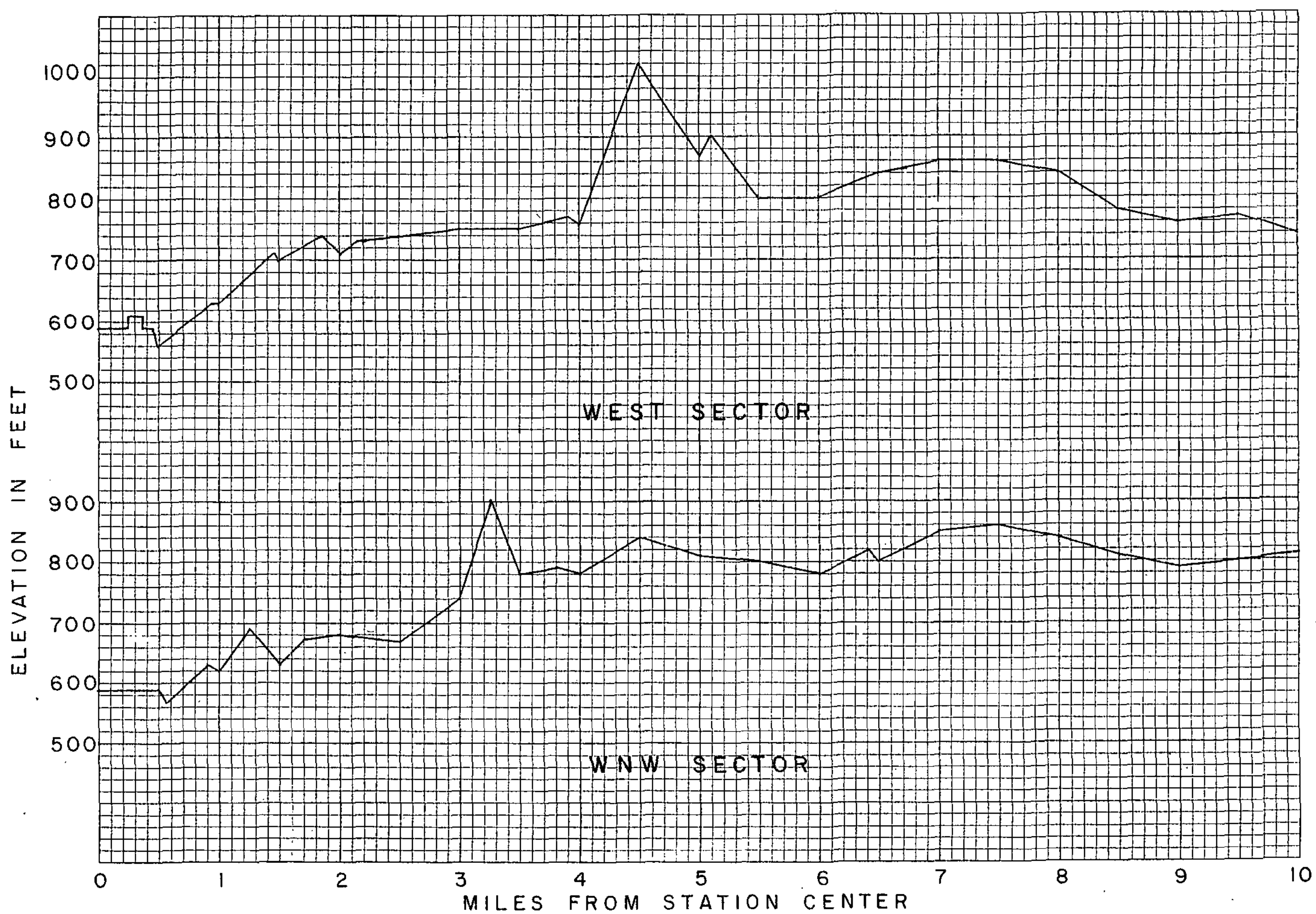
Amendment 4

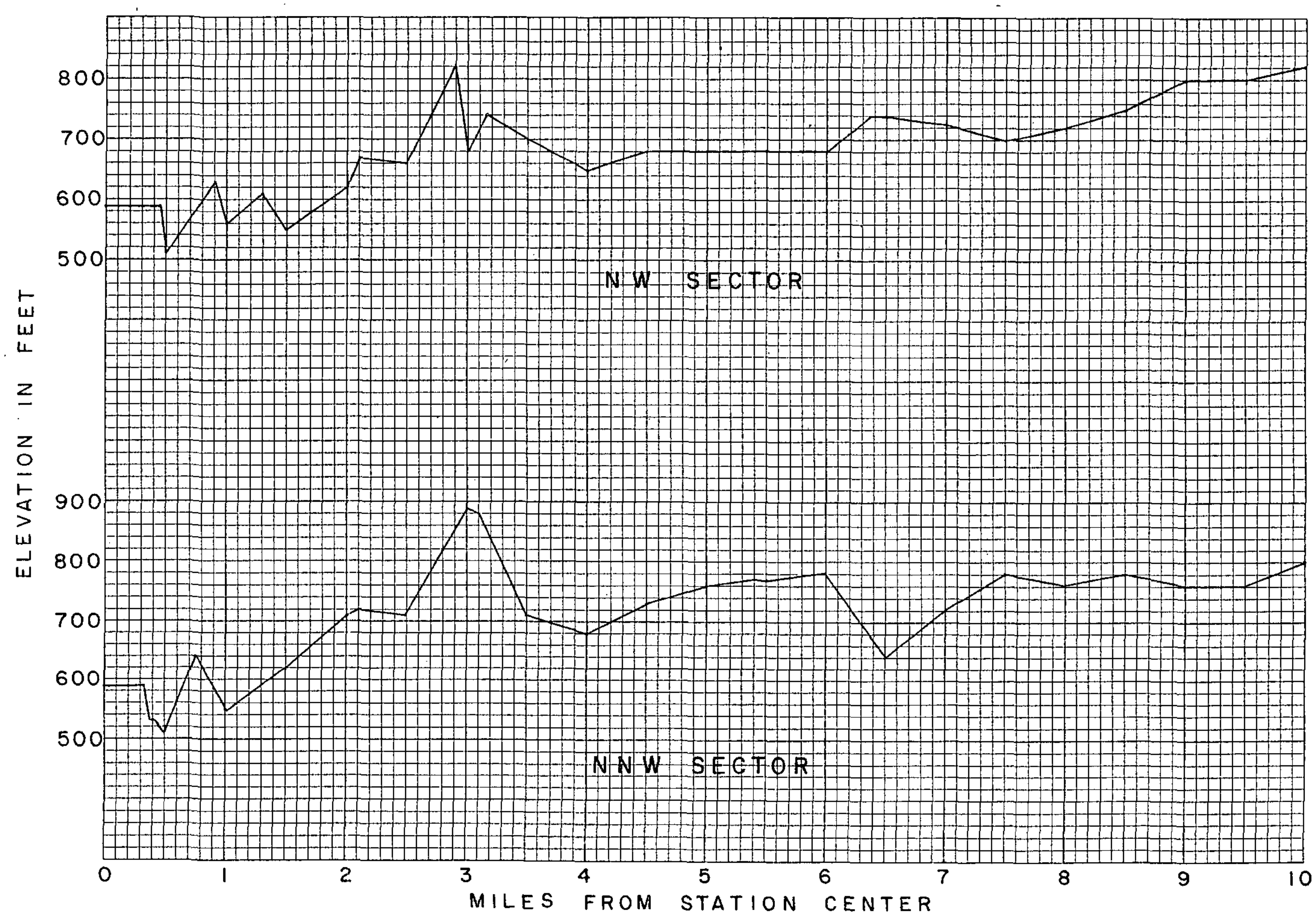
(New)

MAXIMUM TOPOGRAPHIC ELEVATION
VERSUS DISTANCE

CHEROKEE NUCLEAR STATION

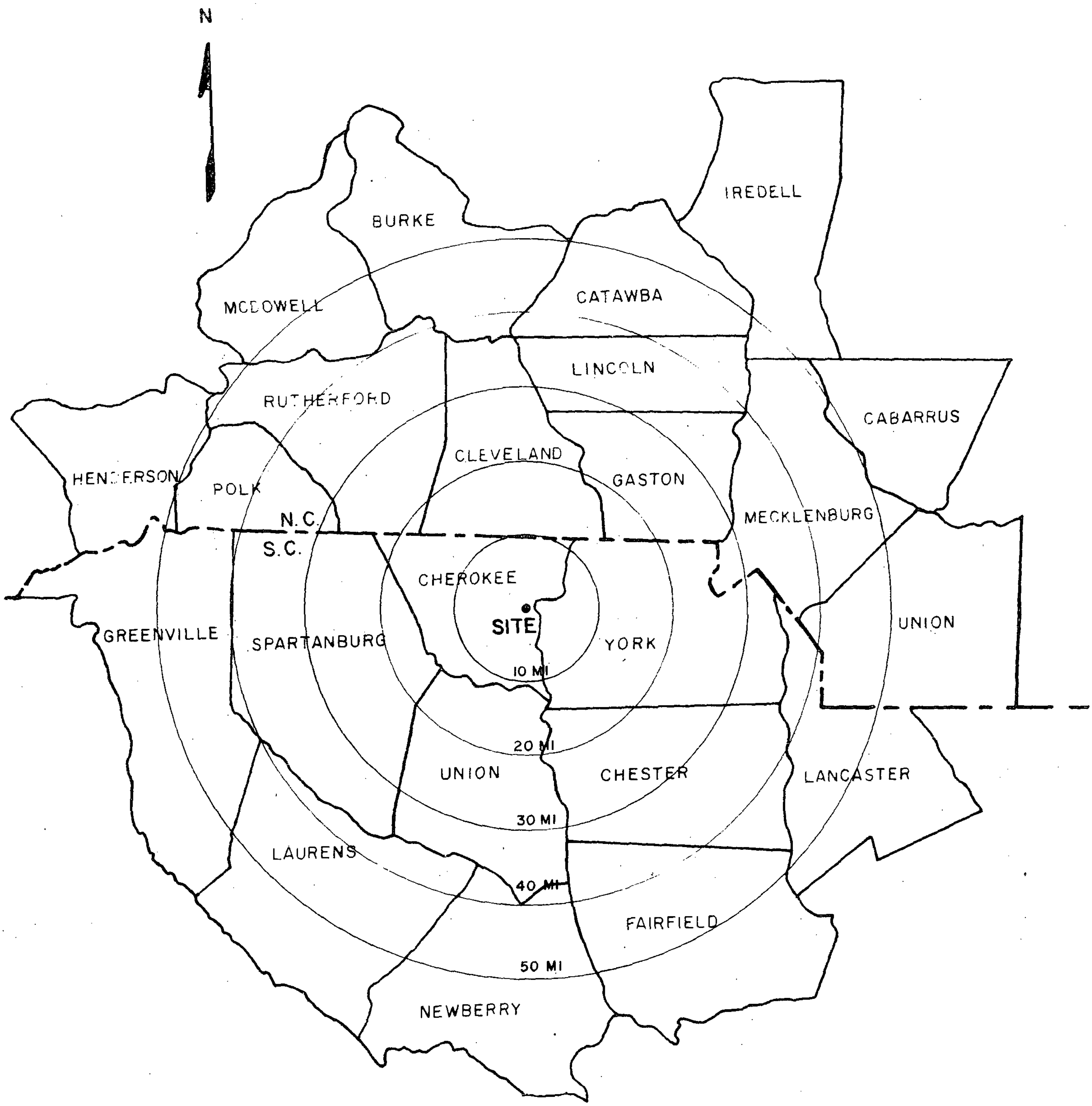
ER Figure 2.1-8 (6 of 7)
Amendment 4
(New)





MAXIMUM TOPOGRAPHIC ELEVATION
VERSUS DISTANCE

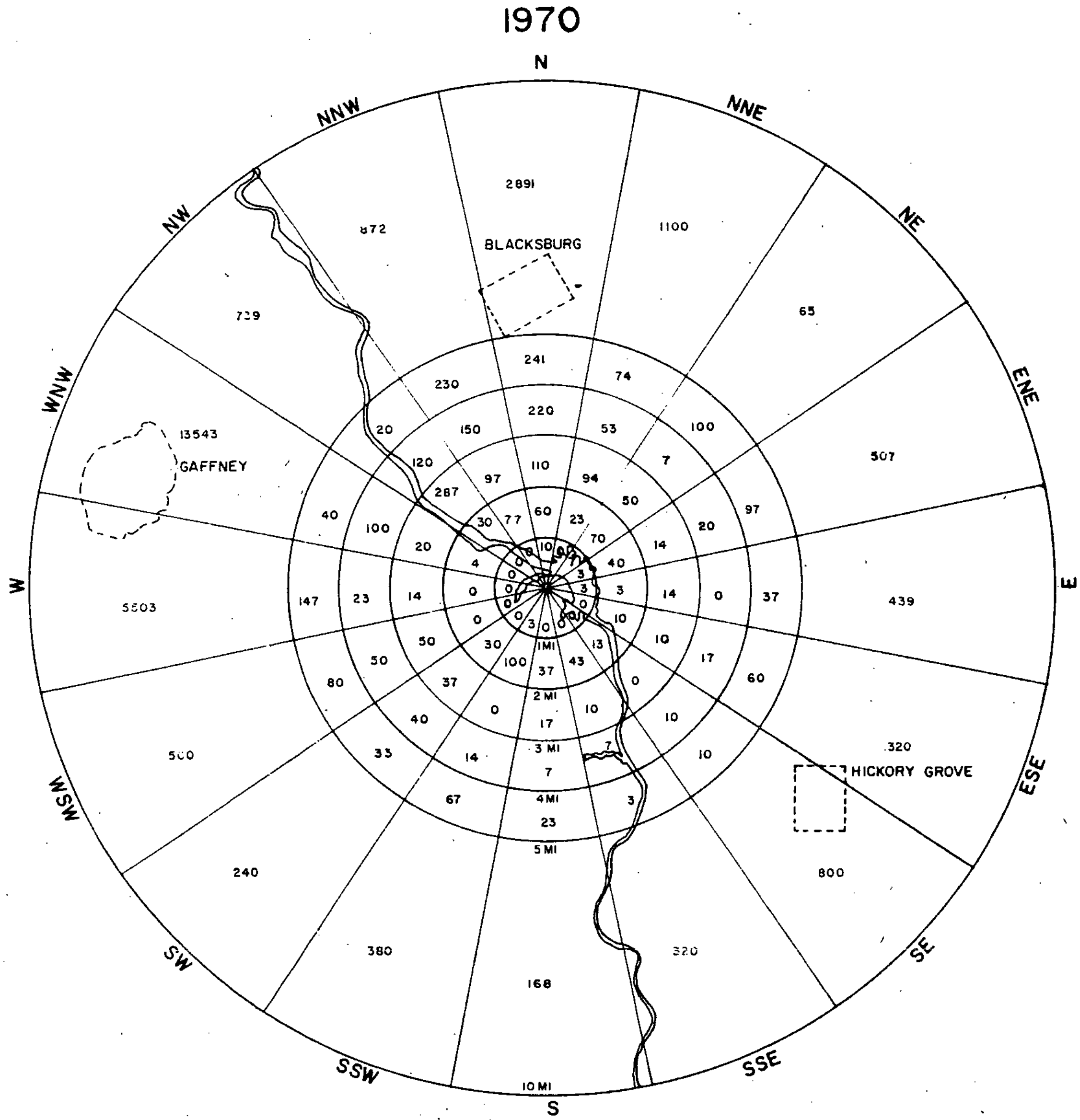
CHEROKEE NUCLEAR STATION
ER Figure 2.1-8 (7 of 7)
Amendment 4
(New)



COUNTIES WITHIN 50 MILES

CHEROKEE NUCLEAR STATION

ER Figure 2.2.1-1

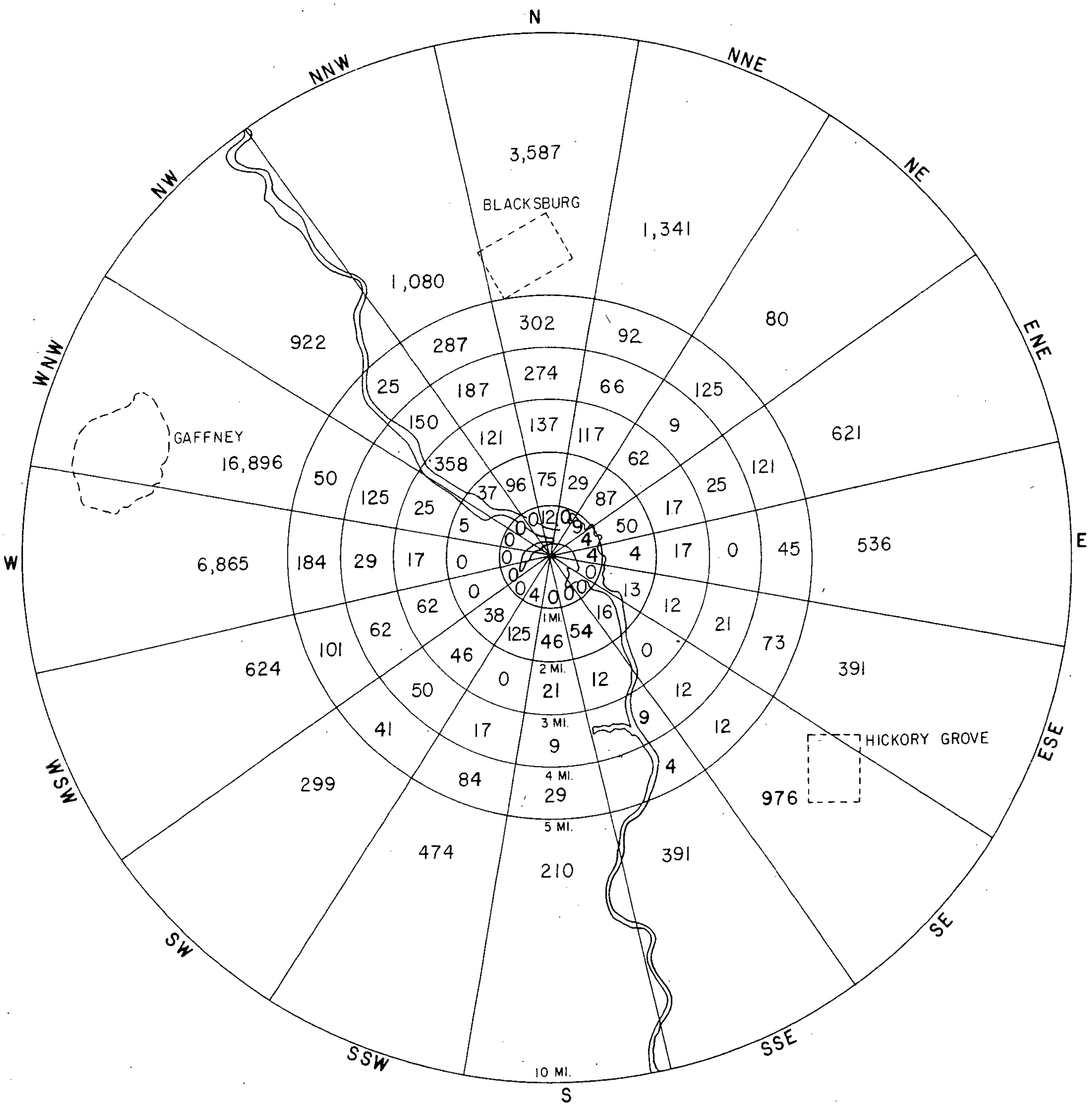


POPULATION WITHIN 10 MILES

CHEROKEE NUCLEAR STATION

ER Figure 2.2.1-2

1984

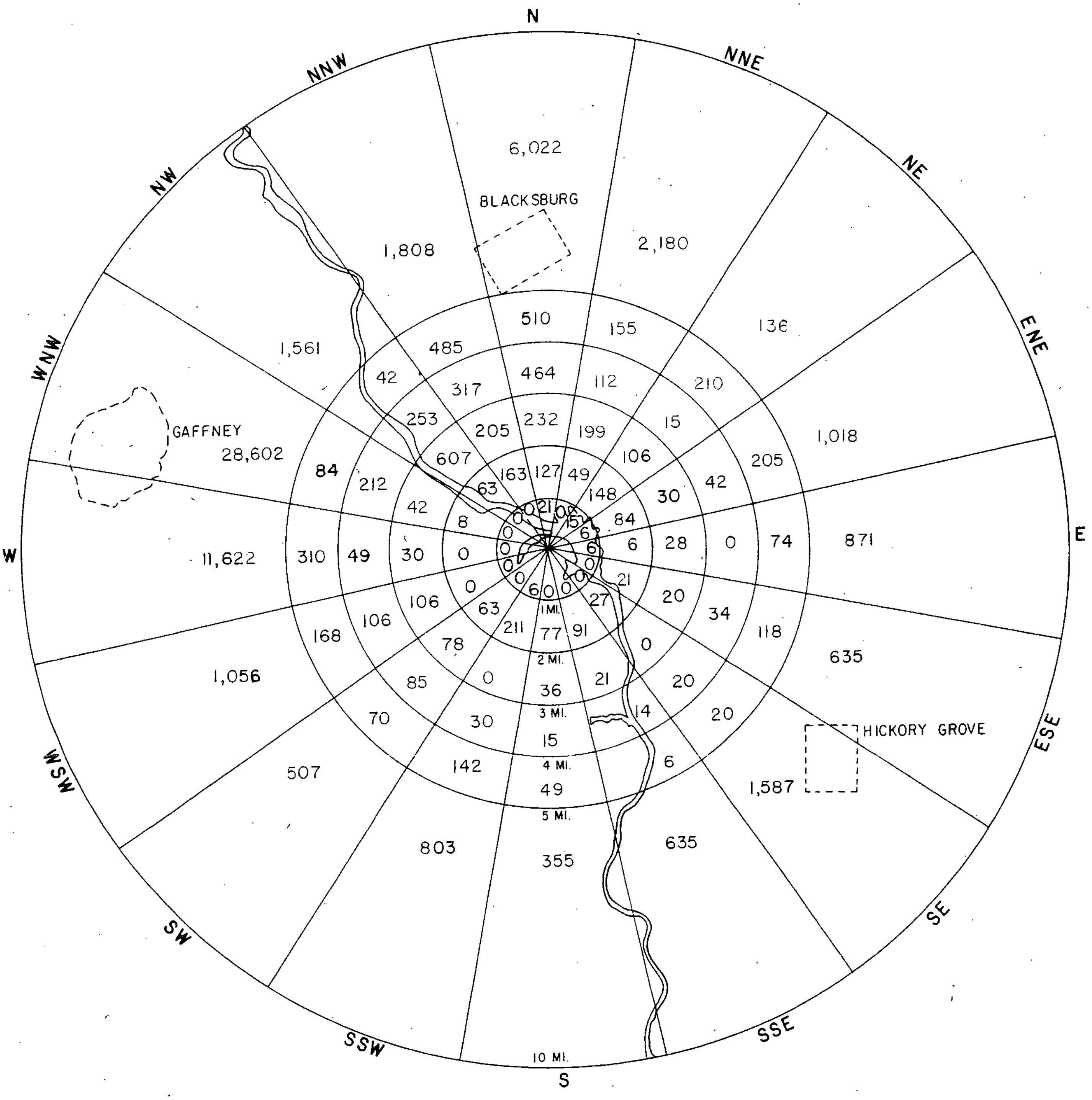


POPULATION WITHIN 10 MILES

CHEROKEE NUCLEAR STATION

ER Figure 2.2.1-3
Amendment 2

2024

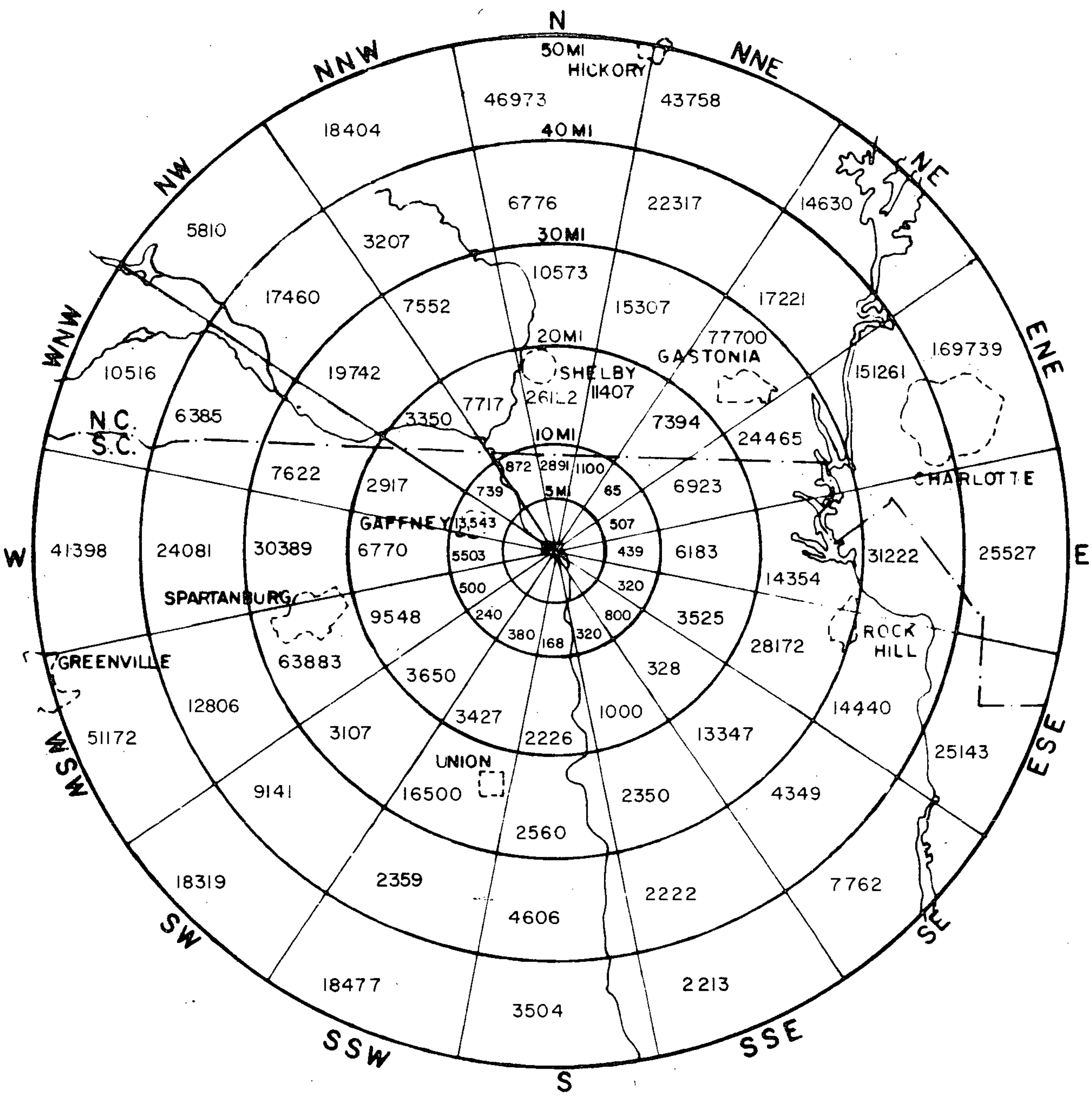


POPULATION WITHIN 10 MILES

CHEROKEE NUCLEAR STATION

ER Figure 2.2.1-4
Amendment 2

1970

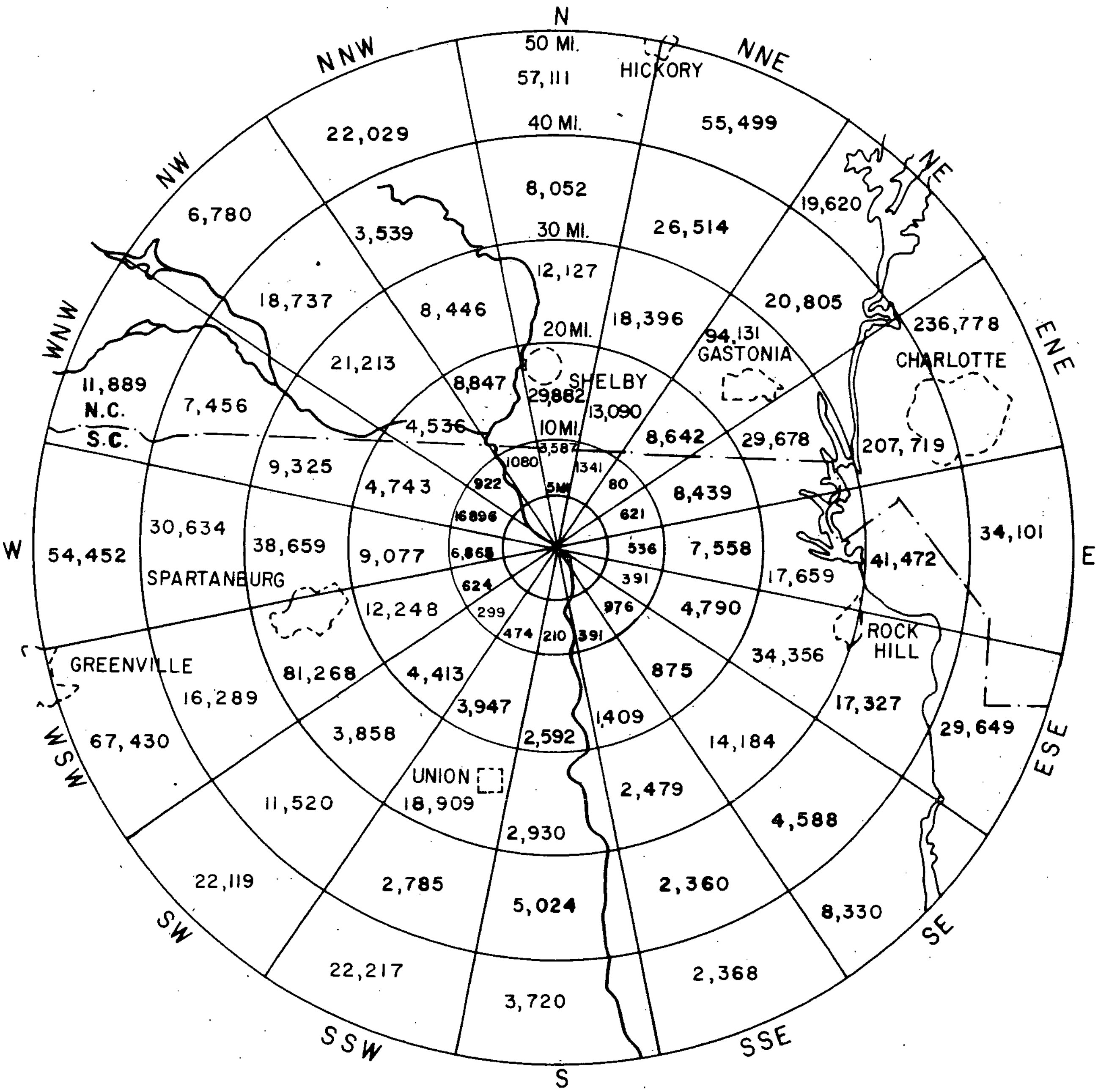


POPULATION BETWEEN 10 & 50 MILES

CHEROKEE NUCLEAR STATION

ER Figure 2.2.1-5

1984

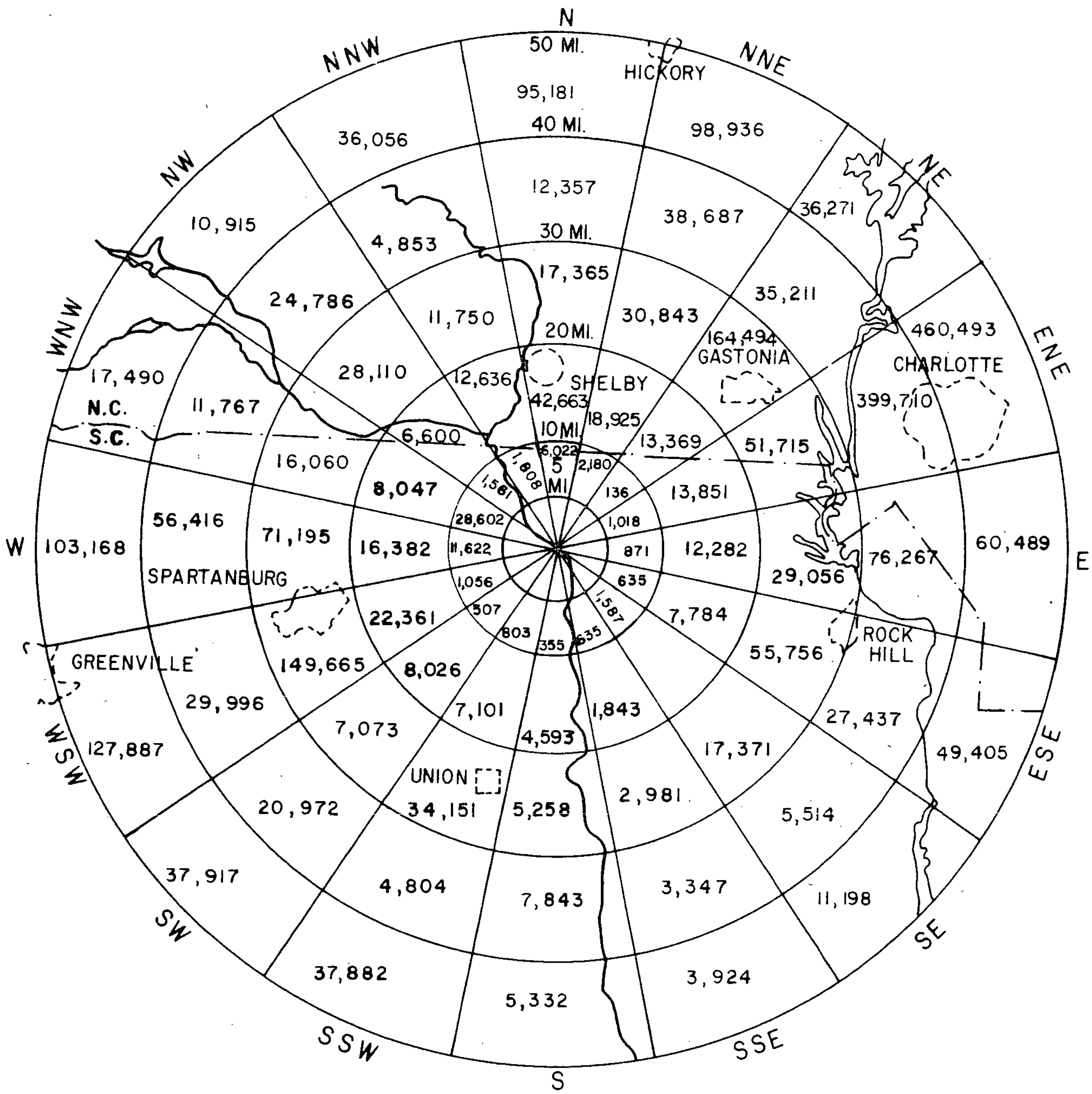


POPULATION BETWEEN 10 & 50 MILES

CHEROKEE NUCLEAR STATION

ER Figure 2.2.1-6
Amendment 2

2024

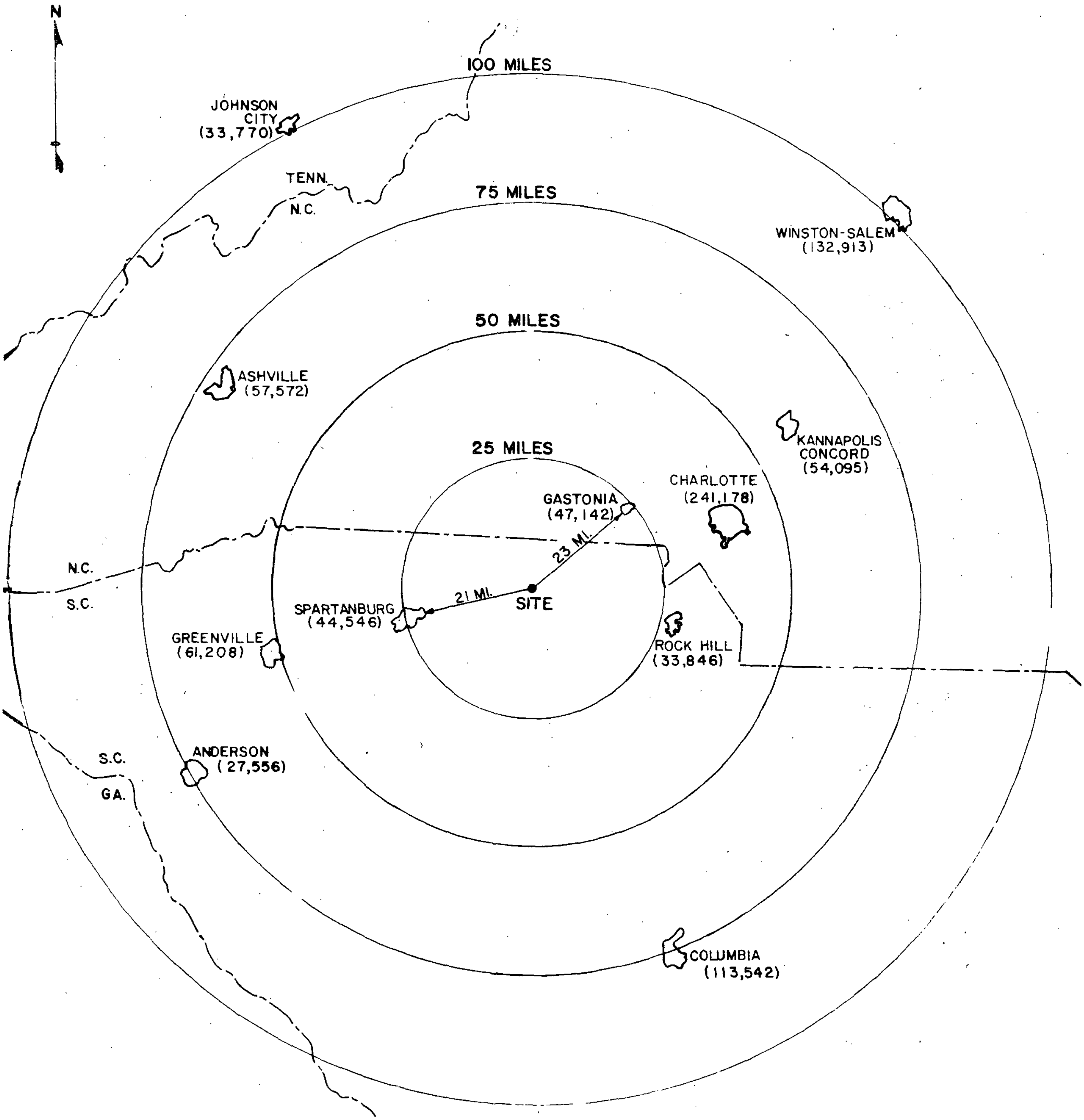


POPULATION BETWEEN 10 & 50 MILES

DUKE POWER

CHEROKEE NUCLEAR STATION

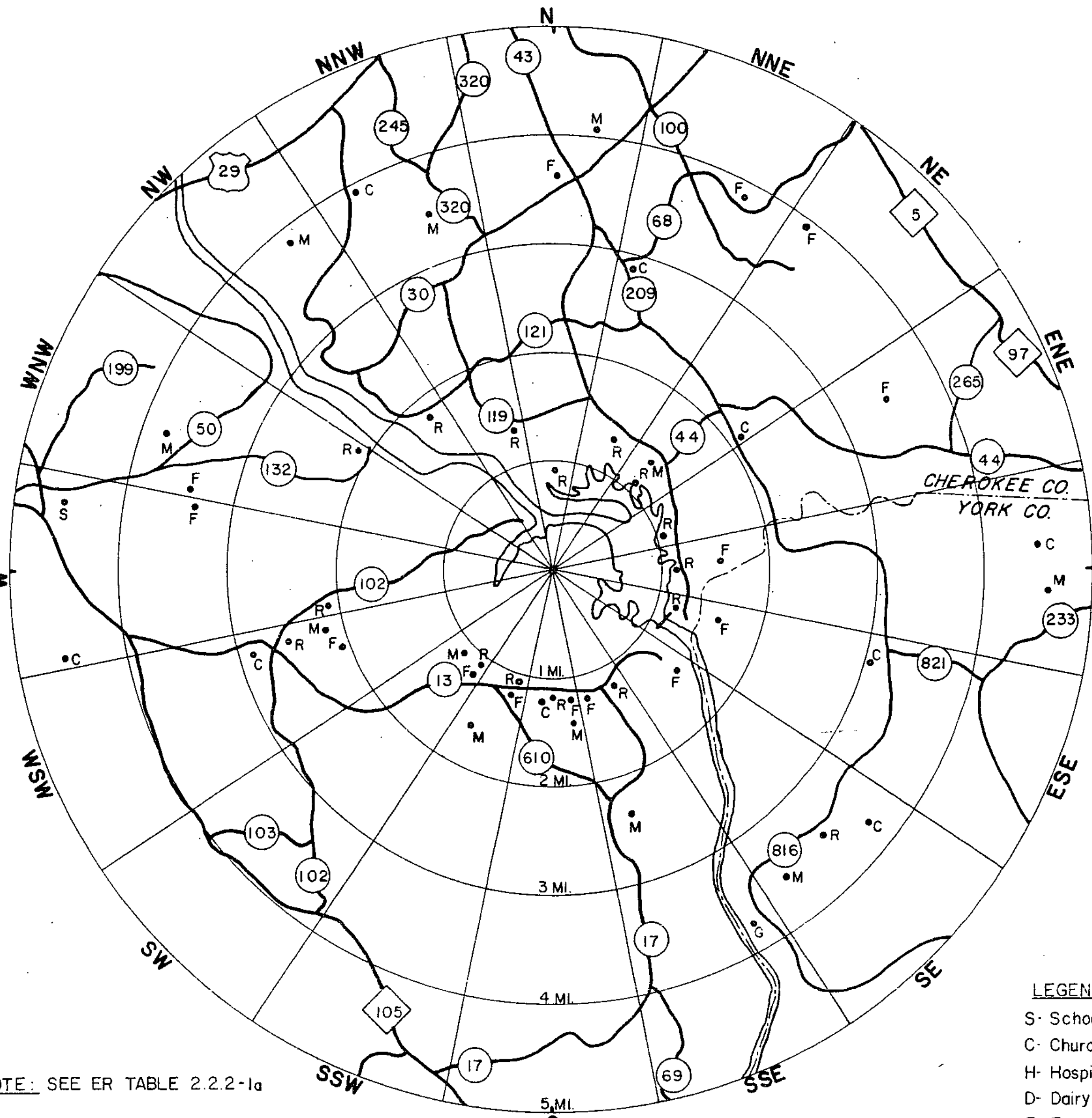
ER Figure 2.2.1-7
Amendment 2



POPULATION CENTERS WITHIN 100 MILES

CHEROKEE NUCLEAR STATION

ER Figure 2.2.1-8



NOTE: SEE ER TABLE 2.2.2-1a

LEGEND
S- School
C- Church
H- Hospital
D- Dairy
F- Farm
R- Residence
M- Milk Cow
G- Goat

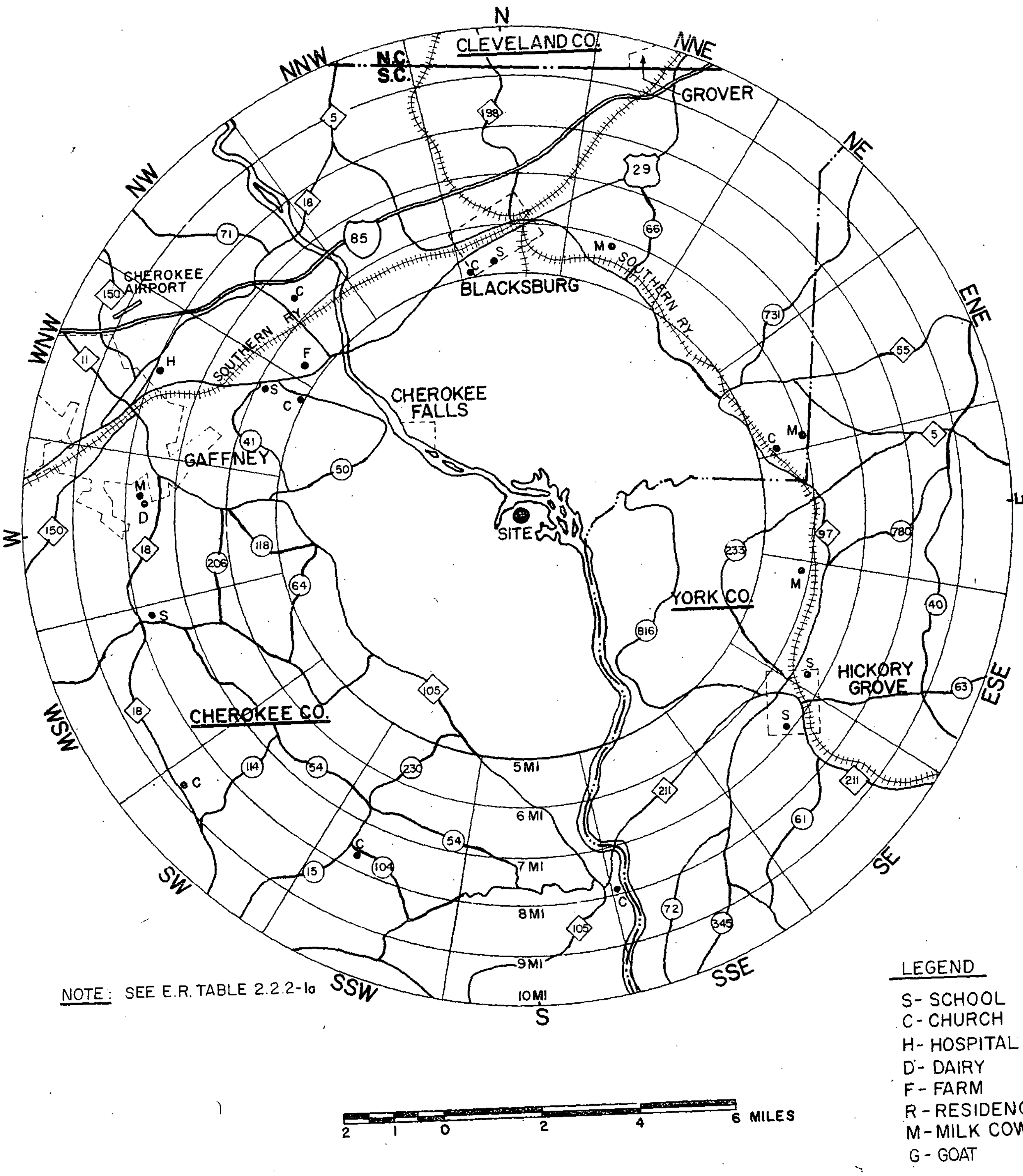
1 0 1 2 3
SCALE - MILES

CLOSEST SCHOOL, CHURCH, HOSPITAL
DAIRY, FARM, RESIDENCE, AND
ANIMAL PRODUCING MILK FOR
HUMAN CONSUMPTION-0-5 MILES

CITIZENSHIP DUKE POWER SERVICE

CHEROKEE NUCLEAR STATION

ER Figure 2.2.2-1 Sheet 1 of 2
Amendment 2
Amendment 3



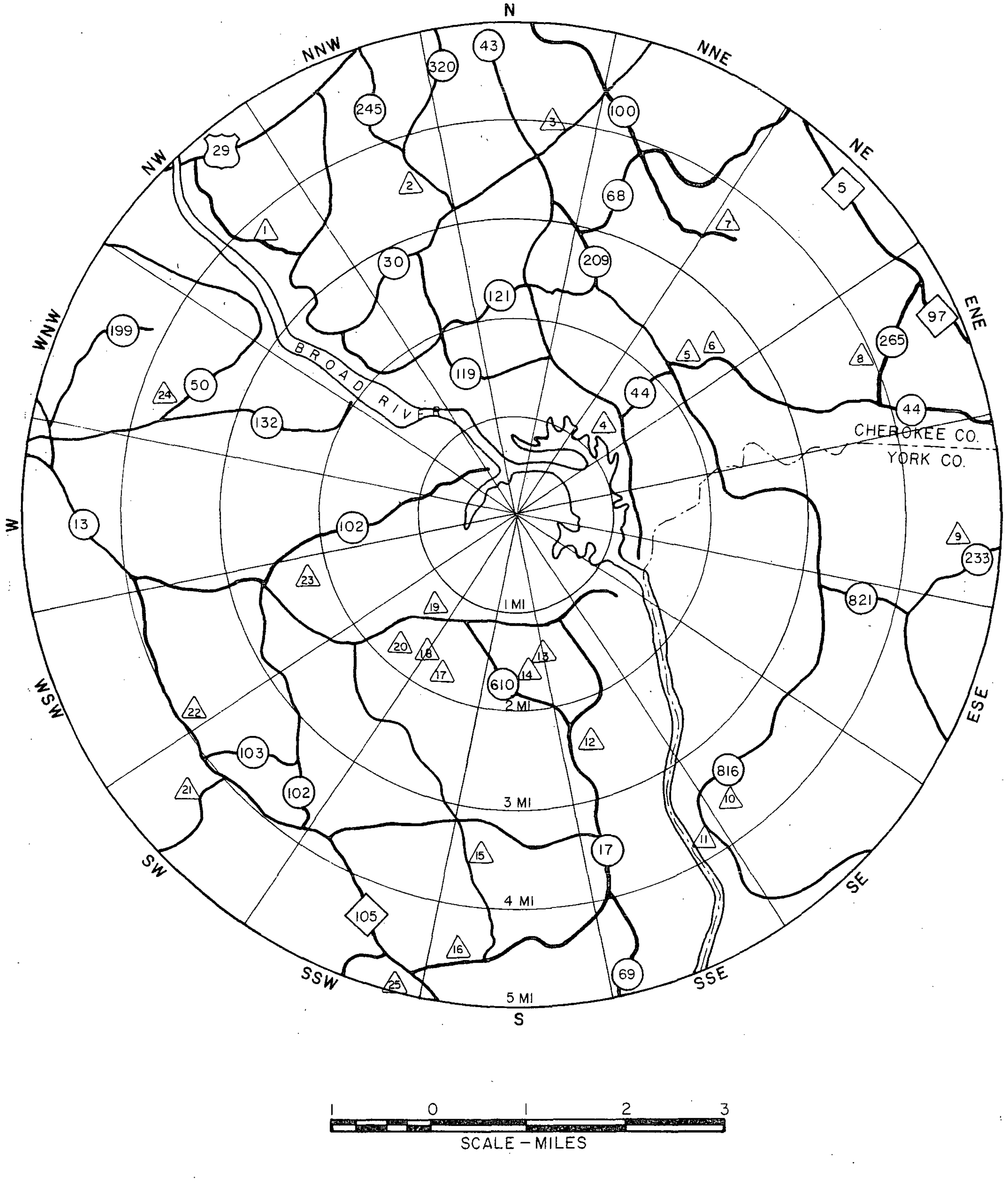
LEGEND

S - SCHOOL
C - CHURCH
H - HOSPITAL
D - DAIRY
F - FARM
R - RESIDENCE
M - MILK COW
G - GOAT

CLOSEST SCHOOL, CHURCH, HOSPITAL
DAIRY, FARM, RESIDENCE, AND
ANIMAL PRODUCING MILK FOR
HUMAN CONSUMPTION-0-10 MILES

CHEROKEE NUCLEAR STATION

ER Figure 2.2.2-1 Sheet 2 of 2
Amendment 2
Amendment 3



NOTES :

1. There are no daries within 5 miles of the site.

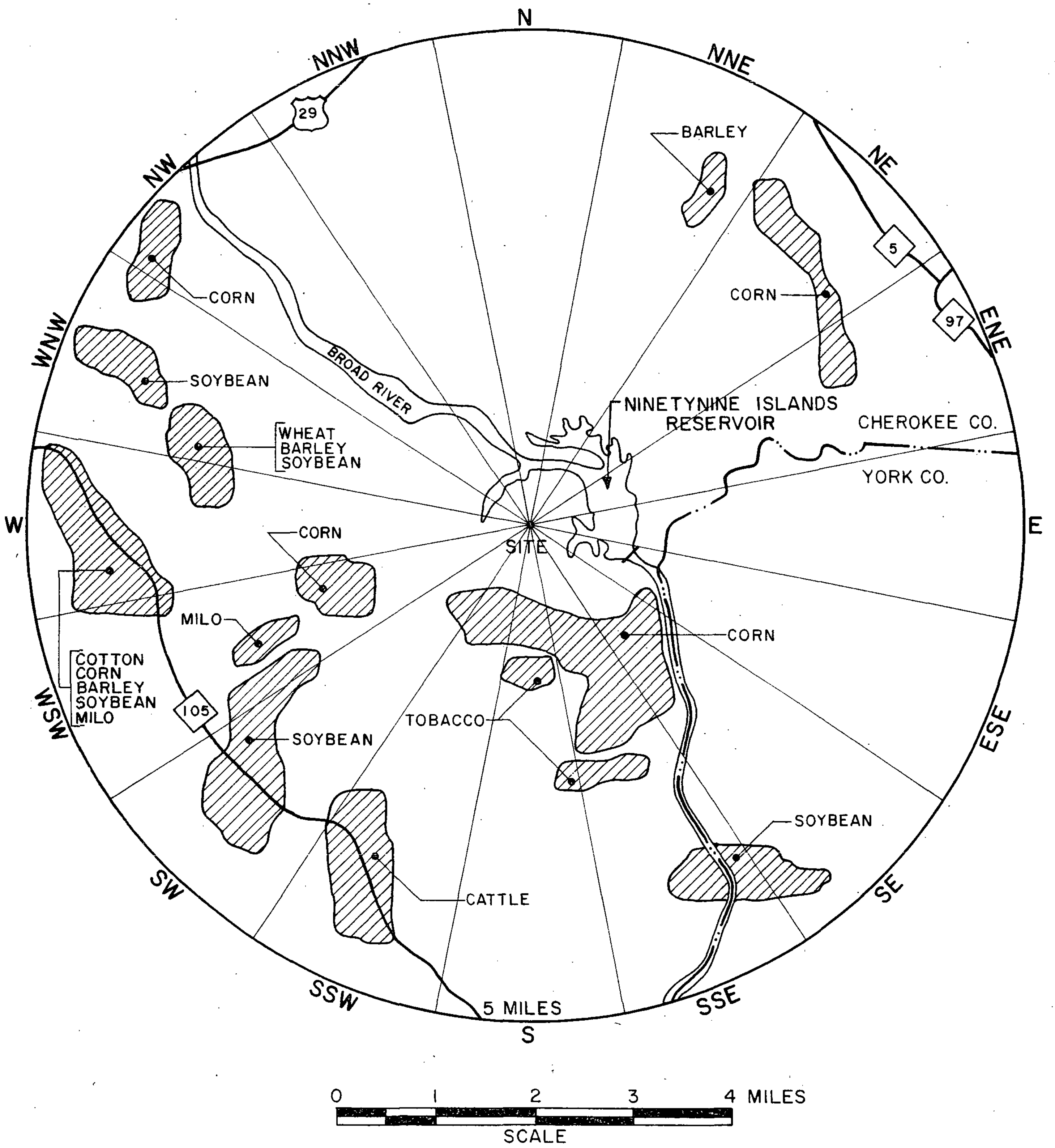
2. △ Indicates location of herd & identification no.

3. See ER Table 2.2.2-1b for details.

LOCATION OF HERDS PRODUCING
MILK FOR HUMAN CONSUMPTION
WITHIN 5 MILES

CHEROKEE NUCLEAR STATION

ER Figure 2.2.2-1a
Amendment 2 (New)

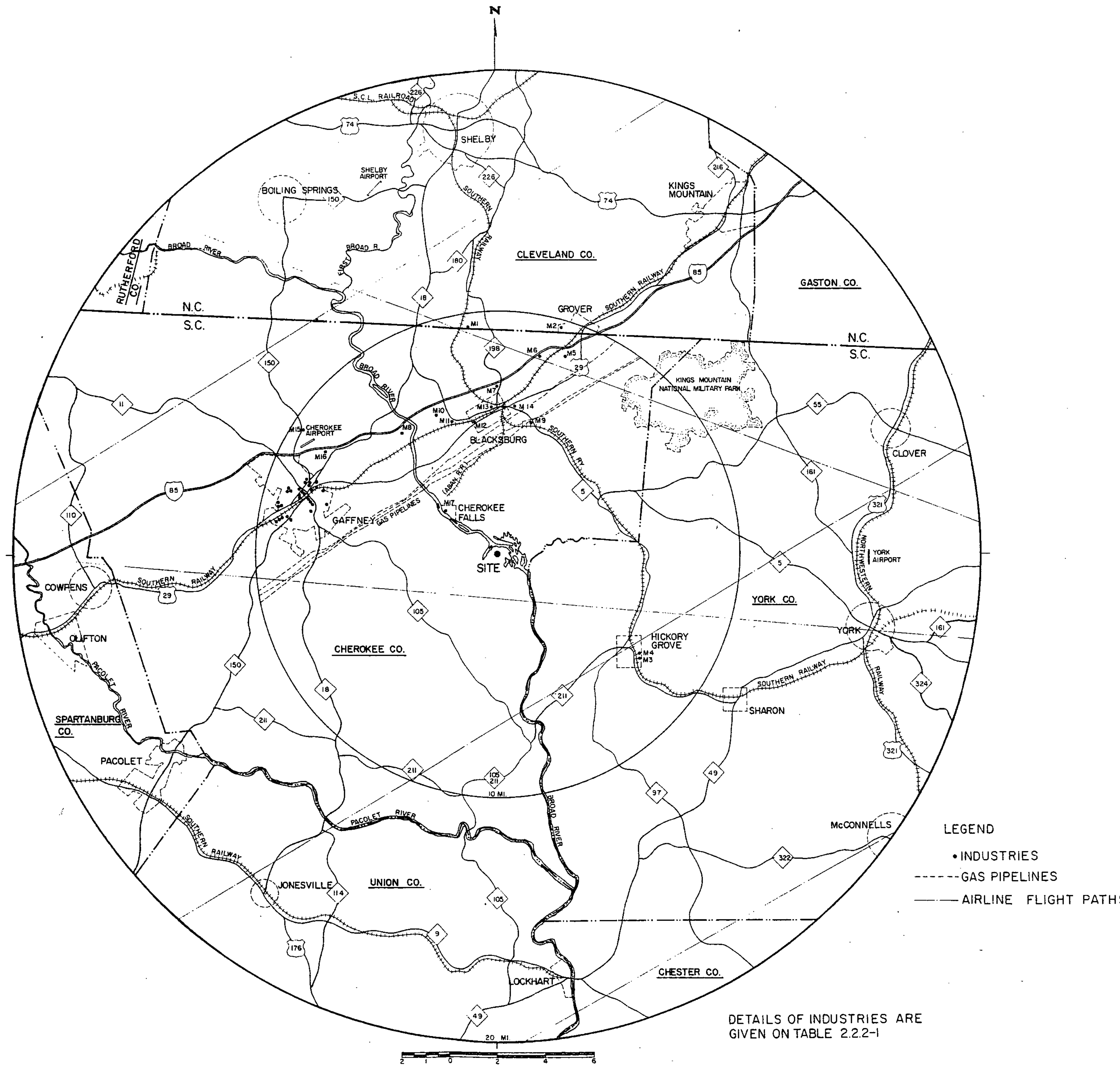


CONCENTRATION OF MAJOR
FARM PRODUCTS

CITIZENSHIP DUKE POWER SERVICE

CHEROKEE NUCLEAR STATION

ER Figure 2.2.2-2
Amendment 2

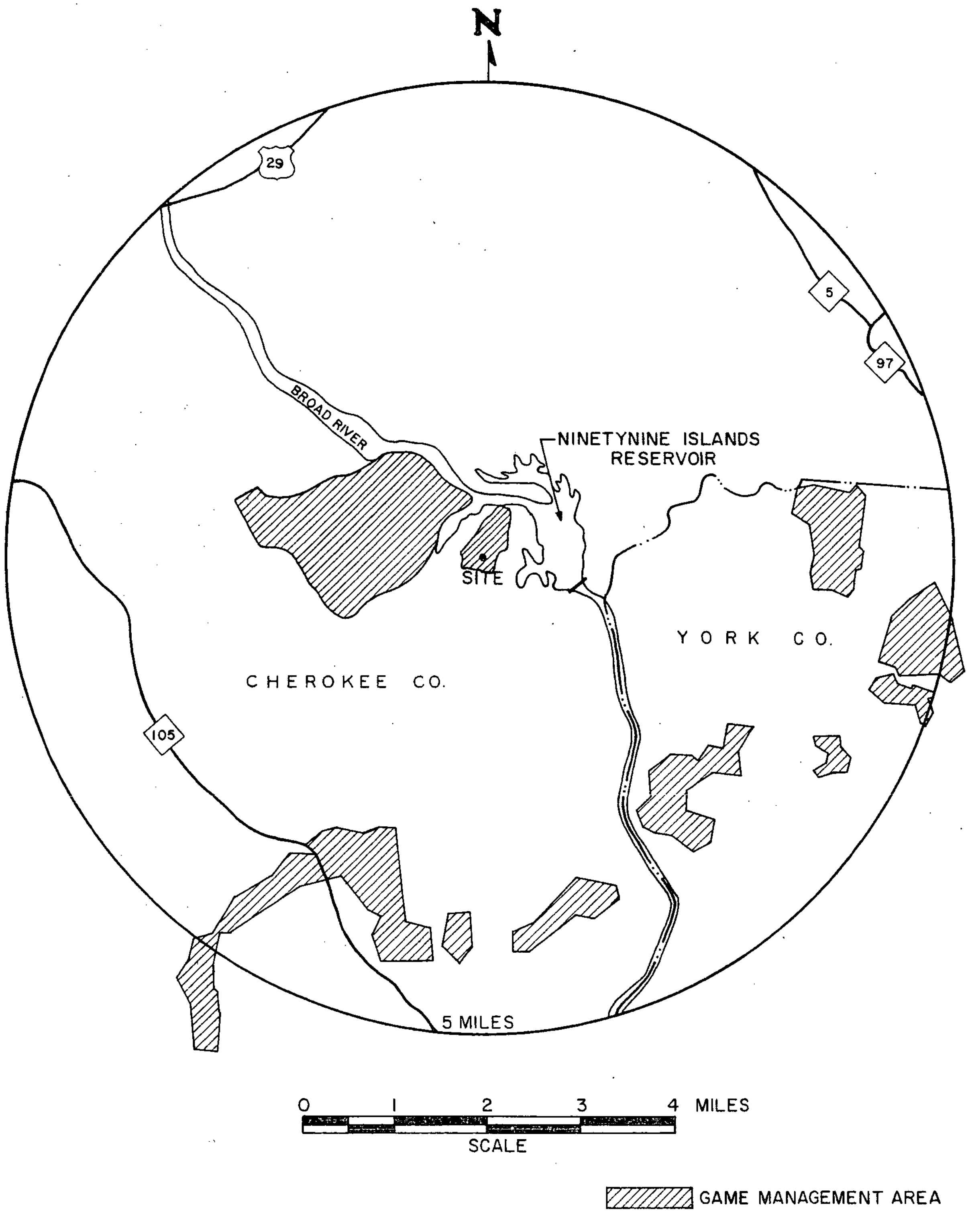


DETAILS OF INDUSTRIES ARE GIVEN ON TABLE 2.2.2-1

MAJOR TRANSPORTATION FACILITIES AND INDUSTRIES

CHEROKEE NUCLEAR STATION

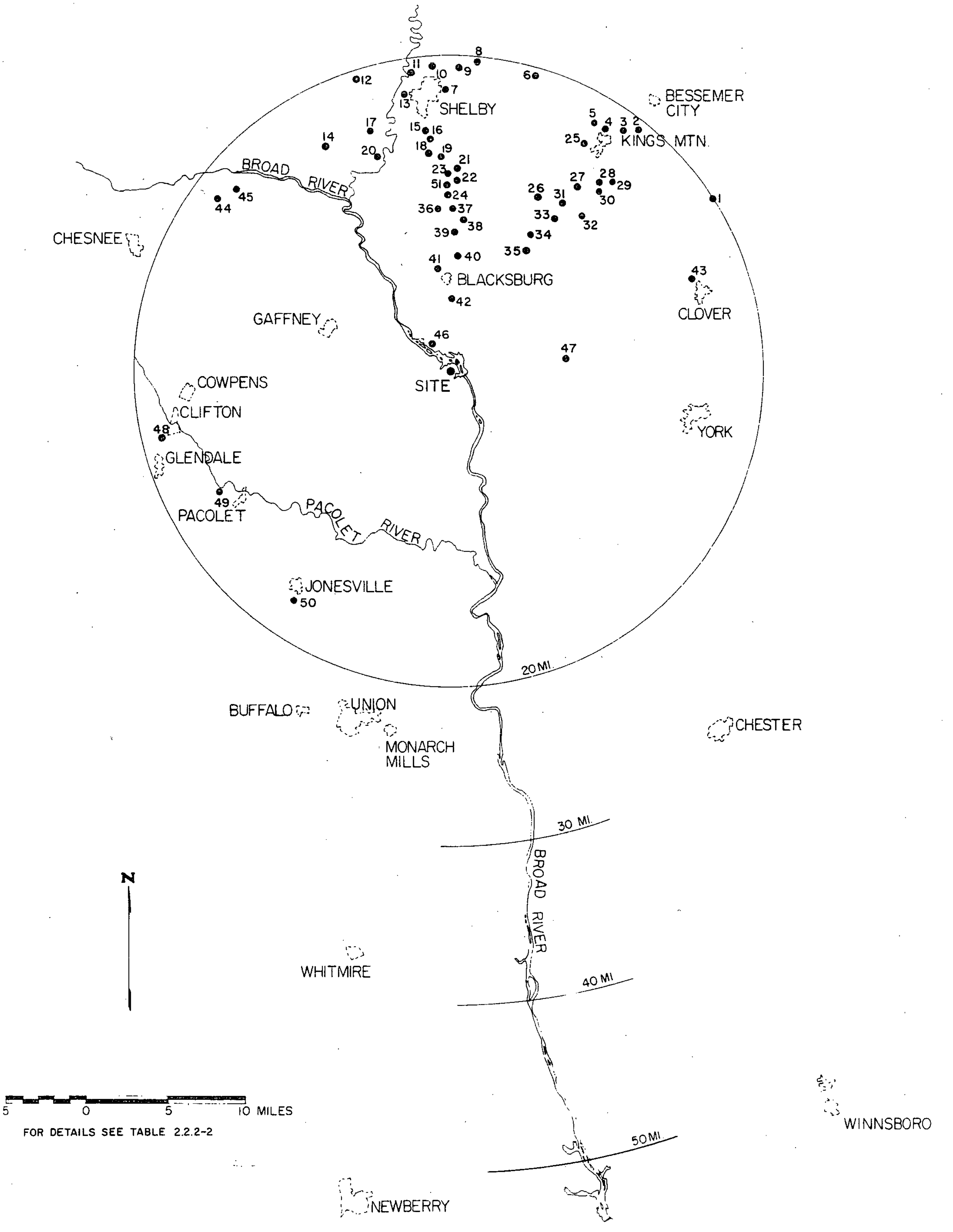
ER Figure 2.2.2-3



WILDLIFE MANAGEMENT AREAS

CHEROKEE NUCLEAR STATION

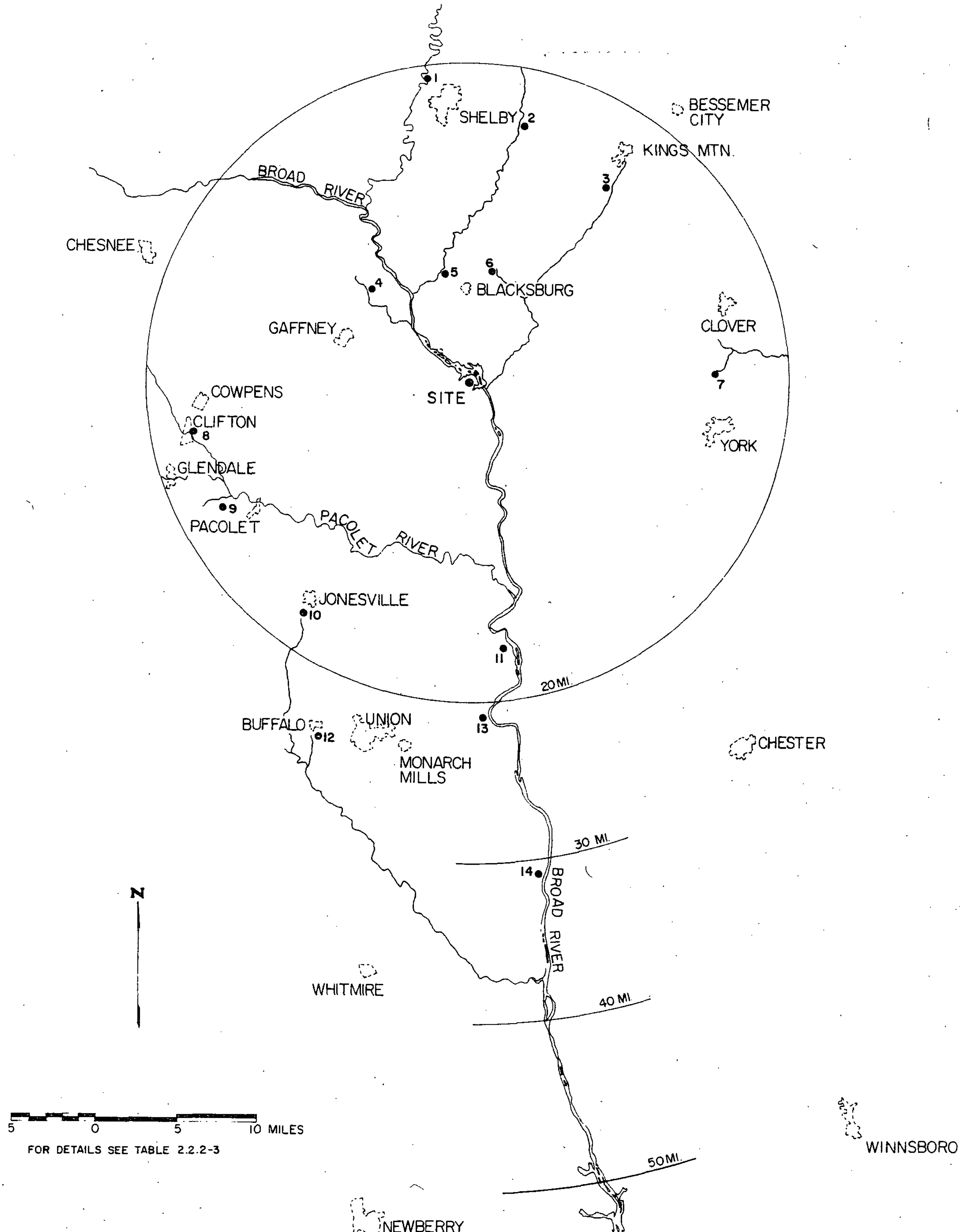
ER Figure 2.2.2-4
Amendment 3



GROUNDWATER INTAKES

CHEROKEE NUCLEAR STATION

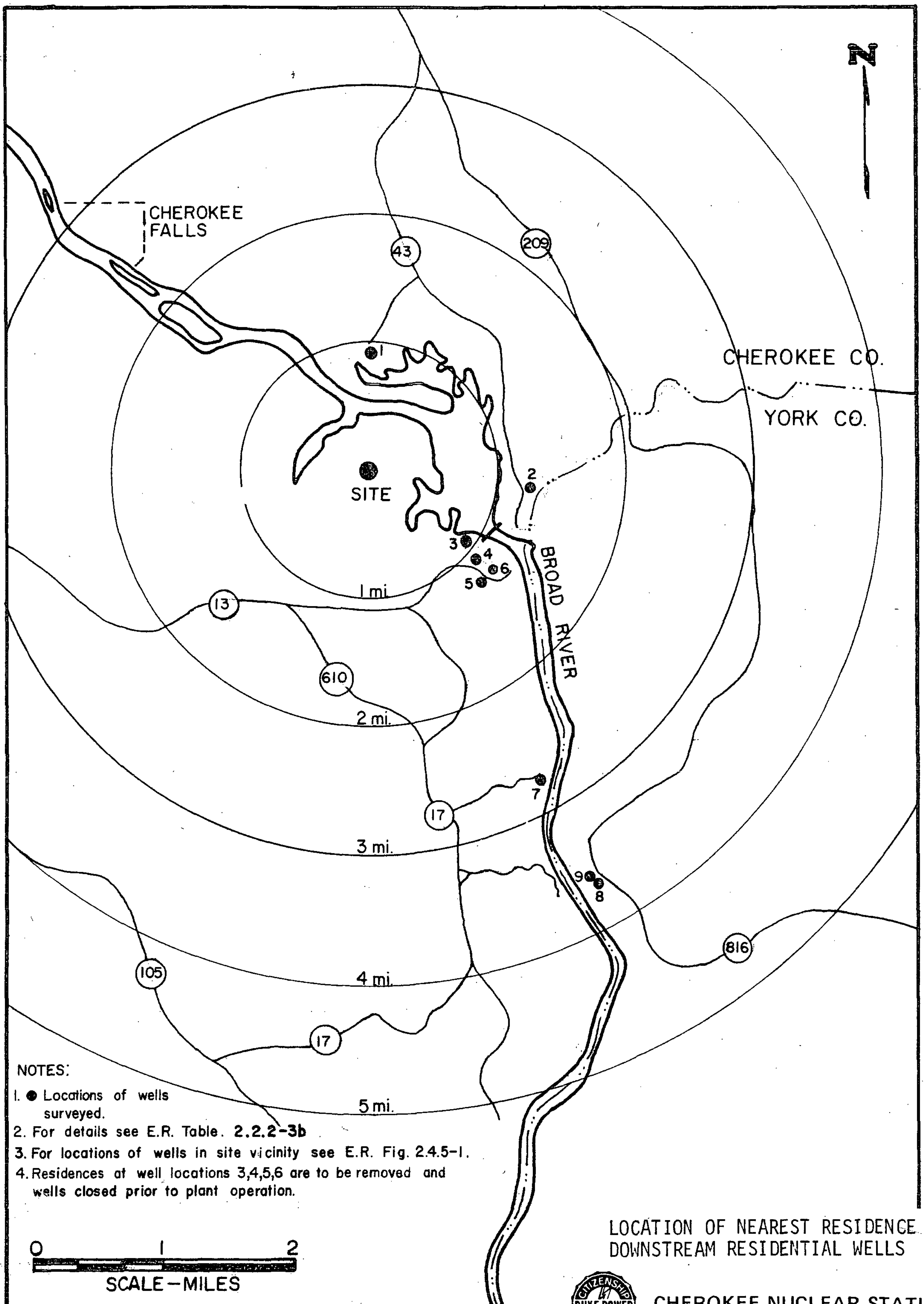
ER Figure 2.2.2-5



SURFACE WATER INTAKES

CHEROKEE NUCLEAR STATION

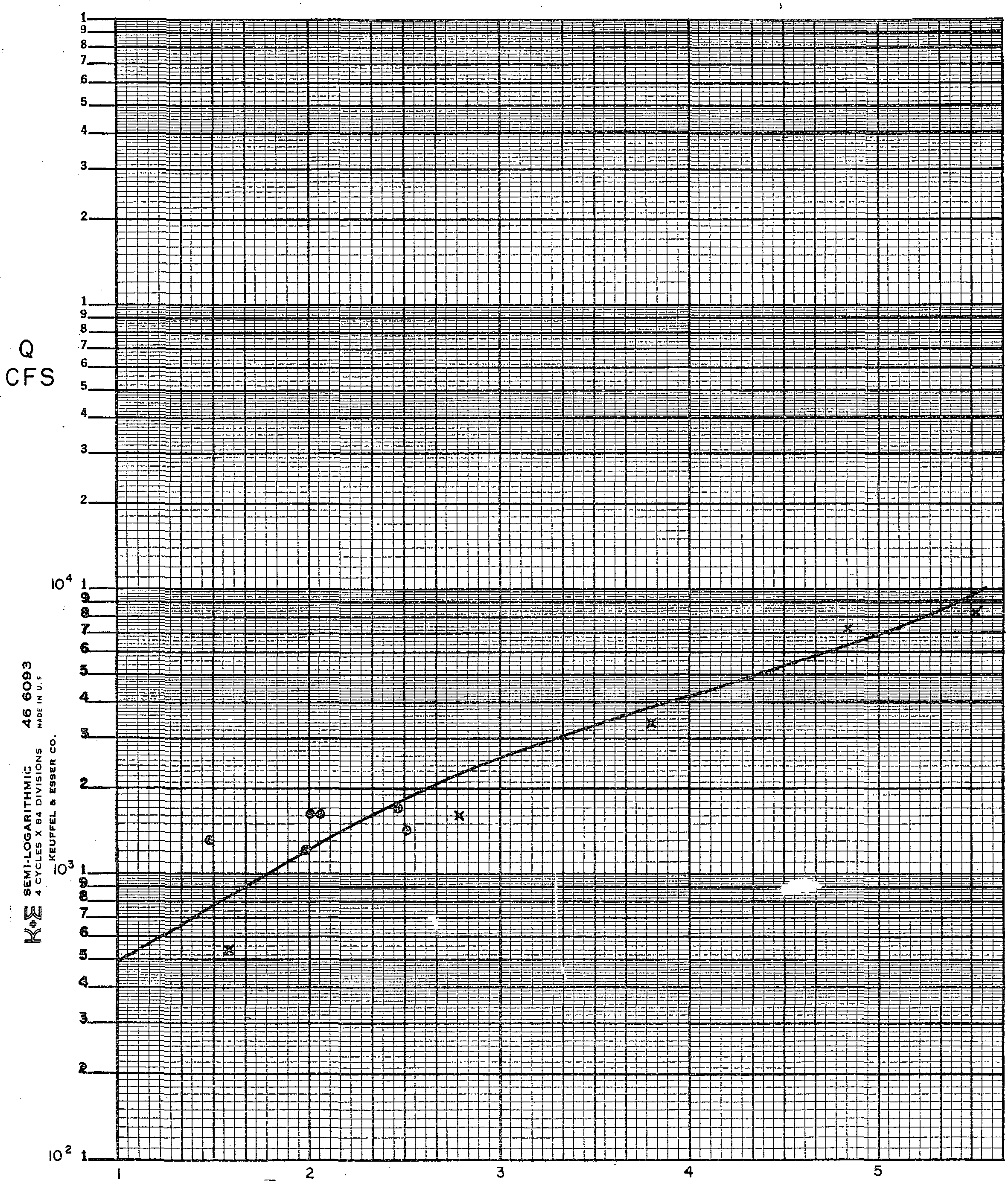
ER Figure 2.2.2-6



LOCATION OF NEAREST RESIDENCE AND
DOWNSTREAM RESIDENTIAL WELLS

CHEROKEE NUCLEAR STATION

ER Figure 2.2.2-6a



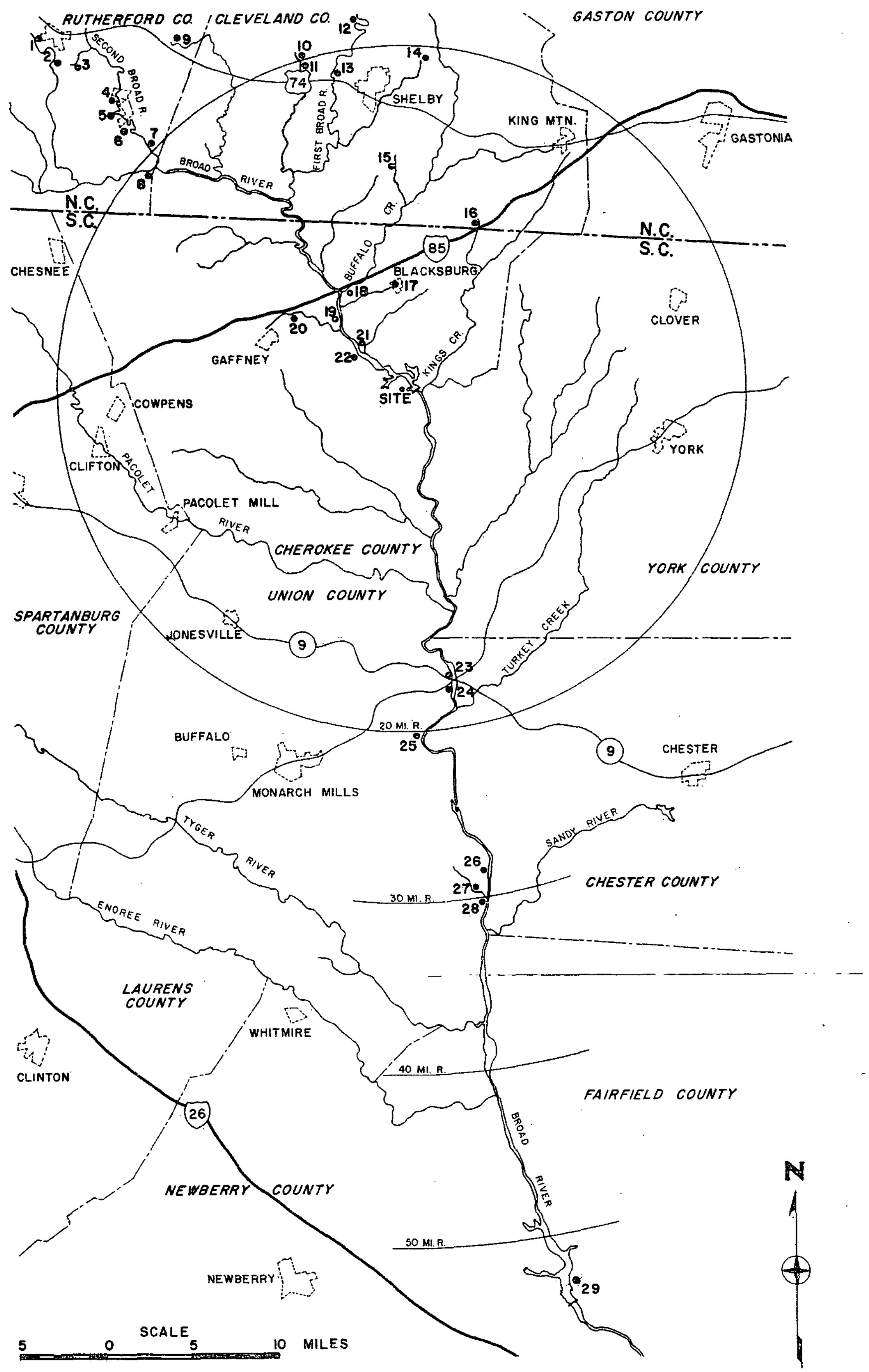
- CROSS-SECTION DATA
- U.S. DEPT. OF INTERIOR

DISCHARGE VS VELOCITY
BROAD RIVER NEAR GAFFNEY, S.C.

CHEROKEE NUCLEAR STATI

ER Figure 2.2.2-7

Amendment 1

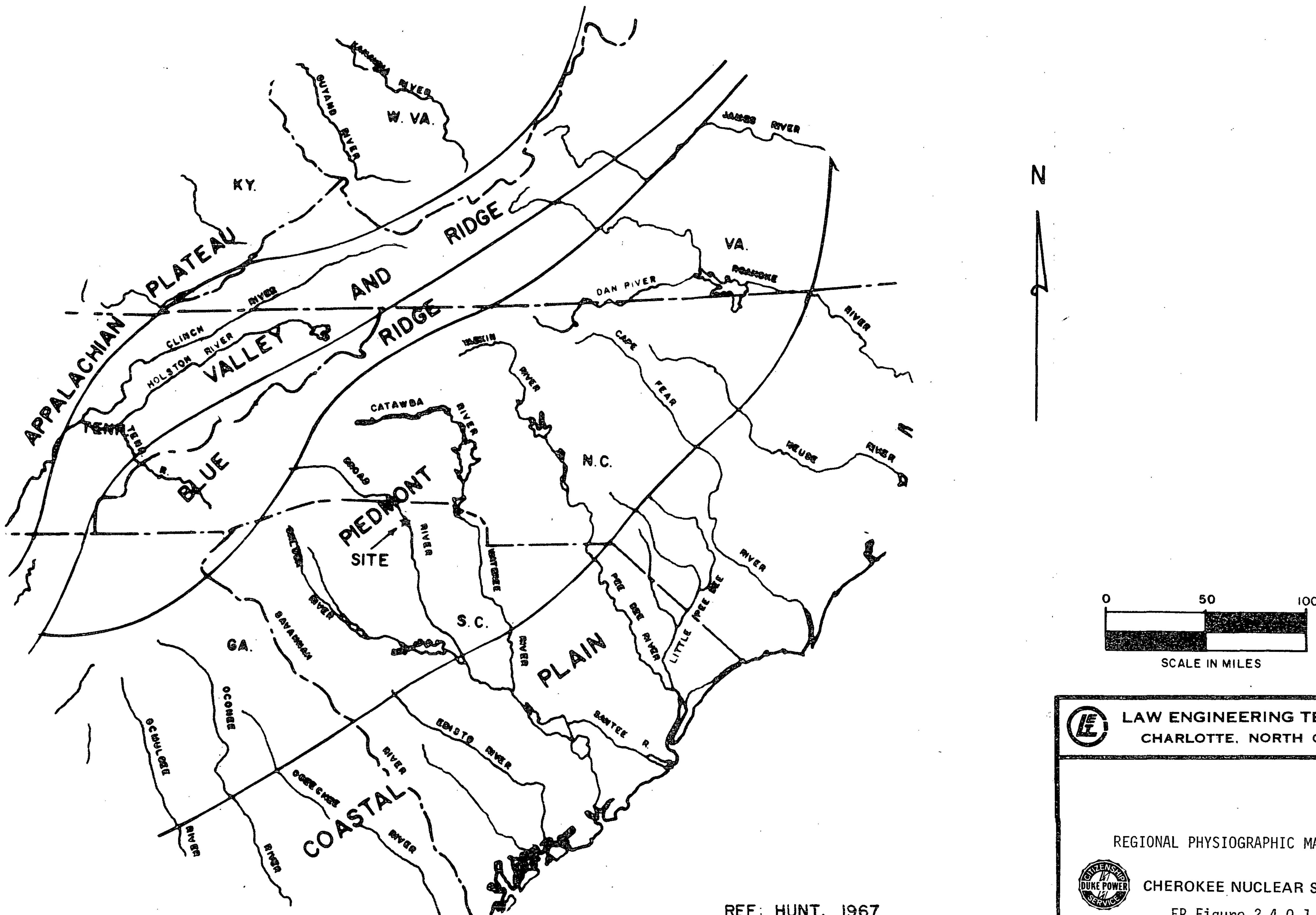


NO.	FACILITY
1	ALEXANDER MILLS
2	N.C. DISPLAY FIXTURE
3	BURLINGTON INDUSTRIES
4	BURLINGTON INDUSTRIES
5	CONE MILLS
6	BURLINGTON INDUSTRIES
7	CONE MILLS
8	DUKE POWER COMPANY (CLIFFSIDE STEAM STATION)
9	PROVIDENCE PILE FABRIC CORPORATION
10	PPG INDUSTRIES
11	CONTAINER CORPORATION OF AMERICA
12	CLEVELAND MILLS COMPANY
13	ORA MILLS
14	DOVER YARN
15	FIBER INDUSTRIES
16	MINETTE MILLS
17	CITY OF BLACKSBURG
18	MAGNOLIA FINISHING PLANT
19	MARION MANUFACTURING COMPANY
20	CITY OF GAFFNEY
21	BURLINGTON INDUSTRIES
22	COLONIAL PIPELINE CO.
23	LOCKHART MILL
24	CITY OF LOCKHART
25	BUFFALO
26	MONARCH MILL
27	CONE MILLS CORP.
28	CARLISLE FINISHING PLANT
29	S.C. ELECTRIC & GAS (PARR STEAM STATION)

LOCATION OF INDUSTRIAL AND MUNICIPAL DISCHARGES

CHEROKEE NUCLEAR STATION

ER Figure 2.2.2-8
Amendment 2
(New)



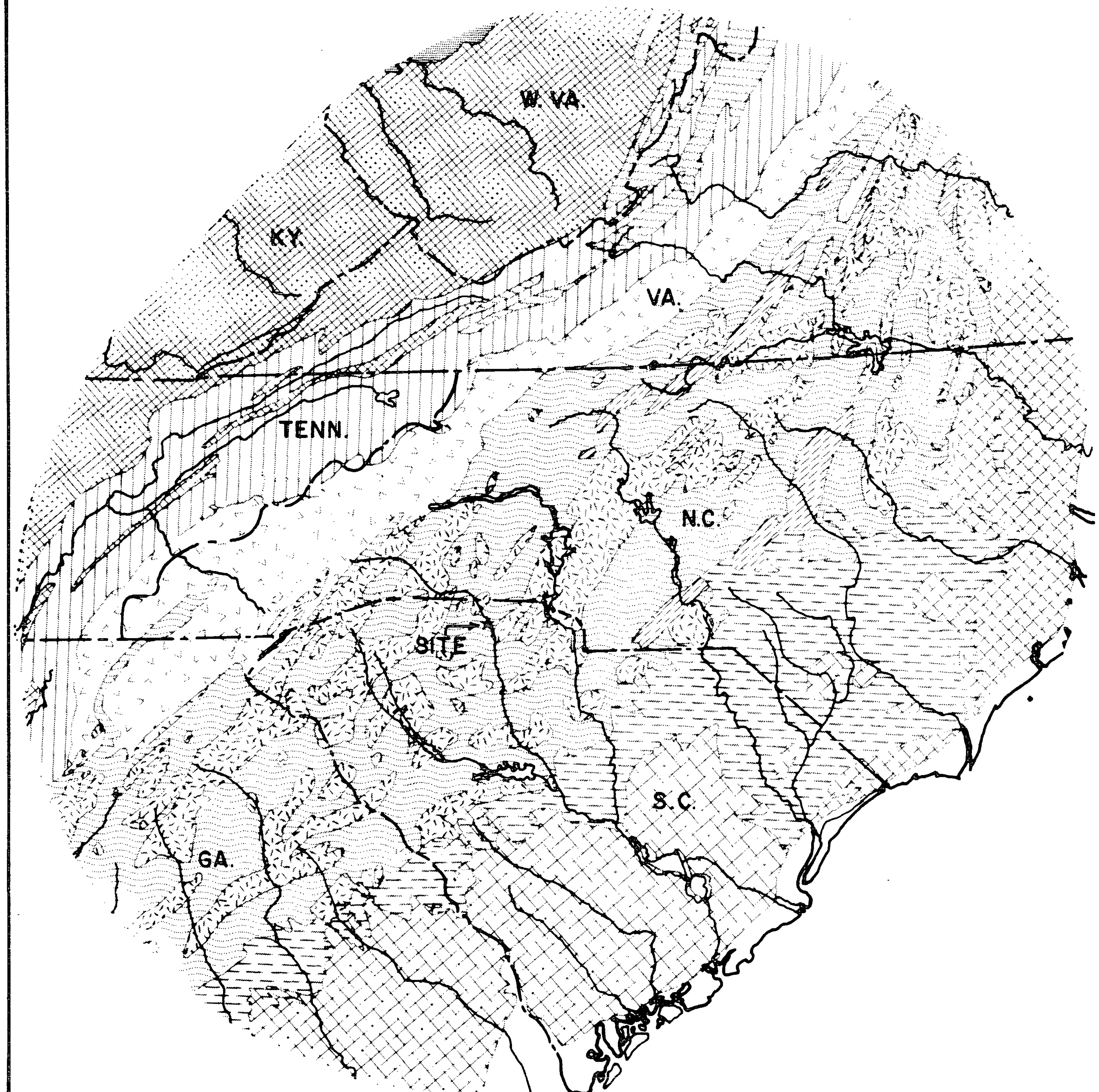
REF: HUNT, 1967

LAW ENGINEERING TESTING CO.
CHARLOTTE, NORTH CAROLINA

REGIONAL PHYSIOGRAPHIC MAP

CHEROKEE NUCLEAR STATION

ER Figure 2.4.0-1



LEGEND

	Quaternary	Alluvium, coastal terrace deposits and beach sands.
	Tertiary	Sediments and sedimentary rocks, mostly marine.
	Cretaceous	Sedimentary rocks, mostly marine.
	Triassic	Marine and continental sedimentary rocks. Includes some basic intrusives.
	Permian	Marine and continental sedimentary rocks.
	Carboniferous	Mostly continental sedimentary rocks.
	Middle Paleozoic	Sedimentary rocks.
	Lower Paleozoic	Sedimentary rocks including some carbonates.
	Paleozoic Intrusives	Mostly granitic. Includes some syenite, diorite and gabbro.
	Paleozoic Metamorphics	Appalachian schist and gneiss. Includes some Precambrian rock.
	Precambrian	Schist and gneiss with some plutonic rocks.

Modified from the Geologic Map of North America, U. S. Geological Survey, 1965.

N

0 50 100

SCALE IN MILES

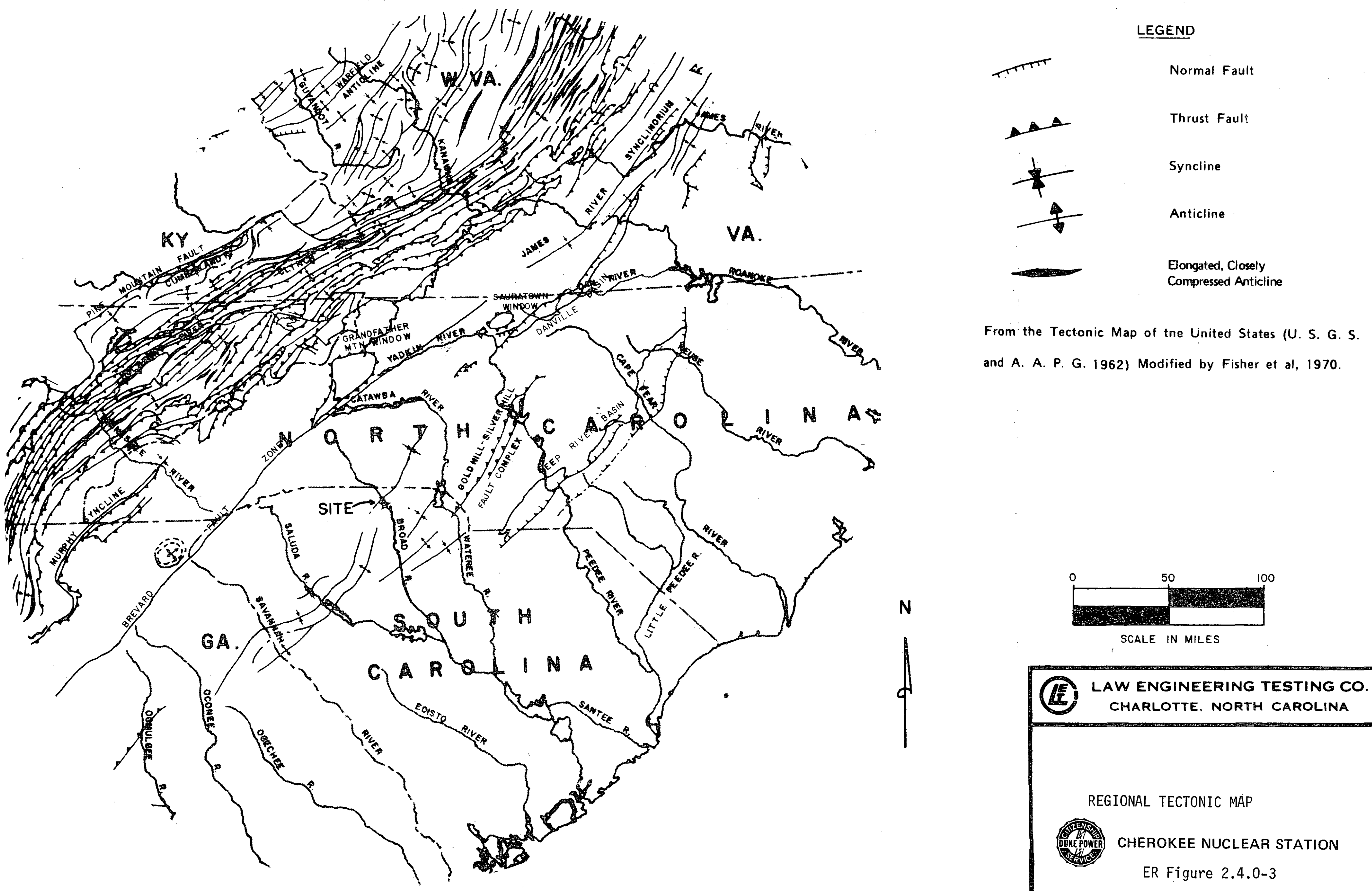
LAW ENGINEERING TESTING CO.
CHARLOTTE, NORTH CAROLINA

REGIONAL GEOLOGIC MAP

DUKE POWER

CHEROKEE NUCLEAR STATION

ER Figure 2.4.0-2



From the Tectonic Map of the United States (U. S. G. S. and A. A. P. G. 1962) Modified by Fisher et al, 1970.

LAW ENGINEERING TESTING CO.
CHARLOTTE, NORTH CAROLINA

REGIONAL TECTONIC MAP

CHEROKEE NUCLEAR STATION

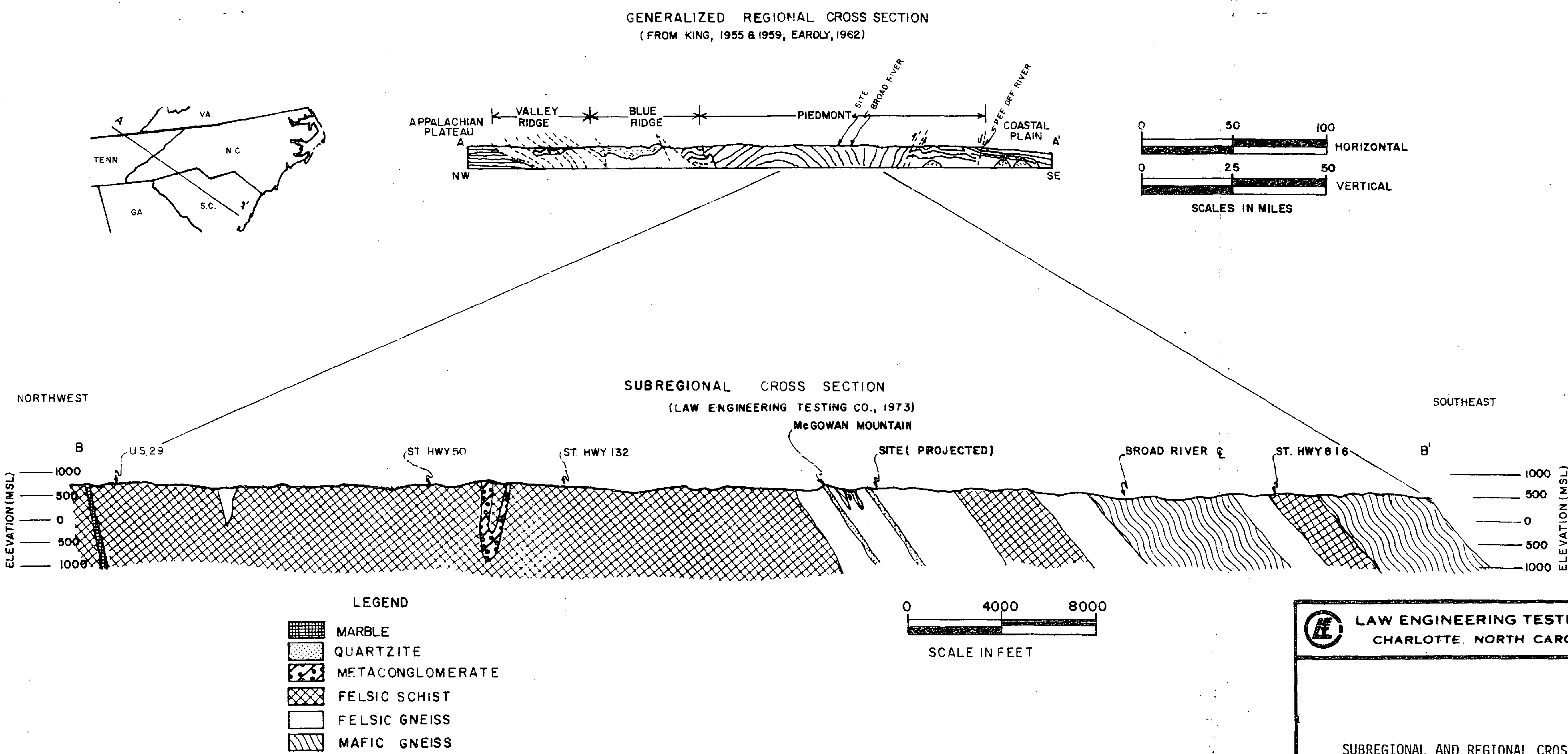
ER Figure 2.4.0-3

THIS PAGE IS AN OVERSIZED DRAWING OR FIGURE,

THAT CAN BE VIEWED AT THE RECORD TITLED:
"SUBREGIONAAL GEOLOGIC MAP, ER Figure 2.4.0-4"

WITHIN THIS PACKAGE... OR BY SEARCHING USING THE

D-04

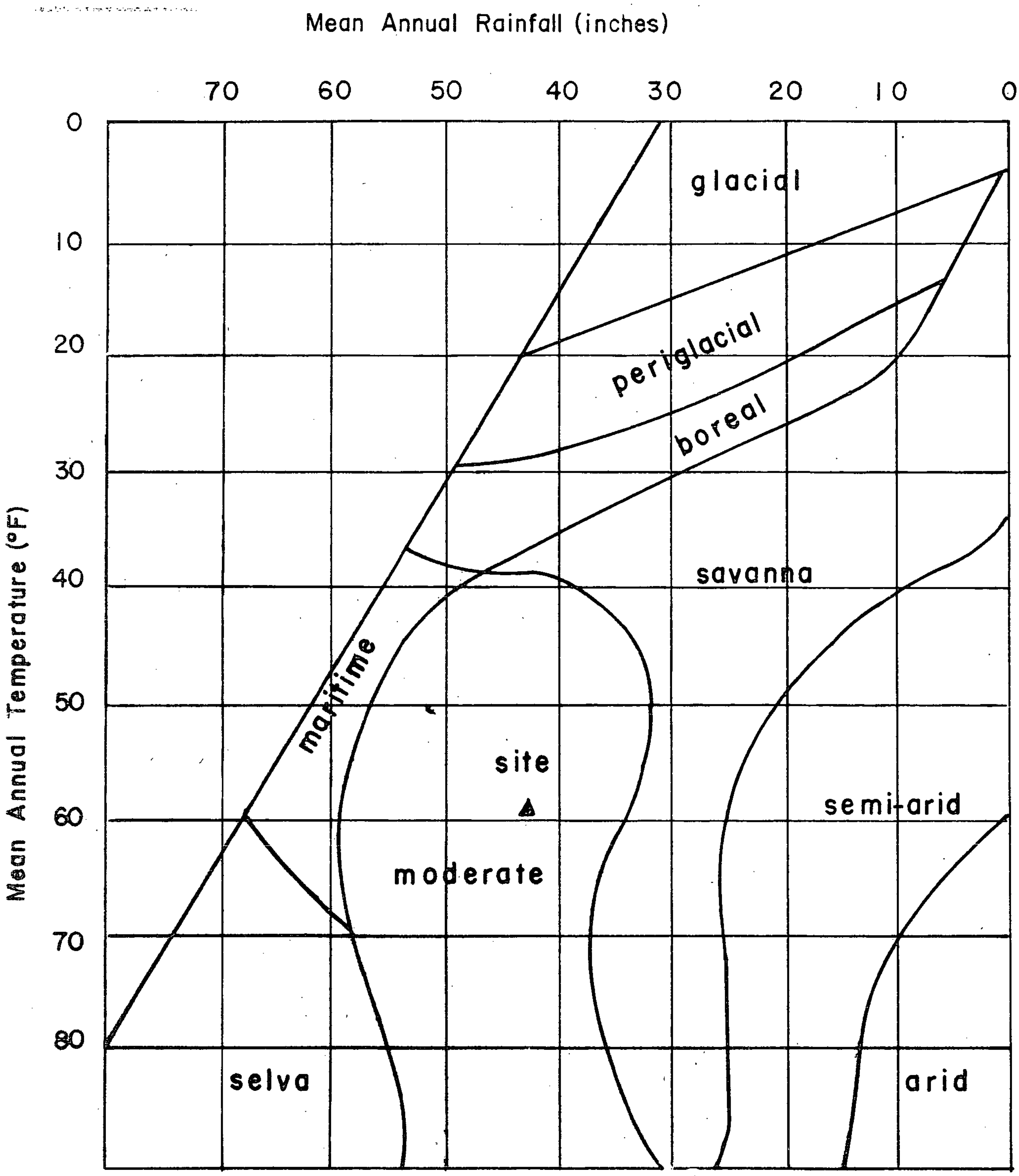


LAW ENGINEERING TESTING CO.
CHARLOTTE, NORTH CAROLINA

SUBREGIONAL AND REGIONAL CROSS SECTION

CHEROKEE NUCLEAR STATION

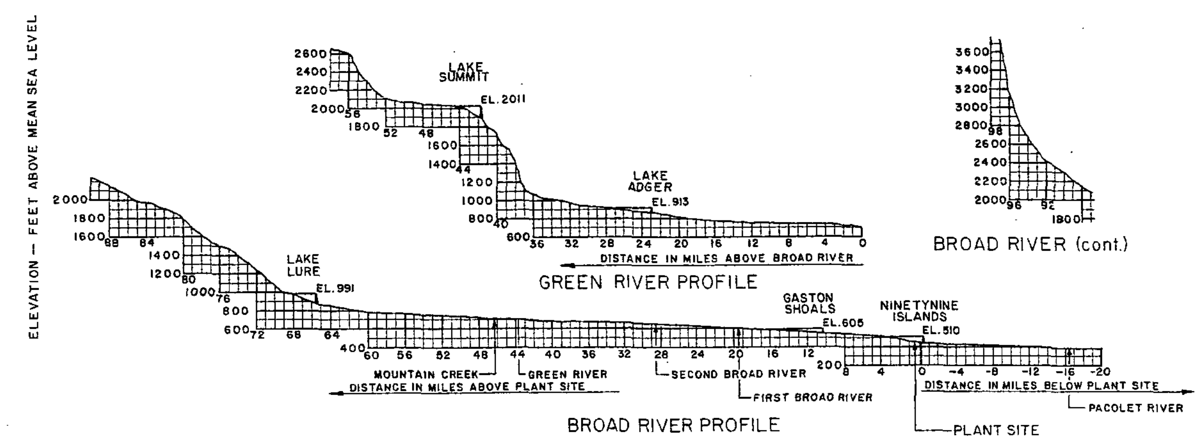
ER Figure 2.4.0-5

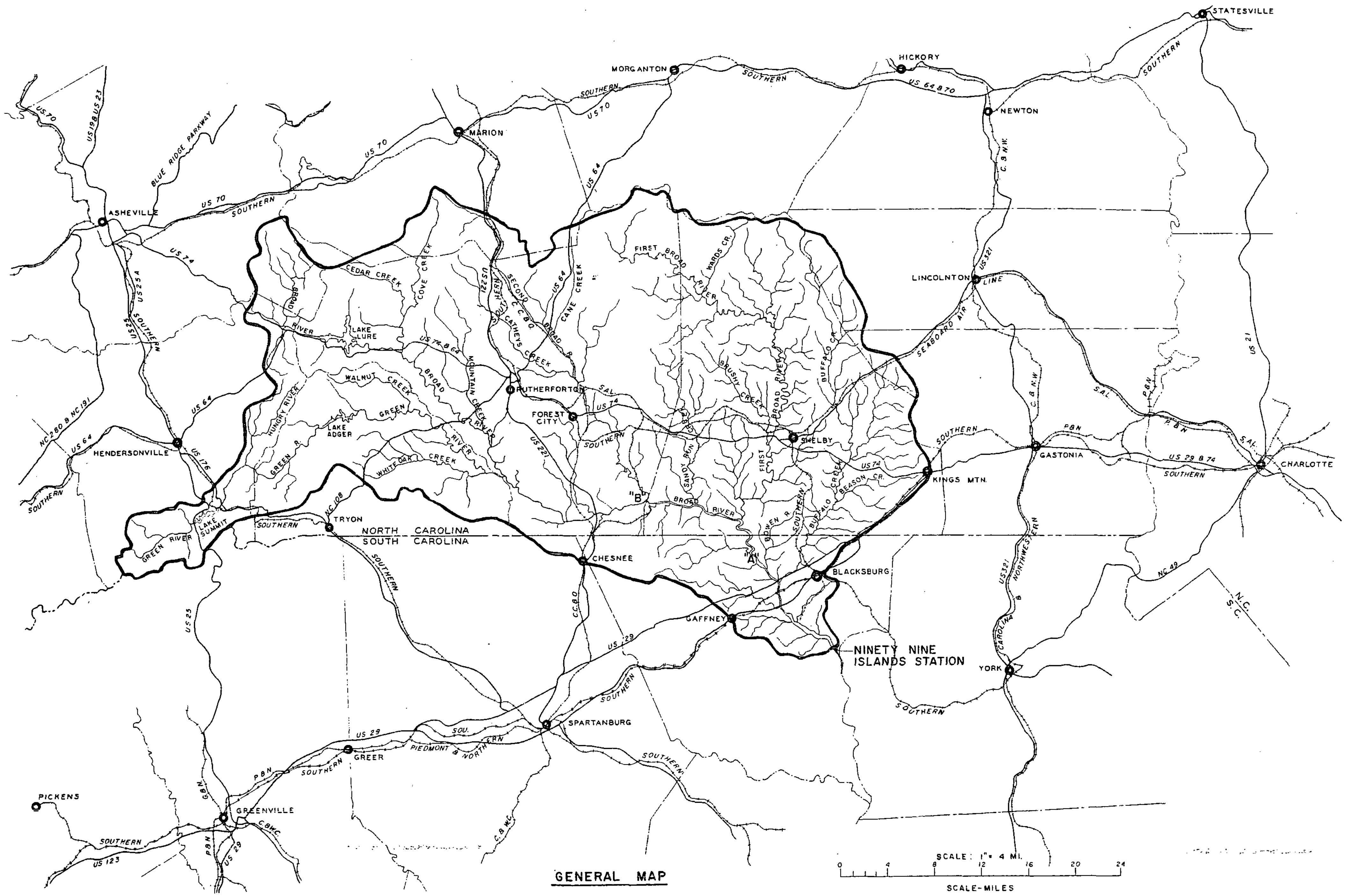


NORPHOGENETIC CLASSIFICATION OF THE SITE

CHEROKEE NUCLEAR STATION

ER Figure 2.4.1-1
Amendment 2 (New)





NOTE:
Elevations shown are U.S.G.S. datum.

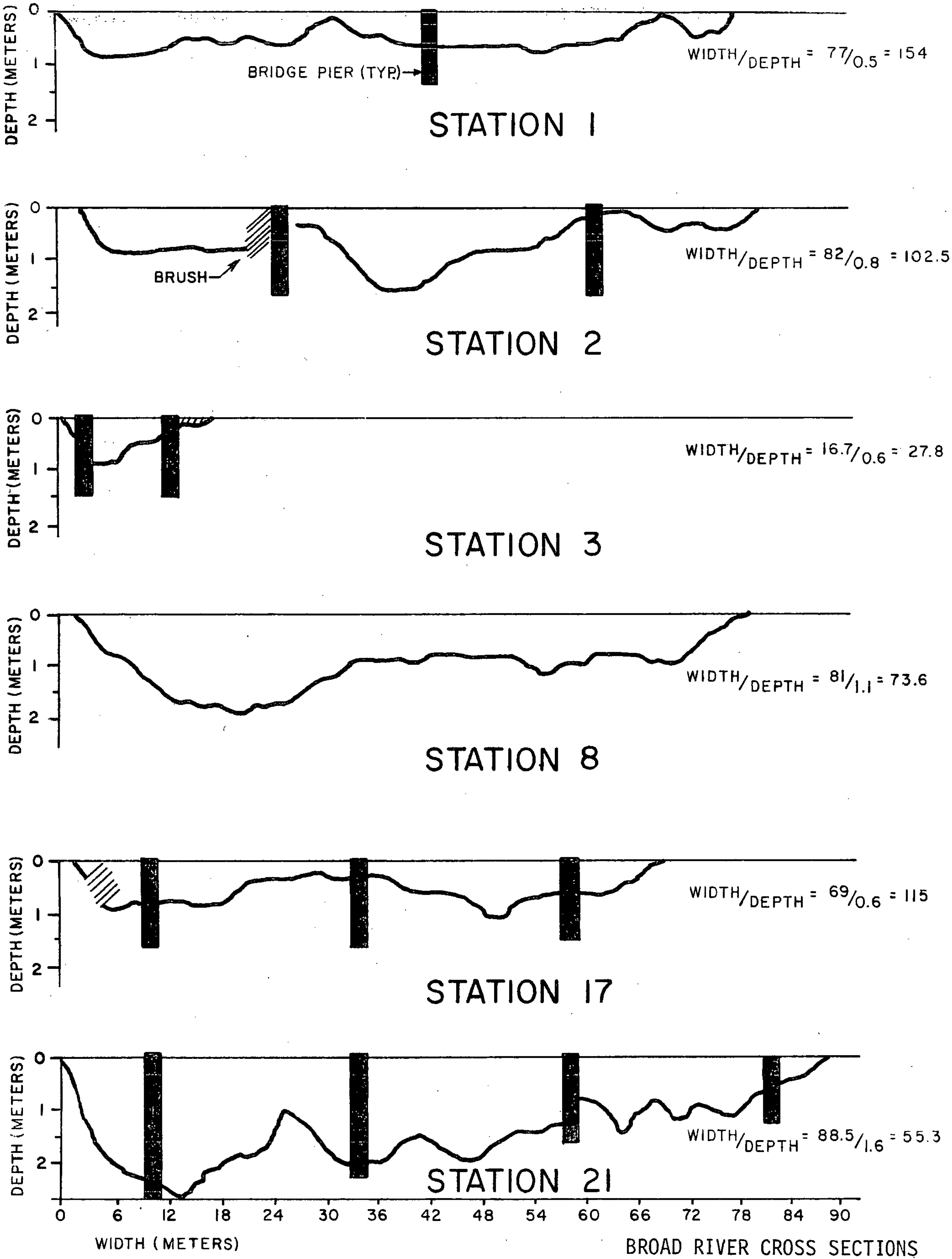
Area designated "A" is the site of Duke Power Co's Gaston Shoals Hydro. Plant.

Area designated "B" is the site of Duke Power Co's Cliffside Steam Station.

BROAD RIVER DRAINAGE
BASIN PLAN AND PROFILE

CHEROKEE NUCLEAR STATION

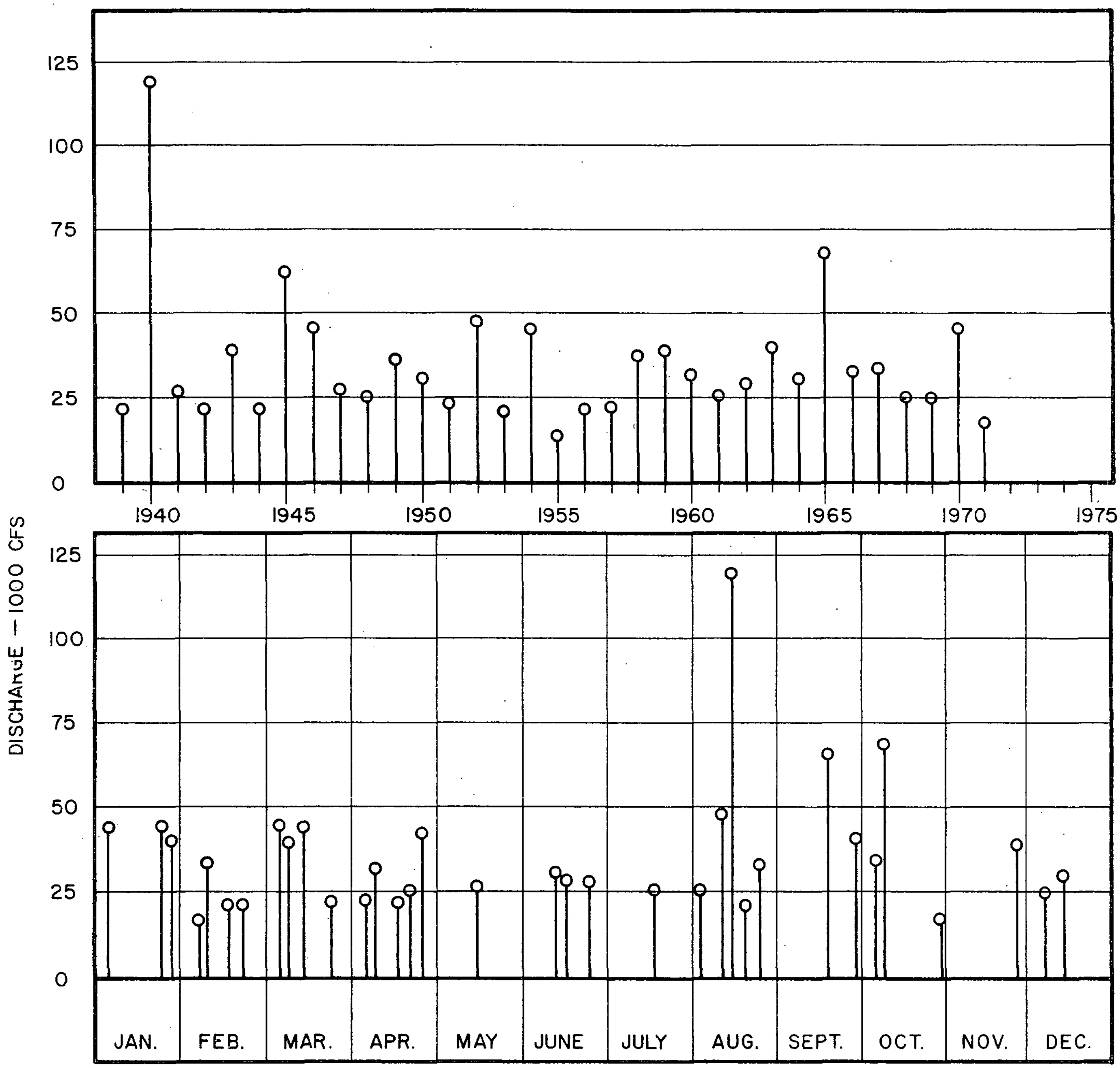
ER Figure 2.5.1-1



BROAD RIVER CROSS SECTIONS

CHEROKEE NUCLEAR STATION

ER Figure 2.5.1-2

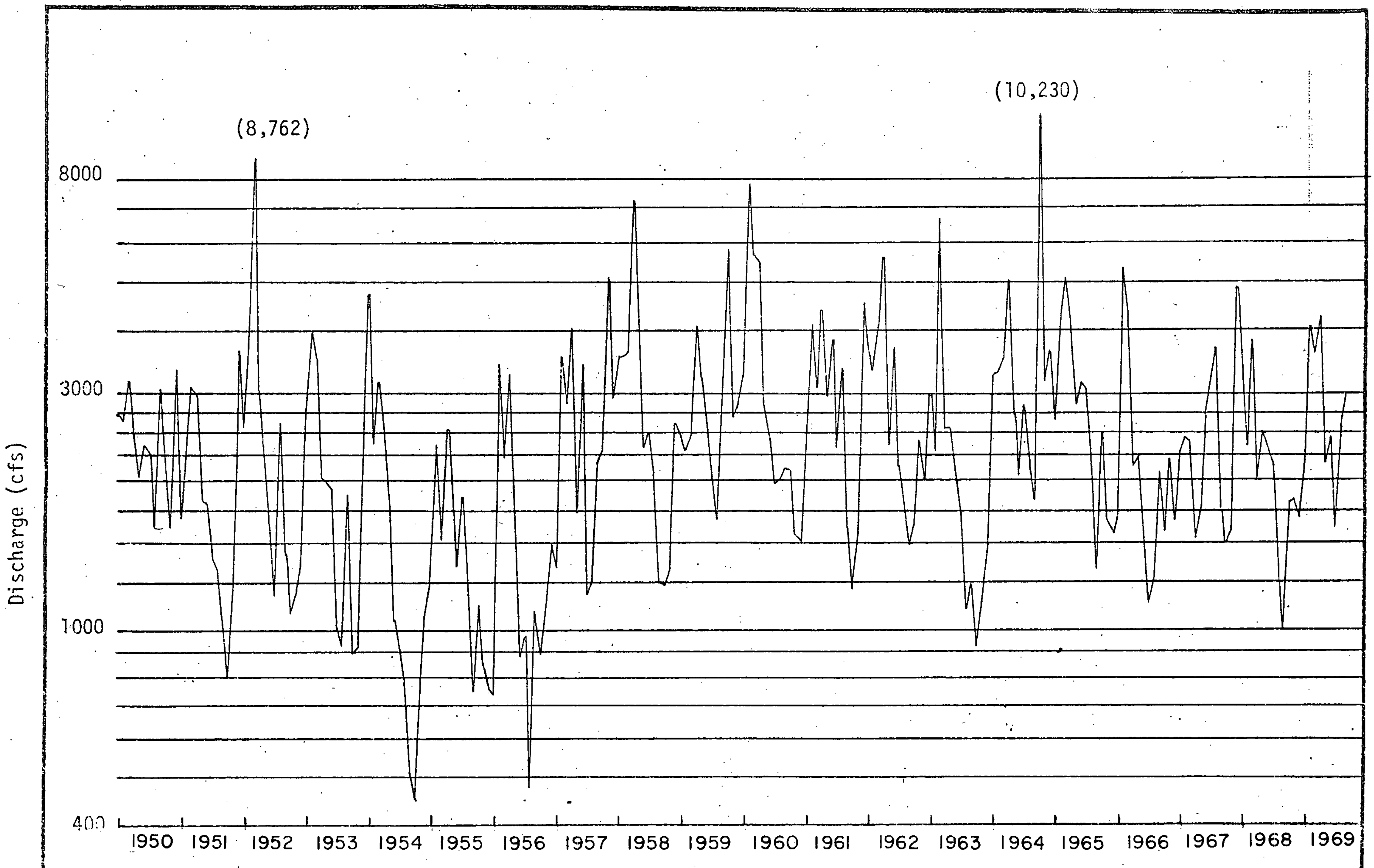


NOTE: BOTTOM CHART SHOWS MONTH OF OCCURANCE OF MAXIMUM ANNUAL FLOWS.

MAXIMUM FLOWS BY MONTHS

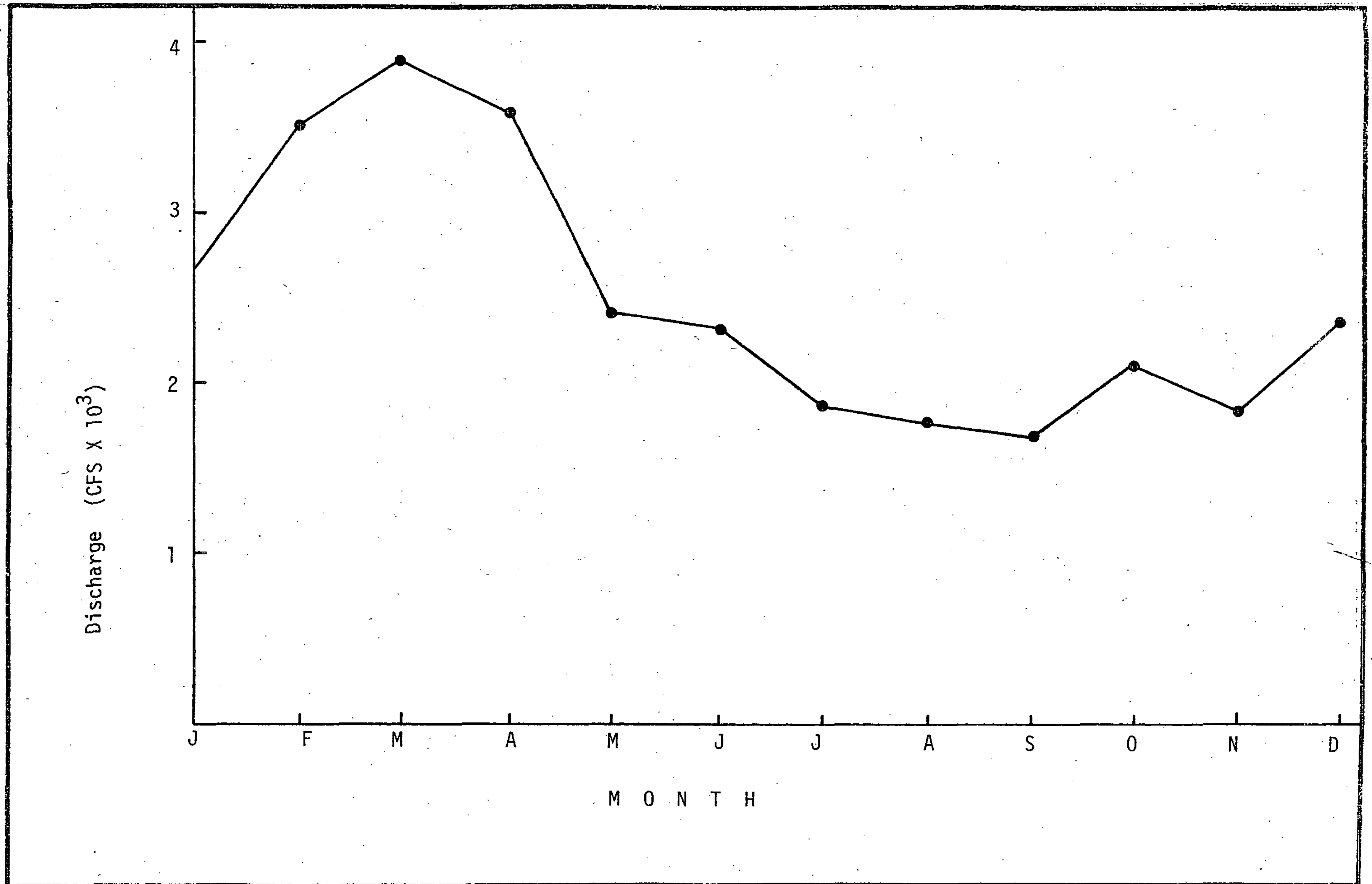
CHEROKEE NUCLEAR STATION

ER Figure 2.5.1-3



VARIATION IN MONTHLY FLOWS -
BROAD RIVER NEAR GAFFNEY, S. C.

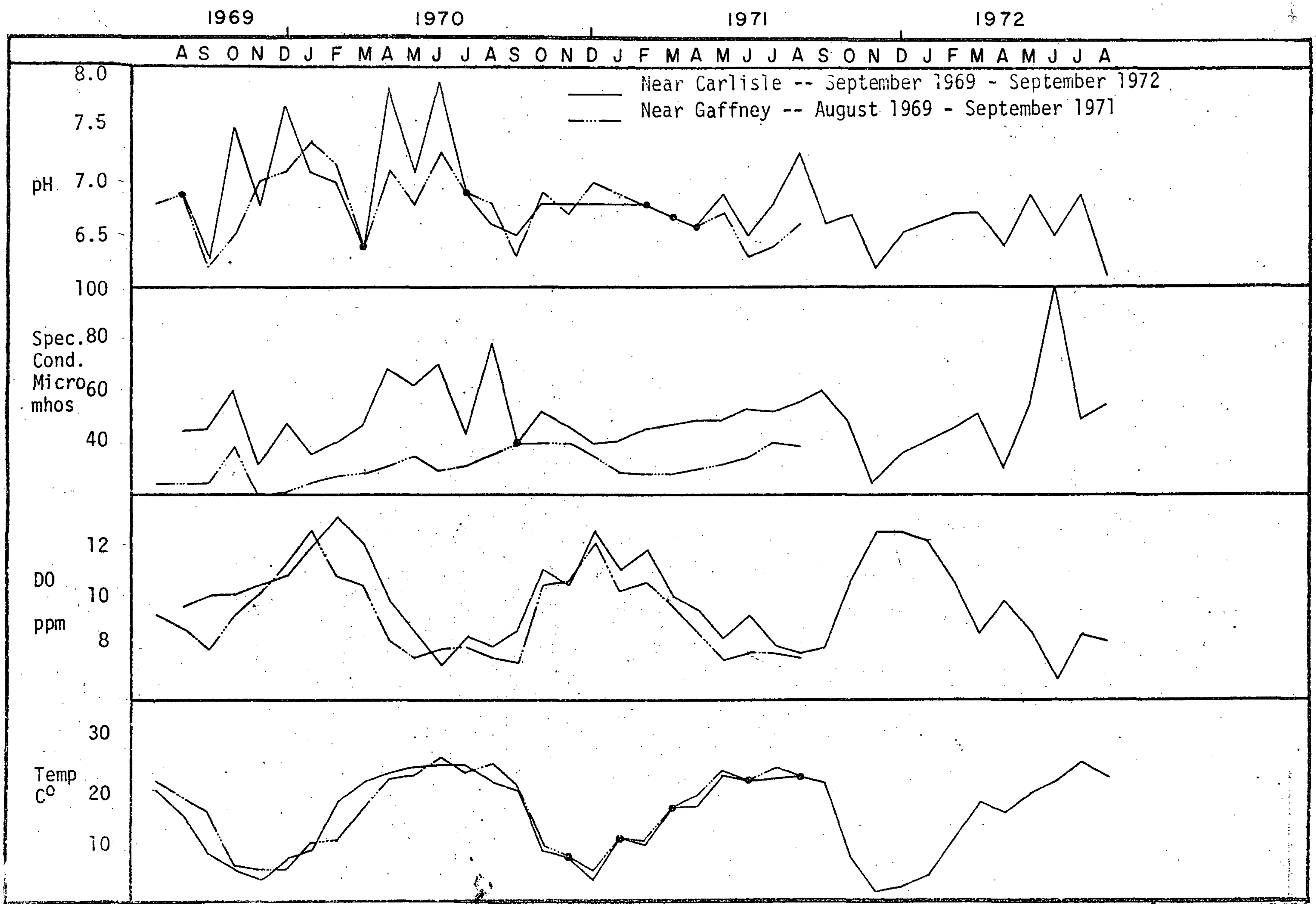
CHEROKEE NUCLEAR STATION



AVERAGE MONTHLY DISCHARGE OF THE
BROAD RIVER AT GAFFNEY, S. C.

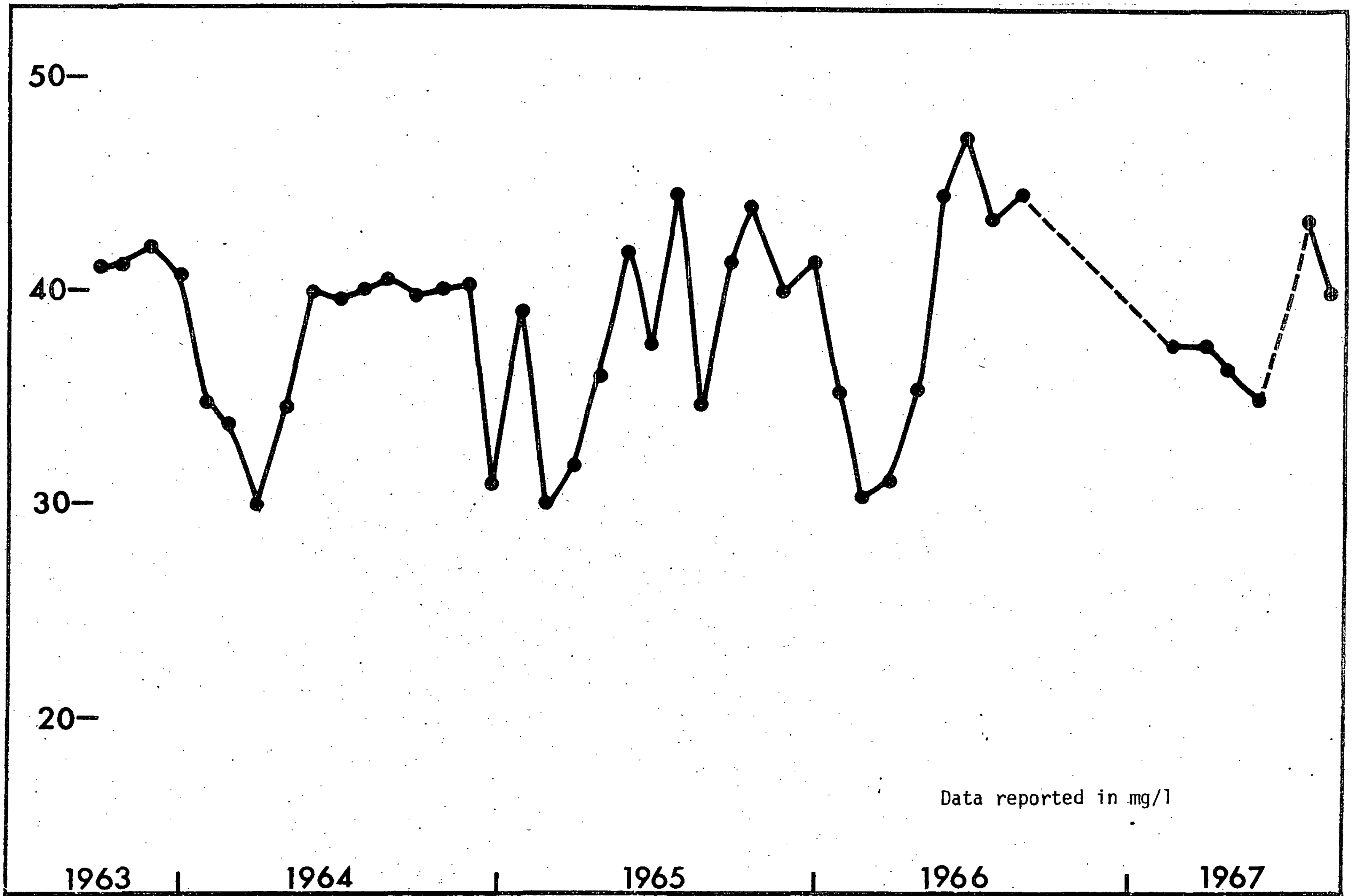
CHEROKEE NUCLEAR STATION

ER Figure 2.5.1-5



VARIATION IN TEMPERATURE, SPECIFIC CONDUCTIVITY, DO, AND pH AT GAFFNEY AND CARLISLE GAGES.

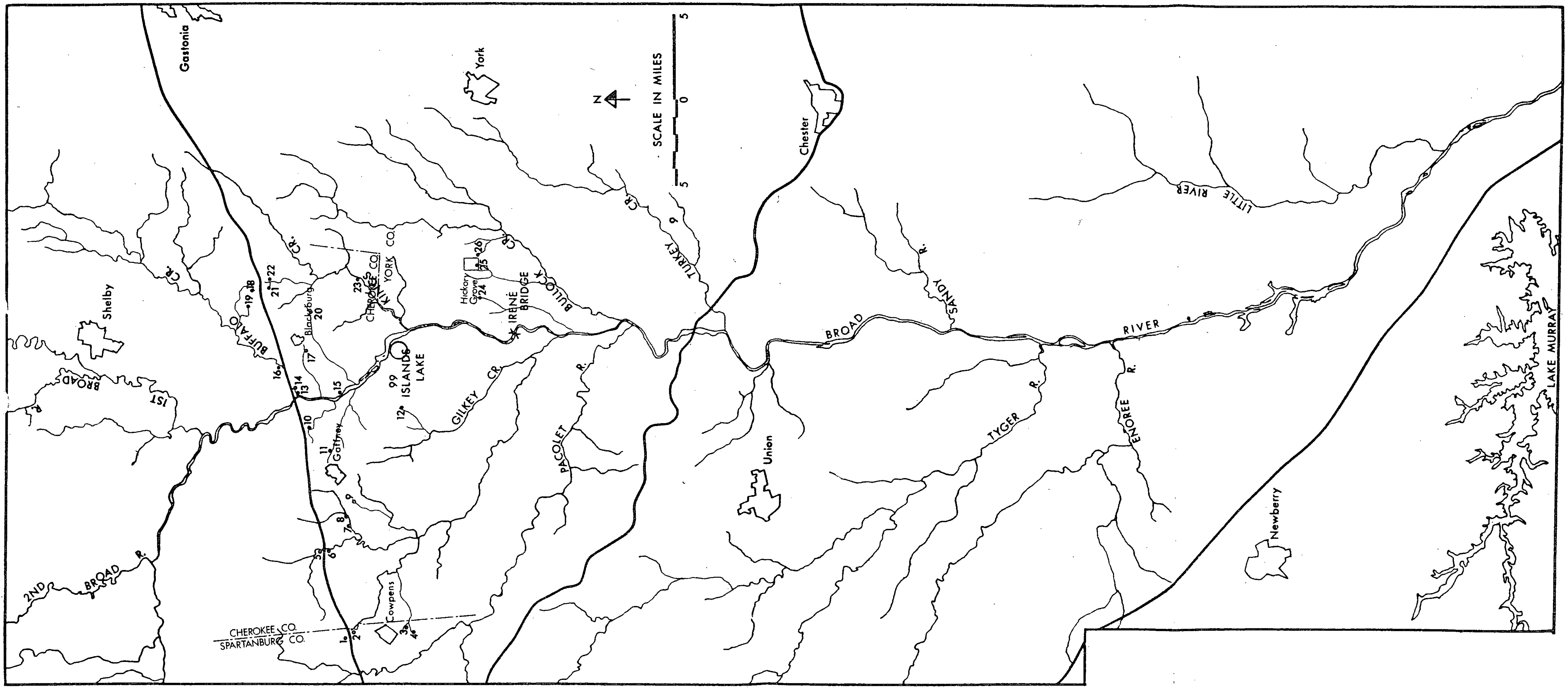
CHEROKEE NUCLEAR STATION



VARIATION IN DISSOLVED SOLIDS AT
THE BOILING SPRINGS GAGE, BROAD RIVER

CHEROKEE NUCLEAR STATION

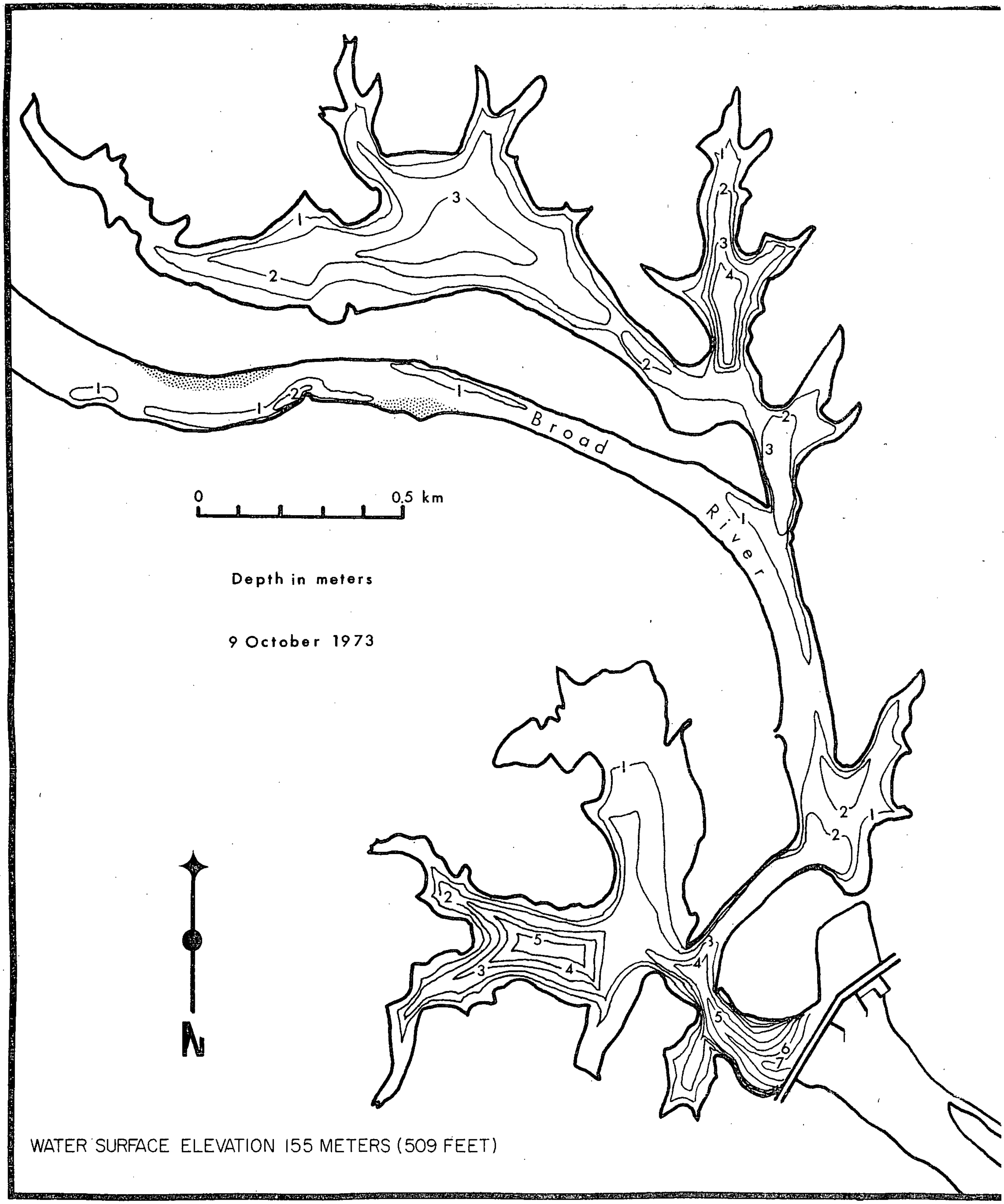
ER Figure 2.5.1-7



LOCATION OF POINT POLLUTION SOURCES

CHEROKEE NUCLEAR STATION

ER Figure 2.5.1-8



BATHYMETRIC MAP OF NINETY NINE ISLANDS RESERVOIR

DUKE POWER CITIZENSHIP SERVICE

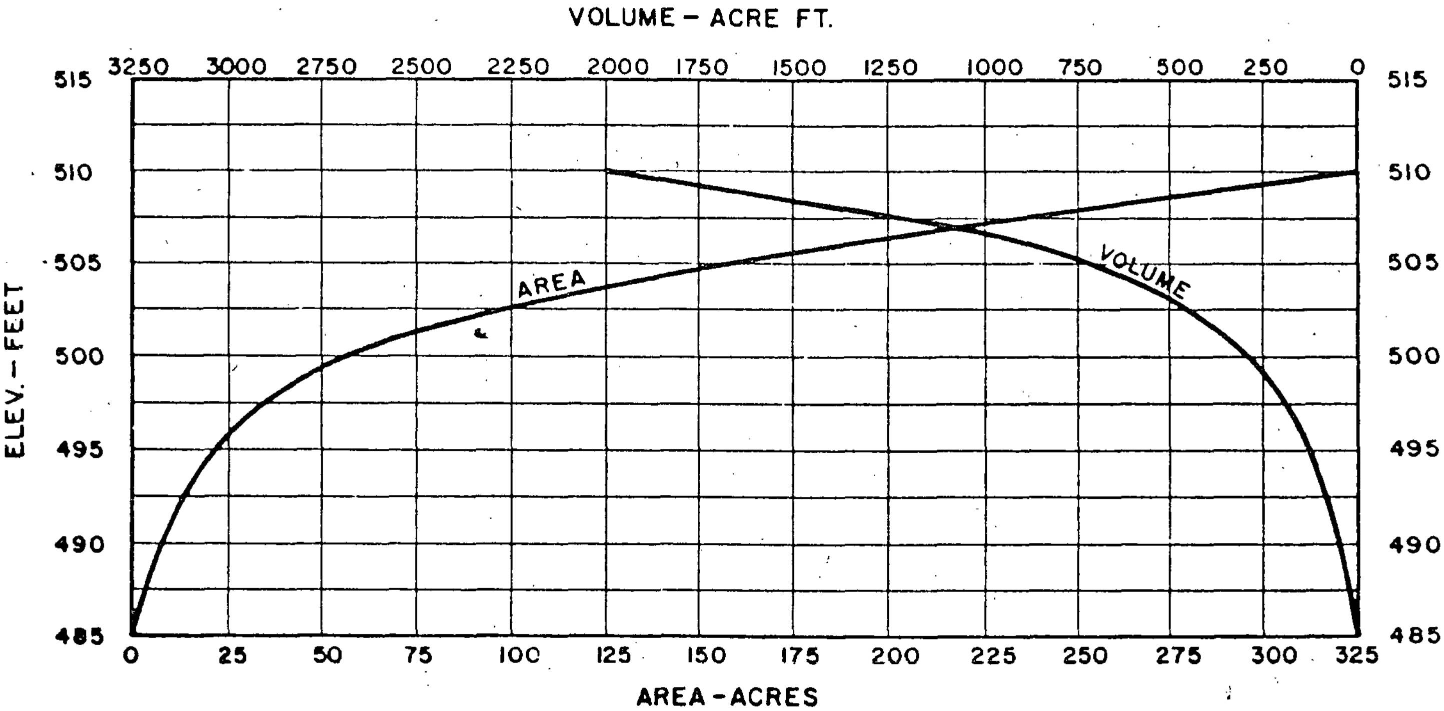
CHEROKEE NUCLEAR STATI(

ER Figure 2.5.2-1

FOREBAY WATER ELEVATIONS

CHEROKEE NUCLEAR STATION

ER Figure 2.5.2-1a
Amendment 2

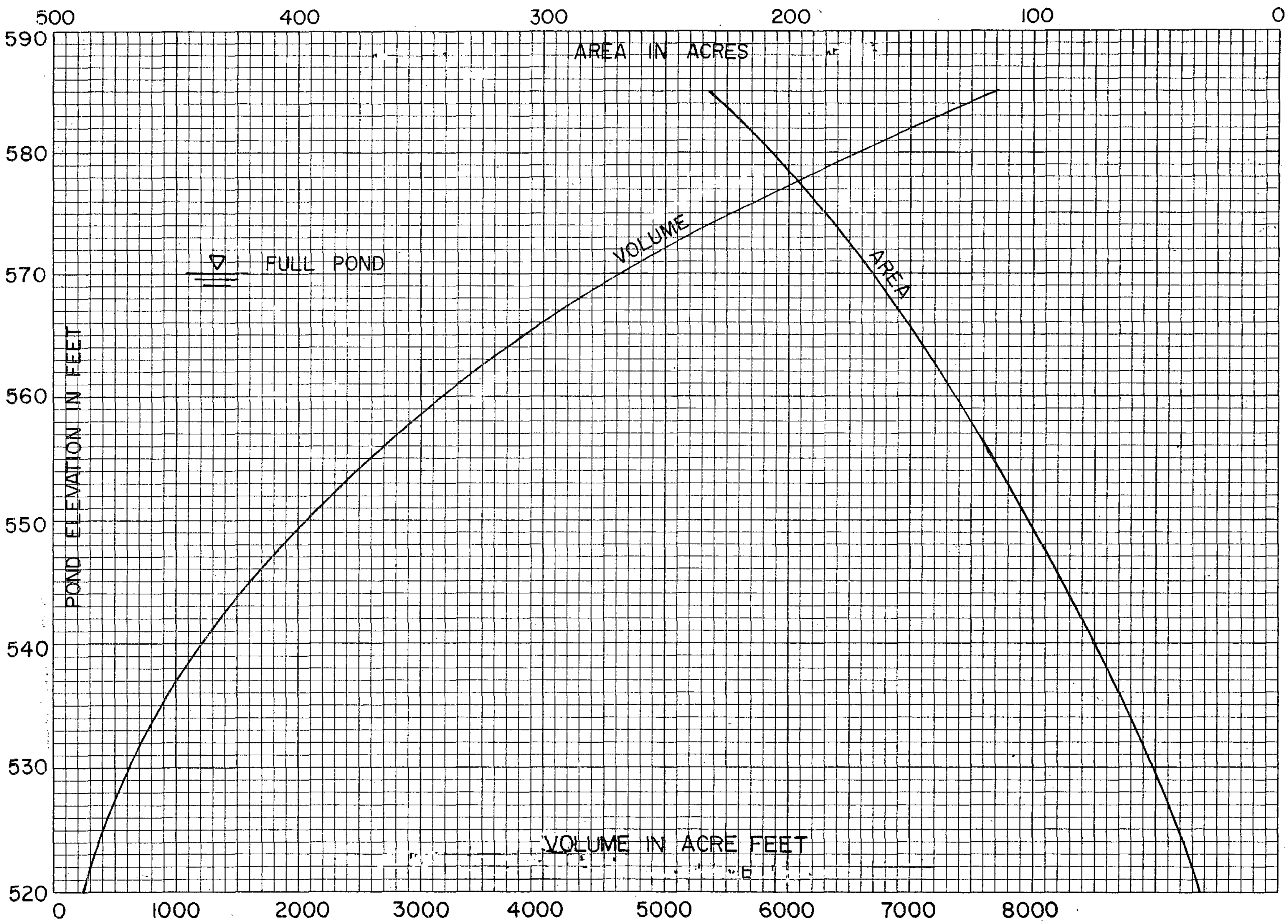


NOTE: AREA VOLUME CURVE DEVELOPED FROM A BATHYMETRIC SURVEY DONE IN SEPTEMBER, 1973

NINETY-NINE ISLANDS RESERVOIR
AREA-VOLUME CURVE

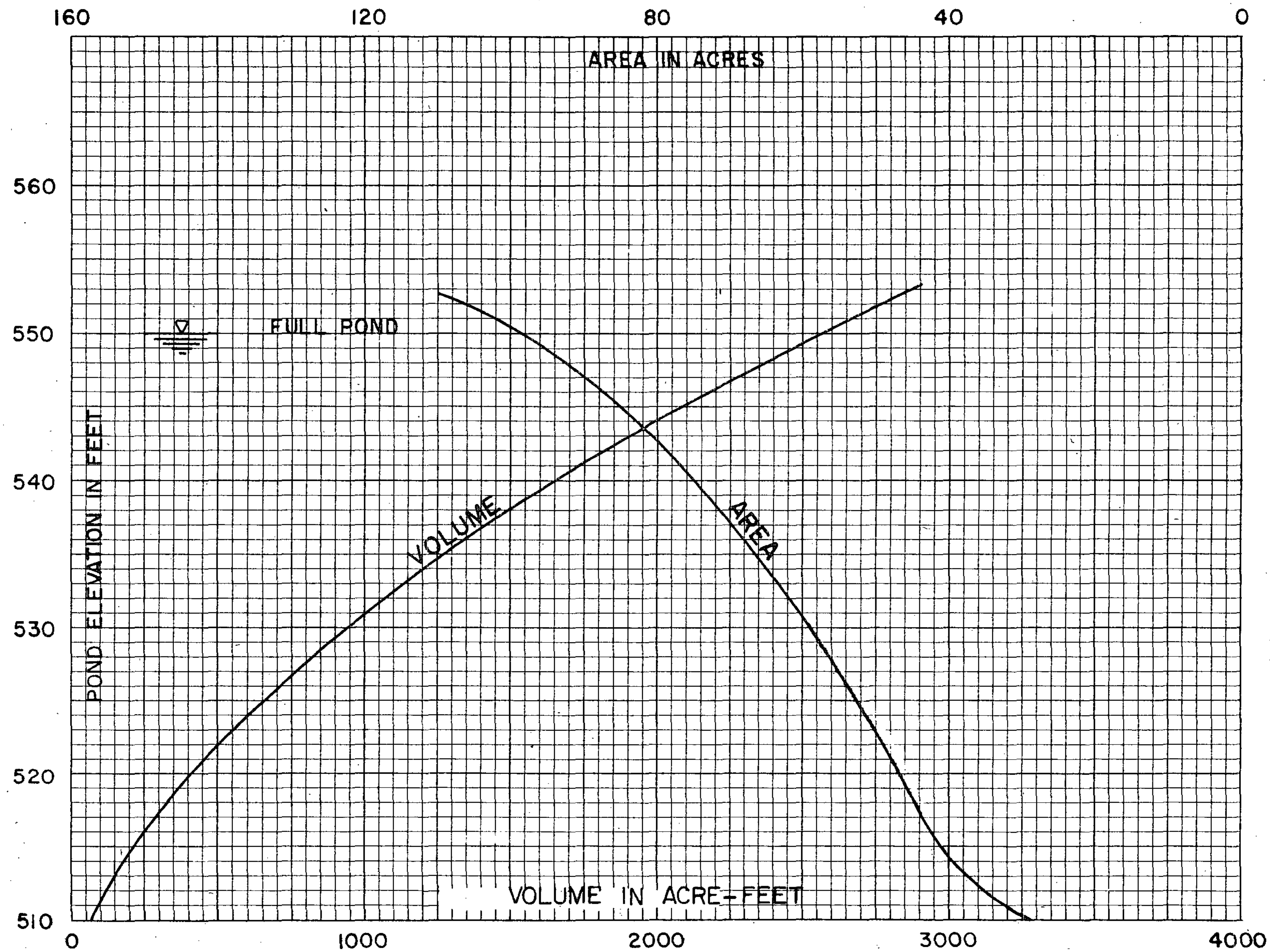
CHEROKEE NUCLEAR STATION

ER Figure 2.5.2-1b
Amendment 2 (New)



NUCLEAR SERVICE WATER POND
AREA-VOLUME CURVE

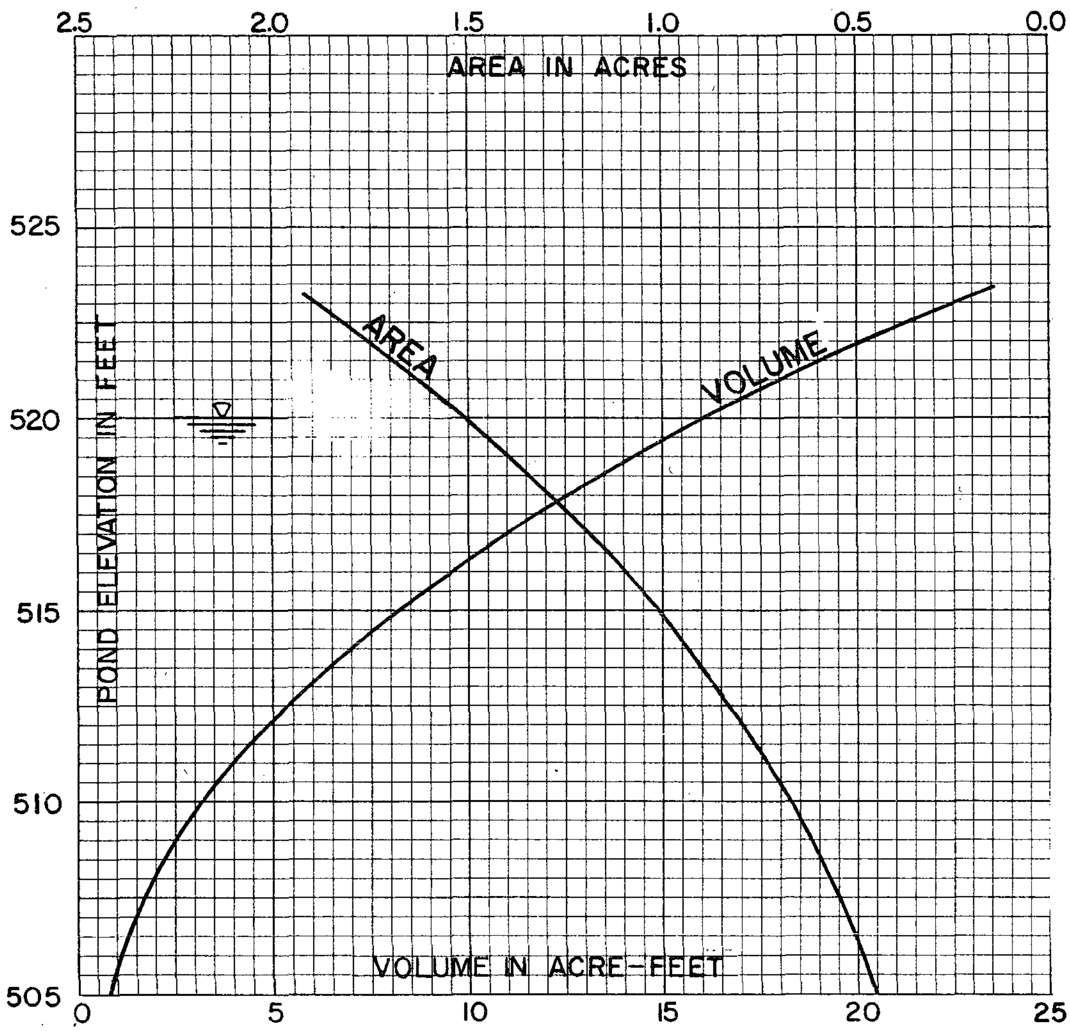
CHEROKEE NUCLEAR STATION
ER Figure 2.5.3-1
Amendment 2 (New)



INTAKE SEDIMENTATION BASIN
AREA-VOLUME CURVE

CHEROKEE NUCLEAR STATION

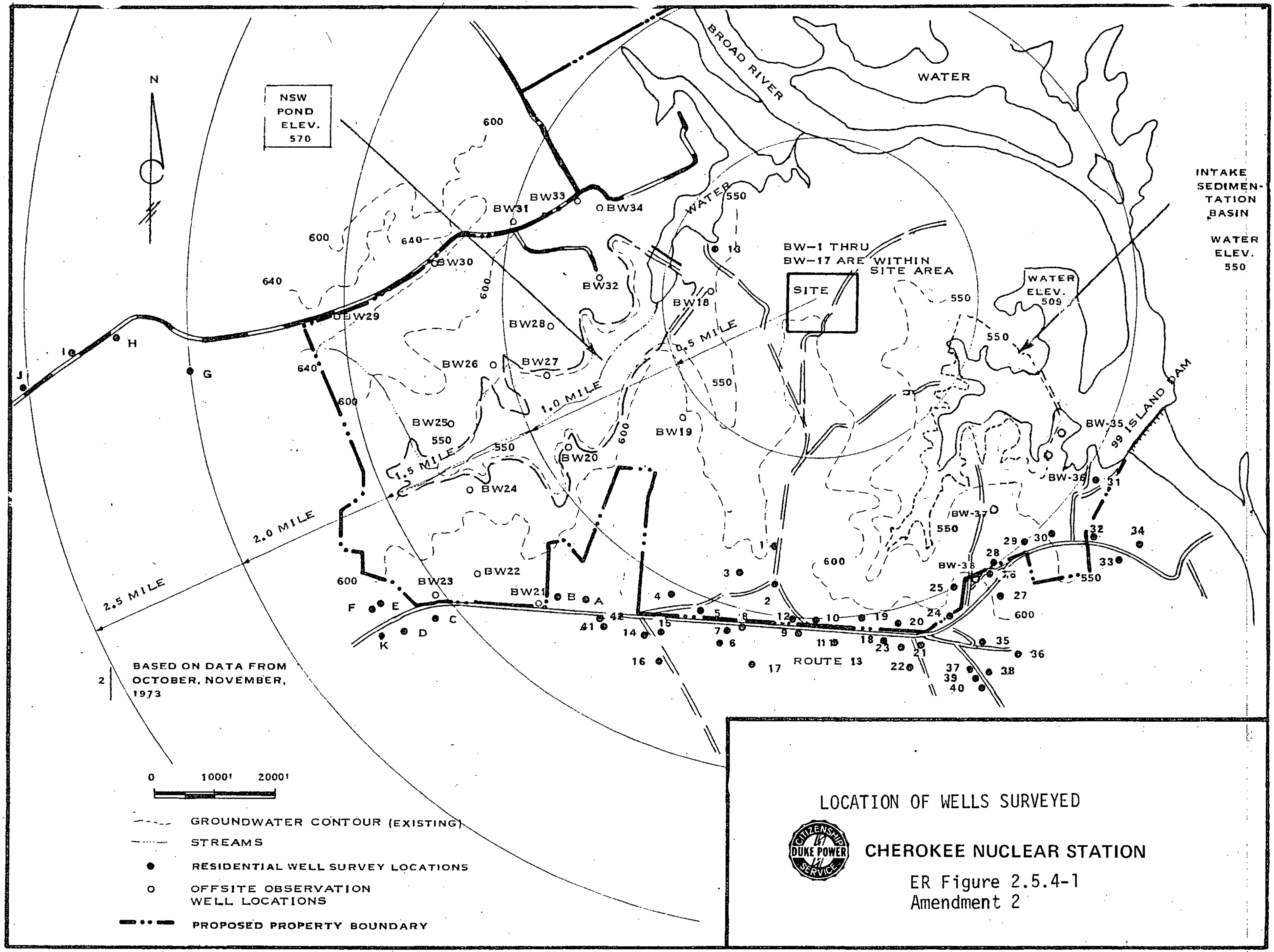
ER Figure 2.5.3-2
Amendment 2 (New)



AUXILARY HOLDING POND
AREA-VOLUME CURVE

CHEROKEE NUCLEAR STATION

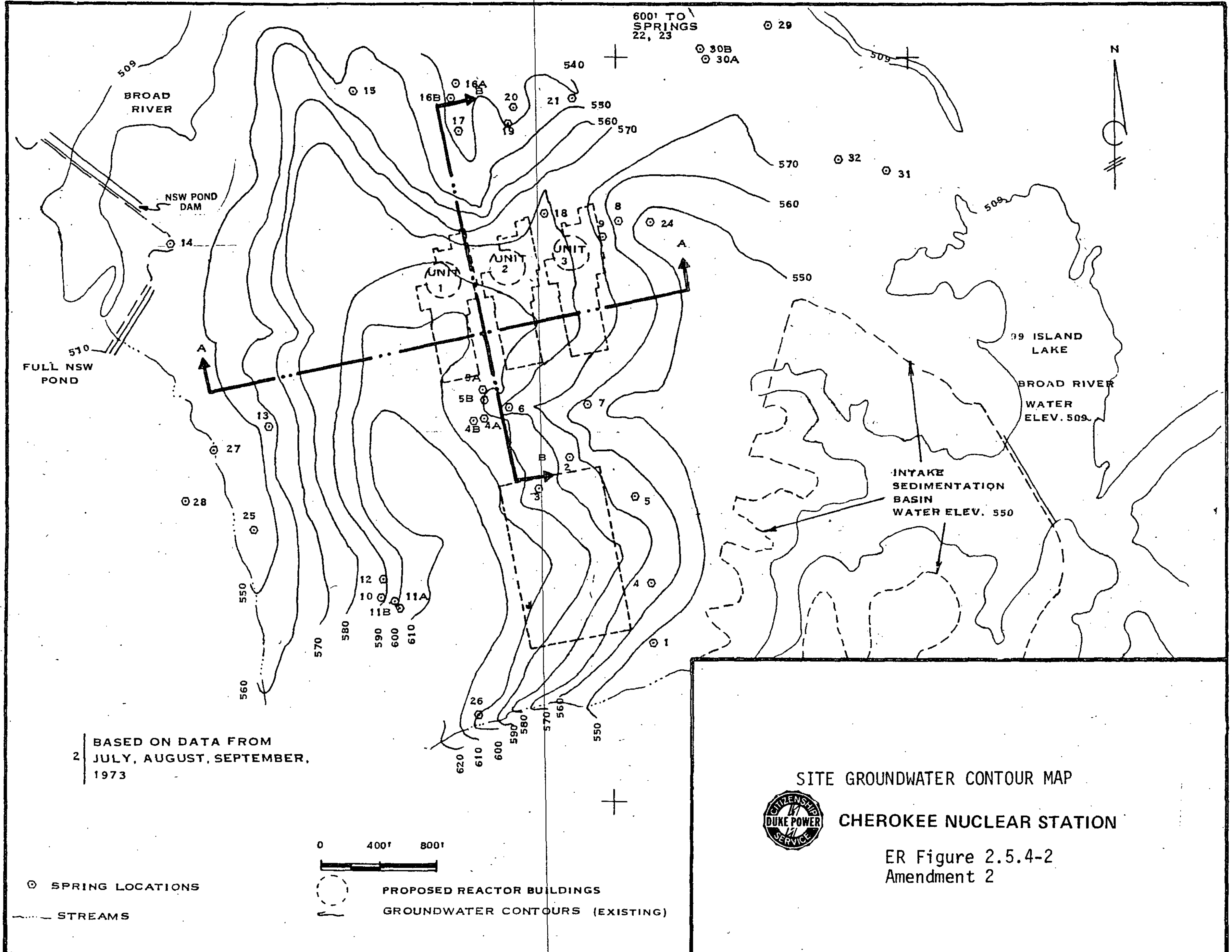
ER Figure 2.5.3-3
Amendment 2 (New)



LOCATION OF WELLS SURVEYED

CHEROKEE NUCLEAR STATION

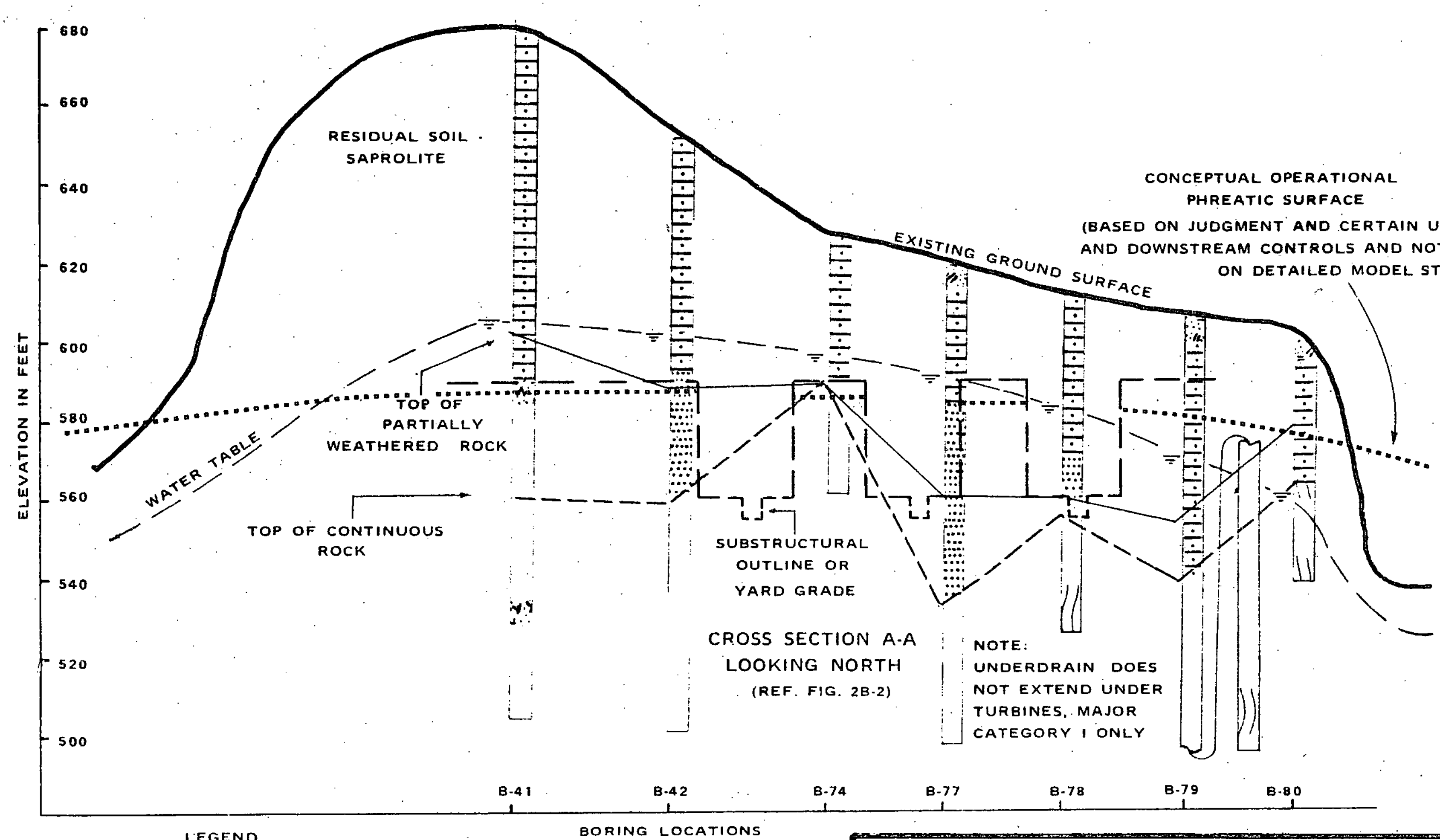
ER Figure 2.5.4-1
Amendment 2



SITE GROUNDWATER CONTOUR MAP

CHEROKEE NUCLEAR STATION

ER Figure 2.5.4-2
Amendment 2



LEGEND

SANDY SILT		MAFIC GNEISS	
CLAYEY SILT		FELSIC GNEISS	
SILTY SAND		PEGMATITE	

HORIZONTAL SCALE

0 400 800

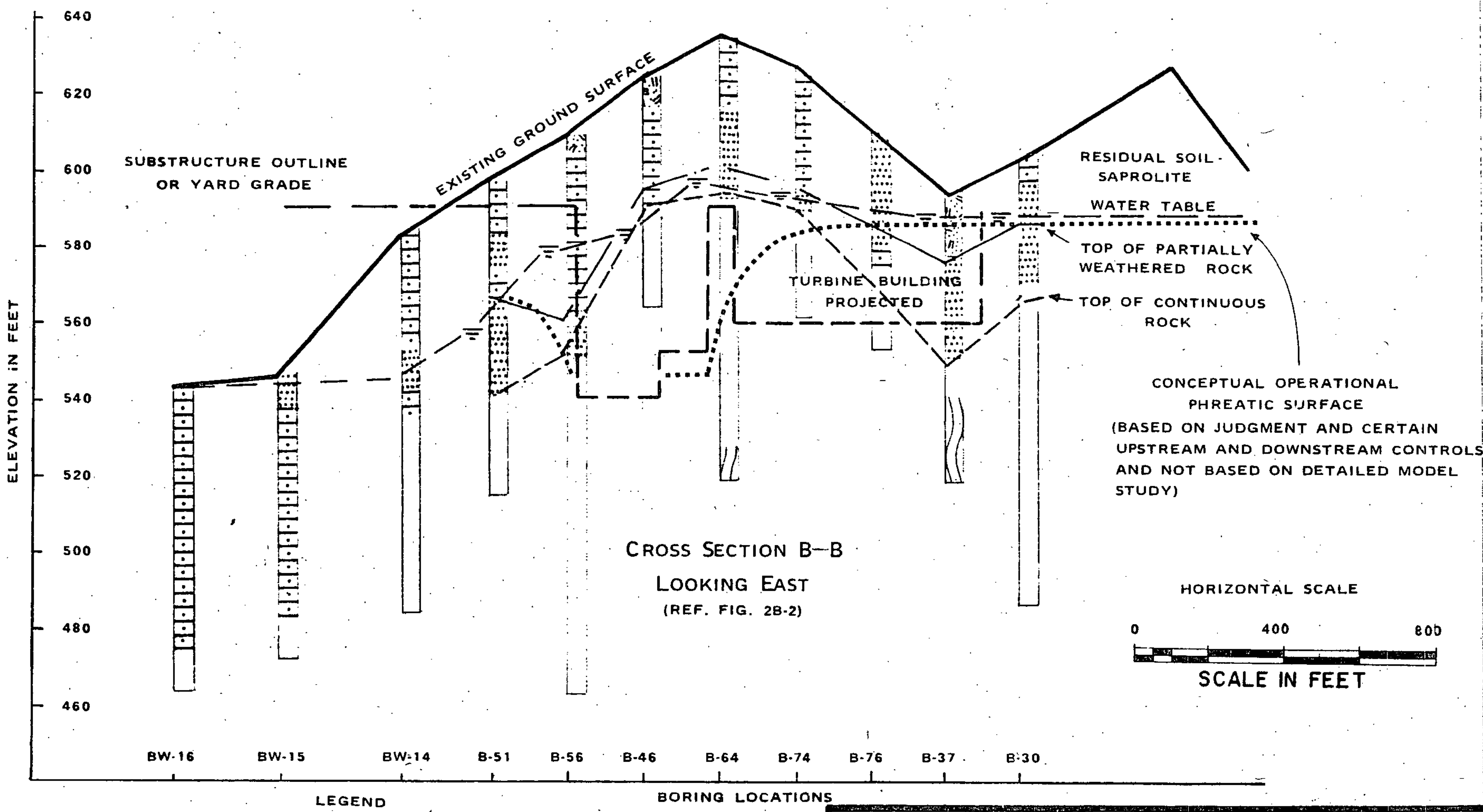
SCALE IN FEET

NOTE: SITE UNDERLAIN BY A SINGLE GROUNDWATER TABLE AQUIFER OF LIMITED EXTENT AND WITHOUT A FORMAL NAME

SITE CROSS SECTIONS

CHEROKEE NUCLEAR STATION

ER Figure 2.5.4-3 (1 of 2)
Amendment 2



LEGEND

SANDY SILT

CLAYEY SILT

SILTY SAND

MAFIC GNEISS

FELSIC GNEISS

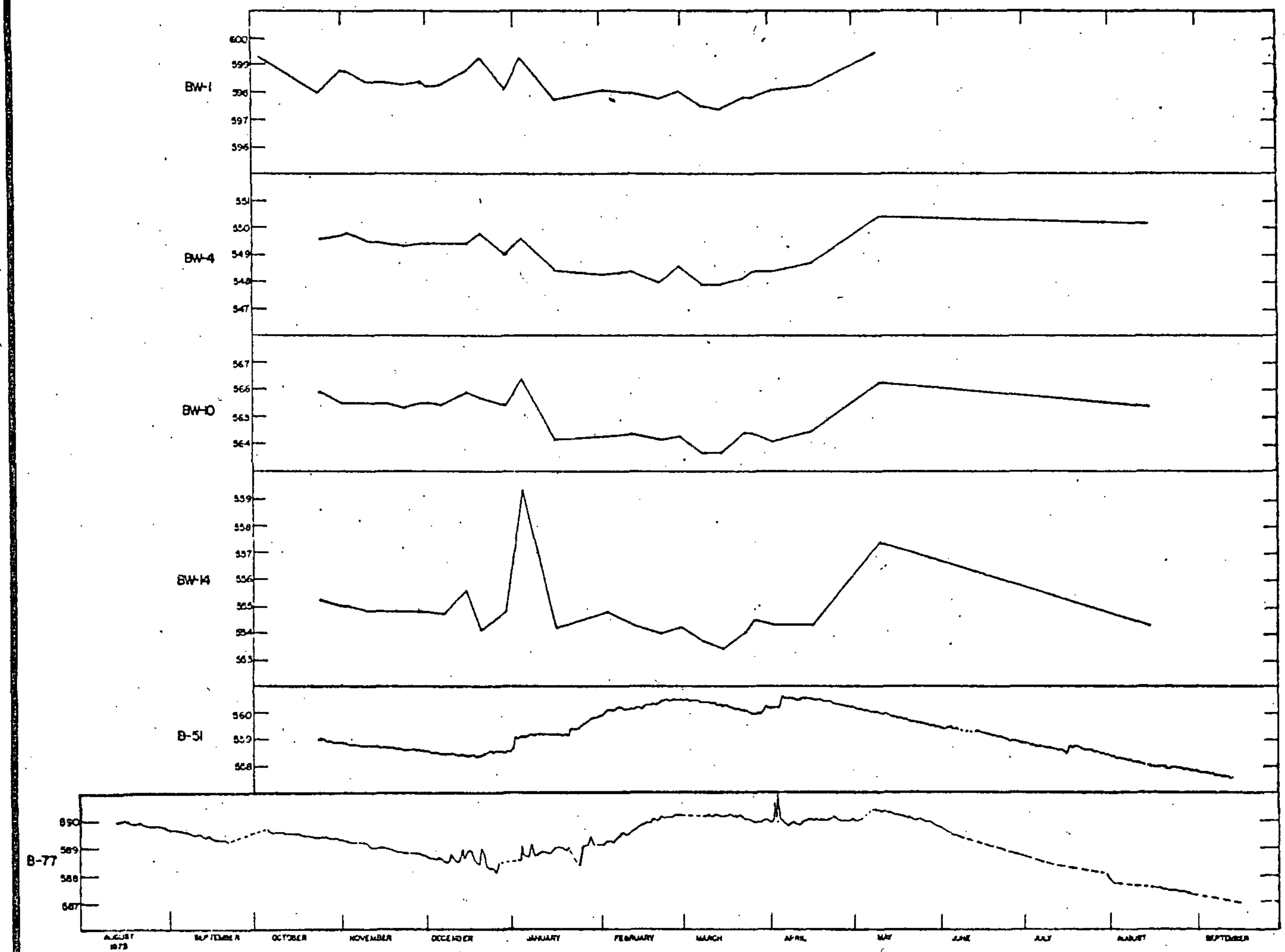
NOTE: SITE UNDERLAIN BY A SINGLE GROUNDWATER TABLE AQUIFER OF LIMITED EXTENT AND WITHOUT A FORMAL NAME

SITE CROSS SECTIONS

DUKE POWER

CHEROKEE NUCLEAR STATION

ER Figure 2.5.4-3 (2 of 2)
Amendment 2



NOTE: BORINGS B-51 AND B-77 ARE EQUIPPED WITH WELL RECORDERS, OTHERS READ MANUALLY ON PERIODIC BASIS.

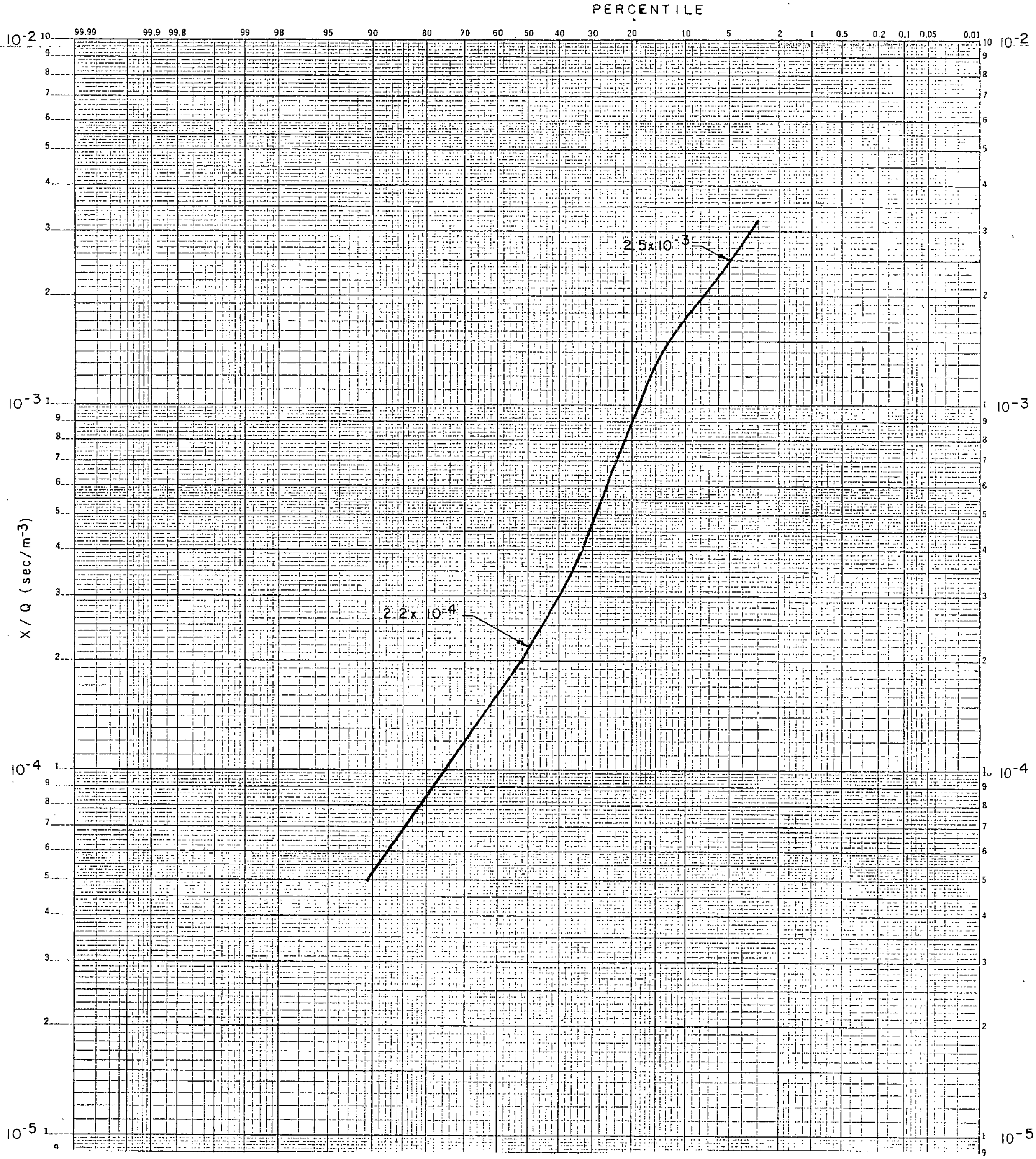
LAW ENGINEERING TESTING CO.
CHARLOTTE, NORTH CAROLINA

GROUNDWATER LEVELS

CITIZENSHIP DUKE POWER SERVICE

CHEROKEE NUCLEAR STATION

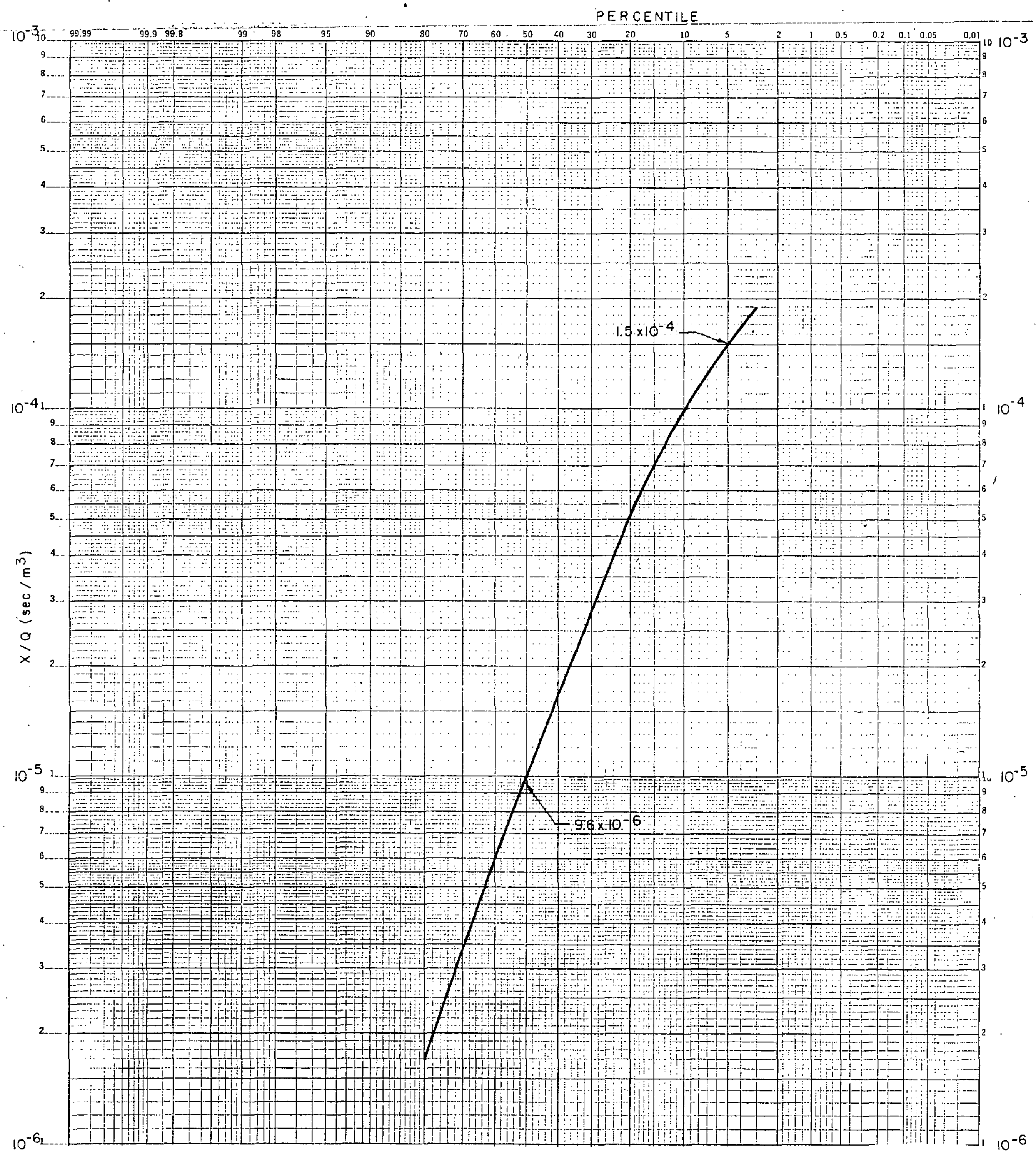
ER Figure 2.5.4-4
Amendment 2



CUMULATIVE FREQUENCY DISTRIBUTION
OF HOURLY X/Q VALVES AT EXCLUSION AREA
BOUNDARY (762m)
PERIOD OF RECORD:
SEPT. 11, 1973 - SEPT. 11, 1974

CHEROKEE NUCLEAR STATION

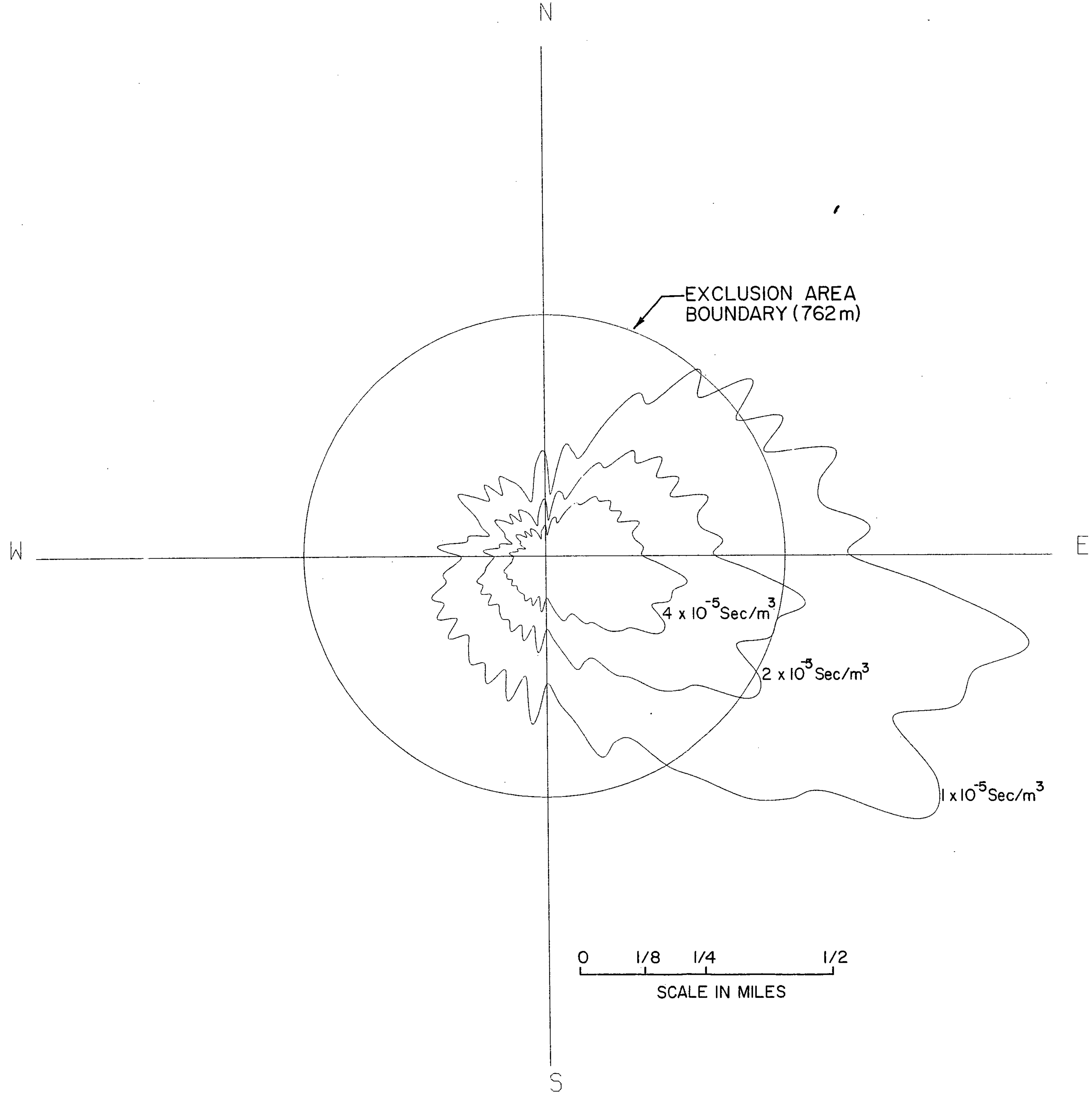
ER Figure 2.6.2-1
Amendment 1
(New)
Amendment 2
(Revised)



CUMULATIVE FREQUENCY DISTRIBUTION OF
HOURLY X/Q VALVES AT LOW POPULATION
ZONE BOUNDARY (8048m)
PERIOD OF RECORD:
SEPT. 11, 1973 - SEPT. 11, 1974

CHEROKEE NUCLEAR STATION

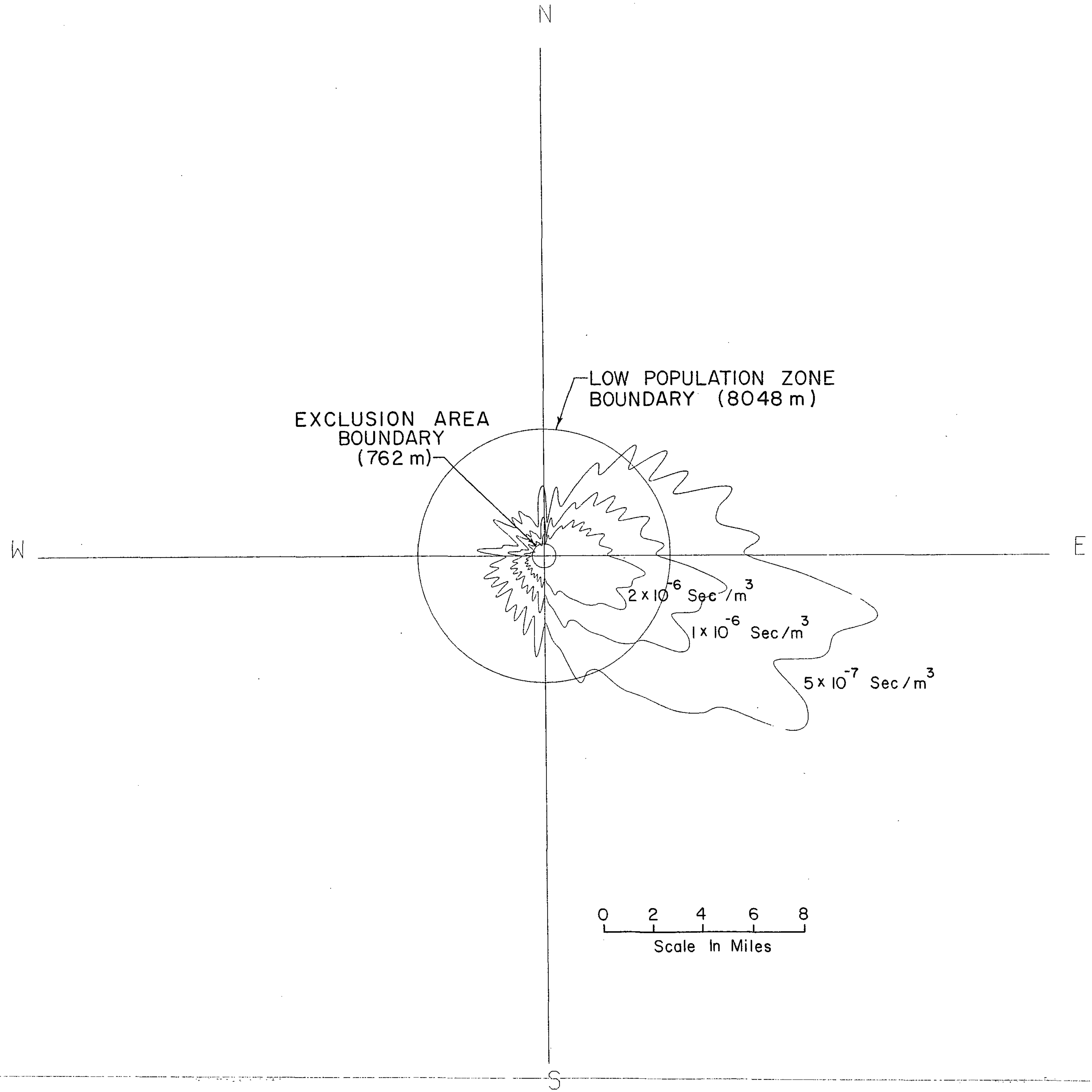
ER Figure 2.6.2-2
Amendment 1
(New)
Amendment 2
(Revised)



AREAL DISTRIBUTION OF ANNUAL
AVERAGE X/Q PERIOD OF RECORD:
SEPT. 11, 1973 - SEPT. 11, 1974

CHEROKEE NUCLEAR STATION

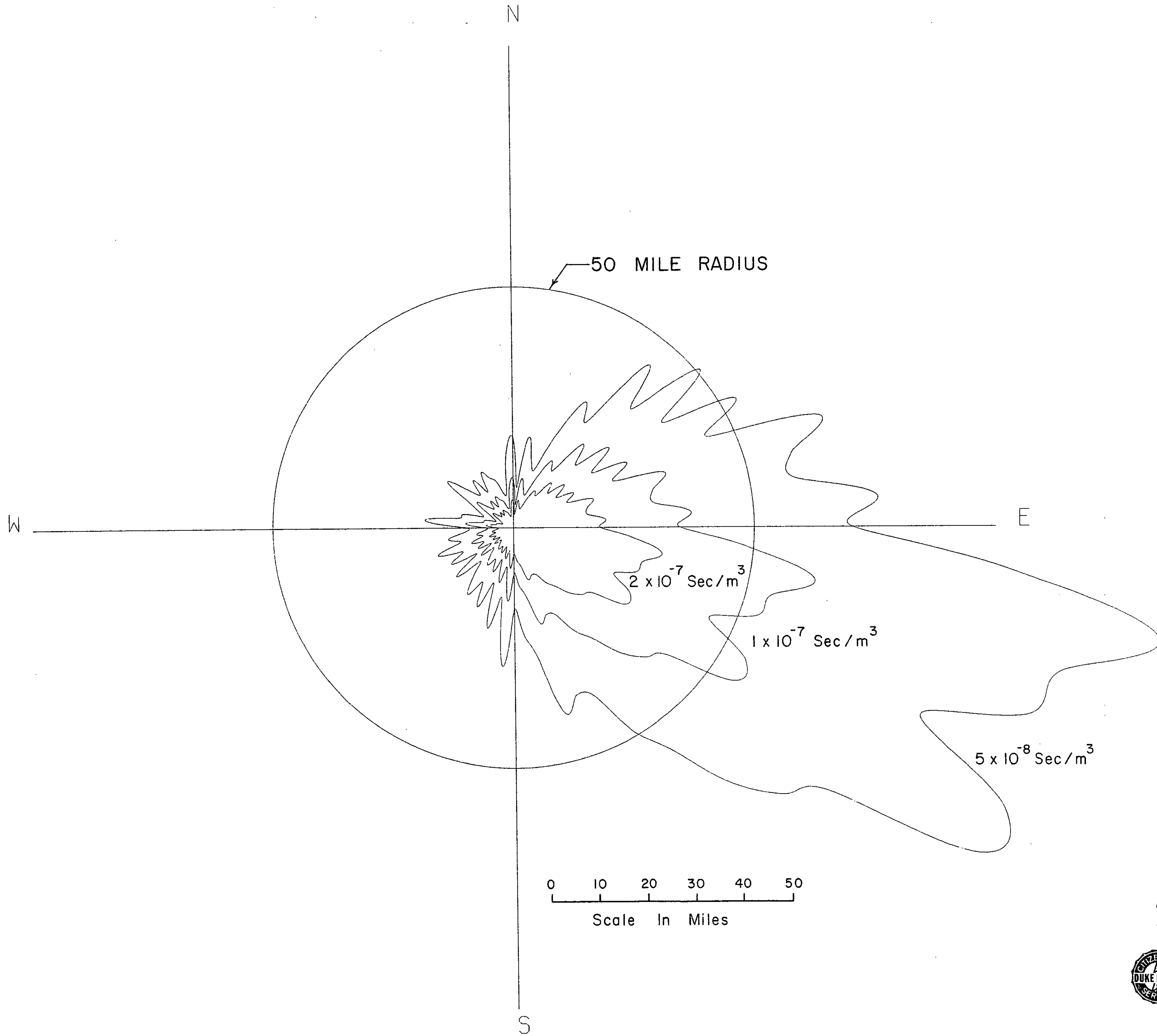
ER Figure 2.6.3-1 (1 of 3)
Amendment 1
(New)
Amendment 2
(Revised)



AREAL DISTRIBUTION OF ANNUAL AVERAGE X/Q PERIOD OF RECORD: SEPT. 11, 1973 - SEPT. 11, 1974

CHEROKEE NUCLEAR STATION

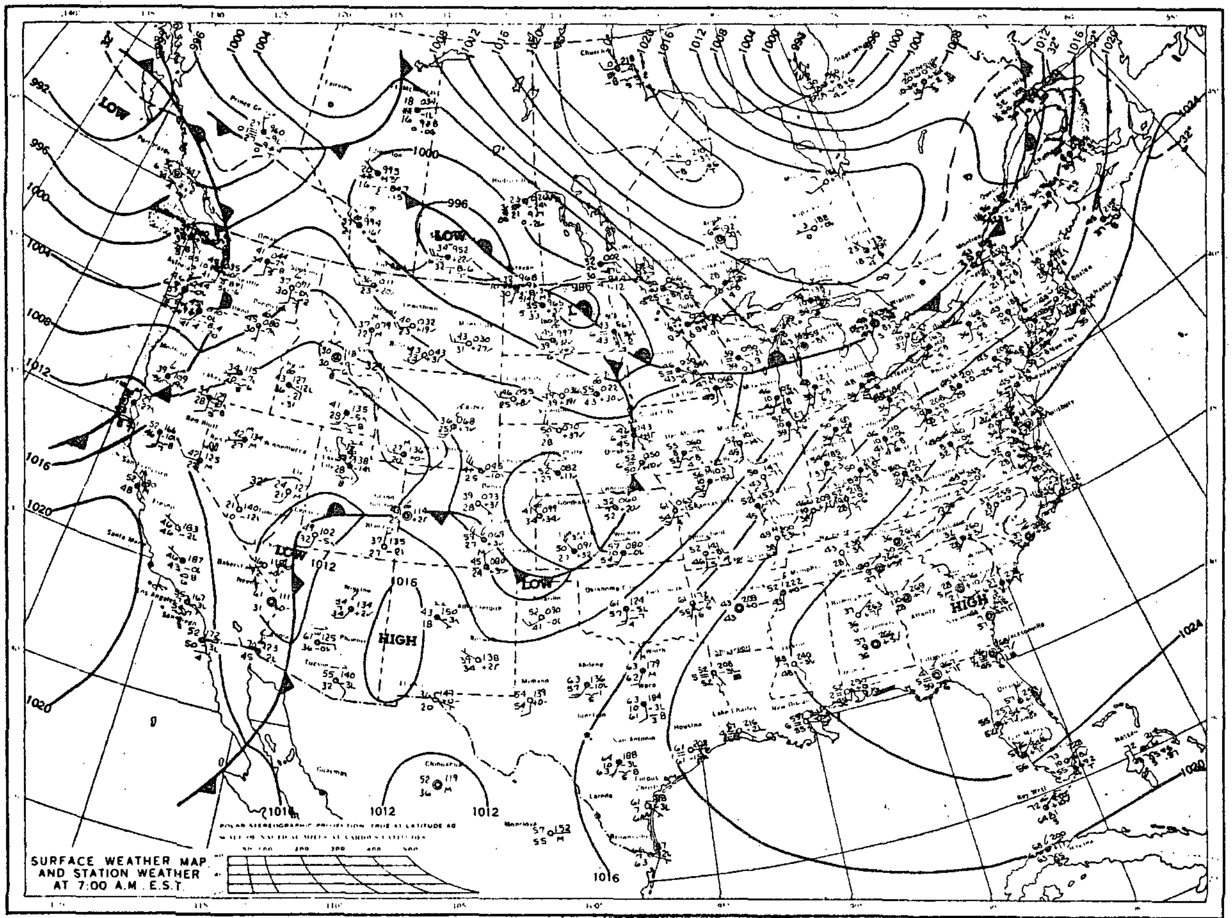
ER Figure 2.6.3-1 (2 of 3)
Amendment 1
(New)
Amendment 2
(Revised)

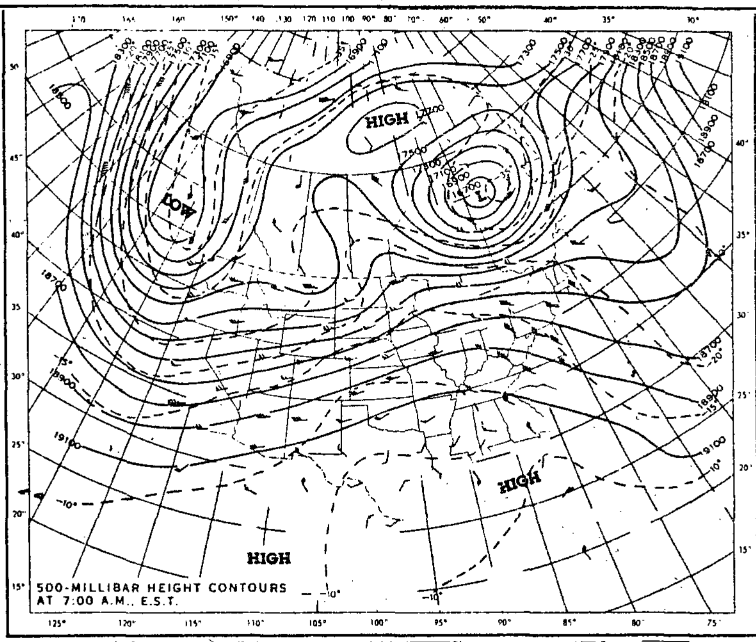


AREAL DISTRIBUTION OF ANNUAL
AVERAGE X/Q PERIOD OF RECORD:
SEPT. 11, 1973 - SEPT. 11, 1973

CHEROKEE NUCLEAR STATION

ER Figure 2.6.3-1 (3 of 3)
Amendment 1
(New)
Amendment 2
(Revised)



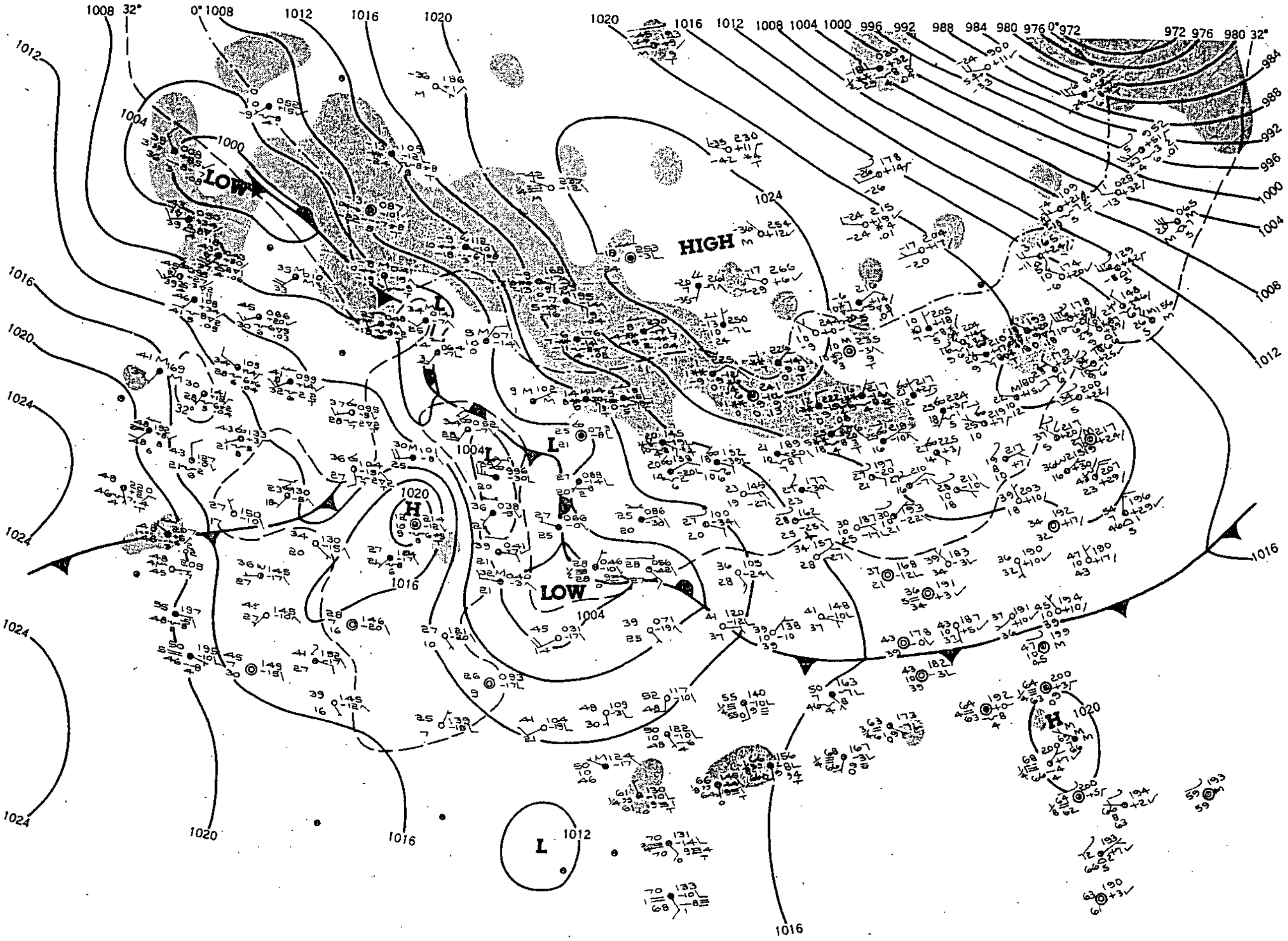


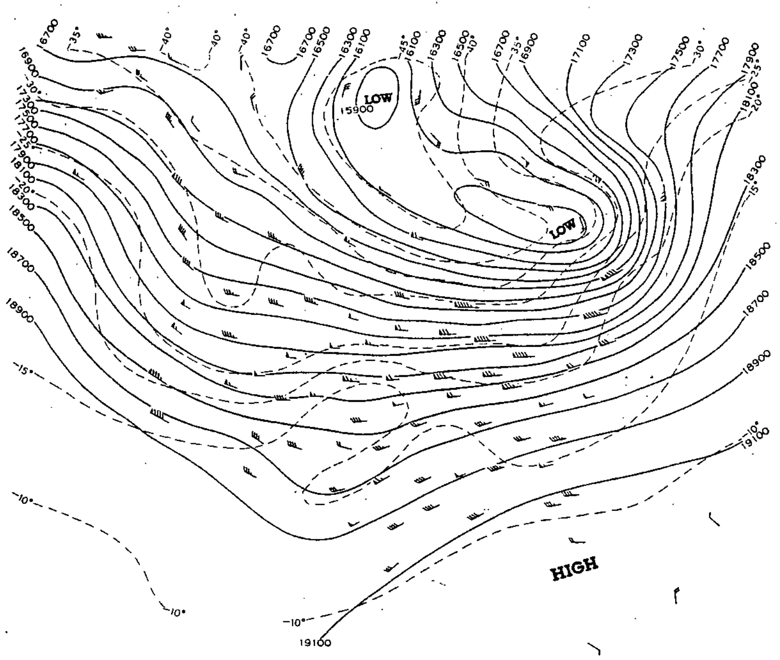
DAILY WEATHER MAPS FOR
NOVEMBER 13, 1973

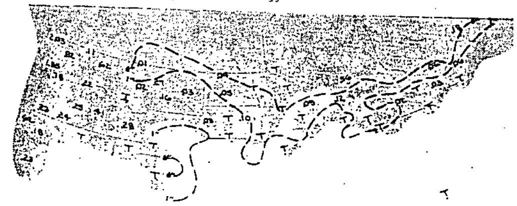
CHEROKEE NUCLEAR STATION

ER Figure 2.6.3-2
Amendment 1
(New)
Amendment 2

FRIDAY, FEBRUARY 1, 1974



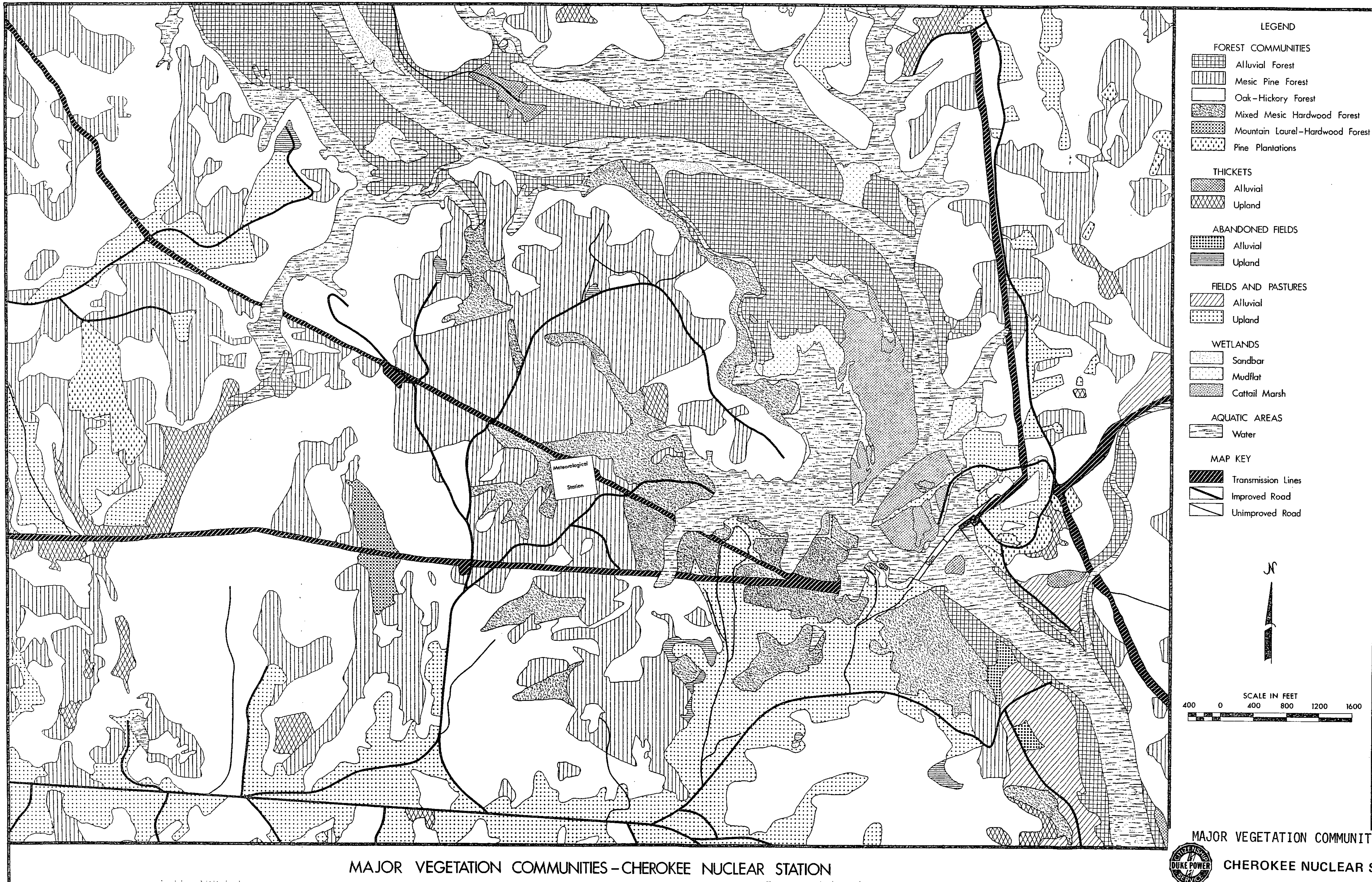




DAILY WEATHER MAPS FOR
FEBURARY 1, 1974

CHEROKEE NUCLEAR STATION

ER Figure 2.6.3-3
Amendment 1
(New)
Amendment 2

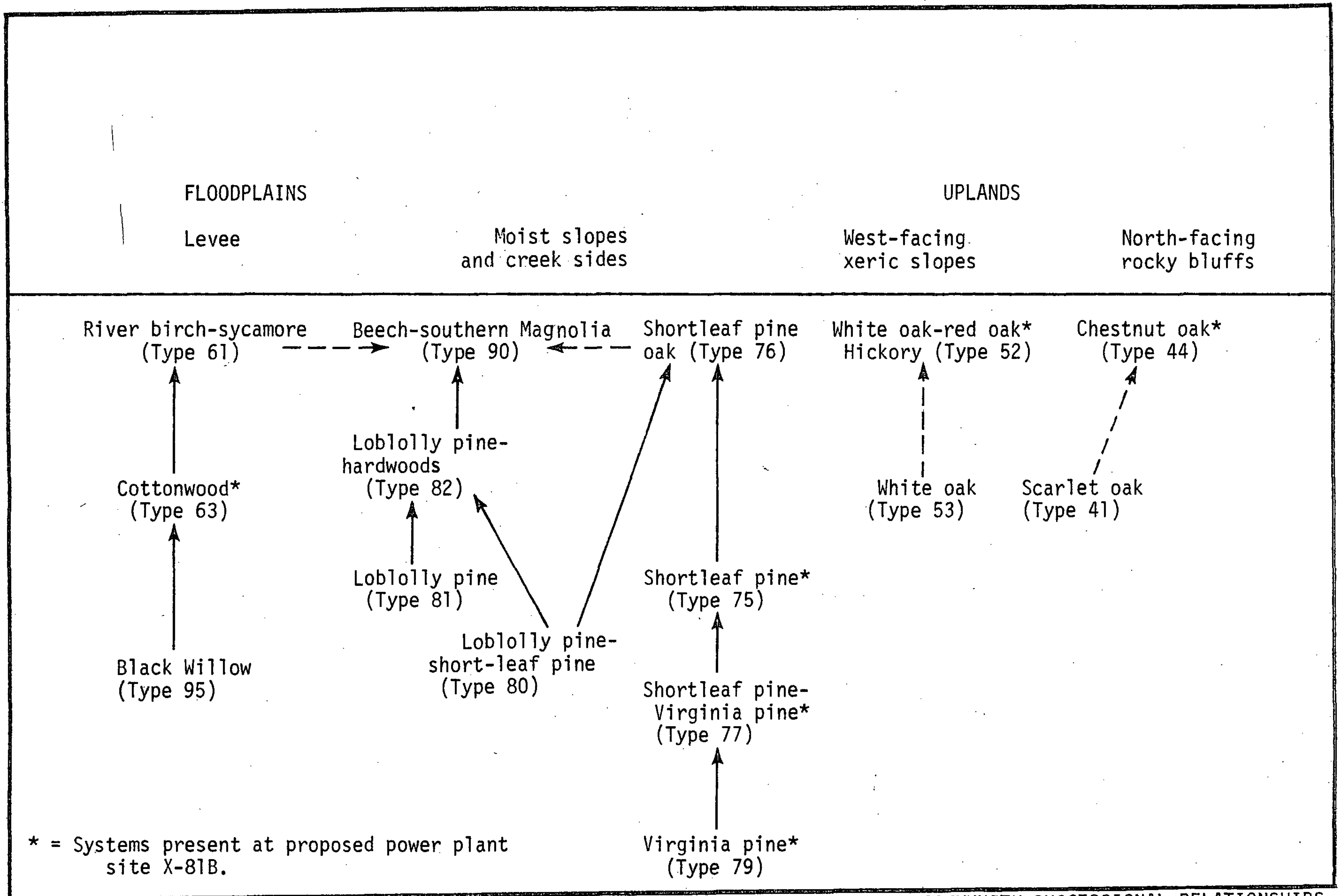


MAJOR VEGETATION COMMUNITIES - CHEROKEE NUCLEAR STATION

MAJOR VEGETATION COMMUNITIES

CHEROKEE NUCLEAR STATION

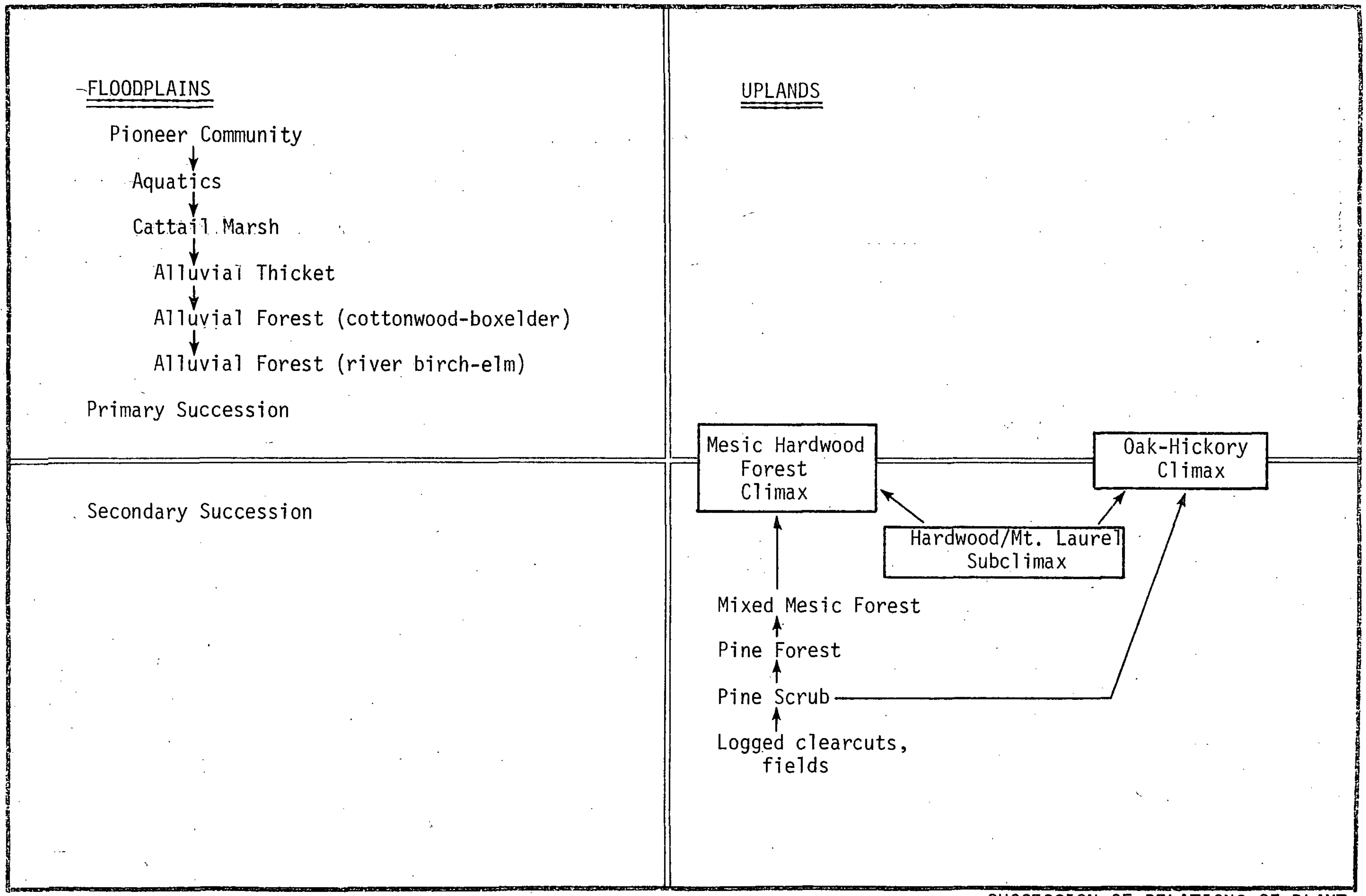
ER Figure 2.7.1-1
Amendment 2



COMMUNITY SUCCESSIONAL RELATIONSHIPS, BROAD RIVER BASIN, SOUTH CAROLINA

CHEROKEE NUCLEAR STATION

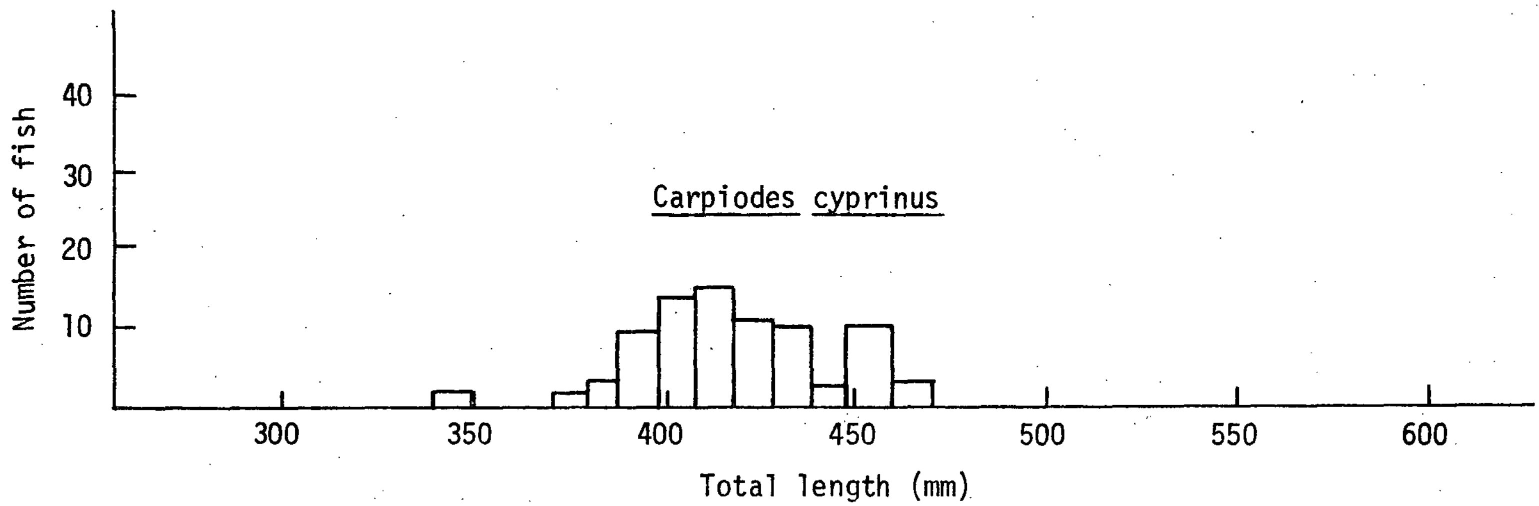
ER Figure 2.7.1-2
Amendment 2



SUCCESSION OF RELATIONS OF PLANT COMMUNITIES IN SITE AREA

CHEROKEE NUCLEAR STATION

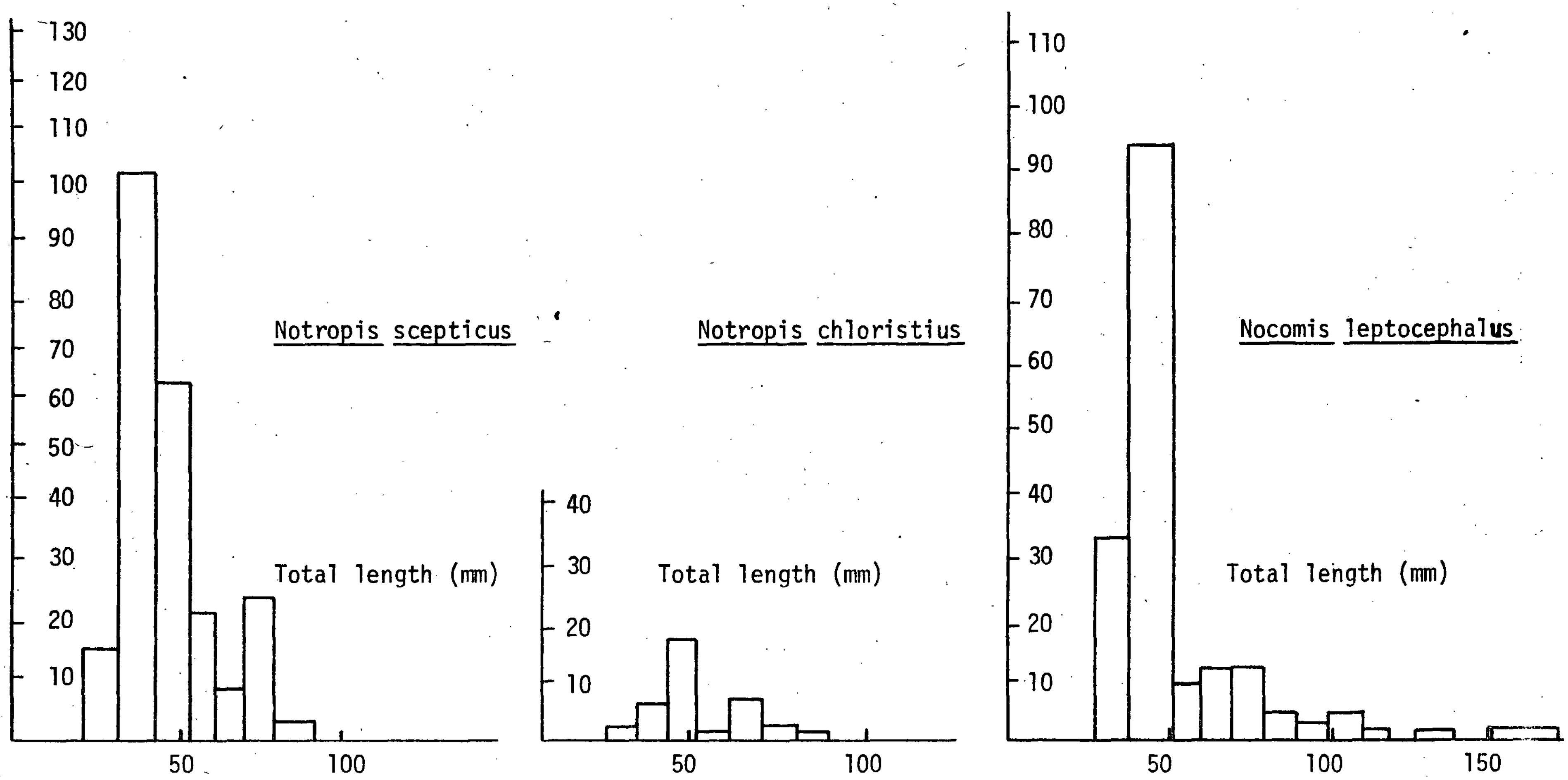
ER Figure 2.7.1-3



LENGTH-FREQUENCY DISTRIBUTION OF THE QUILLBACK CARPSUCKER, Carpiodes cyprinus IN THE BROAD RIVER

CHEROKEE NUCLEAR STATION

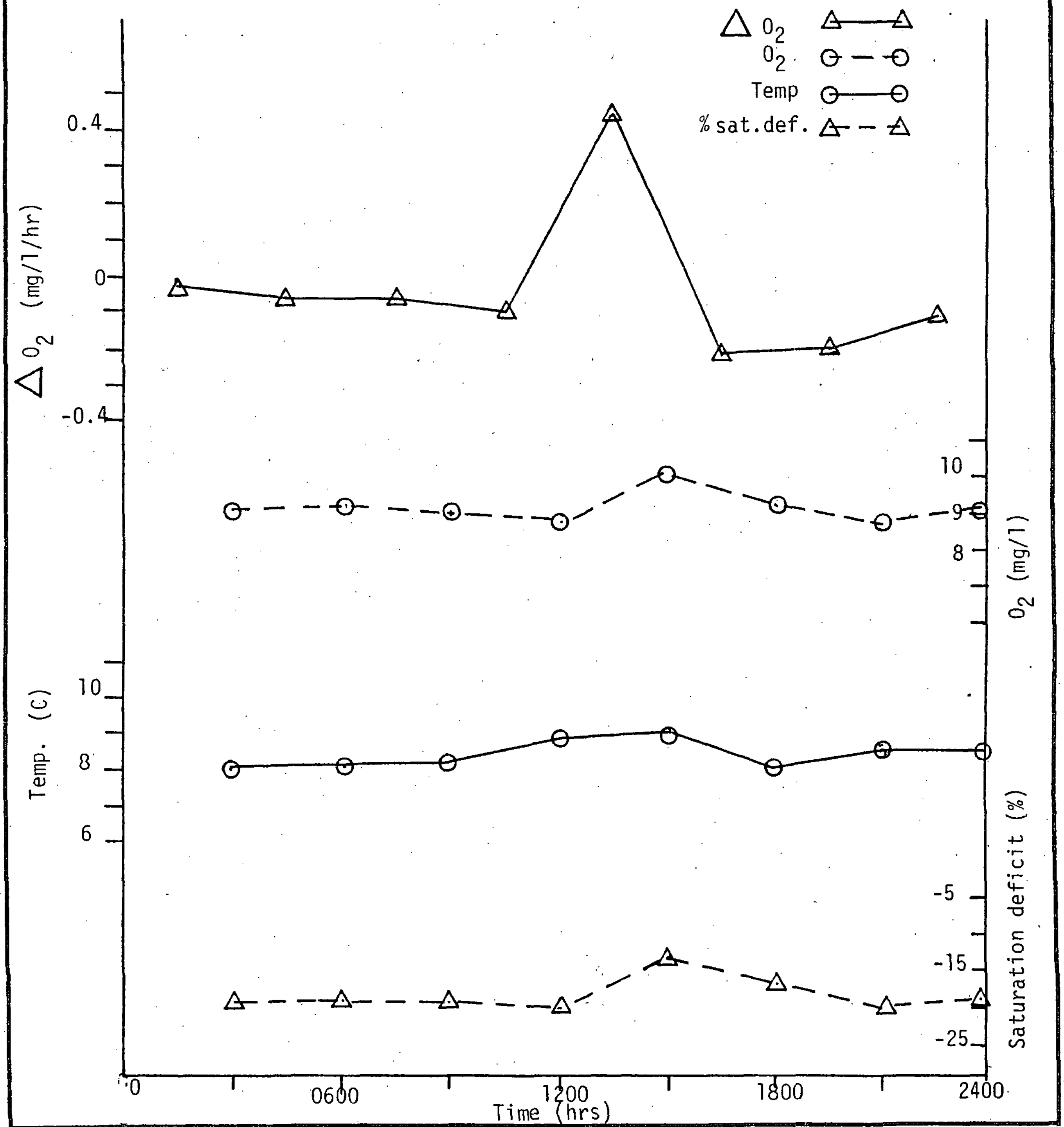
ER Figure 2.7.2-1



LENGTH-FREQUENCY DISTRIBUTIONS OF THE CYPRINIDS Notropis scepticus, Notropis chloristius, AND Nocomis leptocephalus FROM THE BROAD RIVER

CHEROKEE NUCLEAR STATION

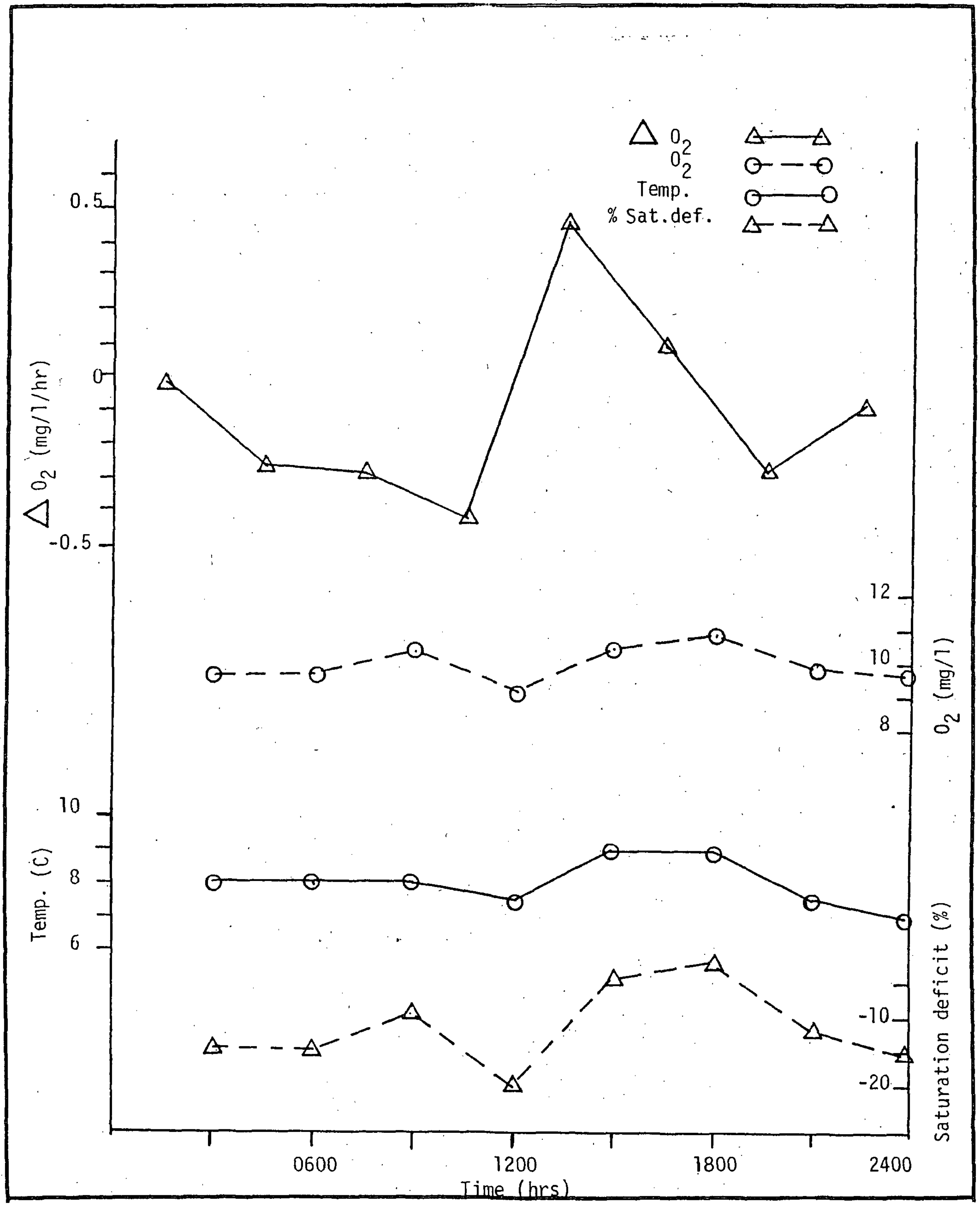
ER Figure 2.7.2-2



DIEL CHANGES IN OXYGEN, TEMPERATURE, SATURATION DEFICIT AND OXYGEN RATE-OF-CHANGE AT STATION 10, 28 FEBURARY-MARCH 1974

CHEROKEE NUCLEAR STATION

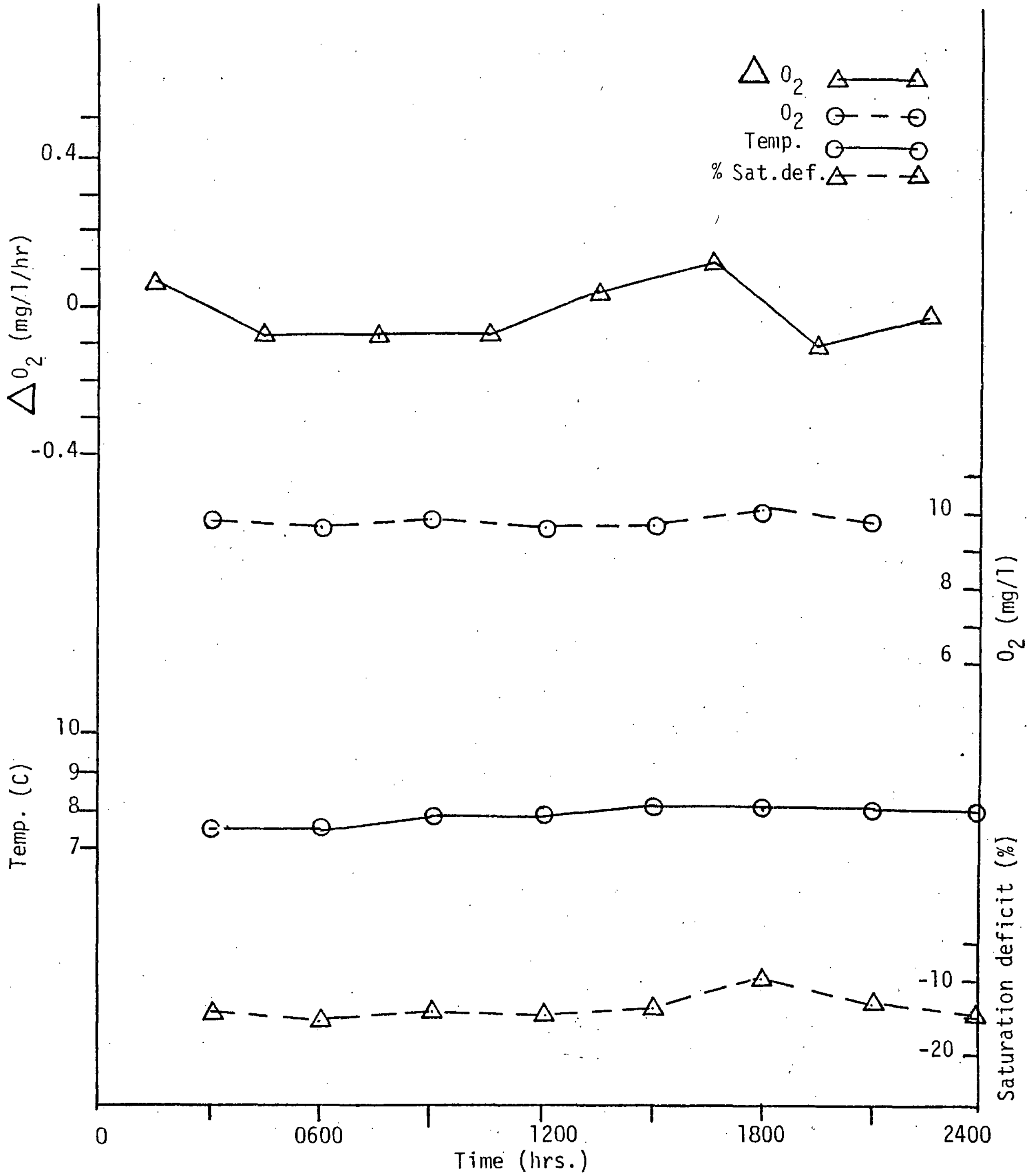
ER Figure 2.7.2-3a
Amendment 2
(New)



DIEL CHANGES IN OXYGEN, TEMPERATURE, SATURATION DEFICIT AND OXYGEN RATE-OF-CHANGE AT STATION 11, 28 FEBURARY-1 MARCH 1974

CHEROKEE NUCLEAR STATION

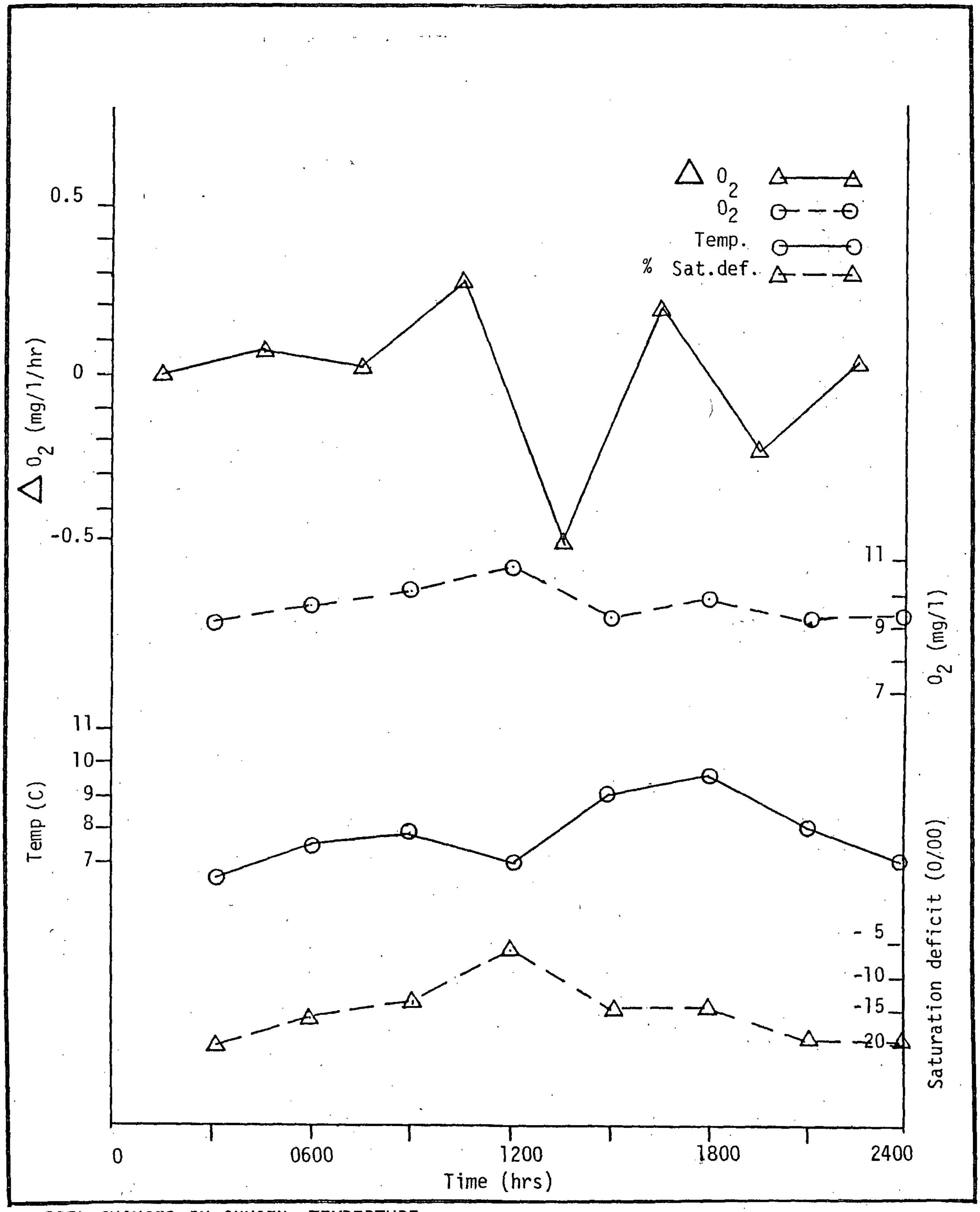
ER Figure 2.7.2-3b
Amendment 2
(New)



DIEL CHANGES IN OXYGEN, TEMPERATURE, ASTURATION DEFICIT AND OXYGEN RATE-OF-CHANGE AT STATION 12, 28 FEBURARY-1 MARCH 1974

CHEROKEE NUCLEAR STATION

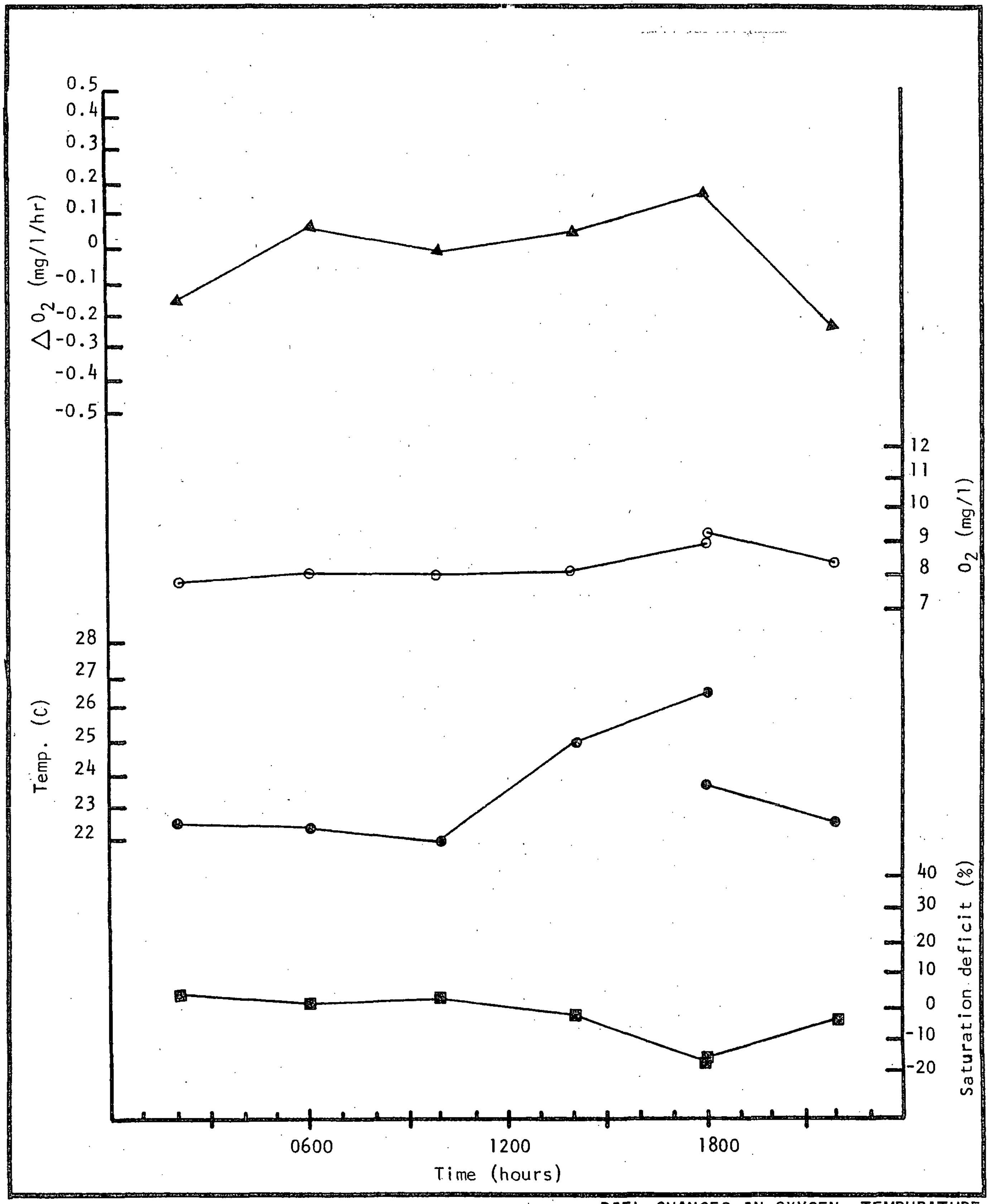
ER Figure 2.7.2-3c
Amendment 2



DIEL CHANGES IN OXYGEN, TEMPERTURE,
SATURATION DEFICIT AND OXYGEN
RATE-OF-CHANGE AT STATION 21,
28 FEBURARY-1 MARCH 1974

CHEROKEE NUCLEAR STATION

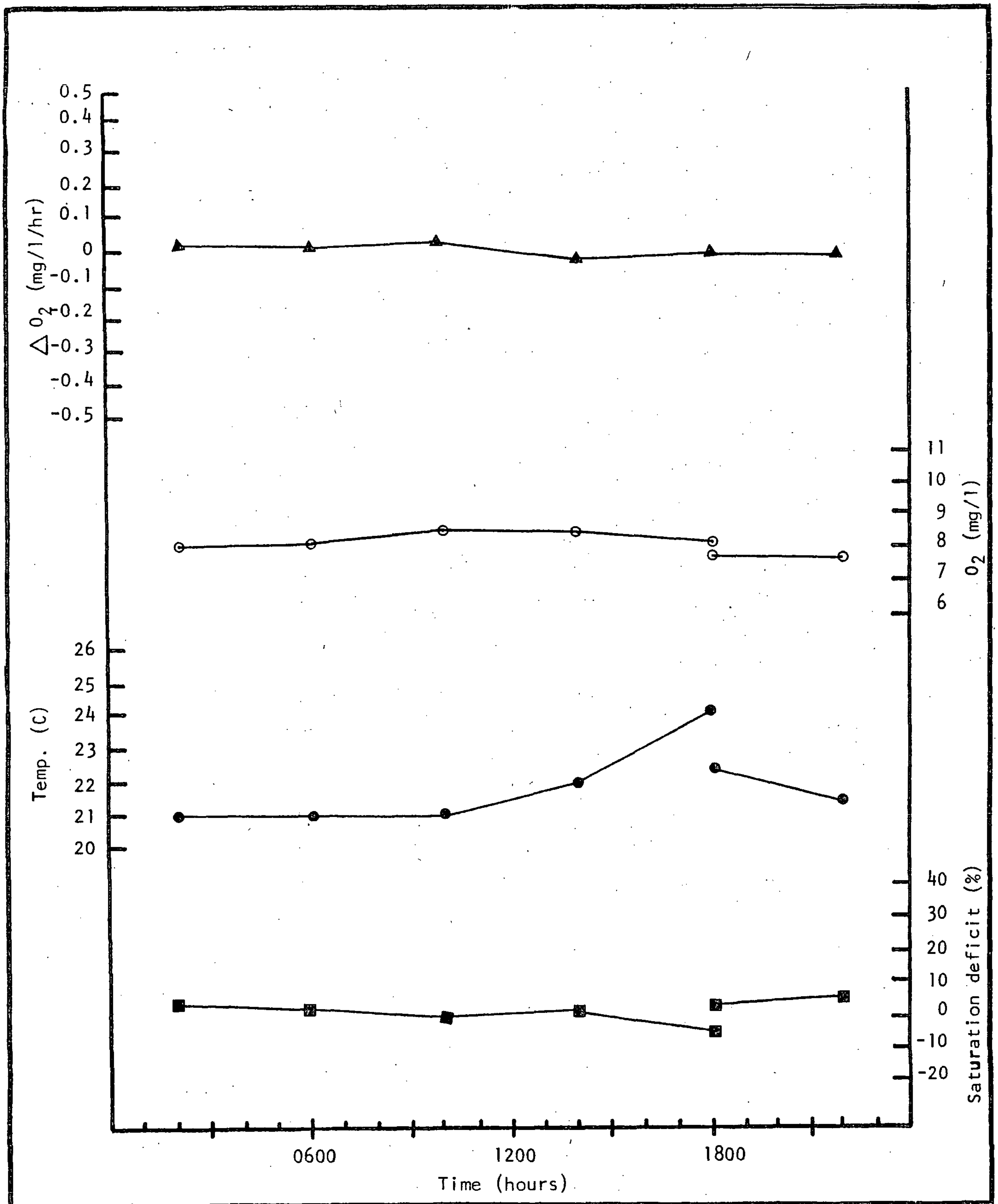
ER Figure 2.7.2-3d
Amendment 2
(New)



DIEL CHANGES IN OXYGEN, TEMPURATURE, SATURATION DEFICIT AND OXYGEN RATE-OF-CHANGE AT STATION 10, 20-21 MAY 1974

CHEROKEE NUCLEAR STATION

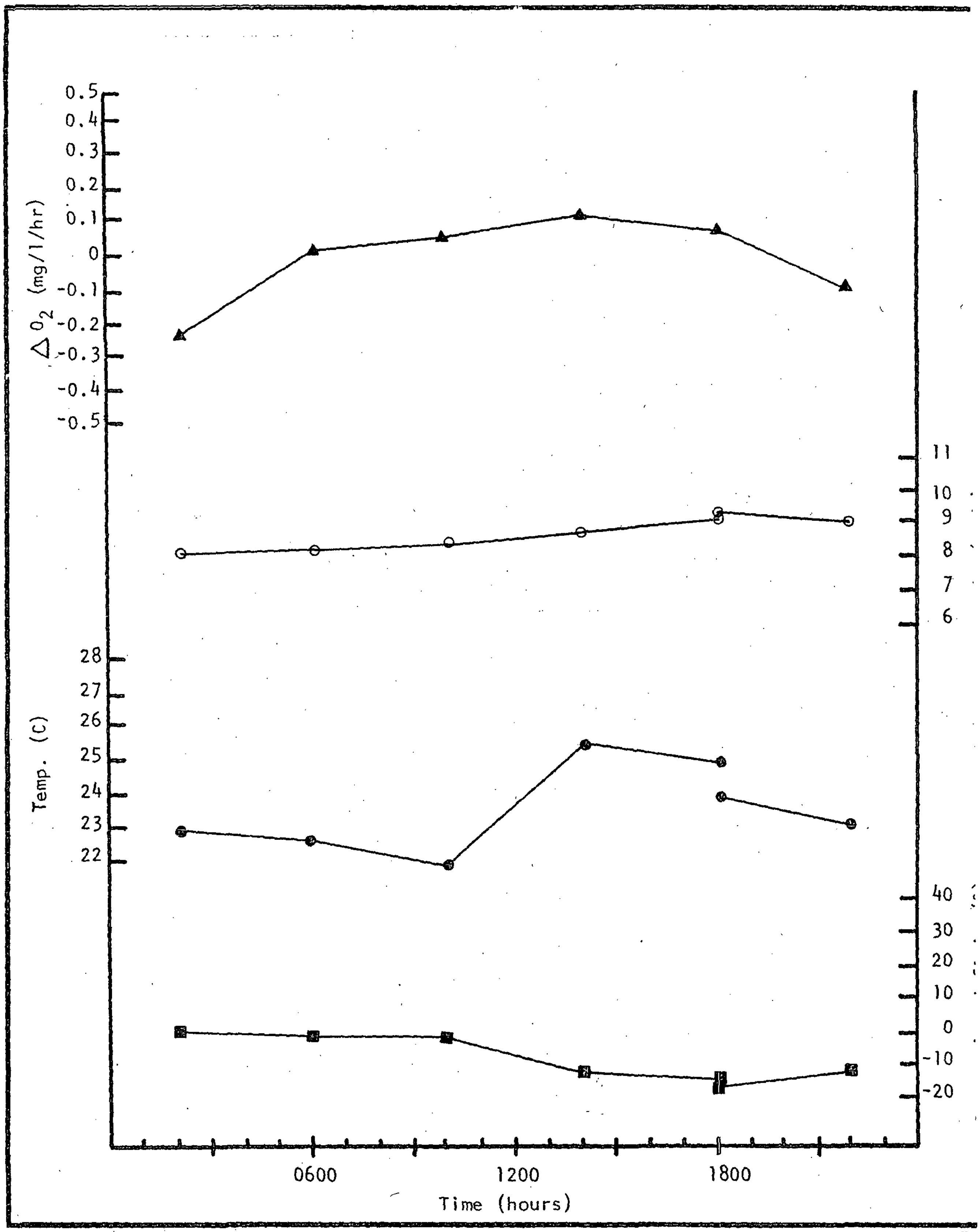
ER Figure 2.7.2-3e
Amendment 2
(New)



DIEL CHANGES IN OXYGEN, TEMPERATURE, SATURATION DEFICIT AND OXYGEN RATE-OF-CHANGE AT STATION 11, 20-21 MAY 1974

CHEROKEE NUCLEAR STATION

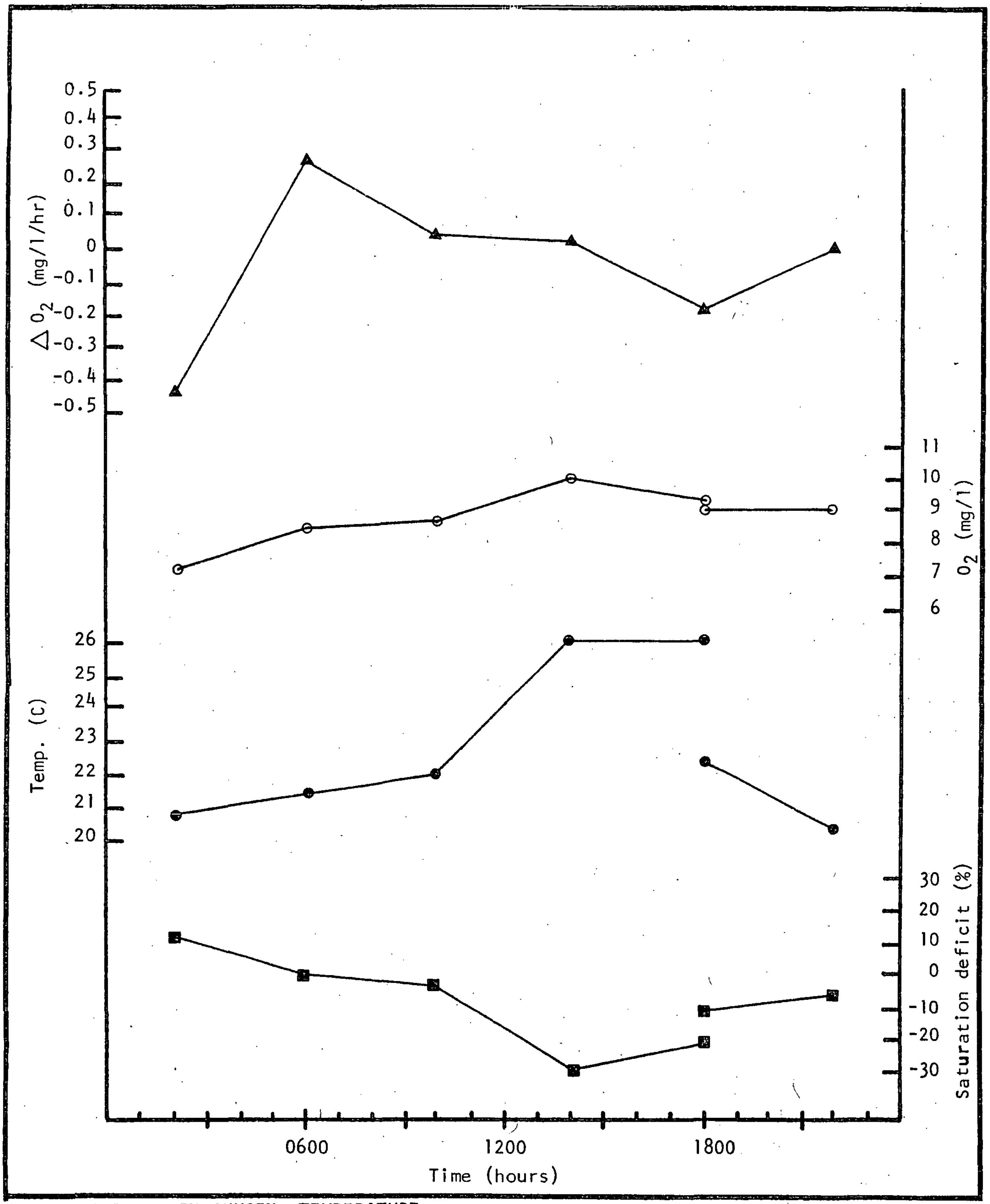
ER Figure 2.7.2-3f
Amendment 2
(New)



DIEL CHANGES IN OXYGEN, TEMPERATURE, SATURATION DEFICIT AND OXYGEN RATE-OF-CHANGE AT STATION 12, 20-21 MAY 1974

CHEROKEE NUCLEAR STATION

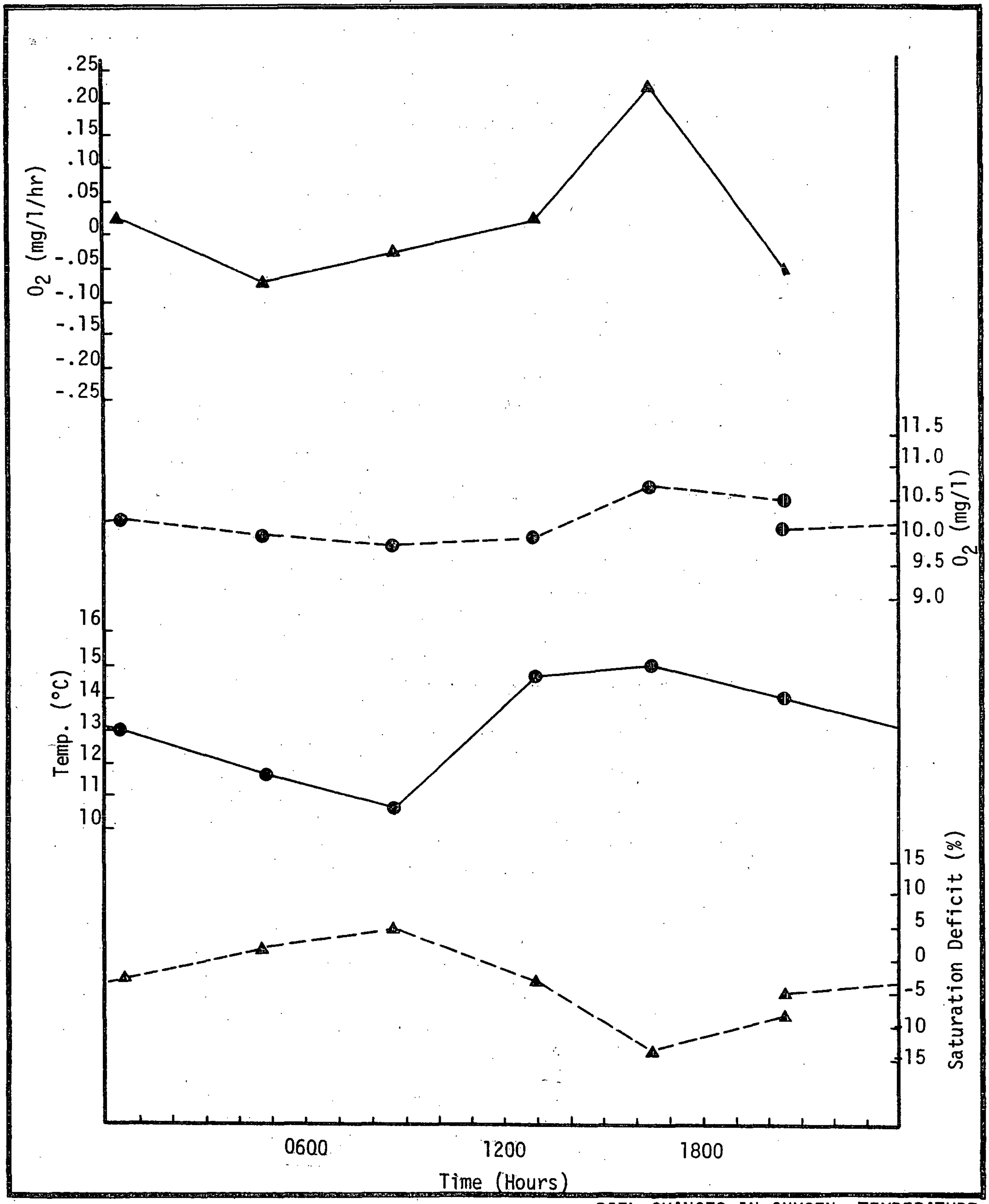
ER Figure 2.7.2-3g
Amendment 2



DIEL CHANGES IN OXYGEN, TEMPERATURE, SATURATION DEFICIT AND OXYGEN RATE-OF-CHANGE AT STATION 21, 20-21 MAY 1974

CHEROKEE NUCLEAR STATION

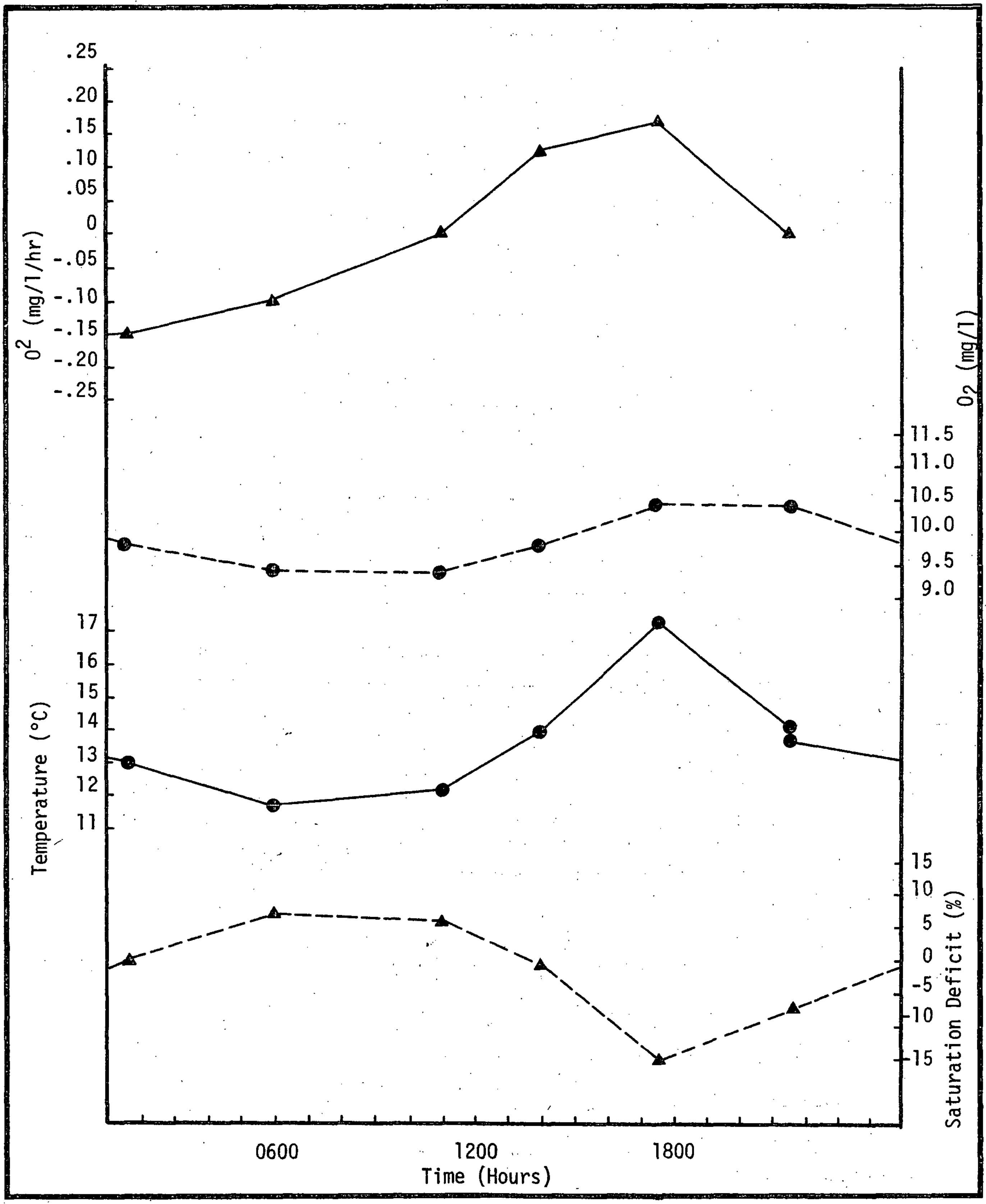
ER Figure 2.7.2-3h
Amendment 2
(New)



DIEL CHANGES IN OXYGEN, TEMPERATURE SATURATION DEFICIT AND OXYGEN RATE-OF-CHANGE AT STATION 10, OCT. 24-25, 1974

CHEROKEE NUCLEAR STATION

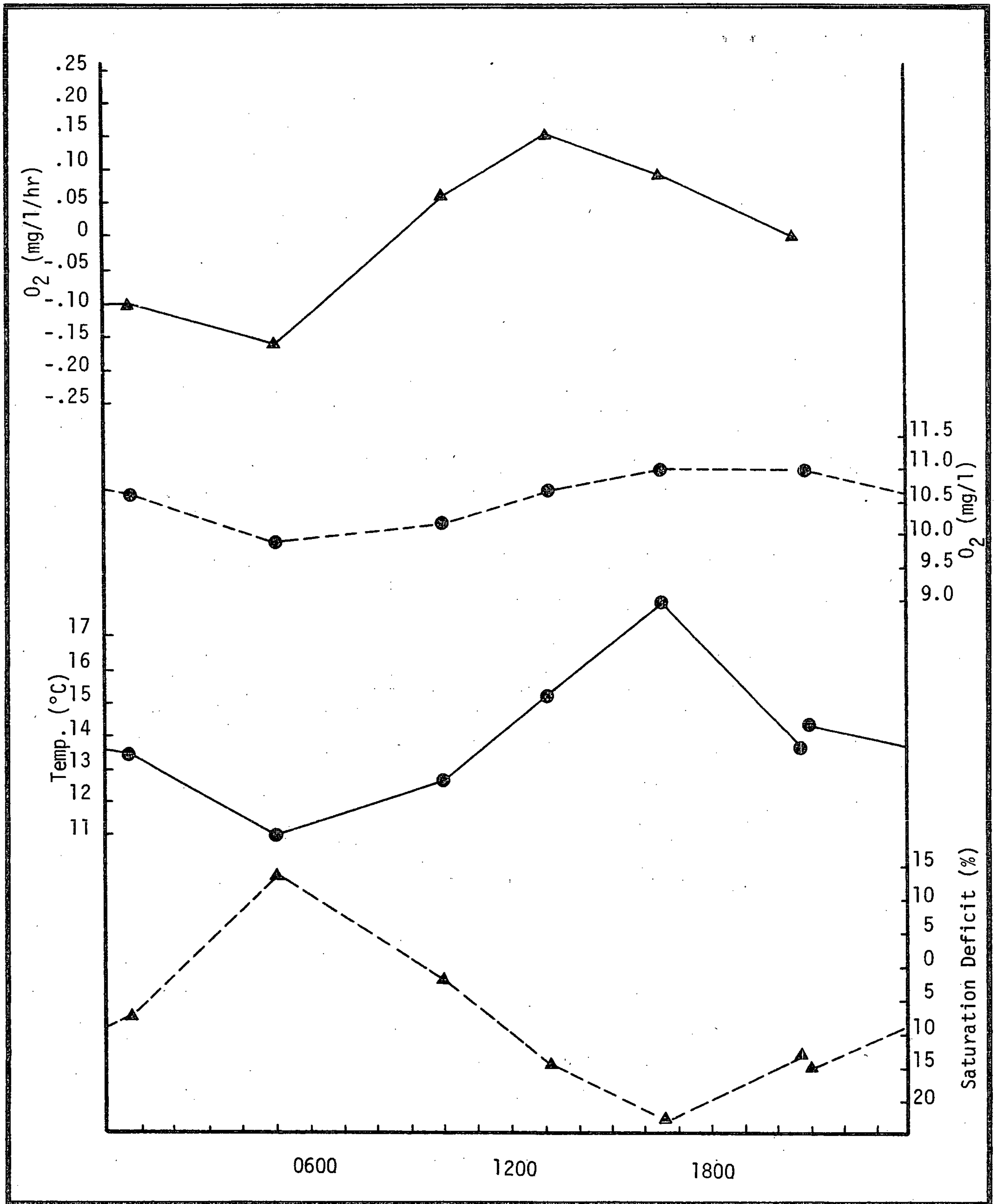
ER Figure 2.7.2-3i
Amendment 2
(New)



DIEL CHANGES IN OXYGEN, TEMPERATURE,
SATURATION DEFICIT AND OXYGEN
RATE-OF-CHANGE AT STATION 11,
OCT. 24-25, 1974

CHEROKEE NUCLEAR STATION

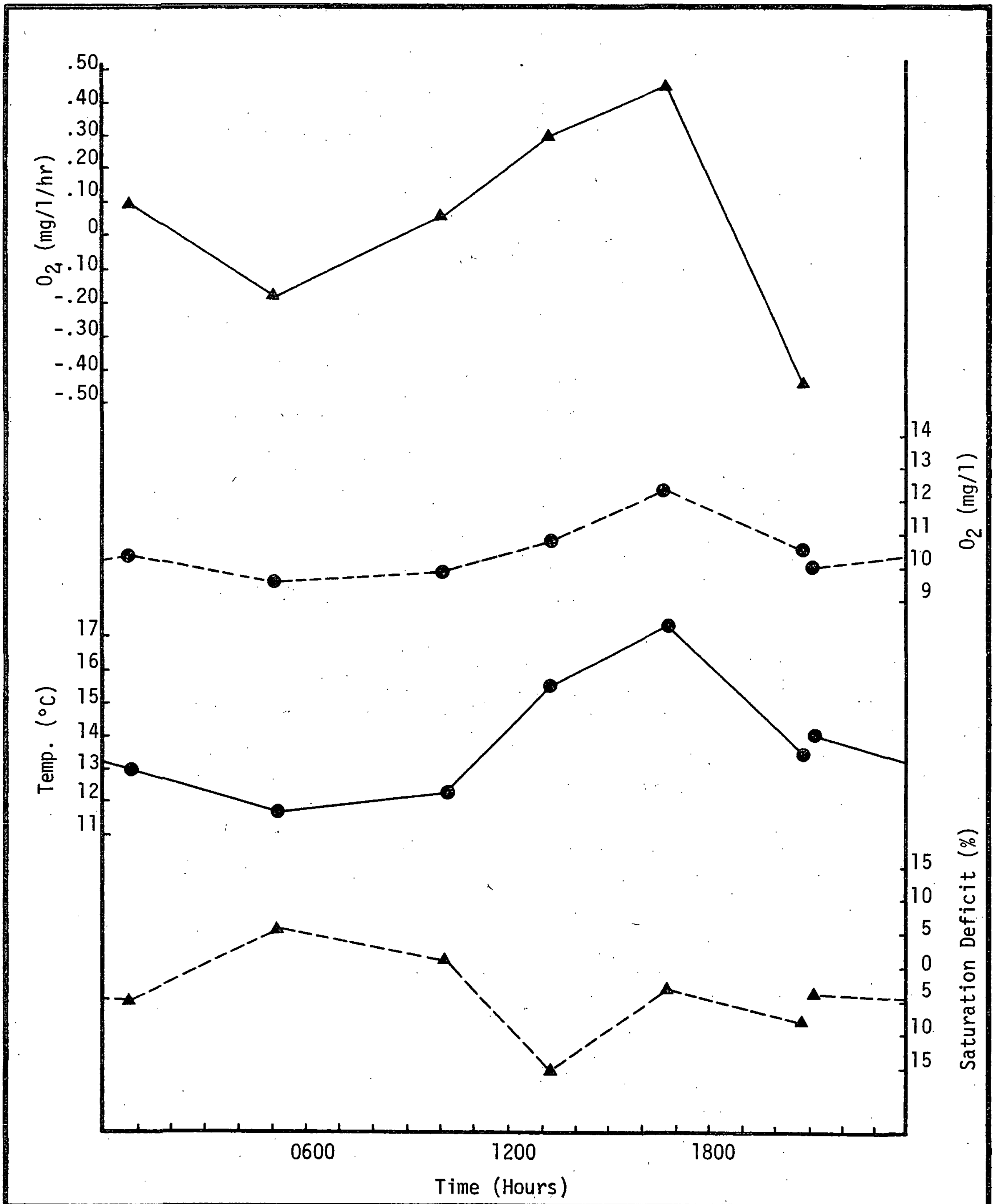
ER Figure 2.7.2-3j
Amendment 2
(New)



DIEL CHANGES IN OXYGEN, TEMPERATURE, SATURATION DEFICIT AND OXYGEN RATE-OF-CHANGE AT STATION 12, OCT. 24-25, 1974

CHEROKEE NUCLEAR STATION

ER Figure 2.7.2-3k
Amendment 2
(New)



DIEL CHANGES IN OXYGEN, TEMPERATURE,
SATURATION DEFICIT AND OXYGEN
RATE-OF-CHANGE AT STATION 21,
OCT. 24-25, 1974

CHEROKEE NUCLEAR STATION

ER Figure 2.7.2-31
Amendment 2
(New)

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3.0 THE PLANT

Chapter 2 of this report discusses the important site associated parameters. This chapter discusses the station to be located on that site. The parameters associated with station appearence, water use, transmission facilities, and various station systems are described in each Section.

3.1 EXTERNAL APPEARANCE

The Cherokee Nuclear Station facilities are to be located in the area shown
on Figure 3.1.0-1. Cherokee Nuclear Station will consist of three reactor
buildings, three auxiliary buildings, three turbine buildings, one shared
1 equipment building and one administration building. There are no plans for
a visitors center on or near the site.

The station layout and perimeter for Cherokee Nuclear Station is illustrated on the site plan shown in Figure 3.1.0-2 and also on the site maps presented in Section 2.1. A perspective of the station in relation to the site is shown in Figure 3.1.0-3.

The architectural design of Cherokee incorporates various materials with contemporary design to create an aesthetically pleasing appearance. The reactor building is constructed of concrete. In the turbine building a masonry wainscot wall is used at ground level, topped with colored siding. The auxiliary building is constructed primarily of concrete; the service and administration buildings are each primarily masonry constructions.

Care is exercised to effectively coordinate building materials and color selections in the overall design development of Cherokee to provide an aesthetically pleasing effect.

Landscaping is planned for the site, areas adjacent to the structures and in the parking areas to complement and blend with the natural surroundings. Landscaping materials used are mostly those which occur naturally in the locality.

The location and elevation of release points for liquid and gaseous wastes
2 1 are shown in Figure 3.1.0-4. The top elevation of the unit vent (gaseous Q3.5.
waste release point) in respect to the top elevation of the other buildings
is shown in Figure 3.1.0-5.

3.2 REACTOR AND STEAM-ELECTRIC SYSTEM

The Cherokee Nuclear Station consists of three units. The Nuclear Steam Supply
System (NSSS) for each unit is a pressurized water reactor manufactured by
Combustion Engineering, Inc. The reactor fuel is zircaloy clad uranium
4 dioxide with a maximum enrichment of 3.6 wt. percent. The NSSS has a
guaranteed main steam flow of 17,185,000 lbs./hr., a warranted output of
3817 MWt, and a design point of 4018 MWt.

The turbine generators are manufactured by General Electric. Each has a
gross rated electrical output of 1,345 MW and a gross valves-wide-open (VWO)
electrical output of 1,387 MW. Auxiliary losses (in-plant electrical
consumption) amount to 58 MW. The cycle net heat rate is approximately
4 9,690 Btu/KWH.

3.3 STATION WATER USE

A flow diagram of the various station water systems is depicted in Figure
3.3.0-1. Figure 3.3.0-1 indicates average and maximum flow rates at key
points in the diagram with the flow rates expressed in gallons per minute. The Q
3 average flow rates represent a water use balance for typical operations at 76% 3.3
capacity factor while the maximum rates are based on system capacities and
estimates of maximum water requirements or waste production. Values for rainfall, runoff, evaporation and seepage for the basins at Cherokee are shown in Figure 3.3.0-1 and detailed in Table 3.3.0-3.

A water intake structure for Cherokee Nuclear Station will be located on the
west side of Broad River above the Ninety Nine Islands Dam. Trash racks and
traveling screens will remove trash from the water. Accumulated trash will be
3 cleaned from the racks by mechanical rake, and from the screens by a backwash
system. The debris will be collected for disposal by landfill. Screened backwash water will return to the river. Pumps in the intake structure supply water to the Intake Sedimentation Basin.

Water will be withdrawn from the Intake Sedimentation Basin for the various station systems. The Fire Protection System has a total capacity of 2,500 GPM as noted on Figure 3.3.0-1 but will normally not be in use. Water will also be withdrawn from the Intake Sedimentation Basin for cooling tower and filtered water make-up.

The Heat Dissipation System is described in Section 3.4. Table 3.3.0-2 lists the calculated evaporation rate from the cooling towers by month for three units at 100% load and at 76% load. The 76% load factor represents the estimated annual average for the station. The maximum and average flow rates indicated on Figure 3.3.0-1 correspond respectively to 100% load with maximum monthly evaporation and to 76% load with the annual average evaporation rate. The towers are expected to be operated at ten cycles of concentration of the make-up water, subject to adjustment as necessitated by variable make-up water quality. Cooling tower treatment and quality of the blowdown are discussed further in Section 3.6. The method used to calculate the evaporation in the cooling towers follows:

From Carrier's equation, the partial pressure of the entering vapor can be determined.

$$Pv = Pv' - \frac{(P_B - P_V')\quad(TDB - TWB)}{2800 - 1.3\ (TWB)}$$

Where Pv = partial pressure of vapor entering, PSIA

Pv' = the partial pressure corresponding to wet bulb temperature, PSIA

TWB = wet bulb temperature of entering air, ^{o}F.

TDB = dry bulb temperature of entering air, ^{o}F.

P_B = Barometric Pressure, PSIA.

$$(S.H.)_{in} = .622 \frac{Pv}{(14.7-Pv)}$$

where $(S.H.)_{in}$ is the inlet specific humidity.

$$T_{Aout} = (T_1 + T_2)\ /2$$

Where:

T_1 = Temperature of warm entering water.

T_2 = Temperature of cold water leaving tower.

T_{Aout} = Approximated exit vapor temperature.

$$(S.H.)_{out} = \frac{(Pv)_{exit*}\ .622}{14.7-Pv_{exit}}$$

Where:

$(S.H.)_{out}$ = the exit specific humidity.

$(P_v)_{exit}$ = the saturated vapor pressure corresponding to $T_{A_{out}}$, PSIA.

The energy balance on the tower is:

4 $$\left((M_w h_{f_{in}}) + M_a h_{a_{in}} \right) + M_a \left((S.H.)_{in} (h_v)_{in} \right) =$$

$$M_w - M_a (S.H._{out} - S.H._{in}) \ h_{f_{out}} + M_a h_{a_{out}} + M_a \ (S.H.)_{out} (h_{v_{out}})$$

Where:

M_w = Mass flow rate of entering water, GPM.

M_a = Mass flow rate of dry air, lb/hr.

h_f = Enthalpy of saturated liquid, BTU/lb.

h_v = Ethalpy of saturated vapor, BTU/lb.

h_a = Enthalpy of air, BUT/lb.

Re-arranging and dividing by M_a the ratio of water flow rate to air flow rate M_w/M_a is obtained.

$$M_w = \frac{(h_{a_{out}} - h_{a_{in}}) + (S.H._{out} * h_{v_{out}} - S.H._{in} * h_{v_{in}}) - (S.H._{out} - S.H._{in})}{* h_{f_{out}}}$$

$$(h_{f_{in}} - h_{f_{out}})$$

$$M_w = \frac{Q}{(500)\ (\text{Range})}$$

Where:

Q = Heat rejected to condenser, BTU/hr.

Range - Range of the tower, °F.

M_w = Flow rate of water, GPM.

$$M_a = \frac{(M_w)\ (500)}{(M_w/M_a)}$$

Where:

M_a = Flow rate of air, lb/hr.

$$W_{evap} = (M_a)\ (S.H._{out} - S.H._{in})$$

Where:

W_{evap} = Water evaporated, lbs/hr.

$$W_{evap_{gpm}} = \frac{W_{evap}}{500}$$

Where:

$W_{evap_{gpm}}$ = Water evaporated, gallons per minute.

$$W_{evap_{cps}} = \frac{W_{evap_{gpm}}}{450}$$

Where: $W_{evap_{cps}}$ = Water evaporated, cubic feet per second.

The drift value of 0.005% is an empirical value determined by the cooling tower manufacturer based on the performance of similar towers.

Filtered water for station use will be obtained from conventional treatment of water withdrawn from the Sedimentation Basin. The water will be treated with biocides and coagulants. This will be followed by filtration through high rate filters. Waste materials from the coagulation and filtration will be flushed to the Waste Water Treatment System (Section 3.6). The filtered water is the supply source for sanitary and potable water, laundry and hot showers, and demineralizer make-up.

Two 700-gallon per minute mixed-bed demineralizers will provide high purity water for make-up to the primary and secondary systems and for lab usage. At
3 normal operation, regeneration of one demineralizer will be required approximately every three days. One demineralizer will normally be in use while the other is being regenerated or is on standby. Sodium hydroxide and sulfuric acid will be used for regeneration of the demineralizers, and the regenerant wastes will be flushed to the Waste Water Treatment System. Further detail on the quantity and disposal of these chemicals is presented in Section 3.6.

As indicated on Figure 3.3.0-1 the remaining nonradioactive waste water from the station will flow to the Waste Water Treatment System for treatment and disposal (Section 3.6) while low-level radioactive liquid wastes will be processed through the Miscellaneous Liquid Waste Management System and released under controlled conditions with proper dilution (Section 3.5).

3.4 HEAT DISSIPATION SYSTEM

The Cherokee Nuclear Station is designed to convert about 35 percent of the thermal energy generated by nuclear fission into electrical energy. The remaining low grade thermal energy is dissipated in the form of heat. Several alternative methods of heat dissipation are discussed in Section 10.1. The selected system uses closed-cycle cooling towers.

The heat dissipation system includes the main Condenser Cooling Water System, the Nuclear Service Water System, the Conventional Service Water System, and the Makeup Water System.

Pertinent system characteristics are presented in Tables 3.3.0-1 and 3.4.0-1. Q3.4.
Layouts of the piping for the various heat dissipation systems are presented in Figure 3.4.0-1.

3.4.1 CONDENSER COOLING WATER SYSTEM

The Condenser Cooling Water (CCW) System includes the main steam condenser cooling towers, pumps, valves, and piping. The flow enters the tubes of the
4 three pass condenser under gravity head from the cooling tower basins. After receiving the plant heat load, the flow is pumped to the closed-cycle wet cooling towers, where it is distributed to the hot water basins at the top of each of the tower cells. Within the towers, nozzles and fill break the water flow to droplet size as it passes to the lower receiving basin. A current of air flow permits surface cooling of the warmed water, partly by conduction. Design and performance data for both summer and winter conditions for the cooling towers are given in graphic and tabular form in Figures 3.4.1-1 and 3.4.1-2 and Tables 3.3.0-1, 3.4.0-1 Q3.4.4
and 3.4.0-2.

The cooled water is collected in the cooling tower basin and piped through
4 the condenser to the condenser cooling water pumps. Circulation of flow for each unit is maintained by three vertical wet pit pumps. The cooling water is then pumped to the cooling towers where it completes the circulation loop.

During normal system operation, the cooling water temperature is raised 24 F as it passes through the condenser. A temperature drop equal to the temperature rise of the total flow is experienced in the cooling towers.

Figure 3.3.0-1 provides schematically the flow paths of all water systems within the Cherokee plant. The flow paths for these systems will not be seasonally dependent. The flow rates, frequency of flows, and dilution for all systems are incorporated in Figure 3.3.0-1.

The temperatures of all water systems, except cooling tower blowdown, will closely reflect ambient conditions. The blowdown temperatures and volumes are estimated on a monthly basis as follows:

Month	Temperature (°F)	Volume (CFS)*
January	70.2	8.1
February	71.2	8.1
March	73.1	8.4
April	77.0	8.5
May	81.0	8.7
June	83.7	8.9
July	85.5	8.8
August	84.9	8.9
September	82.6	8.9
October	77.9	8.7
November	74.3	8.5
December	70.8	8.4

*Volumes are based on 76% plant capacity factor

A cooling water blowdown release is maintained continuously in order to prevent dissolved solids buildup and consequent scaling in the cooling water system. Dissolved solids concentrations in the cooling water are maintained at a level approximately ten times greater than that of the makeup water. Blowdown of the cooling water flow is extracted downstream of pump discharge and flows to the river.

The blowdown discharge structure is located immediately downstream and adjacent to the west abutment of the Ninety-Nine Islands Dam. The structure consists of a concrete retaining wall through which the
3 discharge pipe conveys the blowdown effluent. The effluent discharges onto a continuous rock ledge leading to the spillway apron. Due to the rocky area in which the discharge is released, no further provisions to prevent scour are required. Figure 3.4.1-3 shows the layout of the river intake and discharge system. Figure 3.4.1-4 shows the dimensions, elevations, and a partial cross-section profile at the discharge structure.

The flow paths of all water systems within the Cherokee Station are shown schematically in Figure 3.3.0-1. These flow paths will not be seasonally dependent. The flow rates, frequency of flows, and dilution for all systems are incorporated in Figure 3.3.0-1.

The rate of blowdown varies depending on the rate of solids accumulation which is a function of evaporation in the cooling tower system.

Blowdown releases, evaporative losses and drift losses are replaced by makeup water introduced into the system upstream of the pumps.

3.4.2 NUCLEAR SERVICE WATER SYSTEM

The Nuclear Service Water (NSW) System supplies cooling water to various heat loads in both the primary and secondary portions of each unit. The maximum flow of 151 cfs per unit is pumped by the NSW pump structure through the systems requiring cooling. The heat gained in this process is dissipated in a dedicated closed-cycle wet mechanical draft cooling tower. Makeup for the NSW System is provided from the NSW Pond.

3.4.3 CONVENTIONAL SERVICE WATER SYSTEM

The Conventional Service Water (CSW) System supplies cooling water for various functions on the secondary side of the plant, including the main turbine oil coolers, the generator stator cooler, and the generator hydrogen cooler. CSW is taken from the CCW cooling towers. Three half-capacity pumps maintain the normal 15.4 cfs flow. After passing through the coolers, the average 15.9 F warmer water is returned to the cooling towers for heat dissipation.

3.4.4 MAKE UP WATER SYSTEM

The Make up Water System replaces water that is lost in the cooling towers due to evaporation and blowdown. The River Intake Structure, shown in Figure 3.4.0-1, serves as a platform to support trash racks, screens, pumps, motors, and other equipment. The four 1/3 capacity make up pumps located at the River Intake Structure pump the required maximum flow of 122 cfs to the Intake Sedimentation basin where a second set of pumps is located. This second set of pumps, located on the makeup intake structure, is sized to pump the required makeup to the cooling tower basin. Figure 3.4.4-1 is a profile of the proposed make up water system. The plan and profile of the River Intake Structure are shown in Figures 3.4.4-2 and 3.4.4-3 respectively. The maximum flow rate through the 12 foot traveling screen located in front of each make up pump will
3 be 41cfs while the maximum face velocity at each screen will be 0.5 fps.

3.5 RADWASTE SYSTEMS

There are four systems for each unit that process radioactive or potentially radioactive wastes. No radwaste components or subsystems are shared by, or interconnected between the units. The four systems are designated:

a) Miscellaneous Liquid Waste Management System (MLWMS)
b) Gaseous Waste Management System (GWMS)
c) Solid Waste System (SWS)
d) Steam Generator Blowdown System (SGBS)

The term waste denotes a product that is not practical to recover. The basic design criterion for all the above systems is to reduce the volume and specific activity of the total system input to a minimal amount prior to disposal or discharge. The reduction steps include recovery and recycle of uncontaminated water, separation and removal of non-radioactive gases, filtration and ion exchange, dewatering of resins, and concentration of liquid wastes by evaporation.

Discharge from Ninety-Nine Islands Dam is required during radwaste discharges. Normal operation requires dilution flow for approximately twenty minutes per day per unit. If required, sufficient storage capacity is provided to delay releases. Although it is not anticipated during normal operating circumstances, dilution flow could be required for durations of approximately six hours per day per unit.

3 3.5.1 MISCELLANEOUS LIQUID WASTE MANAGEMENT SYSTEM

The Miscellaneous Liquid Waste Management System flow diagram is shown in Figures 3.5.1-1 and 3.5.1-2. Table 3.5.1-1 lists the estimated quantity, flow rates and sources of input wastes to the MLWMS. Table 3.5.1-2 gives the expected decontamination factors for MLWMS conponents and the variations that are anticipated in waste quantities during normal plant operation. Table 3.5.1-3 lists the radionuclides, their half-lives, and their annual average discharge concentration prior to dilution.

Radioactive liquids are discharged from the MLWMS to the river via the
4 Ninety-Nine Islands Dam, as shown in Figures 3.4.1-3, 3.4.1-3a, and 3.4.1-3b. Radioactive liquid wastes from the plant are mixed with flow from the Dam during discharge periods. The concentrations of radioactive nuclides in the discharge from the dam, prior to entering the river will be at or below the concentrations specified in 10CFR20, Appendix B, Table II, Column 2. There will be variations in the frequency of the discharges depending on variations in the input to the MLWMS. The frequency of discharges may vary from every day to every 30 days.

3.5.1.1 System Description

The Miscellaneous Liquid Waste Management System processes contaminated liquid waste from the laundry, showers, building sumps, lab and sample sink drains, and condensate from the containment coolers. All these sources are potentially radioactive and are generally not suited for cleanup and reuse as

3 reactor coolant. Steam generator blowdown concentrate is not processed in the MLWMS.

The system is designed so that all radioactive liquid wastes that are to be discharged from a unit can be released to the environment only via the release point in the MLWMS. No other systems have release points for radioactive liquid wastes.

The system is designed to operate on a batch basis. Chemically contaminated radioactive and potentially radioactive liquid wastes are directed to the MLWMS via the Equipment and Floor Drainage System. Here the liquid waste is monitored and processed prior to discharge to the environment. The processing selected for the liquid collected in this system is dependent upon its chemical and radionuclide contamination level. Numerous recirculation lines are provided to insure that the required processing is accomplished.

3.5.1.1.1 Liquid Waste From Laundry Operations

Laundry operation liquid wastes which are potentially radioactive and may contain large diameter particles, such as lint, are collected and sampled in the laundry tanks. Because of the expected low radioactivity level, processing of the laundry tank contents generally requires that only filtration be applied prior to discharge to remove any organic material and suspended solids. If the specific activity of the tank contents exceeds a level where direct or diluted discharge is allowed, the flow will be diverted to the waste concentrator to obtain the required processing. Both the flow rate and the activity level of the waste condensate pump discharge line is recorded and flow is automatically terminated if activity reaches a predetermined level.

3.5.1.1.2 Liquid Waste From Sumps and Drains

Liquid wastes which are radioactive and contain both suspended and dissolved solids from various drains, valve leakoffs and sumps are collected and sampled in the waste tanks. Sources, volumes and activities of waste tank
3 inputs are given in Table 3.5.1-1. Four waste tanks are provided to preclude the possibility of having contaminated liquids entering a previously sampled tank while its contents are being discharged. After sampling the contents of the waste tanks, it is necessary to render the liquid suitable for discharge. The waste tank liquid is first filtered to reduce suspended solids concentrations and remove organic material in order to reduce fouling of downstream system equipment. The application of an evaporator to process the filtered liquid provides an established means of reducing dissolved solids concentration as well as radioactivity levels with high decontamination factors. A mixed bed (H-OH form) ion exchanger is provided in the condensate path from each concentrator to further reduce any volatile species which carry over with the dis-
3 tillate. The distillate is collected in one of four waste condensate tanks for sampling and analysis prior to discharge. The concentrate from the evaporators is sent to the Solid Waste System for disposal.

3.5.1.1.3 Liquid Waste From Steam Generator Blowdown

Steam generator blowdown is not introduced into the MLWMS. Any radioactive
3 contamination of the blowdown is removed in the condensate polishers, as dis- Q
4 cussed in Section 3.6.1.5. Anticipated steam generator blowdown mass flow rate 2-a
is 172,000 lb/hr.

3.5.1.1.4 Liquid Waste From Containment Cooling Units

The MLWMS is designed to accept the condensate from the four containment cooling units when activity is detected by sampling. The condensate is collected in one of two tanks which provides sampling capability. When there is airborne radioactivity in the containment air due to leakage from systems that contain radioactive liquids, some of the airborne activity will condense with the water vapor that collects in the drip pans on the containment coolers. If the sample of the condensate tank contents contains significant amounts of radioactivity, the tank contents will be pumped to the waste concentrator for processing. If the sample contains no or insignificant amounts of activity, the tank contents may be routed to either the reactor makeup water tank or the discharge canal depending on its water quality. Volumes and activities are presented in Table 3.5.1-1.

3.5.2 GASEOUS WASTE MANAGEMENT SYSTEM

The Gaseous Waste Management System flow diagram is shown in Figure 3.5.2-1. Table 3.5.2-1 lists the estimated quantities, flow rates and sources of gases directed to the GWMS. Table 3.5.2-2 gives the specific activity of the radioactive gases discharged from the GWMS as well as the holdup time and its variation that is anticipated during normal plant operation. Releases from
4 the GWMS are made via the unit vent stack. The stack is approximately 180 Q1-b
feet high and has an approximate inside diameter of 12 feet. The stack is cylindrical in shape and has a normal flow rate of approximately 170,000 SCFM at 115 F. The location and relative height of the stack with respect to
1 the surrounding buildings is shown on Figures 3.1.0-4 and 3.1.0-5. Q3.5.1

4 The duration and frequency of containment building purge are described in PSAR Subdivision 9.4.5.3 and Subsection 11.3.6. Q1-c

3.5.2.1 System Description

The GWMS is designed to collect, store and monitor the maximum amount of gas generated from all the systems input streams. The primary constituent of the total volume generated is from gas stripping operations in the CVCS. The system is designed to process and hold this volume plus the volume from shutdown degasings as well as normal volumes from the other components served.

The waste gases, primarily composed of hydrogen and fission gases, are routed to the GWMS via the gas collection header (GCH), the containment vent header (CVH), and the gas surge header (GSH).

The CVH collects hydrogenated, potentially radioactive gases from the reactor drain tank and refueling failed fuel detector inside containment and connects with the gas surge header outside containment. The GSH collects the hydrogenated, radioactive gases with negligible oxygen from the CVH, the volume control tank and the gas stripper.

The GCH receives low activity gases containing oxygen from aerated tanks, ion exchangers and concentrators. These gases are then directed to the unit vent for monitoring and discharge.

Gases flow from the GSH to the gas surge tank where they are collected prior to being compressed. The gases remain in the surge tank until the pressure increases to a point where the waste gas compressors are started automatically.

The compressed gases then flow into one of the three gas decay tanks where they are analyzed. The analysis is done automatically by the gas analyzer which determines the oxygen and hydrogen concentration. The gas analyzer returns the sampled oxygenated gas to the GCH and the sampled hydrogenated gas to the GSH. After the contents of the tank have been identified, one of the following actions will be taken:

a) If no significant activity is present, the tank contents may be discharged to the atmosphere via the unit vent.

b) If there are significant quantities of hydrogen or oxygen present, the tank contents are passed through the catalytic type hydrogen recombiner to remove hydrogen and oxygen before returning the gas to another decay tank for long term storage.

c) If there is essentially only radioactive gas present, the tank will be filled to capacity and be allowed to decay by long term storage.

All discharges from the gas decay tanks to the unit vent are monitored with a radiation detector which will alarm if any residual activity is present and automatically close the discharge control valve. The only process flow bypass line that exists in the GWMS leads from the gas surge tank directly to the gas discharge header and bypasses the waste gas compressor and gas decay tanks. This flow path is used mainly to purge air from components after maintenance operations, at which time the vented gas contains essentially no radioactivity. The valve on this bypass line is locked closed to facilitate administrative control.

The system is designed so that all radioactive gases that are collected can be released only via the one discharge point in the GWMS. There are no other systems that have controlled discharge points for radioactive gases.

Ventilation systems that exhaust potentially contaminated areas are filtered
4 to conform to requirements in 10 CFR 50. A complete description of these Q1-a
systems, i.e. systems for the auxiliary and reactor buildings, can be found
in the PSAR Subsections 9.4.2, 9.4.5, and 9.4.7.

3.5.3 SOLID WASTE SYSTEM

The Solid Waste System flow diagram is shown in Figures 3.5.3-1 and 3.5.3-2. Table 3.5.3-1 lists the estimated quantities and sources of input to the SWS. Table 3.5.3-2 gives the expected activity of the solids that are being shipped off site.

3.5.3.1 <u>System Description</u>

The Solid Waste System is best described as a series of process operations involving the drumming of waste concentrator bottoms, spent resins, filter cartridges, chemical wastes and low activity solids.

3.5.3.1.1 Processing Waste Concentrator Bottoms

The concentrator bottoms drumming process is handled remotely from a control panel located behind a shield wall. The shield wall is fitted with lead glass windows for observation. A drum is moved to the fill station via a motorized conveyor. The drumming header nozzle is forced down tightly over the drum fill nozzle. Concentrate may then be pumped to the drumming header where it is blended with the solidification chemicals and catalyst before flowing into the drum. When the drum is filled to a preset level, drumming is automatically stopped. Concentrates remaining in the drumming header are flushed into the drum with demineralized water. The drum is then capped and moved into a storage position with the motorized conveyor. The drumming header may then be isolated. All of the above operations are observed and controlled from the shielded remote control panel.

3.5.3.1.2 Processing Spent Resins

The spent resin sluice pump provides 35 gpm of sluice water flow to flush spent resins from plant ion exchangers into the spent resin storage tanks. The spent resin sluice pump suction lines are connected to the 5000-gallon spent resin storage tanks above the maximum expected spent resin level to assure that the recirculated sluice water is relatively free of spent resins. Johnson screens fitted to the ends of the suction lines and a filter in the discharge piping of the spent resin sluice pump provide additional assurance that the recirculated sluice water is free of resins. In the sluicing process, sluice water is pumped through an ion exchanger from the bottom, thereby breaking up the resin bed, mixing with it, and flushing the spent resins into one of the spent resin storage tanks. When stored resins in a spent resin storage tank have reached a maximum level, that tank is isolated and sluicing flow is then directed to the alternate tank.

In preparation for drumming stored spent resins, the resins may be loosened up by using the spent resin sluice pump to recirculate sluice water from the top of the tank into the bottom. All connections to the tank are then valved off except those required in the drumming process. At the drumming station in the waste shipping area, the drumming header nozzle is manually connected to a truck-mounted, shielded cask.

The remainder of the drumming process is controlled from a remote panel. The spent resin and sluice water mixture is forced through the spent resin feed line to the drumming station at approximately 35 gpm by pressurizing the spent resin storage tank with nitrogen. The spent resins are blended with solidification chemicals and catalyst as in the concentrator bottoms drumming process. When the cask is filled to a preset level, drumming is automatically stopped. The drumming header is flushed, the drumming header nozzle is disconnected, and the cask is sealed. The drumming header is then isolated and residue remaining in the spent resin feed line is flushed back into the spent resin storage tank.

3.5.3.1.3 Processing Spent Filter Cartridges

All potentially radioactive filters are located with access hatches directly above each filter. Once a hatch is removed, the filter transfer vehicle, with associated tools and filter transfer shield, is moved over the hatchway. The filter below is remotely removed from its housing and drawn up into the transfer shield. The vehicle is then transported to the waste drumming area where the transfer shield with filter is removed from the cart and positioned over a bunker containing filter storage drums. The filter is lowered into a drum for storage. The transfer shield is removed, the drum is capped, and the bunker doors are closed.

3.5.3.1.4 Processing Chemical Reagent Wastes

Waste liquids from the chemical drain tank are disposed of in the same manner as concentrator bottoms.

3.5.3.1.5 Processing Miscellaneous Low-Activity Solids

Low activity solid wastes, such as rags, are compressed into 55-gallon drums by a hydraulic compactor. The drums are then stored in a shielded room within the waste shipping area to await shipment.

3.5.4 STEAM GENERATOR BLOWDOWN SYSTEM

The Steam Generator Blowdown System flow diagram is shown in Figure 3.5.4-1.
4 The system is designed to maintain steam generator blowdown during startup and Q
periods of primary-to-secondary leakage and condenser leakage. 2-e

3.5.4.1 System Description

The Steam Generator Blowdown System consists of the lines and associated valves connecting each steam generator blowdown nozzle with the main condenser. Impurities in the blowdown are removed in powdered resin type condensate polishers located downstream of the hotwell pumps. The polishers are described in Section 3.6.1.5.

3 A Steam Generator Blowdown System is provided for each unit. Steam generator blowdown is intermittently performed as required to maintain acceptable secondary side water chemistry. Essentially all of the blowdown liquid is treated and returned as condensate.

Sampling of the steam generator secondary water is the primary means of detecting either a condenser or a primary to secondary leak. A radiation monitor is provided in the Steam Generator Blowdown System as a backup to the sampling technique.

3.6 CHEMICAL AND BIOCIDE WASTES

Chemical and biocide usage at Cherokee Nuclear Station will be at the lowest level that is consistent with reliable operating practices. Treatment and discharge of wastes will be controlled so as to meet all applicable effluent limitations and water quality standards.

3.6.1 CHEMICAL AND BIOCIDE WASTE SOURCES

Chemical and biocide wastes originate in several systems. The Schematic diagram of Figure 3.3.0-1 may be used with the following descriptions to relate the various systems identified as waste sources and to trace the disposal routes.

3.6.1.1 Condenser Cooling System

Unit condensers will have stainless steel tubes for corrosion resistance and a
mechanical cleaning system that will recirculate sponge rubber balls through the
condenser to minimize deposits in tubes. Cooling towers will dissipate heat
from the condenser cooling water. Maximum evaporation is estimated to be 50,400
4 gpm, drift will be 114 gpm and blowdown will be about 5300 gpm. Makeup water
flow of 55,814 gpm maximum will first flow through the Intake Sedimentation
Basin for plain sedimentation to remove 60-70% of the suspended solids. Remaining
solids and incipient precipitates formed by concentrating makeup water will be
stabilized in suspension as sols by substantative action of liquid organic
corrosion and deposit inhibitor mixtures that may contain 10% of a short chain
polyacrylate polymer and aminomethylenephosphonate equivalent to 8.6% as
ortho-phosphate. Inhibitor product usage at 30 ppm concentration in the tower
is expected to permit cooling system operation with water in the range of
4 pH 7.8 to 8.25. The addition of acid to control pH is not expected but will
be used if found to be necessary.

Chlorination of cooling systems sequentially, once a day is expected to control algae and slime forming microorganisms when a free chlorine residual is established and maintained for one hour, or longer, in each system at 0.5 ppm in cold weather and at 1 ppm during warm months. Typically an application of chlorine, 4 to 8 ppm, would be applied for 20 minutes to satisfy the initial chlorine demand of cooling water in each system and to establish the desired concentration of free chlorine. Once established, the free chlorine residual will be maintained for one hour or longer by feeding 1 to 3 ppm of chloride, or as required, to maintain the residual. The chlorine concentration at the cooling water outlet of the condenser will be monitored for control purposes. Three units may use 1600-3200 pounds of chlorine a day through a sodium hypochlorite solution feeder discharging to the suction side of cooling water circulation pumps. As the treated water circulates through the cooling system, the warm water loses some chlorine to the atmosphere. Consequently, not all chlorine nor chlorine reaction products will remain in the water to be removed in the cooling tower blowdown as waste.

Since chlorination will be on an intermittent "slug" treatment basis, the free chlorine residual will disappear into the vapor phase or combine with the chlorine demand of makeup water to form chlorinated organics and mineral chloride salts. Sequential chlorination will cause different concentrations of chlorination products to be in the blowdown from each unit at any time and will result in a lower concentration in the receiving dilution water.

When chlorine-resistent organisms appear, or the use of a non-oxidizing biocide is indicated for any reason, the alternate organic control solution may contain dodecylguanidine hydrochloride as a 35% solution in 15% isopropanol. The product may be applied in the 10-30 ppm concentration range two times a week. The cooling system of each unit would be treated with 1,350 to 4,050 pounds of the active ingredient for each application. The diluted waste will have low toxicity and can be broken down by soil microorganisms.

3.6.1.2 Filtered Water Treatment

River water will pass through the Intake Sedimentation Basin where plain sedimentation can decrease turbidity 60% and can lower suspended solids 70%. The presence of fine clay-type mineral colloids in the settled water makes use of a coagulant mandatory.

The coagulant will be a polyelectrolyte that is approved for use in potable
water. These materials used in the concentration range of 1-4 ppm will replace
about 40 ppm alum and 12 ppm sodium hydroxide. The use of polyelectrolytes
avoids adding 51 ppm soluble sodium sulfate to filtered water. Also the
3 difficult disposition of a voluminous residue of aluminum hydroxide in filter
wash water is avoided. The polyelectrolyte coagulants are bridging agents of
minimal volume. They collect particulate and colloidal matter from water into
a more dense accretion that can be washed from filters and can be settled more
effectively as a waste, resulting in a diminished enviornmental impact.

Three filters of the deep bed upflow type will have a combined output of 2,100
gallons per minute. When 1.5 hours a day is set aside for cleaning each filter,
the system capacity will be three (3) million gallons a day. Chemical usage of
1-4 ppm polyelectrolyte and 2-10 ppm chlorine represents 25 to 100 pounds of
3 polyelectrolyte, and 50 to 250 pounds of chlorine a day at design capacity.
Wastewater from filter backwashing and rinsing will average 20,200 gallons
when 100 JTU water is treated. When the station operates at 76% load factor,
chemical requirements will be about 20-75 pounds a day of polyelectrolyte,
38-190 pounds a day of chlorine, and waste water flow will be about 153,700
gallons a day. Waste water will flow to the waste water holdup basin for
sedimentation of solids.

The frequency of filter washing will depend upon the turbidity of the settled
3 water pumped from the intake sedimentation pond and upon other factors. Waste
streams resulting from water filtration will be 2-8% of the volume of water
filtered.

The capacity of the water filtration system is designed to provide make-up
water during startup periods and under other adverse conditions. During
normal periods of operation the recycling of water through condensate
3 polishing demineralizers and through reverse osmosis will make a sub-
stantial reduction in water requirements in the station. The environmental
effect of a reduction in waste production is a direct result of increased
recovery and reuse of water in station operation.

Biocidal agents will be used to assure the bacteriological safety of the
3 potable water supply. Various means of disinfecting water are under study as
alternative processes to the use of chlorine. Alternate processes, among
others, includes the use of ozone and ultraviolet light.

3.6.1.3 Demineralized Water System

Filters containing granular activated carbon will remove organic compounds and chlorine from filtered water just ahead of two mixed bed demineralizers of 700 gpm capacity each. Periodically, the carbon filters will be backwashed and then steamed to remove suspended and adsorbed wastes that will flow to the Waste Water Treatment System.

Station requirements for demineralized Water may require operation of both ion
3 exchange cells to produce 1,100 gpm at times. Average plant requirements are estimated to demand 115 regenerations a year of a mixed bed demineralizer.

Each regeneration of an ion exchange cell will use 1,871 pounds sodium hydroxide and 1,216 pounds of 66° Be sulfuric acid. The acid will elute sulfates of metallic cations removed during water purification and sodium sulfate with the total being 1,638 pounds as sodium sulfate. The alkali will elute anions from the anion exchange resin, with sulfates from acid neutralization being the most abundant anion. Excess alkali in the waste stream will be 948 pounds as NaOH or 1,185 pounds as $CaCo_3$. The waste will flow to the Waste Water Treatment System and will be neutralized to a waste effluent not exceeding pH 9.0. Approximately 70,000 gallons of waste water result from each cell regeneration.

3.6.1.4 Reactor Coolant Chemicals

The daily usage of reactor coolant chemicals is estimated to include:

165 pounds boric acid for reactor shim management

0.1 pounds lithium hydroxide

~~3.6.1.5 Secondary Coolant Feedwater~~

Volatile treatment of water in the secondary system will use hydrazine as an oxygen scavenger and amines for pH control. Station annual usage of secondary feed water treatment chemicals will not exceed 18,000 lbs. hydrazine, 36,000 lbs. cyclo hexylamine or 180,000 lbs. of morpholine. Hydrazine reacts with oxygen or decomposes forming water, nitrogen or ammonia that may recirculate in the feed water system or leave the system by way of the air ejector. Other amines can follow the same waste routes as the hydrazine.

4 Corrosion protection of the secondary side of shut down units is provided by using a blanket of inert nitrogen and/or by filling steam generators partly or completely with condensate quality water containing 200 ppm hydrazine and 10-15 ppm ammonia to pH 10. When tanks are available, layup solutions will be stored and recycled to conserve materials. When tank storage is not available, wet layup solution will be treated in the Waste Water Treatment System. To illustrate a worst case effect of diluting wet layup solutions into the River (Table ER 3.6.2-1) the assumption was made that 4 wet layups per unit per year would drain 24 full steam generators a year into the WWTS. Daily average discharges and downstream effects are tabulated.

Impurities in the secondary cycle are controlled by full flow powdered
resin condensate polishing demineralizer cells (Figure 3.6.1-1) following Q2-e
the hotwell pumps. Steam generator blowdown aids in steam generator water
chemistry control. Blowdown enters the cycle ahead of the demineralizers,
which act as a filter and demineralizer allowing both suspended and dis-
solved solids removal before the condensate re-enters the steam generators.
The system will include five condensate polishers per unit. Normally,
four polishers per unit will be in operation with the fifth polisher on
standby. Anticipated mass flow rate of condensate through each cell in Q2-b
service is 2,225,647 lb/hr. When the resins become fouled, the polishers
4 are precoated with fresh resins. Radioactively contaminated resins are Q2-d
discharged from the condensate polishing demineralizer backwash tank to the
spent resin tanks in the solid waste system. In the absence of radioactivity
spent resins will be discharged to the Waste Water Treatment System for
sedimentation and subsequent disposal to landfill. Typically, five polish-
ers per week will require precoating. It is estimated that the maximum
number of precoats will be one per day. A single precoat requires 310 lbs.
of resins and 500 gallon of water (backwash) for transport of spent resins. Q2-c
The condensate polishers will remove approximately 400 pounds of iron
oxides per unit per year and will provide some protection from condenser
tube leakage.

3.6.1.6 Miscellaneous

During a construction phase of six years, the pipe fabricating shop area will
use a total of 850 gallons of liquid detergents to spray-clean pipe assemblies
before final assembly into each of three units. Waste water flushed and
drained from pipe sub-assemblies will average containing 142 gallons of liquid
3 detergent a year. The product is designated as a biodegradable formulation.
The dilute waste will be piped from the component assembly area to temporary
~~package sewage treatment units of the extended aeration type used on the job~~
site. The shop waste will be mixed into a unit that receives mostly domestic
type waste from employee toilets. A certified operator is employed and labor-
atory tests assure design level results in waste treatment. Finally, effluent
from the package treatment unit flows through a lagoon before it flows into a
receiving body of water.

The condenser-feed water system of each unit will be cleaned with a hot alkaline solution before startup at intervals of about a year apart for each unit. The divided condenser will be cleaned by sections in sequence using one batch of solution to minimize waste. About 30,000 pounds of commercial trisodium phosphate, $Na_3PO_4 \cdot 12H_2O$, and 138 gallons of liquid detergent will be used in about 720,000 gallons of water. The waste will flow to the Waste Water Treatment System for treatment and controlled release. The annual daily average weights of these startup cleaning materials are included in WWTS discharges and downstream incremental effects of Table ER 3.6.2-1.

3.6.2 CHEMICAL WASTE DISCHARGES

Chemical wastes will be discharged from Cherokee Nuclear Station to the Broad River via (1) Miscellaneous Liquid Waste Management System (2) the cooling tower blowdown and (3) the effluent from the Waste Water Treatment System.

Referring to Figure 3.3.0-1 the effluent from the Miscellaneous Liquid Waste Management System (Section 3.5) will be diluted into the tailrace at Ninety Nine Islands Hydro Station while the generators are running. A separate line transporting cooling tower blowdown will flow to the spillway of the Ninety Nine Islands Dam.

Non-radioactive waste water including turbine building drains, filtered water treatment wastes, demineralizer regenerant wastes and equipment cleaning wastes will flow into the Waste Water Treatment System. The Waste Water Treatment System will consist of a Water Water Holdup Basin, two Settling Basins and a Final Waste Water Holdup Basin.

The Waste Water Holdup Basin will be approximtely 65' wide x 131' long x 8' deep for a nominal volume of 512,000 gallons. This treatment basin will be lined with reinforced concrete with vertical walls. The basin will be equipped with an auto-desludge system or a means for frequent cleaning will be provided. A sand-bed filter or a vacuum filter will be required to de-water the sludge. The discharge from the basin will be gravity flow, if possible. A level control will maintain the basin depth between 5 1/2' and 7 1/2'. The expected retention time at normal flow will be approximately four hours. A draindown pump with a capacity of 1,000 gpm will be required. The discharge from the basin will be pH adjusted. A coagulant may be added under manual control if necessary.

3

Two Settling Basins are provided, each of nominal size 7,500,000 gallons. The dimensions are approximately 250' wide x 500' x 8' deep. The waste water is fed through a sparger for good distribution. The normal discharge will be an underflow into a distribution header and gravity overflow to the Final Treatment Basin. The underflow arrangement will allow control of any oil in the basin. The basin will also be equipped with a draindown pump to pull the level down near the sludge level. Normally one basin will be maintained at the sludge level on standby while the other is in use.

These basins will be of uniform geometry to facilitate treatment. Impervious linings will not be required but provisions for periodic cleaning must be incorporated. The basin will have recirculation capabilities and pH adjustment equipment.

The Final Waste Water Holdup Basin will be approximately 70' wide x 130' long x 16' deep for a nominal volume of 1,000,000 gallons. Normal level will be 8' with a valve controlled gravity discharge to the river. The basin will be continuously monitored for pH and turbidity. If either parameter is out of spec the recirculation pump will be activated and the river discharge valve closed. An alarm will alert the plant operator. Normal recirculation will be back to the Final Basin influent. The extra 8' depth will allow adequate time for the station chemist to manually activate the acid or base feed. If this is not sufficient or if the 16' depth is reached the alternate re-culation mode will be back to the empty Settling Basin until the effluent can be brought into spec.

The basin will also be of uniform configuration without lining. Cleaning should not be required.

A summary of chemical effluents from the two discharge points is given in Table 3.6.2-1. No credit is taken for removal of chemical wastes either in the cooling towers or Waste Water Treatment System. For each of the discharges, the average and maximum discharge quantities of each constituent are listed as well as the average concentration at the point of discharge. The differences in quantity are based primarily on the average and maximum flow differential noted on Figure 3.3.0-1; the discharge concentration will not change appreciably with flow rate changes. The average and maximum contributions of the two streams to downstream concentrations are also given. The river flow rate of 2,467 cubic feet per second corresponds to the present annual average stream flow diminished by the annual average cooling tower evaporation rate at 100% load; the flow rate of 490 cubic feet per second is the lowest 7 day average flow, 1 in 10 year frequency. For comparison, the table also lists the average and amximum concentrations of each constituent normally present in the intake water.

3.7 SANITARY AND OTHER WASTE SYSTEMS

3.7.1 SUMMARY

In addition to the potentially radioactive wastes and chemical wastes described in the previous subsections, there are other miscellaneous liquid and gaseous wastes which will not be radioactive but which may require treatment from a public health standpoint. These liquid wastes include domestic sewage, small quantities of industrial chemicals, ordinary floor and yard drains, and air conditioning condensate. These sources of waste water will be treated as required to make them suitable for disposal, as described by the following subsections.

During plant operation, normal disposition of garbage and other non-radioactive trash will be to landfill.

Gaseous wastes include exhaust emissions from the auxiliary boiler and diesel generator engines.

3.7.2 SEWAGE TREATMENT SYSTEMS

During the period of plant construction, all domestic sewage from the field toilets, field office toilets, and mess hall will amount to a maximum total flow of 35,000 gallons per day. The average flow of effluent from the temporary system will increase to a maximum in 1979 and remain constant until 1982. It will then decrease until construction activities terminate several months following the startup of Unit 3, when the flow of effluent will be zero. These wastes will be treated in prefabricated extended aeration type sewage treatment plants having a combined capacity of 36,000 gallons per day. Up to 6 pounds of hypo-chlorite per day (12-25 ppm) will be used in chlorite contact chambers with 30-40 minutes retention. Sewage solids will be digested completely by extended aeration treatment, leaving a liquid effluent with a minimum free
4 chlorine residual of 0.5-1.0 ppm. The effluent will then be pumped to a holding pond and ultimately to the river.

After the construction period, domestic sewage will total an estimated 8,000
4 gallons per day. This sewage will be treated by extended aeration with tertiary treatment with a capacity of 8,000 gallons per day. The effluent will be treated in a contact chamber that will apply up to 2 pounds of hypo-chlorite per day (12-25 ppm). The effluent will have a minimum residual
4 of 0.5-1.0 ppm free chlorine and will be pumped to the station's holding pond and then ultimately to the river. Suspended solid removal will vary between 60 and 85 percent, and the biochemical oxygen demand (B. O. D.) reduction will
2 be 90 percent

4 Residual combined chlorine in the effluent of both temporary and permanent sewage treatment systems will be determined by daily tests using a procedure outlined in Standards Methods. The sewage treatment facilities will be operated under the supervision of a trained waste treatment plant operator who is certified by the state of South Carolina.

3.7.3 CHEMICAL LABORATORIES

Miscellaneous chemical reagents in very small quantities will be used in the chemical laboratories, and no special chemical waste treatment will be necessary.

Because drains from the "Hot Lab" may contain small quantities of radioactivity, all drains from this lab will be processed through the radioactive liquid waste disposal system described in Section 3.5.

3.7.4 LAUNDRY WASTES

Normally, laundry wastes should require no special chemical treatment. If testing shows that the laundry wastes contain unacceptable quantities of radioactivity, they will be processed through the radioactive liquid waste disposal system described in Section 3.5

3.7.5 DRINKING WATER

Drinking water disinfection and sanitary waste water post-treatment will utilize
4 hypo-chlorite. No disposal considerations will be involved.

3.7.6 PLANT HEATING BOILER

This boiler will be used for plant heating purposes for a period of approximately one year prior to Unit startup. After that, heat will be provided by
1 the Auxiliary Steam System. The boiler will be electric fired; there will be no emissions.

3.7.7 DIESEL ENGINES

The diesel generators will provide emergency power during an accident. They will be started and tested no less than once every two weeks and operate each time for about an hour. The diesels will run on fuel oil having a cetane rating of 37-47. The fuel oil will consist of 0.15 percent weight carbon residue, 0.60 percent weight sulphur, and 0.01 percent weight ash.

Exhaust gases will pass through an exhaust silencer before discharging into
1 the atmosphere. Sulphur dioxide content is expected to be 550 lb/yr. Nitrous oxide content is expected to be 3090 lb/yr.

3.8 RADIOACTIVE MATERIALS INVENTORY

Operation of the Cherokee Nuclear Station will require transportation of spent fuel and radioactive materials from the site and fresh fuel to the site on a regular basis. The nature and quantity of these materials are discussed in this section.

3.8.1 FRESH FUEL

The fuel for each reactor consists of 241 separate assemblies, substantially the same in appearance. A single assembly contains approximately 426.5 Kg of sintered Uranium dioxide fuel pellets and 112 Kg of zirconium alloy cladding, arranged into 236 cylindrical fuel rods. The Uranium is enriched to an upper value of about 3.5 weight percent Uranium - 235. New fuel is delivered by
3 truck from the fabrication plant in approved shipping containers. Shipments are under the general license provided in Title 10 of the Code of Federal Regulations, Part 71, and DOT regulations. Each container holds two fuel assemblies and has an empty weight of approximately 2000 Kg. Approximately 61 shipments are required over a five-year period to supply the three initial loadings, with about 7 shipments per year for each operating reactor thereafter (based on six containers per shipment).

3.8.2 IRRADIATED FUEL

Spent fuel assemblies removed from the reactors have essentially the same appearance as fresh fuel. The 81 assemblies per year which leave each unit (over a three-year period there are 80, 80, 81 fuel assemblies shipped per year per unit) are moved to the Spent Fuel Pools where they remain on site for a minimum 150-day cooling period. Then they are loaded into AEC/DOT authorized casks for shipment to the reprocessing plant, where valuable fuel material is recovered and wastes are isolated for disposal. These shipments have an average batch burnup of 34,410 megawatt days per metric ton of
3 Uranium and a maximum assembly burnup of 43,168 MWD/MTU. It is expected that rail casks (holding ten assemblies) and/or truck casks (holding one assembly) will be employed. Under these assumptions either 241 truck or 25 rail shipments would be required annually to remove spent fuel from the station.

3.8.3 RADIOACTIVE WASTES

Materials discharged from the Solid Waste Disposal System are shipped from the station to an AEC-licensed commercial burial ground for disposal. The solidification capability of the system is discussed in Section 3.5. Estimated quantities of these wastes are listed in Table 3.8.3-1. The weight of material may be conservatively estimated using the density of concrete (147 lb/ft^3). There are no plans to transport liquid or gaseous radwastes from the plant. Activity in curies per cubic foot should be on the order of 1.0 to 10. for resins and filters, 0.1 for evaporator bottoms and chemical wastes, and .01 for miscellaneous compacted solids. Resins, evaporator bottoms, and chemical wastes are shipped, if required, in specification DOT Type B containers or AEC-approved containers for large quantities of radwaste (shielded casks). Filter cartridges are shipped in drums with internal shielding. Compacted trash is shipped in specification DOT Type A containers (55 gallon steel drums). It is expected that disposal of these radwastes will require about 53 truckloads per year for three units.

3.9 TRANSMISSION FACILITIES

3.9.1 DESCRIPTION OF THE LINES

In order to connect Cherokee Nuclear Station with Duke Power's existing
transmission system, three double-circuit 230 kV lines are folded into the
1 Cherokee switchyard. These lines are the Shelby Tap to Peach Valley 230 kV line,
the Catawba to Pacolet 230 kV line, and the Catawba to Shelby Tap 230 kV line.
By folding in these existing transmission lines, the number of rights of way
and the amount of line construction are reduced. (See Figures 3.9.1-1 and Q3.9.
3.9.1-2). Q3.9.

Each fold-in, consisting of an incoming and outgoing line, is described as follows:

1 The Shelby Tap to Peach Valley 230 kV fold-in is a standard three-phase, double-
circuit steel tower line. The conductors are 2515 MCM ACSR (Joree) bundled two
per phase. The two overhead ground wires are 1/2 inch high strength steel. A
common right of way used by the incoming and outgoing lines is 270 ft. wide and
5.9 miles long. Towers are spaced approximately 1100 ft. apart and are 110 to
175 ft. high. Minimum wire clearance to the ground at any point is 35 ft.

A section of right of way approximately 1.4 miles long and adjacent to the nuclear station will be widened to 379 ft. in order to accommodate existing 44 kV and 33 kV lines that are relocated due to plant construction. (See Figure 3.9.4-4).

The Catawba to Pacolet 230 kV fold-in is 7.4 miles long and requires a common corridor 270 ft. wide to accommodate both the incoming and outgoing lines. This line is three-phase, double-circuit, steel tower construction with a two-conductor bundle of 954 MCM ACSR (Cardinal). Towers are approximately 1100 ft. apart and vary in height from 110 to 175 ft.

The fold-in for the Catawba to Shelby Tap 230 kV line consists of an incoming
and outgoing line located on a 270 ft. right of way for the first 1.6 miles
out of Cherokee. The remaining 6.2 miles of line parallels an existing 44 kV
line and requires a right of way 251 ft. wide. The lines are three-phase
1 double-circuit. Conductors are 2515 MCM ACSR (Joree) and are bundled two per
phase on the outgoing line from Cherokee to Shelby Tap. The incoming line
1 from Catawba is single conductor of 2515 MCM ACSR (Joree) at each phase.
Towers are 110 to 175 ft. tall. Minimum wire clearance to the ground is 35 ft.

3.9.2 LAND USE ALONG THE LINES

Shelby Tap to Peach Valley 230 kV Fold-In

Length of Right of Way	5.9 mi.	
Width of Right of Way	379 & 270 ft.	
Total Acres in Right of Way	211.2 ac.	
Forest Land	172.8 ac.	81.8%
Pasture Land	22.2 ac.	10.5%
Active and Inactive Agriculture	16.2 ac.	7.7%

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Shelby Tap to Peach Valley 230 kV Fold-In
(Continued)

Area Cleared	172.8 ac.	
Number of Railroad Crossings	0	
Water Crossings (Area)	0	
Manmade Structures Removed	0	

Catawba to Pacolet Fold-In

Length of Right of Way	7.4 mi.	
Width of Right of Way	270 ft.	
Total Acres in Right of Way	241.2 ac.	
Forest Land	166.1 ac.	68.8%
Pasture Land	46.4 ac.	19.3%
Active and Inactive Agriculture	28.7 ac.	11.9%
Area Cleared	166.1 ac.	
Number of Railroad Crossings	0	
Water Crossings (Area)	0	
Manmade Structures Removed	0	

Catawba to Shelby Tap Fold-In

Length of Right of Way	7.8 mi.	
Width of Right of Way	270 & 251 ft.	
Total Acres in Right of Way	242.7 ac.	
Forest Land	212.1 ac.	87.4%
Pasture Land	16.1 ac.	6.6%
Active and Inactive Agriculture	3.9 ac.	1.6%
Area Cleared	212.1 ac.	
Number of Railroad Crossings	1	
Water Crossings (Area)	10.6 ac.	4.4%
Manmade Structures Removed	0	

Forest and land use types along the Cherokee transmission corridors were determined by the use of aerial photographs and ground reconnaissance. Acreage included in the proposed rights of way is made up of pasture land, active and inactive agricultural fields or woodlands.

The woodland forest types traversed by the transmission lines are typical of the Piedmont region. Figure 3.9.2-1 shows the locations where ground surveys of vegetation were conducted. The following numbered descriptions correspond to the survey areas on the figure. Q3.9.5

Shelby Tap-Peach Valley Fold-In

1. Dry Upland Shortleaf Pine - Virginia Pine Forest. Virginia pine and shortleaf pine are dominant species associated with hardwoods including sweetgum, post oak, blackjack oak, southern red oak, sourwood, hickories, and dogwood.

Amendment 1
Amendment 2
(Entire Page Revised)

2. Chestnut Oak Forest. Chestnut oak is dominant associated with other dry site hardwoods, shortleaf pine, and Virginia pine.

3. Cut over area consisting of small sweetgum, dogwood, and other understory species.

Catawba-Pacolet Fold-In

4. Pine scrub, including mixed Virginia pine, shortleaf pine, and loblolly pine, plus associated hardwoods such as wild plum, sweetgum, and blackjack oak. Typical association of old field succession on dry upland sites in the Piedmont.

5. Upland Shortleaf Pine - Virginia Pine as described above.

6. Pasture Land. Q3.9

7. Loblolly pine plantation approximately three years old with mesic hardwoods left in creek bottoms, including American beech, blackgum, and yellow poplar.

Catawba-Shelby Tap Fold-In

8. Upland Shortleaf Pine-Virginia Pine Forests. Shortleaf pine, Virginia pine, sourwood, sweetgum, dogwood, and American holly are important species.

9. Mixed Mesic Hardwood Forest. Important species include white oak, American beech, hickories, and dogwood.

10. Oak-Hickory Forest. Dominant species include southern red oak, white oak, hickories, sourwood, sweetgum, and red maple. Post oak and chestnut oak occur on drier sites in the area.

All of these plant communities are described in more detail in Section 2.7.1.1.

The impact of the proposed transmission lines out of Cherokee on future land uses in or near the rights of way is studied and investigated. It is found that the lines do not interfere with any projects such as picnic grounds, parks, or other public facilities that exist or are being planned in Cherokee County.

The "Cherokee County Economic Profile," prepared by the Cherokee County Development Board, reveals that the lines do not interfere with any future development plans in the county.

On October 25, 1973, Mr. Herbert P. Blanton, County Supervisor of Cherokee County, was contacted about any conflict the proposed transmission lines might have on future land uses in Cherokee County. At this meeting, the routes were discussed and it was concluded that no plans exist for any recreational or industrial sites along the planned corridors.

3.9.3 ENVIRONMENTAL IMPACT OF THE TRANSMISSION FACILITIES

Duke's studies of the environmental effects of the proposed lines out of Cherokee Nuclear Station indicate that the transmission lines and rights of way are located to minimize the environmental impact on the surrounding area. The use of common right-of-way strips is planned where feasible. Right-of-way corridors are blended with the surrounding areas so that the contrast between cleared areas and natural areas is minimized. Selective cutting is utilized where practical and low-growing vegetation is left at road crossings to enhance the view toward the transmission line. Road crossings bare of vegetation are planted with low-growth species where practical to provide a screen. The use of vegetative screening considerably improves the visual effect of the lines on passing motorists. Where the line crosses or parallels streams, low-growing vegetation is not disturbed along the banks so that soil stability is maintained and aquatic life is not affected.

Where possible, towers are constructed in locations to minimize the visual impact and to lower the tower silhouette against the sky. The procedures proposed in the U. S. Departments of the Interior and Agriculture publication, "Environmental Criteria for Electric Transmission Systems," are followed where practical. In selecting the proposed routes, a positive effort is made to follow the Federal Power Commission's "Guidelines for the Protection of Natural, Historic, Scenic and Recreational Values in the Design and Location of Rights of Way and Transmission Facilities."

Historical research is conducted to insure that no historical sites are disturbed by the Cherokee transmission lines. No historic sites listed or nominated to be listed in the Department of the Interior's National Park Service-National Register of Historic Places are in the route of the proposed lines.

On October 26, 1973, Mr. Jack Blanton, a noted historian of Cherokee County, and Mr. Bobby G. Moss, a professor of history at Limestone College, met with Duke to determine the impact the proposed transmission lines might have on historic sites in Cherokee County. Professor Moss stated that no historic sites listed or nominated to be listed in the National Register of Historic Places are located in or near the line routes.

Mr. Blanton and Professor Moss said that numerous iron smelting furnaces, dating back to the Revolutionary War, are present throughout Cherokee County. Some of these furnaces are still standing but none are developed historic sites. Professor Moss noted that a few of these furnaces are located in the Kings Creek area of Cherokee County near the proposed Catawba to Shelby Tap fold-in. This section of the line route was examined carefully and none of these furnaces were found to be in the proposed right of way.

Also, Mr. Blanton revealed plans for a historic park that is proposed for an area east of County Road 50 near the Broad River. This park will be developed around the original site of the Cherokee Ford Iron Works.

1 The proposed Shelby Tap to Peach Valley fold-in is located approximately 0.28 mile west of the park. The line is not visible from the park because of the dense woodlands in the area, and therefore has no effect on its scenic or historic value.

The transmission line rights of way out of Cherokee permit many possible beneficial land uses which could be developed in the line corridors. Agricultural and pasture lands crossed by the lines can continue their present use with no interference with the lines. Land that must be cleared is planted with suitable vegetation to provide food and cover for local wildlife. Also, some areas along the rights of way have the potential for development of hiking trails, game food plots, Christmas tree cultivation, and many other uses that the property owner may choose.

Section 5.6 discusses the possible electrical effects caused by operation of the transmission lines.

3.9.4 230 KV SWITCHING STATION

The 230 kV Switching Station at Cherokee is located about 800 ft. south of the powerhouse and encompasses an area of approximately 17 acres. Approximately 19 acres is reserved for a 525 kV switching station adjacent to the 230 kV switching station on the south side. The 230 kV and the tentative 525 kV switching stations' designs utilize low profile modern rigid frame structures to enhance the overall appearance and to harmonize with the contemporary architectural concept of the complete nuclear station at the site. A pleasing symmetrical arrangement of busses and equipment as seen in Figure 3.9.4-1 is achieved in the layout by utilizing the modern concept of breaker placement known as the breaker and a half arrangement. This design allows the reduction in the number of circuit breakers required in each switching station as compared to other comparable methods and is shown in Figure 3.9.4-2. An area will be reserved for inclusion of autobank transformers at Cherokee if the 525 kV switching station is later justified at this location. A typical autobank installation is shown in Figure 3.9.4-3.

Power is transmitted from each nuclear generating unit on two separate overhead transmission lines connecting to the 230 kV switching station. This, thereby, complies with regulations requiring each unit to have two connections to the offsite power system. Initially the 230 kV switching station will interconnect with the Duke Power Transmission Network by six double-circuit overhead transmission lines as shown in Figure 3.9.4-4. Provisions for two additional double circuit 230 kV transmission lines are included in the design for Cherokee plus space requirements for a future 525 kV switching station. The utilization of double-circuit lines for 230 kV transmission permits the reduction in number of rights of way required by allowing the use of one tower line for two 3-phase circuits.

All the transmission lines interconnecting with the switching station are composed of stranded aluminum wire, insulators that are sky gray in color and attaching hardware that has a galvanized coating of a silver gray color. The colors blend in well with other equipment in the switching station.

Inside the switching station all supporting structures for the busses and equipment are of a tapered rigid frame design and are constructed as low as standards will permit without sacrificing adequate electrical clearances. Power circuit breakers are also of a low profile design as well as the switching station relay house, the only building in the switching station. The power circuit breakers use an inert, nontoxic gas for insulation and power interruption. Since there is no oil in these breakers, no source of pollution from oil fires, explosions or leaking oil exists from this source, thereby aiding in preserving the natural environment. The autotransformers use an insulating oil with a high flash point. Sumps are provided to contain any transformer oil spillage. All

the autotransformers are protected against fire by an automatic water spray
2 system. The color of the power circuit breakers and transformers harmonizes
with the switching station structures, the aluminum busses, the overhead lines,
the siding of the relay house and the powerhouse and the surface of the switching
2 station, including the road which is covered with crushed stone. Prefabricated
trenches of concrete or other suitable material carry all the necessary power
and control cables underground throughout the station eliminating this from
view. The covers of these trenches provide walkways inside the station.

All of these features provide the station with its low profile, its subtle blend of colors and establish its aesthetically pleasing appearance. These features also subdue the outline of the station against natural surrounding terrain as demonstrated by Figure 3.9.4-5.

ER Table 3.3.0-1
Cherokee Nuclear Station
Station Water Use

FLOW	AVERAGE GPM	MAXIMUM GPM
River Water Make-up	41,723	54,800
Rainfall & Runoff to NSW Pond	629	- - -
Evaporation & Seepage from NSW Pond	1,085	- - -
Cooling Tower Make-up	40,627	55,814
Cooling Tower Evaporation CCW & NSW	36,540	50,400
Cooling Tower Drift Loss	87	114
Cooling Tower Blowdown	4,000	5,300
Intake Screen Backwash	3,400	4,200
Exterior Fire Protection	∿0	1,000
Interior Fire Protection	∿0	1,500
Filtered Water Make-up	640	3,400
Water Treatment Waste	130	2,000
Demineralized Water Make-up	535	1,100
Secondary Coolant Make-up	500	1,100
Secondary System Pump Seals & Leakage	500	1,000
Turbine Building Drains	630	4,500
Steam Generator Blowdown	115	150
Containment Cooler Condensate	1	2
Lab Drains and Waste Water	1	3
CVCS Make-up	0.5	400
Primary Coolant Leakage	0.4	30
Primary Coolant Leakage	0.03	3
Laundry and Shower	1	3.5
Sanitary and Potable Water	6	25
MLWM System Discharge	3	250
Waste Water Treatment System Discharge	636	

ER Table 3.3.0-2

Cherokee Nuclear Station

Cooling Tower Evaporation[1]

Not Including Drift[2]

Month	3 Units 100% Load CFS	3 Units 76% Load CFS
January	100	76
February	102	78
March	105	80
April	107	81
May	110	84
June	112	85
July	110	84
August	110	84
September	112	85
October	110	84
November	109	83
December	103	78
Average	107	82

Maximum evaporation will occur when three units operate at 100% load factor.

Average evaporation will occur at 76% load factor.

[1]ER Table 3.3.0-2 includes CCW and NSW cooling towers.

[2]Drift at 0.005% will cause an additional loss of 0.25 CFS at 100% load factor for three units.

ER Table 3.3.0-3
Cherokee Nuclear Station
Effects of Rainfall, Runoff, Evaporation, and Seepage on Basins

	Intake Sedimentation Basin	Nuclear Service Water Basin	Waste Water Treatment Basins
Basin Area, Acres	100	173	6.2
Runoff Area, Acres	373	1557	0
Rainfall Into Basin, Avg. GPM	241	417	15
Runoff To Basin Avg. GPM	389	1874	0
Total Input Avg. GPM	629	2291	15
Loss By Evaporation Avg. GPM	-196	-339	-12
Loss By Seepage, Avg. GPM	-898	-898	-56
Total Avg. Losses GPM	-1085	-1237	-68
Net Effect Avg. GPM	-465	+1054	-53

ER Table 3.4.0-1
Cherokee Nuclear Station
Heat Dissipation System

Heat Load		
Main Condenser (100% load)	8.7×10^9	BTU/hr/unit
Service Water (Normal Conditions)	5.5×10^6	BTU/hr/unit
Nuclear Service Water (Normal Conditions)	$80. \times 10^6$	BTU/hr/unit
Circulating Water Flow		
Condenser	2,175,000	gpm/station
Conventional Service Water	6,900	gpm/station
NSW	105,000	gpm/station
Cooling Towers (CCW)		
Design Wet Bulb	76° F	
Range	24° F	
Approach	11.3° F	
4 Exit Air Velocity	35.5 fps	
Exit Air Temperature	102° F	
Maximum Drift Rate	.005%	
Condenser		
Delta T	24° F	
Surface Area	1,100,000 square feet	
Tube Material	Stainless Steel	
Tube Length	39 feet	
Tube Diameter	1-1/4 inch	

ER Table 3.4.0-2 (Sheet 1 of 2)
Cherokee Nuclear Station
Design & Performance Data for CCW Cooling Towers

	Summer[1]	Winter[2]
Number of Towers	9	9
Height of Towers[3]	74 Ft.	74 Ft.
Capacity of Water Cooled	2,175,000 gpm	2,175,000 gpm
Range	24 F	24 F
Approach	11.3 F	29.5 F
Design Wet Bulb	76 F	40 F
Design Dry Bulb	92 F	48 F
Makeup Rate[4]	53,900 gpm (Max.)	42,917 gpm
Blowdown Rate	5,300 gpm	5,300 gpm
Efflux Air: Vertical Velocity	36 fps	35 fps
Temperature	102 F	85 F
Drift Rate	0.005%	0.005%

1 Design wet bulb based on temperature exceeded less than 5 percent of the time during the four summer months. Design dry bulb is corresponding temperature assuming 50 percent relative humidity.

2 Winter wet bulb and dry bulb based on average 4:00 P.M. meteorological conditions in January (based on Charlotte, N. C. weather data from 7-55 to 6-64).

3 Includes 18 Ft. for height of fan stack.

4 Summer evaporation is 47,823 gpm. Winter evaporation is 37,617 gpm.

ER Table 3.5.1-1
Cherokee Nuclear Station

Sources, Estimated Volumes and Activities of MLWMS Waste Inputs per Unit

1. Waste Tank Inputs

Source	Volume (gal/year)	Activity (Fraction of RCS)	Assumption
Containment Building Sump	4,088	1.0	14 gpd (3)
Auxiliary Building Floor Drains	58,400	0.1	200 gpd (1)
Lab Drains and Waste Water	116,800	0.002	400 gpd (1)
Sample Sink Drains	10,220	1.0	35 gpd (1)
Miscellaneous Sources	1,226,400	0.002	4200 gpd (2)

2. Laundry Tank Inputs

Source	Volume (gal/year)	Activity (Fraction of RCS)	Assumption (1)
Laundry, Laundry Sump, Contaminated Sinks and Showers	131,400	10^{-4} μCi/cc	450 gpd

3. Containment Cooler Condensate Input

Source	Volume (gal/year)	Activity (Fraction of RCS)	Assumption (3)
Containment Cooler Condensate	91,980	0.05	315 gpd

(1) Based on WASH-1258, July, 1973
(2) Based on Oconee Nuclear Station operating data
(3) Based on 240 LB/DAY primary leak to containment, average atmospheric condition inside and outside containment, purges 20% of the time with 52% of leakage becoming airborne

ER Table 3.5.1-2
Cherokee Nuclear Station

Miscellaneous Liquid Waste Management System Equipment Decontamination Factors

Nuclide	Waste Filter	Waste Concentrator Bottoms/Distillate	(1) Feed/Distillate	Waste Condensate Ion Exchanger	Laundry Filter
I	1	10^4	200	10	1
Cs	1	10^4	200	10	1
Rb	1	10^4	200	10	1
Mo	1	10^4	200	1	1
Y	1	10^4	200	1	1
Other Cations and Anions	1	10^4	200	10	1
Crud	1	10^4	200	1	1
Tritium	1	1	1	1	1

(1) Waste concentrator concentration factor = 50.

Holdup Times for Miscellaneous Liquid Waste Management System Tanks

	Component	Holdup Time, Days Normal (1)	Holdup Time, Days Minimum (2)
	Waste Tanks	22	2
	Laundry Tanks	35	3
3	Waste Condensate Tanks	15	2
	Containment Cooler Condensate Tanks	25	3

(1) Based on inputs given in Table 3.5.1-1.
(2) Order of magnitude increase in the normal volume of inputs.

ER Table 3.5.1-3
Cherokee Nuclear Station

Annual Average Discharges from the MLWMS of One Unit

	Nuclide	Half-life (Hours)	Annual Discharge Curies/year
	I 131	1.9(2)*	1.3(-2)*
	I 132	2.3	1.0(-4)
	I 133	2.1(1)	1.4(-2)
	I 135	6.7	3.3(-3)
	Mo 99	6.7(1)	9.2(-2)
4	Cs 134	1.8(4)	1.1(-3)
	Cs 136	3.1(2)	1.2(-3)
	Cs 137	2.6(5)	4.6(-3)
	Co 58	1.7(3)	4.4(-3)
	Co 60	4.6(4)	4.8(-4)
	TOTAL**		1.4(-1)
	H 3	1.1(5)	4.5(+1)

* ( ) indicates power of ten

** The sum of all other nuclides comprise less than 1 percent of the total

Amendment 1
(Entire page revised)
Amendment 3
(Entire page revised)
Amendment 4

ER Table 3.5.2-1
Cherokee Nuclear Station

Sources, Volumes and Flow Rates of
GWMS Waste Gas Inputs per Unit
Gas Collection Header (GCH)

Sources	Annual Volume (SCF)	Flow Rate (SCFM)
a. Blowdown Recycle IX	56	16
b. PCPS Pool IX's	112	16
c. Purification IX	112	16
d. Deborating IX	56	16
e. Waste Condensate IX	102	16
f. Boric Acid Condensate IX	102	16
g. Preholdup IX	56	16
h. Waste Concentrator	987	1
i. Boric Acid Concentrator	2,626	1
j. Laundry Tanks	17,567	7
k. Waste Tanks	53,325	7
l. Waste Condensate Tanks	53,325	7
m. Spent Resin Tanks	1,337	22
n. Reactor Makeup Water Tank	127,480	22
o. Holdup Tank	141,644	16
p. Refueling Water Tank	14,164	22
q. Equipment Drain Tanks	1,952	16
r. Concentrate Tanks	4,438	1
TOTAL	419,441	

Gas Surge Header (GSH)

Sources	Annual Volume (SCF)	Flow Rate (SCFM)
Reactor Drain Tank(2)	7,759	.02
Volume Control Tank	1,624	.004
Gas Stripper	145,000	.32
Refueling Failed Fuel Detector(2)	1,673	.004
TOTAL	156,056	

(1) Flow rates are estimated maximums, not continuous. Volumes include anticipated operational occurrences.

(2) Inputs that enter the GSH via the containment vent header.

ER Table 3.5.2-2
Cherokee Nuclear Station

Annual Average Discharge from GWMS

Nuclide	Half-life, Hours	Discharge per unit, Curies/year
Kr-85M	4.4E+00	5.8
Kr-85	9.4E+04	3.7(+2)
Kr-87	1.3E+00	3.7
Kr-88	2.8E+00	1.0(+1)
Xe-131m	2.8E+02	6.5(-1)
Xe-133	1.3E+02	1.0(+2)
Xe-135	9.3E+00	2.2(+1)
Xe-138	2.8E-01	2.4
I-129	1.5E+11	1.2(-11)
I-131	1.9E+02	9.8(-4)
I-132	2.3E+00	1.2(-4)
I-133	2.1E+01	1.0(-3)
I-134	8.7E-01	7.6(-5)
I-135	6.7E+00	4.2(-4)

4

Note: Credit taken for one year holdup of the nuclides in the gas decay tanks prior to discharge.

*( ) Indicates power of ten.

ER Table 3.5.3-1
Cherokee Nuclear Station

Sources and Estimated Volumes of Waste
Inputs and Discharges for the Solid Waste System

Source	Input Volume For One Unit, ft^3/yr	Discharge Volume For Three Units, ft^3/yr
Spent Resins	324	972 (1)
3 Waste Concentrator Bottoms	3785	15140 (2)
Spent Filter Cartridges	70	210
Miscellaneous Low Activity Solids		
Compressible	2500	1500
Noncompressible	1000	3000
Chemical Reagent Wastes	120	480 (2)

(1) This volume is 1296 ft^3/yr (75 percent waste) if the resins are bound rather than dewatered.
(2) 75 percent waste.

ER Table 3.5.3-2
Cherokee Nuclear Station

Estimated Annual Activities of Discharges from the Solid Waste System per Unit, Curies/Year

	Discharge			
Nuclide	Spent Resins (1)	Concentrator Bottoms (2)	Chemical Reagent Wastes (3)	Spent Filter Cartridges (4)
I-129	4.1E-08	5.6E-07	1.4E-08	0.
I-131	6.4E-04	3.8E+01	6.4E-02	0.
I-132	0.	5.3E-09	2.1E-04	0.
I-133	0.	6.8E+00	1.0E-02	0.
I-134	0.	0.	5.5E-05	0.
I-135	0.	2.4E-02	1.8E-03	0.
Br-84	0.	0.	2.0E-06	0.
Rb-88	0.	0.	7.8E-05	0.
Rb-89	0.	0.	2.1E-06	0.
Sr-89	3.0E+00	5.9E-02	5.1E-04	0.
Sr-90	5.9E+00	2.7E-03	6.6E-05	0.
Sr-91	0.	3.7E-04	4.1E-06	0.
Y-90	0.	3.9E-03	4.5E-04	0.
Y-91	2.2E+01	3.0E-01	2.9E-04	0.
Zr-95	4.0E-05	2.8E-03	9.5E-04	3.4E+00
Mo-99	0.	1.7E+01	1.7E-02	0.
Ru-103	1.9E+00	9.9E-02	6.8E-04	0.
Ru-106	2.7E+01	1.3E-02	4.5E-04	0.
Te-129	0.	0.	1.6E-06	0.
Te-132	0.	2.6E+02	2.6E-03	0.
Te-134	0.	0.	3.1E-06	0.
Cs-134	1.4E+03	4.0E+00	7.5E-02	0.
C-136	9.3E-04	3.6E+00	9.5E-03	0.
Cs-137	7.3E+03	1.7E+01	3.2E-01	0.
Cs-138	0.	0.	6.7E-05	0.
Ba-140	7.9E-04	9.8E-02	2.3E-04	0.
La-140	0.	3.0E-02	2.9E-05	0.
Pr-143	1.1E-03	7.1E-02	2.0E-04	0.
Ce-144	5.4E+01	5.3E-02	1.0E-03	0.
Cr-51	4.4E-06	2.7E-01	3.3E-03	1.6E+02
Mn-54	1.5E-05	6.1E-03	2.6E-04	1.8E+01
Co-58	1.5E-04	5.5E-01	1.4E-02	7.5E+02
Co-60	2.3E-04	6.1E-02	3.1E-03	2.4E+02
Fe-59	3.5E-07	3.3E-03	5.9E-05	3.1E+00
Cu-64	0.	0.	0.	0.
H-3	0.	2.4E+01	2.1E-01	0.
TOTALS	8.8E+03	3.8E+02	7.4E-01	1.2E+03

(1) Credit taken for six months decay.
(2) Credit taken for 72 hours decay.
(3) Credit taken for decay while filling continuously.
(4) No credit taken for decay.

ER Table 3.6.2-1
Cherokee Nuclear Station
Waste Water Discharge

	BROAD RIVER WATER QUALITY		COOLING TOWER BLOWDOWN			WASTE WATER TREATMENT SYSTEM			MISCELLANEOUS LIQUID WASTE WASTE MANAGEMENT SYSTEM			DOWNSTREAM INCREMENTAL CONCENTRATION (1)	
	HIGH Mg/l	AVERAGE Mg/l	MAXIMUM Lbs/Day	AVERAGE Lbs/Day	AVERAGE Mg/l	MAXIMUM Lbs/Day	AVERAGE Lbs/Day	AVERAGE Mg/l	MAXIMUM Lbs/Day	AVERAGE Lbs/Day	AVERAGE Mg/l	MAXIMUM Mg/l	AVERAGE Mg/l
pH	7.8	6.8			8.0			8.5			8.0		
Color Pt-Co	26	8	4950	3760	75	450	100	15	14	0.5	15	2.05	0.29
Turbidity JTU	540	80									10		
Conductivity Micro Mho	130	60											
B O D_5	8	3	1860	1420	28	70	8	1.2	9	0.3	10	0.73	0.11
M B A'S	0.3	0.15	93	70	1.4	18	2	0.3	5	0.15	5	0.042	0.005
Alkalinity as Ca CO_3	40	15	9300	7042	139	2015	812	122	23	0.9	25	4.3	0.59
Hardness as Ca CO_3	14	12	7440	5640	112	560	62	9.3	14	0.5	15	3.04	0.43
Calcium Ca	3.8	3	1860	1410	28	154	17	2.6	5	0.15	5	0.76	0.11
Magnesium Mg	1.5	1	620	470	9	45	5	0.75	1.4	0.05	1.5	0.25	0.04
Sodium Na	6.6	4.5	3770	2600	52	1900	775	116	14	0.5	15	2.15	0.26
Potassium K	1.7	1.3	806	610	12	45	5	0.75	5	0.15	5	0.32	0.005
Iron Fe	0.18	0.1	62	47	0.9	18	2	0.3	0.09	0.004	0.1	0.03	0.004
Manganese Mn	0.1	0.05	31	23	0.46	9	1	0.15	- - -	- - -	<0.05	0.015	0.002
Ammonia NH_3	0.3	0.15	62	50	1	27	3	0.45	0.9	0.04	1	0.40	0.053
Nitrate NO_3	0.2	0.12	744	564	11	32	3	0.45	1.8	0.07	2	0.30	0.043
Phosphate PO_4	0.45	0.3	186	141	2.8	245	27	4.1	1.8	0.07	2	0.22	0.013
Chloride Cl	8.3	5	3720	2820	56	1300	144	22	7	0.28	8	1.9	0.22
Fluoride F	0.2	0.1	62	47	0.9	18	2	0.3	0.2	0.007	0.2	0.03	0.004
Silica SiO_2	16	12	7440	5630	111	180	20	3	16	0.6	17	2.9	0.42
Sulfate SO_4	5.6	4	4900	3100	61	4100	1660	250	9	0.3	10	3.43	0.36
Suspended Solids	2200	135	27900	21130	418	1200	133	20	9	0.3	10	11.0	1.60
Dissolved Solids	98	53	32860	24885	493	9900	3550	535	60	2.3	65	16.2	2.14
Polyacrylate Polymer (2)	--	--	186	141	2.8	--	--	--	- - -	- - -	- - -	0.07	0.01
Aminomethylene Phosphonate as PO_4 (2)	--	--	161	122	2.4	--	--	--	- - -	- - -	- - -	0.06	0.01
Boron (3)	--	--	10	6	0.12	(10)	(6)	(0.9)	1.9	0.07	2	0.004	0.0005
Hydrazine (3)	--	--	129	2	0.04	(129)	(2)	(0.3)	2.8	0.11	3	0.049	0.0002
Ammonia (3)	--	--	10	8	0.16	(10)	(1)	(0.15)	0.09	0.004	0.1	0.004	0.0001
Organic Biocide (Alternative)	--	--	617	467	9.24	--	--	--	- - -	- - -	- - -	0.24	0.035

FOOTNOTES

(1) DOWNSTREAM INCREMENTAL CONCENTRATIONS. Maximum Mg/l occurs when maximum lbs/day are added to a downstream flow of 490 cfs. Average Mg/l refers to average lbs/day in an average downstream flow of 2467 cfs.

(2) Poylacrylate polymer and aminomethylene phosphonate are components of a deposit and corrosion inhibitor added to cooling water.

(3) Numbers enclosed "(10)" are alternate discharge points.

ER Table 3.8.3-1

Cherokee Nuclear Station

Estimated Maximum Volumes of Radioactive Waste Shipments (Three Units)

Type of Waste	Volumes (ft^3/yr)	Nature of Waste
Spent Resins	972[1]	Chemical resins and fission and corrosion products
3 Waste Concentrator Bottoms	15,140 [2]	Boron precipitate with fission and corrosion products
Filters	210	Filter cartridges with fission and corrosion products, resin fines, particulates, etc.
Miscellaneous Low Activity Solids		
Compressible	1500	Rags, paper, glass, clothing, etc. with fission and corrosion products
Noncompressible	3000	
Chemical Wastes	480[2]	Spent and excess sample liquid which is likely to be tritiated and/or which may contain chemicals required for analysis.

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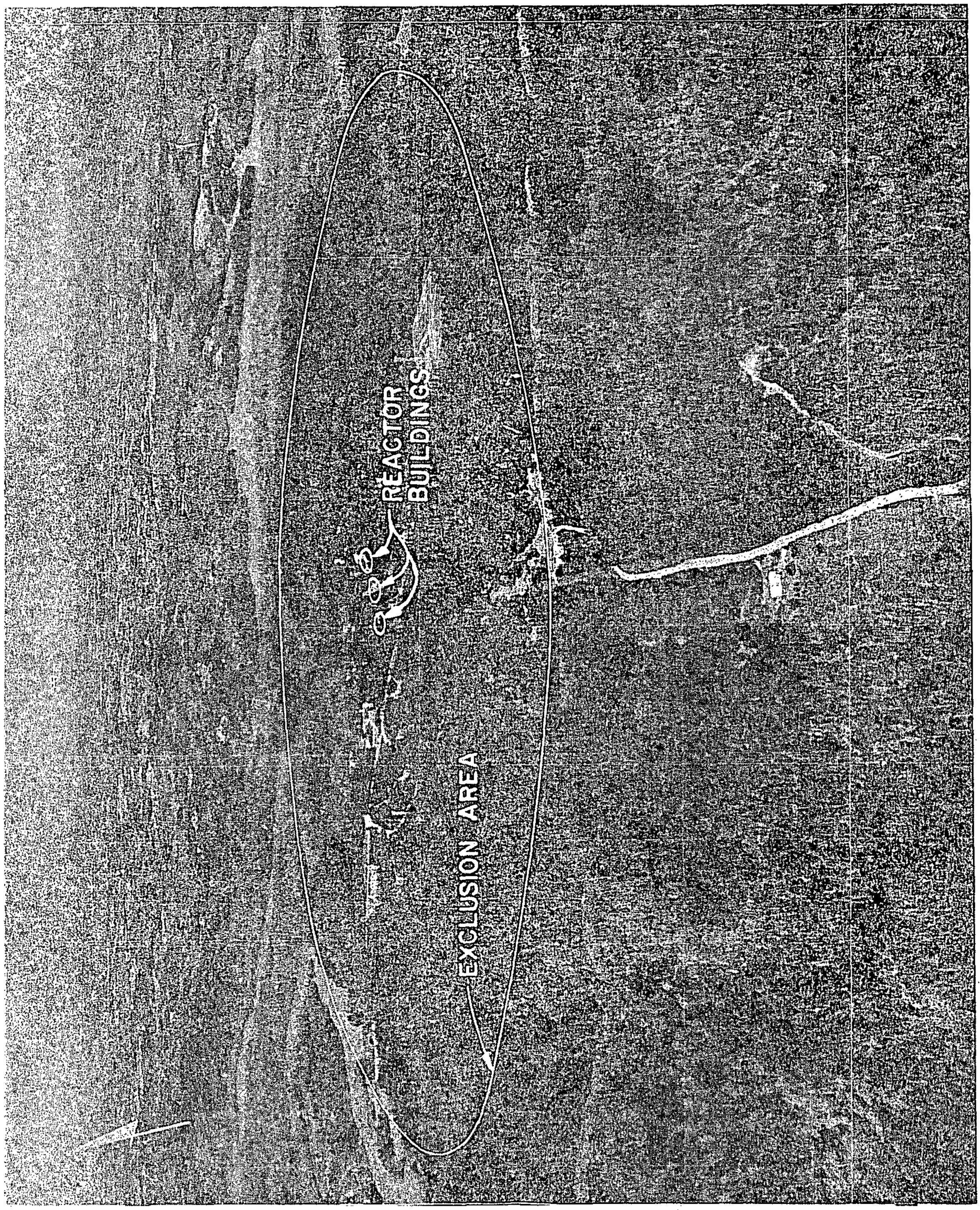
[1] This volume is 1296 ft^3/yr (75% waste) if the resins are bound rather than dewatered.

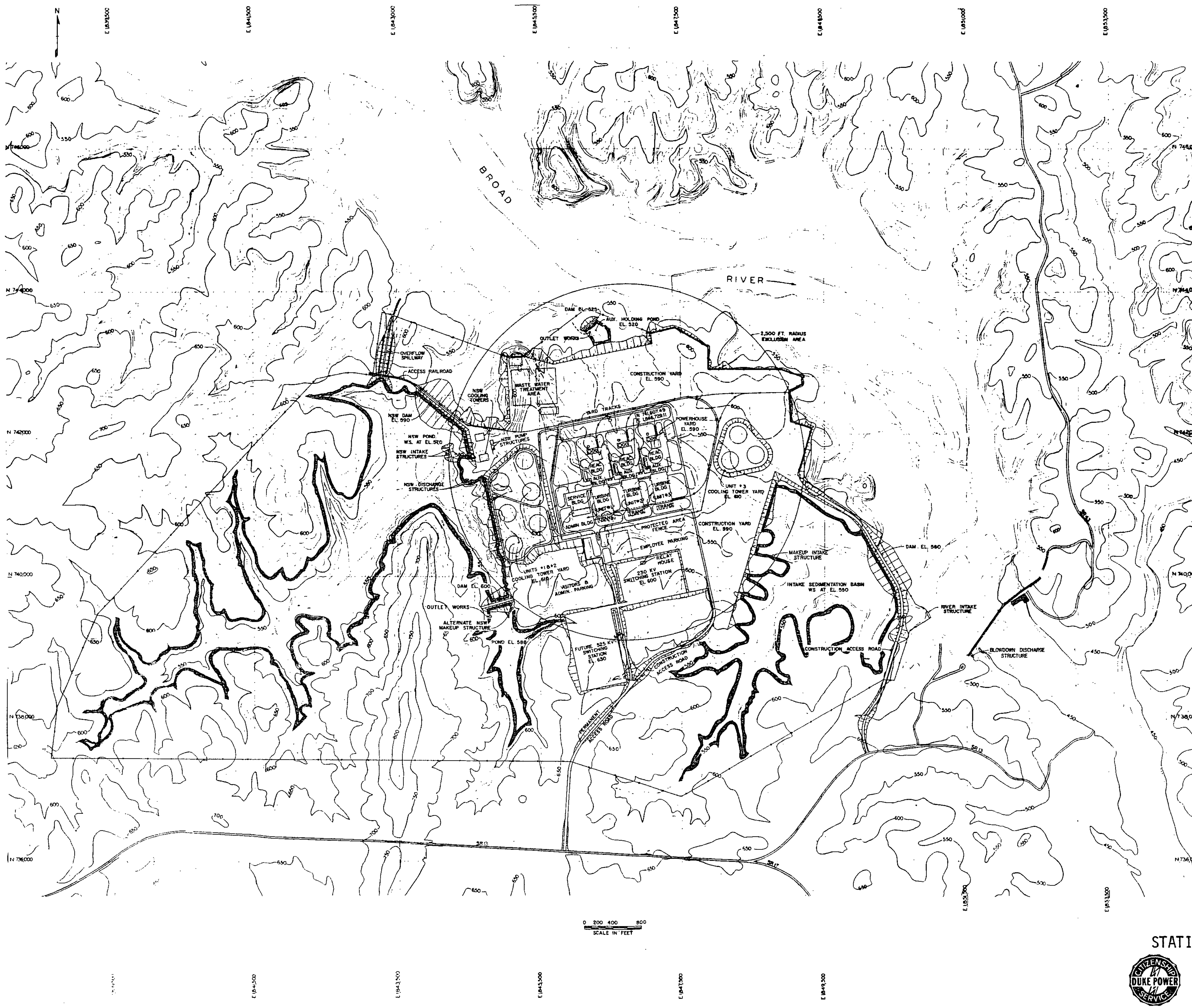
[2] 75% waste.



OBLIQUE AERIAL PHOTOGRAPH
OF STATION SITE

CHEROKEE NUCLEAR STATION

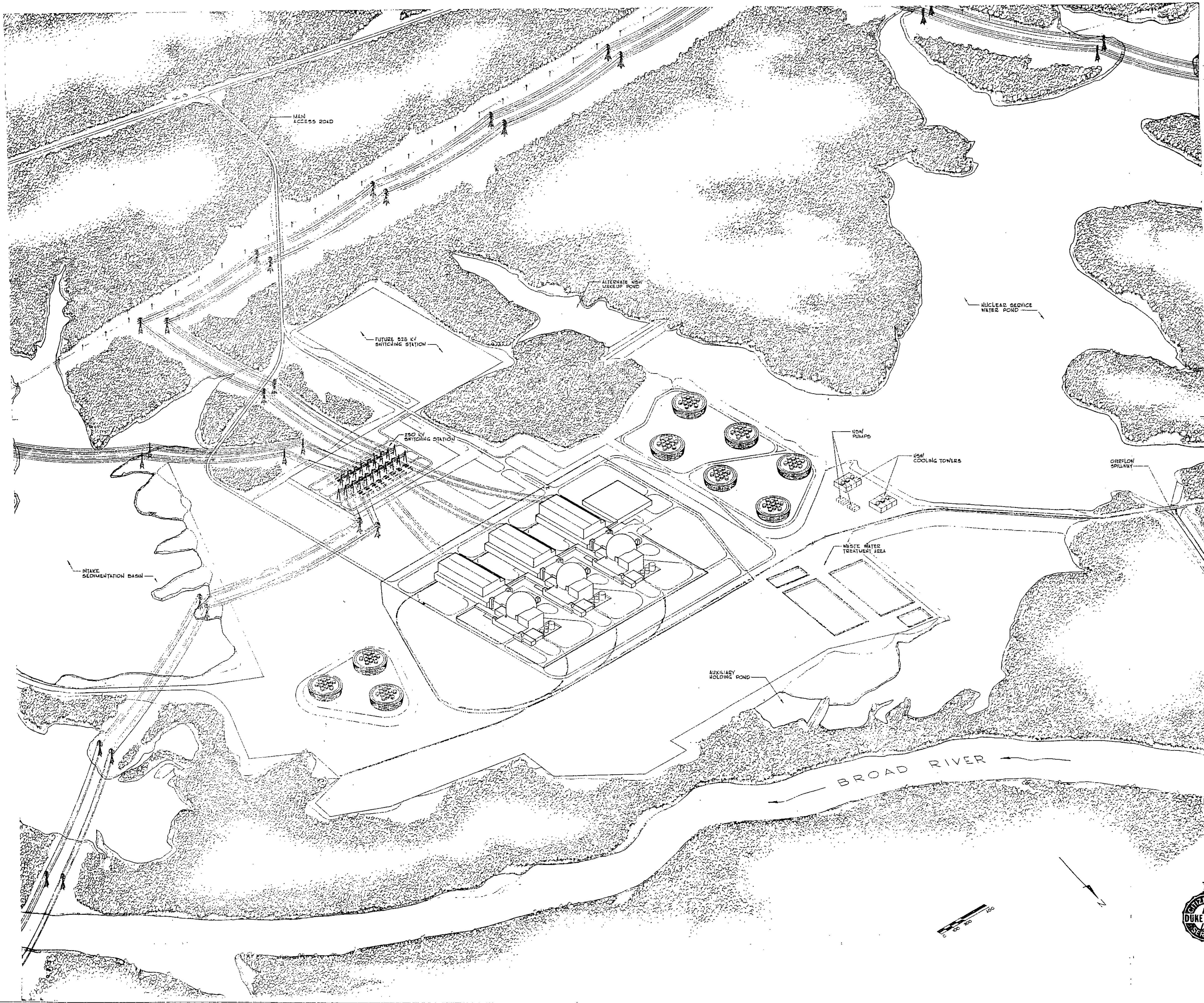
ER Figure 3.1.0-1



STATION LAYOUT

CHEROKEE NUCLEAR STATION

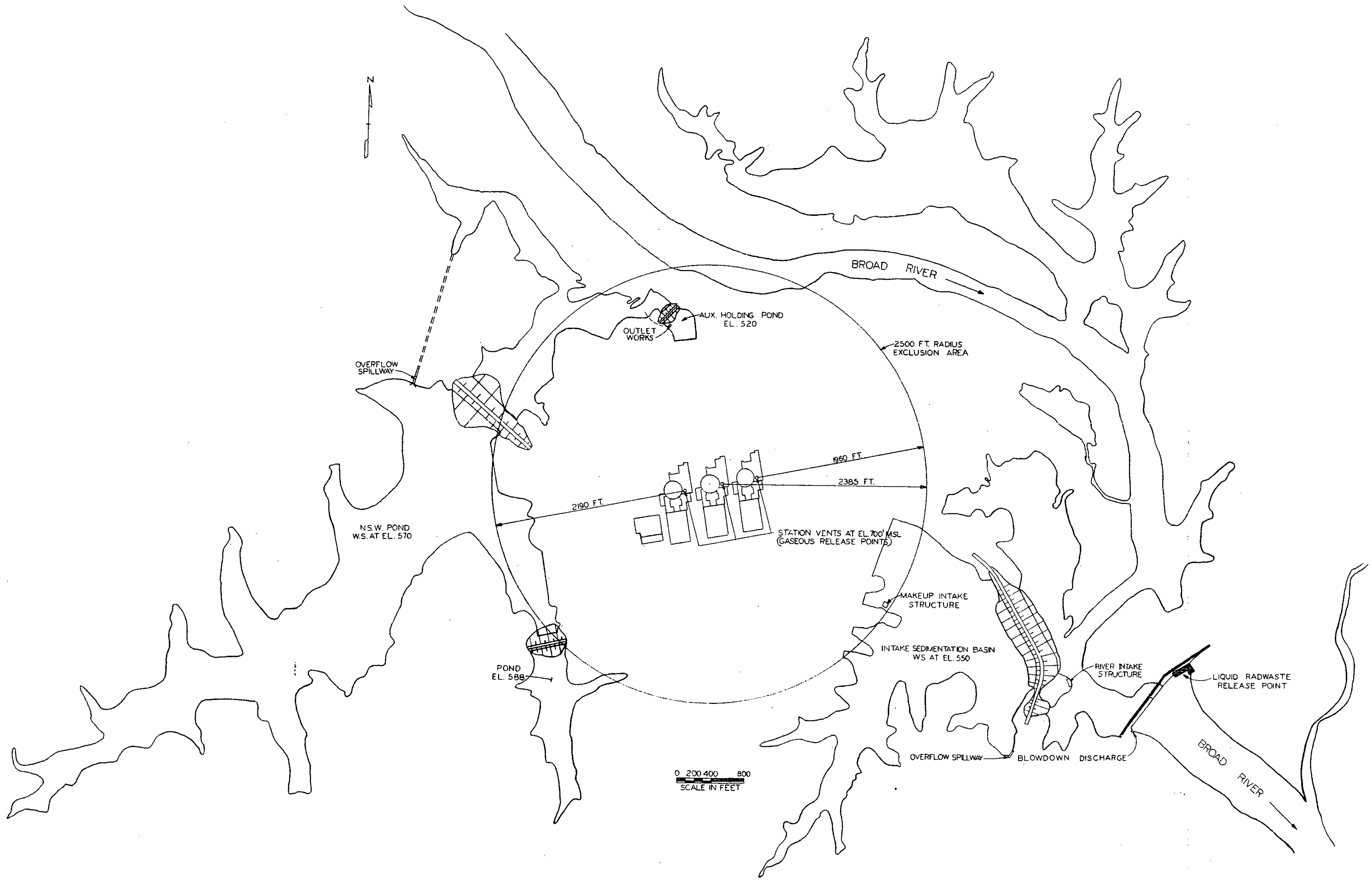
ER Figure 3.1.0-2
Amendment 2
Amendment 3



ISOMETRIC SITE LAYOUT

CHEROKEE NUCLEAR STATION

ER Figure 3.1.0-3
Amendment 2
Amendment 3



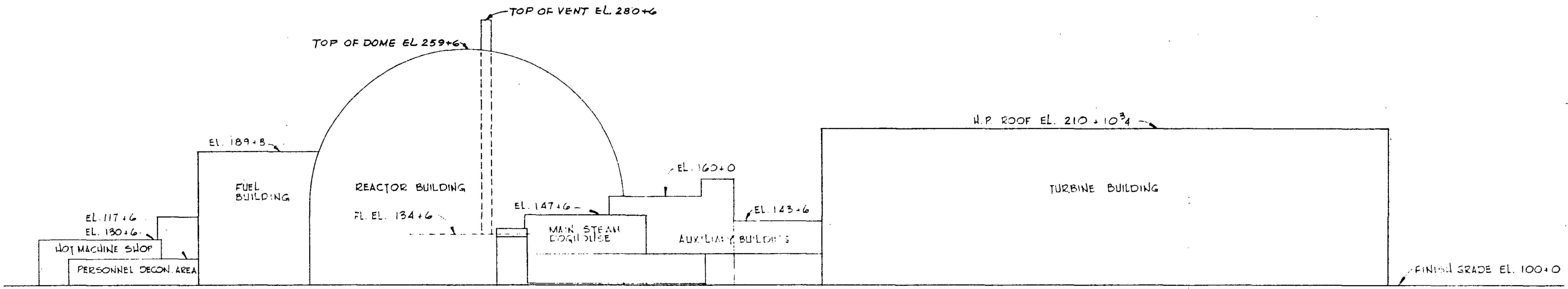
RELEASE POINTS

CHEROKEE NUCLEAR STATION

ER Figure 3.1.0-4

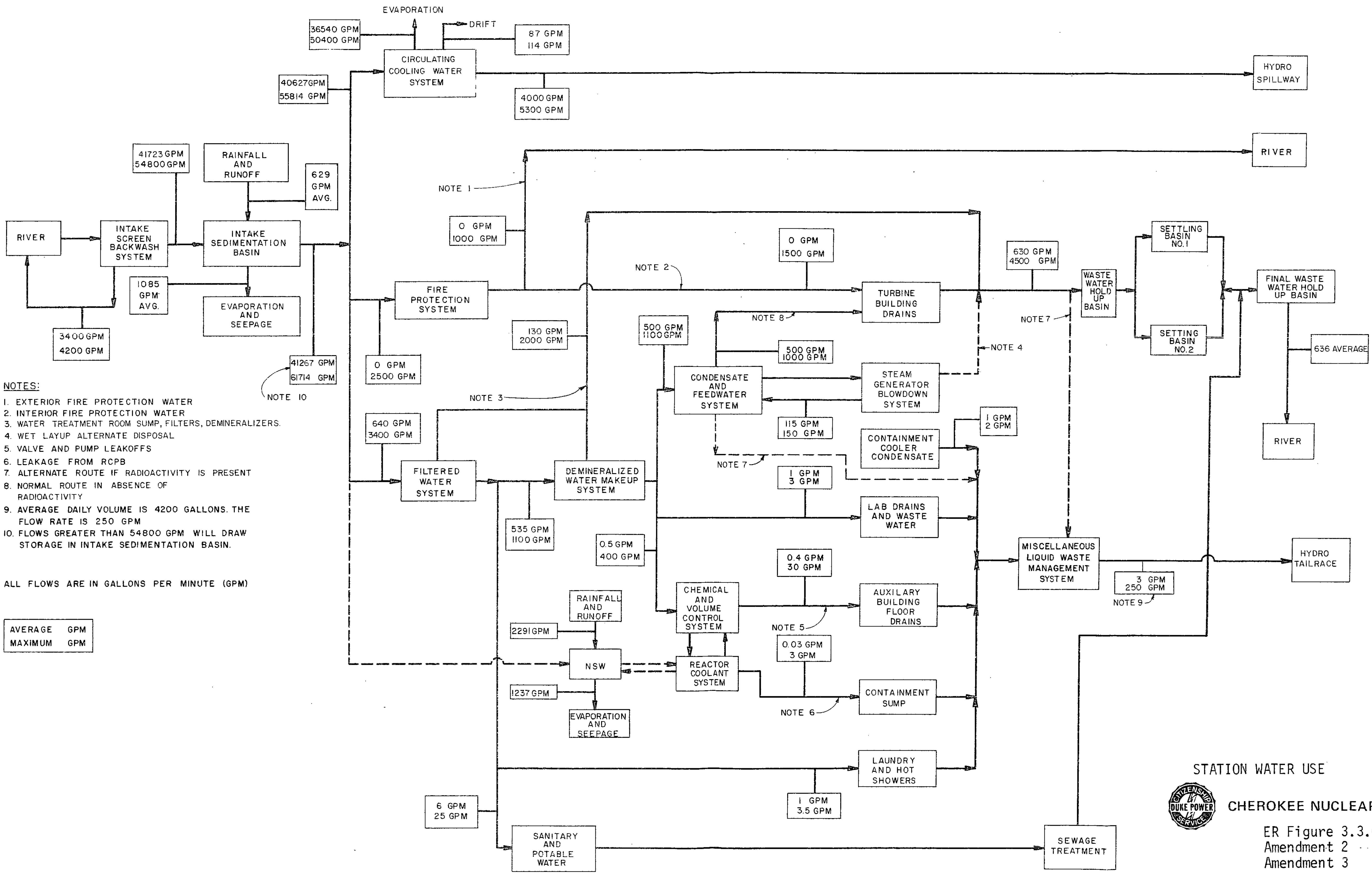
Amendment 2

Amendment 3



SCHEMATIC ELEVATION

CHEROKEE NUCLEAR STATION
ER Figure 3.1.0-5
Amendment 1
(New)
Amendment 4



NOTES:

1. EXTERIOR FIRE PROTECTION WATER
2. INTERIOR FIRE PROTECTION WATER
3. WATER TREATMENT ROOM SUMP, FILTERS, DEMINERALIZERS.
4. WET LAYUP ALTERNATE DISPOSAL
5. VALVE AND PUMP LEAKOFFS
6. LEAKAGE FROM RCPB
7. ALTERNATE ROUTE IF RADIOACTIVITY IS PRESENT
8. NORMAL ROUTE IN ABSENCE OF RADIOACTIVITY
9. AVERAGE DAILY VOLUME IS 4200 GALLONS. THE FLOW RATE IS 250 GPM
10. FLOWS GREATER THAN 54800 GPM WILL DRAW STORAGE IN INTAKE SEDIMENTATION BASIN.

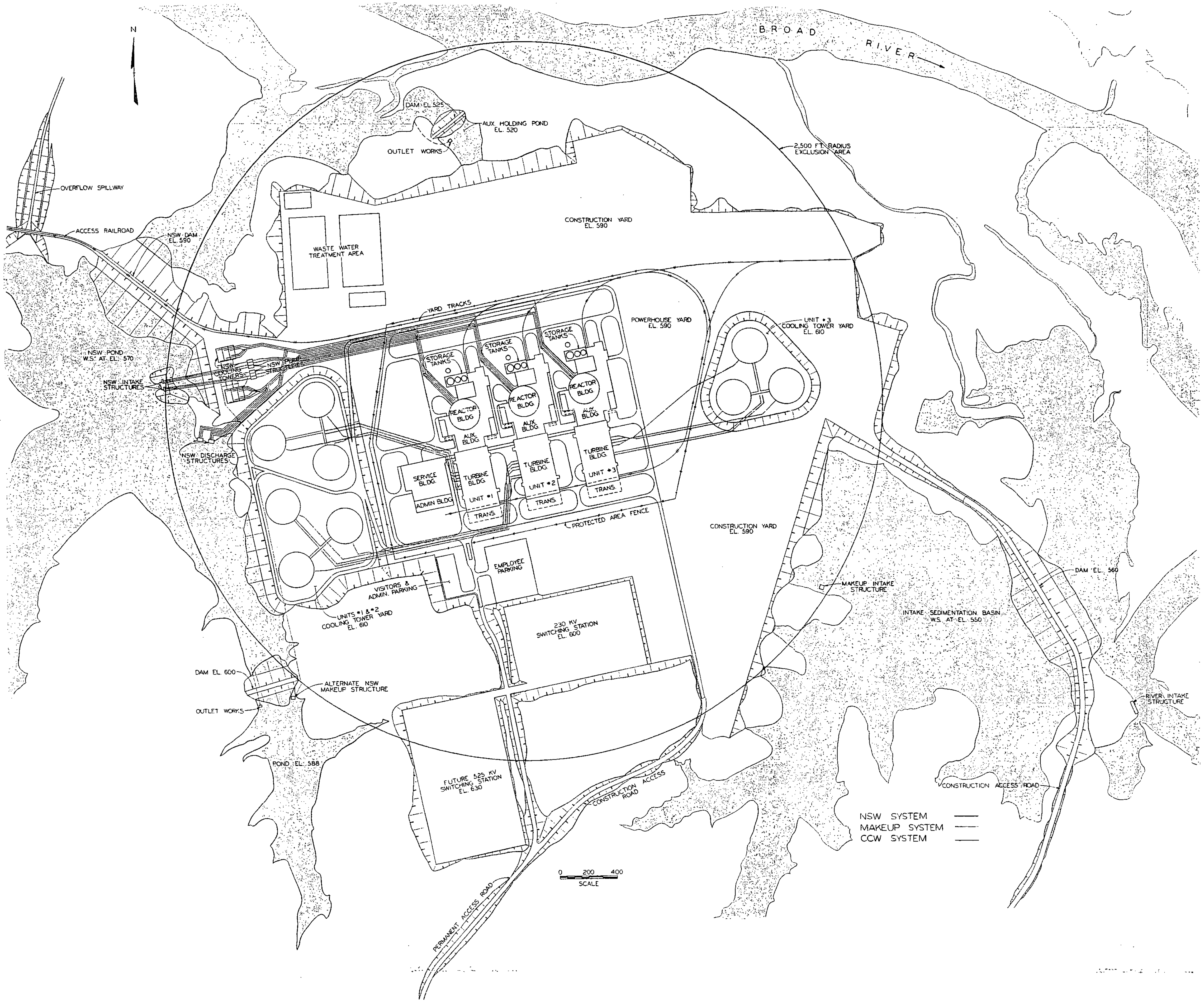
ALL FLOWS ARE IN GALLONS PER MINUTE (GPM)

AVERAGE	GPM
MAXIMUM	GPM

STATION WATER USE

CHEROKEE NUCLEAR STATION

ER Figure 3.3.0-1
Amendment 2
Amendment 3



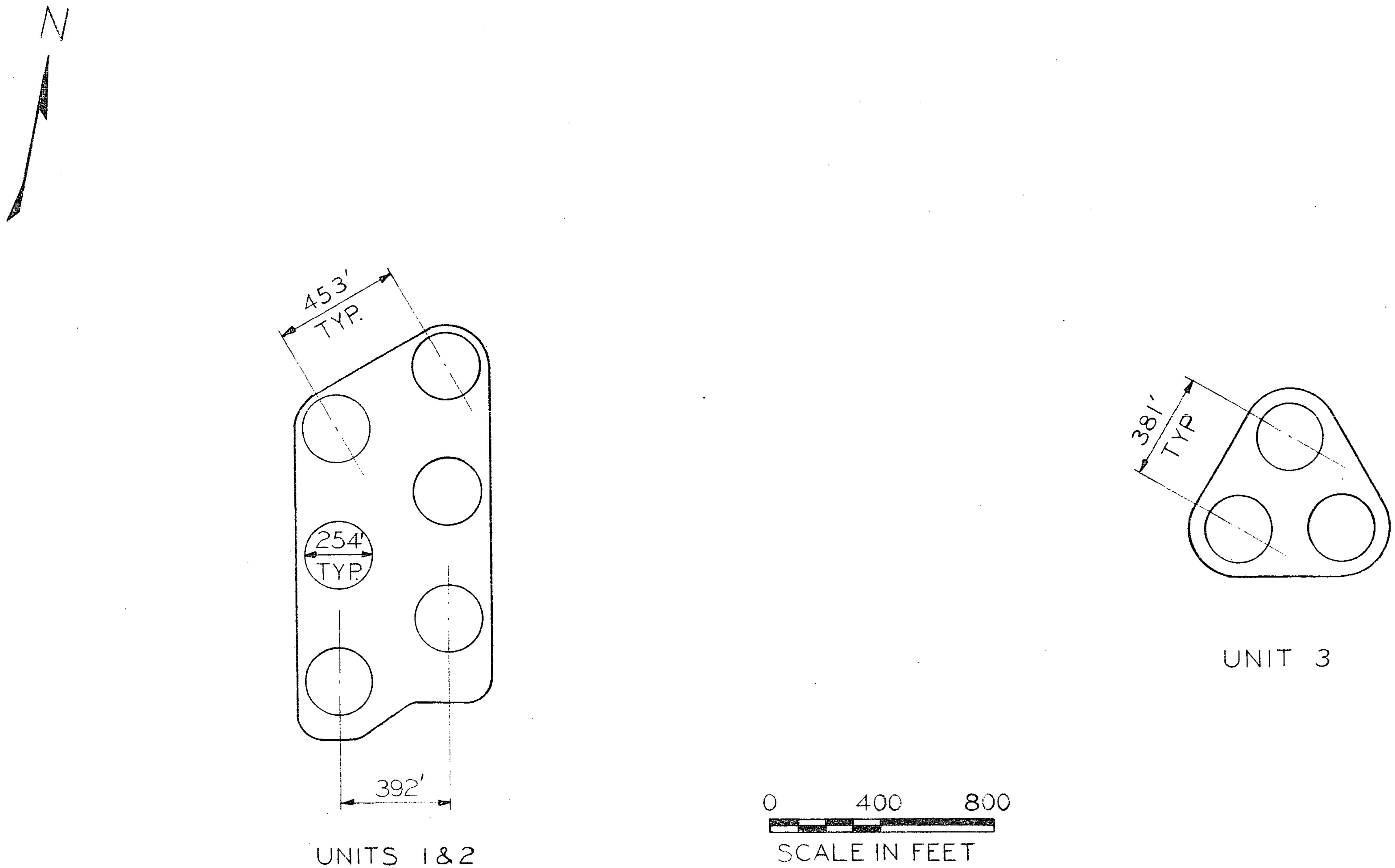
HEAT DISSIPATION SYSTEM

CHEROKEE NUCLEAR STATION

ER Figure 3.4.0-1

Amendment 2

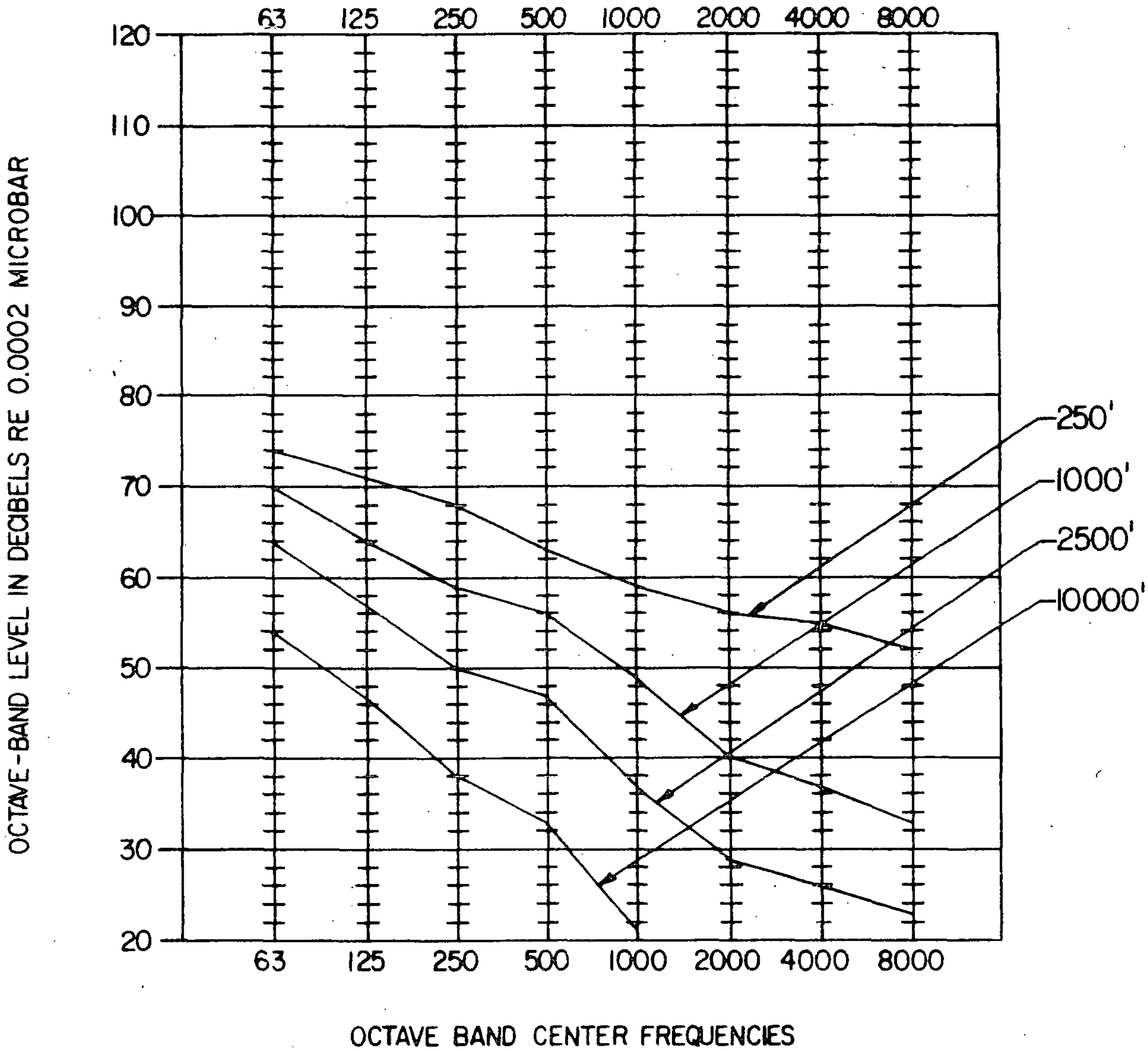
Amendment 3



COOLING TOWER ARRANGEMENT

CHEROKEE NUCLEAR STATION

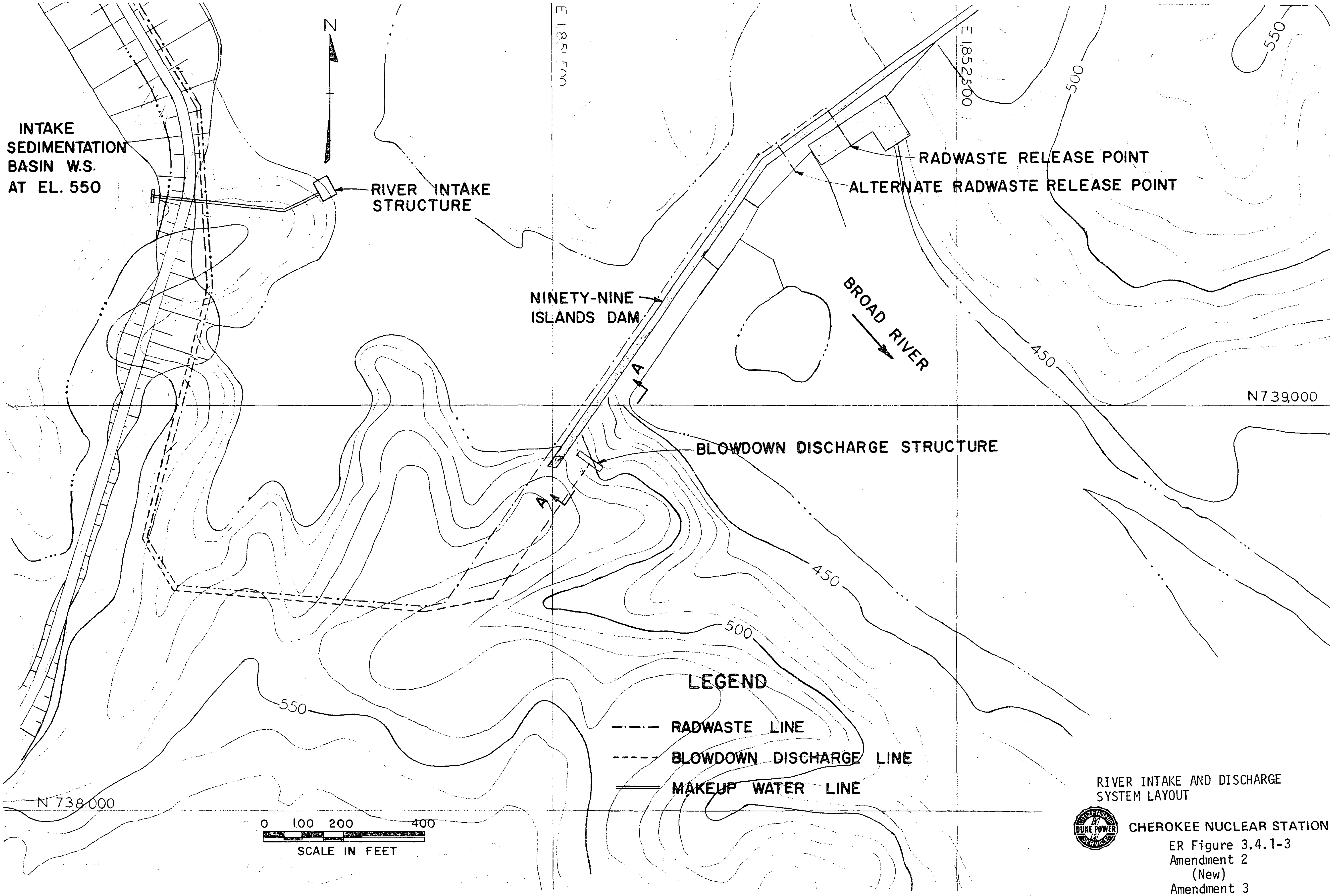
ER Figure 3.4.1-1
Amendment 2
Amendment 3



SOUND ANALYSIS

CHEROKEE NUCLEAR STATIO

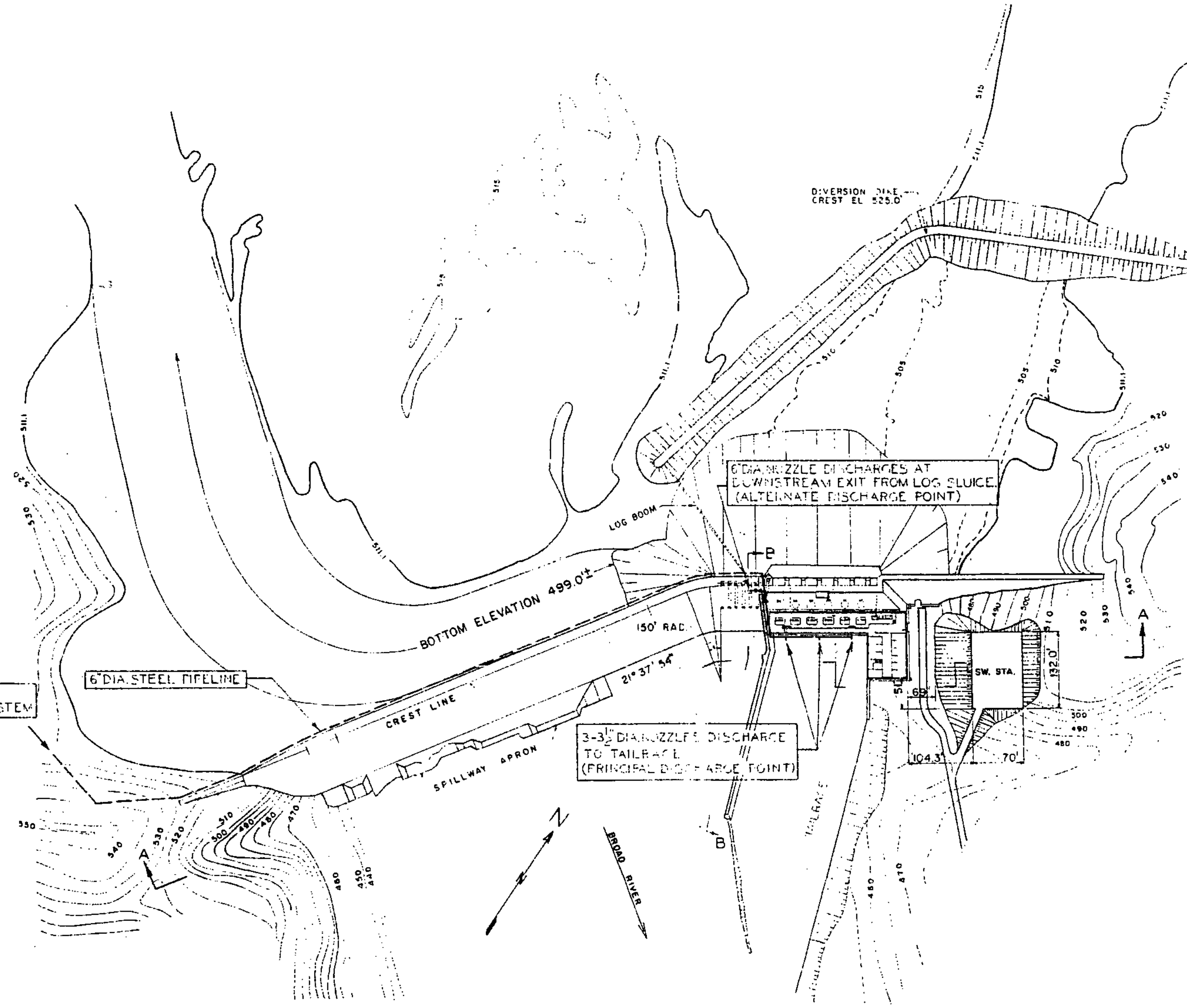
ER Figure 3.4.1-2
Amendment 2



RIVER INTAKE AND DISCHARGE
SYSTEM LAYOUT

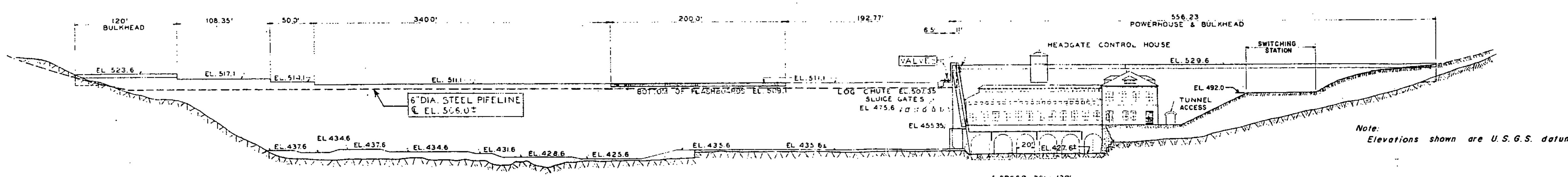
CHEROKEE NUCLEAR STATION

ER Figure 3.4.1-3
Amendment 2
(New)
Amendment 3



PLAN
SCALE 1"=100'

0 50 100 200 300 400 500 600
SCALE - FEET



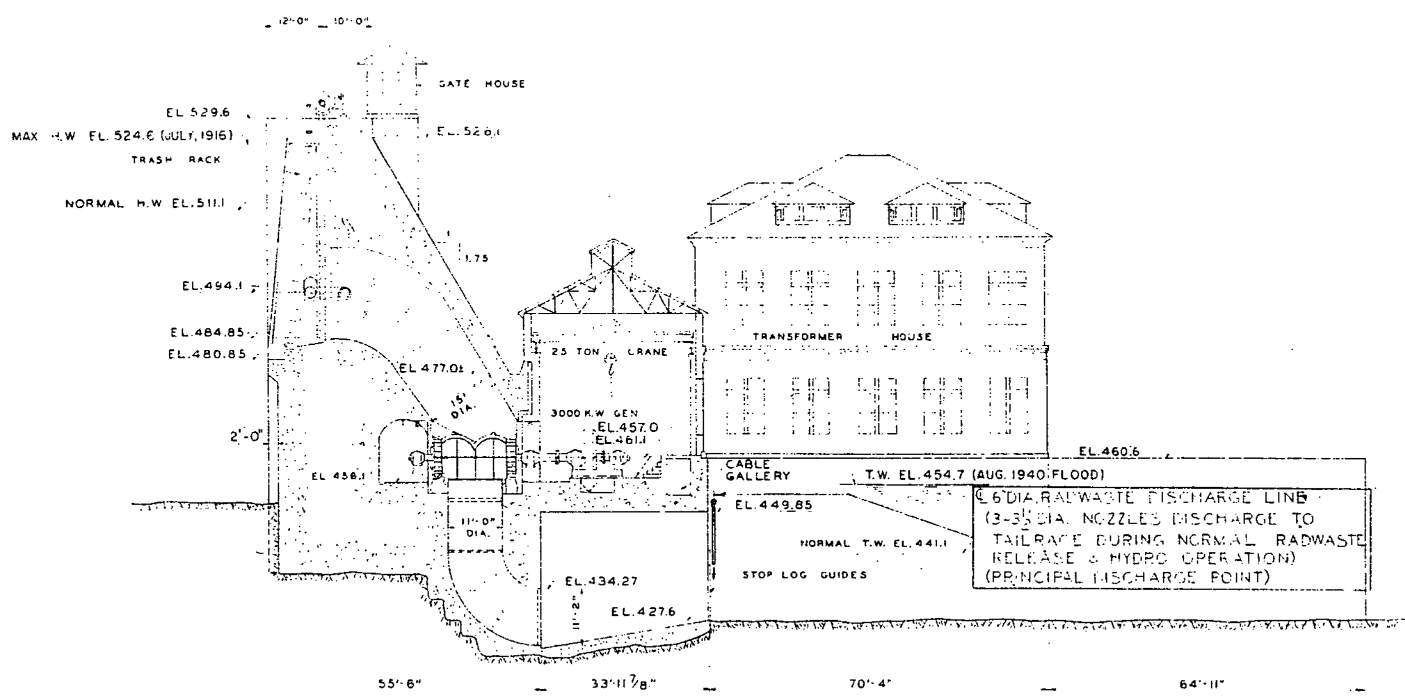
Note:
Elevations shown are U.S.G.S. datum.

ELEVATION A-A
SCALE 1"=50'

0 50 100 200 300
SCALE - FEET

LIQUID RADWASTE DISCHARGE POINTS
PLAN AND ELEVATION

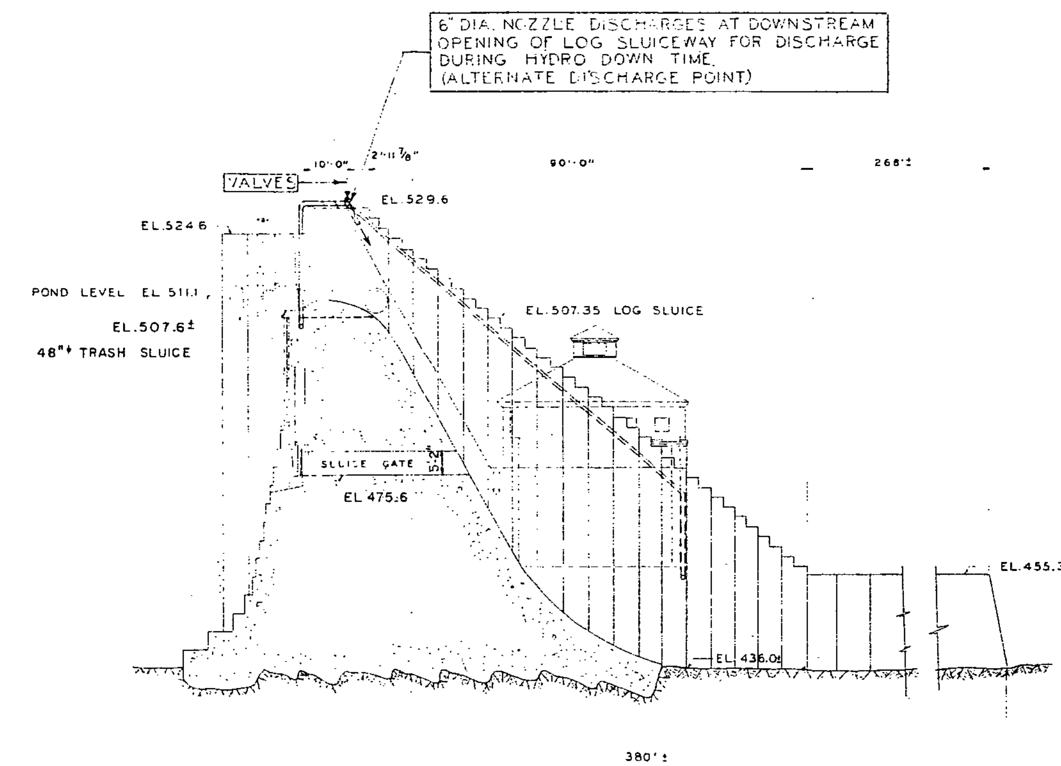
CHEROKEE NUCLEAR STATION
ER Figure 3.4.1-3a
Amendment 4
(New)



POWERHOUSE CROSS SECTION

SCALE 1/16" = 1'-0"

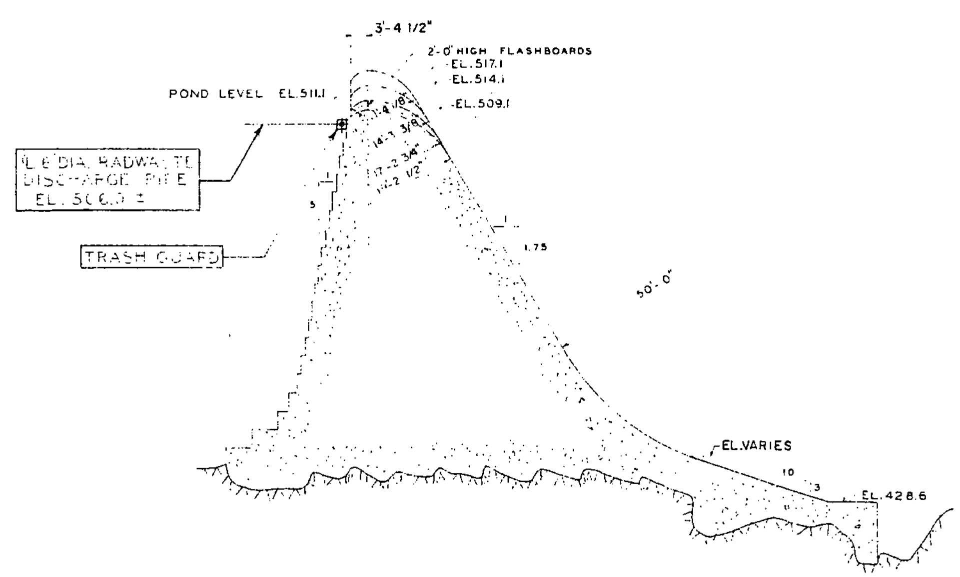
0 5 10 15 20
SCALE IN FEET



SECTION B-B

SCALE 1/16" = 1'-0"

0 5 10 15 20
SCALE IN FEET



SPILLWAY SECTION

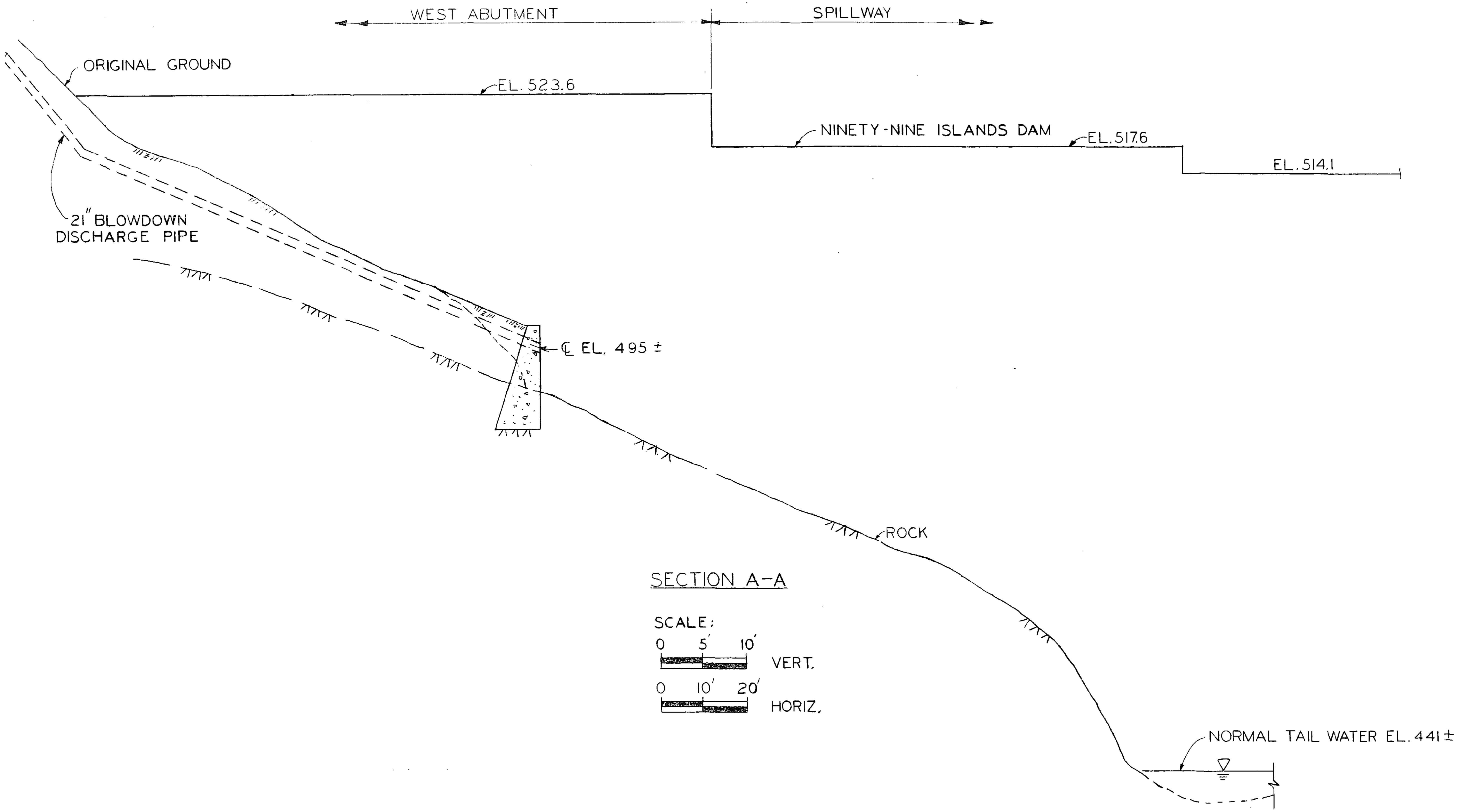
SCALE 1/16" = 1'-0"

0 5 10 15 20
SCALE IN FEET

Note:
Elevations shown are U.S.G.S. datum.

LIQUID RADWASTE DISCHARGE POINTS
PLAN AND ELEVATION

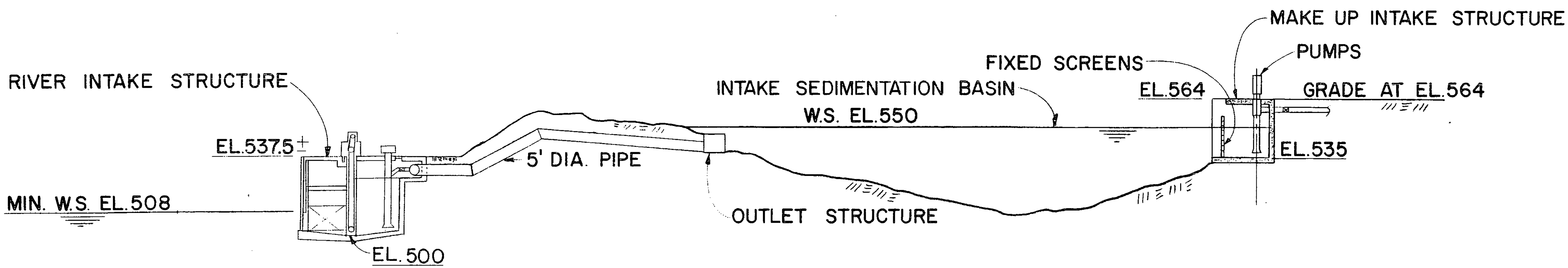
CHEROKEE NUCLEAR STATION
ER Figure 3.4.1-3b
Amendment 4
(New)



BLOWDOWN DISCHARGE STRUCTURE

CHEROKEE NUCLEAR STATION

ER Figure 3.4.1-4
Amendment 2
Amendment 3

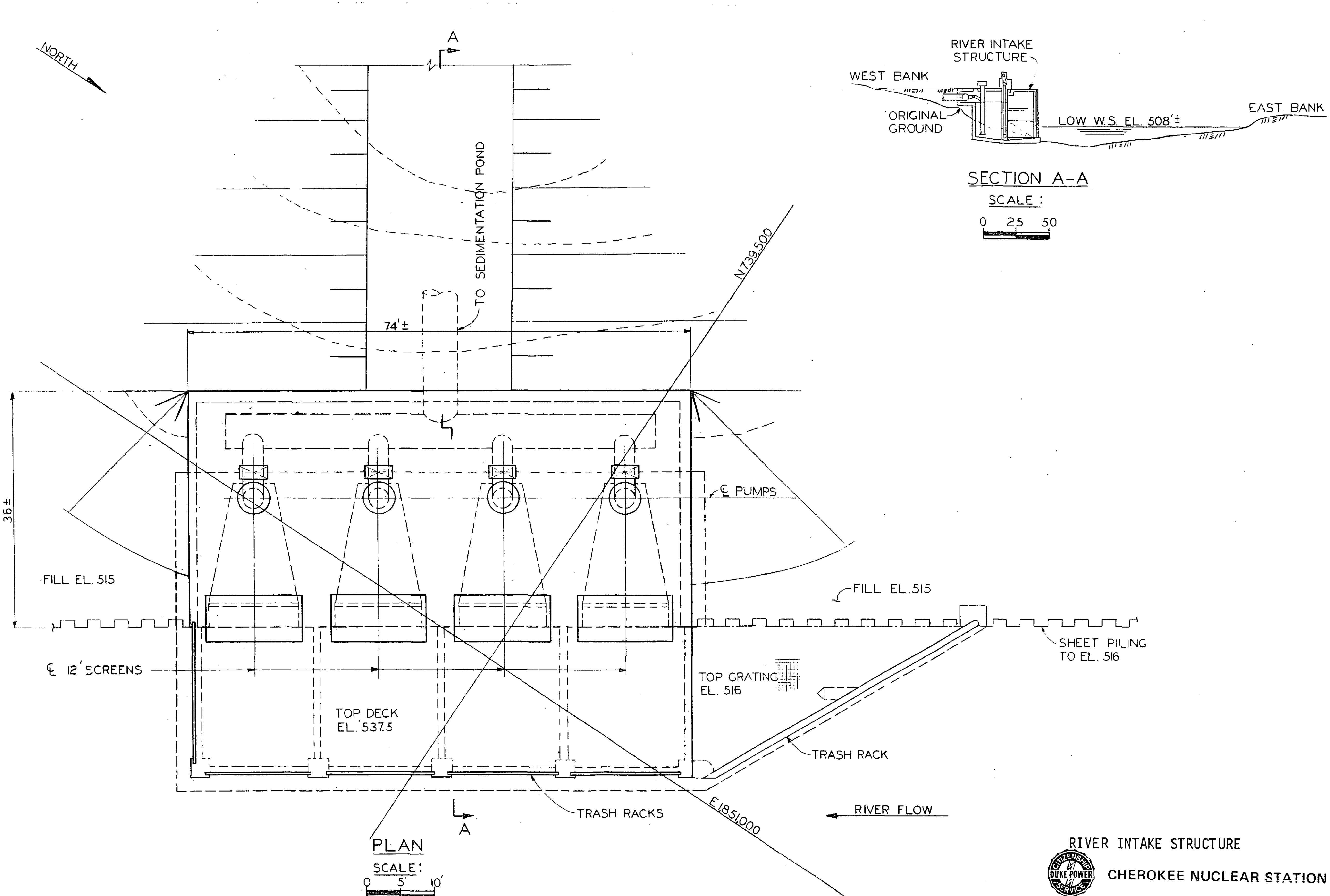


SCALE: NONE

MAKE UP WATER INTAKE SYSTEM

CHEROKEE NUCLEAR STATION

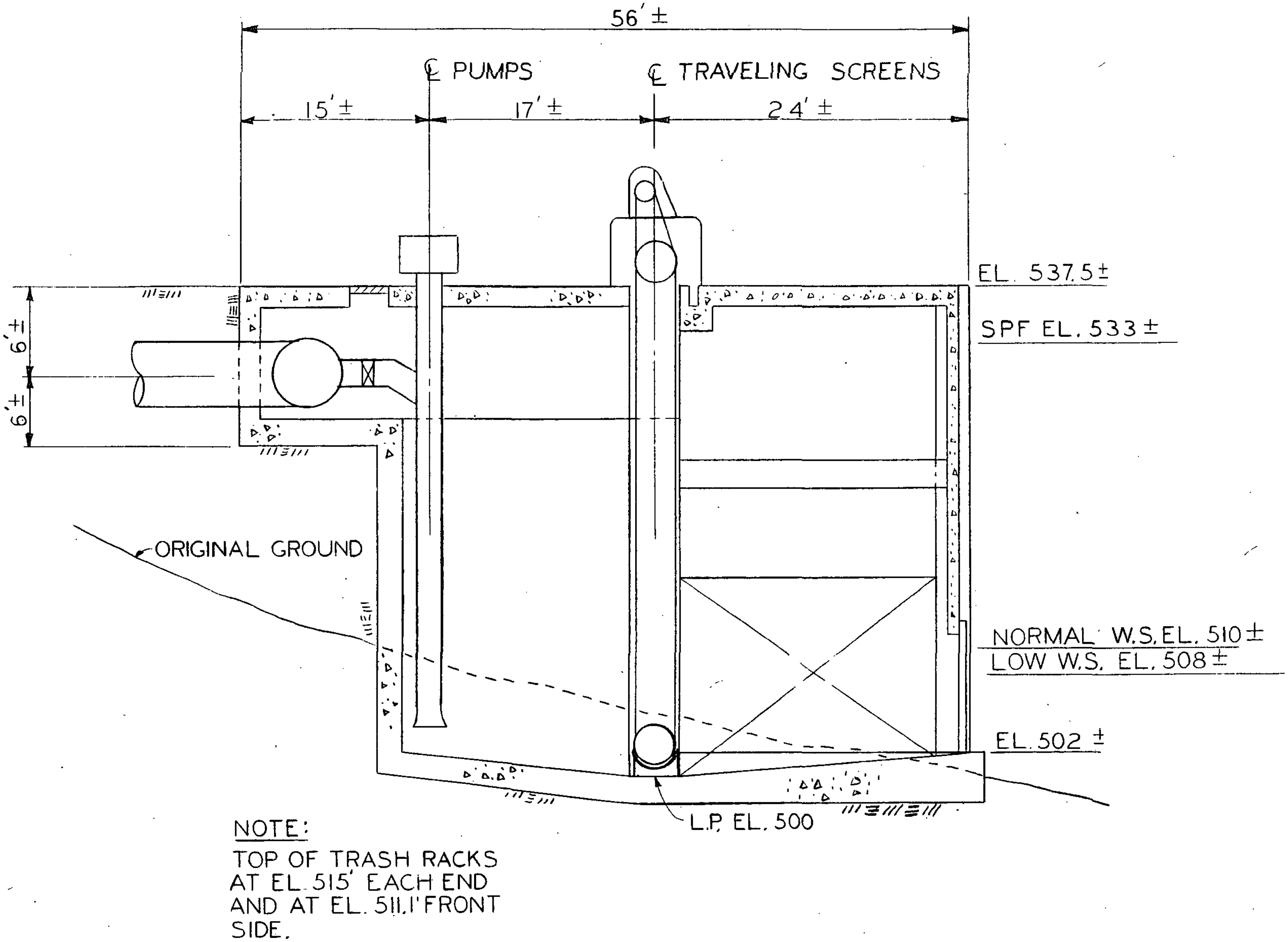
ER Figure 3.4.4-1
Amendment 2
Amendment 3



RIVER INTAKE STRUCTURE

CHEROKEE NUCLEAR STATION

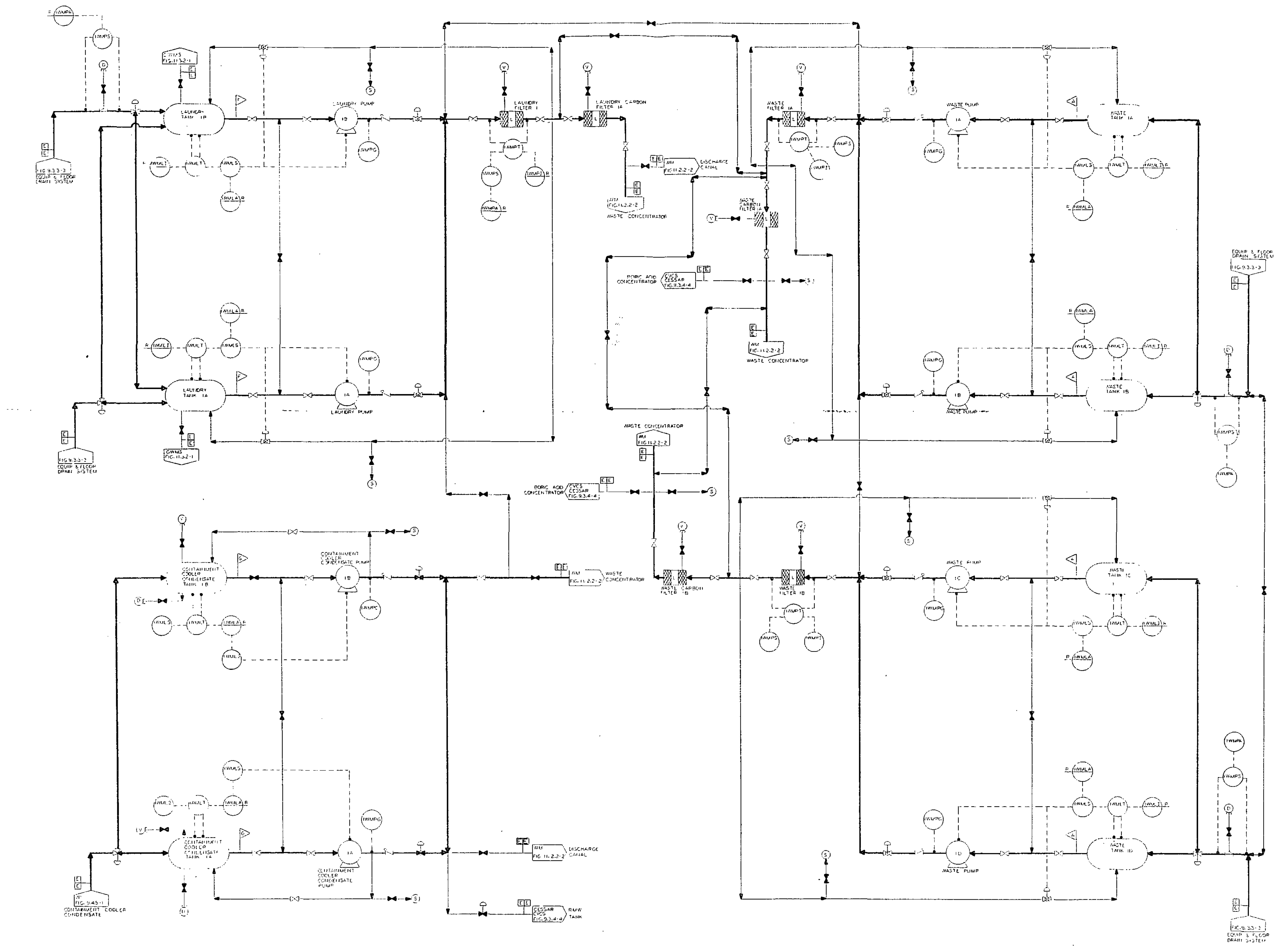
ER Figure 3.4.4-2
Amendment 2
Amendment 3



SECTION THRU TYPICAL BAY OF RIVER INTAKE STRUCTURE

CHEROKEE NUCLEAR STATION

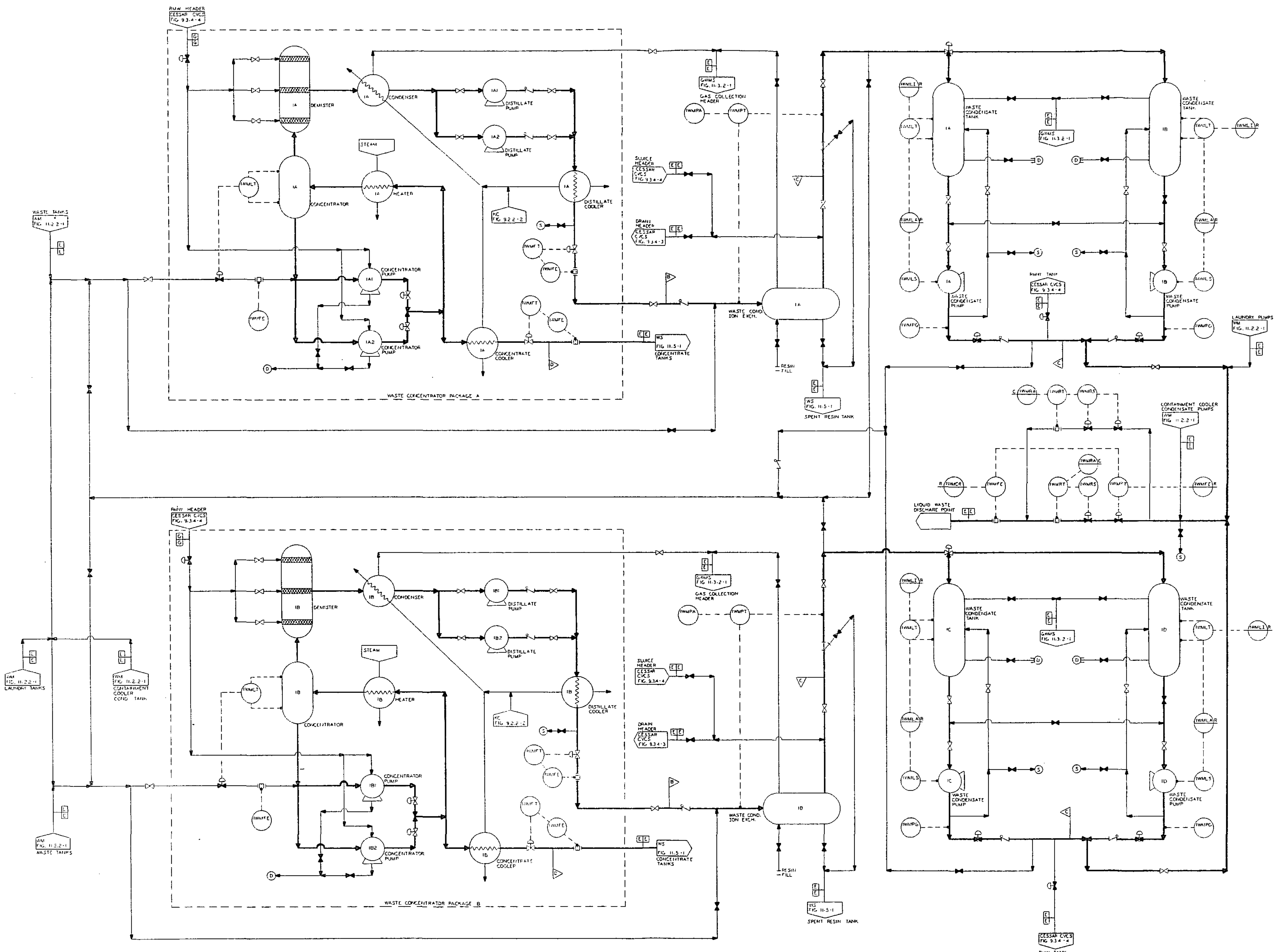
ER Figure 3.4.4-3
Amendment 2
Amendment 3



FLOW DIAGRAM OF
MISCELLANEOUS LIQUID WASTE
MANAGEMENT SYSTEM (WM)

CHEROKEE NUCLEAR STATION

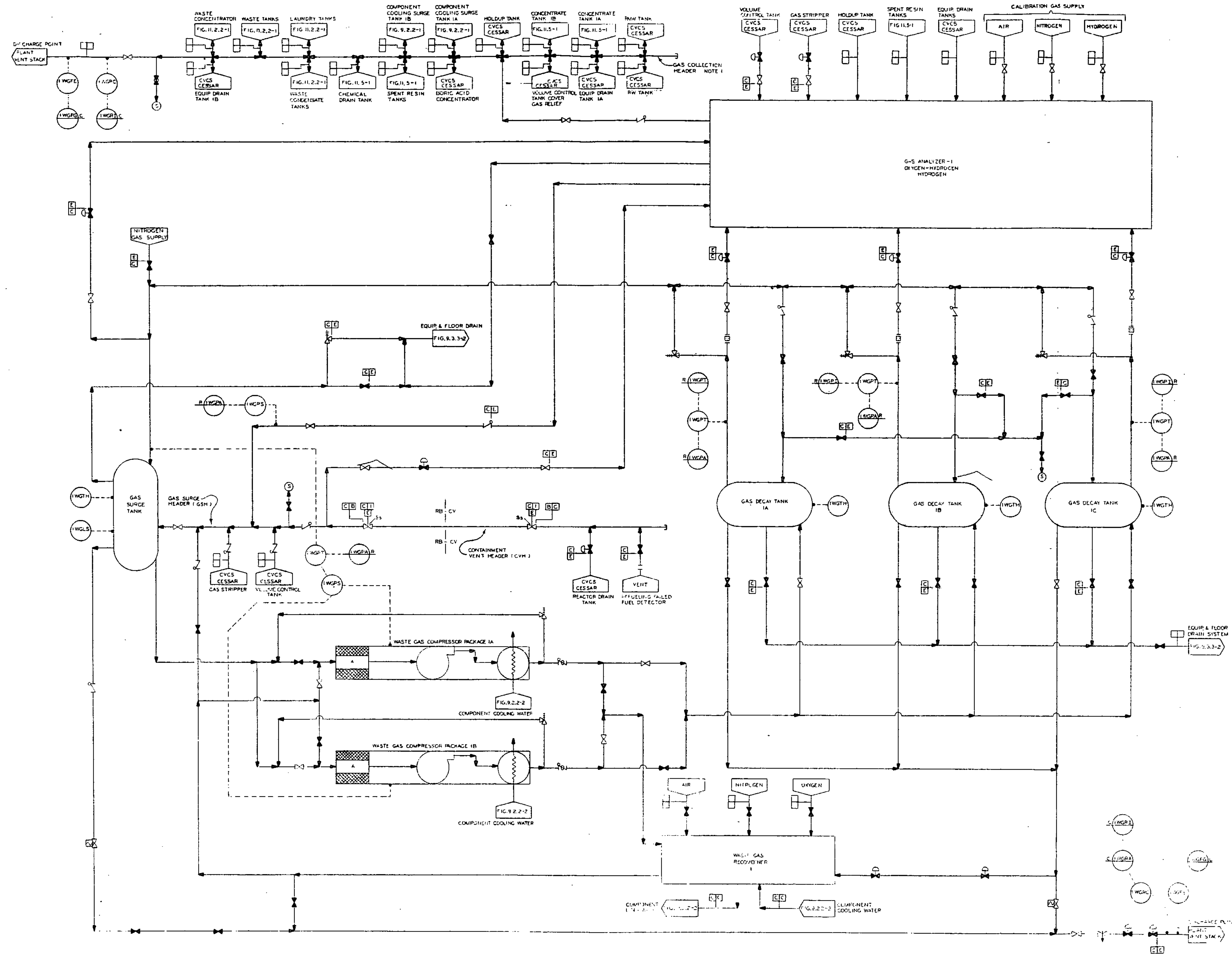
ER Figure 3.5.1-1
Amendment 3



FLOW DIAGRAM OF
MISCELLANEOUS LIQUID WASTE
MANAGEMENT SYSTEM (WM)

CHEROKEE NUCLEAR STATION

ER Figure 3.5.1-2
Amendment 3
(New)

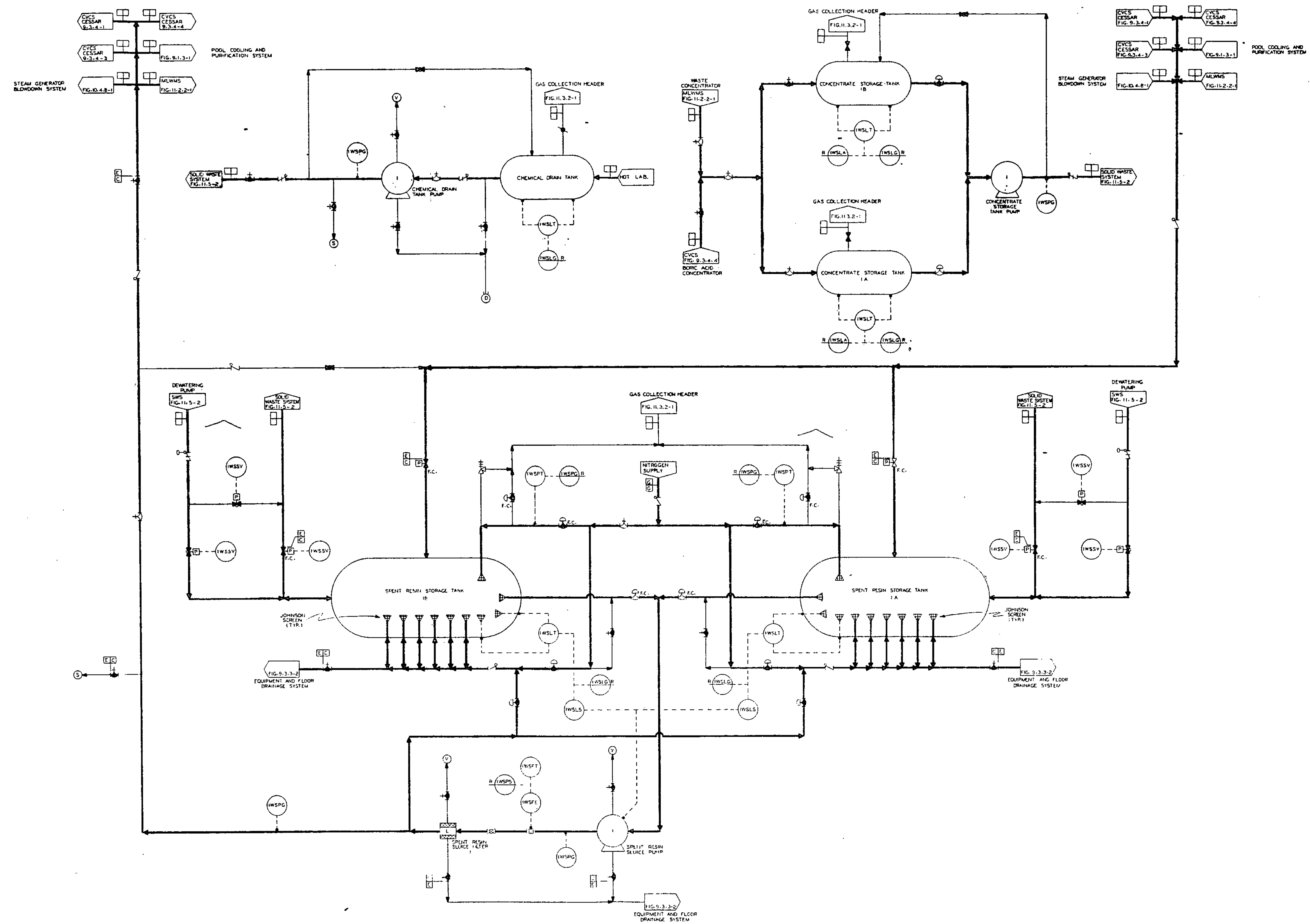


2. LINE CONTINUATION FLAGS REFER TO EITHER THE PROJECT B? PSAR OR CESSAR FIGURE.

FLOW DIAGRAM OF GASEOUS WASTE MANAGEMENT SYSTEM (WG)

CHEROKEE NUCLEAR STATION

ER Figure 3.5.2-1

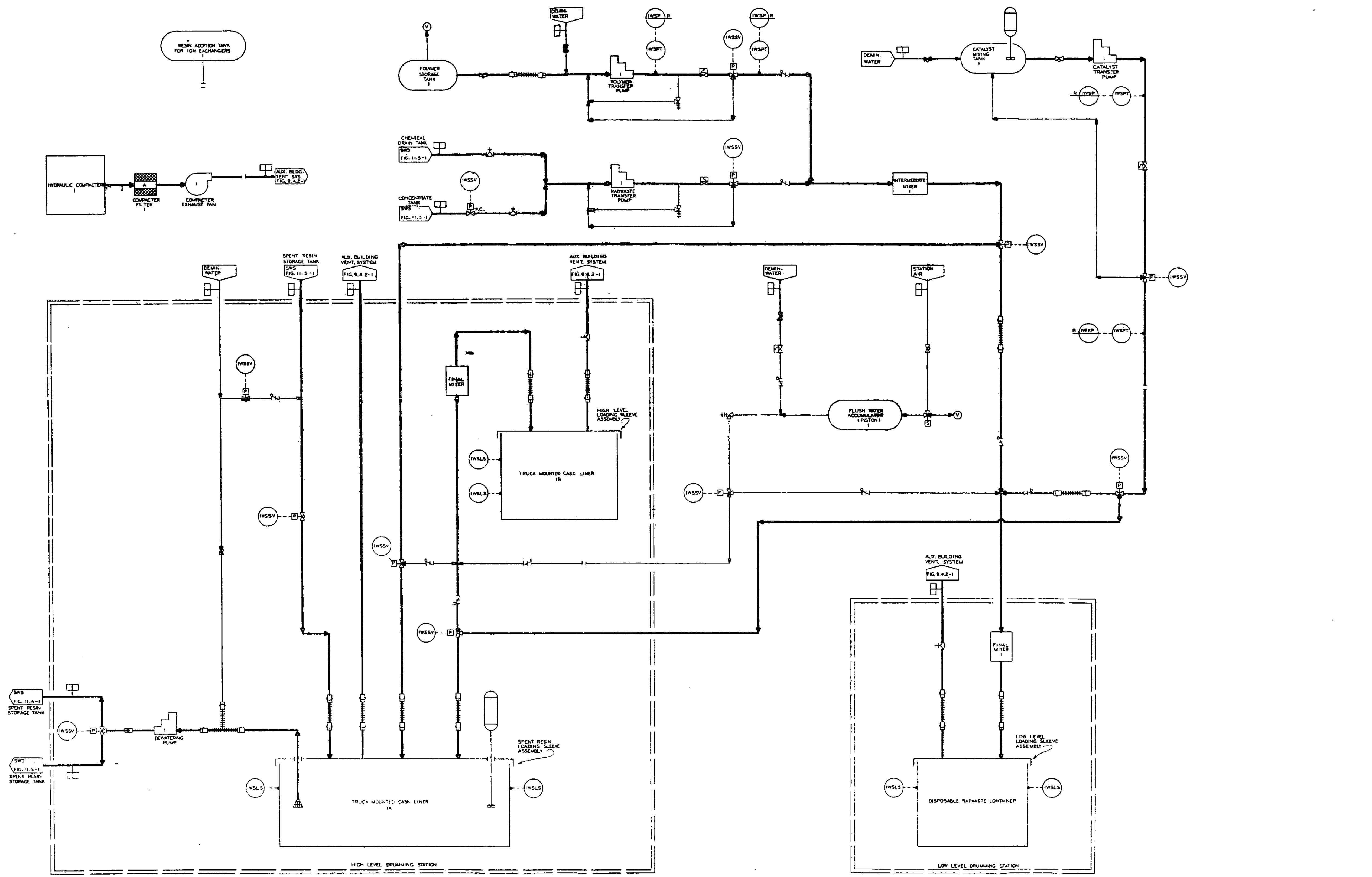


NOTES:
1. LINE CONTINUATION FLAGS REFER TO EITHER THE PROJECT 81 PSAR OR CESSAR FIGURE.

FLOW DIAGRAM OF SOLID WASTE SYSTEM (WS)

CHEROKEE NUCLEAR STATION

ER Figure 3.5.3-1

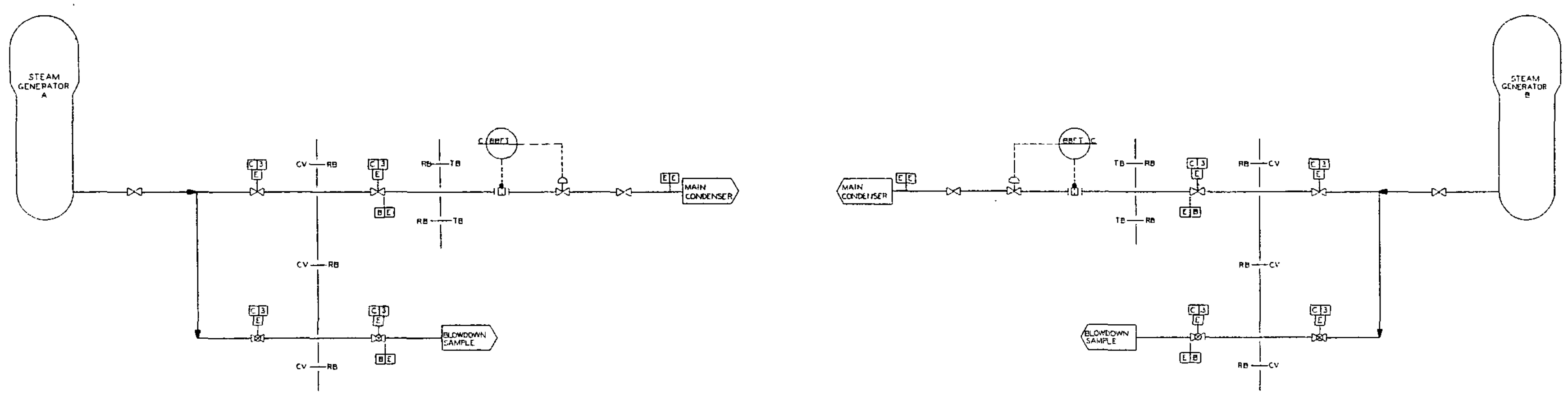


NOTES:
1. LINE CONTINUATION FLAGS REFER TO EITHER THE PROJECT 81 PSAR OR CESSAR FIGURES.

FLOW DIAGRAM OF SOLID WASTE SYSTEM (WS)

CHEROKEE NUCLEAR STATION

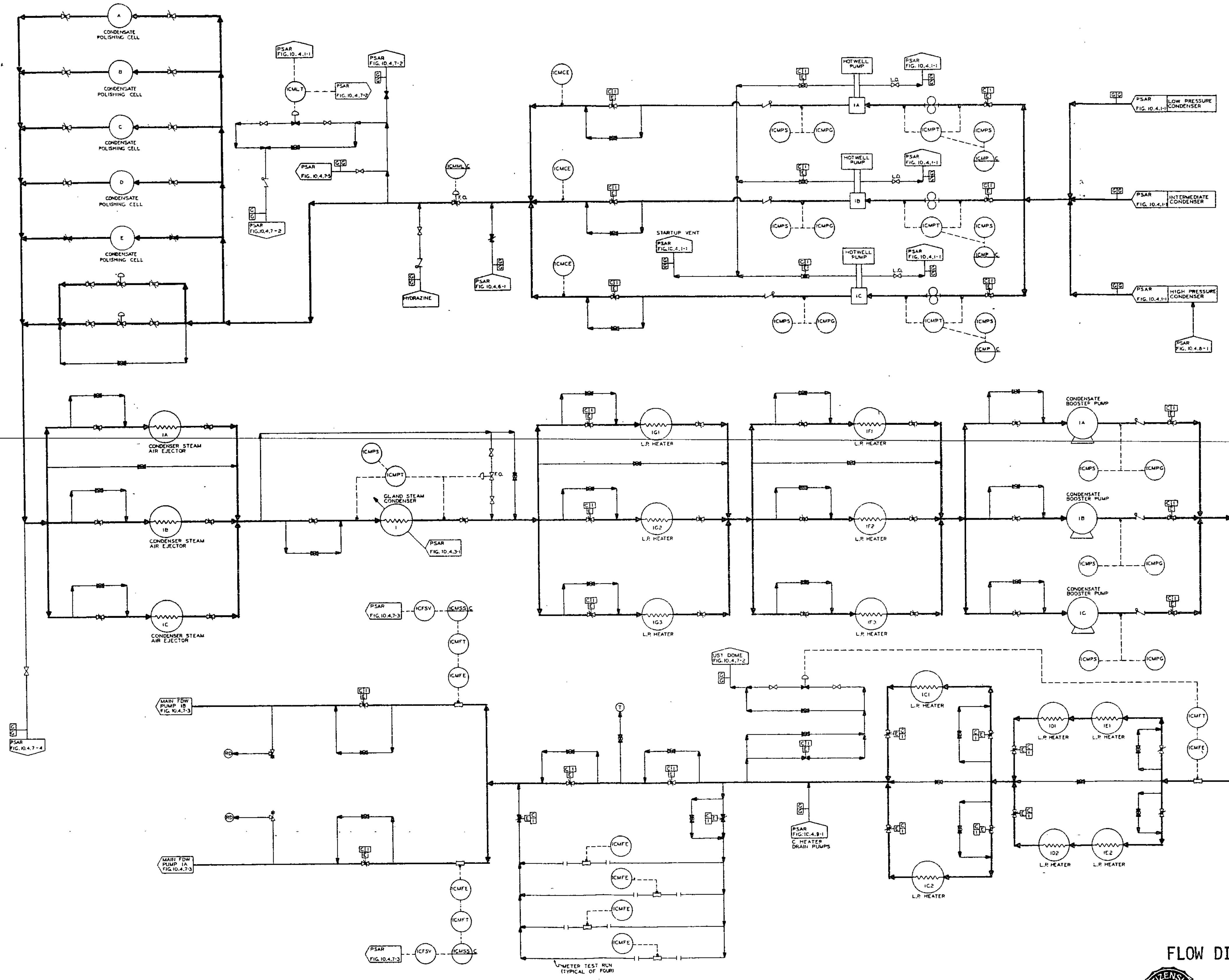
ER Figure 3.5.3-2



FLOW DIAGRAM OF STEAM GENERATOR BLOWDOWN SYSTEM

CHEROKEE NUCLEAR STATION

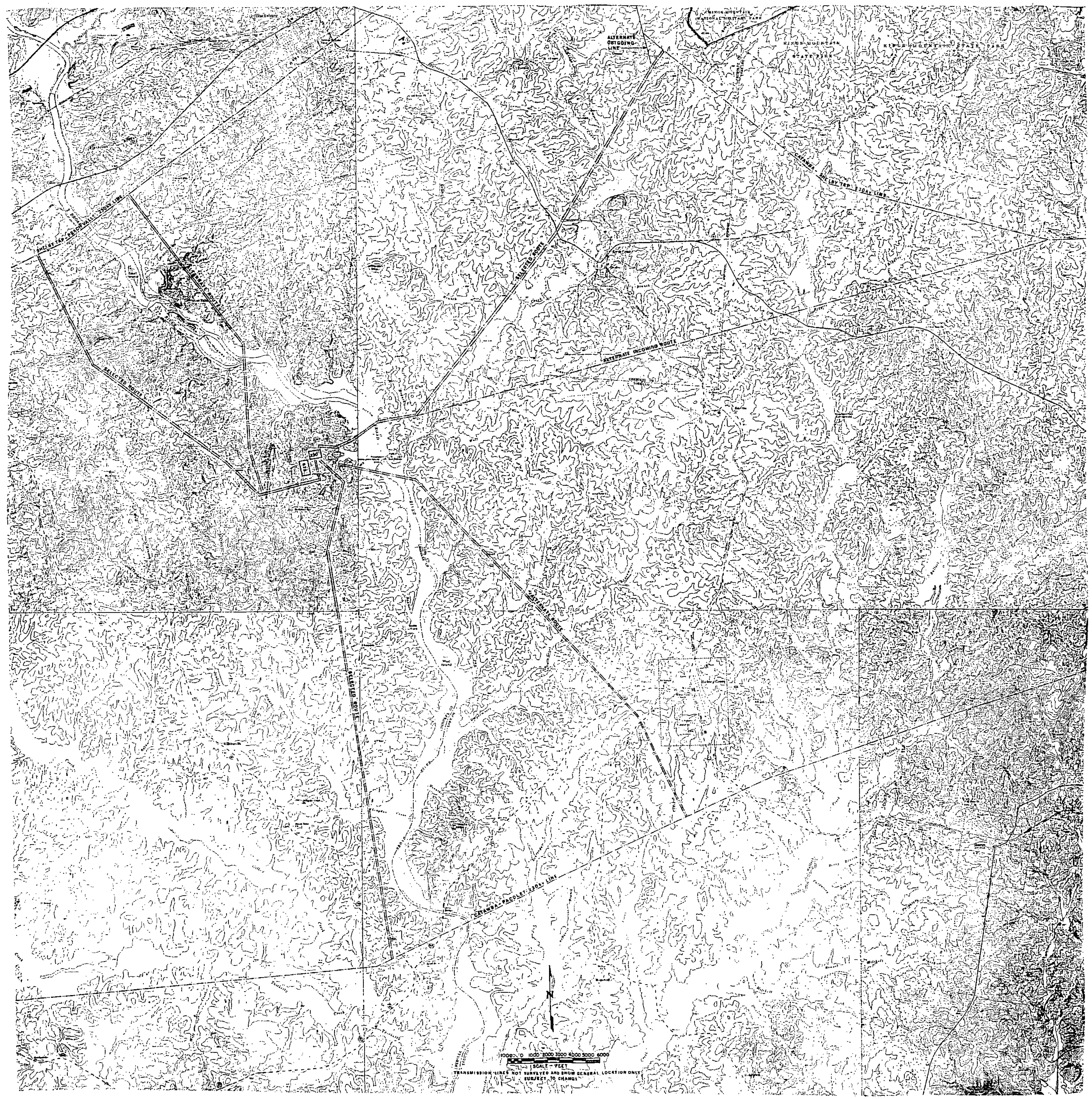
ER Figure 3.5.4-1
Amendment 3



FLOW DIAGRAM OF CONDENSATE SYSTEM

CHEROKEE NUCLEAR STATION

ER Figure 3.6.1-1
Amendment 4
(New)



SELECTED AND ALTERNATE
TRANSMISSIONS LINES

CHEROKEE NUCLEAR STATION

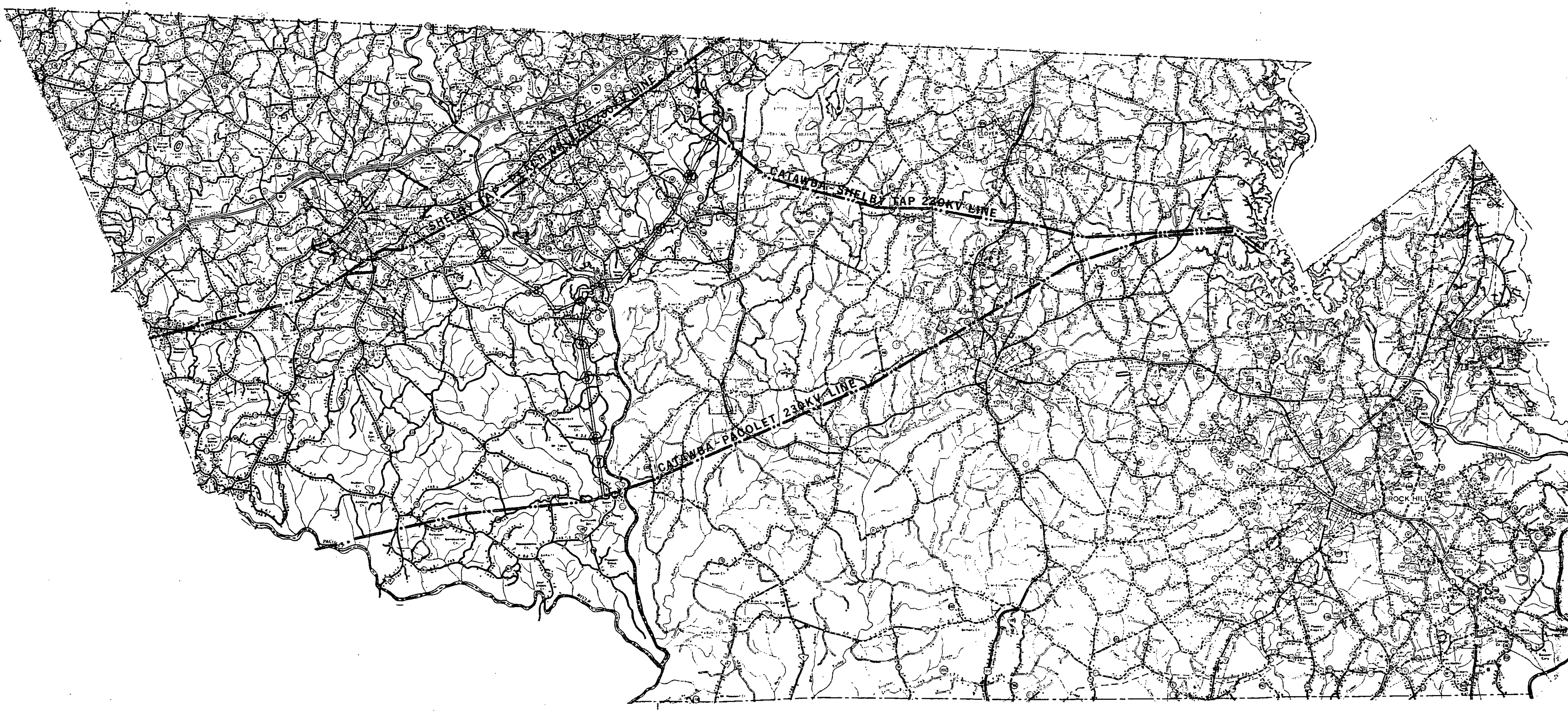
ER figure 3.9.1-1
Amendment 2

THIS PAGE IS AN OVERSIZED DRAWING OR FIGURE,

THAT CAN BE VIEWED AT THE RECORD TITLED:
"AERIAL PHOTOGRAPHS OF CHEROKEE TRANSMISSION LINES, ER Figure 3.9.1-2"

WITHIN THIS PACKAGE... OR BY SEARCHING USING THE

D-05X



Legend:

1 Vegetation Survey Area

Existing Lines

Selected Routes

Note: Transmission line routes are not surveyed and show only general line location that is subject to change.

Scale in Miles

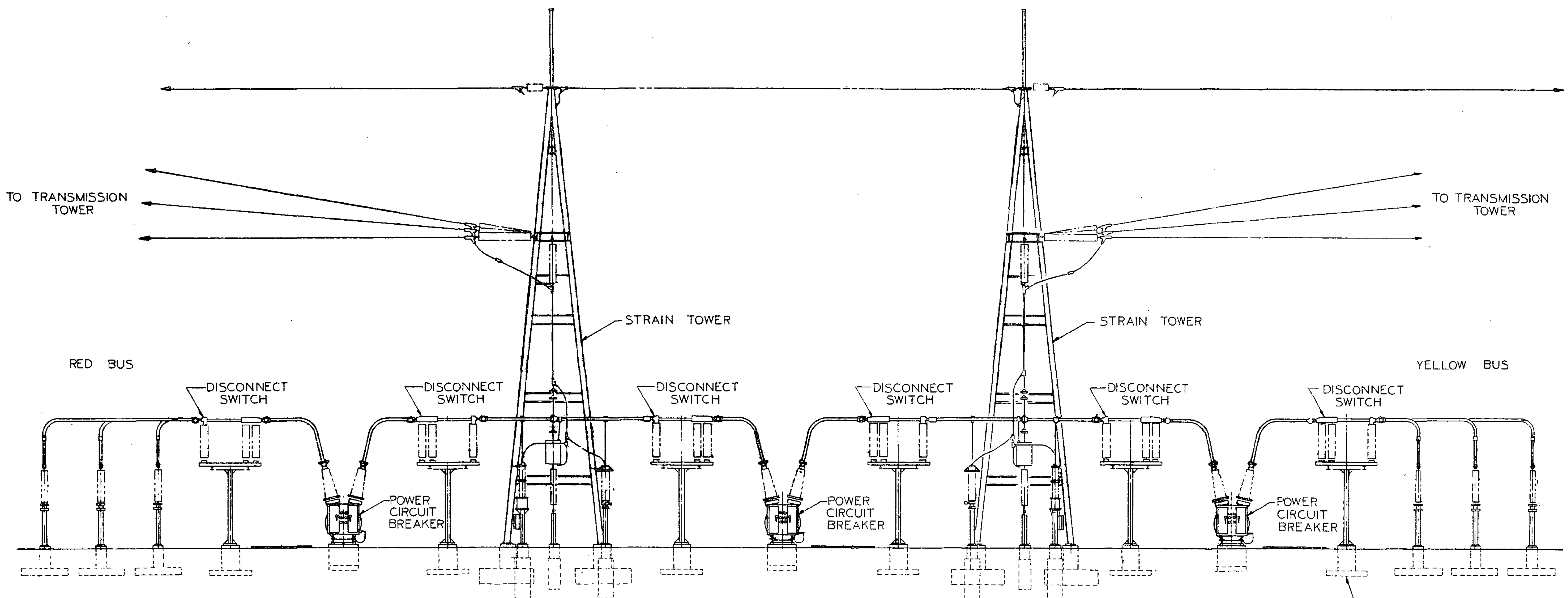
1 0 1 2 3 4

N

VEGETATION SURVEY AREAS ALONG SELECTED CHEROKEE TRANSMISSION CORRIDORS

CHEROKEE NUCLEAR STATION

ER Figure 3.9.2-1
Amendment 2
(New)

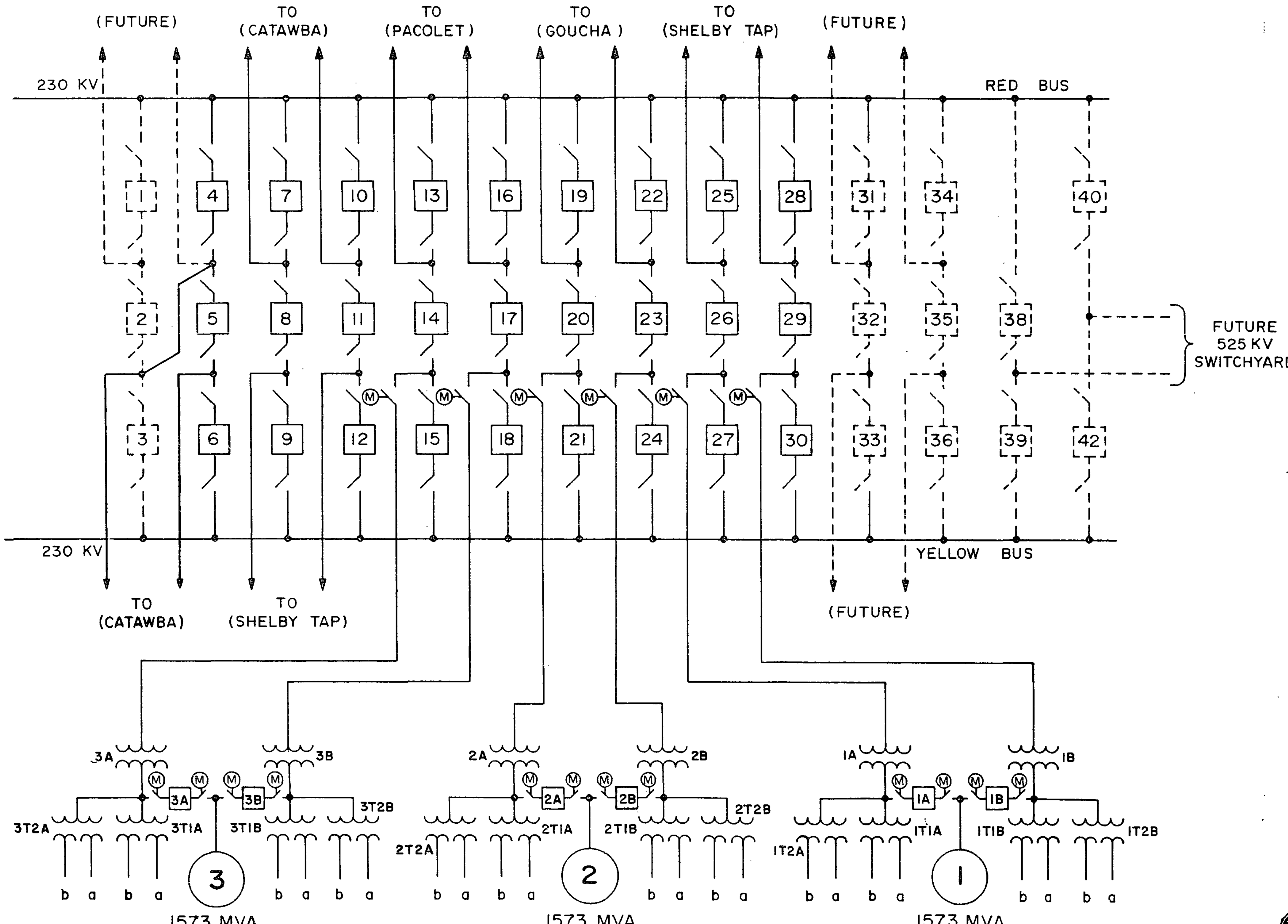


ELEVATION THRU 230 KV SWITCHING STATION

TYPICAL 230 kV SWITCHING STATION, CROSS SECTION

CHEROKEE NUCLEAR STATION

ER Figure 3.9.4-1



LEGEND

Ⓜ INDICATES MOTOR OPERATED DISC.

b - 13.8 KV

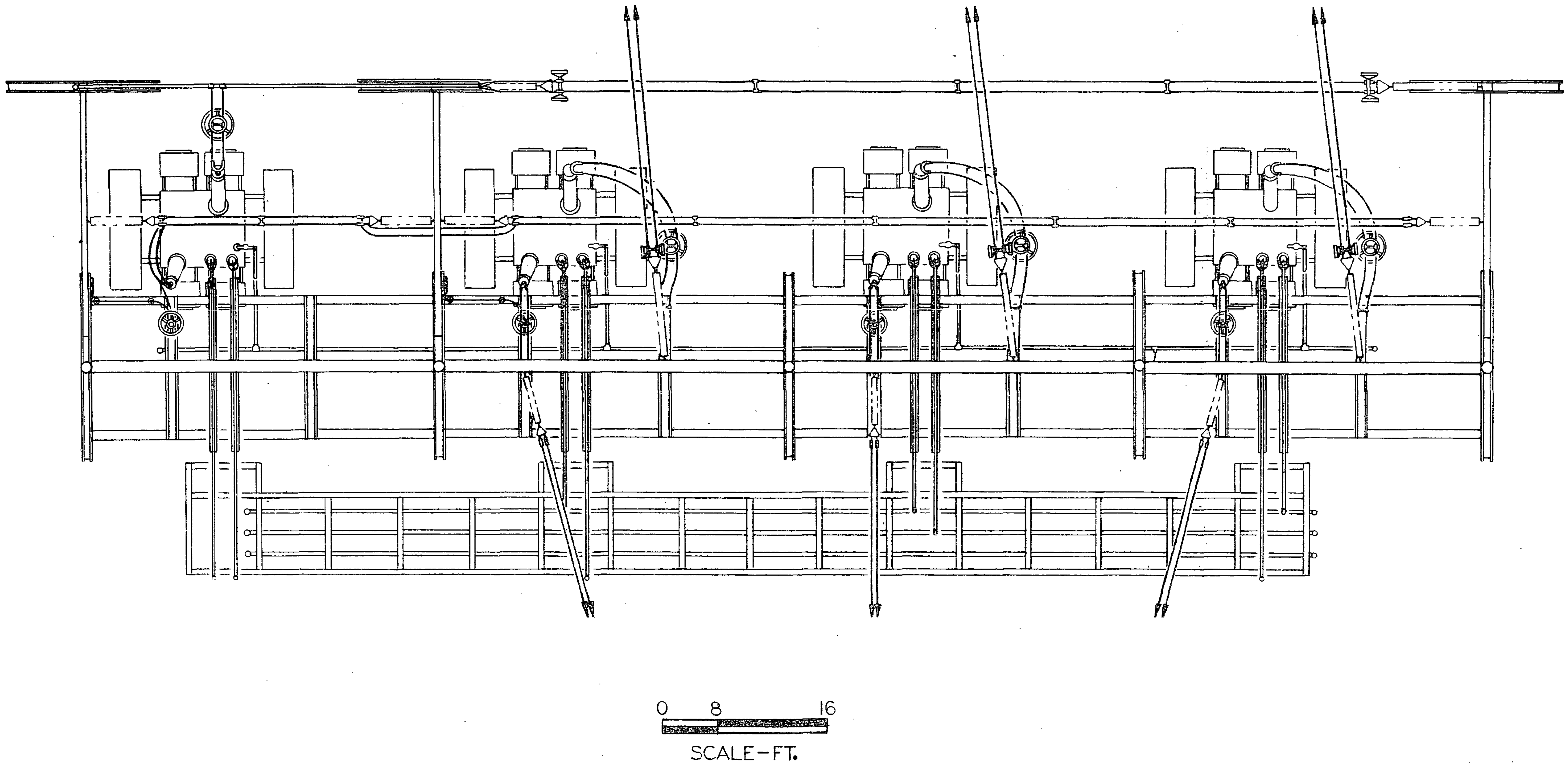
a - 6.9 KV

SWITCHING STATION SCHEMATIC (230 KV)

CHEROKEE NUCLEAR STATION

ER Figure 3.9.4-2

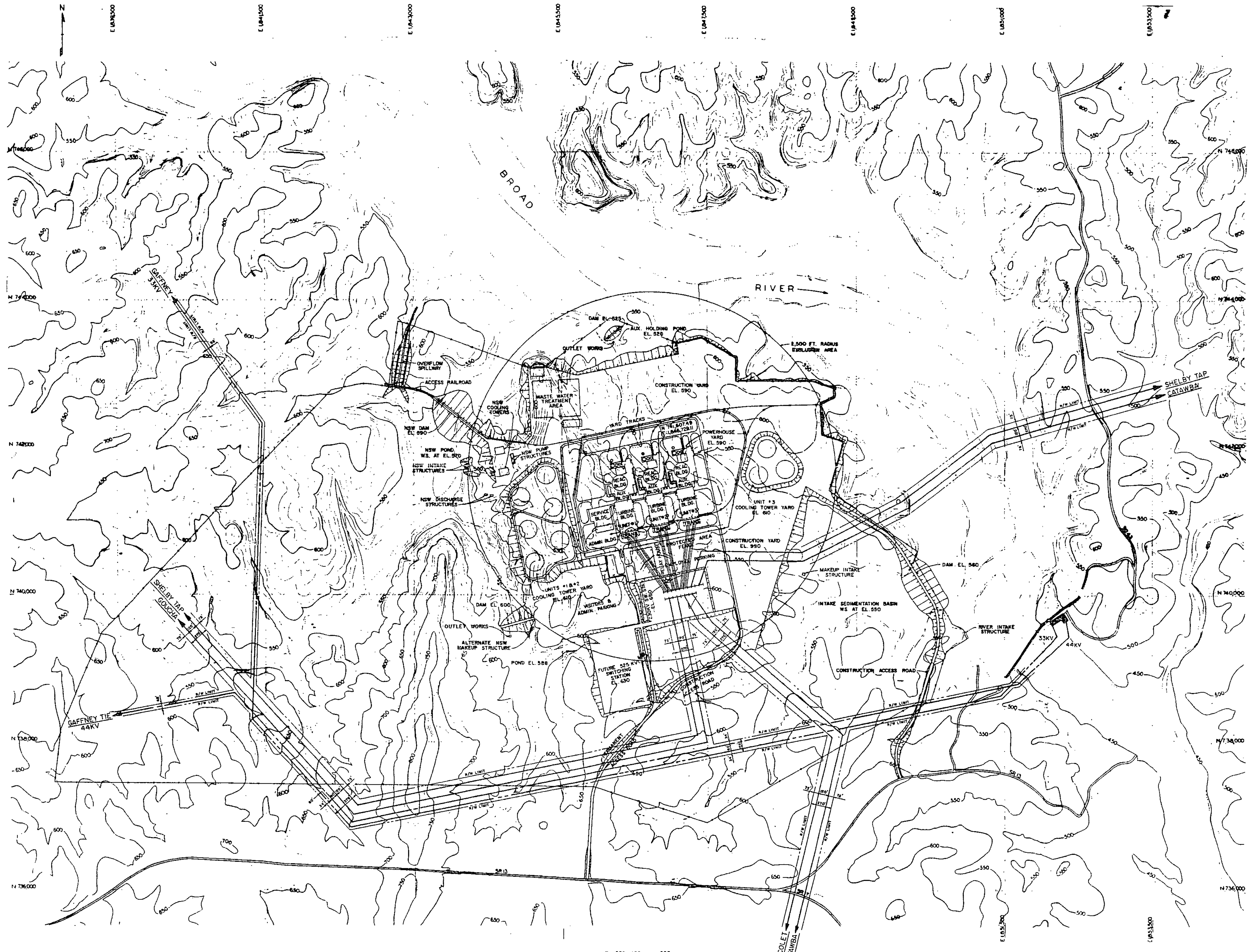
Amendment 2



230 kV and 525 kV AUTOTRANSFORMER BANK PLAN

CHEROKEE NUCLEAR STATION

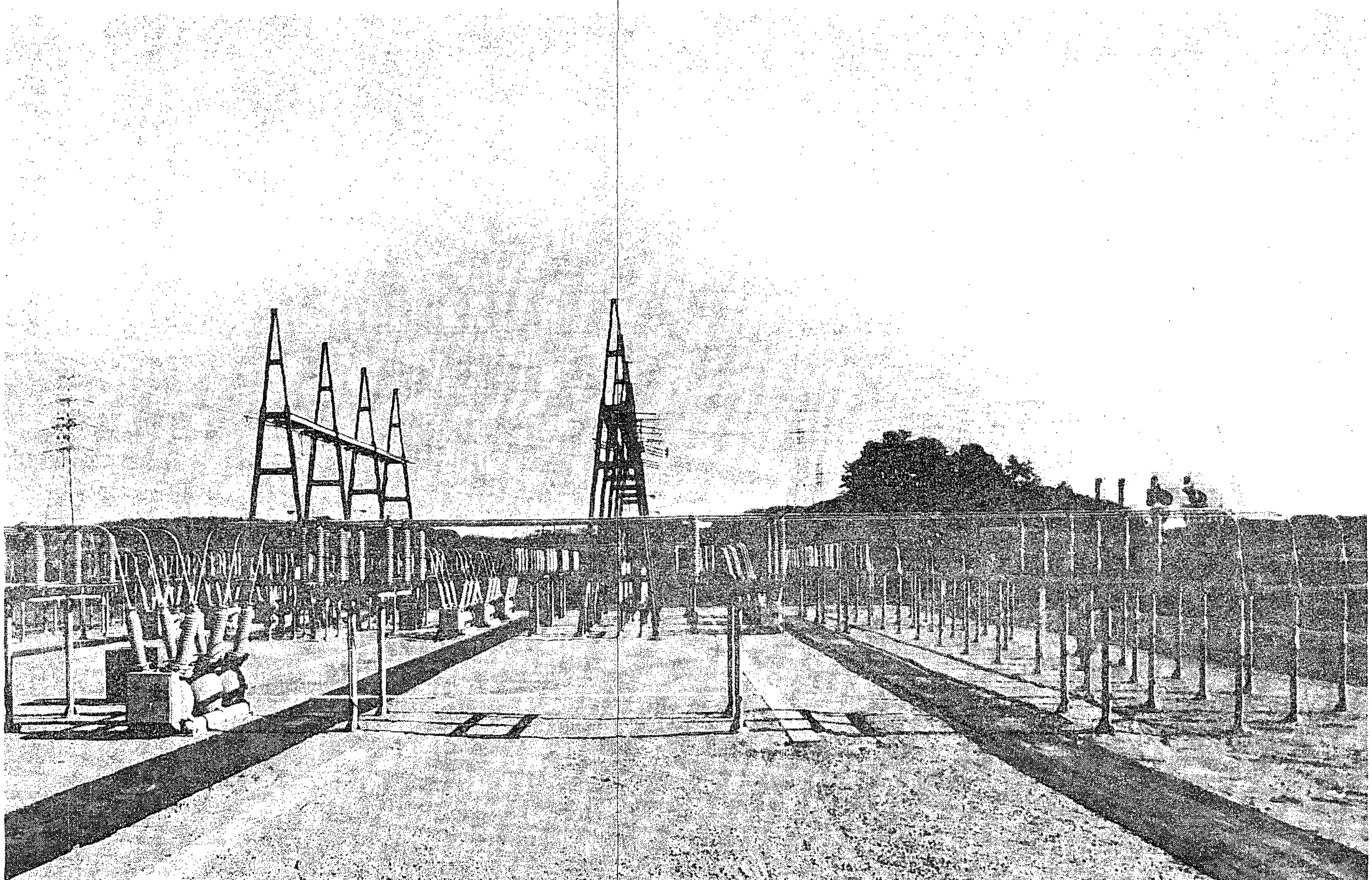
ER Figure 3.9.4-3



TRANSMISSION LINES AND RIGHTS-OF-WAY

CHEROKEE NUCLEAR STATION

ER Figure 3.9.4-4
Amendment 3



TYPICAL 230 kV SWITCHING STATION

CHEROKEE NUCLEAR STATION

ER Figure 3.9.4-5

ATTACHMENT 1

CHAPTER 3

CHEROKEE NUCLEAR STATION

BASIC DATA FOR SOURCE TERM CALCULATIONS

Cherokee Nuclear Station

Basic Data For Source Term Calculation

The following information is submitted in response to Appendix I, USNRC Regulatory Guide 4.2

Question	Answer
1. Reactor power (MWt) at which impact is to be analyzed.	1. Impact is analyzed at a reactor power level of 3990 MWt.
2. Weight of U loaded (first loading and equilibrium cycle).	2. 99,314 Kg U (initial), 102,780 Kg U (equilibrium)
3. Isotopic ratio in fresh fuel (first loading and equilibrium cycle).	3. The isotopic ratio in fresh fuel in the first loading is 2.4 percent and is 3.35 percent in the equilibrium cycle.
4. Expected percentage of leaking fuel.	4. The expected level of leaking fuel is 0.1 percent.
5. Escape rate coefficient used (or reference).	5. CESSAR Table 11.1-1
6. Plant capacity factor.	6. The plant capacity factor is assumed at 80 percent.
7. Number of steam generators	7. There are two steam generators per unit.
8. Type of steam generators (recirculating, once through).	8. The steam generators are vertical shell with U-tubes.
9. Mass of primary coolant in system total (lb.) and mass of primary coolant in reactor (lb.).	9. 5.713×10^5 lb. - primary system total 4.13×10^4 lb. - reactor coolant
10. Primary coolant flow rate (lb/hr).	10. The mass flow rate of the Reactor Coolant System is 164×10^6 lb/hr.
11. Mass of steam and mass of liquid in each generator (lb.)	11. There is 181,217 pounds of coolant in the secondary side of each steam generator of which 90.0 percent is water. There is 101,271 pounds of coolant in the primary side of each steam generator. These values are for 100 percent power (3817 MWt).
12. Total active mass of secondary coolant (lb.) (excluding condensate storage tanks).	12. The total mass of secondary coolant is approximately 4×10^6 pounds for each unit.
13. Steam generator operating conditions (temperature F, pressure psi, flow rate lb/hr).	13. The steam generator operating conditions at the shell side outlet nozzles are 1070 psia at 553 F. The total main steam flow rate is 17.18×10^6 lbs/hr for each unit.
14. The number, type, and size of condensate demineralizer and total flow rate (lb/hr).	3 14. There are four full flow, powdered resin condensate polishing demineralizer cells, each 6.5 ft in diameter and 16 ft in height, with an additional cell in standby. The total flow rate processed is 12.1×10^6 lbs/hr.
15. What is the containment free volume (ft^3)?	15. The containment free volume is 3.3 million cubic feet.
16. What is the expected leak rate of primary coolant (lb/hr) to the containment atmosphere?	16. The expected leak rate of primary coolant to the containment is 240 lb/day.
17. Is there an internal air cleanup system for iodine in the containment? If so, what volume per unit time is circulated through it? What decontamination factor is expected? How long will the system be operated prior to purging?	17. Each unit is provided with a separate internal cleanup system for removal of iodine from containment air.

Cherokee Nuclear Station

Basic Data For Source Term Calculation

Question	Answer
20.	20. (Continued) Gases stripped from these sources are collected in a header and allowed to decay in the gas decay tanks. The annual curie discharges given in Table 3.5.2-2 are based on a holdup time of one year. Stripping fractions used were 100 percent for noble gases and 0.1 percent for iodine.
21. How are the noble gases and iodines stripped from that portion of the letdown stream which is sent to the boron control system? How are these gases collected? What decay do they receive prior to release?	21. See response to Question 20.
22. Are the releases from the gaseous waste storage tanks passed through a charcoal absorber? What decontamination factor is expected?	22. There are no charcoal absorbers provided in the discharge path from the gas decay tanks because the activity of the noble gases will dominate at the time the tanks are discharged.
23. How frequently is the system shut down and degassed and by what method? How many volumes of the primary coolant system are degassed in this way each year? What fraction of the gases present are removed? What fraction of other principal nuclides are removed, and by what means? What decay time is provided?	23. The Reactor Coolant System does not have to be shutdown to be degassed. The 145,000 SCF of gases generated by continuous stripping for one core cycle corresponds to over 500 Reactor Coolant System volumes. The stripping fractions for principal radioactive gases are given in answer 20 above. Hydrogen is also removed from the letdown stream at close to 100 percent efficiency.
24. Are there any other methods of degassing (i.e., through pressurizer, etc.)? If so, describe. How is it treated?	24. No credit is taken from gas stripping in either the volume control tank or pressurizer. Gas stripping these components is not intended as a normal mode of plant operation.
25. What is the expected leak rate of primary coolant (lb/hr) to the secondary system?	25. The expected primary coolant to secondary coolant leak rate is 110 lb/day.
26. What is the expected rate of steam generator blowdown (lb/hr) during power operation with the expected leak rate noted in Question No. 25? Where are the gases from the blowdown vent discharged? Are there charcoal absorbers and/or condensers on the blowdown tank vent? If so, what decontamination factor is expected? How will the blowdown liquid be treated?	26. The rate of steam generator blowdown will depend on the actual primary-to-secondary leak rate in order to maintain secondary water chemistry limits. 3 For the leak rate given in answer to Question 25, a 50 gpm blowdown would be required. The blowdown is returned to the main condenser. Gases that carry over with the blowdown exit the condenser via the air ejectors. The air ejector discharge is passed through charcoal absorbers prior to entering the environment. The treatment that the steam generator blowdown liquid receives is described in Subsection 3.5.4.
27. What is the expected leak rate of steam (lb/hr) to the turbine building? What is the ventilation air flow (cfm) through the turbine building? Where is it discharged? Is the air filtered or treated before discharge? If so, provide expected performance.	27. The expected steam leak rate to the turbine building is 1700 lb/hr. There are four changes of air in the turbine building per hour. The air is discharged to the atmosphere unfiltered.
28. What is the flow rate (dfm) of gaseous effluent from the main condenser ejector? What treatment is provided? Where is it released?	28. The normal flow rate from the air ejectors is 60 SCFM total. The non-condensables are discharged from the air ejector are passed through charcoal absorbers before being sent to the ventilation stack for discharge from the unit.

Cherokee Nuclear Station

Basic Data For Source Term Calculation

Question

29. What is the origin of the steam used in the gland seals (i.e., is it primary steam, condensate, or demineralized water from a separate source, etc.)? How is the effluent steam from the gland seals treated and disposed of?

30. What is the expected leak rate of primary coolant (lb/hr) to the auxiliary building? What is the ventilation air flow through the auxiliary building (cfm)? Where is it discharged? Is the air filtered or otherwise treated before discharge? If so, provide expected performance.

31. Provide average gallons/day and Ci/cc prior to treatment for following categories of liquid waste effluents. Use currently observed data in the industry where different from the SAR or Environmental Report (indicate which is used).

    a. High-level wastes (for example, primary coolant let down, "clean" or low-conductivity waste, equipment drains and deaerated wastes);
    b. "Dirty" wastes (for example, floor drain wastes, high-conductivity wastes, aerated wastes, and laboratory wastes);
    c. Laundry, decontamination, and wash-down wastes;
    d. Steam generator blowdown - give average flow rate and maximum short-term flows and their duration;
    e. Drains from turbine building;
    f. Frequency of regenerating condensate demineralizers and expected volume of regenerant solutions.

    For the above-listed wastes (a-f) provide:
    1. Number and capacity of collector tanks.
    2. Fraction of water to be recycled and factors controlling decision.
    3. Treatment steps - include number, capacity, and process decontamination factor for each principal nuclide for each step. If step is optional, state factors controlling decision.
    4. Decay time from primary loop to discharge.

Answer

29. During power operation, the turbine gland seals receive steam from the main steam system. During startup, auxiliary steam from the auxiliary boiler is used until main steam flow is sufficient to supply this demand. The discharge from the gland seals is condensed in a separate condenser and the condensables are returned to the main condensate system. The exhauster on this condenser discharges noncondensables to the atmosphere via a turbine building roof vent.

30. The expected leak rate of primary coolant to the Auxiliary Building is 160 lb/day. The air, changed ten times per hour, is discharged to the atmosphere through the unit vent after passing through a 99 percent effective filter.

31. The sources, quantities and expected activities of potentially radioactive liquid wastes are given in Tables 11.2.2-1 and 11.2.2-2 of the PSAR. The following is a brief discussion of the wastes in the categories requested:

    a) Reactor coolant letdown to the CVCS and drains from tanks that contain what is essentially reactor coolant are completely recovered and recycled by the Chemical and Volume Control System (CVCS).

    b) "Dirty" wastes from building sumps and floor drains are directed to the Miscellaneous Liquid Waste Management System (MLWMS).

    c) Laundry, decontamination and cask wash-down wastes are also sent to the MLWMS. Of these, only laundry waste is considered a normal input.

3 d) Steam generator blowdown is not routed to the MLWMS.

    e) Drains from the turbine building will be discharged to the waste water pond. The quantity of turbine building drains is expected to average approximately 7200 gallons per day.

3 f) Powdered resin condensate demineralizers will be used, therefore, no regenerant solutions are generated.

Cherokee Nuclear Station

Basic Data For Source Term Calculation

Question

31.

Answer

31. (Continued)
The following is a presentation of each unit's capacity and capability for the systems that process letdown reactor coolant and wastes in categories a) through d) above:

a) Letdown and Clean Drains

1. The CVCS holdup tank receives the letdown steam after it has been filtered, ion exchanged and degassed and prior to processing in the boric acid concentrator. The holdup tank capacity is 450,000 gallons. After being processed in the concentrator, the distillate is directed to the reactor makeup water tank which has a capacity of 402,000 gallons and the concentrate is sent to the refueling water tank which has a capacity of 590,000 gallons. Drains and valve leakoffs from systems that contain reactor coolant are directed to either the equipment drain tank or the reactor drain tank which have capacities of 10,500 and 2,850 gallons respectively. The contents from these tanks are also processed in the boric acid concentrator and recycled to the reactor makeup water tank and refueling water tank.

2. All of the water collected in the above tanks is normally recycled.

3. The treatment performed on the coolant letdown from the reactor coolant system is described in CESSAR Section 9.3.4. Decontamination factors for CVCS equipment are presented in CESSAR Section 11.2.2.1.

4. Since all of this source is recycled, credit for decay is not necessary.

b) Floor Drain Wastes

3 1. Floor drains are routed to one of four waste tanks in the MLWMS. Each waste tank has a 27,700 gallon capacity. After processing in one of two concentrators, the waste is held up in one of four waste condensate tanks for monitoring prior to discharge. Each waste condensate tank has a 27,700 gallon capacity.

2. None of the processed floor drain waste will be recycled because of chemical contamination. It is expected that chloride concentration will generally be unacceptably high for use as primary or secondary makeup.

3. The treatment steps, decontamination factors and nuclide concentrations during the processing of floor drains are described in Subsection 3.5.1.

4. No credit is taken for decay in calculating the specific activity at the discharge point (point C) on Table 3.5.1.3.

Cherokee Nuclear Station

Basic Data For Source Term Calculation

Question

31.

32. Dilution flow rate for liquid effluents, minimum and normal gpm and total gallons per year.

33. How is waste concentrate (filter cake, demineralizer resin, evaporator bottoms) handled? Give total volume, weight and curies per day or year.

34. Include the expected annual volume of dry waste and curie content of each drum.

Answer

31. (Continued)

c) Laundry Wastes

3 1. Laundry wastes are routed to one of two laundry tanks in the MLWMS. Each laundry tank has a 8000 gallon capacity.

2. None of the laundry wastes will be recycled becuase of detergent contamination.

3. Two options are available for the processing of laundry wastes. If there is significant activity in the waste, the tank contents will be processed in the same manner as floor drain wastes. When there is insignificant amounts of activity in the waste, the tank contents will be directly discharged or discharged with dilution flow as required.

4. No credit is taken from decay in calculating the specific activity at the discharge point (point C) on Table 3.5.1-3.

d) Steam Generator Blowdown

1. Steam generator blowdown is directed to the main condenser.

2. Essentially all of the steam generator blowdown is recycled as condensate makeup. Subsection 3.5.4 describes the operation of

3 the Steam Generator Blowdown System.

3. The treatment steps for steam generator blowdown are described in Section 3.5.4. Decontamination factors for the various nuclides are the same as those in Section 3.5.1.

4. Since Steam generator blowdown is recycled, decay times are not considered in liquid waste effluents.

32. The maximum dilution flow is 150 cfs or as necessary to maintain discharge concentrations below limits set in 10CFR20.

33. Solid wastes are handled as described in Subsection 3.5.3. Table 3.5.3-1 gives the estimated quantity and activity of these sources for one year of operation.

34. Table 3.5.3-2 gives the estimated annual activity in curies per year for each source of solid waste.

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2 4.0 ENVIRONMENTAL EFFECTS OF SITE PREPARATION, PLANT AND TRANSMISSION FACILITIES CONSTRUCTION

Site preparation and station construction, discussed in Section 4.1, transmission facilities construction, discussed in Section 4.2, and committed resources, discussed in Section 4.3, are described in terms of their environmental impact.

Duke's discussion of adverse environmental effects clearly indicates which effects are considered unavoidable but reversible and which effects are considered unavoidable and irreversible.

2 4.1 SITE PREPARATION AND PLANT CONSTRUCTION

This section discusses the effects of site preparation and station construction of Duke's proposed Cherokee Nuclear Station. General construction activities including the schedule, manpower requirements, access roads and railroads and station construction, human activities, and effects of construction are considered.

4.1.1 GENERAL CONSTRUCTION ACTIVITIES

The Cherokee Nuclear Station site located west of Duke's Ninety-Nine Islands Reservoir occupies a total of 1567 acres. Construction activities, including permanent station facilities and temprorary construction facilities, directly affect approximately 661 acres. Of the latter area, approximately 607 acres are in upland forest, 13 acres in alluvial forest, 9 acres transmission rights-of-way, and the remaining 32 acres are backwaters of the Ninety Nine Islands Reservoir. The permanent three unit station and auxiliaries occupy 381 acres.

Figure 4.1.1-1 indicates the existing topography in the site area. The plot plan and site boundary of the permanent facilities is shown on Figure 2.1-2. A perspective of the permanent facilities is shown on Figure 3.1.0-2. Figure 4.1.1-2 indicates the location of various temporary construction facilities and areas and that portion of the site area necessarily cleared for construction activities.

Pre-construction activities to date are limited to soil and rock borings, geological surveys, groundwater pumping tests, and the excavation of six test pits. Archeological, ecological, and meterological surveys are also in progress.

4.1.1.1 Schedule

Construction activities (site preparation) at the site are scheduled to
3 begin in November, 1976, with pouring of the first permanent concrete
foundations starting in September, 1978.

The principal activities and scheduled dates are presented in Table 4.1.1-1, while a detailed preliminary construction schedule is shown on Figure 4.1.1-3.

2

4.1.1.2 Manpower Requirements

The estimated yearly average of construction employees at work on the Cherokee Nuclear Station site during station construction is presented in Table 4.1.1-3.

3 A peak construction force of about 2,660 persons is anticipated during 1982. The peak and yearly averages include all employees of Duke's Construction Department and contractors working at the Cherokee site, on a one shift per day basis, including administrative, supervisory, technical, and clerical personnel.

During early construction stages of the project, the work force is expected to consist primarily of structure crafts with a transition to predominately mechanical and electrical crafts in the later stages. The majority of craftsmen to be employed at the site are from the surrounding communities and area. Duke's construction experience indicates that about 75 percent of the work force for a project is drawn from the neighboring counties; and 13 percent move to the area from other Duke jobs and the remaining 12 percent live within commuting distance.

A major portion of the skilled labor force at Cherokee, drawn from the unskilled laborers hired locally, are to be trained under Duke's in-house training program. Duke's experience in training indicates that about 44 percent of the skilled labor force at a job is locally hired and Duke trained.

4.1.1.3 Access Roads

A construction access road is planned in order to carry truck and automobile traffic. Both roads are to be designed to meet South Carolina State Highway Standards. These road locations, shown on Figure 4.1.1-2, are chosen to minimize traffic and associated noise in the areas near the site.

Construction materials are to arrive at the site by rail or truck. Traffic problems are to be reduced by providing parking and unloading points for commercial carriers off the public roads and access roads. On site parking is provided for construction workers and visitors. Station construction is expected to cause some increase in traffic on local roads; however, turning lanes at the major intersection with S. C. Route 13 will minimize traffic congestion during peak travel periods. The South Carolina State Highway Commission will be consulted prior to the start of station construction concerning the effects of construction on the local roads. Q 4.1.9

4.1.1.4 Access Railroad

4 The Cherokee Nuclear Station access rail route is refined to the final proposed alignment stage. All highway crossings are to be at grade and have been reviewed by local and state highway officials. Final field survey is in progress, however, permanent right-of-way negotiations have not begun. Eminent domain procedures will be used as necessary but the number of individual legal actions required is not known. Q 4.1.5

The access rail route extends approximately 6.8 miles in a southeastern direction from Gaffney, South Carolina, to the plant site, as shown on Figure 4.1.1-4. A minimum 100 foot right-of-way, for a total of 83 acres is to be utilized for the rail route. Of the 83 acres needed, 21.3 percent is now harvested cropland or open pasture, 36.2 percent is utility rights-of-way, 24.4 percent is mesic pine-hardwood forest, and the remaining 18.1 percent is oak-hickory forest. This acreage is to be permanently lost for its current usage due to railroad construction.

There are no bridges requiring construction along the access rail route right-of-way. One family is expected to relocate due to the access rail route. Little economic impact is expected due solely to the construction of the railroad. The railroad spur is estimated to cost approximately $2.3 million.

4 Figure 10.10.0-1 shows all of the alternate routes which were considered for the access rail route. Detailed evaluation of these alternates is given in subsection 10.10. To obtain the final proposed alignment, routes O and B are combined to utilize the advantages of each. Route O is the most economical route from Gaffney, South Carolina, to S. C. Route 50; however, the route interrupts a large timber stand east of S. C. Route 50. Route B is more cost prohibitive west of S. C. Route 50 while having the distinct environmental advantage of avoiding the large timber stands. Therefore, by following route O from Gaffney, South Carolina to S. C. Route 50 and route B from S. C. Route 50 to the plant site, the best overall route is obtained.

The selected route destroys less timberland and crosses the steep-sloped hill east of S. C. Route 50 along a relatively-flat natural bench, thus causing less sedimentation problems for the stream below. Therefore, the selected route is the most acceptable from a combined environmental and economic standpoint.

4.1.1.5 Station Construction

3 Station construction is scheduled to commence with site preparation in November, 1976. Construction methods and procedures are aimed at minimizing the impact on the area environment, and are proposed to be used at the Cherokee site.

When the site area is prepared for construction, only the minimum amount of necessary clearing is done. Those areas in the site vicinity that may be cleared of all vegetation are shown on Figure 4.1.1-2. Excavation, filling, and spoiling are done only within the cleared areas. Areas not needed for the permanent plant facilities are restored by suitable landscaping to blend with the natural terrain. Mechanical seeding and hydro seeding, are most likely to be used. Seeding and restoration planting are done as soon after construction as possible.

During construction, efforts are made to minimize the environmental impact. Erosion, sedimentation, dust, smoke, noise, unsightly landscape, and waste disposal are controlled to practical levels and permissible limits, where such limits are specified by regulatory authorities. In the absence of such regulations, Duke abides by dictates of good citizenship.

The term "Dictates of good citizenship" is simply a common sence term that means those policies and procedures that society abides by in everyday living. They are not laws Duke is required to abide by, instead, they are everyday actions that any good citizen and neighbor would practice to keep his home or business clean and neat as conditions will allow and not being a nuisance to himself or neighbor. Q 4.1.4

Good drainage, dry weather wetting, and the paving of the most heavily traveled construction roads reduces the dust generated by vehicular traffic. Bare areas are provided with a ground cover wherever and whenever practicable.

Erosion in the construction area and the resulting sedimentation are controlled by providing piped drainage systems, intercept and berm ditches, and ground covers where necessary to control the flow of surface water. Spoiled materials are deposited in a controlled manner such that high water or surface runoff do not transport materials to the adjacent Ninety-Nine Islands Reservoir.

Excessive and objectionable construction noises are to be reduced to acceptable levels. Contractor's and Company's motor powered equipment are equipped with noise reducing equipment and are maintained in good order. Tree lined fringes, left around most of the construction area for visual pollution abatement, contribute to noise reduction.

Care is taken to control smoke and other undesirable emissions to the atmosphere during construction. Combustible debris generated by station construction will be burned under provisions of permits issued by state and local authorities. If permits are not made available, materials will be buried in a spoiled fill area. Duke adheres to air pollution control regulations applicable to Cherokee County and the State of South Carolina, as they relate to open burning and the operation of certain fuel-burning equipment. Permits and operating certificates are applied for as required. All reasonable precautions are taken to prevent accidental fires on the construction site and brush or forest fires on adjacent lands. Q 4.1.3

Wastes, such as chemicals, fuels, lubricants, bitumens, and raw sewage, are not deposited onto the natural watershed where surface runoff can transport these materials into the reservoir. Waste products will be handled in accordance with state and local laws. A sewage treatment facility, which will meet the standards required by these laws, will be on site. Bitumens, such as asphalt waste, are the responsibilities of the supplier and are not disposed of on the construction site. There are not any waste chemicals or fuels that are disposed of on the site. A spill control program in case fuels are inadvertently spilled will be implemented. Other waste products, such as solid waste, will be disposed of in a Duke Construction Department sanitary landfill. Solid construction waste, such as foliage, packing materials, rags, scrap iron, etc., is either buried or transported off-site to an approved landfill. Q 4.1.

Construction buildings, storage and maintenance areas, and parking areas are maintained in a neat manner to improve the construction plant appearance. Construction yards, construction substations, employee and office parking areas, mess hall, and construction office are temporary and are suitable landscaping to blend with the natural and developed landscape.

The concrete batch plant is to be located as shown on ER Figure 4.1.1-2. The plant contains an eight cubic yard mixer with appropriate stockpiles of materials for normal operation. All cement is to be stored in enclosed bins with vents filtered to reduce dust problems. Traffic areas are to be watered as necessary to prevent dust. Liquid effluents from plant operation are drained to a sediment wash pit for settling of solids prior to release. Based on current experience, noise produced is not extreme and is not a hazard to workers or the public. Conditions are to be monitored to assure compliance with OSHA regulations. Q 4.1.

The permanent fire protection system is installed as soon as excavation and backfill operations permit and is maintained during the remainder of the construction program.

The final construction activities at the Cherokee Site are scheduled to be the removal of construction facilities and the final grading and landscaping of the station site.

For the period of time when one unit or two units are in operation and construction of the remaining unit(s) is being completed, it is estimated that construction personnel receive an exposure of 60 man-rem, assuming the exposure times shown in the table below. The dose rates from Unit 1 are
3 9.0×10^{-6} rem/hr and 1.2×10^{-6} rem/hr at Unit 2 and Unit 3 respectively. The Q
dose rate at Unit 3 resulting from operation of Units 1 and 2 is 1.02×10^{-5} 4.1
rem/hr.

Construction Man-Hours

Unit	Approximate Beginning of Power Operations	Total Man-Hours
1	9-1-83	
3 2	9-1-85	8,790,080
3	9-1-87	3,016,000

4.1.2 HUMAN ACTIVITIES

The major impact of station construction on human activities is expected to be a result of the large influx of labor into the area on a daily or semi-permanent basis.

The bulk of the labor force is expected to come from Cherokee and the surrounding counties. An increase in vehicular traffic is expected. There is expected to be an expansion of small business in the area.

Duke believes that the expected benefits derived by the local populace from construction of the station outweigh the usual minor inconveniences associated with that construction, or construction of any large industry.

Temporary external costs of building the station are as follows:

a) Noise

Environmental effects of excessive noise levels including induced hearing loss and annoyance to inhabitants of the area. It is highly unlikely that either of these will occur during construction of the plant. Reasons for this are as follows:

Based on measurements at other construction sites, it is expected that the overall noise levels during construction at the exclusion boundary Q
be in the 45-73 dB(A) range. This will occur during the period of site 4.1
excavation when large earthmoving equipment is in operation.

Transmission of noise is affected by wind direction and velocity, topography, buildings and natural screening such as trees. While no absolute value can be predicted for each location and physical and meteorological conditions, about 63 dB(a) could be expected at a point on a clear line of sight at a distance of 2500 feet from the source of the noise. This value would be reduced if a clear line of sight did not exist.

An observer in the site vicinity would probably detect total levels of 45 to 73 dB(A), but these noise levels will not cause physical damage. It is an established fact (based on observations and measurements) that no hearing loss is induced by a lifetime of exposure to sound levels of 80 dB(A) or less. Data developed by the American Academy of Opthamology and Otolaryngology for numerically estimating the percentage risk of developing a hearing loss for lifetime exposures consider only levels of 80 dB(A) and above.

The above range of noise levels will momentarily be exceeded when explosive charges are discharged during rock excavation. The noise generated by each of these blasts will be of extremely short duration and will not be as loud as naturally occurring thunder generated by lightning during local summer storms. An observer at the site boundary would hear these explosions and some echo as the sound reflects from natural obstructions. Duke has no record of significant adverse environmental effects from blasting.

The annoyance factor varies widely with individuals and the degree of acceptability by inhabitants near the boundary is quite difficult to establish.

Criteria that considers average public reaction to varying noise levels have been developed. When used as a basis for determining the reaction to anticipated levels, these criteria indicate no widespread complaints at anticipated daytime levels during the construction period. Noise levels during operation are expected to be much lower at the boundary. When subjected to the same criteria, no adverse public reaction would be anticipated.[1]

b) <u>Community Services and Facilities</u>

Based on Duke's construction experience, only about 13 percent of the construction work force are expected to move into the vicinity as new residents. These additional residents will cause the student attendance of the local schools to increase during the construction phase. The attendance increase due to construction activities will be temporary and is not expected to affect the normal year to year increase significantly. Additional schools will not be needed merely to accommodate the additional students accruing from the construction work force.

A mobile home park with 150 sites is planned for development approximately three miles from the Cherokee site. A residential community about six miles from the site has approximately 80 wooded lots remaining for future construction of homes. Adjacent to the community, a small apartment complex is presently being constructed, containing 28 units to be rented upon completion.

Additional mobile home parks will probably develop in the area around the Cherokee site to aid in the accommodation of the construction work force. A few new houses and stores will be built in the vicinity, although no additional projects, such as residential communities or major shopping centers are expected.

The hospital closest to the site, located in Gaffney, South Carolina, will be affected slightly. This hospital will be used for obtaining emergency medical treatment for the construction workers when necessary. The building of additional hospitals in the vicinity will not be necessary. Minor illnesses or accidents will be treated at the on-site First Aid Station.

The development of new fire departments or police departments will not be needed, since Cherokee will be equipped with its own Fire Protection System and Guard Service. Q 4.1.6

c) Traffic

The construction of Cherokee will cause some increase in vehicular traffic on the local roads. Duke plans to discuss the effects of the increase in traffic on existing local raods with the State Highway Commission to determine if any modifications are necessary. Suitable access roads will be built in the construction area to accommodate construction traffic. On site parking will be provided for the construction force.

4.1.3 CONSTRUCTION EFFECTS ON TERRAIN, VEGETATION, AND WILDLIFE

The expected impact of site preparation and station construction on the local environment is a function of the condition of the present natural setting, the extent of proposed clearing operations, techniques used in site preparation and station construction, and implementation of control and reclamation procedures. Proposed clearing operations near the center of the exclusion area are to be accomplished using environmentally sound techniques. Estimated volumes of earthwork are shown on Table 4.1.3-1.

4.1.3.1 Effects on Terrain

Construction activities are not expected to have any adverse effects on the terrain outside the construction area. Effects on the terrain are to be confined to the project area where construction activities are to include. Clearing, grubbing, excavating, filling, grading, stock-piling, and building. These alterations are not expected to cause any permanent adverse effects.

The anticipated effect of clearing operations on the terrain is the short term increase in potential soil erosion. Solution of the Universal Soil Loss Equation indicates that erosion of bare soil at the site equals 120 tons/acre/year compared to 4.5 tons/acre/year under existing cover conditions. Assuming that a maximum of 100 acres of the site are bare at a given time, the potential soil loss in excess of natural erosion equals 960 tons per month.

Short term undesirable effects such as the potential soil erosion, are mitigated by proper construction techniques. Erosion control measures are implemented as necessary. Berms and dikes are constructed as necessary. Interceptor ditches are built to protect side hill cuts. Cleared areas, cuts, and fills are seeded as soon as practical. Sheet piling and and-bagging are used to control erosion as needed. Fugitive dust is controlled by use of watering and natural windbreaks.

A secondary effect of the clearing operations on the terrain is a reduction in natural asethetic quality. However, as much of the site as practicable is to be cleaned up and landscaped with appropriate grasses, shrubs, and trees after construction.

The earthwork volumes shown in Table 4.1.3-1 are the best available estimates at the time of application. Due to plant facility layout changes, i.e., cooling tower yard, etc., further refinement will optimize necessary earth-work to minimize spoil materials. If excess materials are available, they will be used as compacted fill in adjacent low areas to serve as construction yard space and for equipment storage. Q 4.1.12

Figure 2.1-2 indicates that approximately 268 acres of land will be inundated by the three impoundments at the site. The approximate percentages of land uses and forest areas for each impoundment are listed below. For detailed communities see Figure 2.7.1-2.

1) The Nuclear Service Water Pond - approximately 173 acres of land composed of the following:

   12 percent Aquatic Areas
   20 percent Abandoned Fields and Transmission Lines Right-of-Way
   28 percent Thickets
   40 percent Forest Communities

2) The Intake Sedimentation Basin - approximately 100 acres composed of the following: Q 4.1.13

   10 percent Abandoned Fields and Transmission Lines Right-of-Way
   58 percent Forest Communities
   32 percent Aquatic Areas

3) The Auxiliary Holding Pond - less than two acres. Forest communities and aquatic areas comprise the entire area.

4.1.3.2 Effect on Vegetation

Construction activities are not expected to have any adverse impacts on vegetation outside the immediate construction area. No herbicides, growth retardants, or sprays are used in clearing operations. Vegetation in the immediate station area is to be cleared completely. The site contains no rare or endangered plants but is covered with upland forests as discussed in Subsection 2.7.2.

4.1.3.3 Effect on Wildlife

The clearing operations and site preparation are expected to remove 661 acres of oak-hickory pine and mixed mesic forest from the existing wildlife habitat in the site vicinity. The clearing operations result in the loss of some small animal life, especially mammals. Construction activities, including generating of noise, displaces wildlife at the site. Although emigration is possible, displaced birds, mammals, amphibians, and reptiles may find that suitable niches in adjacent woodlands are already occupied. The more mobile birds and mammals are probably going to keep shifting from place to place until they locate a new home; however, sedentary species, such as amphibians, are going to find it difficult to adjust. It is unlikely that a significant segment of the resident wildlife population is going to be destroyed. No known rare or endangered species are affected as detailed in Subsection 2.7.3.

When construction is completed and landscaping accomplished, much of the cleared area may again be available as wildlife habitat.

4.1.4 CONSTRUCTION EFFECTS ON ADJACENT WATERS AND AQUATIC LIFE

The impact of site preparation and station construction on the local aquatic environment is a function of the condition of the present natural setting, the proposed operations, and the measures taken to mitigate any adverse environmental impacts.

4.1.4.1 Effect on Surface Water

The effect of site preparation and station construction on surface water quality is to be minimized by proper construction techniques. Some increase in turbidity in the reservoir is expected to result from runoff during rainstorms; however, adequate erosion control measures minimize this impact.

Erosion control procedures used reflect best available practices as determined by the specific situation. Clearing will be staged to provide minimum space requirements for earthwork and excavation. In the early stages of construction, detention ponds and berms will be provided as Q
necessary to detain sediment laden water and provide settlement of sediment 4.1.11
prior to discharge into the receiving streams. A permanent drainage system will be installed as soon as practical to prevent excessive erosion from overland travel of rainfall runoff. At the earliest practical time, all areas not paved will be seeded to obtain a stand of vegetation. All paved areas will be sloped and drained in a manner to prevent erosion of non-paved areas.

Current Cherokee site excavation and grading activities are required for determination of geologic structure as needed for licensing. Specifically, test pits have been excavated as suggested by AEC personnel to visually inspect this structure. These pits must remain open until they are no longer Q
needed for this purpose. Spoil removed from the pits has been stockpiled 2.2.14
in designated areas for future use as fill material in plant construction or for refilling the pit excavations. Erosion of the observation pit walls produces sediment in the pit excavation which is periodically removed to the

designated spoil area. Areas around the designated spoil areas have been
left in their natural state to serve as a buffer zone. These buffer zones Q
serve to trap and filter sediment washing from the spoil areas. Effects of 2.2.14
erosion and sediment transport into the Ninety Nine Islands Reservoir from
current site excavation and grading are therefore insignificant.

Dewatering of major excavations is expected to produce a small but continuous flow of water which is to be pumped into the Ninety Nine Islands Reservoir. Neither the quality nor quantity of this additional water adversely affects the river quality.

A very conservatively calculated maximum volume of dewatering effluent from
the excavation of the three units is approximately 450 gpm. The groundwater
which is removed directly from the subsurface will be clear. Groundwater Q
which is collected in sumps and pumped out of the excavations is expected 4.1.10
to be slightly turbid due to construction activities and runoff. The de-
watering effluent will be held up in detention ponds, thereby protecting
the adjacent streams and river from construction related sediment.

Certain consumable liquids are expected to be transported to the site
1 during the construction period. The principal liquids used are fuel oil,
gasoline, diesel fuel, paint, and thinner. The gasoline diesel fuel and
1 fuel oil, stored in large suitable tanks, and the paint and thinner, re-
ceived and stored in metal containers, are to be used in a manner which
assures that they are not released to the environment.

Organic wastes from construction personnel are to be controlled by the use of portable chemical toilets until temporary waste treatment facilities are installed. These toilets are periodically emptied into closed tank trucks and the wastes transported offsite for proper disposal.

The effects of construction of the river intake and discharge structure on
water quality and water supply will be minimal, as detailed in Sections 10.2 Q
1 and 10.3. The water quality parameters of the Broad River and The Ninety 4.1.7
Nine Islands Reservoir will remain unchanged, as will downstream water
supply.

4.1.4.2 Effects on Groundwater

The proposed facilities require several excavations of considerable size. The dewatering of these excavations to lower the groundwater table affects groundwater only in the site area.

The dewatering for the structure excavations will not lower the groundwater
table beyond the site area since the most conservatively calculated radius Q
of influence extends less than 420 feet beyond the excavations. The site 4.1.8
boundary is at least 1500 feet away from any excavations as shown by
Figure 2.1-2.

Computations are based on the following empirical equation:[2]

$$R = C'(H-hw)\ \ k$$

Where R = radius of influence (ft)
(H-hw) = drawdown at well (ft)
K = permeability of soil (10^{-4} cm per sec)
C' = dimensionless constant

Q 4.1.8

Values for rock permeability for the site are given in PSAR Appendix 2B, and the value of C' used in computations is 3.0.

When construction is complete, the groundwater table is expected to return to its previous level, resulting in no adverse impact on the aquifer.

4.1.4.3 Effects on Aquatic Life

Site preparation and station construction will have an impact on aquatic life in the Ninety-Nine Islands Impoundment, but for the most part effects will be minor and temporary. Two permanent changes will result, however. The construction of the 173 acre Nuclear Service Water Pond will block off a small (10 acre) backwater area on the northwest corner of the impoundment, and change approximately one mile of McKown's Creek drainage from a lotic to a lentic habitat. The 100 acre Intake Sedimentation Basin will be formed by a dam between two points of land on the west bank of the impoundment. This will result in the permanent separation of a 34 acre backwater area, and the alteration of about 1000 feet of a small site creek. The size and extent of both these impoundments are shown in ER Figure 4.1.1-2.

Most of the remaining construction effects on the Ninety-Nine Islands Impoundment will stem from increased turbidity due to runoff of surface waters. The severity of this stress will depend on water levels and rainfall during the construction period. It should be no worse, however, than similar stresses to which the impoundment has been subjected during its sixty-five year history, most recently extensive dredging and construction directly in the forebay of the hydro station. The steps that will be taken in the site area to control this problem are described in Subdivision 4.1.4.1.

The intake structure (described in Subdivision 10.2.2) will be located on a point on the west bank of the impoundment, approximately 1000 feet above the Ninety-Nine Islands Dam (ER Figure 4.1.1-2). Construction is expected to take approximately 12 months and will require the installation of a cellular cofferdam or similar structure. This will extend approximately 70 feet into the water and will permit the dewatering of about half an acre of lake bottom. While in place the cofferdam face will provide attachment surface for periphyton. The installation and removal of the cofferdam will result in a temporary and local increase in turbidity and silt load. Normal populations of benthos, however, should become reestablished quickly. The only permanent change in bottom topography will be the presence of the major portion of the intake structure including the verticial sheet pile retaining wall.

Q 4.1.

The blowdown discharge structure (Subsection 10.3.2) will be positioned on the west end, downstream face of the Ninety-Nine Islands spillway. The radwaste discharge pipe and its protective shield (Subsection 3.5.1) will be routed across the upstream face of the dam to the tailrace and sluice gates of the hydro station. No appreciable construction effects on the aquatic environment should result from the installation of either of these structures.

4.2 TRANSMISSION FACILITIES CONSTRUCTION

2 4.2.1 CONSTRUCTION OF THE CHEROKEE FOLD-INS

The effects of construction and installation of transmission towers and
related facilities on the land and surrounding population are minimal. The
1 selected line routes out of Cherokee are in the rural section of Cherokee
County. No concentrated residential or industrial areas are located in or
near the proposed rights of way; therefore, no significant adverse effects
1 due to construction are anticipated. Motorists passing under the lines are
not inconvenienced by construction equipment, and there is no expected
traffic rerouting.

In accord with practices used by Duke in constructing the lines, hand labor
and such equipment as necessary are used to clear the right-of-way corridors.
No herbicides, growth retardants, or sprays are used in the clearing
operations. All slash and unmerchantable timber are removed, buried, or
otherwise disposed of in accordance with local regulations. The rights of
way, where cleared, are planted with 50 pounds of Fescue #31 per acre.
1 Sericea lespedeza is used in rough areas such as steep slopes. Where
necessary, other vegetation such as German millet is planted along with
the fescue to provide cover and protection until the grass becomes established.
Selective clearing is performed adjacent to the highway and in areas of high
visual exposure. In areas where selective clearing is used, as much natural
vegetative cover as practical is retained within the right of way. Trees
which could affect the operation of the energized line are removed. A
truck-mounted crane is used to set the steel towers in place. The conductor
is strung and tensioned by equipment mounted on trucks with high flotation
tires. Also, a track-mounted backhoe is used for digging the foundation
of some towers.

After construction of the lines is completed, cleanup and restoration are
1 performed as required. Cleanup and restoration entails removal of excess
material from the site and the smoothing and seeding of work areas. Old
fences on the right of way are repaired and new fences and gates installed
where required. Where necessary, culverts or other drainage devices are
installed to maintain adequate drainage and prevent or control erosion.

The environmental impact of clearing tall growing vegetation from the right
of way is slight in that the forested areas adjacent to the right of way
are left intact and the clearing and planting of the right of way creates
an "edge effect" that is beneficial to the resident wildlife. These
openings, created in continuous forest areas, allow desirable wildlife
foods to become established and aid in the propagation of bird and animal
species.

The proposed transmission lines do not cross any natural shorelines, marshlands,
wildlife refuges, scenic or historic areas. Approximately 16.7 miles of wood-
land are included in the selected rights of way. However, none of the
2 timberland is included in any national forest, shelter belt, or wilderness Q3.9.3
area. The location of specified game lands as well as Kings Mountain National
Military Park and the site of the proposed Cherokee Ford Iron Works Historic
Park are shown on Figure 4.2.1-1.

For access of construction equipment, one temporary road is needed for each right-of-way corridor. By using common rights of way, only three roads are needed. The temporary roads are built along the line rights of way since experience indicates that this method is far less damaging to the environment than traveling across country to reach the construction sites. The Shelby
1, 2 Tap to Peach Valley 230 kV fold-in requires 5.9 miles of road. Approximately
2 7.4 miles of road is needed for the Catawba to Pacolet lines and 7.8 miles are required for the Catawba to Shelby Tap fold-in.

After construction and cleanup are completed, the temporary roads are seeded along with the remaining right of way to impede erosion and return it to suitable wildlife habitat.

Erosion caused by construction is minimal. As soon as clearing is completed, the rights of way are seeded; and after all construction is completed, reseeding is performed where required. Culverts are installed along access roads where indicated and all natural drainage is maintained and improved where necessary.

Only minimal loss in agricultural productivity is expected due to construction of the transmission lines out of Cherokee. Only the area directly under the transmission towers is to be taken out of production. The productivity of the
1 remaining agricultural area traversed by the lines is not expected to be affected.

No rare or unusual species of flora or fauna are in danger of being disrupted or threatened with extinction due to the construction and subsequent operation of the transmission lines out of Cherokee Nuclear Station. As discussed in Section 2.7.1.2.2, the Broad River does support a limited population of both migratory and non-migratory waterfowl. No adverse effects on these birds are anticipated from the construction and operation of the Cherokee transmission
2 lines. For the most part the lines are located away from the floodplain of Q3.9.1
the river and do not interfere with breeding habits or migration patterns.

One small section of the Catawba-Shelby Tap line fold-in does cross the 99 Islands Reservoir but is not expected to create any hazards because of the small population of ducks in the area and limited use of the river by migrating waterfowl.

4.2.2 MODIFICATION OF THE EXISTING TRANSMISSION SYSTEM

In order to facilitate the transfer of power from Cherokee Nuclear Station to other points of the Duke Power service area, the following modifications
2 will be made on the existing transmission system. (See Figure 4.2.2-1). Q3.9.4

1. Installation of Goucha Tap Station where the Shelby Tap-Peach Valley 230 kV line crosses the Pacolet Tie-Cliffside 230 kV line.

2. Rebuild the section of the Shelby Tap-Peach Valley 230 kV line between Shelby Tap and the proposed Goucha Tap.

3. Rebuild the Catawba-Pacolet 230 kV line between Catawba Nuclear Station and Pacolet Tie Station.

The proposed Goucha Tap Station will be located on a 4-acre lot approximately 5.5 miles southwest of Gaffney, S. C. The installation of Goucha Tap will enhance Duke's transmission system reliability by providing additional pathways for the power generated at Cherokee.

In constructing the tap station existing vegetation will be preserved intact on the property where it provides screening around the station and does not conflict with the area to be developed or does not jeopardize the normal operation or maintenance of the transmission lines. Areas cleared for construction will be seeded immediately with suitable ground cover to prevent erosion. In addition, a detailed site study will be conducted to see if additional plant material is needed to improve the overall appearance of the tap station.

The rebuild of the Shelby Tap-Peach Valley 230 kV line consists of replacing the towers with towers designed to support the larger two-conductor bundle of 2515 MCM ACSR. The line will be rebuilt from Shelby Tap Station to the proposed Goucha Tap Station. Construction involves approximately 19 miles of existing line and replacement of 117 towers. Q3.9

The existing 954 MCM ACSR conductor on the Catawba-Pacolet 230 kV line will be replaced by a two-conductor bundle of 954 MCM ACSR. Because of the added loading of weight, wind and tension resulting from the bundled conductors, about 223 towers between Catawba Nuclear Station and Pacolet Tie Station will be replaced or upgraded. This rebuild involves approximately 40.1 miles of line.

On both the Shelby Tap-Peach Valley line and the Catawba-Pacolet line, two dead-end type structures will be installed on each right of way in order to route the lines to the Cherokee Station. No additional right of way will be required as a result of the rebuilds or installations and all damage done to the existing rights of way during construction will be repaired.

Construction has not started on the Catawba-Shelby Tap 230 kV line and no modifications or tower replacement will be necessary. The only change that will occur on this line will be the installation of the two dead-end structures.

The procedures proposed in the U. S. Departments of the Interior and Agriculture publication "Environmental Criteria for Electric Transmission Systems" and the Federal Power Commission's "Guidelines for the Protection of Natural, Historic, Scenic and Recreational Values in the Design and Location of Rights of Way and Transmission Facilities" will be followed where practical.

4.3 RESOURCES COMMITTED

Site preparation and station and transmission lines construction commit onsite resources and offsite resources. Some of the resources are irreversibly committed and irretrievably lost.

4.3.1 ONSITE RESOURCES

The land area committed during site preparation and station and transmission lines construction is a resource. Of the area inside the exclusion area, approximately 91.8 percent is in upland forest, 2 percent is alluvial forest, 1.3 percent is transmission corridor right-of-way, and 4.9 percent is backwaters of the reservoir. Approximately 654.2 acres are required for transmission lines rights-of-way. Of this, approximately 84 percent is in forest, 7 percent is in fields and pasture, and 9 percent is used for crop growing. Approximately 550 acres, 84 percent of the rights-of-way, need clearing. Only a portion of the site area is to be used for permanent facilities. Those areas cleared for station construction and transmission lines rights-of-way are recoverable as wildlife habitat upon restoration.

Total land use requirements are detailed in Table 4.3.1-1.

Land owners negotiated with local timber and pulpwood dealers to remove marketable trees from their respective tracts with the exception of two tracts which were owned and cleared of trees by their previous owner. Land owners retained the right to remove trees on approximately 90 percent of the land purchased. The wooded areas over all should carry a classification of C grade woods. This acreage would include some scattered pulpwood and a few trees that may be classified as saw timber. Overall per acre value on timber rights retained by the owners would be approximately $40.00 per acre considering that all trees be cut for pulpwood and that the market value of pulpwood is $5.00 per cord and estimated at 8 cords per acre. Q 2.7.

Duke places no logging restrictions on individual owners; however, wooded areas cleared by the company shall be cleared by the highest standard of good forrestry practices. Duke, as always, will make every possible effort to control erosion; however, logging operations conducted by former land owners will be impossible to monitor with respect to erosion until the company actually grubs and clears the newly acquired property.

There should be no effect on wildlife or unique habitat due to logging. There is ample cover for wildlife adjacent to any timber clearing operation within the site. Any effect from erosion should be minimal and will be corrected if it occurs. There were no selected harvesting of pines. All logging was general and any pines cut were incidential to overall sale of trees. Duke has no records on the forest areas that have been logged since land negotiations began. Duke does not know which areas will be logged prior to construction.

Several water resources are to be committed during the site preparation and construction of Cherokee Nuclear Station. Construction of the intake and discharge structures on the Broad River is not expected to adversely affect Q 4.3.

the water quality of fish and wildlife populations of the Broad River. (See Subsection 4.1.4-3). Q 4.3.1

Nearby groundwater users will not be affected by dewatering of excavation or the construction of impoundments on the site as discussed in Subsections 4.1.4.2 and 5.1.3. The Auxiliary Holding Pond adjacent to the site will furnish sources of water for fire protection and concrete batch mixing. Wells with a maximum total usage of 60 gpm will provide water for other construction uses.

Implementation of the erosion control program will minimize the effect of sediment deposit in the Broad River and nearby tributaries.

4.3.1 OFFSITE RESOURCES

In addition to the onsite resources that are irretrievably lost during construction, there are also offsite resources irretrievably lost. During construction, the heavy equipment on site will consume millions of gallons of diesel fuel. Processed oxygen, processed acetylene, and electricity are consumed.

Major materials required during plant construction include concrete aggregate and cement, reinforcing steel, lumber, piping materials, and electric wire and cable.

Additional steel required for the transmission system needed to transport the power from Cherokee to the Duke grid amounts to approximately 2,070 tons. Approximately 2,250 tons of conductor are used.

Concrete and steel constitute the bulk of the construction materials; however, there are numerous other minor resources incorporated into the physical plant. Some materials, such as copper wire and cable, are valuable enough to be recycled, whereas the value of others does not encourage recycling. Only a small portion of the station is subject to radioactive contamination to such a degree that decontamination is needed to reclaim and recycle the constituents. The quantities of materials that are not decontaminated for recycling purposes represents a small fraction of the sources available in broad use in industry.

ER Table 4.1.1-1
Cherokee Nuclear Station
Highlight Construction Schedule
for Project 81

Item	Perkins Nuclear Station Unit 1	Perkins Nuclear Station Unit 2	Perkins Nuclear Station Unit 3	Cherokee Nuclear Station Unit 1	Cherokee Nuclear Station Unit 2	Cherokee Nuclear Station Unit 3
Receive Construction Permit	3-76	3-76	3-76	8-76	8-76	8-76
3 Break Ground	3-76	3-76	3-76	11-76	11-76	11-76
Complete Access Railroad	*6-77	*6-77	*6-77	*5-78	*5-78	*5-78
Start Concrete Foundation	*7-77	*7-79	*7-81	*9-78	*9-80	*9-82
Set Reactor Vessel	12-79	12-81	12-83	12-80	12-82	12-84
Start T-G Erection	4-81	5-83	5-85	4-82	5-84	5-86
3 Start Hot Functional Testing	3-82	3-84	3-86	3-83	3-85	3-87
Load Fuel	5-82	5-84	5-86	5-83	5-85	5-87
Commercial Operation	1-83	1-85	1-87	1-84	1-86	1-88

*Subject to slight shift as detailed scheduling is completed.

ER Table 4.1.1-2
Cherokee Nuclear Station

DELETED

ER Table 4.1.1-3
Cherokee Nuclear Station
Construction Manpower Requirements

Year	Average Construction Employment
1976	20
1977	160
1978	540
1979	1,190
1980	1,840
1981	2,510
1982	2,590
1983	2,590
1984	2,290
1985	1,940
1986	1,530
1987	750
1988	180

Amendment 3
(Entire Page Revised)

ER Table 4.1.3-1
Cherokee Nuclear Station
Earthwork Volumes

Waste Water Collection Basin Dam	34,000 cubic yards fill
Nuclear Service Water Pond Dam	625,000 cubic yards fill
Intake Sedimentation Basin Dam	520,000 cubic yards fill
Station Yard (including plant yard, cooling tower yard, and switchyards)	9,340,000 cubic yards excavation 6,700,000 cubic yards fill

ER Table 4.3.1-1
Cherokee Nuclear Station
Land Use Requirements

Item	Total Area	Farmland or Pasture	Woods	Other
Site	1567	284.02	1267.31	6.86
Railroad	85	9.35	73.44	2.21
Transmission Lines	654.2	104.5	549.4	0.3
Total	2306.2	397.87	1890.15	9.37

Item	Area Permanent Facility	Farmland or Pasture	Woods	Other
Station	381 [1]	0	381	0
Railroad	85	9.35	73.44	2.21
Transmission Lines	654.2	104.5	549.4	0.3
Total	1220.2	113.85	1003.84	2.51

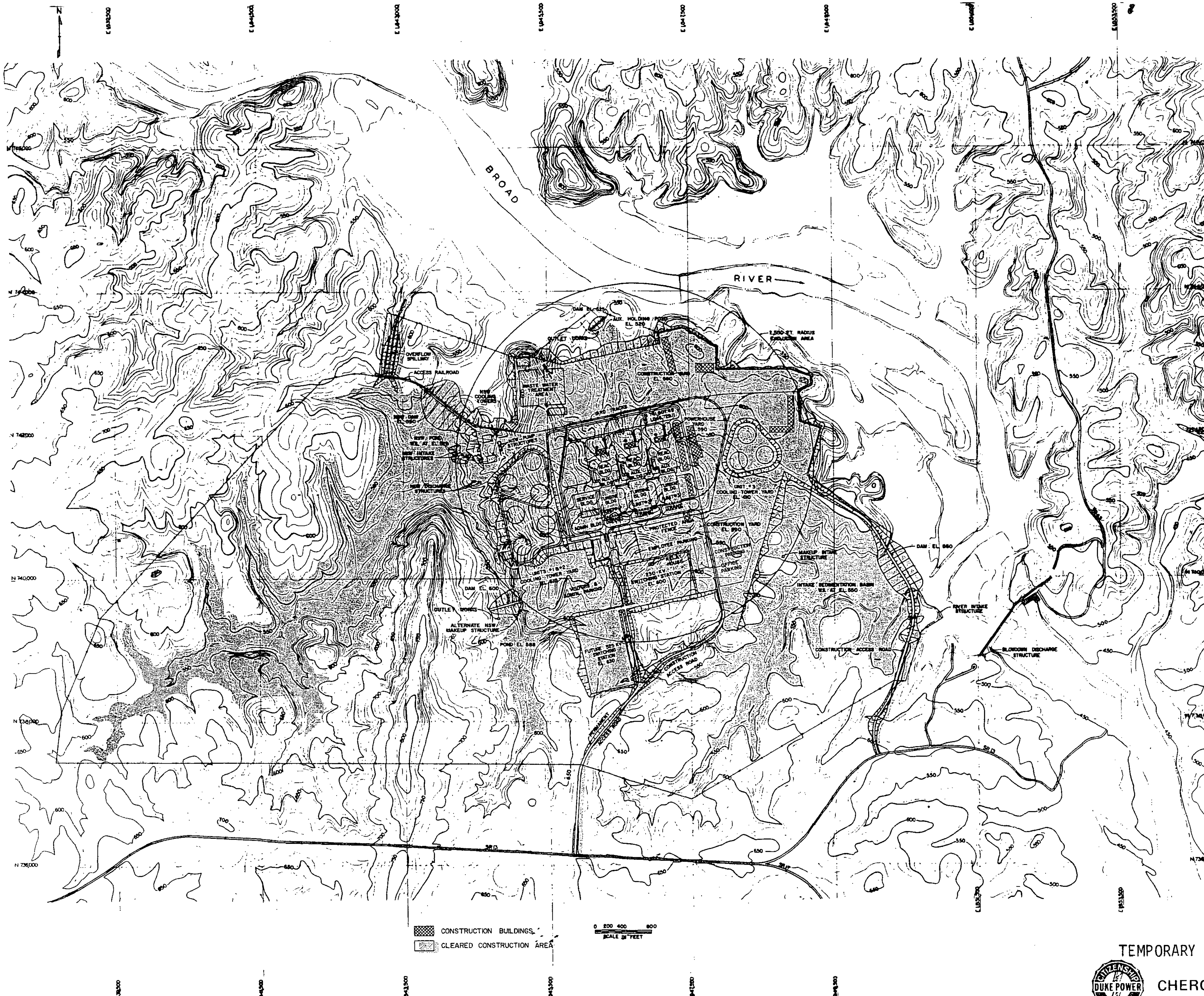
All Land Use in Acres

(1) Permanent Station Facilities Only

EXISTING TOPOGRAPHY

CHEROKEE NUCLEAR STATION

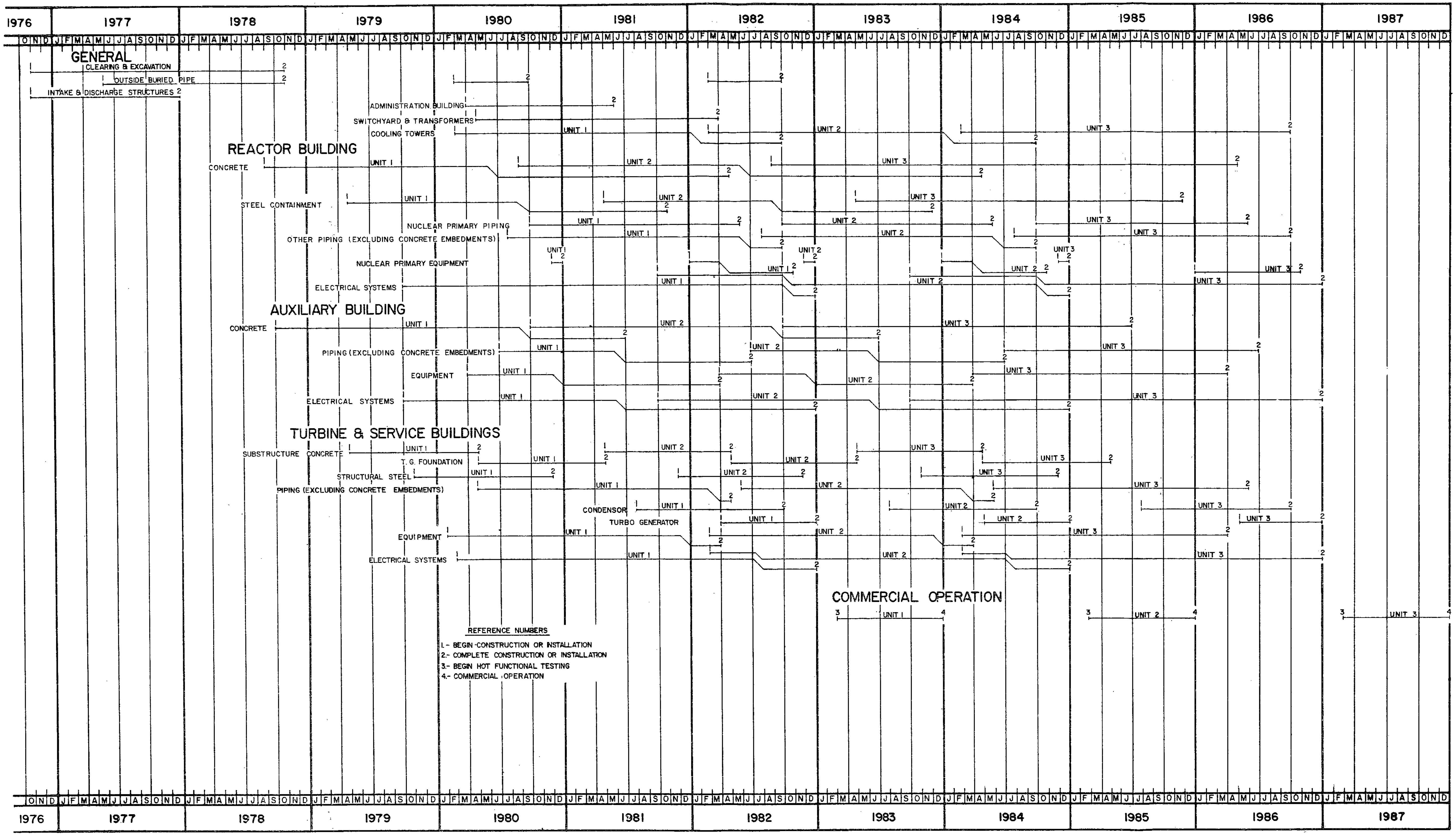
ER Figure 4.1.1-1



TEMPORARY CONSTRUCTION FACILITIES

CHEROKEE NUCLEAR STATION

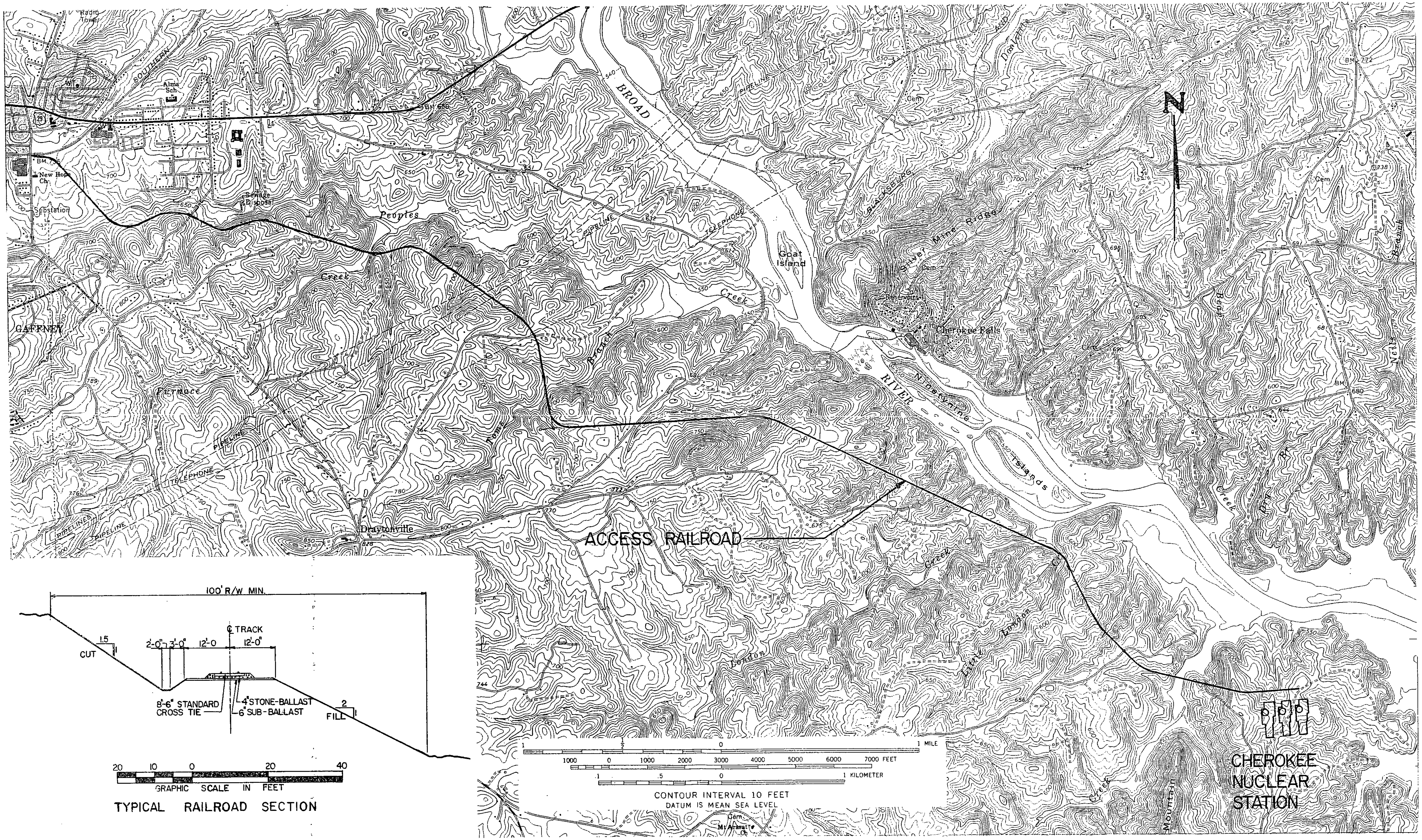
ER Figure 4.1.1-2
Amendment 2
Amendment 3



PRELIMINARY CONSTRUCTION SCHEDULE

CHEROKEE NUCLEAR STATION

ER Figure 4.1.1-3
Amendment 2
Amendment 3

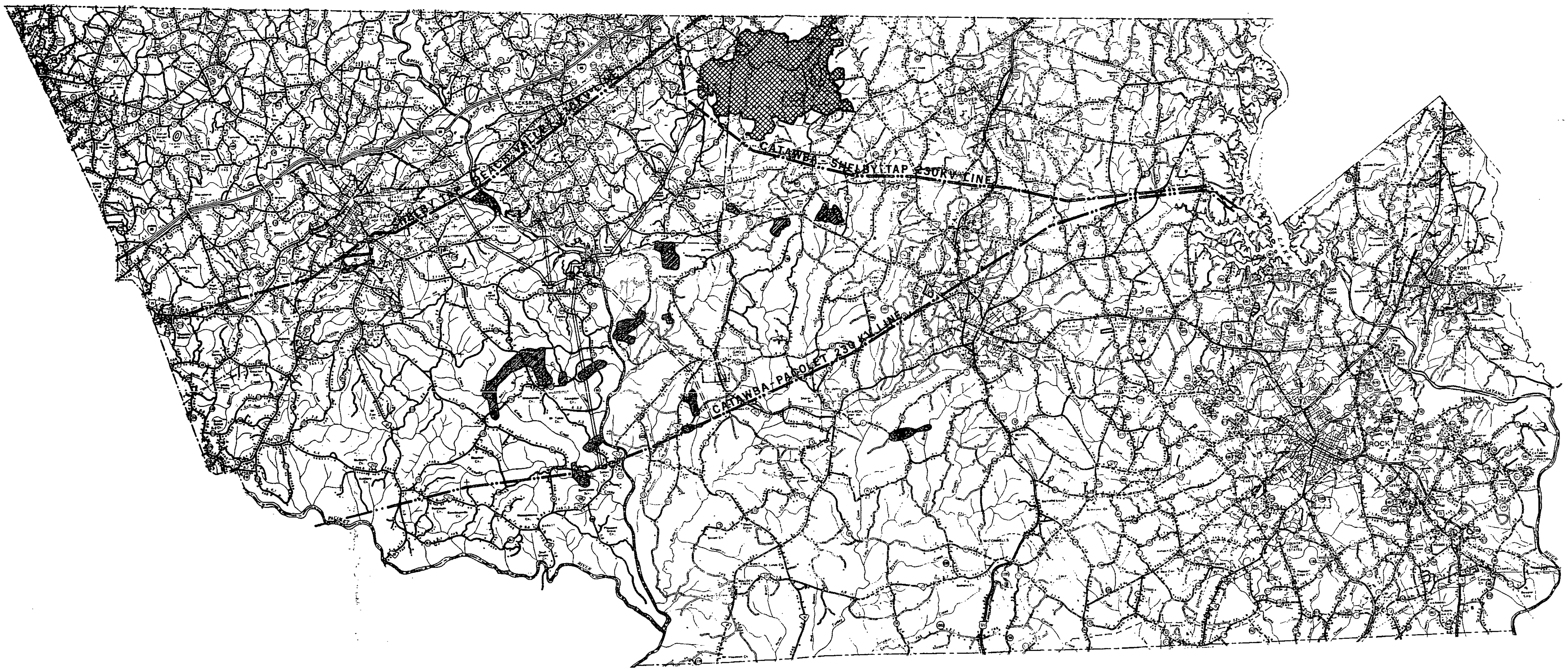


ACCESS RAILROAD

CHEROKEE NUCLEAR STATION

ER Figure 4.1.1-4

Amendment 4



Legend:

Game Management Areas Within 1 Mile of Transmission Line Corridors

Proposed Cherokee Iron Works Historic Park

Kings Mountain National Military Park

Existing Lines

Proposed Selected Routes

Proposed Alternate Routes

Note: Transmission Line Routes are not surveyed and show only general line location that is subject to change.

N

Scale in Miles

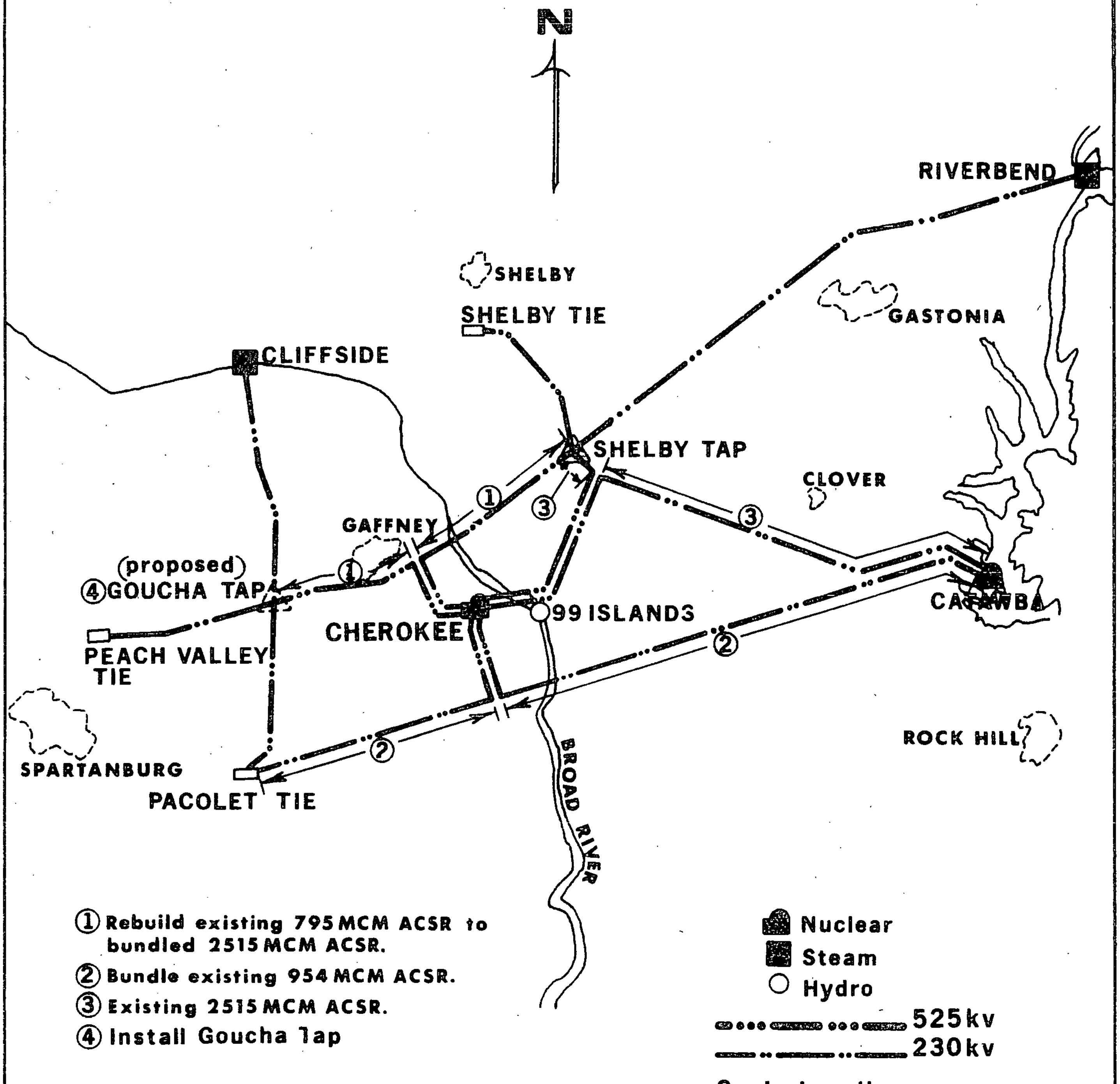
1 0 1 2 3 4

PUBLIC USE AREAS NEAR CHEROKEE TRANSMISSION CORRIDORS

DUKE POWER CITIZENSHIP SERVICE

CHEROKEE NUCLEAR STATION

ER Figure 4.2.1-1
Amendment 2
(New)



MODIFICATIONS OF EXISTING TRANSMISSION FACILITIES

CHEROKEE NUCLEAR STATION

ER Figure 4.2.2-1
Amendment 2
(New)