

THREE MILE ISLAND AQUATIC STUDY
MONTHLY REPORT FOR NOVEMBER 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

DECEMBER 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 November (Table 1). Creel surveys originally scheduled for 2 and 19 November on the proposed TMINS Aquatic Sampling Schedule were rescheduled and subsequently conducted on 16 and 26 November, respectively. Creel surveys at the General Reservoir, West Dam, and East Dam (during the 1701-2100h period) were not conducted due to darkness. The 1701-2100h York Haven Generating Station creel survey was not conducted due to darkness on 16, 22, and 26 November.

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 12 November 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 12 November 1985 consisted of replicate (4) samples taken at each of the three benthos stations (Table 1). Laboratory identification of chironomids collected on 16 April, 14 May, and 11 June were 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: Ichthyoplankton field sampling for the 1985 season was completed with the 28 August collection. Laboratory identification/tabulation of all ichthyoplankton collected on 1, 8, 15, 22, and 29 April and 6 May were 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 5 November 1985 (Table 1). Fishes collected from Stations 4A2 and 10A2 on 24 April were identified and processed.

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 7 November 1985 (Table 1). Samples consisted of 232 fish of 18 species (Table 2). More fish (70 specimens) were collected at Station 13A1 than at any other station. The greatest variety of species (11) was found at Station 4A1. Redbreast sunfish was the predominant species captured in November. Ectoparasites observed on fishes taken by electrofisher during November included: leeches on 1 channel catfish and 1 redbreast sunfish; glochidia on 1 redbreast sunfish and 1 bluegill. Fin rot was observed and inflicted 1 green sunfish. Wounds related to angling (e.g., mouth fungus, eye injuries, etc.) were seen on 1 channel catfish, 1 redbreast sunfish, and 3 smallmouth bass.

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 conducted on 10, 16, 22, and 26 November 1985 (Table 1). Interviews consisted of 72 anglers who reportedly fished 129.75 hours, caught 188 fish, and harvested 93 fish (49% of the total catch) (Tables 3 through 6). The average catch per effort (c/e) and harvest per effort (h/e) was 1.45 and 0.72 per hour, respectively. Smallmouth bass was the predominant species caught (91 specimens) and harvested (39 specimens) by anglers. Most anglers (44), most fish caught (132), most fish harvested (61) and most hours fished (95.50) were recorded at the General Reservoir. The highest c/e (2.00) was recorded at the York Haven Generating Station. 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 NOVEMBER 1985
IN COMPLIANCE WITH THREE MILE ISLAND NUCLEAR
STATION ENVIRONMENTAL TECHNICAL SPECIFICATIONS

<u>Discipline</u>	<u>November</u>				
	<u>1-2</u>	<u>3-9</u>	<u>10-16</u>	<u>17-23</u>	<u>24-30</u>
Water Quality Analysis			X		
Benthic Macroinvertebrates			X		
Ichthyoplankton(a)					
Seine		X			
Electrofishing		X			
Oriel Survey			XX	X	X

(a) Sampling (for 1985) completed on 28 August 1985.

TABLE 2 FISHES CAPTURED BY AC ELECTROFISHER ON 7 NOVEMBER 1985 NEAR TMINS

Zone	TM-AQF -4A1	TM-AQF -13A1	TM-AQF -10A3	TM-AQF -9B5	TM-AQF -10B3	TM-AQF -11B1	TOTAL
Time	1958	2022	2133	2216	1907	1826	
Duration (min)	18	20	19	13	18	17	
Air Temp (C)	11.9	12.1	11.7	11.3	11.7	13.5	
Water Temp (C)	11.8	11.9	12.2	11.8	12.0	11.8	
Dissolved Oxygen (mg/L)	12.9	12.0	11.8	11.7	12.8	9.3	
pH	8.1	7.7	7.8	7.6	7.8	7.6	
Conductivity (micromhos/cm)	316	321	349	316	288	253	
Secchi Disc (cm)	124.5	121.9	96.5	121.9	121.9	58.4	
Volts	175	168	170	170	175	175	
Amps	7.5	7.0	7.5	7.0	7.0	7.0	
Gizzard shad	8	18	15	6	1	3	51
Common carp	-	1	2	-	1	2	6
Golden shiner	-	-	-	-	-	2	2
Spottail shiner	-	-	1	-	1	-	2
Quillback	-	1	8	2	3	8	22
White sucker	1	-	-	-	-	1	2
Shorthead redhorse	-	1	-	-	3	-	4
Channel catfish	1	-	1	-	-	-	2
Rock bass	1	5	1	-	-	-	7
Redbreast sunfish	1	32	29	1	4	1	68
Green sunfish	-	1	-	-	-	-	1
Pumpkinseed	6	3	-	-	-	20	29
Bluegill	1	-	-	-	-	6	7
Smallmouth bass	2	7	2	-	1	-	12
Largemouth bass	3	1	-	-	-	-	4
White crappie	1	-	-	-	-	-	1
Black crappie	2	-	-	-	2	2	6
Walleye	-	-	3	1	2	-	6
Total Specimens	27	70	62	10	18	45	232
Total Species	11	10	9	4	9	9	18

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

Day	10 SUN		16 Sat		22 Fri		26 Tue	
Weather	Partly Cloudy		Light Rain		Heavy Rain;Light Rain		Overcast	
River Stage (m)	1.28		1.67		1.99		1.64	
Air Temp (C)	18.5	21.5	3.5	4.0	2.0	2.0	5.0	4.0
Water Temp (C)	11.0	12.0	9.0	8.5	8.0	8.0	6.0	5.5
Times:								
a) morning (0900-1300)	a		a		a		a	
b) afternoon (1301-1700)		b		b		b		b
c) evening (1701-2100)			c1		c1		c1	
Total Per Time Period:								
Anglers	10	31	3	-	-	-	-	-
Fish Caught	41	89	2	-	-	-	-	-
Fish Kept	14	47	-	-	-	-	-	-
Hours Fished	23.50	67.50	4.50	-	-	-	-	-
Catch/Effort (h)	1.74	1.32	0.44	-	-	-	-	-
Day Totals:								
Anglers		41		3		-		-
Fish Caught		130		2		-		-
Fish Kept		61		-		-		-
Hours Fished		91.00		4.50		-		-
Catch/Effort (h)		1.43		0.44		-		-
Species:								
Channel catfish	1R	1R	-	-	-	-	-	-
Rock bass	5R	1R	-	-	-	-	-	-
Sunfishes (<i>Lepomis</i> spp.) ²	2R	22K2R	-	-	-	-	-	-
Smallmouth bass	12K14R	24K38R	-	-	-	-	-	-
Largemouth bass	2K2R	-	-	-	-	-	-	-
Crappies (<i>Pomoxis</i> spp.) ²	3R	1K	2R	-	-	-	-	-

1 Survey not conducted due to darkness

2 General identification

K Kept

R Released

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

Day	10 Sun	16 Sat	22 Fri	26 Tue
Weather	Partly Cloudy	Light Rain	Heavy Rain; Light Rain	Overcast; Light Rain
River Stage (m)	1.28	1.67	1.99	1.64
Air Temp (C)	18.5	2.5	1.0	5.0
Water Temp (C)	11.0	8.5	6.5	5.5
Times:				
a) morning (0900-1300)	a	a	a	a
b) afternoon (1301-1700)	b	b	b	b
c) evening (1701-2100)	c1	c1	c1	c1
Total Per Time Period:				TOTAL
Anglers	2	-	-	2
Fish Caught	4	-	-	4
Fish Kept	2	-	-	2
Hours Fished	4.00	-	-	4.00
Catch/Effort (h)	1.00	-	-	1.00
Day Totals:				
Anglers	2	-	-	-
Fish Caught	4	-	-	-
Fish Kept	2	-	-	-
Hours Fished	4.00	-	-	-
Catch/Effort (h)	1.00	-	-	-
Species:				
Smallmouth bass	2K	-	-	2K
Walleye	2R	-	-	2R

1 Survey not conducted due to darkness

K Kept

R Released

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

Day	10 Sun	16 Sat	22 Fri	26 Tue
Weather	Partly Cloudy	Light Rain	Heavy Rain; Overcast	Overcast; Light Rain
River Stage (m)	1.28	1.67	1.99	1.64
Air Temp (C)	21.0	2.0	1.0	4.0
Water Temp (C)	12.5	8.5	6.5	5.5
Times:				
a) morning (0900-1300)	a	a	a	a
b) afternoon (1301-1700)	b	b	b	b
c) evening (1701-2100)	c1	c1	c1	c1
Total Per Time Period:				TOTAL
Anglers	3	-	-	5
Fish Caught	6	-	-	8
Fish Kept	-	-	-	2
Hours Fished	6.00	-	-	8.25
Catch/Effort (h)	1.00	-	-	0.97
Day Totals:				
Anglers	3	-	-	2
Fish Caught	6	-	-	2
Fish Kept	-	-	-	2
Hours Fished	6.00	-	-	2.25
Catch/Effort (h)	1.00	-	-	0.89
Species:				
Rock bass	3R	-	-	3R
Crappies (Pomoxis spp.) ²	3R	-	-	3R
Walleye	-	-	-	2R

1 Survey not conducted due to darkness

2 General identification

R Kept

R Released

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

Day	10 Sun			16 Sat		22 Sun		26 Tue		
Weather	Partly Cloudy			Light Rain		Heavy Rain; Light Rain		Light Rain		
River Stage (m)	1.28			1.67		1.99		1.64		
Air Temp (C)	22.5	22.0	21.0	3.5	4.5	5.0	3.5	5.5	5.0	
Water Temp (C)	13.0	12.5	12.5	9.0	8.5	8.5	8.0	6.0	6.0	
Times:										
a) morning (0900-1300)	a			a		a		a		
b) afternoon (1301-1700)		b			b		b		b	
c) evening (1701-2100)			c		c1		c1			c1
Total Per Time Period:										
Anglers	1	7	10	1	2	-	-	-	-	TOTAL
Fish Caught	-	38	5	-	1	-	-	-	-	21
Fish Kept	-	25	2	-	1	-	-	-	-	44
Hours Fished	0.25	9.25	7.50	1.00	4.00	-	-	-	-	28
Catch/Effort (h)	0.00	4.11	0.67	0.00	0.25	-	-	-	-	22.00
										2.00
Day Totals:										
Anglers		18			3		-		-	
Fish Caught		43			1		-		-	
Fish Kept		27			1		-		-	
Hours Fished		17.00			5.00		-		-	
Catch/Effort (h)		2.53			0.20		-		-	
Species:										
Rock bass	-	2K13R	1K2R	-	1K	-	-	-	-	4K 15R 19
Bluegill	-	1K	-	-	-	-	-	-	-	1K - 1
Smallmouth bass	-	1K	-	-	-	-	-	-	-	1K - 1
Black crappie	-	11K	1K1R	-	-	-	-	-	-	12K 1R 13
Crappies (<i>Pomoxis</i> spp.) ²	-	10K	-	-	-	-	-	-	-	10K - 10

1 Survey not conducted due to darkness

2 General identification

K Kept

R Released