SUPPLEMENT

TO THE

ANNUAL ENVIRONMENTAL MONITORING REPORT

FOR

ARKANSAS NUCLEAR ONE - UNITS 1 & 2

DOCKET NOS. 50-313 & 50-368

LICENSE NOS. DPR-51 & NPF-6

ANNUAL ENVIRONMENTAL MONITORING REPORT, 1981

SUPPLEMENT

A post-submittal review of the Annual Environmental Monitoring Report, ANO-1 & 2, 1981 by the Safety Review Committee has identified several items that require clarification and/or explanation in the subject report.

1. The Environmental Technical Specification Table 4-3 states that the Trawling Survey will have "2 samples in each area every other week March, April, May, June". One page 41, item number 3 in the report indicates that sampling began on March 27, 1981. This is generally true for most years of the program. The rationale for this apparent deviation from Appendix "B" specifications follows:

   The fishery survey of the reservoir was designed to characterize the fishery in the reservoir and aid in the assessment of the impact on the reservoir due to the operation of ANO. Since this was the first study of its kind for the reservoir, sampling times were widely bracketed to ensure complete data for each type of sampling gear. The meter net is a trawl used early in the year to detect spawning activity.

   The first two years of sampling with the meter net indicated that no significant spawning activity took place in the first weeks of March. Subsequent years of sampling confirmed this observation. (See table below.) Significant spawning appears to begin in April,

reaching a peak from mid-April through May. Discussions with Arkansas Tech personnel, other environmental consultants and NRC staff revealed that the trawling survey could meet the intent of the survey by beginning meter netting in April. Therefore, meter net sampling was changed to weekly samples beginning the last week in March through July, weather permitting. However, no formal technical specification change has been submitted.

Since the objectives of the trawling survey are being met, we believe that the intent of this technical specification has been satisfied.

The technical specifications also require replicate samples be taken in each area for the trawling survey and the shoreline seine. All the tables in the report are a composite of the replicate samples in each area. Procedures for sampling are itemized beginning on page 42 of the report and the reader is referred to these pages for sampling specifics.

Meter net sampling results for the first two sample dates from 1974 through 1981. Areas and replicate samples are composited into one total sample per date.

Date	1st Sample	# of Fish	2nd Sample	# of Fish
1974	3/22	0	4/6	0
1975	3/15	0	3/27	0
1976	3/29	5	4/2	13
1977	4/2	0	4/9	86
1978	3/31	0	4/8	12
1979	3/30	1	4/7	66
1980	3/28	0	4/5	25
1981	3/27	0	4/4	1

2. The complete date on which monthly water quality data were collected was not reported in Appendix I-IV of the Dardanelle Reservoir - Illinois Bayou Embayment Survey.

The day of sampling was inadvertently omitted in the title of the computer processed version of the data tables. Sampling in 1981 was performed on the following dates:

January 24	July 18
February 20	August 29
March 25	September 19
April 29	October 23
May 20	November 14
June 20	December 29

Corrections will be made to computer software so that the 1982 report will contain the complete date.

3. Water temperature data reported in the Dardanelle Reservoir - Illinois Bayou Embayment Survey (Appendix I, Tables 8-19) indicate differences greater than 15°F existed between the ANO intake (Station 16) and discharge canal (Station 1).

ANO Unit 1 has three thermal Limiting Conditions for Operation (ETS Section 2.1). One LCO limits the maximum change in temperature across the condenser. Under normal operating conditions with four circulating water pumps in operation, a maximum differential temperature of 15°F is permitted. If one or two circulating water pumps is inoperable, the maximum differential temperature across the condenser is limited to 30°F. These limits are monitored and maintained using hourly measurements from the condenser inlet and discharge canal RTD's.

One objective of the Dardanelle Reservoir Survey is to define the horizontal and vertical area of thermal influence by ANO on the temperature of the reservoir. Temperature data are not collected simultaneously and at the appropriate locations to determine the differential accurately. In fact, measurements at the areas of the intake and discharge are often made hours apart, so they can only be used for estimating differences between the two locations and thus are not intended to monitor compliance with the 15°F ΔT specification.

4. ANO Unit 1 Environmental Technical Specification (Section 4.1.1.a.6(b)) requires that data on "local fishing conditions" be collected monthly at each of the 18 sampling sites on Dardanelle Reservoir. These data are not presented in this report.

   From the date of Environmental Technical Specification issuance to about 1974, reporting of "local fishing conditions" as a "physical" water quality parameter was attempted. Little useful data was collected and reported, however, because of the subjective nature of the specification. Observations could not be quantified and trending from year to year was impossible. The implied objective of the specification was later interpreted to be that of monitoring the effect of ANO on the fishery resource of the reservoir. This monitoring effort was then incorporated into the Arkansas Tech University Fishery Research Project, which was implemented in 1974.

5. In the report on Thermal Impact Evaluation after a scheduled ANO Unit 1 shutdown, a change in temperature of greater than 10°F is reported on January 2, 1981.

   The discharge temperature at 2200 hours on January 2, 1981, was 48.13°F, not 58.13°F as reported. At no hourly interval was the rate of change greater than 5°F as specified in ETS Section 2.1.4.

6. The following paragraphs should be added to page 456:

During 1981 there were two brief periods (six samples analyzed) in which the iodine-131 dose equivalent activity in the reactor coolant exceeded 1.0 μCi/g. These "spikes" were of short duration as the primary demineralizers were able to reduce the iodine concentration to normal levels.

In accordance with ANO-2 Technical Specification 3.4.8, these events were reported as Licensee Events Reports (LER) 81-008 and 81-008 Rev. 1.

7. Minor typographical errors or omissions on pages 418, 425, 427, 446 and 448, and page 7 of Attachment 1 have been corrected and the pages attached.

8. The Table of Chemical Usage (page 451, attached) has been revised to include a "Total" column for comparison with Technical Specification limits given in Table 3.1.

9. Table 1 page 347 was inadvertently repeated on page 353.

10. On page 385 it is stated that, "ANO Unit 2 reached criticality in December 1978." This should be, "ANO Unit 2 reached criticality in September 1978."

11. On page 406 the sentence, "In comparison with 1980 data, no iodine-131 was detected in any milk samples collected in 1981." should read, "No iodine-131 was detected in any milk samples collected in 1981."

ENVIRONMENTAL RADIOLOGICAL MONITORING PROGRAM ANNUAL SUMMARY

Name of Facility ANO-1 and ANO-2 Docket No. 50-313 and 50-368
Location of Facility Pope, Arkansas Reporting Period Jan.-Dec., 1981
(County, State)

Medium or Pathway Sampled (Unit of Measurement)	Type and Total Number of Analyses Performed	Lower Limit of Detection (LLD)	All Indicator Locations Mean (f) Range	Location with Highest Annual Mean: Name, Distance and Direction	Mean (f)[b] Range	Control Locations Mean (f)[b] Range	Number of Nonroutine Reported Measurement
I. Air							
A. Particulate	103 Ru	10	30 (29/72) (19-41)	#3 South of H. Bennett Homesite (0.4 Miles 4°)	32 (4/12) (24-38)	34 (5/12) (24-46)	0
(pCi/m^3) (E-3)	137 Cs	10	4 (3/72) (3-4)	#4 Near the May Cemetery (0.4 Mile 171°)	4 (1/12)	4 (1/12)	0
	141 Ce	20	23 (28/72) (13-49)	#5 Ray Walters' residence in Knoxville, AR (8.5 Miles 298°)	28 (5/12) (19-49)	21 (5/12) (11-31)	
	144 Ce	20	44 (26/72) (8-82)	#3 South of H. Bennett Homesite (0.4 Mile 4°)	63 (3/12) (36-82)	58 (3/12) (44-69)	0

[b] Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses. (f)

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II. Water							
B. Bottom Sediments	Gamma 10						
	54 Mn	100	63 (3/8) (33/97)	#8 Mouth of Discharge Canal (0.1 Mile 180°)	65 (2/2) (33/97)	<LLD	0
	58 Co	80	198 (6/8) (51/654)	#8 Mouth of Discharge Canal (0.1 Mile 180°)	374 (2/2) (93/654)	12 (1/2)	0
(pCi/Kg) dry weight	60 Co	40	403 (8/8) (76/1184)	#8 Mouth of Discharge Canal (0.1 Mile 180°)	964 (2/2) (744/1184)	46 (2/2) (30/63)	0
	95 Nb	40	148 (5/8) (108/261)	#8 Mouth of Discharge Canal (0.1 Mile 180°)	261 (1/2)	95 (1/2)	0

[b] Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses. (f)

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II. Water							
B. Bottom Sediments	134 Cs	80	356 (8/8) (122/1143)	#8 Mouth of Discharge Canal (0.1 Mile 180°)	798 (2/2) (452/1143)	60 (2/2) (25/95)	0
	137 Cs	60	1750 (8/8) (531/4723)	#8 Mouth of Discharge Canal (0.1 Mile 180°)	3838 (2/2) (2954/4723)	242 (2/2) (82/403)	0
(pCi/Kg) dry weight (Cont.)	144 Ce	80	<LLD	-	<LLD	32 (1/2)	0
	95 Zr	40	<LLD	-	<LLD	18 (1/2)	0

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II. Water B. Bottom Sediments	89 Sr 5	0.5	10.3 (1/4)	#8 Mouth of Discharge Canal (0.1 Mile 180°)	10.3 (1/1)	<LLD	0
(pCi/g) dry weight	90 Sr 5	0.2	<LLD	-	<LLD	<LLD	0

[b] Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses. (f)

MILK ANIMAL SURVEY

APRIL 14-15, 1981

In accordance with Environmental Technical Specification 4.2.10, a survey was conducted April 14-15, 1981 to determine the location of animals which produce milk for human consumption. Milk-producing animals (milk cows) are divided into two categories defined as:

1. Class A Dairies - Dairies in which milk is intended primarily for human consumption as Grade A milk.
2. Individual Milk Cows - Family cows in which the milk is intended primarily for home use.

CLASS A DAIRIES

	Dairy	No. of Cows	Azimuth-Distance
1.	Ark. Tech Univ. Dairy	50	105° - 5.5
2.	Bill Harms Dairy	100	21° - 7.75
3.	J. Odom - R. Meyer Dairy	100	287° - 9.0
4.	R. A. Young Dairy (CONTROL)	100	74° - 12.0
5.	Harold Steuber	80	22° - 7.0
6.	Lawrence Steuber	70	358° - 7.5
7.	Buddy Boxnick	50	23° - 7.0
8.	Robberson Dairy	60	183° - 10.5

MILK ANIMAL SURVEY

AUGUST 13-14, 1981

In accordance with Environmental Technical Specification 4.2.10, a survey was conducted August 13-14, 1981 to determine the location of animals which produce milk for human consumption. Milk-producing animals (milk cows) are divided into two categories defined as:

1. Class A Dairies - Dairies in which milk is intended primarily for human consumption as Grade A milk.
2. Individual Milk Cows - Family cows in which the milk is intended primarily for home use.

CLASS A DAIRIES

	Dairy	No. of Cows	Azimuth-Distance
1.	Ark. Tech Univ. Dairy	50	105° - 5.5
2.	Bill Harms Dairy	100	21° - 7.75
3.	J. Odom - R. Meyer Dairy	100	287° - 9.0
4.	R. A. Young Dairy (CONTROL)	100	74° - 12.0
5.	Harold Steuber	80	22° - 7.0
6.	Lawrence Steuber	70	358° - 7.5
7.	Buddy Boxnick	60	23° - 7.0
8.	Robberson Dairy	80	183° - 10.5

1981 ANO CHEMICAL USAG
(Qty. Used lbs.)

Chemical (lbs)	Jan.	Feb.	March	April	May	June	July
Unit #1							
Sulf. Acid 66 Baume	1,540	16,845	46,448	77,454	50,854	47,728	42,225
Sodium Hydroxide 50%	798	30,389	64,576	54,953	85,259	75,617	102,447
Ammonium Hydroxide	561	0	5,984	7,689	8,976	5,984	5,236
Hydrazine 35%	1,800	0	1,350	2,250	4,050	1,350	3,600
Sodium Nitrite	100	0	50	100	75	150	225
Borax	10	20	40	25	25	30	20
Boron	1,479	114	3,374	229	343	229	1,030
Lithium Hydroxide	0	0	0	0	0	0	0
Unit #2							
Sulf. Acid 66 Baume	12,592	4,466	462	0	0	12,530	14,253
Cooling Tower Acid Sulf. Acid 66 Baume	359,636	309,544	196,709	0	0	5,442	240,108
Sodium Hydroxide 50%	15,954	5,698	796	0	0	22,107	22,576
Ammonium Hydroxide	0	0	0	0	0	0	0
Hydrazine 35%	3,600	2,250	4,500	450	0	2,250	3,600
Sodium Nitrite	300	200	50	200	75	150	300
Borax	40	30	10	25	25	20	10
Boron	114	1,659	1,544	686	1,030	3,432	858
Lithium Hydroxide	0	0	0	0	0.4	0	42
Cooling Tower							
Calgon (CL-246W)	9,101	7,070	5,269	0	0	2,874	7,348
Calgon (CL-2490)	0	0	0	0	0	0	0
Calgon (CL-95)	2,080	2,600	1,820	0	0	0	520
Calgon (CL-5)	2,020	1,820	260	0	0	520	780
Unit #1 & #2							
Chlorine	1,125	1,000	1,125	1,125	1,000	1,125	1,125
Detergents	447	225	126	255	32	32	172