

Nebraska Public Power District

COOPER NUCLEAR STATION

ANNUAL ENVIRONMENTAL OPERATING REPORT

Volume I - Nonradiological

USNRC Docket 50-298

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Section I

Technical Specification 2.0

ENVIRONMENTAL PROTECTION CONDITION

## 2.0 ENVIRONMENTAL PROTECTION CONDITION

Requirements of Section 2.3 (Chemical Analyses and Chemical Use Report) have been met as demonstrated by Table 1 and the following summary text.

### 2.3 Chemical Analyses and Chemical Use Report

#### Chemical Analyses

River water samples were collected by plant personnel and analyzed monthly from January through December 1982. The samples were collected at the intake structure and the discharge canal of Cooper Nuclear Station (CNS).

Analyses for turbidity, specific conductance, chlorine, copper, iron, potassium, sodium, and pH were conducted by plant personnel as specified in the CNS Environmental Technical Specifications (ETS). Turbidity and specific conductance at the discharge were within 10 percent of the inlet values and therefore did not exceed the ETS limitations. Total chlorine in the discharge canal did not exceed the ETS maximum concentration limit of 0.1 mg/l. The pH values ranged from a minimum of 7.7 to a maximum of 8.4. The pH was well within the ETS limitations of 6.5 to 9.0. The concentration of copper, iron, potassium, and sodium in the discharge canal does not indicate any substantial increase due to plant operation.

The limitations of the above-mentioned parameters were not exceeded; therefore, there has been no significant chemical effect on the Missouri River water due to station operation in 1982.



TABLE 1

## SEMIANNUAL BULK CHEMICAL USE REPORT

January 5, 1982 to July 15, 1982

CHEMICAL	PREVIOUS INVENTORY	RECEIVED	PRESENT INVENTORY	USED
Sulfuric Acid	7,450 gals	6,239 gals	1,600 gals	12,089 gals
Sodium Hydroxide	6,300 gals	9,808 gals	10,600 gals	5,508 gals
Bulk Lime	44,000 lbs	84,440 lbs	26,240 lbs	102,200 lbs
Calcium Hypochlorite	470 lbs	200 lbs	390 lbs	280 lbs
Alkameen	75 gals	0	65 gals	10 gals
Dearborn 253 AF	286 lbs	12 lbs*	293 lbs	5 lbs
Dearborn 521	47 gals	0	47 gals	0
Dearborn 713	79 gals	0	78 gals	1 gal
Dearborn 922	2 gals	0	2 gals	0
Nalcolyte 8103	190 gals	0	105 gals	85 gals
Sodium Sulfite	120 lbs	200 lbs	300 lbs	20 lbs
Sodium Nitrite	176 lbs	0	176 lbs	0
Dearborn Sludge-trol-600	23 gals	0	22 gals	1 gal

\*12 lbs received to adjust previous inventory to correct amount

TABLE 1 (CONT'D)

## SEMIANNUAL BULK CHEMICAL USE REPORT

July 15, 1982 to January 18, 1983

CHEMICAL	PREVIOUS INVENTORY	RECEIVED	PRESENT INVENTORY	USED
Sulfuric Acid	1,600 gals	6,521 gals	4,250 gals	3,871 gals
Sodium Hydroxide	10,600 gals	16,955 gals	4,600 gals	22,955 gals
Bulk Lime	26,240 lbs	120,520 lbs	62,000 lbs	84,760 lbs
Calcium Hypochlorite	390 lbs	300 lbs	535 lbs	155 lbs
Alkameen	65 gals	0 gal	65 gals	0 gal
Dearborn 253 AF	293 lbs	0 lbs	290 lbs	3 lbs
Dearborn 521	47 gals	0 gal	47 gals	0 gal
Dearborn 713	78 gals	0 gal	77.5 gals	0.5 gal
Dearborn 922	2 gals	0 gal	0 gal	2 gals
Nalcolyte 8103	105 gals	110 gals	145 gals	70 gals
Sodium Sulfite	300 lbs	0 gal	230 lbs	70 lbs
Sodium Nitrite	176 lbs	0 lbs	171 lbs	5 lbs
Dearborn Sludge-trol-600	22 gals	0 gal	21 gals	1 gal
Tri Sodium Phosphate	0 lb	100 lbs	50 lbs	50 lbs
Dearborn 66	0 lb	110 lbs	110 lbs	0 lb

Section II

Technical Specification 4.0

ENVIRONMENTAL SURVEILLANCE  
AND  
SPECIAL STUDIES

#### 4.0 ENVIRONMENTAL SURVEILLANCE AND SPECIAL STUDIES

Requirements of Cooper Nuclear Station ETS paragraph 4.1.1.2 (Plant Cooling Water Systems Fish Entrapment) have been met as demonstrated by Tables 1 through 4 and the following summary.

##### 4.1.1.2 Plant Cooling Water Systems Fish Entrapment Limits

Samples of fish impinged on the traveling screens were collected in accordance with the ETS. Sampling was conducted hourly at least twice per month with the July, August, and September collections being performed during hours of darkness.

During the 1982 impingement sampling (28 hourly periods), 621 fish representing 14 species were collected (Table 1). Monthly impingement rates ranged from an average of 0 (March) to 98.3 (October) fish per hour.

Predominant fishes impinged, in order of decreasing magnitude, included gizzard shad, freshwater drum, carp, river carpsucker, smallmouth buffalo, and white bass. These six species represented 96.6 percent of the total fish impinged. Game species including white bass, channel catfish, flathead catfish, white crappie, white perch, bluegill, and paddlefish comprised only 3.7 percent of the impinged fish. Species composition and relative abundance of fish impinged during the 1982 sampling were similar to those of previous years (Table 2), except for the white perch collected in August. This was the first time this species was collected at CNS.



Nineteen of the 28 impingement sampling periods were during periods of darkness (1900-0770 hours). The nocturnal impingement rate averaged 30.4 fish/hour while the diurnal impingement rate averaged 4.9 fish/hour during nine sample periods (Table 3).

The greatest rate of impingement at CNS during 1982 was 253 fish/hour and occurred on October 21, 1982. In accordance with ETS paragraph 4.1.1.2.B.4, the sampling frequency was increased to every other day until two consecutive samples each resulted in no more than 90 fish. Sampling on October 23 and 25, 1982, resulted in impingement rates of 80 and 48 fish/hour, respectively.

Fish impinged on the traveling screens at CNS are returned to the Missouri via a return pipe from the continuous wash system. During 1982, 40.6 percent of the impinged fish were classified as alive and active (Table 4) and can be assumed to have survived the impingement process.

Table 1. Monthly summary of fish impinged (total number) at Cooper Nuclear Station, January-December, 1982.

Taxon	Month												Total No.	Percent of Total
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.		
Smallmouth buffalo	-	-	-	-	-	-	-	-	-	8	-	4	12	1.9
Gizzard shad	-	-	-	-	4	-	6	34	63	315	18	33	473	76.2
Freshwater drum	-	-	-	2	-	-	2	3	-	54	-	5	66	10.6
Carp	2	-	-	5	1	2	7	-	-	10	-	1	28	4.5
River carpsucker	-	-	-	-	-	-	-	9	3	1	-	-	13	2.1
White bass	1	-	-	4	-	-	-	-	-	3	-	-	8	1.3
White crappie	-	-	-	-	-	-	-	-	-	1	-	-	1	0.2
White perch	-	-	-	-	-	-	-	1	-	-	-	-	1	0.2
Goldeye	-	-	-	-	-	-	3	-	-	-	-	1	4	0.6
Bluegill	-	-	-	-	1	-	-	-	-	-	-	-	1	0.2
Shortnose gar	-	-	-	1	-	-	-	-	-	-	-	1	2	0.3
Unidentifiable	-	-	-	-	-	-	-	-	-	1	-	-	1	0.2
Paddlefish	-	-	-	1	-	-	-	-	-	-	-	-	1	0.2
Channel catfish	-	3	-	-	-	-	-	-	2	-	-	-	5	0.8
Flathead catfish	-	2	-	-	-	-	-	-	-	-	-	3	5	0.8
TOTAL	3	5	0	13	6	2	18	47	68	393	18	48	621	
No. of Hourly Collections	2	2	2	2	2	2	3	2	2	4	2	3	28	
Mean No./Hr.	1.5	2.5	0.0	6.5	3.0	1.0	6.0	23.5	34.0	98.3	9.0	16.0	22.2	

Table 2. Summary of the relative abundance (%) of fish impinged at Cooper Nuclear Station, 1974-82.

Taxon	Year								
	1974	1975	1976	1977	1978	1979	1980	1981	1982
Shovelnose sturgeon	<0.1	-	0.1	0.2	-	0.4	-	-	-
Paddlefish	<0.1	0.5	0.1	0.7	-	-	-	-	0.2
Longnose gar	<0.1	-	-	0.1	-	-	0.4	-	-
Shortnose gar	0.6	0.4	0.1	0.4	-	-	0.8	0.6	0.3
Unidentified gar	0.1	-	0.1	0.3	-	0.4	-	-	-
Gizzard shad	56.4	32.7	56.1	41.2	47.0	63.7	35.8	70.7	76.2
Goldeye	0.6	1.3	2.8	3.8	1.1	0.7	3.5	3.3	0.6
Carp	2.1	4.4	2.5	4.6	6.4	10.7	3.5	4.8	4.5
Unidentified minnows	0.9	6.2	3.0	2.6	10.9	0.7	4.3	0.6	-
River carpsucker	3.3	26.0	10.2	22.3	0.8	1.9	3.5	6.9	2.1
White sucker	-	-	0.2	-	-	-	-	-	-
Blue sucker	-	-	0.4	-	-	-	0.4	-	-
Bigmouth buffalo	-	1.6	0.4	0.8	0.4	1.1	0.4	0.6	-
Smallmouth buffalo	1.4	0.5	0.3	0.8	-	0.4	-	0.3	1.9
Unidentified buffalo	-	-	0.4	0.1	-	-	-	-	-
Unidentified suckers	-	-	-	0.2	-	-	-	-	-
Black bullhead	<0.1	0.5	0.1	0.1	0.8	1.1	0.4	-	-
Unidentified bullhead	<0.1	1.5	-	0.3	-	-	-	-	-
Channel catfish	0.4	1.6	2.2	1.1	1.9	0.4	2.3	-	0.8
Flathead catfish	0.4	1.9	0.8	1.2	0.4	1.9	1.2	-	0.8
Unidentified catfish	-	-	0.2	-	1.5	2.2	1.2	0.9	-
White bass	1.4	1.6	1.7	1.5	0.8	-	3.9	0.3	1.3
Green sunfish	-	0.1	-	-	-	-	-	-	-
Bluegill	0.4	0.5	0.8	0.5	0.4	-	0.4	0.3	0.2
Smallmouth bass	-	-	-	0.1	-	-	-	-	-
Largemouth bass	0.1	0.1	0.5	0.2	0.8	-	-	-	-
Crappie ( <i>Pomoxis</i> spp.)	0.4	0.9	2.2	0.3	1.1	-	2.7	0.3	0.2
Unidentified sunfish	-	-	0.4	-	0.4	0.4	-	-	-
Sauger	<0.1	0.9	0.5	1.7	0.4	-	0.4	0.3	-
Freshwater drum	21.2	16.3	14.1	15.0	25.2	14.1	34.6	10.1	10.6
Unidentified	-	-	-	0.1	-	-	-	-	0.2
White Perch	-	-	-	-	-	-	-	-	0.2

Table 3. Number of fish impinged per hour during diurnal and nocturnal sampling periods at Cooper Nuclear Station, January-December 1982.

Month	Diurnal (0700-1900 hr.)			Nocturnal (1900-0700 hr.)		
	No. of Sample Periods (Hr.)	No. of Fish	No./Hr.	No. of Sample Periods (Hr.)	No. of Fish	No./Hr.
January	1	2	2.0	1	1	1.0
February	1	2	2.0	1	3	3.0
March	1	0	0.0	1	0	0.0
April	0	-	-	2	13	6.5
May	1	3	3.0	1	3	3.0
June	2	2	1.0	0	-	-
July	0	-	-	3	18	6.0
August	0	-	-	2	47	23.5
September	0	-	-	2	68	39.0
October	1	12	12.0	3	381	127.0
November	1	2	2.0	1	16	16.0
December	1	21	21.0	2	27	13.5
TOTAL	9	44		19	577	
Mean No./Hr.			4.9			30.4



Table 4. Summary of the physical condition of fish impinged at the intake structure at Cooper Nuclear Station, January-December 1982.

Species	Alive and Active		Alive and Inactive		Dead With No Physical Damage		Dead With Physical Damage	
	No.	%	No.	%	No.	%	No.	%
Smallmouth buffalo	-	-	2	16.7	6	50.0	4	33.3
Gizzard shad	178	37.6	240	50.7	34	7.2	21	4.4
Freshwater drum	21	31.8	27	40.9	15	22.7	3	4.5
Carp	21	75.0	3	10.7	1	3.6	3	10.7
River carpsucker	12	92.3	1	7.7	-	-	-	-
White bass	7	87.5	1	12.5	-	-	-	-
White crappie	-	-	1	100.0	-	-	-	-
White perch	1	100.0	-	-	-	-	-	-
Goldeye	2	50.0	1	25.0	-	-	1	25.0
Bluegill	1	100.0	-	-	-	-	-	-
Shortnose gar	2	100.0	-	-	-	-	-	-
Paddlefish	1	100.0	-	-	-	-	-	-
Channel catfish	4	80.0	1	20.0	-	-	-	-
Flathead catfish	2	40.0	3	60.0	-	-	-	-
Unidentifiable	-	-	-	-	-	-	1	100.0
TOTAL	252	40.6	280	45.1	56	9.0	33	5.3