

THREE MILE ISLAND AQUATIC STUDY
MONTHLY REPORT FOR JULY 1985

Prepared for

GPU Nuclear Corporation
P. O. Box 480
Route 441 South
Middletown, Pennsylvania 17057

Prepared by

EA Engineering, Science and Technology, Inc.
Hunt Valley/Loveton Center
15 Loveton Circle
Sparks, Maryland 21152

AUGUST 1985

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INTRODUCTION

The objective of this monthly report is to document compliance with the nonradiological (aquatic) environmental monitoring programs specified in Sections 3.1.1.a(4), 3.1.2.a., and 4.6.1 of the Environmental Technical Specifications (ETS). These programs have been carried out as directed in the Environmental Controls Aquatic Sampling Manual. Program elements being conducted under contract to GPU Nuclear Corporation include benthic macroinvertebrates, ichthyoplankton, fish population dynamics (seine and electrofishing), creel surveys, and water quality. The ultimate purpose of these studies is to obtain a database sufficient to establish the natural fluctuations within the ecosystem and identify any significant biological alterations resulting from the TMINS.

Compliance with all programs specified in the ETS and detailed in the Aquatic Sampling Manual was achieved in July (Table 1). Ichthyoplankton sampling originally scheduled for 2 July was conducted on 1 July, allowing for availability of EA technicians for said sampling. All other field sample dates during July followed the prescribed 1985 "TMINS Aquatic Sampling Schedule" proposed by EA during March. Details are provided in the following pages wherein progress is described for each program.

Data presented in this report are considered provisional, pending subsequent proofing, analysis, and presentation in the annual report.

Water Quality Analysis

Objective: To measure select physical and chemical parameters of the Susquehanna River in the vicinity of Three Mile Island Nuclear Station (TMINS) concurrent with General Ecological Survey samples.

Progress: Water quality samples were collected on 16 July 1985 and forwarded to TMI-EC (Table 1). Select water quality parameters were also measured at sampling times and locations of the General Ecological Survey.

Benthic Macroinvertebrates

Objective: To assess the abundance, distribution, and diversity of benthic macroinvertebrates at three stations in the vicinity of TMINS.

Progress: Benthos sampling on 16 July 1985 consisted of replicate (4) samples taken at each of the three benthos stations (Table 1). Laboratory sorting of benthos collected during May was also completed.

Ichthyoplankton

Objective: To determine species composition, relative abundance, density, seasonal and spatial distribution of ichthyoplankton at eight stations in the vicinity of TMINS.

Progress: Replicate (2) ichthyoplankton samples were taken at each of the eight sampling stations on 1, 10, 17, 24 and 30 July (Table 1). Laboratory sorting of ichthyoplankton collected on 8 April, 15 April, 20 May and 5 June was also completed.

Seine

Objective: To assess species composition, relative abundance, seasonal and spatial distribution, condition factor, occurrence of parasites, anomalies and fish kills, and species diversity of fishes vulnerable to seine capture at six stations in the vicinity of TMINS.

Progress: Seine collections were taken at each of the six sampling stations on 9 July 1985 (Table 1).

Electrofishing

Objective: To assess species composition, relative abundance, occurrence of parasites, anomalies, and species diversity of fishes vulnerable to electrofisher capture at six stations in the vicinity of TMINS.

Progress: Electrofishing at the six stations was completed on 18 July 1985 (Table 1). Samples consisted of 126 fish of 13 species (Table 2). More fish (56 specimens) were collected at Station 10B3 than at any other station, however, most species (9 species) were taken at Station 10A3. Collectively, centrarchids were most abundant with redbreast sunfish, bluegill, and pumpkinseed dominating the catch. The redbreast sunfish accounted for 40% of the total catch. Ectoparasites observed on fishes taken by electrofishing during July included: leeches on 4 redbreast sunfish and 1 largemouth bass; anchor worms (*Lernaea*) on 1 spottail shiner, 1 redbreast sunfish, 2 pumpkinseed, and 2 bluegill; and cysts on 1 redbreast sunfish. Wounds related to angling (e.g., mouth fungus, eye injuries, etc.) were seen on 1 pumpkinseed, 2 smallmouth bass, and 1 largemouth bass. Lesions (of undetermined origin) were seen on one bluegill specimen and fin-rot afflicted 1 channel catfish, 1 redbreast sunfish, 1 bluegill, and one black crappie.

Creel Survey

Objective: To investigate the extent of success of sport-fishing, and determine angler residence and use of catch, in the Susquehanna River near TMINS.

Progress: Creel surveys were completed on 13, 15, 26 and 28 July 1985 (Table 1). Interviews consisted of 217 anglers who reportedly fished 396.49 hours, caught 328 fish, and harvested 58 fish (18% of the catch)(Tables 3 through 6). The average catch per effort (c/e) and harvest per effort (h/e) was 0.83 and 0.15 per hour, respectively. Channel catfish (107 specimens) and smallmouth bass (92 specimens) were the predominant species caught by anglers, while redbreast sunfish (21 specimens) dominated angler harvest. Most anglers (102) and most hours fished (176.42) were recorded at the General Reservoir. However, the most fish caught (140) and most fish harvested (35) were recorded at the York Haven Generating Station. The highest c/e (2.76) was recorded at the West Dam. Anglers interviewed were predominately residents of York or Dauphin counties, and the majority indicated that they eat at least a portion of their catch.

TABLE 1 AQUATIC SAMPLING CONDUCTED DURING JULY 1985 IN
COMPLIANCE WITH THREE MILE ISLAND NUCLEAR STATION
ENVIRONMENTAL TECHNICAL SPECIFICATIONS

Discipline	JULY 1-6	JULY 7-13	JULY 14-20	JULY 21-27	JULY 28-31
Water Quality Analysis			X		
Benthic Macro- invertebrates			X		
Ichthyoplankton	X	X	X	X	X
Seine		X			
Electrofishing			X		
Creel Survey		X	X	X	X

TABLE 2 FISHES CAPTURED BY AC ELECTROFISHER ON 18 JULY 1985 NEAR TMINS

Zone	TM-AQF -4A1	TM-AQF -13A1	TM-AQF -10A3	TM-AQF -9B5	TM-AQF -10B3	TM-AQF -11B1	TOTAL
Time	2332	0010	0040	0115	2238	2202	
Duration (min)	18	15	16	16	18	20	
Air Temp (C)	20.0	20.0	20.0	19.5	23.0	23.0	
Water Temp (C)	27.0	29.0	28.0	28.0	28.0	27.0	
Dissolved Oxygen (mg/l)	13.0	10.8	10.0	10.6	9.6	11.1	
pH	7.7	7.8	7.8	7.7	7.5	8.1	
Conductivity (micromhos/cm)	400	410	425	440	275	325	
Secchi Disc (cm)	38.1	53.3	45.7	38.1	71.1	58.4	
Volts	180	175	175	175	180	180	
Amps	11.0	10.0	10.0	10.0	7.0	7.0	
Common carp	1	-	2	-	-	3	6
Spottail shiner	-	-	-	-	1	-	1
Quillback	1	3	2	7	-	-	13
Channel catfish	-	-	-	-	2	-	2
Rock bass	-	-	4	-	-	-	4
Redbreast sunfish	1	8	14	-	27	1	51
Pumpkinseed	2	2	2	-	6	2	14
Bluegill	-	-	2	2	15	-	19
Smallmouth bass	2	3	1	-	2	-	8
Largemouth bass	-	-	-	-	-	2	2
White crappie	-	-	-	1	-	-	1
Black crappie	-	-	1	-	2	-	3
Walleye	-	-	1	-	1	-	2
Total Specimens	7	16	29	10	56	8	126
Total Species	5	4	9	3	8	4	13

TABLE 3. CREEL SURVEY DATA FROM THE GENERAL RESERVOIR (GR) FOR EACH SURVEY DAY IN JULY 1985

TABLE 3. CREEK SURVEY DATA FROM THE 1980s													
Day	13 Sat			15 Mon			26 Fri			28 Sun			
Weather	Haze			Overcast;Haze; Haze			Overcast;Overcast Thunderstorms			Partly Cloudy			
River Stage (m)	1.10			1.15			1.05			1.07			
Air Temp (C)	28.0	31.0	31.0	25.5	31.5	31.0	25.0	29.5	29.0	28.5	31.0	30.0	
Water Temp (C)	27.5	30.0	29.0	28.0	29.0	29.5	26.0	27.5	27.0	27.5	27.5	28.0	
Times:													
a) morning (0900-1300)	a			a			a			a			
b) afternoon (1301-1700)		b			b			b			b		
c) evening (1701-2100)			c			c			c			c	
Total Per Time Period:													TOTAL
Anglers	25	7	2	6	7	9	-	4	-	17	16	9	102
Fish Caught	30	4	1	6	1	9	-	1	-	18	5	10	85
Fish Kept	6	-	1	1	1	6	-	-	-	-	-	-	15
Hours Fished	65.25	17.50	6.00	12.50	2.50	11.67	-	3.50	-	35.00	12.01	10.49	176.42
Catch/Effort (h)	0.46	0.23	0.17	0.48	0.40	0.77	-	0.29	-	0.51	0.42	0.95	0.48
Day Totals:													
Anglers	34			22			4			42			
Fish Caught	35			16			1			11			
Fish Kept	7			8			-			-			
Hours Fished	88.75			26.67			3.50			57.50			
Catch/Effort (h)	0.39			0.60			0.29			0.57			
Species:													
Common carp	-	-	-	-	-	-	-	-	-	-	2R	-	- 2R 2
Channel catfish	4R	1R	-	4R	-	1K2R	-	-	-	6R	-	2R	1K 19R 20
Rock bass	3R	-	-	-	1K	1K	-	-	-	-	2R	2R	2K 7R 9
Redbreast sunfish	-	-	-	-	-	2K	-	-	-	-	-	-	2K - 2
Bluegill	-	-	-	1R	-	-	-	-	-	-	-	-	- 1R 1
Sunfishes (Lepomis spp.) ¹	-	1R	-	-	-	-	-	-	-	4R	1R	5R	- 11R 11
Smallmouth bass	6K17R	1R	1K	1K	-	1K1R	-	1R	-	8R	-	1R	9K 29R 38
Crappies (Pomoxis spp.) ¹	-	-	-	-	-	1K	-	-	-	-	-	-	1K - 1
Yellow perch	-	1R	-	-	-	-	-	-	-	-	-	-	- 1R 1

¹ General Identification

K Kept

R Released

TABLE 4. CREFL SURVEY DATA FROM THE WEST DAM (WD) FOR EACH SURVEY DAY IN JULY 1985

Day	13 Sat			15 Mon			26 Fri			28 Sun			
Weather	Haze			Overcast; Haze			Overcast; Overcast Thunderstorms			Partly Cloudy			
River Stage (m)	1.10			1.15			1.05			1.07			
Air Temp (C)	29.5	30.0	31.5	27.0	32.0	31.0	26.0	28.5	27.5	29.0	29.0	28.5	
Water Temp (C)	28.0	28.0	28.5	27.5	28.5	29.0	25.5	27.0	27.0	26.0	27.5	28.0	
Times:													
a) morning (0900-1300)	a			a			a			a			
b) afternoon (1301-1700)		b			b			b			b		
c) evening (1701-2100)			c			c			c			c	
Total Per Time Period:													TOTAL
Anglers	-	2	3	-	-	-	-	-	-	8	6	-	19
Fish Caught	-	28	1	-	-	-	-	-	-	57	8	-	94
Fish Kept	-	7	-	-	-	-	-	-	-	1	-	-	8
Hours Fished	-	4.00	5.25	-	-	-	-	-	-	18.00	6.75	-	34.00
Catch/Effort (h)	-	7.00	0.19	-	-	-	-	-	-	3.17	1.18	-	2.76
Day Totals:													
Anglers		5									14		
Fish Caught		29									65		
Fish Kept		7									1		
Hours Fished		9.25									24.75		
Catch/Effort (h)		3.14									2.63		
Species:													
Common carp	-	1R	-	-	-	-	-	-	-	-	-	-	1R 1
Suckers (Catostomidae)1	-	-	-	-	-	-	-	-	-	-	-	-	1R 1
Channel catfish	-	3K13R	-	-	-	-	-	-	-	13R	3R	-	29R 32
Rock bass	-	1R	1R	-	-	-	-	-	-	2R	-	-	4R 4
Redbreast sunfish	-	4K	-	-	-	-	-	-	-	-	-	-	4K 4
Sunfishes (Lepomis spp.)1	-	6R	-	-	-	-	-	-	-	14R	-	-	20R 20
Smallmouth bass	-	-	-	-	-	-	-	-	-	1K24R	5R	-	1K 29R 30
Yellow perch	-	-	-	-	-	-	-	-	-	1R	-	-	1R 1
Walleye	-	-	-	-	-	-	-	-	-	1R	-	-	1R 1

1 General Identification

K Kept

R Released

TABLE 5. CREEL SURVEY DATA FROM THE EAST DAM (ED) FOR EACH SURVEY DAY IN JULY 1985

Day Weather	13 Sat Haze			15 Mon Haze			26 Fri Overcast;Overcast Thunderstorms			28 Sun Partly Cloudy		
River Stage (m)	1.10			1.15			1.05			1.07		
Air Temp (C)	30.0	29.0	32.5	26.0	32.0	32.0	26.0	30.0	28.5	26.0	30.5	31.0
Water Temp (C)	28.0	30.0	28.5	27.0	28.0	28.0	25.5	26.5	26.5	26.5	29.0	28.5
Times:												
a) morning (0900-1300)	a			a			a			a		
b) afternoon (1301-1700)		b			b			b			b	
c) evening (1701-2100)			c			c			c			c
Total Per Time Period:	TOTAL											
Anglers	1	-	5	-	-	1	-	-	-	-	-	-
Fish Caught	1	-	7	-	-	1	-	-	-	-	-	-
Fish Kept	-	-	-	-	-	-	-	-	-	-	-	-
Hours Fished	0.17	-	20.00	-	-	1.50	-	-	-	-	-	-
Catch/Effort (h)	5.88	-	0.35	-	-	0.67	-	-	-	-	-	-
Day Totals:												
Anglers	6			1			-			-		
Fish Caught	8			1			-			-		
Fish Kept	-			-			-			-		
Hours Fished	20.17			1.50			-			-		
Catch/Effort (h)	0.40			0.67			-			-		
Species:												
Channel catfish	-	-	4R	-	-	-	-	-	-	-	-	-
Sunfishes (<i>Lepomis</i> spp.) ¹	-	-	-	-	-	1R	-	-	-	-	-	-
Smallmouth bass	1R	-	3R	-	-	-	-	-	-	-	-	-

1 General Identification

K Kept

R Released

TABLE 6. CREEL SURVEY DATA FROM THE YORE HAVEN GENERATING STATION (YHGS) FOR EACH SURVEY DAY IN JULY 1985

Day	13 Sat			15 Mon			26 Fri			28 Sun			
Weather	Haze			Haze			Overcast;Overcast Thunderstorms			Partly Cloudy;Partly Cloudy Clear			
River Stage (m)	1.10			1.15			1.05			1.07			
Air Temp (C)	30.0	31.5	30.5	29.5	32.0	30.0	27.0	30.0	26.0	27.5	30.6	26.5	
Water Temp (C)	29.0	30.5	29.0	28.0	30.0	29.5	27.0	29.0	27.5	24.5	26.0	26.0	
Times:													
a) morning (0900-1300)	a			a			a			a			
b) afternoon (1301-1700)		b			b			b			b		
c) evening (1701-2100)			c			c			c			c	
Total Per Time Period:													TOTAL
Anglers	8	19	16	6	5	5	1	1	1	12	7	8	89
Fish Caught	14	23	16	5	6	14	-	2	5	29	7	19	140
Fish Kept	-	3	4	5	-	1	-	-	-	19	-	3	35
Hours Fished	11.67	44.66	22.00	7.99	7.41	9.50	0.50	1.00	1.00	30.75	9.92	16.00	164.40
Catch/Effort (h)	1.20	0.52	0.73	0.62	0.81	1.47	0.00	2.00	1.67	0.94	0.70	1.19	0.85
Day Totals:													
Anglers	43			16			3			27			
Fish Caught	53			25			7			55			
Fish Kept	7			6			-			22			
Hours Fished	78.33			24.90			4.50			56.67			
Catch/Effort (h)	0.68			1.00			1.56			0.97			
Species:													
Muskellunge	-	-	-	-	-	-	-	-	-	1K	-	-	1K - 1
Common carp	-	2R	1K10R	-	-	12R	-	2R	5R	8R	5R	-	1K 44R 45
Channel catfish	9R	1K13R	1K1R	4K	1R	1R	-	-	-	2K1R	2R	2K13R	10K 41R 51
Redbreast sunfish	-	-	2K	1K	-	-	-	-	-	12K	-	-	15K - 15
Bluegill	-	-	-	-	-	-	-	-	-	1K	-	-	1K - 1
Sunfishes (Lepomis spp.) ¹	-	1R	-	-	1R	1K	-	-	-	-	-	-	1K 2R 3
Smallmouth bass	5R	4R	-	-	4R	-	-	-	-	3K1R	-	3R	3K 17R 20
Walleye	-	2K	1R	-	-	-	-	-	-	-	-	1K	3K 1R 4

¹ General Identification

K Kept

R Released