Southern Nuclear
Operating Company, Inc.
40 Inverness Center Parkway
Post Office Box 1295
Birmingham, Alabama 35201-1295

Tel 205.992.5000

January 6, 2012

SOUTHERN COMPANY

Docket Nos.: 50-348
50-364

NL-11-2560

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555-0001

Joseph M. Farley Nuclear Plant
NPDES Permit Renewal

Ladies and Gentlemen:

In accordance with the Environmental Protection Plan, Appendix B to Facility Operating License Numbers NPF-2 and NPF-8, Section 3.2, Southern Nuclear Operating Company hereby submits for your information a copy of the renewal application for National Pollutant Discharge Elimination System (NPDES) permit number AL0024619 issued by the Alabama Department of Environmental Management.

This letter contains no NRC commitments. If you have any questions, please contact Jack Stringfellow at (205) 992-7037.

Respectfully submitted,

Mark J Ajluni
M. J. Ajluni
Nuclear Licensing Director

MJA/GAL/lac

Enclosure: Renewal Application National Pollutant Discharge Elimination System (NPDES) Permit Number AL0024619

cc: Southern Nuclear Operating Company
Mr. S. E. Kuczynski, Chairman, President & CEO
Mr. D. G. Bost, Chief Nuclear Officer
Mr. T. A. Lynch, Vice President – Farley
Ms. P. M. Marino, Vice President – Engineering
Mr. B. L. Ivey, Vice President – Regulatory Affairs
RTYPE: CFA04.054

U. S. Nuclear Regulatory Commission
Mr. V. M. McCree, Regional Administrator
Mr. R. E. Martin, NRR Project Manager – Farley
Mr. E. L. Crowe, Senior Resident Inspector – Farley

Joseph M. Farley Nuclear Plant
NPDES Permit Renewal

Enclosure

Renewal Application National Pollutant Discharge Elimination System (NPDES)
Permit Number AL0024619

Southern Nuclear
Operating Company, Inc.
40 Inverness Center Parkway
Post Office Box 1295
Birmingham, Alabama 35201

SOUTHERN
COMPANY
Energy to Serve Your World℠

DEC 29 2011

Log: EV-11-2546
File: E.01.13

FEDERAL EXPRESS

Farley Nuclear Plant
NPDES Permit No. AL0024619, Renewal Application

Mr. Lance R. LeFleur, Director
Alabama Department of Environmental Management
1400 Coliseum Boulevard
Montgomery, Alabama 36110-2059
Attention: Industrial Section, Water Division

Dear Mr. LeFleur:

Enclosed is the NPDES Permit renewal application package for Farley Nuclear Plant (FNP). The current permit became effective July 1, 2007, and expires on June 30, 2012. The enclosed renewal package contains the completed ADEM Form 187 and EPA Forms 3510-1, 3510-2C, and 3510-2F.

A check in the amount of $14,605.00 is enclosed for payment of the required permit renewal fees per ADEM Administrative Code R.335-1-6. If you have any questions or require additional information regarding the enclosed reapplication package, please contact Mary Beth Lloyd at (205) 992-5062.

Sincerely,

T. C. Moorer

Thomas C. Moorer
Manager, Environmental Affairs, Chemistry and Radiological Services

TCM/MBL:ahl

Enclosure

cc: Brian Marshall (w/ Enclosure)

bcc:
- B. J. Adams
- T. A. Lynch
- T. L. Youngblood
- C. M. Stover
- S. A. Varnum
- M. A. Reiser
- SNC Document Management – Farley Rtype CFA02.003

Application for Permit Renewal

NPDES Permit No. AL0024619

Joseph M. Farley Nuclear Power Plant

Submitted by Southern Nuclear Operating Company
December 2011

SOUTHERN COMPANY

U.S. EPA Form 3510-1
General Information
Consolidated Permits Program

Joseph M. Farley Nuclear Power Plant
NPDES No. AL0024619

Submitted by Southern Nuclear Operating Company
December 2011

Please print or type in the unshaded areas only
(fill-in areas are spaced for elite type, i.e., 12 characters/inch).

For Approved. OMB No. 2040-0086. Approval expires 5-31-92

FORM 1 GENERAL

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

S F		T/A	C
F	AL0024619		D
1	2 13	14	15

LABEL ITEMS

- **I. EPA I.D. NUMBER**
- **III. FACILITY NAME**
- **V. FACILITY MAILING LIST**
- **VI. FACILITY LOCATION**

PLEASE PLACE LABEL IN THIS SPACE

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent *(the area to the left of the label space lists the information that should appear)*, please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI*(except VI-B which must be completed regardless)*. Complete all items if no label has been proved. Refer to the instructions for detailed item descriptions and for the legal authorization under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental from listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of **bold-faced terms**.

SPECIFIC QUESTIONS	MARK "X" YES	NO	FORM ATTACHED	SPECIFIC QUESTIONS	MARK "X" YES	NO	FORM ATTACHED
A. Is this facility a **publicly owned treatment works** which results in a **discharge** to **waters of the U.S.**? (FORM 2A)	☐ 16	☒ 17	☐ 18	B. Does or will this facility *(either existing or proposed)* include a **concentrated animal feeding operation** or **aquatic animal production facility** which results in a **discharge** to **waters of the U.S.**? (FORM 2B)	☐ 19	☒ 20	☐ 21
C. Is this facility which currently results in **discharges** to **waters of the U.S.** other than those described in A or B above? (FORM 2C)	☒ 22	☐ 23	☒ 24	D. Is this proposal facility *(other than those described in A or B above)* which will result in a **discharge** to **waters of the U.S.**? (FORM 2D)	☐ 25	☒ 26	☐ 27
E. Does or will this facility treat, store, or dispose of **hazardous wastes**? (FORM 3)	☐ 28	☒ 29	☐ 30	F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)	☐ 31	☒ 32	☐ 33
G. Do you or will you inject at this facility any produced water other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)	☐ 34	☒ 35	☐ 36	H. Do you or will you inject at this facility fluids for special processes such as mining of sulfer by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)	☐ 37	☒ 38	☐ 39
I. Is this facility a proposed **stationary source** which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the **Clean Air Act** and may affect or be located in an **attainment area**? (FORM 5)	☐ 40	☒ 41	☐ 42	J. Is this facility a proposed **stationary source** which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an **attainment are**? (FORM 5)	☐ 43	☒ 44	☐ 45

III. NAME OF FACILITY

C 1 | SKIP | FARLEY NUCLEAR PLANT
15 | 16-29 | 30 69

IV. FACILITY CONTACT

	A. NAME & TITLE *(last, first, & title)*	B. PHONE *(area code & no.)*		
C 2	THOMAS C. MOORER, ENV AFFRS, CHEM, & RAD SVCS MGR	205	992	5807
15	16 45	46 48	49 51	52 55

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX
C 3 | P. O. BOX 1295
15 | 16 45

	B. CITY OR TOWN	C. STATE	D. ZIP CODE
C 4	BIRMINGHAM	AL	35201
15	16 40	41 42	47 51

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER
C 5 | 7388 NORTH STATE HIGHWAY 95
15 | 16 45

B. COUNTY NAME
HOUSTON
46 70

	C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE
C 6	COLUMBIA	AL	36319	N/A
15	16 40	41 42	47 51	52 54

CONTINUED ON REVERSE

CONTINUED FROM THE FRONT

VII. SIC CODES *(4-digit, in order of priority)*

A. FIRST			**B. SECOND**		
C 7	4911	*(specify)* GENERATION OF ELECTRICITY	7		*(specify)* N/A
15	16 17		15	16 19	
C. THIRD			**D. FOURTH**		
C 7		*(specify)* N/A	7		*(specify)* N/A
15	16 17		15	16 19	

VIII. OPERATOR INFORMATION

	A. NAME	**B. Is the name listed in Item VIII-A also the owner?**
C 8	SOUTHERN NUCLEAR OPERATING COMPANY	☐ YES ☒ NO
18	19 55	

C. STATUS OF OPERATOR *(Enter the appropriate letter into the answer box; if "Other," specify.)*

F = FEDERAL
S = STATE
P = PRIVATE
M = PUBLIC *(other than federal or state)*
O = OTHER *(specify)*

P	*(specify)* N/A	
56		

D. PHONE *(area code & no.)*

C A	205	992	5000
15	16 18	19 21	22 25

E. STREET OR PO BOX

P. O. BOX 1295
26 55

	F. CITY OR TOWN	**G. STATE**	**H. ZIP CODE**
C B	BIRMINGHAM	AL	35201
15	16 40	42 42	47 51

IX. INDIAN LAND

Is the facility located on Indian lands?
☐ YES ☒ NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES *(Discharges to Surface Water)*			**D. PSD** *(Air Emissions from Proposed Sources)*		
C 9	T N	AL0024619	C 9	T P	NONE
B. UIC *(Underground Injection of Fluids)*			**E. OTHER** *(specify)*		*(Specify)*
C 9	T U	NONE	C 9		SEE ATTACHED	SEE ATTACHED
C. RCRA *(Hazardous Wastes)*			**E. OTHER** *(specify)*		*(Specify)*
C 9	T R	NONE	C 9		SEE ATTACHED	SEE ATTACHED

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS *(provide a brief description)*

Generation of electricity through the use of nuclear fuel.

XIII. CERTIFICATION *(see instructions)*

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE *(type or print)*	B. SIGNATURE	C. DATE SIGNED
Bradley J. Adams, VP - Fleet Operations	Bradley J Adams	12-29-11

COMMENTS FOR OFFICIAL USE ONLY

C C	
15	16 55

Attachment 1 to U.S. EPA Form 3510-1

Section X. Existing Environmental Permits

Joseph M. Farley Nuclear Power Plant
NPDES No. AL0024619

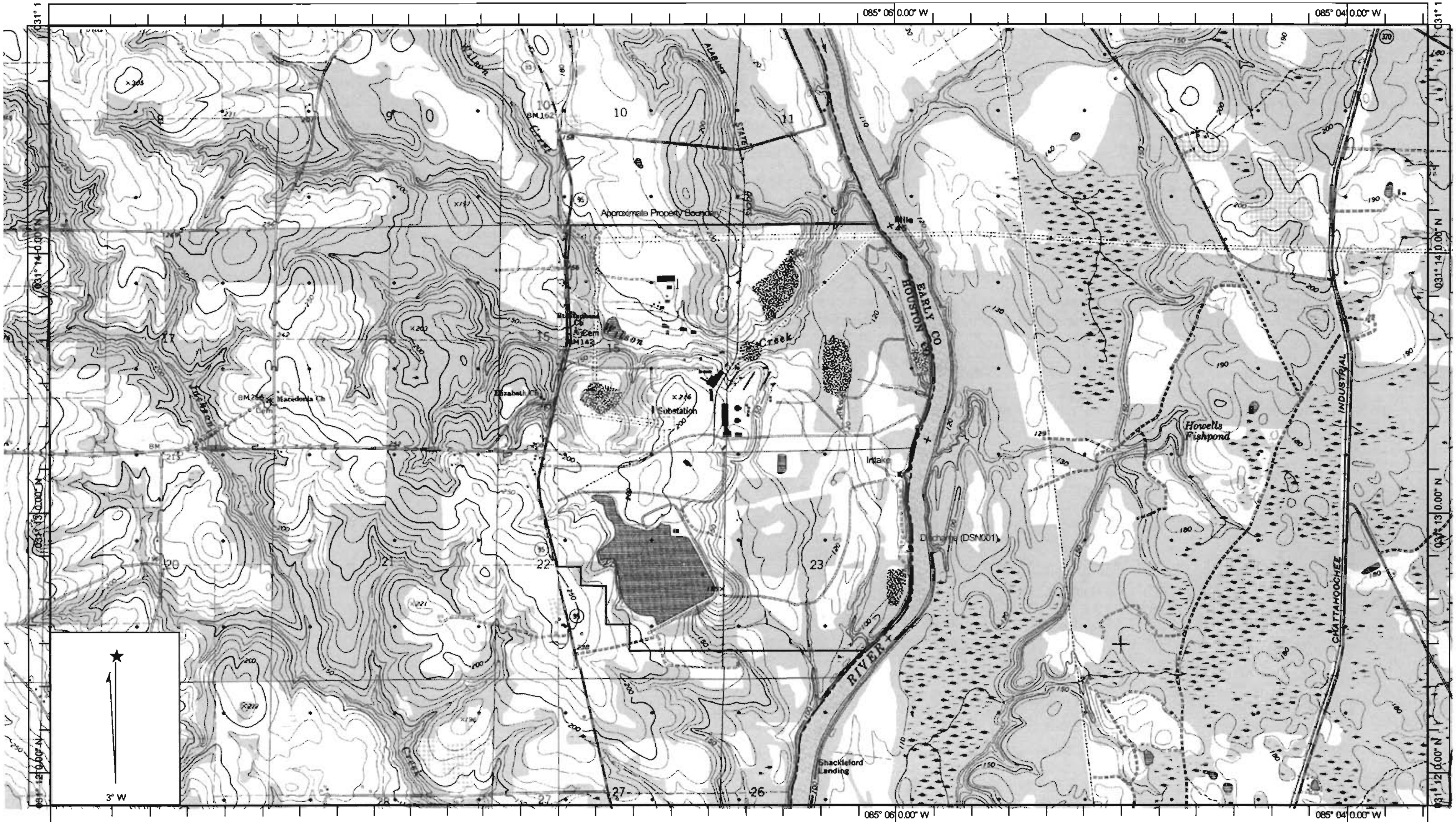
Existing Environmental Permits
Farley Nuclear Plant

Permit Name	Permit Number	Held By
NPDES Permit	AL0024619	Southern Nuclear Operating Co
Water Supply Permit	2007-507	Southern Nuclear Operating Co
Solid Waste Disposal Facility Permit	35-05	Southern Nuclear Operating Co
Certificate of Use (Issued by Office of Water Resources)	0063.2	Southern Nuclear Operating Co
NPDES Construction Stormwater Registration (ADEM Code Ch. 335-6-12)	ALR108019	Southern Nuclear Operating Co

Attachment 2 to U.S. EPA Form 3510-1

Section XI. Topographic Map

Joseph M. Farley Nuclear Power Plant
NPDES No. AL0024619



Name: GORDON
Date: 7/29/2005
Scale: 1 inch equals 2000 feet

Location: 031° 13' 22.9" N 085° 06' 42.8" W
Caption: Farley Nuclear Plant
Southern Nuclear Operating Company
NPDES Permit No. AL0024619

U.S. EPA Form 3510-2C
Application for Permit to Discharge Wastewater
Consolidated Permits Program

Joseph M. Farley Nuclear Power Plant
NPDES No. AL0024619

Submitted by Southern Nuclear Operating Company
December 2011

Please type or print in the unshaded areas only	EPA ID Number *(Copy from Item 1 of Form 1)* *AL0024619*	*Form Approved* *OMB No. 2040-0086* *Approval expires 7-31-88*

Form
2C
NPDES

U.S. ENVIRONMENTAL PROTECTION AGENCY

APPLICATION FOR PERMIT TO DISCHARGE WASTEWATER
EXISTING MANUFACTURING, COMMERCIAL, MINING AND SILVICUTLRAL OPERATIONS

Consolidated Permits Program

I. Outfall Location

For this outfall, list the latitude and longitude, and name of the receiving water(s)

Outfall Number *(list)*	Latitude			Longitude			Receiving Water *(name)*
	Deg	Min	Sec	Deg	Min	Sec	
001-001k	*31*	*12*	*52*	*85*	*05*	*55*	*CHATTAHOOCHEE RIVER*

II. Flows, Sources of Pollution, and Treatment Technologies

A. For each outfall, provide a description of (1) all operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and stormwater runoff; (2) the average flow contributed by each operation; and (3) the treatment received by the wastewater. Continue on additional sheets if necessary.

B. For each outfall, provide a description of (1) all operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and stormwater runoff; (2) the average flow contributed by each operation; and (3) the treatment received by the wastewater. Continue on additional sheets if necessary.

1. Outfall Number	2. Operations Contributing Flow		3. Treatment		
	a. OPERATION *(list)*	b. AVERAGE FLOW	a. DESCRIPTION	b. LIST CODES FROM TABLE 2C-1	
001	*MAIN COMBINED FACILITY DISCHARGE*	*82.31 MGD*	*SEE ATTACHED*	*4-A*	
001a	*COOLING TOWER BLOWDOWN - UNIT 1*	*6.04 MGD*	*SEE ATTACHED*	*4-A*	*2-E*
001b	*COOLING TOWER BLOWDOWN - UNIT 2*	*6.04 MGD*	*SEE ATTACHED*	*4-A*	*2-E*
001c	*TREATED CHROMATE BEARING WASTEWATER*	*	*SEE ATTACHED*	*4-A*	*2-J*
001d	*TURBINE BUILDING SUMP - UNIT 1*	*	*SEE ATTACHED*	*4-A*	
001e	*TURBINE BUILDING SUMP - UNIT 2*	*	*SEE ATTACHED*	*4-A*	
001f	*STEAM GENERATOR BLOWDOWN - UNIT 1*	*0.13 MGD*	*SEE ATTACHED*	*4-A*	
001g	*STEAM GENERATOR BLOWDOWN - UNIT 2*	*0.13 MGD*	*SEE ATTACHED*	*4-A*	
001h	*LIQUID RADWASTE SYSTEM - UNIT 1*	*	*SEE ATTACHED*	*4-A*	*2-J*
001i	*LIQUID RADWASTE SYSTEM - UNIT 2*	*	*SEE ATTACHED*	*4-A*	*2-J*
001j	*CONDENSER WATER BOX DRAIN - UNIT 1*	*	*SEE ATTACHED*	*4-A*	
001k	*CONDENSER WATER BOX DRAIN - UNIT 2*	*	*SEE ATTACHED*	*4-A*	
	** INTERMITTENT FLOWS*				

Please type or print in the unshaded areas only	EPA ID Number *(Copy from Item 1 of Form 1)* **AL0024619**	*Form Approved* *OMB No. 2040-0086* *Approval expires 7-31-88*

Form
2C
NPDES

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

APPLICATION FOR PERMIT TO DISCHARGE WASTEWATER

EXISTING MANUFACTURING, COMMERCIAL, MINING AND SILVICUTLRAL OPERATIONS

Consolidated Permits Program

I. Outfall Location

For this outfall, list the latitude and longitude, and name of the receiving water(s)

Outfall Number *(list)*	Latitude			Longitude			Receiving Water *(name)*
	Deg	Min	Sec	Deg	Min	Sec	
012	*31*	*12*	*52*	*85*	*05*	*55*	*CHATTAHOOCHEE RIVER*
022-023	*31*	*12*	*52*	*85*	*05*	*55*	*CHATTAHOOCHEE RIVER*
024-024b	*31*	*12*	*52*	*85*	*05*	*55*	*CHATTAHOOCHEE RIVER*
025-025b	*31*	*12*	*52*	*85*	*05*	*55*	*CHATTAHOOCHEE RIVER*

II. Flows, Sources of Pollution, and Treatment Technologies

A. For each outfall, provide a description of (1) all operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and stormwater runoff; (2) the average flow contributed by each operation; and (3) the treatment received by the wastewater. Continue on additional sheets if necessary.

B. For each outfall, provide a description of (1) all operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and stormwater runoff; (2) the average flow contributed by each operation; and (3) the treatment received by the wastewater. Continue on additional sheets if necessary.

1. Outfall Number	2. Operations Contributing Flow		3. Treatment		
	a. OPERATION *(list)*	b. AVERAGE FLOW	a. DESCRIPTION	b. LIST CODES FROM TABLE 2C-1	
012	*CHEMICAL METAL CLEANING WASTES*	*	*SEE ATTACHED*	*4-A*	
022	*RIVER WATER BUILDING SUMP - SOUTH*	*	*SEE ATTACHED*	*4-A*	
023	*RIVER WATER BUILDING SUMP - NORTH*	*	*SEE ATTACHED*	*4-A*	
024	*SOUTHEAST YARD DRAINAGE*	*	*SEE ATTACHED*	*4-A*	
024a	*TREATED CHROMATE BEARING WASTEWATER*	*	*SEE ATTACHED*	*4-A*	*2-J*
024b	*WASTE SETTLING POND*	*0.30 MGD*	*SEE ATTACHED*	*4-A*	*1-V*
025	*EAST YARD DRAINAGE*	*	*SEE ATTACHED*	*4-A*	
025a	*COOLING TOWER OVERFLOW - UNIT 1*	*	*SEE ATTACHED*	*4-A*	
025b	*SEWAGE TREATMENT PLANT*	*0.02 MGD*	*SEE ATTACHED*	*4-A* *1-V*	*2-F* *3-A*
	** INTERMITTENT FLOWS*				

Please type or print in the unshaded areas only	EPA ID Number *(Copy from Item 1 of Form 1)* **AL0024619**	*Form Approved* *OMB No. 2040-0086* *Approval expires 7-31-88*

Form **2C** NPDES

EPA

U.S. ENVIRONMENTAL PROTECTION AGENCY

APPLICATION FOR PERMIT TO DISCHARGE WASTEWATER
EXISTING MANUFACTURING, COMMERCIAL, MINING AND SILVICUTLRAL OPERATIONS

Consolidated Permits Program

I. Outfall Location

For this outfall, list the latitude and longitude, and name of the receiving water(s)

Outfall Number *(list)*	Latitude			Longitude			Receiving Water *(name)*
	Deg	Min	Sec	Deg	Min	Sec	
026-027a	*31*	*13*	*45*	*85*	*05*	*45*	*WILSON CREEK*
028-030	*31*	*12*	*52*	*85*	*05*	*55*	*CHATTAHOOCHEE RIVER*

II. Flows, Sources of Pollution, and Treatment Technologies

A. For each outfall, provide a description of (1) all operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and stormwater runoff; (2) the average flow contributed by each operation; and (3) the treatment received by the wastewater. Continue on additional sheets if necessary.

B. For each outfall, provide a description of (1) all operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and stormwater runoff; (2) the average flow contributed by each operation; and (3) the treatment received by the wastewater. Continue on additional sheets if necessary.

1. Outfall Number	2. Operations Contributing Flow		3. Treatment		
	a. OPERATION *(list)*	b. AVERAGE FLOW	a. DESCRIPTION	b. LIST CODES FROM TABLE 2C-1	
026	*NORTHWEST YARD DRAINAGE*	*	*SEE ATTACHED*	*4-A*	
027	*NORTHCENTRAL YARD DRAINAGE*	*	*SEE ATTACHED*	*4-A*	
027a	*WEST YARD DRAINAGE*	*	*SEE ATTACHED*	*4-A*	
028	*WEST YARD DRAINAGE*	*	*SEE ATTACHED*	*4-A*	
029	*SOUTHWEST YARD DRAINAGE*	*	*SEE ATTACHED*	*4-A*	
030	*INTAKE SCREEN BACKWASH WATER TO INTAKE CANAL (UNITS 1 &2)*	*	*SEE ATTACHED*	*4-A*	
	** INTERMITTENT FLOWS*				

CONTINUED FROM THE FRONT

C. Except for storm runoff, leaks, or spills, are any of the discharges described in Items II-A or B intermittent or seasonal?

☒ **YES** *(complete the following table)* ☐ **NO** *(go to Section III)*

1. OUTFALL NUMBER *(list)*	2. OPERATION(s) CONTRIBUTING FLOW *(list)*	3. FREQUENCY		4. FLOW				
		a. DAYS PER WEEK *(specify average)*	b. MONTHS PER YEAR *(specify average)*	a. FLOW RATE *(in mgd)*		b. TOTAL VOLUME *(specify with units)*		c. DURATION *(in days)*
				1. LONG TERM AVERAGE	2. MAXIMUM DAILY	1. LONG TERM AVERAGE	2. MAXIMUM DAILY	
01c	***TREATED CHROMATE BEARING WASTEWATER***	***SEE ATTACHED***						
01d	***TURBINE BUILDING SUMP - UNIT 1***	***SEE ATTACHED***						
01e	***TURBINE BUILDING SUMP - UNIT 2***	***SEE ATTACHED***						
01h	***LIQUID RADWASTE SYSTEM - UNIT 1***	***SEE ATTACHED***						
01i	***LIQUID RADWASTE SYSTEM - UNIT 2***	***SEE ATTACHED***						
01j	***CONDENSER WATER BOX DRAIN - UNIT 1***	***SEE ATTACHED***						

III. PRODUCTION

A. Does an effluent guideline limitation promulgated by EPA under Section 304 of the Clean Water Act apply to your facility?

☒ **YES** *(complete Item III-B)* ☐ **NO** *(go to Section IV)*

B. Are the limitations in the applicable effluent guideline expressed in terms of production *(or other measure of operation)*?

☐ **YES** *(complete Item III-C)* ☒ **NO** *(go to Section IV)*

C. If you answered "yes" to Item III-B, list the quantity which represents an actual measurement of your level of production, expressed in the terms and units used in the applicable effluent guideline, and indicate the affected outfalls.

1. AVERAGE DAILY PRODUCTION			2. AFFECTED OUTFALLS *(list outfall numbers)*
a. QUANTITY PER DAY	b. UNITS OF MEASURE	c. OPERATION, PRODUCT, MATERIAL, ETC. *(specify)*	
N/A			

IV. IMPROVEMENTS

A. Are you now required by any Federal, State, or local authority to meet any implementation schedule for the construction, upgrading, or operation of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.

☐ **YES** *(complete the following table)* ☒ **NO** *(go to Item IV-B)*

1. IDENTIFICATION OF CONDITION, AGREEMENT, ETC.	2. AFFECTED OUTFALLS		3. BRIEF DESCRIPTION OF PROJECT	4. FINAL COMPLIANCE DATE	
	a. No	b. SOURCE OF DISCHARGE		a. REQUIRED	b. PROJECTED
N/A					

B. OPTIONAL: You may attach additional sheets describing any additional water pollution control programs *(or other environmental projects which may affect your discharges)* you now have underway or which you plan. Indicate whether each program is now underway or planned, and indicate your actual or planned schedules for construction.

☐ **MARK "X" IF DESCRIPTION OF ADDITIONAL CONTROL PROGRAM IS ATTACHED**

CONTINUED ON PAGE 3

CONTINUED FROM THE FRONT

C. Except for storm runoff, leaks, or spills, are any of the discharges described in Items II-A or B intermittent or seasonal?

☒ **YES** *(complete the following table)* ☐ **NO** *(go to Section III)*

1. OUTFALL NUMBER (list)	2. OPERATION(s) CONTRIBUTING FLOW (list)	3. FREQUENCY		4. FLOW				
		a. DAYS PER WEEK *(specify average)*	b. MONTHS PER YEAR *(specify average)*	a. FLOW RATE *(in mgd)*		b. TOTAL VOLUME *(specify with units*		c. DURATION *(in days)*
				1. LONG TERM AVERAGE	2. MAXIMUM DAILY	1. LONG TERM AVERAGE	2. MAXIMUM DAILY	
01k	***CONDENSER WATER BOX DRAIN - UNIT 2***	***SEE ATTACHED***						
012	***CHEMICAL METAL CLEANING WASTES***	***SEE ATTACHED***						
022	***RIVER WATER BUILDING SUMP - SOUTH***	***SEE ATTACHED***						
023	***RIVER WATER BUILDING SUMP - NORTH***	***SEE ATTACHED***						
024	***SOUTHEAST YARD DRAINAGE***	***SEE ATTACHED***						

III. PRODUCTION

A. Does an effluent guideline limitation promulgated by EPA under Section 304 of the Clean Water Act apply to your facility?

☒ **YES** *(complete Item III-B)* ☐ **NO** *(go to Section IV)*

B. Are the limitations in the applicable effluent guideline expressed in terms of production *(or other measure of operation)*?

☐ **YES** *(complete Item III-C)* ☒ **NO** *(go to Section IV)*

C. If you answered "yes" to Item III-B, list the quantity which represents an actual measurement of your level of production, expressed in the terms and units used in the applicable effluent guideline, and indicate the affected outfalls.

1. AVERAGE DAILY PRODUCTION			2. AFFECTED OUTFALLS *(list outfall numbers)*
a. QUANTITY PER DAY	b. UNITS OF MEASURE	c. OPERATION, PRODUCT, MATERIAL, ETC. *(specify)*	
N/A			

IV. IMPROVEMENTS

A. Are you now required by any Federal, State, or local authority to meet any implementation schedule for the construction, upgrading, or operation of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.

☐ **YES** *(complete the following table)* ☒ **NO** *(go to Item IV-B)*

1. IDENTIFICATION OF CONDITION, AGREEMENT, ETC.	2. AFFECTED OUTFALLS		3. BRIEF DESCRIPTION OF PROJECT	4. FINAL COMPLIANCE DATE	
	a. No	b. SOURCE OF DISCHARGE		a. REQUIRED	b. PROJECTED
N/A					

B. OPTIONAL: You may attach additional sheets describing any additional water pollution control programs *(or other environmental projects which may affect your discharges)* you now have underway or which you plan. Indicate whether each program is now underway or planned, and indicate your actual or planned schedules for construction.

☐ **MARK "X" IF DESCRIPTION OF ADDITIONAL CONTROL PROGRAM IS ATTACHED**

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C. Except for storm runoff, leaks, or spills, are any of the discharges described in Items II-A or B intermittent or seasonal?

☒ **YES** *(complete the following table)* ☐ **NO** *(go to Section III)*

1. OUTFALL NUMBER *(list)*	2. OPERATION(s) CONTRIBUTING FLOW *(list)*	3. FREQUENCY		4. FLOW				
		a. DAYS PER WEEK *(specify average)*	b. MONTHS PER YEAR *(specify average)*	a. FLOW RATE *(in mgd)*		b. TOTAL VOLUME *(specify with units)*		c. DURATION *(in days)*
				1. LONG TERM AVERAGE	2. MAXIMUM DAILY	1. LONG TERM AVERAGE	2. MAXIMUM DAILY	
024a	*TREATED CHROMATE BEARING WASTEWATER*	*SEE ATTACHED*						
025	*EAST YARD DRAINAGE*	*SEE ATTACHED*						
025a	*COOLING TOWER OVERFLOW - UNIT 1*	*SEE ATTACHED*						
026	*NORTHWEST YARD DRAINAGE*	*SEE ATTACHED*						
027	*NORTHCENTRAL YARD DRAINAGE*	*SEE ATTACHED*						
028	*WEST YARD DRAINAGE*	*SEE ATTACHED*						

III. PRODUCTION

A. Does an effluent guideline limitation promulgated by EPA under Section 304 of the Clean Water Act apply to your facility?

☒ **YES** *(complete Item III-B)* ☐ **NO** *(go to Section IV)*

B. Are the limitations in the applicable effluent guideline expressed in terms of production *(or other measure of operation)*?

☐ **YES** *(complete Item III-C)* ☒ **NO** *(go to Section IV)*

C. If you answered "yes" to Item III-B, list the quantity which represents an actual measurement of your level of production, expressed in the terms and units used in the applicable effluent guideline, and indicate the affected outfalls.

1. AVERAGE DAILY PRODUCTION			2. AFFECTED OUTFALLS *(list outfall numbers)*
a. QUANTITY PER DAY	b. UNITS OF MEASURE	c. OPERATION, PRODUCT, MATERIAL, ETC. *(specify)*	
N/A			

IV. IMPROVEMENTS

A. Are you now required by any Federal, State, or local authority to meet any implementation schedule for the construction, upgrading, or operation of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.

☐ **YES** *(complete the following table)* ☒ **NO** *(go to Item IV-B)*

1. IDENTIFICATION OF CONDITION, AGREEMENT, ETC.	2. AFFECTED OUTFALLS		3. BRIEF DESCRIPTION OF PROJECT	4. FINAL COMPLIANCE DATE	
	a. NO.	b. SOURCE OF DISCHARGE		a. REQUIRED	b. PROJECTED
N/A					

B. OPTIONAL: You may attach additional sheets describing any additional water pollution control programs *(or other environmental projects which may affect your discharges)* you now have underway or which you plan. Indicate whether each program is now underway or planned, and indicate your actual or planned schedules for construction.

☐ **MARK "X" IF DESCRIPTION OF ADDITIONAL CONTROL PROGRAM IS ATTACHED**

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C. Except for storm runoff, leaks, or spills, are any of the discharges described in Items II-A or B intermittent or seasonal?

☒ **YES** *(complete the following table)* ☐ **NO** *(go to Section III)*

1. OUTFALL NUMBER *(list)*	2. OPERATION(s) CONTRIBUTING FLOW *(list)*	3. FREQUENCY		4. FLOW				
		a. DAYS PER WEEK *(specify average)*	b. MONTHS PER YEAR *(specify average)*	a. FLOW RATE *(in mgd)*		b. TOTAL VOLUME *(specify with units)*		c. DURATION *(in days)*
				1. LONG TERM AVERAGE	2. MAXIMUM DAILY	1. LONG TERM AVERAGE	2. MAXIMUM DAILY	
029	*SOUTHWEST YARD DRAINAGE*	*SEE ATTACHED*						
030	*INTAKE SCREEN BACKWASH WATER (UNITS 1 & 2)*	*SEE ATTACHED*						

III. PRODUCTION

A. Does an effluent guideline limitation promulgated by EPA under Section 304 of the Clean Water Act apply to your facility?

☒ **YES** *(complete Item III-B)* ☐ **NO** *(go to Section IV)*

B. Are the limitations in the applicable effluent guideline expressed in terms of production *(or other measure of operation)*?

☐ **YES** *(complete Item III-C)* ☒ **NO** *(go to Section IV)*

C. If you answered "yes" to Item III-B, list the quantity which represents an actual measurement of your level of production, expressed in the terms and units used in the applicable effluent guideline, and indicate the affected outfalls.

1. AVERAGE DAILY PRODUCTION			2. AFFECTED OUTFALLS *(list outfall numbers)*
a. QUANTITY PER DAY	b. UNITS OF MEASURE	c. OPERATION, PRODUCT, MATERIAL, ETC. *(specify)*	
N/A			

IV. IMPROVEMENTS

A. Are you now required by any Federal, State, or local authority to meet any implementation schedule for the construction, upgrading, or operation of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.

☐ **YES** *(complete the following table)* ☒ **NO** *(go to Item IV-B)*

1. IDENTIFICATION OF CONDITION, AGREEMENT, ETC.	2. AFFECTED OUTFALLS		3. BRIEF DESCRIPTION OF PROJECT	4. FINAL COMPLIANCE DATE	
	a. No	b. SOURCE OF DISCHARGE		a. REQUIRED	b. PROJECTED
N/A					

B. OPTIONAL: You may attach additional sheets describing any additional water pollution control programs *(or other environmental projects which may affect your discharges)* you now have underway or which you plan. Indicate whether each program is now underway or planned, and indicate your actual or planned schedules for construction.

☐ **MARK "X" IF DESCRIPTION OF ADDITIONAL CONTROL PROGRAM IS ATTACHED**

CONTINUED ON PAGE 3

EPA ID Number *(Copy from Item 1 of Form 1)*
AL0024619AL0024619

CONTINUED FROM PAGE 2

V. INTAKE AND EFFLUENT CHARACTERISTICS

A, B, & C: See instructions before proceeding - Complete one set of tables or each outfall - Annotate the outfall number in the space provided.
NOTE: Tables V-A, V-B, and V-C are included on separate sheets number V-1 through V-9.

D: Use the space below t list any of the pollutants listed in Tables 2c-3 of the instructions, which you know or have reason to believe is discharged or may be discharged from any outfall. For every pollutant you list, briefly describe the reasons you believe it to be present and report any analytical data in your possession.

1. POLLUTANT	2. SOURCE	1. POLLUTANT	2. SOURCE
NONE			

VI. POTENTIAL DISCHARGES NOT COVERED BY ANALYSIS

Is any pollutant listed in Item V-C a substance or a component of a substance which you currently use or manufacture as an intermediate or final product or byproduct?

☐ **YES** *(list all such pollutants below)* ☒ **NO** *(go to Item VI-B)*

N/A

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VII. BIOLOGICAL TOXICITY TESTING DATA

Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

☒ **YES** *(identify the test(s) and describe their purpose below)* ☐ **NO** *(go to Section VIII)*

ANNUAL BIOMONITORING AS REQUIRED BY EXISTING NPDES PERMIT ON THE MAIN COMBINED FACILITY DISCHARGE (DSN001).

VIII. CONTRACT ANALYSIS INFORMATION

Were any of the analyses reported in Item V performed by a contract laboratory or consulting firm?

☒ **YES** *(list the name, address, and telephone number of, and pollutants analyzed by, each such laboratory or firm below)* ☐ **NO** *(go to Section IX)*

A. NAME	B. ADDRESS	C. TELEPHONE *(area code & no.)*	D. POLLUTANTS ANALYZED *(list)*
Alabama Power Company General Test Laboratory	*Building No. 8 P.O. Box 2641 Birmingham, AL 35291*	*(205) 664-6194*	*All except radiological.*
Florida Radiochemistry Services, Inc.	*5456 Hoffner Avenue Suite 201 Orlando, FL 32812*	*(407) 382-7733*	*Radiological*
		( )	19 1919
		( )	
		( )	
		( )	
		( )	
		( )	
		( )	
		( )	

IX. CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

A. NAME & OFFICIAL TITLE *(type or print)*
Bradley J. Adams, VP - Fleet Operations

B. PHONE NO. *(area code & no.)*
(205) 992-5000

C. SIGNATURE
Bradley J Adams

D. DATE SIGNED
12-29-11

PLEASE PRINT OR TYPE IN THE UNSHADED AREAS ONLY. You may report some or all of this information on separate sheets *(use the same format)* instead of completing these pages. SEE INSTRUCTIONS.

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*
AL0024619

V. INTAKE AND EFFLUENT CHARACTERISTICS *(continued from page 3 of Form 2-C)*

PART A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

1. POLLUTANT	2. EFFLUENT							3. UNITS *(specify if blank)*		4. INTAKE *(optional)*		
	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE *(if available)*		c. LONG TERM AVRG. VALUE *(if available)*		d. NO. OF ANALYSIS	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
a. Biochemical Oxygen Demand *(BOD)*	*< 2*	*<623*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 2*	*<690*	*1*
b. Chemical Oxygen Demand *(COD)*	*10*	*3,114*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*4*	*1,380*	*1*
c. Total Organic Carbon *(TOC)*	*3.38*	*1,052*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*2.8*	*965.9*	*1*
d. Total Suspended Solids *(TSS)*	*2*	*623*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*2*	*690*	*1*
e. Ammonia *(as N)*	*0.07*	*21.8*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*0.07*	*24.15*	*1*
f. Flow	Value *106.8*		Value *99.05*		Value *82.31*		*1,077*	*MGD*	*n/a*	Value *91.19*		*24*
g. Temperature *(winter)*	Value *23.33*		Value *19.31*		Value *17.32*		*33*	°C		Value *12.3*		*37*
h. Temperature *(summer)*	Value *38.89*		Value *36.67*		Value *34.56*		*33*	°C		Value *30.1*		*43*
i. pH	Minimum *6.83*	Maximum *8.03*	Minimum *7.06*	Maximum *7.78*			*154*	STANDARD UNITS				

PART B - Mark "X" in column 2-a for each pollutant you know or have reason to believe is present. Mark "X" in column 2-b for each pollutant you believe to be absent. If you mark column 2a for any pollutant which is limited either directly, or indirectly but expressly, in an effluent limitation guideline, you must provide the results of at least one analysis for that pollutant. For other pollutants for which you mark column 2a, you must provide quantitative data or an explanation of their presence in your discharge. Complete one table for each outfall. See the instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. *(if available)*	2. MARK 'X'		2. EFFLUENT							3. UNITS *(specify if blank)*		4. INTAKE *(optional)*		
	a. BELIEVED PRESENT	b. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE *(if available)*		c. LONG TERM AVRG. VALUE *(if available)*		d. NO. OF ANALYSIS	a. CONCEN-TRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
a. Bromide (24959-67-9)	☐	☒	*0.05*	*15.57*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*0.79*	*272.52*	*1*
b. Chlorine, Total Residual	☒	☐	*<0.01*	*<3.11*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.01*	*<3.45*	*1*
c. Color	☒	☐	*19*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*PCU*	*n/a*	*12*	*n/a*	*1*
d. Fecal Coliform	☒	☐	*< 1*	*<311.4*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*col/100 ml*	*n/a*	*2*	*689.9*	*1*
e. Fluoride (16984-48-8)	☐	☒	*0.16*	*49.82*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*0.13*	*44.85*	*1*
f. Nitrate-Nitrite *(as N)*	☒	☐	*0.15*	*46.71*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*0.14*	*48.3*	*1*

ITEM V-B CONTINUED FROM FRONT

1. POLLUTANT AND CAS NO. *(if available)*	2. MARK 'X'		2. EFFLUENT							3. UNITS *(specify if blank)*		4. INTAKE *(optional)*		
	a. BELIEVED PRESENT	b. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE *(if available)*		c. LONG TERM AVRG. VALUE *(if available)*		d. NO. OF ANALYSIS	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
			(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
g. Nitrogen, Total Organic *(as N)*	☒	☐	*0.21*	*65.39*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*0.19*	*65.54*	*1*
h. Oil and Grease	☒	☐	*<1.4*	*<435.93*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 1.4*	*<482.96*	*1*
i. Phosphorus *(as P)*, Total (7723-14-0)	☒	☐	*0.07*	*21.8*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*0.02*	*6.9*	*1*
j. Radioactivity														
(1) Alpha, Total	☒	☐	*<1.1*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*pCi/l*	*n/a*	*<1.0*	*n/a*	*1*
(2) Beta, Total	☒	☐	*4.1*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*pCi/l*	*n/a*	*3.7*	*n/a*	*1*
(3) Radium, Total	☒	☐	*0.5*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*pCi/l*	*n/a*	*<0.2*	*n/a*	*1*
(4) Radium 226, Total	☒	☐	*0.4*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*pCi/l*	*n/a*	*<0.3*	*n/a*	*1*
k. Sulfate *(as SO_4) (14808-79-8)*	☒	☐	*12.9*	*4,016.7*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*10.7*	*3,691.2*	*1*
l. Sulfide (as S)	☒	☐	*<0.01*	*<3.11*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*0.08*	*27.6*	*1*
m. Sulfite *(as SO_3)(14265-45-3)*	☐	☒	*<2*	*<622.8*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<2*	*<689.94*	*1*
n. Surfactants	☒	☐	*0.02*	*6.23*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*0.01*	*3.45*	*1*
o. Aluminum, Total (7429-90-5)	☒	☐	*0.346*	*107.74*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*0.118*	*40.71*	*1*
p. Barium, Total (7440-39-3)	☒	☐	*0.021*	*6.54*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*0.017*	*5.86*	*1*
q. Boron, Total (7440-42-8)	☒	☐	*0.351*	*109.29*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*0.314*	*108.32*	*1*
r. Cobalt, Total (7440-48-4)	☐	☒	*<0.005*	*<1.56*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.005*	*<1.72*	*1*
s. Iron, Total (7439-89-4)	☒	☐	*0.352*	*109.6*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*0.142*	*48.99*	*1*
t. Magnesium, Total (7439-95-4)	☒	☐	*2.54*	*790.89*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*2.16*	*745.13*	*1*
u. Molybdenum, Total (7439-98-7)	☐	☒	*<0.01*	*<3.11*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.01*	*<3.45*	*1*
v. Manganese, Total (7439-96-5)	☒	☐	*0.074*	*23.04*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*0.045*	*15.52*	*1*
w. Tin, Total (7440-31-5)	☐	☒	*<0.002*	*<0.62*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.002*	*<0.69*	*1*
x. Titanium, Total (7440-32-6)	☒	☐	*0.018*	*5.6*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*0.007*	*2.41*	*1*

CONTINUE ON PAGE V-3

CONTINUED FROM PAGE 3 OF FORM 2-C

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*	OUTFALL NUMBER
AL0024619	*DSN001*

PART C - If you are a primary industry and this outfall contains process wastewater, refer to Table 2c-2 in the instructions to determine which of the GC/MS fractions you must test for. Mark "X" in column 2-a for all such GC/MS fractions that apply to your industry and for ALL toxic metals, cyanides, and total phenols. If you are not required to mark column 2-a *(secondary industries, nonprocess wastewater outfalls, and non-required GC/MS fractions)*, mark "X" in column 2-b for each pollutant you know or have reason to believe is present. Mark "X" in column 2-c for each pollutant you believe is absent. If you mark column 2a for any pollutant, you must provide the results of at least one analysis for that pollutant. If you mark column 2b for any pollutant, you must provide the results of at least one analysis for that pollutant. If you know or have reason to believe it will be discharged in concentrations of 10 ppb or greater. If you mark column 2b for acrolein, acrylonitrile, 2,4 dinitrophenol, or 2-methyl-4, 6 dinitrophenol, you must provide the results of at least one analysis for each of these pollutants which you know or have reason to believe that you discharge in concentrations of 100 ppb or greater. Otherwise, for pollutants for which you mark column 2b, you must either submit at least one analysis or briefly describe the reasons the pollutant is expected to be discharged. Note that there are 7 pages to this part; please review each carefully. Complete one table *(all 7 pages)* for each outfall. See instructions for additional details and requirements.

1. POLLUTANT AND CAS NO. *(if available)*	2. MARK 'X'			2. EFFLUENT							3. UNITS *(specify if blank)*		4. INTAKE *(optional)*		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE *(if available)*		c. LONG TERM AVRG. VALUE *(if available)*		d. NO. OF ANALYSIS	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
METALS, CYANIDE, AND TOTAL PHENOLS															
1m. Antimony, Total (7440-36-0)	☒	☐	☒	*<0.003*	*<0.93*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.003*	*<1.03*	*1*
2M. Arsenic, Total (7440-38-2)	☒	☐	☒	*<0.004*	*<1.25*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.004*	*<1.38*	*1*
3M. Beryllium, Total (7440-41-7)	☒	☐	☒	*<0.001*	*<0.31*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.001*	*<0.34*	*1*
4M. Cadmium, Total (7440-43-9)	☒	☐	☒	*<0.005*	*<1.56*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.005*	*<1.72*	*1*
5M Chromium, Total (7440-47-3)	☒	☐	☐	*0.03*	*9.34*	*0.048*	*15.02*	*0.010*	*3.11*	*12*	*mg/l*	*kg/day*	*0.029*	*10*	*1*
6M Copper, Total (7440-50-8)	☒	☐	☐	*0.01*	*3.11*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.005*	*<1.72*	*1*
7M lead, Total (7439-92-1)	☒	☐	☒	*<0.005*	*<1.56*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.005*	*<1.72*	*1*
8M Mercury, Total (7439-97-6)	☒	☐	☒	*<0.0002*	*<0.06*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	<0.0002	*<0.07*	*1*
9M Nickel, Total (7440-02-0)	☒	☐	☒	*<0.001*	*<0.31*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.001*	*<0.34*	*1*
10M Selenium, Total (7782-49-2)	☒	☐	☒	*<0.005*	*<1.56*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.005*	*<1.72*	*1*
11M Silver, Total (7440-22-4)	☒	☐	☒	*0.008*	*2.49*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*0.011*	*3.79*	*1*
12M Thallium, Total (7440-28-0)	☒	☒	☐	*<0.002*	*<0.62*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*0.002*	*0.69*	*1*
13M Zinc, Total (7440-66-6)	☒	☒	☐	*0.026*	*8.1*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*0.027*	*9.31*	*1*
14M Cyanide, Total (57-12-5)	☒	☒	☐	*<0.005*	*<1.56*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.005*	*<1.72*	*1*
15M Phenols, Total	☒	☒	☐	*<0.01*	*<3.11*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.01*	*<3.45*	*1*
DIOXIN															
2,3,7,8-Tetrachlorodibenzo-P-Dioxin (1764-01-6)	☐	☐	☒	DESCRIBE RESULTS ***NOT TESTED***											

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NO. (if available)	2. MARK 'X'			2. EFFLUENT							3. UNITS (specify if blank)		4. INTAKE (optional)		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE (if available)		c. LONG TERM AVRG. VALUE (if available)		d. NO. OF ANALYSIS	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS - VOLATILE COMPOUNDS															
1V. Acrolein (107-02-8)	☒	☐	☒	*< 0.002*	*<0.62*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.002*	*<0.69*	*1*
2V Acrylonitrile (107-13-1)	☒	☐	☒	*< 0.001*	*<0.31*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.001*	*<0.34*	*1*
3V Benzene (71-43-2)	☒	☐	☒	*< 0.002*	*<0.62*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.002*	*<0.69*	*1*
4V Bis *(Chloromethyl)* Ether (542-88-1)	☐	☐	☒	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*0*	*n/a*	*n/a*	*n/a*	*n/a*	*0*
5V Bromoform (75-25-2)	☒	☐	☒	*< 0.003*	*<0.93*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.003*	*<1.03*	*1*
6V Carbon Tetrachloride (56-23-5)	☒	☐	☒	*< 0.002*	*<0.62*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.002*	*<0.69*	*1*
7V Chlorobenzene (108-90-7)	☒	☐	☒	*< 0.001*	*<0.31*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.001*	*<0.34*	*1*
8V Chlorodibromomethane (124-48-1)	☒	☐	☒	*< 0.001*	*<0.31*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.001*	*<0.34*	*1*
9V Chloroethane (75-00-3)	☒	☐	☒	*< 0.002*	*<0.62*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.002*	*<0.69*	*1*
10V 2-Chloroethylvinyl Ether (110-75-8)	☒	☐	☒	*< 0.001*	*<0.31*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.001*	*<0.34*	*1*
11V Chloroform (67-66-3)	☒	☐	☒	*<0.002*	*<0.62*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.002*	*<0.69*	*1*
12V Dichlorobromoethane (75-71-8)	☒	☐	☒	*< 0.001*	*<0.31*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.001*	*<0.34*	*1*
13V Dichlorodifluoromethane (75-71-8)	☐	☐	☒	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*0*	*n/a*	*n/a*	*n/a*	*n/a*	*0*
14V 1,1-Dichloroethane (75-34-3)	☒	☐	☒	*< 0.002*	*<0.62*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.002*	*<0.69*	*1*
15V 1,2-Dichloroethane (107-06-2)	☒	☐	☒	*< 0.002*	*<0.62*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.002*	*<0.69*	*1*
16V 1,1-Dichloroethylene (75335-4)	☒	☐	☒	*< 0.001*	*<0.31*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.001*	*<0.34*	*1*
17V 1,2-Dichloropropane (78-87-5)	☒	☐	☒	*< 0.002*	*<0.62*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.002*	*<0.69*	*1*
18V 1,3-Dichloropropylene (542-76-6)	☒	☐	☒	*< 0.001*	*<0.31*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.001*	*<0.34*	*1*
19V Ethylbenzene (100-41-4)	☒	☐	☒	*< 0.002*	*<0.62*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.002*	*<0.69*	*1*
20V Methyl Bromide (74-83-9)	☒	☐	☒	*< 0.002*	*<0.62*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.002*	*<0.69*	*1*
21V Methyl Chloride (74-87-3)	☒	☐	☒	*< 0.002*	*<0.62*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.002*	*<0.69*	*1*

CONTINUE ON PAGE V-5

CONTINUED FROM PAGE V-4

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*
AL0024619

OUTFALL NUMBER
DSN001

1. POLLUTANT AND CAS NO. *(if available)*	2. MARK 'X'			2. EFFLUENT							3. UNITS *(specify if blank)*		4. INTAKE *(optional)*		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE *(if available)*		c. LONG TERM AVRG. VALUE *(if available)*		d. NO. OF ANALYSIS	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS - VOLATILE COMPOUNDS *(continued)*															
22 V Methylene Chloride (75-09-2)	☒	☐	☒	*< 0.002*	*<0.62*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.002*	*<0.69*	*1*
23V 1,1,2,2-Tetra-Chloroethane (79-34-5)	☒	☐	☒	*< 0.002*	*<0.62*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.002*	*<0.69*	*1*
24V Tetrachloroethylene (127-18-4)	☒	☐	☒	*< 0.002*	*<0.62*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.002*	*<0.69*	*1*
25V Toluene (108-88-3)	☒	☐	☒	*< 0.002*	*<0.62*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.002*	*<0.69*	*1*
26V 1,2-Trans-Dichloroethylene (156-60-5)	☒	☐	☒	*< 0.001*	*<0.31*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.001*	*<0.34*	*1*
27V 1,1,1-Trichloroethane (71-55-6)	☒	☐	☒	*< 0.001*	*<0.31*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.001*	*<0.34*	*1*
28V 1,1,2-Trichloroethane (79-00-5)	☒	☐	☒	*< 0.002*	*<0.62*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.002*	*<0.69*	*1*
29V Trichloroethylene (79-01-6)	☒	☐	☒	*< 0.002*	*<0.62*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.002*	*<0.69*	*1*
30V Trichlorofluoromethane (75-69-4)	☐	☐	☒	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*n/a*	*0*	*n/a*	*n/a*	*n/a*	*n/a*	*0*
31V Vinyl Chloride (75-01-4)	☒	☐	☒	*< 0.001*	*<0.31*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.001*	*<0.34*	*1*
GC/MS FRACTION - ACID COMPOUNDS															
1A 2-Chlorophenol (95-57-8)	☒	☐	☒	*<0.0033*	*<1.03*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0033*	*<1.14*	*1*
2A 2,4-Dichlorophenol (120-83-2)	☒	☐	☒	*<0.0027*	*<0.84*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0027*	*<0.93*	*1*
3A 2,4-Dimethylphenol (105-67-9)	☒	☐	☒	*<0.0027*	*<0.84*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0027*	*<0.93*	*1*
4A 4,6-Dinitro-O-cresol (534-52-1)	☒	☐	☒	*< 0.024*	*<7.47*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.024*	*<8.28*	*1*
5A 2,4-Dinitrophenol (51-28-5)	☒	☐	☒	*< 0.042*	*<13.08*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.042*	*<14.49*	*1*
6A 2-Nitrophenol (88-75-5)	☒	☐	☒	*<0.0036*	*<1.12*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0036*	*<1.24*	*1*
7A 4-Nitrophenol (100-02-7)	☒	☐	☒	*<0.0024*	*<0.75*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0024*	*<0.83*	*1*
8A P-Chloro-M-Cresol (59-50-7)	☒	☐	☒	*<0.0030*	*<0.93*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0030*	*<1.03*	*1*
9A Pentachlorophenol (87-86-5)	☒	☐	☒	*<0.0036*	*<1.12*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0036*	*<1.24*	*1*
10A Phenol (10/-95-2)	☒	☐	☒	*<0.0015*	*<0.47*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0015*	*<0.52*	*1*
11A 2,4,6-Trichlorophenol (88-06-2)	☒	☐	☒	*<0.0027*	*<0.84*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0027*	*<0.93*	*1*

CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NO. *(if available)*	2. MARK 'X'			2. EFFLUENT							3. UNITS *(specify if blank)*		4. INTAKE *(optional)*		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE *(if available)*		c. LONG TERM AVRG. VALUE *(if available)*		d. NO. OF ANALYSIS	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS															
1B Acenphthene (83-32-9)	☒	☐	☒	<0.0019	<0.59	n/a	n/a	n/a	n/a	1	mg/l	kg/day	<0.0019	<0.66	1
2B Acenaphtylene (208-96-8)	☒	☐	☒	<0.0035	<1.09	n/a	n/a	n/a	n/a	1	mg/l	kg/day	<0.0035	<1.21	1
3B Anthracene (120-12-7)	☒	☐	☒	<0.0019	<0.59	n/a	n/a	n/a	n/a	1	mg/l	kg/day	<0.0019	<0.66	1
4B Benzidine. (92-87-5)	☒	☐	☒	< 0.044	<13.7	n/a	n/a	n/a	n/a	1	mg/l	kg/day	< 0.044	<15.18	1
5B Benzo (a) Anthracene (56-55-3)	☒	☐	☒	<0.0078	<2.43	n/a	n/a	n/a	n/a	1	mg/l	kg/day	<0.0078	<2.69	1
6B Benzo (a) Pyrene (50-32-8)	☒	☐	☒	<0.0025	<0.78	n/a	n/a	n/a	n/a	1	mg/l	kg/day	<0.0025	<0.86	1
7B 3,4-Benzofluoranthene (205-99-2)	☒	☐	☒	<0.0048	<1.49	n/a	n/a	n/a	n/a	1	mg/l	kg/day	<0.0048	<1.66	1
8B Benzo *(ghi)* Perylene (191-24-2)	☒	☐	☒	<0.0041	<1.28	n/a	n/a	n/a	n/a	1	mg/l	kg/day	<0.0041	<1.41	1
9B Benzo *(k)* Fluoranthene (207-08-9)	☒	☐	☒	<0.0025	<0.78	n/a	n/a	n/a	n/a	1	mg/l	kg/day	<0.0025	<0.86	1
10B Bis *(2-Chloroethoxy)* Methane (111-91-1)	☒	☐	☒	<0.0053	<1.65	n/a	n/a	n/a	n/a	1	mg/l	kg/day	<0.0053	<1.83	1
11B Bis *(2-Chloroethyl)* Ether (111-44-4)	☒	☐	☒	<0.0057	<1.77	n/a	n/a	n/a	n/a	1	mg/l	kg/day	<0.0057	<1.97	1
12B Bis *(2-Chloroisapropyl)* Ether (102-60-1	☒	☐	☒	<0.0057	<1.77	n/a	n/a	n/a	n/a	1	mg/l	kg/day	<0.0057	<1.97	1
13B Bis*(2-Ethylhexyl)* Phthalate (117-81-7)	☒	☐	☒	0.0223	6.94	n/a	n/a	n/a	n/a	1	mg/l	kg/day	0.0044	1.52	1
14 B 4-Bromophenyl Phenyl Ether (101-55-3)	☒	☐	☒	<0.0019	<0.59	n/a	n/a	n/a	n/a	1	mg/l	kg/day	<0.0019	<0.66	1
15B Butyl Benzyl Phthalate (85-68-7)	☒	☐	☒	<0.0025	<0.78	n/a	n/a	n/a	n/a	1	mg/l	kg/day	<0.0025	<0.86	1
16B 2-Chloronaphthalene (91-68-7)	☒	☐	☒	<0.0019	<0.59	n/a	n/a	n/a	n/a	1	mg/l	kg/day	<0.0019	<0.66	1
17B 4-Chlorophenyl Phenyl Ether (7005-72-3)	☒	☐	☒	<0.0042	<1.31	n/a	n/a	n/a	n/a	1	mg/l	kg/day	<0.0042	<1.45	1
18B Chrysene (218-01-9)	☒	☐	☒	<0.0025	<0.78	n/a	n/a	n/a	n/a	1	mg/l	kg/day	<0.0025	<0.86	1
19B Dibenzo *(a,h)* Anthracene (53-70-3)	☒	☐	☒	<0.0025	<0.78	n/a	n/a	n/a	n/a	1	mg/l	kg/day	<0.0025	<0.86	1
20B 1,2-Dichlorobenzene (95-50-1)	☒	☐	☒	<0.0019	<0.59	n/a	n/a	n/a	n/a	1	mg/l	kg/day	<0.0019	<0.66	1
21B 1,3-Dichlorobenzene (541-73-1)	☒	☐	☒	<0.0019	<0.59	n/a	n/a	n/a	n/a	1	mg/l	kg/day	<0.0019	<0.66	1

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CONTINUED FROM PAGE V-6

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*
AL0024619

OUTFALL NUMBER
DSN001

1. POLLUTANT AND CAS NO. *(if available)*	2. MARK 'X'			2. EFFLUENT							3. UNITS *(specify if blank)*		4. INTAKE *(optional)*		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE *(if available)*		c. LONG TERM AVRG. VALUE *(if available)*		d. NO. OF ANALYSIS	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS - BASE/NEUTRAL COMPOUNDS *(continued)*															
22B 1,4-Dichlorobenzene (106-46-7)	☒	☐	☒	*<0.0044*	*<1.37*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0044*	*<1.52*	*1*
23B 3,3'-Dichlorobenzidine (91-94-1)	☒	☐	☒	*<0.0165*	*<5.14*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0165*	*<5.69*	*1*
24B Diethyl Phthalate (84-66-2)	☒	☐	☒	*<0.0019*	*<0.59*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0019*	*<0.66*	*1*
25B Dimethyl Phthalate (131-11-3)	☒	☐	☒	*<0.0016*	*<0.5*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0016*	*<0.55*	*1*
26B Di-N-Butyl Phthalate (131-11-3)	☒	☐	☒	*<0.0025*	*<0.78*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0025*	*<0.86*	*1*
27B 2,4-Dinitrotoluene (121-14-2)	☒	☐	☒	*<0.0057*	*<1.77*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0057*	*<1.97*	*1*
28B 2,6-Dinitrotoluene (606-20-2)	☒	☐	☒	*<0.0019*	*<0.59*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0019*	*<0.66*	*1*
29B Di-N-Octyl Phthalate (117-84-0)	☒	☐	☒	*<0.0025*	*<0.78*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0025*	*<0.86*	*1*
30B 1,2-Diphenylhydrazine *(as Azo-benzene)* (122-66-7)	☒	☐	☒	*< 0.003*	*<0.93*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.003*	*<1.03*	*1*
31B Fluoranthene (206-44-0)	☒	☐	☒	*<0.0022*	*<0.69*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0022*	*<0.76*	*1*
32B Fluorene (86-73-7)	☒	☐	☒	*<0.0019*	*<0.59*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0019*	*<0.66*	*1*
33B Hexachlorobenzene (118-74-1)	☒	☐	☒	*<0.0019*	*<0.59*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0019*	*<0.66*	*1*
34B Hexachlorobutadiene (87-68-3)	☒	☐	☒	*<0.0009*	*<0.28*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0009*	*<0.31*	*1*
35B Hexachlorocyclopentadiene (77-47-4)	☒	☐	☒	*< 0.001*	*<0.31*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.001*	*<0.34*	*1*
36B Hexachloroethane (67-72-1)	☒	☐	☒	*<0.0016*	*<0.5*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0016*	*<0.55*	*1*
37B Indeno *(1,2,3-cd)* Pyrene (193-39-5)	☒	☐	☒	*<0.0037*	*<1.15*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0037*	*<1.28*	*1*
38B Isophorone (78-59-1)	☒	☐	☒	*<0.0022*	*<0.69*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0022*	*<0.76*	*1*
39B Napthalene (91-20-3)	☒	☐	☒	*<0.0016*	*<0.5*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0016*	*<0.55*	*1*
40B Nitrobenzene (98-95-3)	☒	☐	☒	*< 0.002*	*<0.62*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.002*	*<0.69*	*1*
41B N-Nitrosodimethylamine (62-75-9)	☒	☐	☒	*< 0.003*	*<0.93*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.003*	*<1.03*	*1*
42B N-Nitrosdi-N-Propylamine (621-64-7)	☒	☐	☒	*< 0.002*	*<0.62*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.002*	*<0.69*	*1*

CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

1. POLLUTANT AND CAS NO. *(if available)*	2. MARK 'X'			2. EFFLUENT							3. UNITS *(specify if blank)*		4. INTAKE *(optional)*		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE *(if available)*		c. LONG TERM AVRG. VALUE *(if available)*		d. NO. OF ANALYSIS	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS FRACTION - BASE/NEUTRAL COMPOUNDS *(continued)*															
43B N-Nitrosodiphenylamine (86-30-6)	☒	☐	☒	*<0.0019*	*<0.59*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0019*	*<0.66*	*1*
44B Phenanthrene (85-01-/	☒	☐	☒	*<0.0054*	*<1.68*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0054*	*<1.86*	*1*
45B Pyrene (129-00-0)	☒	☐	☒	*<0.0019*	*<0.59*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0019*	*<0.66*	*1*
46B 1,2,4-Trichlorobenzene (120-82-1)	☒	☐	☒	*<0.0019*	*<0.59*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*<0.0019*	*<0.66*	*1*
GC/MS FRACTION - PESTICIDES															
1P Aldrin (309-00-2)	☐	☐	☒	*< 0.003*	*<0.93*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.003*	*<1.03*	*1*
2P β-Bhc (319-85-7)	☐	☐	☒	*< 0.003*	*<0.93*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.003*	*<1.03*	*1*
4P γ-BHC (58-89-9)	☐	☐	☒	*< 0.003*	*<0.93*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.003*	*<1.03*	*1*
5P δ-BHC (319-86-8)	☐	☐	☒	*< 0.003*	*<0.93*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.003*	*<1.03*	*1*
6P Chlordane (57-74-9)	☐	☐	☒	*< 0.003*	*<0.93*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.003*	*<1.03*	*1*
7P 4,4'-DDT (50-29-3)	☐	☐	☒	*< 0.003*	*<0.93*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.003*	*<1.03*	*1*
8P 4,4'-DDE (72-55-9)	☐	☐	☒	*< 0.003*	*<0.93*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.003*	*<1.03*	*1*
9P 4,4'-DDD (72-54-8)	☐	☐	☒	*< 0.003*	*<0.93*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.003*	*<1.03*	*1*
10P Dieldrin (60-57-1)	☐	☐	☒	*< 0.003*	*<0.93*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.003*	*<1.03*	*1*
11P α-Endosulfan (115-29-7)	☐	☐	☒	*< 0.003*	*<0.93*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.003*	*<1.03*	*1*
12P β-Endosulfan (115-29-7	☐	☐	☒	*< 0.003*	*<0.93*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.003*	*<1.03*	*1*
13P Endosulfan Sulfate (1031-07-8)	☐	☐	☒	*< 0.003*	*<0.93*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.003*	*<1.03*	*1*
14P Endrin (72-20-8)	☐	☐	☒	*< 0.001*	*<0.31*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.001*	*<0.34*	*1*
15P Endrin Aldehyde (7421-93-4)	☐	☐	☒	*< 0.003*	*<0.93*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.003*	*<1.03*	*1*
16P Heptachlor (76-44-8)	☐	☐	☒	*< 0.003*	*<0.93*	*n/a*	*n/a*	*n/a*	*n/a*	*1*	*mg/l*	*kg/day*	*< 0.003*	*<1.03*	*1*

CONTINUE ON PAGE V-9

CONTINUED FROM PAGE V-6

EPA I.D. NUMBER *(copy from Item 1 of Form 1)*
AL0024619

OUTFALL NUMBER
DSN001

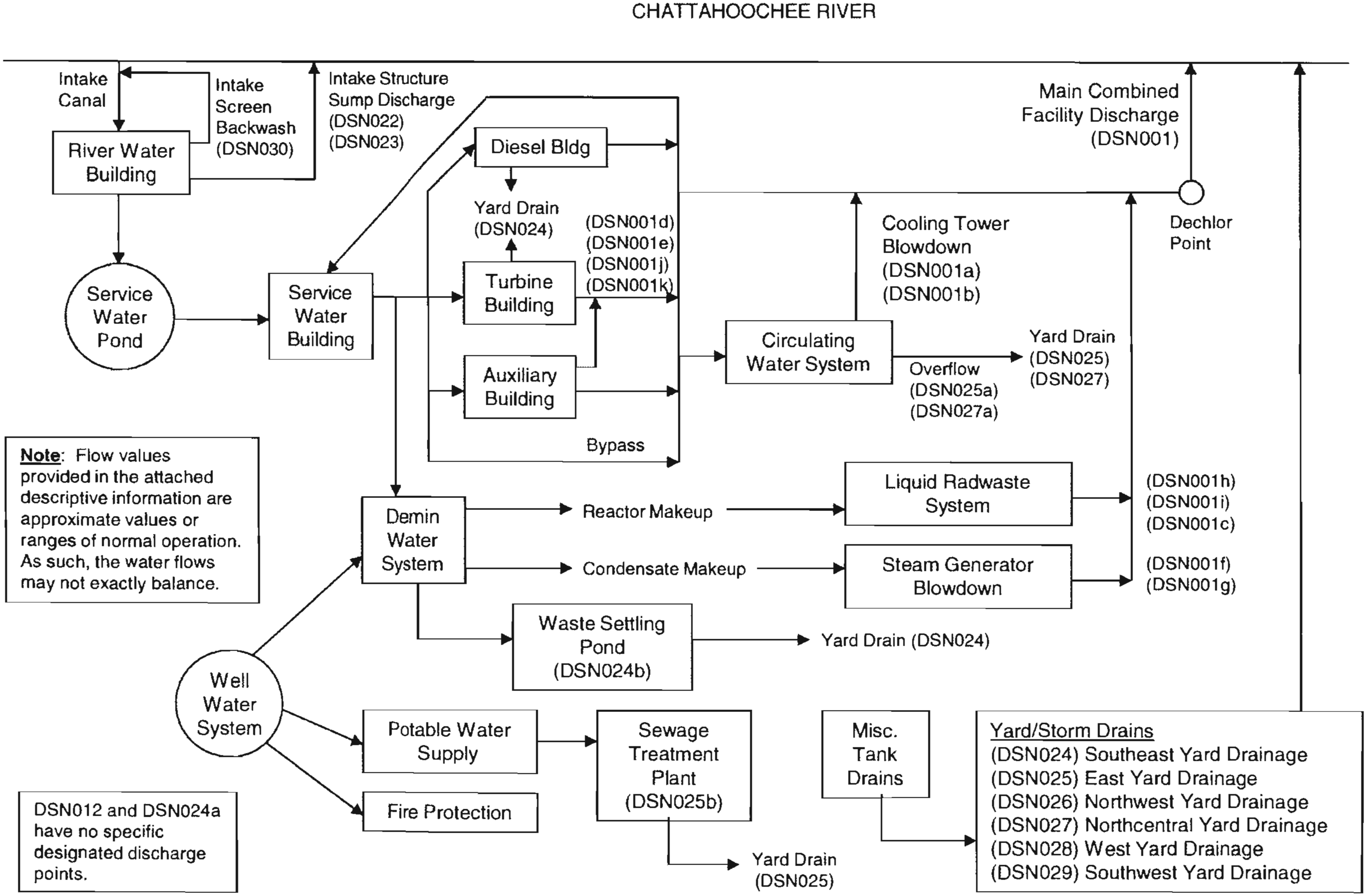
1. POLLUTANT AND CAS NO. *(if available)*	2. MARK 'X'			2. EFFLUENT							3. UNITS *(specify if blank)*		4. INTAKE *(optional)*		
	a. TESTING REQUIRED	b. BELIEVED PRESENT	c. BELIEVED ABSENT	a. MAXIMUM DAILY VALUE		b. MAXIMUM 30 DAY VALUE *(if available)*		c. LONG TERM AVRG. VALUE *(if available)*		d. NO. OF ANALYSIS	a. CONCENTRATION	b. MASS	a. LONG TERM AVERAGE VALUE		b. NO. OF ANALYSES
				(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS	(1) CONCENTRATION	(2) MASS				(1) CONCENTRATION	(2) MASS	
GC/MS - PESTICIDES *(continued)*															
17P Heptachlor Expxide (1024-57-3)	☐	☐	☒	< 0.003	<0.93	n/a	n/a	n/a	n/a	1	mg/l	kg/day	< 0.003	<1.03	1
18P PCB-1242 (53469-21-9)	☐	☐	☒	< 0.005	<1.56	n/a	n/a	n/a	n/a	1	mg/l	kg/day	< 0.005	<1.72	1
19P PCB-1254 (11097-69-1)	☐	☐	☒	< 0.005	<1.56	n/a	n/a	n/a	n/a	1	mg/l	kg/day	< 0.005	<1.72	1
20P PCB-1221 (11104-28-2)	☐	☐	☒	< 0.005	<1.56	n/a	n/a	n/a	n/a	1	mg/l	kg/day	< 0.005	<1.72	1
21P PCB-1232 (11141-16-5)	☐	☐	☒	< 0.005	<1.56	n/a	n/a	n/a	n/a	1	mg/l	kg/day	< 0.005	<1.72	1
22P PCB-1248 (12672-29-6)	☐	☐	☒	< 0.005	<1.56	n/a	n/a	n/a	n/a	1	mg/l	kg/day	< 0.005	<1.72	1
23P PCB-1260 (11096-82-5)	☐	☐	☒	< 0.005	<1.56	n/a	n/a	n/a	n/a	1	mg/l	kg/day	< 0.005	<1.72	1
24P PCB-1016 (12674-11-2)	☐	☐	☒	< 0.005	<1.56	n/a	n/a	n/a	n/a	1	mg/l	kg/day	< 0.005	<1.72	1
25P Toxaphene (8001-35-2)	☐	☐	☒	< 0.003	<0.93	n/a	n/a	n/a	n/a	1	mg/l	kg/day	< 0.003	<1.03	1

Attachment 1 to U.S. EPA Form 3510-2C

Section IIA. Line Drawing

Joseph M. Farley Nuclear Power Plant
NPDES No. AL0024619

Farley Nuclear Plant
Line Drawing/Water Balance
Permit No. AL0024619



Note: Flow values provided in the attached descriptive information are approximate values or ranges of normal operation. As such, the water flows may not exactly balance.

Yard/Storm Drains
(DSN024) Southeast Yard Drainage
(DSN025) East Yard Drainage
(DSN026) Northwest Yard Drainage
(DSN027) Northcentral Yard Drainage
(DSN028) West Yard Drainage
(DSN029) Southwest Yard Drainage

DSN012 and DSN024a have no specific designated discharge points.

Farley Nuclear Plant
Line Drawing/Water Balance
Permit No. AL0024619

Drawing Notes

1) River Water Intake - This structure is operational, with a maximum withdrawal capacity of 97,500 gpm. Average withdrawal rate is ~68,700 gpm.

2) Average discharge from from the River Water Intake Structure sump discharge is ~1,250 gpm. This is an intermittent flow.

3) Blowdown of the cooling tower system is required to maintain proper chemical balance. Cooling tower blowdown flow is intermittent, and is typically performed for a period of 3 to 5 hours each day. Average flows for Unit 1 and Unit 2 are ~710,000 gallons per event and 730,000 gallons per event, respectively.

4) The sewage treatment plant has a maximum capacity of ~4,200 gpm.

5) The discharges of once-through cooling service water from each unit are combined and carried to the Main Combined Facility Discharge. Other various flows discharge at this point as well (cooling tower blowdown, steam generator blowdown, liquid radwaste system, etc.). The Main Combined Facility Discharge averages a flow of ~56,360 gpm.

6) During normal operation, Condensate Makeup is primarily used to replenish secondary water that is discharged via steam generator blowdown. Total steam generator blowdown for both units is 200 to 240 gpm during normal operation.

7) Reactor and auxiliary system leakages and other auxiliary building wastes which are not recyclable are processed, as necessary, to ensure that all discharges are well below the limits established by the Nuclear Regulatory Commission. The Liquid Radwaste System discharges in batches, and not continuously. The volume of water that is batch released during normal operation can be normalized to a continuous flow of ~275 gpm for Units 1 and 2 combined.

8) The yard drainage system conveys stormwater runoff from areas associated with industrial activity to the Chattahoochee River. None of the areas discharge directly to the river, but discharge directly or indirectly to small tributaries which ultimately discharge to the Chattahoochee River. Flow is intermittent and varies according to rainfall events.

9) Groundwater is used to supply the fire protection system, the potable water system, and other small miscellaneous systems. Groundwater can be used as an alternate supply to the demin water system. Typical groundwater use is ~166,300 gallons per day.

10) Service Water, which provides cooling and makeup water to both units, is withdrawn from a 95 acre service water pond which is supplied from the Chattahoochee River. During normal operation, the service water pond stores water pumped from the river prior to use.

11) The Service Water system primarily provides once-through cooling water for various plant systems. Typical flow is ~36,000 gpm per unit. The majority of service water flow is used for equipment cooling in the turbine building and auxiliary building.

12) The Demin water system provides high purity water to the reactors and steam generators. Maximum installed capacity is 360 gpm, with a normal operation flow of ~240 gpm.

13) Makeup to the circulating water system and cooling towers is performed as necessary to offset drift/evaporation loss and cooling tower blowdown. Normal circulating water makeup is ~29,000 gpm for both units. An additional ~4,000 gpm is used per unit during periods of cooling tower blowdown.

14) The effluent from the water treatment plant complex sump and area runoff is discharged via the waste settling pond. The pond discharge is ultimately routed to the southeast yard drain. This is normally a continuous flow, but can be intermittent depending on plant operation.

Attachment 2 to U.S. EPA Form 3510-2C

Corrosion Inhibitors, Biocides, and Other Chemical Products In Use

Joseph M. Farley Nuclear Power Plant
NPDES No. AL0024619

Corrosion Inhibitors, Biocides, and Chemical Treatments
Farley Nuclear Plant

Service Water System – Units 1 & 2 (Service Water Intake Structure)

Sodium Hypochlorite

Added to maintain concentrations adequate to control Corbicula (Asiatic clams) in the service water system. Rate is controlled to assure that TRC values are in compliance with permit discharge limits at the Main Combined Facility Discharge (DSN001).

Ammonium Bisulfite

Ammonium bisulfite is utilized as a dechlorination agent to dechlorinate residual chlorine present in Service Water due to cooling tower blowdown. Sufficient ammonium bisulfite is added to dechlorinate the amount of residual chlorine present in cooling tower blowdown, plus some excess to ensure dechlorination during any transients that may occur.

3D TRASAR 3DT197

3D TRASAR 3DT197 is added to inhibit copper corrosion of the service water system. Treatment concentration does not exceed 10 ppm in the service water system.

ControlBrom CB70

ControlBrom CB70 is added as needed to control microbiological fouling of the service water and circulating water systems. When added, the treatment target of 6.4 ppm in service water is maintained.

Circulating Water System – Units 1 & 2

Sodium Hypochlorite

Sodium Hypochlorite is added to maintain concentrations adequate to control biofouling in the circulating water system. Farley is currently continuously adding sodium hypochlorite to maintain a constant residual of approximately 0.50 mg/l Free Available Chlorine (FAC) within the cooling towers. Cooling tower blowdown is continuously dechlorinated using ammonium bisulfite at the Service Water surge tank on each unit.

3D TRASAR 3DT190

3D TRASAR 3DT190 is a dispersant used in the circulating water system and is added as needed for solids control. When added, a target value of 8.3 ppm of product in the circulating water system is maintained.

3D TRASAR 3DT177

3D TRASAR 3DT177 is added as needed for corrosion control of the circulating water system. When added, a target concentration of 8.3 ppm of product in the circulating water system is maintained.

Circulating Water System – Units 1 & 2 continued

Spectrus CT1300

Spectrus CT1300 is an aqueous solution of proprietary quaternary ammonium compound that is added as needed for biofouling control in the cooling towers.

Nalco 7465 Antifoam

Nalco 7465 Antifoam is a proprietary blend of surface active agents added as needed to control foam in the circulating water system.

Reactor Coolant System

Lithium Hydroxide

Added at a rate to maintain approximately 0.20 – 4.36 ppm concentration in the reactor coolant system.

Boric Acid

Added to achieve a maximum of approximately 2,500 ppm in the reactor coolant system.

Hydrogen Peroxide

Treatment during unit shutdown uses approximately 40 quarts.

Hydrazine

Treatment during unit startup uses approximately 5 quarts.

Zinc Acetate

Currently added to maintain approximately 5 – 35 ppb zinc in the reactor coolant system.

Secondary System Chemical Control

Hydrazine

Added as needed to maintain approximately 110 – 150 ppb concentration in the secondary system. During wet lay-up process, hydrazine concentration is maintained at 75 – 500 ppm in the steam generators.

Ethanolamine (ETA)

Added as needed to the secondary system to maintain a concentration of approximately 0.5 – 4.0 ppm.

Ammonium Chloride

Added as needed to the secondary system at a rate of approximately 0.05 – 0.30 ml/min of a 10 – 40 ppm chloride solution.

Component Cooling Water System

Potassium Chromate

Added as needed to maintain approximately 175 – 1,000 ppm concentration with 400 ppm as the normal range for corrosion control.

Potassium Dichromate

Added as needed in the system for pH control.

Potassium Hydroxide

Added as needed in the system for pH control.

Service Building / Turbine Building HVAC Systems

Drewguard 4109 Corrosion Treatment (4% Sodium Nitrite Solution)

Added as needed in systems to maintain approximately 300 – 1,400 ppm concentration.

Diesel Generator Jacket Water System

Drewguard 4109

Added as needed to maintain approximately 500 – 1,000 ppm concentration in the system.

BIOSPERSE 254

Previously approved for use by ADEM (July 29, 1992) in the system as an antimicrobial product for control of slime-forming/sulfate-reducing bacteria and algae. This product is not currently in use at FNP but may be utilized in the future.

Drew WPD 11-166 (Tolytriazole Buffered with Sodium Hydroxide)

Added as necessary for yellow metal corrosion control.

Sewage Treatment Plant

Calcium / Sodium Hypochlorite

Added in concentrations necessary to achieve sufficient residual to assure bacteriological control.

Sodium Hydroxide

Added in concentrations necessary for the purpose of alkalinity control.

Drinking Water System

Production & Construction Systems

Sodium hypochlorite added to maintain approximately 0.5 – 2.0 ppm FAC residual in systems.

IONICS Ultrapure Water System

Spectrus NX108

Added as needed for biocide treatment of the reverse osmosis water purification system.

Attachment 3 to U.S. EPA Form 3510-2C

Descriptive Information and Data for Water Uses

Joseph M. Farley Nuclear Power Plant
NPDES No. AL0024619

Descriptive Information and Data for Water Uses
Farley Nuclear Plant

Introduction

Farley Nuclear Plant (FNP), located on the west bank of the Chattahoochee River at approximately river mile 44.3, consists of two generating units with a total nameplate rating of 1,776 megawatts. The plant provides approximately 15 to 20 percent of the power available to Alabama Power customers.

Service Water, which provides cooling and make-up water to both units, is withdrawn from a 95 acre Service Water Pond which is supplied from the Chattahoochee River. The FNP river water intake structure is located at the terminus of a 200 foot intake canal and delivers water from the Chattahoochee River to the Service Water Pond. During normal plant operation, the Service Water Pond stores water pumped from the river prior to use in the Service Water system. The Service Water system receives make-up from the Service Water intake structure located at the Service Water Pond. Service Water is pumped from the Service Water intake structure to the Plant to provide once-through cooling water to certain plant systems and make-up water to the water treatment plant and Circulating Water system. The Service Water Pond also provides the required cooling water storage capacity to accomplish and maintain simultaneous safe shutdown and cooldown conditions for both nuclear reactor units.

The discharges of Service Water from each unit are combined and carried to the plant discharge structure (DSN001) by a single 60 inch diameter pipe.

The FNP Circulating Water system consists of counterflow mechanical draft cooling towers which provide cooling for the main condensers. Make-up to the Circulating Water system is provided to replace water lost to cooling tower evaporation, drift, and blowdown. Blowdown is mixed with once-through Service Water and routed for discharge via DSN001.

The water treatment plant provides high purity water to the reactors and steam generators.

A 100,000 GPD sewage treatment plant provides treatment of sanitary wastes at FNP.

NOTE:

The following information provides detail on water use at FNP required for the NPDES Permit renewal application. The information is categorized by plant system. Current NPDES point source designations are indicated in parentheses.

River Water System

River Water Intake – North and South

FNP withdraws water from the Chattahoochee River for cooling and other plant uses via a 200 foot intake canal. The river water intake structure contains two (2) sections, each housing five (5) pumps with a total capacity of approximately 48,750 gpm. The river water pumps provide water to a storage pond for plant use. The pumps also provide water for river water screen backwash, pump cooling, and filter backwash.

River Water Intake Screen Backwash – North and South (DSN030)

The screens are backwashed, as necessary, at different intervals during the day. Material removed from the screens during backwashing is disposed, as necessary, in a solid waste landfill. The screen backwash water is returned to the intake canal. The average flow combined for both units is 45,000 GPD and the maximum flow is 140,000 GPD.

River Water Pumps Mini-Flow – South

The mini-flow provides pump protection by allowing a minimum flow from the pump discharge header to the wet pit. The average flow is approximately 1,440,000 GPD and the maximum flow is approximately 2,160,000 GPD.

River Water Pumps Mini-Flow – North

The mini-flow provides pump protection by allowing a minimum flow from the pump discharge header to the wet pit. The average flow is approximately 1,440,000 GPD and the maximum flow is approximately 2,160,000 GPD.

River Water Building Sump Discharge – South (DSN022) and North (DSN023)

All cooling water and leakage flows are routed to the building sump and are subsequently discharged to the Chattahoochee River. The average flow for DSN022 is approximately 22,000 GPD. The average flow for DSN023 is approximately 7,800 GPD. Flows are itemized below:

1. River Water Pumps Cooling Water

   The cooling water is supplied from the river water pumps discharge header and is discharged to the building sump.

2. River Water Pumps Air Compressor Cooling Water

   Air compressor cooling water is supplied from the river water pumps discharge header and is discharged through the building sump.

3. River Pumps Cooling Water-Filter Backwash Water

   The backwash water is supplied from the river water pumps discharge header and flushes debris from the filter. The water is discharged to the building sump.

Service Water System

Service Water Intake Structure – Units 1 & 2

The FNP Service Water system withdraws water from the Service Water Pond for plant cooling and other plant uses. The Service Water system primarily provides cooling water for various plant systems. It also provides water to the water treatment plant for production of high quality water for use in the reactors and steam supply systems. The components of the Service Water system are itemized below:

Service Water Intake Screen Backwash – Units 1 & 2

The intake screens are backwashed, as needed, at different intervals during the day. Material removed from the screens by backwashing is disposed in a solid waste landfill. The backwash water is routed back to the Service Water Pond.

Service Water Pumps Mini-Flow – Units 1 & 2

The mini-flow provides pump protection by allowing a minimum flow from the pump discharge header to the wet-pit.

Service Water Structure Sump Discharge – Units 1 & 2

All cooling waters and leakage flows are routed to the building sump and are subsequently discharged to the Southwest Yard Drainage (DSN029). The components which discharge to the building sump are itemized below:

1. Service Water Pump Cooling Water – Units 1 & 2

   The cooling water is supplied from the Service Water pumps and is discharged to the building sump.

2. Service Water Pumps Air Compressor Cooling Water – Units 1 & 2

   Air compressor cooling water is supplied from the Service Water pumps discharge header and is discharged to the building sump.

Once-Through Cooling Water System

This discharge is composed of the combined flows of service water used for plant equipment cooling. The components contributing to this discharge are itemized below:

1. Auxiliary Building and Containment Building Equipment Cooling Water – Units 1 & 2

   Various equipment cooling waters in the auxiliary building and the containment building exchange heat to service water which is ultimately discharged as once-through cooling water via DSN001.

2. Diesel Generator Building Equipment Cooling Water – Units 1 & 2

   This water provides cooling water for the emergency diesels and is discharged as once-through cooling water. The system is supplied by Service Water.

3. Turbine Building Equipment Cooling Water – Units 1 & 2

   The Service Water system provides cooling water for various equipment heat exchangers in the turbine building. The water is ultimately discharged as once-through cooling water.

4. Dilution By-Pass – Units 1 & 2

   By-pass lines in the Service Water system are provided to allow flow in excess of demand to be discharged in order to protect plant components from over-pressurization.

Turbine Building System

Turbine Building Sump – Units 1 & 2 (DSN001d, DSN001e)

This discharge consists of all drains, cooling waters, and leakage flows collected in the turbine building. The components contributing to this discharge are itemized below:

1. Turbine Building Chemistry Lab Drains – Units 1 & 2

   Wastes from routine chemical analyses on the steam system are discharged to the Unit 2 turbine building sump.

2. Turbine Building Floor Drains – Units 1 & 2

   The floor drain system collects equipment and valve leakage and routes it to the turbine building sump.

3. Circulating Water Canal Drainage – Units 1 & 2

   During outages maintenance may require drainage of the circulating water system. A portion of this drainage is routed to the turbine building sump.

4. Auxiliary Building Sumps – Units 1 & 2

   The auxiliary building sumps collect water from equipment draining and valve leakoff. The sumps normally discharge to the turbine building sump.

5. Draining of Steam Generators – Units 1 & 2

   During outages the steam generators may be drained through the turbine building sump.

Condenser Water Box Drain – Units 1 & 2 (DSN001j, DSN001k)

This discharge is required periodically for maintenance of the condenser and for investigation of condenser tube leaks. This water is discharged to the turbine building sump.

Diesel Building System

Diesel Building Sump

Drains in the emergency diesel room are routed to a sump/oil-water separator outside the diesel building which is routed to the southeast yard drain (DSN024). Diesel building air compressor cooling water (Service Water) continuously flows through this discharge path. The components of this system currently are:

1. Floor Drain System

   The floor drain system collects equipment and valve leakage and routes it to the diesel building sump.

2. Air compressor Cooling Water

   Service Water provided as air compressor cooling water is routed to the diesel building sump.

Liquid Radwaste System

Liquid Radwaste System – Units 1 & 2 (DSN001h, DSN001i)

Reactor and auxiliary system leakages and other auxiliary building wastes which are not recyclable are processed, as necessary, to ensure that all discharges are well below the limits established by the Nuclear Regulatory Commission. This discharge is also processed, as necessary, to remove chromates. Boron, which is used in the reactor and auxiliary systems, may be discharged in very low concentrations via this system. This system ultimately discharges to the Chattahoochee River via DSN001.

1. Refueling Water Storage Tank Retention Area – Units 1 & 2

   For radiological control, a retention area has been constructed around the refueling water storage tank which is designed to contain the volume of the entire tank in the event of a rupture. Water from equipment leakage is also routed to the liquid radwaste system via this area.

2. Reactor Make-Up Water Storage Tank Retention Area – Units 1 & 2

   For radiological control, a retention area has been constructed around the reactor make-up water storage tank which is designed to contain the volume of the entire tank in the event of rupture. Water from equipment leakage is routed to the liquid radwaste system.

3. Waste Solidification Building Sump – Units 1 & 2

   All drains, cooling waters, and equipment leakages in the waste solidification building are routed to the building sump. This sump is routed to the liquid radwaste system.

4. Low Level Radwaste Storage Building Sump – Units 1 & 2

   This sump is provided as a captive sump to contain any emergency release.

Steam Generator Blowdown – Units 1 & 2 (DSN001f, DSN001g)

The steam generators must be blown down to minimize the concentration of contaminants in the system and to regulate treatment chemical concentrations.

Water Treatment Plant System

Waste Settling Pond (DSN024b)

The effluent from the water treatment plant complex sump and runoff from the water treatment plant bulk chemical storage area is discharged via the waste settling pond. The pond discharge is ultimately routed to the Southeast Yard Drainage (DSN024). Components contributing to this discharge include:

1. Water Treatment Plant Complex Sump

   This sump collects all water treatment wastes, regeneration wastes, backwashes, and cooling water. The discharge from this sump is routed to the waste settling pond. The components are identified as follows:

A. Clarifier Backwash

The clarifier uses alum, coagulant, chlorine, and a pH adjuster to convert service water to a purity level acceptable for demineralization. Backwash of the clarifier is required periodically each day to remove accumulated material. This flow is routed to the water treatment plant complex sump.

B. Water Treatment Plant Carbon Filter Backwash – Units 1 & 2

The backwash removes suspended solids which are retained on top of the carbon during the backwash operation. This discharge is routed to the water treatment plant complex sump.

C. Water Treatment Plant Sump – Units 1 & 2

All demineralizer regeneration wastes are discharged to this sump. The effluent from this sump is discharged to the neutralization tank.

D. Neutralization Tank – Units 1 & 2

This tank is used in conjunction with the water treatment plant sump to recirculate and neutralize regeneration wastes prior to discharge. Tank capacity is 20,000 gallons. The tank discharge is routed to the water treatment plant complex sump.

E. Ionics Water Treatment System

All backwash and treatment system rinse water is routed to the water treatment plant complex sump.

2. Acid and Caustic Tank Area Storm Runoff

This discharge consists of the runoff from the pad on which the acid and caustic bulk tanks are located. This discharge is routed to the waste settling pond.

Cooling Tower System – Units 1 & 2

The cooling tower system is a recirculating system which includes the condensers and cooling towers. Components of this discharge include:

1. Cooling Tower System Evaporation / Drift – Units 1 & 2

Evaporation / drift is estimated to be approximately 1.5% of the cooling tower system flow rate.

2. Cooling Tower Blowdown – Units 1 & 2 (DSN001a, DSN001b)

Blowdown of the cooling tower system is required to maintain the proper chemical balance in the cooling tower system. At times, the blowdown may be isolated while chemical additions for control of biofouling and corrosion protection are being made. Average flow for DSN001a and DSN001b is approximately 6.0 MGD during discharge. Currently, the cooling tower blowdown is normally continuously open.

3. Cooling Tower System Overflow – Units 1 & 2 (DSN025a, DSN027a)

Periodically, due to imbalances or equipment malfunction in the cooling tower system, some of the system contents will overflow the basin and flow to the yard drains. When this occurs, action is initiated to correct the problem. Average annual flows for DSN025a and DSN027a are approximately 45,000 gallons per unit, based on four (4) hours per event and three (3) events per year.

Condenser Drain (Hot Well Flush) System – Units 1 & 2

This discharge is used periodically to control the level of contaminants in the steam cycle, especially during plant start-ups and in chemical control during system transients.

Sewage Treatment Plant System (DSN025b)

The sewage treatment plant has a capacity of 100,000 GPD with 96% BOD removal. A sand filter is in place to improve plant efficiency. The effluent from the sand filter can be discharged through three (3) separate paths:

East Yard Drainage System (normal flow path) (DSN025)
Waste Settling Pond (alternate) (DSN024b)
Southeast Yard Drainage System (alternate) (DSN024)

Miscellaneous Systems

1. Chemical Metal Cleaning Wastes System (DSN012)

   Wastewaters which result from chemical metal cleaning activities associated with plant systems will be treated and discharged in accordance with the requirements of 40 CFR Part 423. This generic point establishes monitoring requirements and effluent limits for the treatment process. The effluent from the treatment process may be discharged to various outfalls based on the location of the metal cleaning activities provided DSN012 limits are met.

2. Treated Chromate Bearing Waste Water System (DSN001c)

   This discharge point involves a portable ion-exchange wastewater treatment unit which is used to remove chromium from component cooling water containing potassium chromate as a corrosion inhibitor. This portable system may be moved to various parts of the plant for use and may be released via the Liquid Radwaste System. Monitoring to confirm compliance with chromium limits is conducted on each batch of wastewater treated. The average flow is approximately 500 gallons per batch.

3. Treated Chromate Bearing Waste Water System (DSN024a)

   This discharge point involves a portable ion-exchange wastewater treatment unit which is used to remove chromium from component cooling water containing potassium chromate as a corrosion inhibitor. This portable system may be used in the Water Treatment Plant and released via the WTP sump which is routed to the Waste Settling Pond discharge point. Monitoring to confirm compliance with chromium limits is conducted on each batch of wastewater treated. The average flow is approximately 500 gallons per batch.

4. Petroleum Storage Area (DSN035)

   Various diked petroleum storage areas are drained as necessary to remove accumulated rainwater. Best management practices are used when draining diked areas, in accordance with the provisions of the existing NPDES permit.

Yard Drainage System

1. Southeast Yard Drainage (DSN024)

   This drainage receives storm runoff from buildings and yards in the southeast areas of the plant as well as equipment cooling water and other non-routine inputs. The average flow is approximately 34,900,000 gallons per event from a drainage area of approximately 204 acres. This drainage consists of the following:

   A. Southeast Yard Drain

      This drain system provides a discharge path for the roof and yard drains in the southeast parts of the plant. Other inputs to the system are described below:

      a. Diesel Building Sump
      The discharge from the diesel building sump is routed to the southeast yard drain.

      b. Low Voltage Switchyard Transformer Area Runoff
      All plant main power transformers are surrounded by a concrete berm which will direct any transformer oil from a spill or rupture to an oil separator. Any rainwater which collects in the area passes through the oil separator prior to discharge to the yard drains. The separator is designed to retain the entire volume of the largest transformer in case of rupture.

      c. Circulating Water Pumps Sump Discharge – Unit 1
      This discharge is primarily sanitary water. Cooling water supplied by the circulating water pump discharge header is used as a back-up supply.

      d. Circulating Water Canal Drainage – Unit 1
      During outages maintenance may require drainage of the circulating water system. A portion of this drainage may be routed to the yard drainage system.

      e. Service Building HVAC Sump Discharge
      This discharge is used to regulate the amount of suspended solids and dissolved solids in the HVAC system below the allowable levels. Supply to this system is demineralized water or potable water.

      f. Diesel Generator Fuel Oil Storage Tanks Unloading Pad Storm Runoff
      The unloading pad is designed to provide containment for any diesel fuel spilled during unloading activities. Periodically, the rainwater that collects on the pad must be drained. This drainage is routed to the southeast yard drain.

      g. Turbine Building Oil Sump – Unit 1
      The turbine building oil sump collects small amounts of water in addition to the oil from various equipment. The water is discharged through a portable oil-water separator to the southeast yard drain.

   B. Utility Building Area Runoff

      General runoff from this area is routed to the southeast yard drainage.

C. Auxiliary Boiler Diesel Fuel Oil Tank Retention Area Storm Runoff

The auxiliary boiler diesel fuel oil tank is surrounded by a containment structure which is designed to retain the entire contents of the tank in case of rupture. Periodically, rainwater which collects inside the containment structure must be drained. This drainage is routed to the southeast yard drainage.

D. Waste Settling Pond

Discharge from the waste settling pond is routed to the southeast yard drainage.

2. East Yard Drainage (DSN025)

This drainage receives storm runoff from buildings and yards in the east plant areas as well as equipment cooling water and other non-routine inputs. The average flow is approximately 684,200 gallons per event from a drainage area of approximately 4 acres.

The east yard drain is the collection point for all the various plant water inputs to the east yard drainage. The inputs are described below:

A. Tendon Access Gallery Sump Discharge – Units 1 & 2
This discharge consists primarily of ground water which seeps into the annulus around the containment buildings.

B. Fire Pump Cooling Water
The supply for this cooling water is the fire pump discharge header. The discharge is routed to the east yard drain.

C. Central Alarm Station HVAC Cooling Water
The sanitary water system provides the cooling water to the Central Alarm Station HVAC system. The discharge is routed to the east yard drain.

D. Cooling Tower System Overflow – Unit 1 (DSN025a)
Periodically, due to imbalances or equipment malfunctions in the cooling tower system, some of the system contents will overflow the basins and will flow to the east yard drain. When this occurs, immediate action is initiated to correct the problem. The contents of the system are periodically pumped out for maintenance. This volume of water is discharged to the east yard drain.

E. Electrical Cable Tunnel Sump Discharge
There is a concrete underground tunnel which connects the diesel generator building with the Unit 1 Auxiliary building. This tunnel provides a path for emergency power to be supplied to the plant. The sump collects and discharges any ground water which may collect in the tunnel to the east yard drain.

F. Turbine Building Air Compressor Cooling Water – Units 1 & 2
The service water system provides cooling water to the Turbine building air compressors. This discharge is routed to the east yard drain.

G. Circulating Water Canal Drainage – Unit 1
During outages maintenance may require drainage of the circulating water system. A portion of this drainage may be routed to the yard drainage system.

3. Northcentral Yard Drainage (DSN027)

The northcentral yard drainage collects storm runoff from buildings and yards in the northcentral area of the plant as well as plant water inputs on a routine basis. The northcentral yard drain consists of three (3) pipes which merge into one common discharge prior to contact with Wilson Creek. The average flow is approximately 855,300 gallons per event from a drainage area of approximately five (5) acres. The components of this system are described below:

A. Circulating Water Pump Sump Discharge – Unit 2
This discharge is primarily cooling water supplied by the circulating water pump discharge header. Sanitary water is supplied as a backup.

B. Turbine Building Oil Sump – Unit 2
The turbine building oil sump collects small amounts of water in addition to the oil from various equipment. The water is discharged through a portable oil-water separator to the northcentral yard drain.

C. Cooling Tower System Overflow – Unit 2 (DSN027a)
Periodically, due to imbalances or equipment malfunctions in the cooling tower system, some of the system contents will overflow the basins and will flow to the northcentral yard drain. When this occurs, immediate action is initiated to correct the problem. The contents of the system are periodically pumped out for maintenance. This volume of water is discharged to the northcentral yard drain.

D. Circulating Water Canal Drainage – Unit 2
During outages maintenance may require drainage of the circulating water system. A portion of this drainage may be routed to the yard drainage system.

4. Northwest Yard Drainage (DSN026)

The northwest yard drainage collects runoff from a small part of the northwest area of the plant and receives the discharge from the construction air compressor structure. The average flow is approximately 684,200 gallons per event from an approximate drainage area of four (4) acres. The discharges from the air compressor structure are described below:

A. Construction Air Compressor Cooling Water
The potable water system provides secondary cooling for the compressed air system. The discharge is routed through an oil-water separator to the northwest yard drain.

B. Construction Air Compressor Structure Drains
The floor drains from the air compressor structure are routed through an oil-water separator to the northwest yard drain.

C. High Voltage Switchyard Drainage
This discharge consists of stormwater drainage from the west side of the high voltage switchyard to the northwest yard drain.

5. West Yard Drainage (DSN028)

The west yard drain collects runoff from the west portion of the plant and the construction garage and routes it to Wilson Creek. The average flow is approximately 2,600,000 gallons per event from a drainage area of approximately fifteen (15) acres.

A. Construction Garage Wash Area Oil-Water Separator
Discharge from the construction garage wash area is discharged to an oil-water separator that. The effluent from the oil-water separator discharges to the west yard drain which ultimately discharges to Wilson Creek.

6. Southwest Yard Drainage (DSN029)

   The southwest yard drainage system provides a discharge path for drainage from the southwest area of the plant, the main parking lot, and the Fire Training Center. The average flow is approximately 500,000 gallons per event from an approximate area of two (2) acres.

   A. Fire Training Area Fuel Oil Storage Area Oil-Water Separator
      The oil-water separator removes any oil which may be combined with rainwater inside the oil storage area berm prior to discharge. The discharge from this oil-water separator is routed to the southwest yard drainage.

   B. Fire Training Area Stormwater Runoff
      The majority of the stormwater runoff from this area is routed to a oil-water separator before discharging to the southwest yard drainage.

   C. Main Parking Lot Runoff
      Stormwater runoff from the main parking lot is routed to the southwest yard drainage.

   D. Service Water Structure Sump Discharge – Units 1 & 2
      All cooling waters and leakage flows are routed to the building sump and are subsequently discharged to the southwest yard drainage.

7. Water Tank Drainage System

   There are several tank systems that store water for various plant uses. On occasion, these tanks require drainage for testing or maintenance operations. The tanks in this system are described below:

   A. Clarified / Well Water Storage Tank Drainage
      Drainage from this tank would be routed to the southeast yard drain.

   B. Demineralizer Water Storage Tank Drainage
      Drainage from these tanks would be routed to the southeast yard drain.

   C. Condensate Storage Tank Drainage – Units 1 & 2
      Drainage from these tanks would be routed to the east yard drain.

   D. Sanitary Water Tank Drainage (Production & Construction)
      Drainage from these tanks would be routed to the east yard drain (Production) and the northwest yard drain (Construction).

   E. Fire Protection Tank Drainage
      Drainage from these tanks would be routed to the east yard drain.

8. Well Water System

   On-site wells provide groundwater for the sanitary water system, for the fire protection system, and as back-up to the demineralizers. Occasionally, if a well has not been used for a period of time, it must be flushed to produce water of acceptable quality for plant use.

9. Miscellaneous Valve Boxes and Electrical Cable Pullboxes – Units 1 & 2

   Miscellaneous valve boxes and electrical cable pullboxes which collect and discharge any rainwater or valve leakoff to the yard drain system are located in various areas of the plant.

Attachment 4 to U.S. EPA Form 3510-2C

Proposed Permit Revisions

Joseph M. Farley Nuclear Power Plant
NPDES No. AL0024619

Submitted by Southern Nuclear Operating Company
December 2011

Description of Proposed Permit Revisions
Farley Nuclear Plant

The following permit revisions are requested:

1. DMR Reports changed from monthly to quarterly submittals.
2. Toxicity testing changed to allow grab composite sampling. This would maintain consistency with other ADEM NPDES permits issued to Alabama Power Company owned steam electric power plants.
3. River water sumps (DSN 022 and DSN 023) sampling changed from pH and flow estimate on a 6 month frequency to monthly visual inspection. Analytical data previously collected and reported to ADEM for these outfalls demonstrates consistent water quality. This potential change was discussed with the ADEM representative during the most recent NPDES inspection at the facility, and it is believed that regular visual inspections would be sufficient to identify any adverse changes in water quality based on the limited industrial activity that occurs at the river water intake structure.

ADEM Form 187
NPDES Permit Application Supplementary Information

Joseph M. Farley Nuclear Power Plant
NPDES No. AL0024619

Submitted by Southern Nuclear Operating Company
December 2011

SOUTHERN COMPANY

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
PERMIT APPLICATION SUPPLEMENTARY INFORMATION

ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
WATER DIVISION – INDUSTRIAL / MINING PERMIT SECTION
POST OFFICE BOX 301463
MONTGOMERY, ALABAMA 36130-1463

INSTRUCTIONS: APPLICATIONS SHOULD BE TYPED OR PRINTED IN INK AND SUBMITTED TO THE DEPARTMENT IN DUPLICATE. IF INSUFFICIENT SPACE IS AVAILABLE TO ADDRESS ANY ITEM, PLEASE CONTINUE ON AN ATTACHED SHEET OF PAPER. PLEASE MARK N/A IN THE APPROPRIATE BOX WHEN AN ITEM IS NON-APPLICABLE TO THE APPLICANT.

PURPOSE OF THIS APPLICATION

☐ INITIAL PERMIT APPLICATION FOR NEW FACILITY
☐ INITIAL PERMIT APPLICATION FOR EXISTING FACILITY
☐ MODIFICATION OF EXISTING PERMIT
☑ REISSUANCE OF EXISTING PERMIT
☐ REVOCATION & REISSUANCE OF EXISTING PERMIT

1. Facility Name: Joseph M. Farley Nuclear Plant

   a. Operator Name: Southern Nuclear Operating Company

   b. Is the operator identified in 1.a., the owner of the facility? Yes ☐ No ☑
   If no, provide the name and address of the operator and submit information indicating the operator's scope of responsibility for the facility.
   See Attachement 1

2. NPDES Permit Number AL 0 0 2 4 6 1 9

3. SID Permit Number (if applicable): IU __ __ - __ __ - __ __ __ __ __

4. NPDES General Permit Number (if applicable) ALG __ __ __ __ __ __ __

5. Facility Physical Location: (Attach a map with location marked; street, route no. or other specific identifier)

   Street: 7388 North State Highway 95

   City: Columbia County: Houston State: Alabama Zip: 36319

   Facility (Front Gate) Latitude: 31° 13' 10" Longitude: 85° 07' 34"

6. Facility Mailing Address (Street or Post Office Box): P. O. Box 1295

   City: Birmingham State: Alabama Zip: 35201-1295

7. Responsible Official (as described on page 13 of this application):

Name and Title: Bradley J. Adams, Vice President -- Fleet Operations

Address: P. O. Box 1295

City: Birmingham State: Alabama Zip: 35201-1295

Phone Number: 205-992-5000

EMAIL Address: bjadams@southernco.com

8. Designated Facility Contact:

Name and Title: Thomas C. Moorer, Environmental Affairs, Chemistry, and Radiological Services Manager

Phone Number: 205-992-5807

EMAIL Address: tcmoorer@southernco.com

9. Designated Discharge Monitoring Report Contact:

Name and Title: Mary Beth Lloyd, Senior Environmental Specialist

Phone Number: 205-992-5062

EMAIL Address: mblloyd@southernco.com

10. Type of Business Entity:

☑ Corporation ☐ General Partnership ☐ Limited Partnership

☐ Sole Proprietorship ☐ Other (Please Specify) ____________

11. Complete this section if the Applicant's business entity is a Corporation

a) Location of Incorporation:

Address: 1209 Orange Street

City: Wilmington County: New Castle State: Delaware Zip: 19801

b) Parent Corporation of Applicant:

Name: Southern Company

Address: 270 Peachtree Street

City: Atlanta State: Georgia Zip: 30303

c) Subsidiary Corporation(s) of Applicant:

Name: N/A

Address:

City: State: Zip:

d) Corporate Officers:

Name: Stephen Kuczynski, President and CEO

Address: P. O. Box 1295

City: Birmingham State: Alabama Zip: 35201-1295

Name: Bradley J. Adams

Address: P. O. Box 1295

City: Birmingham State: Alabama Zip: 35201-1295

e) Agent designated by the corporation for purposes of service:

Name: Cheryl W. Brakefield, Vice President -- Comptroller, Treasurer, and Secretary

Address: P. O. Box 1295

City: Birmingham State: Alabama Zip: 35201-1295

12. If the Applicant's business entity is a Partnership, please list the general partners.

Name: N/A

Address:

City: State: Zip:

Name:

Address:

City: State: Zip:

13. If the Applicant's business entity is a Proprietorship, please enter the proprietor's information.

Name: N/A

Address:

City: State: Zip:

14. Permit numbers for Applicant's previously issued NPDES Permits and identification of any other State of Alabama Environmental Permits presently held by the Applicant, its parent corporation, or subsidiary corporations within the State of Alabama:

Permit Name	Permit Number	Held By
See Attachment 2		

15. Identify all Administrative Complaints, Notices of Violation, Directives, Administrative Orders, or Litigation concerning water pollution, if any, against the Applicant, its parent corporation or subsidiary corporations within the State of Alabama within the past five years (attach additional sheets if necessary):

Facility Name	Permit Number	Type of Action	Date of Action
None			

SECTION B – BUSINESS ACTIVITY

1. Indicate applicable Standard Industrial Classification (SIC) Codes for all processes (If more than one applies, list in order of importance:

a. 4911

b.

c.

d.

e.

2. If your facility conducts or will be conducting any of the processes listed below (regardless of whether they generate wastewater, waste sludge, or hazardous waste), place a check beside the category of business activity (check all that apply):

<u>Industrial Categories</u>

[ ] Aluminum Forming
[ ] Asbestos Manufacturing
[ ] Battery Manufacturing
[ ] Can Making
[ ] Canned and Preserved Fruit and Vegetables
[ ] Canned and Preserved Seafood
[ ] Cement Manufacturing
[ ] Centralized Waste Treatment
[ ] Carbon Black
[ ] Coal Mining
[ ] Coil Coating
[ ] Copper Forming
[ ] Electric and Electronic Components Manufacturing
[ ] Electroplating
[ ] Explosives Manufacturing
[ ] Feedlots
[ ] Ferroalloy Manufacturing
[ ] Fertilizer Manufacturing
[ ] Foundries (Metal Molding and Casting)
[ ] Glass Manufacturing
[ ] Grain Mills
[ ] Gum and Wood Chemicals Manufacturing
[ ] Inorganic Chemicals
[ ] Iron and Steel
[ ] Leather Tanning and Finishing
[ ] Metal Finishing
[ ] Meat Products
[ ] Metal Molding and Casting
[ ] Metal Products
[ ] Nonferrous Metals Forming
[ ] Nonferrous Metals Manufacturing
[ ] Oil and Gas Extraction
[ ] Organic Chemicals Manufacturing
[ ] Paint and Ink Formulating
[ ] Paving and Roofing Manufacturing
[ ] Pesticides Manufacturing
[ ] Petroleum Refining
[ ] Phosphate Manufacturing
[ ] Photographic
[ ] Pharmaceutical
[ ] Plastic & Synthetic Materials
[ ] Plastics Processing Manufacturing
[ ] Porcelain Enamel
[ ] Pulp, Paper, and Fiberboard Manufacturing
[ ] Rubber
[ ] Soap and Detergent Manufacturing
[✓] Steam and Electric
[ ] Sugar Processing
[ ] Textile Mills
[ ] Timber Products
[ ] Transportation Equipment Cleaning
[ ] Waste Combustion
[ ] Other (specify)_____________

A facility with processes inclusive in these business areas may be covered by Environmental Protection (EPA) categorical standards. These facilities are termed "categorical users" and should skip to question 2 of Section C.

3. Give a brief description of all operations at this facility including primary products or services (attach additional sheets if necessary):

This is a two unit steam electric generating facility with a combined rating of 1,776 megawatts.

SECTION C – WASTEWATER DISCHARGE INFORMATION

Facilities that checked activities in question 2 of Section B and are considered Categorical Industrial Users should skip to question 2 of this section.

1. **For Non-Categorical Users Only**: Provide wastewater flows for each of the processes or proposed processes. Using the process flow schematic (Figure 1, pg 14), enter the description that corresponds to each process. [New facilities should provide estimates for each discharge.]

Process Description	Last 12 Months (gals/day) Highest Month Avg. Flow	Highest Flow Year of Last 5 (gals/day) Monthly Avg. Flow	Discharge Type (batch, continuous, intermittent)
N/A			

If batch discharge occurs or will occur, indicate: [New facilities may estimate.]

a. Number of batch discharges: N/A per day

b. Average discharge per batch: ________ (GPD)

c. Time of batch discharges ________ at ________
(days of week) (hours of day)

d. Flow rate: ________ gallons/minute

e. Percent of total discharge: ________

Non-Process Discharges (e.g. non-contact cooling water)	Last 12 Months (gals/day) Highest Month Avg. Flow	Highest Flow Year of Last 5 (gals/day) Monthly Avg. Flow

2. **Complete this Section only if you are subject to Categorical Standards and plan to directly discharge the associated wastewater to a water of the State.** If Categorical wastewater is discharged exclusively via an indirect discharge to a public or privately-owned treatment works, check "Yes" in the appropriate space below and proceed directly to part 2.c .

[ ] Yes

For Categorical Users: Provide the wastewater discharge flows or production (whichever is applicable by the effluent guidelines) for each of your processes or proposed processes. Using the process flow schematic (Figure 1, pg 14), enter the description that corresponds to each process. [New facilities should provide estimates for each discharge.]

2a.

Regulated Process	Applicable Category	Applicable Subpart	Type of Discharge Flow (batch, continuous, intermittent)
See Attachment 3			

2b.

Process Description	Last 12 Months (gals/day) Highest Month Average*	Highest Flow Year of Last 5 (gals/day) Monthly Average*	Discharge Type (batch, continuous, intermittent)
See Attachment 3			

*** Reported values should be expressed in units of the applicable Federal production-based standard. For example, flow (MGD), production (pounds per day), etc.**

If batch discharge occurs or will occur, indicate: [New facilities may estimate.]

a. Number of batch discharges: ________ per day

b. Average discharge per batch: ________ (GPD)

c. Time of batch discharges ________ (days of week) at ________ (hours of day)

d. Flow rate: ________ gallons/minute

Percent of total discharge: ________

2c.

Non categorical Process Description	Last 12 Months (gals/day) Highest Month Avg. Flow	Highest Flow Year of Last 5 (gals/day) Monthly Avg. Flow	Discharge Type (batch, continuous, intermittent)
See Attachment 3			

If batch discharge occurs or will occur, indicate: [New facilities may estimate.]

a. Number of batch discharges: ________ per day

b. Average discharge per batch: ________ (GPD)

c. Time of batch discharges ________ (days of week) at ________ (hours of day)

d. Flow rate: ________ gallons/minute

Percent of total discharge: ________

2d.

Non-Process Discharges (e.g. non-contact cooling water)	Last 12 Months (gals/day) Highest Month Avg. Flow	Highest Flow Year of Last 5 (gals/day) Monthly Avg. Flow
See Attachment 3		

All Applicants must complete Questions 3 – 5.

3. Do you have, or plan to have, automatic sampling equipment or continuous wastewater flow metering equipment at this facility?

Flow Metering	Yes ✓	No ___	N/A ___
Sampling Equipment	Yes ___	No ✓	N/A ___

If so, please indicate the present or future location of this equipment on the sewer schematic and describe the equipment below:

N/A

4. Are any process changes or expansions planned during the next three years that could alter wastewater volumes or characteristics? Yes ☐ No ☑ (If no, skip Question 5)

Briefly describe these changes and their anticipated effects on the wastewater volume and characteristics:

N/A

5. List the trade name and chemical composition of all biocides and corrosion inhibitors used:

Trade Name	Chemical Composition
See Attachment 4	

For each biocide and/or corrosion inhibitor used, please include the following information:

(1) 96-hour median tolerance limit data for organisms representative of the biota of the waterway into which the discharge will ultimately reach,
(2) quantities to be used,
(3) frequencies of use,
(4) proposed discharge concentrations, and
(5) EPA registration number, if applicable

SECTION D – WATER SUPPLY

Water Sources (check as many as are applicable):

[✓] Private Well
[ ] Municipal Water Utility (Specify City):
[✓] Surface Water
[ ] Other (Specify): See Attachment 5 for well info

IF MORE THAN ONE WELL OR SURFACE INTAKE, PROVIDE DATA FOR EACH ON AN ATTACHMENT

City: 0 *MGD Well: ____ *MGD Well Depth: ____ Ft. Latitude: ____ Longitude: ____

Surface Intake Volume: 89.2 *MGD Intake Elevation in Relation to Bottom 13 Ft.

Intake Elevation: 64 Ft. Latitude: 31° 13' 01" Longitude: 85° 05' 58"

Name of Surface Water Source: Chattahoochee River

*** MGD – Million Gallons per Day**

Cooling Water Intake Structure Information

Complete questions 1 and 2 if your water supply is provided by an outside source and not by an onsite water intake structure? (e.g., another industry, municipality, etc...)

1. Does the provider of your source water operate a surface water intake? Yes ☐ No ☐
   (If yes, continue, if no, go to Section E.)

   a) Name of Provider ____ b)Location of Provider ____

   c) Latitude: ____ Longitude: ____

2. Is the provider a public water system (defined as a system which provides water to the public for human consumption or which provides only treated water, not raw water)? Yes ☐ No ☐
   (If yes, go to Section E, if no, continue.)

Only to be completed if you have a cooling water intake structure or the provider of your water supply uses an intake structure and does not treat the raw water.

3. Is any water withdrawn from the source water used for cooling? Yes ☑ No ☐

4. Using the average monthly measurements over any 12-month period, approximately what percentage of water withdrawn is used exclusively for cooling purposes? 100 %

5. Does the cooling water consist of treated effluent that would otherwise be discharged? Yes ☐ No ☑
   (If yes, go to Section E, if no, complete questions 6 – 17.)

6. Is the cooling water used in a once-through or closed cycle cooling system? Yes ☑ No ☐

7. When was the intake installed? intake became operational in 1977
   (Please provide dates for all major construction/installation of intake components including screens)

8. What is the maximum intake volume? 140.4 MGD
   (maximum pumping capacity in gallons per day)

9. What is the average intake volume? 92.75 MGD
   (average intake pump rate in gallons per day average in any 30-day period)

10. How is the intake operated? (e.g., continuously, intermittently, batch) continuously

11. What is the mesh size of the screen on your intake? 3/8"

12. What is the intake screen flow-through area? canal cross-section is 897 square feet at 77' river elevation

13. What is the through screen design intake flow velocity? < 1 ft/sec

14. What is the mechanism for cleaning the screen? (e.g., does it rotate for cleaning) screen rotation and screen backwash

15. Do you have any additional fish detraction technology on your intake? Yes ☐ No ☑

16. Have there been any studies to determine the impact of the intake on aquatic organisms? Yes ☑ No ☐ (If yes please provide.)

17. Attach a site map showing the location of the water intake in relation to the facility, shoreline, water depth, etc.

SECTION E – WASTE STORAGE AND DISPOSAL INFORMATION

Provide a description of the location of all sites involved in the storage of solids or liquids that could be accidentally discharged to a water of the state, either directly or indirectly via such avenues as storm water drainage, municipal wastewater systems, etc., which are located at the facility for which the NPDES application is being made. Where possible, the location should be noted on a map and included with this application:

Description of Waste	Description of Storage Location
See attachment 6	

Provide a description of the location of the ultimate disposal sites of solid or liquid waste by-products (such as sludges) from any wastewater treatment system located at the facility.

Description of Waste	Quantity (lbs/day)	Disposal Method*
See attachment 6		

***Indicate which wastes identified above are disposed of at an off-site treatment facility and which are disposed of on-site. If any wastes are sent to an off-site centralized waste treatment facility, identify the waste and the facility.**

SECTION F – COASTAL ZONE INFORMATION

Is the discharge(s) located within 10-foot elevation of Mobile or Baldwin County?

Yes ☐ No ☑ If yes, then complete items A through M below:	YES	NO
A. Does the project require new construction?	☐	☐
B. Will the project be a source of new air emissions?	☐	☐
C. Does the project involve dredging and/or filling?	☐	☐
Has the Corps of Engineers (COE) permit been received?	☐	☐
Corps Project Number ____________________		
D. Does the project involve wetlands and/or submersed grassbeds?	☐	☐
E. Are oyster reefs located near the project site? (Include a map showing project and discharge location with respect to oyster reefs)	☐	☐
F. Does the project involve the siting, construction and operation of an energy facility as defined in ADEM Admin. Code R. 335-8-1-.02(bb)?	☐	☐
G. Does the project involve shoreline erosion mitigation?	☐	☐
H. Does the project involve construction on beaches and dunes?	☐	☐
I. Will the project interfere with public access to coastal waters?	☐	☐
J. Does the project lie within the 100-year floodplain?	☐	☐
K. Does the project involve the registration, sale, use, or application of pesticides?	☐	☐
L. Does the project propose to construct a new well or alter an existing well to pump more than 50 GPD?	☐	☐
M. Has the applicable permit been obtained?	☐	☐

SECTION G – ANTI-DEGRADATION EVALUATION

In accordance with 40 CFR 131.12 and the Alabama Department of Environmental Management Administrative Code, Section 335-6-10-.04 for antidegradation, the following information must be provided, if applicable. It is the applicant's responsibility to demonstrate the social and economic importance of the proposed activity. If further information is required to make this demonstration, attach additional sheets to the application.

1. Is this a new or increased discharge that began after April 3, 1991? Yes ☐ No ☑
   If yes, complete question 2 below. If no, go to Section H.

2. Has an Anti-Degradation Analysis been previously conducted and submitted to the Department for the new or increased discharge referenced in question 1? Yes ☐ No ☐

   If yes, do not complete this section.

If no, and the discharge is to a Tier II waterbody as defined in ADEM Admin. Code r. 335-6-10-.12(4), complete questions A through F below and ADEM forms 311 and 313 (attached). Form 313 must be provided for each alternative considered technically viable.

Information required for new or increased discharges to high quality waters:

A. What environmental or public health problem will the discharger be correcting?

B. How much will the discharger be increasing employment (at its existing facility or as the result of locating a new facility)?

C. How much reduction in employment will the discharger be avoiding?

D. How much additional state or local taxes will the discharger be paying?

E. What public service to the community will the discharger be providing?

F. What economic or social benefit will the discharger be providing to the community?

SECTION H – EPA Application Forms

All Applicants must submit EPA permit application forms. More than one application form may be required from a facility depending on the number and types of discharges or outfalls found there. The EPA application forms are found on the Department's website at http://www.adem.state.al.us/. The EPA application forms must be submitted in duplicate as follows:

1. All applicants must submit Form 1.
2. Applicants for existing industrial facilities (including manufacturing facilities, commercial facilities, mining activities, and silvicultural activities) which discharge process wastewater must submit Form 2C.
3. Applicants for new industrial facilities which propose to discharge process wastewater must submit Form 2D.
4. Applicants for new and existing industrial facilities which discharge only non-process wastewater (i.e., non-contact cooling water and/or sanitary wastewater) must submit Form 2E.
5. Applicants for new and existing facilities whose discharge is composed entirely of storm water associated with industrial activity must submit Form 2F, unless exempted by § 122.26(c)(1)(ii). If the discharge is composed of storm water and non-storm water, the applicant must also submit Forms 2C, 2D, and/or 2E, as appropriate (in addition to Form 2F).

SECTION I – ENGINEERING REPORT/BMP PLAN REQUIREMENTS

See ADEM 335-6-6-.08(i) & (j)

SECTION J– RECEIVING WATERS

Receiving Water(s)	303(d) Segment? (Y / N)	Included in TMDL?* (Y / N)
Chattahoochee River	No	No

*If a TMDL Compliance Schedule is requested, the following should be attached as supporting documentation:
(1) Justification for the requested Compliance Schedule (e.g. time for design and installation of control equipment, etc.);
(2) Monitoring results for the pollutant(s) of concern which have not previously been submitted to the Department (sample collection dates, analytical results (mass and concentration), methods utilized, MDL/ML, etc. should be submitted as available);
(3) Requested interim limitations, if applicable;
(4) Date of final compliance with the TMDL limitations; and,
(5) Any other additional information available to support requested compliance schedule.

SECTION K – APPLICATION CERTIFICATION

THE INFORMATION CONTAINED IN THIS FORM MUST BE CERTIFIED BY A RESPONSIBLE OFFICIAL AS DEFINED IN ADEM ADMINISTRATIVE RULE 335-6-6-.09 "SIGNATORIES TO PERMIT APPLICATIONS AND REPORTS" (SEE BELOW).

"I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHER AND EVALUATE THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS."

"I FURTHER CERTIFY UNDER PENALTY OF LAW THAT ALL ANALYSES REPORTED AS LESS THAN DETECTABLE IN THIS APPLICATION OR ATTACHMENTS THERETO WERE PERFORMED USING THE EPA APPROVED TEST METHOD HAVING THE LOWEST DETECTION LIMIT FOR THE SUBSTANCE TESTED."

SIGNATURE OF RESPONSIBLE OFFICIAL: Bradley J Adams DATE SIGNED: 12-29-11

(TYPE OR PRINT) NAME OF RESPONSIBLE OFFICIAL: Bradley J. Adams

TITLE OF RESPONSIBLE OFFICIAL: Vice President Fleet Operations

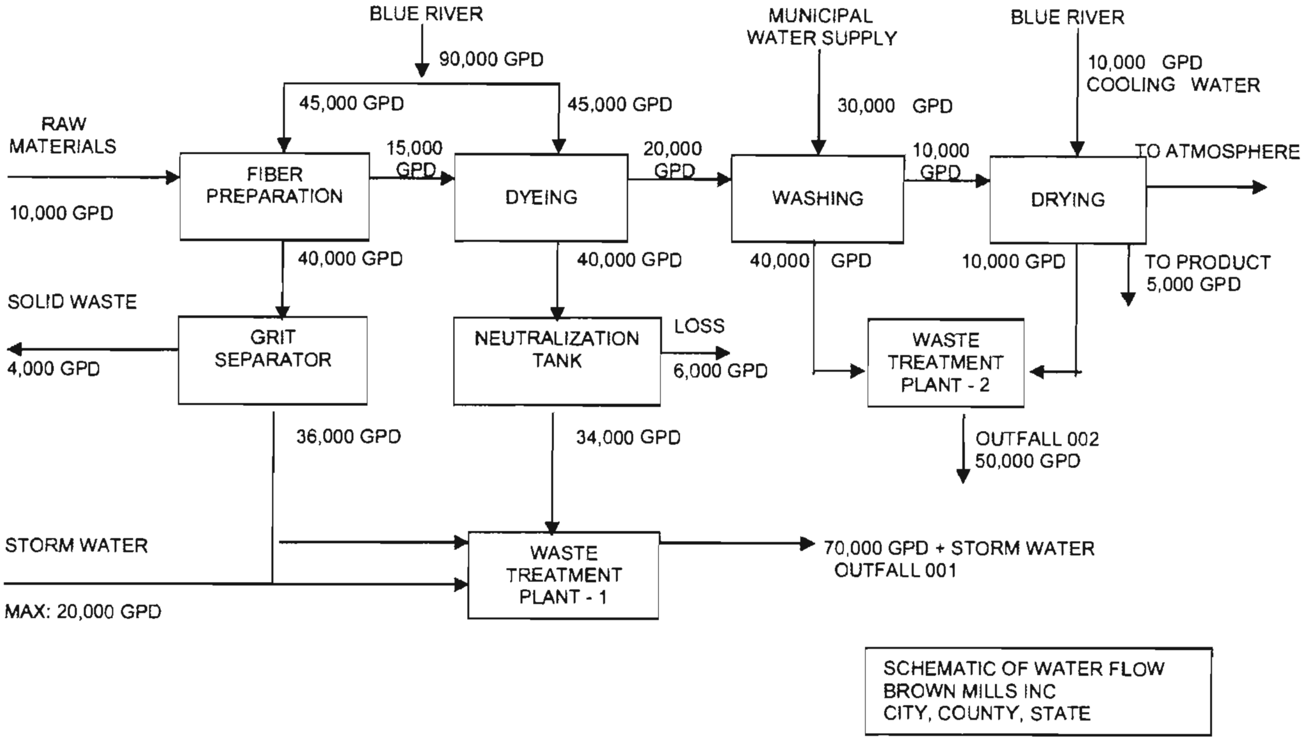
MAILING ADDRESS: P. O. Box 1295

CITY, STATE, ZIP: Birmingham, Alabama 35201-1295 PHONE: 205-992-5000

335-6-6-.09 SIGNATORIES TO PERMIT APPLICATIONS AND REPORTS.

(1) The application for an NPDES permit shall be signed by a responsible official, as indicated below:
(a) In the case of a corporation, by a principal executive officer of at least the level of vice president, or a manager assigned or delegated in accordance with corporate procedures, with such delegation submitted in writing if required by the Department, who is responsible for manufacturing, production, or operating facilities and is authorized to make management decisions which govern the operation of the regulated facility;
(b) In the case of a partnership, by a general partner;
(c) In the case of a sole proprietorship, by the proprietor; or
(d) In the case of a municipal, state, federal, or other public entity, by either a principal executive officer, or ranking elected official.

FIGURE 1


BLUE RIVER
90,000 GPD
45,000 GPD
45,000 GPD
MUNICIPAL WATER SUPPLY
30,000 GPD
BLUE RIVER
10,000 GPD COOLING WATER
RAW MATERIALS
10,000 GPD
FIBER PREPARATION
15,000 GPD
DYEING
20,000 GPD
WASHING
10,000 GPD
DRYING
TO ATMOSPHERE
40,000 GPD
40,000 GPD
40,000 GPD
10,000 GPD
TO PRODUCT 5,000 GPD
SOLID WASTE
4,000 GPD
GRIT SEPARATOR
NEUTRALIZATION TANK
LOSS
6,000 GPD
WASTE TREATMENT PLANT - 2
36,000 GPD
34,000 GPD
OUTFALL 002 50,000 GPD
STORM WATER
MAX: 20,000 GPD
WASTE TREATMENT PLANT - 1
70,000 GPD + STORM WATER OUTFALL 001
SCHEMATIC OF WATER FLOW
BROWN MILLS INC
CITY, COUNTY, STATE

Attachment 1 to ADEM Form 187

Owner and Operator Information

Joseph M. Farley Nuclear Power Plant
NPDES No. AL0024619

Owner and Operator Information
Farley Nuclear Plant

The operator of Farley Nuclear Plant is Southern Nuclear Operating Company. Alabama Power Company is the owner of this facility. Southern Nuclear Operating Company is responsible for the safe and reliable operation of six (6) nuclear units, including Farley Nuclear Plant, and is the licensed operator under U.S. Nuclear Regulatory Commission regulations.

Operator Address:
Southern Nuclear Operating Company
P.O. Box 1295
Birmingham, AL 35201-1295

Owner Address:
Alabama Power Company
600 North 18th Street
Birmingham, AL 35291

Attachment 2 to ADEM Form 187

Previously Issued State Environmental Permits

Joseph M. Farley Nuclear Power Plant
NPDES No. AL0024619

Previously Issued NPDES Permits and Other State Environmental Permits
Farley Nuclear Plant

Permit Name	Permit Number	Held By
NPDES Permit	AL0024619	Southern Nuclear Operating Co
Water Supply Permit	2007-507	Southern Nuclear Operating Co
Solid Waste Disposal Facility Permit	35-05	Southern Nuclear Operating Co
Certificate of Use (Issued by Office of Water Resources)	0063.2	Southern Nuclear Operating Co
NPDES Construction Stormwater Registration (ADEM Code Ch. 335-6-12)	ALR108019	Southern Nuclear Operating Co

Attachment 3 to ADEM Form 187

Categorical Process Information

Joseph M. Farley Nuclear Power Plant
NPDES No. AL0024619

Categorical Standards Information
Farley Nuclear Plant

Regulated Process	Applicable Category	Applicable Subpart	Type of Discharge Flow
Once-Through Cooling	40 CFR 423	423.13(b)(1) 423.13(b)(2)	Continuous
Metal Cleaning	40 CFR 423	423.12(b)(5)	Continuous
Low Volume Wastes	40 CFR 423	423.12(b)(3)	Continuous & Intermittent
Cooling Tower Blowdown	40 CFR 423	423.13(d)(1) 423.13(d)(2)	Continuous

Categorical Process	Last 12 Months Highest Month Flow	Max Year in Last 5 Years Monthly Average	Type of Discharge Flow
DSN001	99.05 MGD	87.68 MGD	Continuous
DSN001a	2.052 MGD	3.64 MGD	Continuous
DSN025a	0 MGD	0.553 MGD	Intermittent
DSN001b	2.52 MGD	6.114 MGD	Continuous
DSN027a	0.00126 MGD	0.039 MGD	Intermittent
DSN012	0 MGD	0 MGD	Continuous
DSN024a	0 MGD	0 MGD	Batch
DSN001c	0.00088 MGD	0.00088 MGD	Batch
DSN024b	0.431 MGD	0.318 MGD	Continuous
DSN001d	1.152 MGD	1.152 MGD	Intermittent
DSN001e	1.152 MGD	1.344 MGD	Intermittent
DSN001f	0.142 MGD	0.165 MGD	Continuous
DSN001g	0.101 MGD	0.124 MGD	Continuous
DSN001j	1.152 MGD	1.152 MGD	Intermittent
DSN001k	1.152 MGD	1.329 MGD	Intermittent
DSN022	0.216 MGD	0.137 MGD	Intermittent
DSN023	0.216 MGD	0.127 MGD	Intermittent

Non-Categorical Process	Last 12 Months Highest Month Flow	Max Year in Last 5 Years Monthly Average	Type of Discharge Flow
DSN025b	0.0509 MGD	0.036 MGD	Continuous

Batch Release Information

Outfalls DSN001h and DSN001i are batch release operations. These outfalls are liquid radwaste discharges from each unit, and are released in accordance with U.S. Nuclear Regulatory Commission (NRC) regulations and requirements. There is not a specified frequency for these discharges; the frequency and volume of water processed by the liquid radwaste system is highly dependent on activities that occur within the facility. For example, the volume of water processed is typically higher during unit refueling outages which occur on 18-month cycles. Each unit has two 5,000 gallon Waste Monitor Tanks (WMT) from which liquid radwaste discharges occur. The design flow of each WMT discharge pump is 35 gpm.

Attachment 4 to ADEM Form 187

Biocides and Corrosion Inhibitors

Joseph M. Farley Nuclear Power Plant
NPDES No. AL0024619

Biocides and Corrosion Inhibitors
Farley Nuclear Plant

A Material Safety Data Sheet (MSDS) is available for each of the products listed, and can be provided upon request.

Commodity Sodium Hypochlorite (Bleach)

Trade Name	N/A (Provided by GE Water Technologies)
Composition	Sodium Hypochlorite, Sodium Chloride, Sodium Hydroxide
Aquatic Toxicology	Rainbow Trout 96-hr Static Acute Bioassy LC50 = 1.9 mg/L No Effect Level = 1.38 mg/L Daphnia Magna 48-hr Static Acute Bioassay LC50 = 1.6 mg/L No Effect Level = 0.51 mg/L
Quantities	Bulk
Frequencies of Use	Daily/Continuous
Discharge Concentrations	In accordance with NPDES permit limitations
EPA Registration Number	---

Potassium Chromate

Trade Name	N/A (Provided by Fisher Scientific)
Composition	Chromic Acid Dipotassium Salt
Aquatic Toxicology	Daphnia Magna LC50 = 15.3 µg/L as chromium
Quantities	Commercially available packages
Frequencies of Use	As needed
Discharge Concentrations	Not subject to discharge (utilized in closed system).
EPA Registration Number	---

Potassium Dichromate

Trade Name	N/A (Provided by Fisher Scientific)
Composition	Chromic Acid, Dipotassium Salt
Aquatic Toxicology	Fathead Minnow LC50 = 17,300 µg/L as chromium Water Flea Daphnia EC50 = 1,750 µg/L as chromium
Quantities	Commercially available packages
Frequencies of Use	As needed
Discharge Concentrations	Not subject to discharge (utilized in closed system).
EPA Registration Number	---

Drewgard 4109 Corrosion Inhibitor

Trade Name	Drewgard 4109 Corrosion Inhibitor
Composition	Sodium Metaborate Tetrahydrate, Sodium Nitrate, Sodium Tetraborate Decahydrate, Sodium Nitrite, Sodium Metasilicate Anhydrous, Acrylic Polymer
Aquatic Toxicology	No ecological data provided on Material Safety Data Sheet
Quantities	Commercially available packages
Frequencies of Use	As needed
Discharge Concentrations	Not subject to discharge (utilized in closed system).
EPA Registration Number	---

Biosperse 254 Microbiocide

Trade Name	Biosperse 254 Microbiocide
Composition	Glutaraldehyde, Methanol
Aquatic Toxicology	Seven Day Ceriodaphnia dubia static renewal conditions: 7 Day LC50 = 2.6 mg/L NOEC = 1.56 mg/L LOEC = 3.13 mg/L IC50 = 2.2 mg/L
Quantities	Commercially available packages
Frequencies of Use	As needed
Discharge Concentrations	Not subject to discharge (utilized in closed system).
EPA Registration Number	---

11-166 WPD

Trade Name	11-166 WPD
Composition	Sodium Tolyltriazole
Aquatic Toxicology	No ecological data provided on Material Safety Data Sheet
Quantities	Commercially available packages
Frequencies of Use	As needed
Discharge Concentrations	Not subject to discharge (utilized in closed system).
EPA Registration Number	---

Spectrus CT1300

Trade Name	Spectrus CT1300
Composition	Alkyl Dimethyl Benzyl Ammonium Chloride, Ethyl Alcohol
Aquatic Toxicology	Channel Catfish 96-hr Acute Toxicity: LC50 = 0.86 mg/L No Effect Level = 0.54 mg/L Fathead Minnow 96-hr Flow-Thru Bioassay: LC50 = 0.72 mg/L No Effect Level = 0.41 mg/L
Quantities	Bulk
Frequencies of Use	As needed for microbiological and algae control in the cooling towers, added when cooling tower blowdown is closed and allowed to naturally decay for at least 6 hours prior to opening blowdown.
Discharge Concentrations	Normally product is decayed prior to opening cooling tower blowdown; concentrations at the Main Combined Facility Discharge are not expected to exceed the LC50 values provided above.
EPA Registration Number	---

Spectrus NX108

Trade Name	Spectrus NX108
Composition	2,2,-Dibromo-3-Nitrilopropionamide, Sodium Bromide, Dibromoacetonitrile, Monobromo-3-Nitrilopropionamide, 2,2-Dibromopropanediamide
Aquatic Toxicity	Fathead Minnow 96-hr Static Renewal Bioassay: LC50 = 8.7 No Effect Level = 3.1 mg/l Daphnia Magna 48-hr Static Renewal Bioassay LC50 = 3.3 No Effect Level = 2.15 mg/l
Quantities	Bulk
Frequencies of Use	As needed for biocide treatment of IONICS RO ultrapure water system
Discharge Concentrations	IONICS wastewater is processed through polishers (which removes treatment chemicals) and is discharged to the waste settling pond
EPA Registration Number	---

3D TRASAR 3DT177

Trade Name	3D TRASAR 3DT177
Composition	Phosphoric Acid
Aquatic Toxicity	Fathead Minnow 96-hr Exposure LC50 = 7,201 mg/l Rainbow Trout 96-hr Exposure LC50 = >10,000 mg/l
Quantities	Bulk
Frequencies of Use	As needed for corrosion control of circulating cooling water
Discharge Concentrations	Treatment target of 8.3 ppm in circ water
EPA Registration Number	---

3D TRASAR 3DT197

Trade Name	3D TRASAR 3DT197
Composition	Substituted aromatic amine, Substituted Triazole
Aquatic Toxicity	Fathead Minnow 96-hr Exposure LC50 = 63.3 mg/l Ceriodaphnia dubia 48-hr Exposure LC50 = 79.7 mg/l
Quantities	Bulk
Frequencies of Use	As needed to inhibit copper corrosion of service water system
Discharge Concentrations	Treatment not to exceed 10 ppm in service water
EPA Registration Number	---

ControlBrom CB70

Trade Name	ControlBrom CB70
Composition	Sodium Bromide
Aquatic Toxicity	Fathead Minnow 96-hr Exposure LC50 = >5,000 mg/l Ceriodaphnia dubia 48-hr Exposure LC50 = >5,000 mg/l
Quantities	Bulk
Frequencies of Use	As needed for microbiological fouling control of service water and circulating cooling water systems
Discharge Concentrations	Treatment target of 6.4 ppm in service water
EPA Registration Number	---

Attachment 5 to ADEM Form 187

Water Supply Sources – Wells

Joseph M. Farley Nuclear Power Plant
NPDES No. AL0024619

Water Supply Sources – Wells
Farley Nuclear Plant

Well	Capacity (MGD)	Depth (ft)	Latitude	Longitude
Production Well #1	Out of Service	---	---	---
Production Well #2	0.720	775	31° 13' 56" N	85° 06' 34" W
Production Well #3	0.180	392	31° 13' 01" N	85° 06' 50" W
Production Well #4	0.432	857	31° 13' 31" N	85° 06' 30" W
Construction Well #1	0.216	244	31° 13' 35" N	85° 06' 51" W
Construction Well #2	0.216	325	31° 13' 34" N	85° 07' 02" W
Water Supply Well	0.036	220	31° 12' 45" N	85° 06' 39" W
Plant Entrance Well	0.022	240	31° 13' 09" N	85° 07' 22" W
Daniel Well #3	Abandoned	---	---	---
Daniel Well #4	Abandoned	---	---	---

Attachment 6 to ADEM Form 187

Waste Storage and Disposal Information

Joseph M. Farley Nuclear Power Plant
NPDES No. AL0024619

Materials Management Practices
Farley Nuclear Plant

There have been no significant quantities of hazardous materials or wastes at FNP over the past three (3) years which have been treated, stored, or disposed in a manner which would result in exposure to stormwater and / or contamination of stormwater runoff. The following FNP procedures address management of hazardous materials and hazardous wastes and provide guidance relative to prevention of contamination resulting from contact with stormwater.

FNP-0-AP-60	Oil Spill Prevention, Control, and Countermeasure Plan, Hazardous Waste Contingency Plan
FNP-0-CCP-900	Hazardous Waste Holding Area Requirements
FNP-0-CCP-901	Shipping of Hazardous Wastes
FNP-0-CCP-904	Receipt and Identification of Industrial Wastes
FNP-0-CCP-905	Chemistry Support to NMP-CH-002
NMP-CH-002	Chemical Product Control
NMP-EN-602	Hazardous Waste Program
NMP-SH-012-001	Farley Hazard Communication Program
FNP-0-SHP-30	Waste Disposal
FNP-0-ENV-25	Operation of the Farley Nuclear Plant Landfill
FNP-0-TCP-23	Hazardous Waste Training Plan

In addition to the above procedures, proactive materials management practices are employed to minimize contact of hazardous materials with stormwater including indoor storage, structural control measures, secondary containment for tanks and container storage, and materials management training. A formal Hazard Communication Program (NMP-SH-012-001) has also been implemented.

A Hazardous Waste Holding Area is located at the sewage treatment plant, and a Mixed Waste Holding Area is located inside the Auxiliary Building. Hazardous Waste Satellite Accumulation Areas have been established at the Secondary Chemistry Laboratory, the Water Treatment Plant, the Spent Battery Storage Building, the Paint Shop, and the Security Firing Range. The largest storage container at these locations is a 55-gallon drum. Additionally, an on-site Hazardous Waste Storage Area has been designated to be used in the event that the facility were to become a Large Quantity Generator.

Universal Waste collection areas have been established at the warehouse and at the Turbine Building Bay.

Sludge from the sewage treatment plant is removed by a contractor, and the ultimate disposal site is the Omussee Creek Treatment Plant, operated by the City of Dothan.

Attachment 7 to ADEM Form 187

Environmental Study

Joseph M. Farley Nuclear Power Plant
NPDES No. AL0024619

Submitted by Southern Nuclear Operating Company
December 2011

SOUTHERN COMPANY

JOSEPH M. FARLEY NUCLEAR PLANT

COOLING WATER INTAKE STUDY
316(b) DEMONSTRATION
(Two-Unit Operation)

1981 - 1983

ALABAMA POWER COMPANY

JOSEPH M. FARLEY NUCLEAR PLANT
COOLING WATER INTAKE STUDY
316(b) DEMONSTRATION

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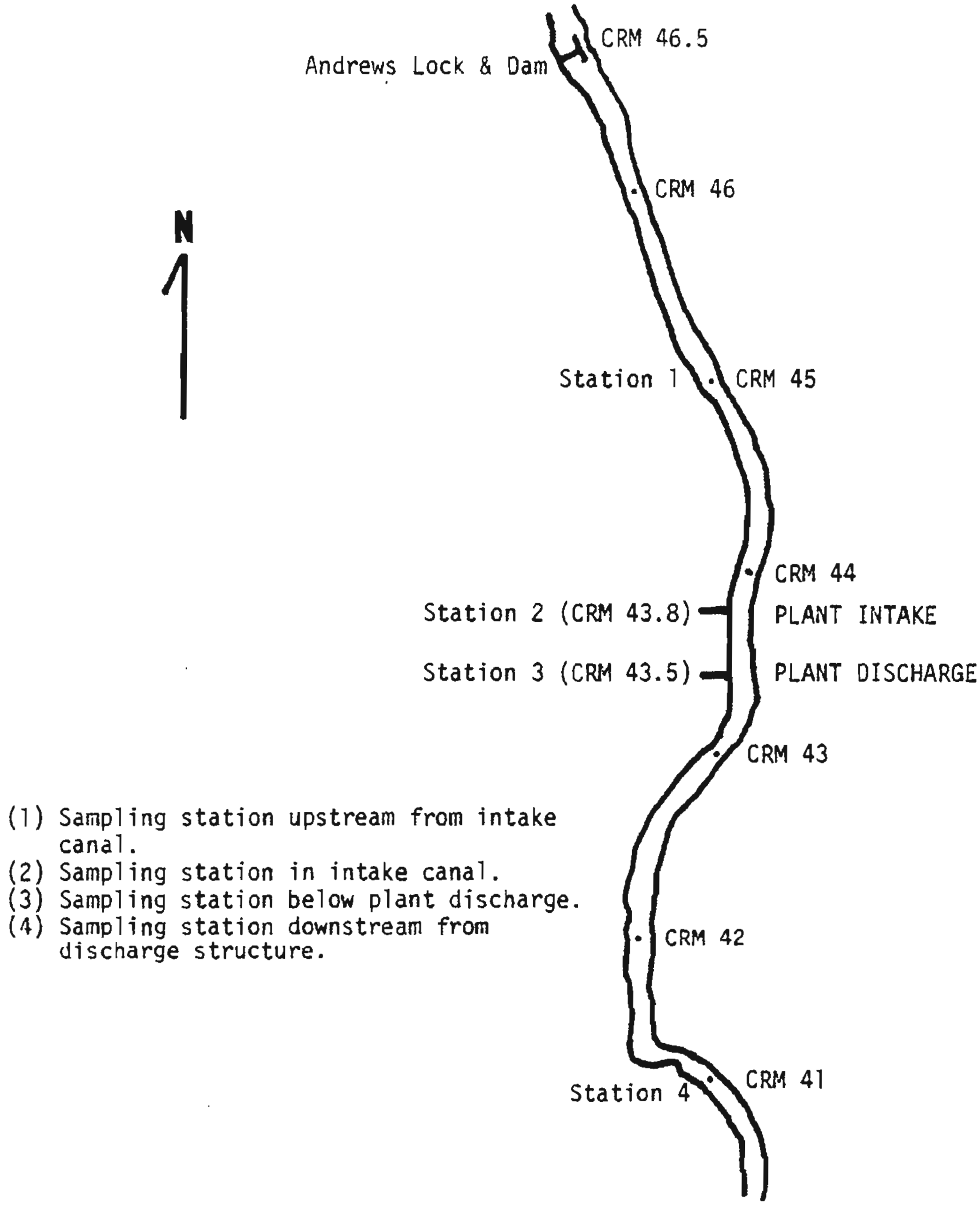
BIOLOGICAL CONCLUSIONS

1. The concentrations of a majority of the water quality parameters associated with biological studies varied seasonally; however, no differences that would have biological significance were detected between upstream control and downstream discharge sites.
2. Variations in phytoplankton and zooplankton densities occurred over the course of the study; however, there were no qualitative or quantitative changes in plankton communities of the adjacent Chattahoochee River that were attributable to the operation of the Farley Nuclear Plant intake.
3. Larval fish studies in the vicinity of the plant failed to indicate any significant effects of plant intake operation on larval fish in the Chattahoochee River.
4. Impingement studies at the Farley Nuclear Plant intake indicated low impingement rates were occurring relative to game and commercial species. Impingement rates for other species were also considered insignificant relative to any effect on fish populations existing in the Chattahoochee River.
5. The results of biological studies of the Chattahoochee River near Farley Nuclear Plant failed to indicate any significant changes in biological communities which could be associated with intake operation.

STUDY AREA

The section of the Chattahoochee River (CR) included in this study extended from River Mile 45.2 (CRM 45.2) downstream to River Mile 41.0 (CRM 41.0) (Fig. 1). The Joseph M. Farley Nuclear Plant is located on the banks of the Chattahoochee River between CRM 43 and 44. Sample station 1, located at CRM 45, is 1.5 miles below Andrews Lock and Dam and approximately one mile above the Farley Plant. Sample station 2 is located in the river water intake canal at CRM 43.8, Station 3 extended from the discharge structure to 1/2 mile downstream (CRM 43.0-43.5), and Station 4 is located in the Smith's Bend section of the river (CRM 41.0-41.5).

Plankton and water samples were collected from depths of 0.3, 1, 2, 4 and 8 meters (when river depth allowed), and larval fish samples were collected from depths of 1.5, 3.0 and 4.5 meters (when river depth allowed). This section of the Chattahoochee River is subject to a large degree of sand sedimentation so that water depth was seldom more than 4-6 meters on most dates.



(1) Sampling station upstream from intake canal.
(2) Sampling station in intake canal.
(3) Sampling station below plant discharge.
(4) Sampling station downstream from discharge structure.

Figure 1 Schematic diagram of Chattahoochee River near the Joseph M. Farley Nuclear Plant showing sample stations. CRM--Chattahoochee River Miles.

WATER STUDIES

Sampling Procedures

Samples were collected about the middle of each month beginning in August, 1981 and continuing through January, 1983 for a total of eighteen sampling dates. Water quality variables measured at each site and depth included temperature and dissolved oxygen (DO). These measurements were made using a YSI Model 51A oxygen meter. Secchi disc visibility was also measured at each station.

Water samples for chlorophyll analyses were collected with a submersible pump and hose and stored in Nalgene plastic containers. All water samples were held in ice chests for transport back to laboratory facilities located at Auburn University, Auburn, Alabama. For the analyses of chlorophyll a, b and c, a 100 ml aliquot of water from each depth was filtered onto a 0.45 μ pore size, Millipore filter pad, macerated in a tissue grinder and the pigments extracted in 90% acetone. Chlorophyll concentrations were estimated using the Trichromatic Method (APHA et el. 1980).

Water samples for plankton analyses were also collected with a submersible pump and hose apparatus. For phytoplankton analysis, a 500 ml water sample was collected at each depth and placed in a one liter flat-bottomed Nalgene jar containing 18 ml of merthiolate preserving solution. Zooplankton samples were collected at each depth by pumping 80 liters of water through a standard Wisconsin style (80 μ mesh) plankton net. Zooplankters were washed from the net bucket into 100 ml Nalgene plastic containers and preserved in 5% formalin. Plankton samples were counted and identified using Sedgwick-Rafter counting chambers following the procedures recommended by Weber (1973).

Plankton data reported by station and depth include standing crops for phytoplankton and zooplankton. By station, data included chlorophyll concentrations, dominant plankters and for zooplankton communities, species diversity ($\bar{d}$) and equitability (e) values.

RESULTS AND DISCUSSION

Water Variables

Secchi Disc Readings

Light transmission through the water was measured by Secchi disc readings at each station. Visibility as measured by the Secchi disc provides an estimate of turbidity. When the turbidity in the river is not due primarily to suspended sediment, Secchi disc readings correlate well with phytoplankton density. Summaries of the Secchi disc visibility data are provided in Table 1.

The limited visibility of waters near the Farley Nuclear Plant result from two primary sources: 1) the high degree of turbulence in the river as a result of hydroelectric power generation through Walter F. George Dam and the regeneration of this turbulence as the water passes through Andrews Dam; 2) the waters released from both dams contain higher standing crops of phytoplankton (which will reduce visibility giving lower Secchi disc readings) than would normally be encountered in a river transporting as much sediment as the Chattahoochee.

There is no evidence from visibility data provided by the Secchi disc readings that the intake or discharge from the Farley Nuclear Plant caused any change in the sediment or phytoplankton load of the waters in this reach of the Chattahoochee River.

Temperature and Dissolved Oxygen (DO)

Temperature and DO content in the water column at each station are shown in Tables 2 and 3. Additionally, temperature profiles of the water column at each station are provided on Figures 3-20 and 22-36 of plankton standing crops. These data show the seasonal variability expected for water temperatures, but no indication of significant variations between stations

Table 1. Mean Secchi disc readings in the Chattahoochee River at each station sampled from August 1981 to January 1983.

Date	Station 1	Station 2 (cm)	Station 3	Station 4	River means
Aug-81	100	105	100	100	101.3
Sept	70	71	70	71	70.5
Oct	125	125	125	135	127.5
Nov	120	125	115	100	115.0
Dec	85	85	85	85	85.0
Jan-82	60	60	60	60	60.0
Feb	30	30	30	30	30.0
Mar	58	56	58	60	58.0
Apr	75	70	70	70	71.3
May	68	67	69	66	67.5
Jun	78	79	78	79	78.5
Jul	78	80	80	75	78.3
Aug	100	100	95	85	95.0
Sept	70	68	67	80	71.3
Oct	130	130	128	128	129.0
Nov	68	75	78	82	75.8
Dec	77	76	75	75	75.8
Jan-83	50	52	53	53	52.0
$\bar{X}$	80.1	80.8	79.8	79.7	80.1

Table 2. Mean temperatures of waters in the Chattahoochee River at each station sampled from August 1981 to January 1983.

Date	Station 1	Station 2	Station 3	Station 4	River means
			°C		
Aug-81	29.87	29.30	30.00	30.00	29.82
Sept	27.00	27.07	27.00	26.68	26.92
Oct	22.43	22.47	22.67	22.43	22.50
Nov	18.00	18.70	18.70	17.50	18.17
Dec	10.75	11.50	12.50	12.30	11.77
Jan-82	9.00	9.00	9.00	9.00	9.00
Feb	13.00	12.88	12.88	12.78	12.88
Mar	16.00	16.00	16.00	16.00	16.00
Apr	17.63	17.63	17.88	17.90	17.76
May	22.00	22.50	22.25	22.88	22.41
Jun	27.00	28.00	28.00	28.00	27.77
Jul	28.45	28.50	28.25	28.00	28.30
Aug	31.25	30.50	30.75	31.00	30.88
Sept	29.10	29.10	29.10	29.25	29.14
Oct	24.80	24.80	25.00	25.25	24.96
Nov	20.00	20.50	21.00	21.00	20.63
Dec	17.50	17.50	17.50	17.50	17.50
Jan-83	10.50	11.00	11.13	11.00	10.91
$\overline{X}$	20.79	20.94	21.09	21.03	20.96

Table 3. Mean dissolved oxygen concentrations in waters of the Chattahoochee River at each station sampled from August 1981 to January 1983.

Date	Station 1	Station 2	Station 3	Station 4	River means
	mg/l				
Aug-81	7.40	8.70	8.08	8.25	8.11
Sept	6.63	7.87	8.20	7.18	7.39
Oct	9.93	10.00	9.93	9.58	9.84
Nov	10.30	10.30	10.30	10.35	10.32
Dec	11.65	11.67	12.00	12.00	11.84
Jan-82	12.80	12.80	12.80	12.80	12.80
Feb	11.20	11.20	11.20	11.08	11.16
Mar	12.40	13.00	13.00	13.00	12.86
Apr	10.00	10.10	10.00	10.80	10.26
May	9.90	10.50	10.65	9.88	10.21
Jun	8.00	8.53	8.27	8.80	8.43
Jul	6.80	8.00	8.00	8.00	7.70
Aug	8.00	7.90	8.00	7.80	7.93
Sept	8.35	8.35	8.35	8.50	8.39
Oct	8.40	8.50	8.00	7.95	8.21
Nov	9.95	9.90	9.60	9.75	9.80
Dec	9.26	9.20	9.20	9.20	9.22
Jan-83	11.50	11.40	11.33	11.50	11.43
$\overline{X}$	9.58	9.88	9.85	9.80	9.77

or depths on a given sampling date. There was no evidence from the study that indicated any change in temperature or DO concentration associated with the intake or discharge from the Farley Nuclear Plant.

Summary of Water Variables

The watershed upstream from the stretch of the Chattahoochee River studied provides an excess sediment load (primarily sand) to the water. Deposition and erosion of the sandy river bottom in the region of the Farley Nuclear Plant is a continuous process that resulted in decreasing water depths following channel dredging operations. Because of the close proximity of the nuclear plant to Andrews Dam and Walter F. George Dam, this reach of the river is essentially like a modified tailrace below a major river impoundment.

Water temperature and dissolved oxygen content measured on each sampling trip indicated that within this stretch of the river these water quality variables were favorable for the support of aquatic life. The waters discharged by the Farley Nuclear Plant were at no time observed to appreciably alter temperature or dissolved oxygen values.

Secchi disc visibility of the water at each station on all dates sampled also indicated no unfavorable conditions for the support of aquatic communities.

Plankton Studies

Phytoplankton

Mean phytoplankton abundance by group (algal division) and chlorophyll a concentrations for the 18 month study are shown in Figure 2. The vertical distribution of phytoplankton in the water column, temperature profiles and mean chlorophyll a, b and c concentrations for each station and date are shown in Figures 3 through 20. Data on numerical dominance by phytoplankton group (algal division) and species appear in Tables 4 and 5, respectively.

Mean chlorophyll a values ranged from a low of 2.6 mg/m^3 in September of 1982 to a high of 12.1 mg/l^3 in October of 1981 (Fig. 2). Winter and spring phytoplankton communities were dominated by diatoms (Chrysophyta) mostly, except for one date when green algae (Chlorophyta) were dominant (Fig. 2 and Table 4). The diatoms were mostly various unidentified pennate and centric diatoms (Table 5). The summer and fall samples were dominated by various green and blue-green (Cyanophyta) algae. During the warm months of July, August and September 1982, blue-green blooms dominate phytoplankton (Fig. 2). The phytoplankton standing crops in this reach of the Chattahoochee River are higher than similar riverine habitats around Alabama. This is attributable to the influence of pools formed by Walter F. George Lock and Dam and Columbia Lock and Dam, both located upstream from the Farley Nuclear Plant.

The vertical distribution of phytoplankters in the water column was relatively uniform. Between stations the phytoplankton distribution patterns, densities and chlorophyll concentrations were remarkedly similar on any given date (Figs. 3-20).

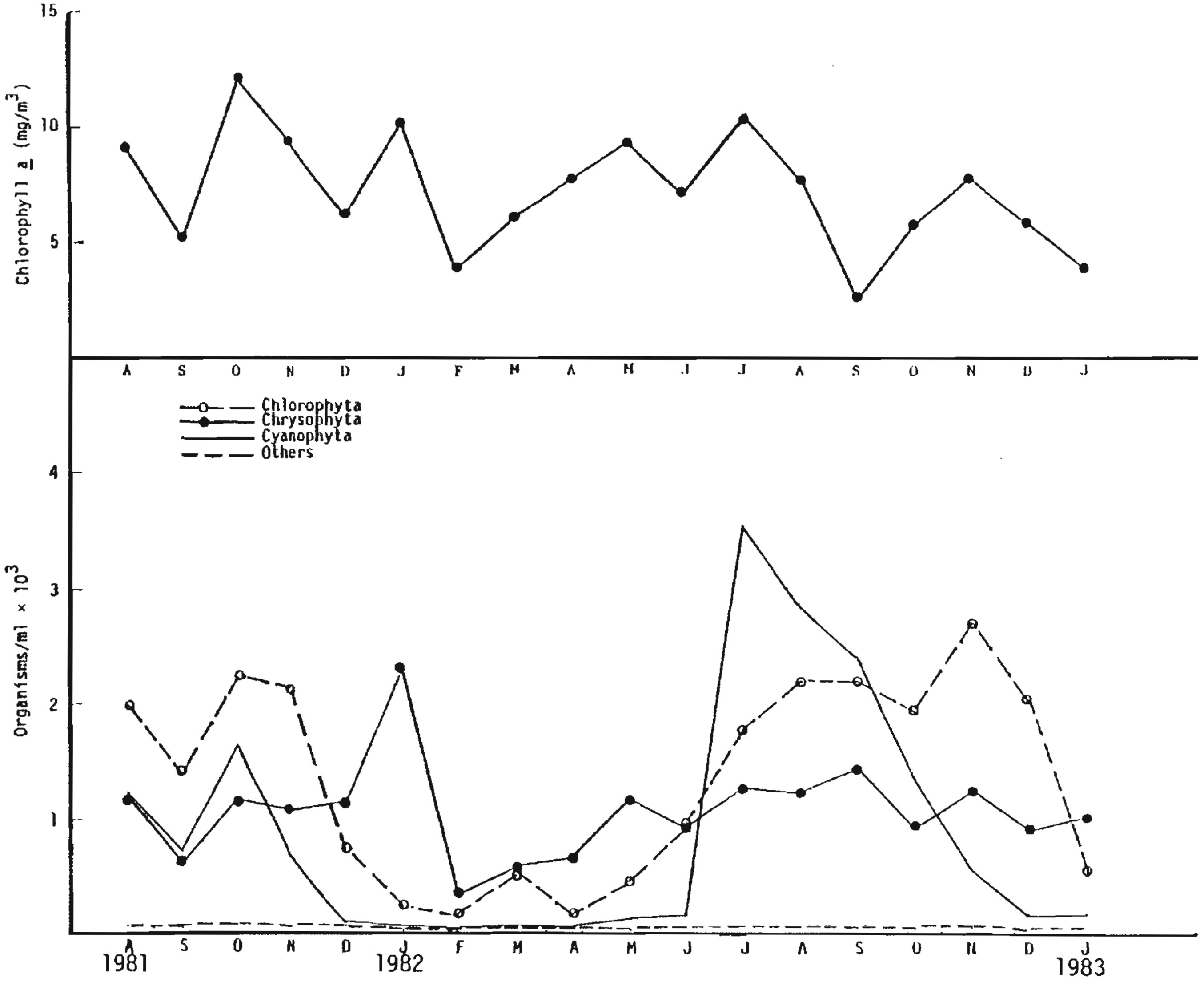


Figure 2. Mean number of phytoplankters and chlorophyll a values from the four stations on each date. Sampling extended from August 1981 through January 1983.

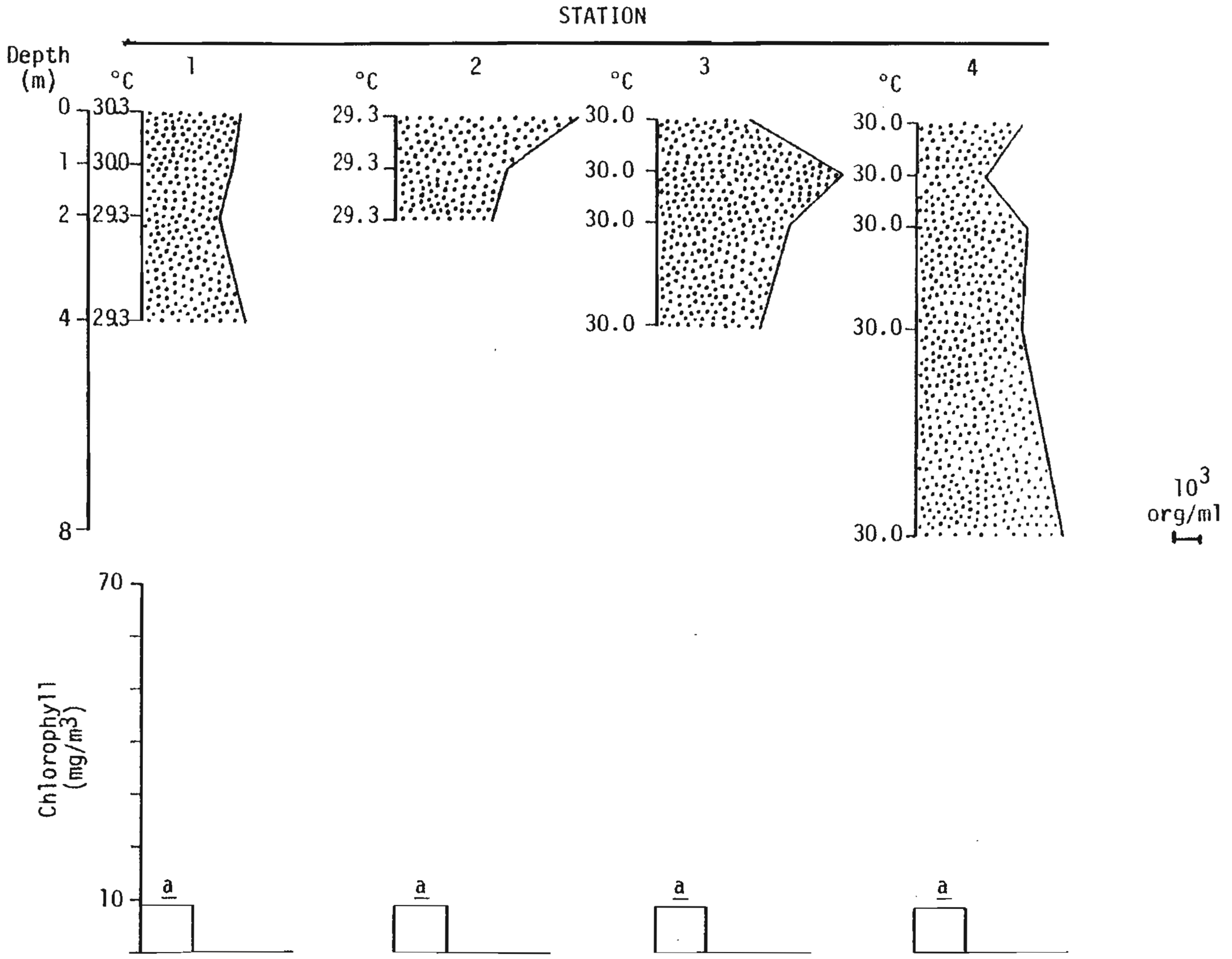


Fig. 3. Temperature profile, vertical distribution of phytoplankters (organisms/ml) and chlorophyll concentrations at each sampling station on 12 August 1981.

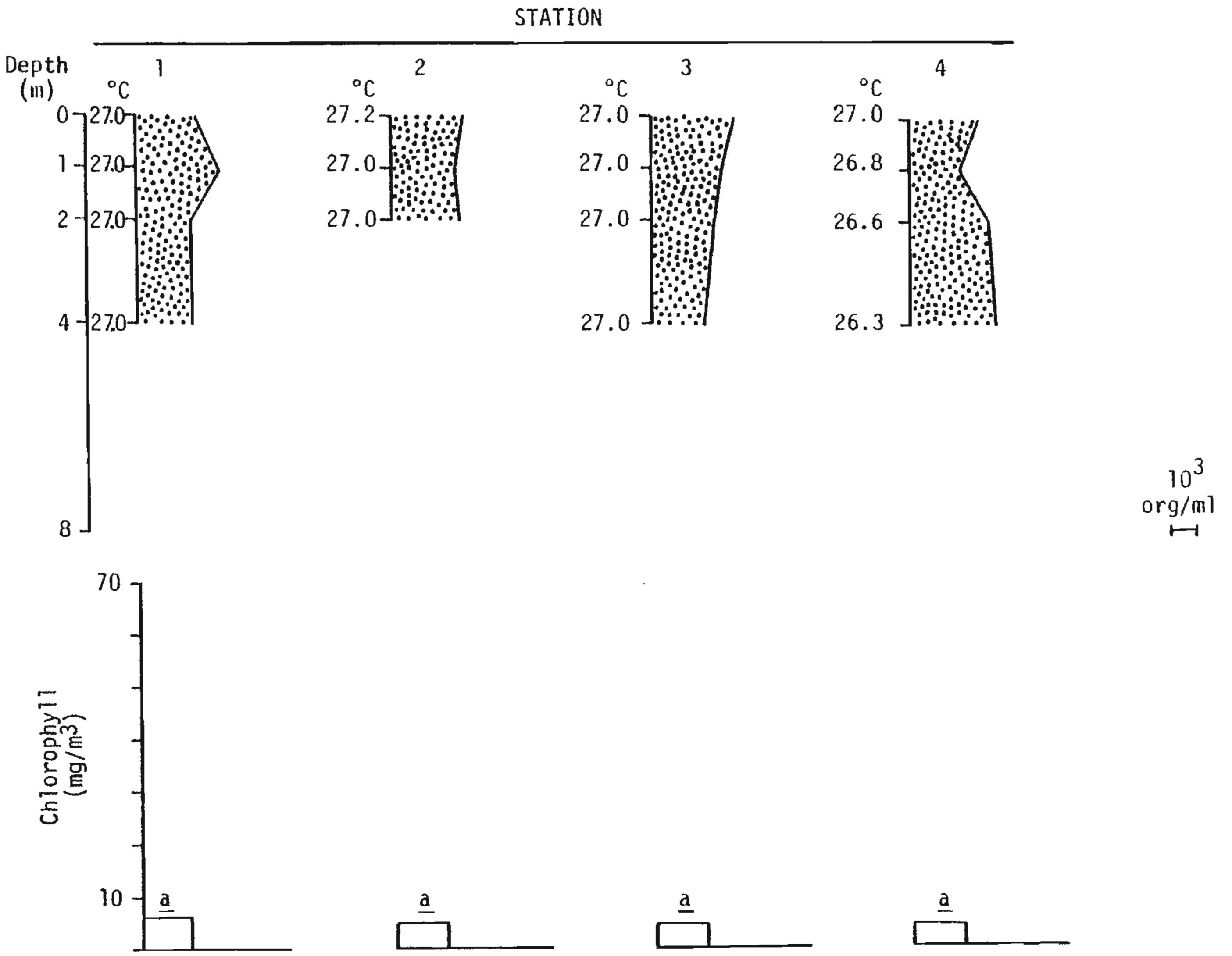


Fig. 4, Temperature profile, vertical distribution of phytoplankters (organisms/ml) and chlorophyll concentrations at each sampling station on 17 September 1981.

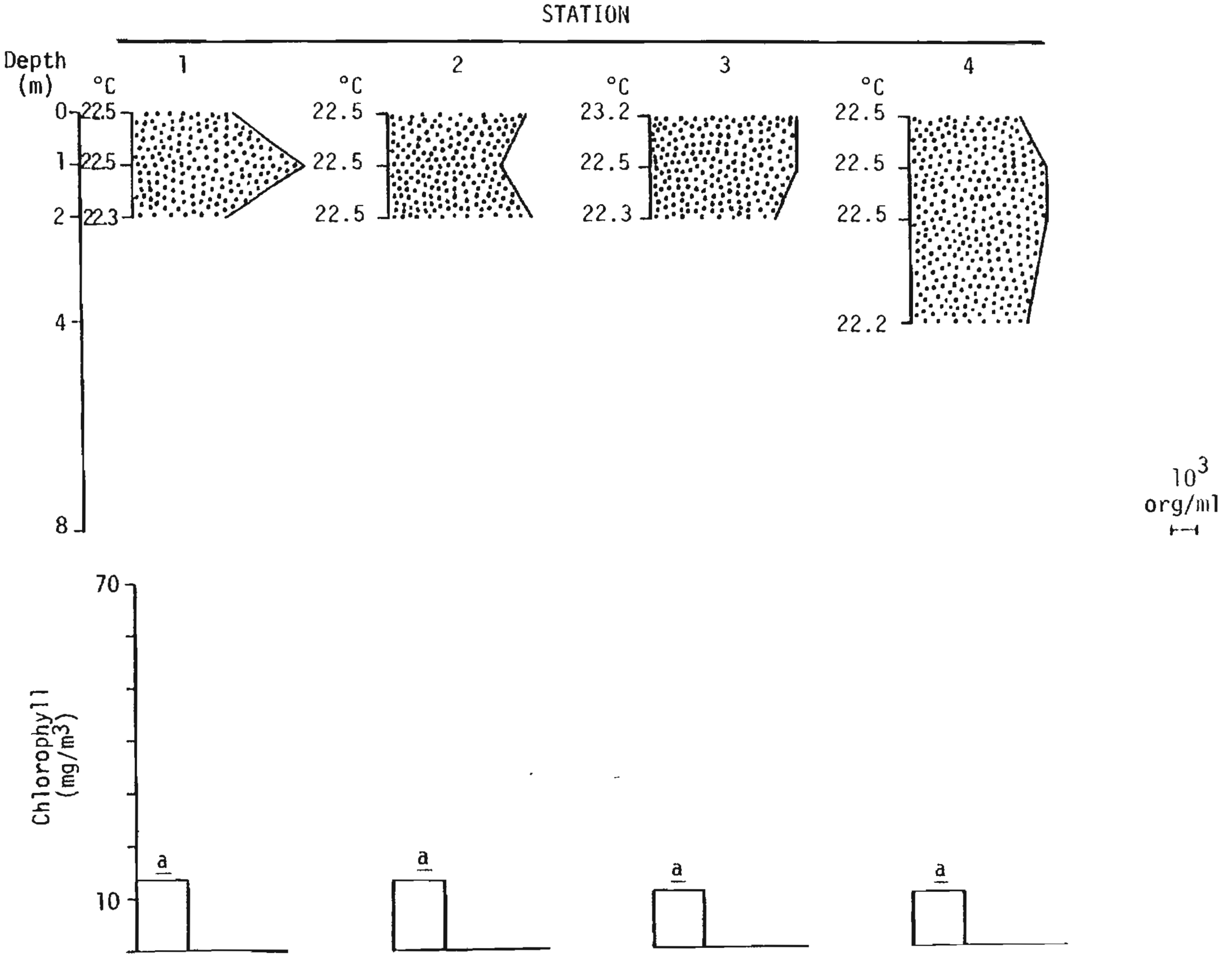


Fig. 5. Temperature profile, vertical distribution of phytoplankters (organisms/ml) and chlorophyll concentrations at each sampling station on 13 October 1981.

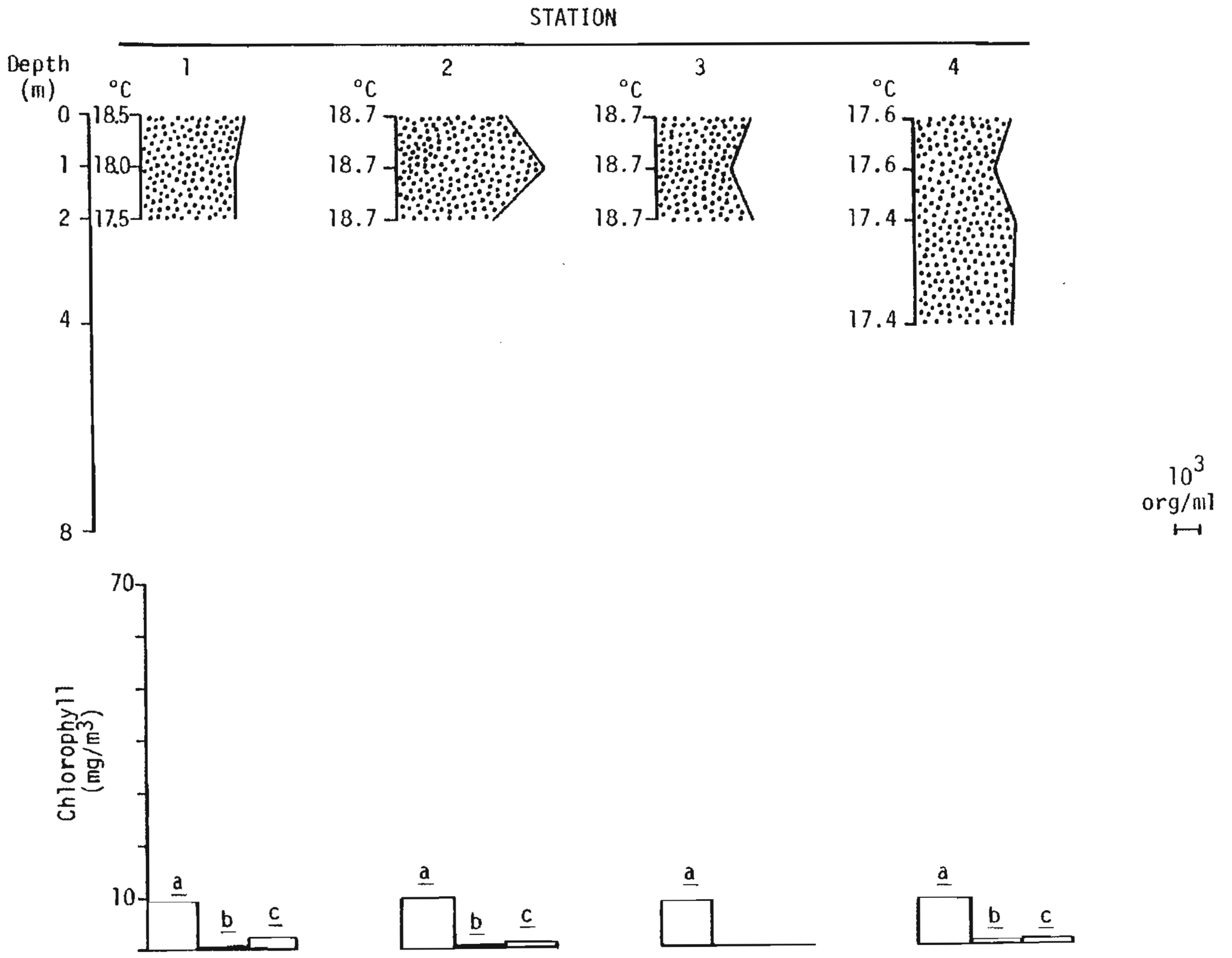


Fig. 6. Temperature profile, vertical distribution of phytoplankters (organisms/ml) and chlorophyll concentrations at each sampling station on 12 November 1981.

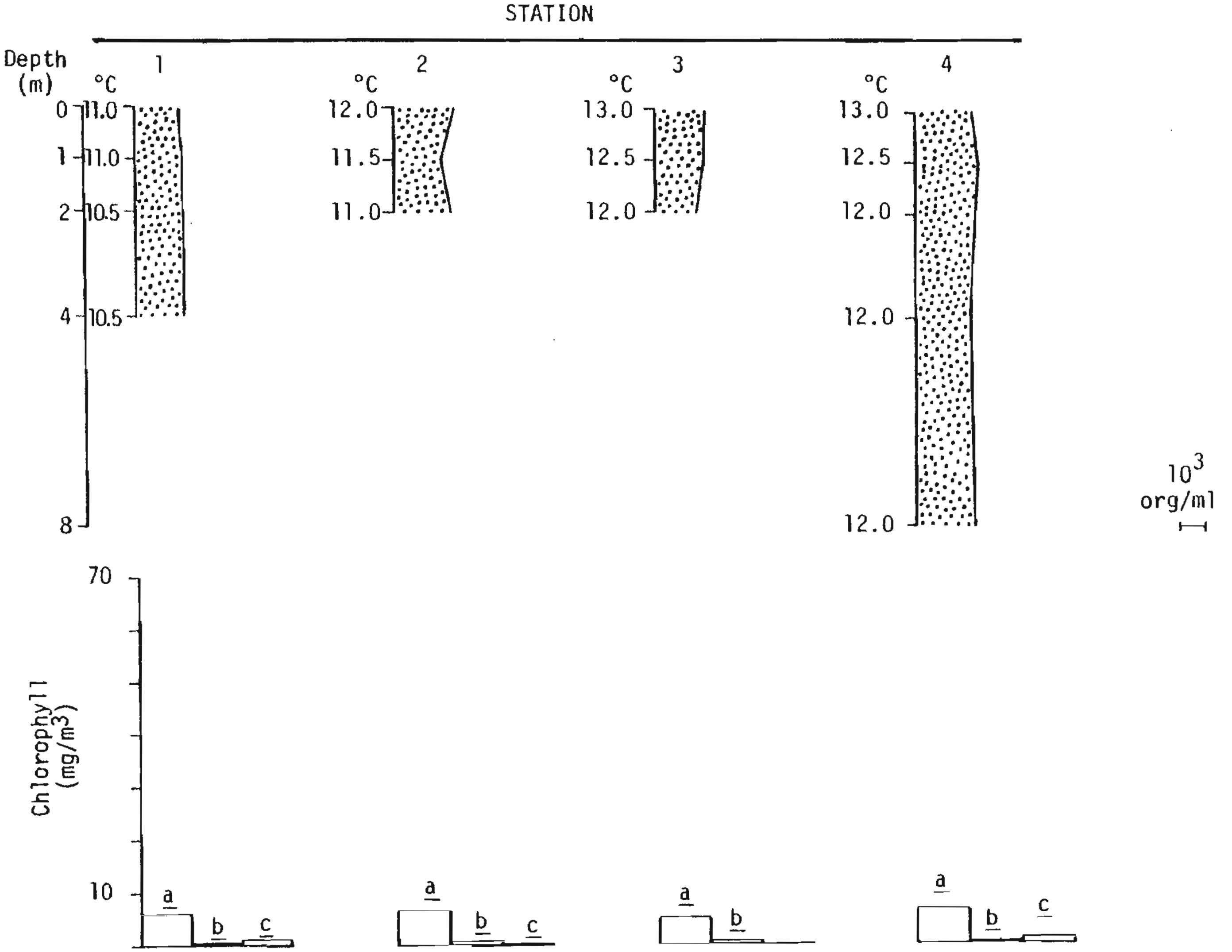


Fig. 7. Temperature profile, vertical distribution of phytoplankters (organisms/ml) and chlorophyll concentrations at each sampling station on 12 Decmeber 1981.

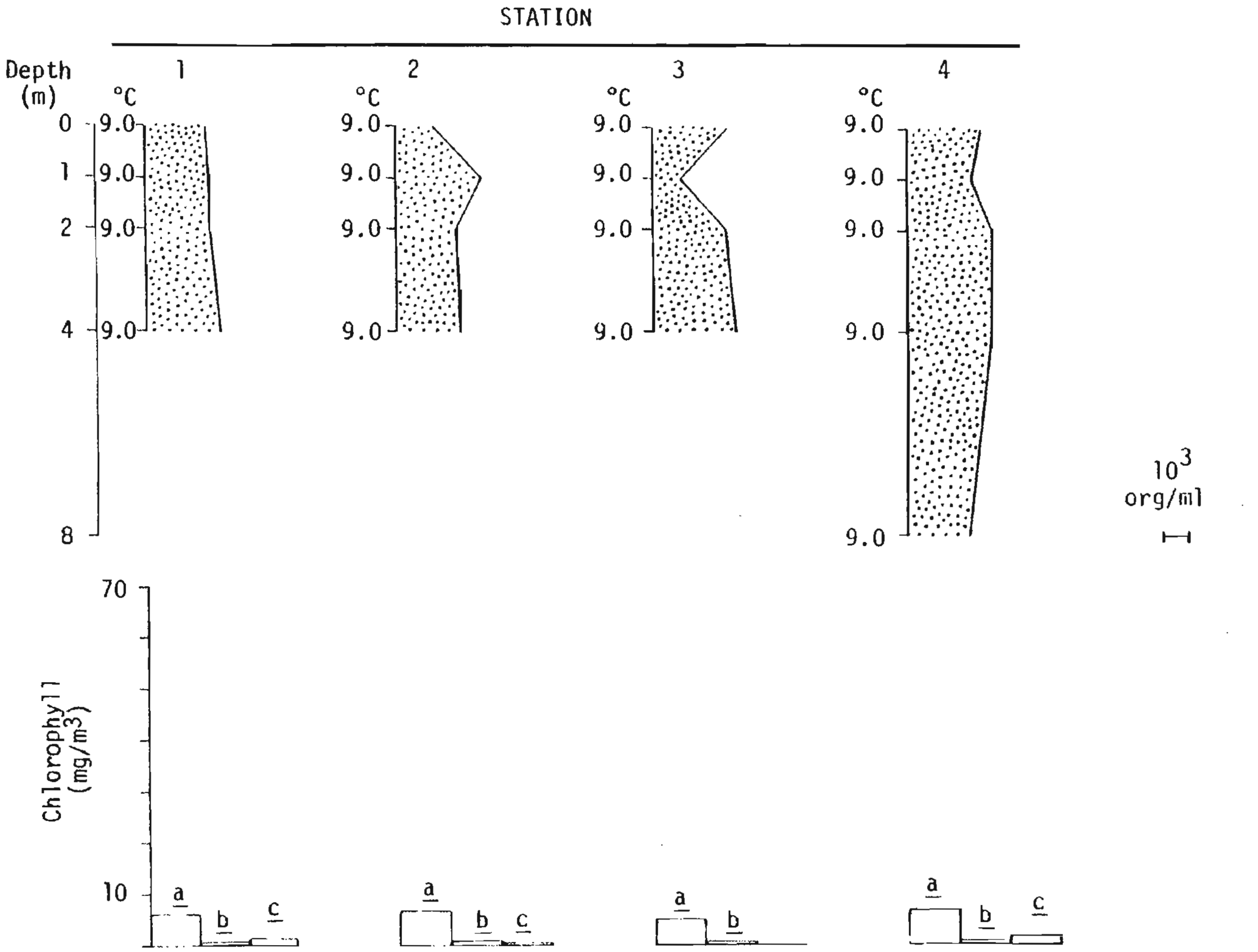


Fig. 8. Temperature profile, vertical distribution of phytoplankters (organisms/ml) and chlorophyll concentrations at each sampling station on 26 January 1982.

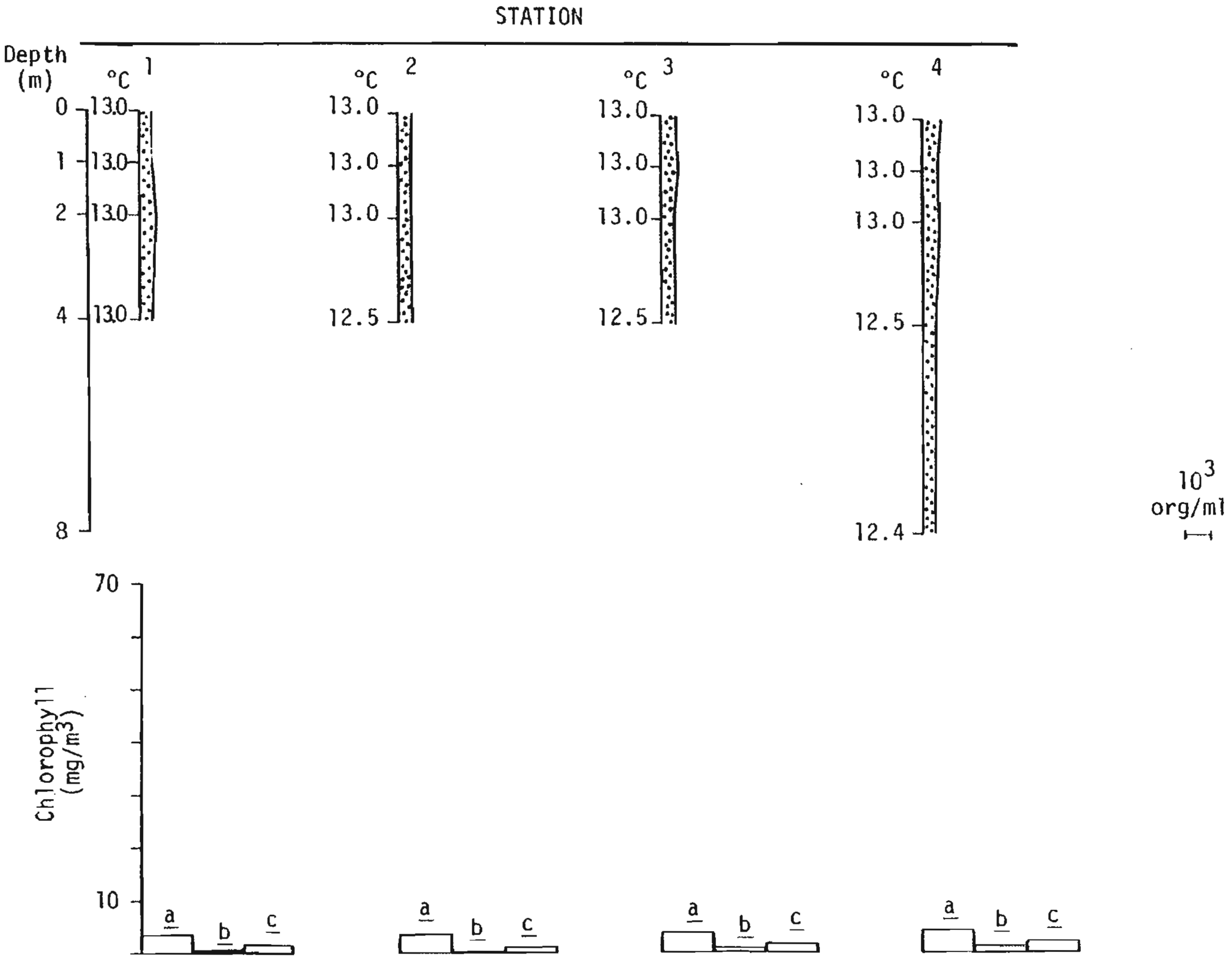


Fig. 9. Temperature profile, vertical distribution of phytoplankters (organisms/ml) and chlorophyll concentrations at each sampling station on 18 February 1982.

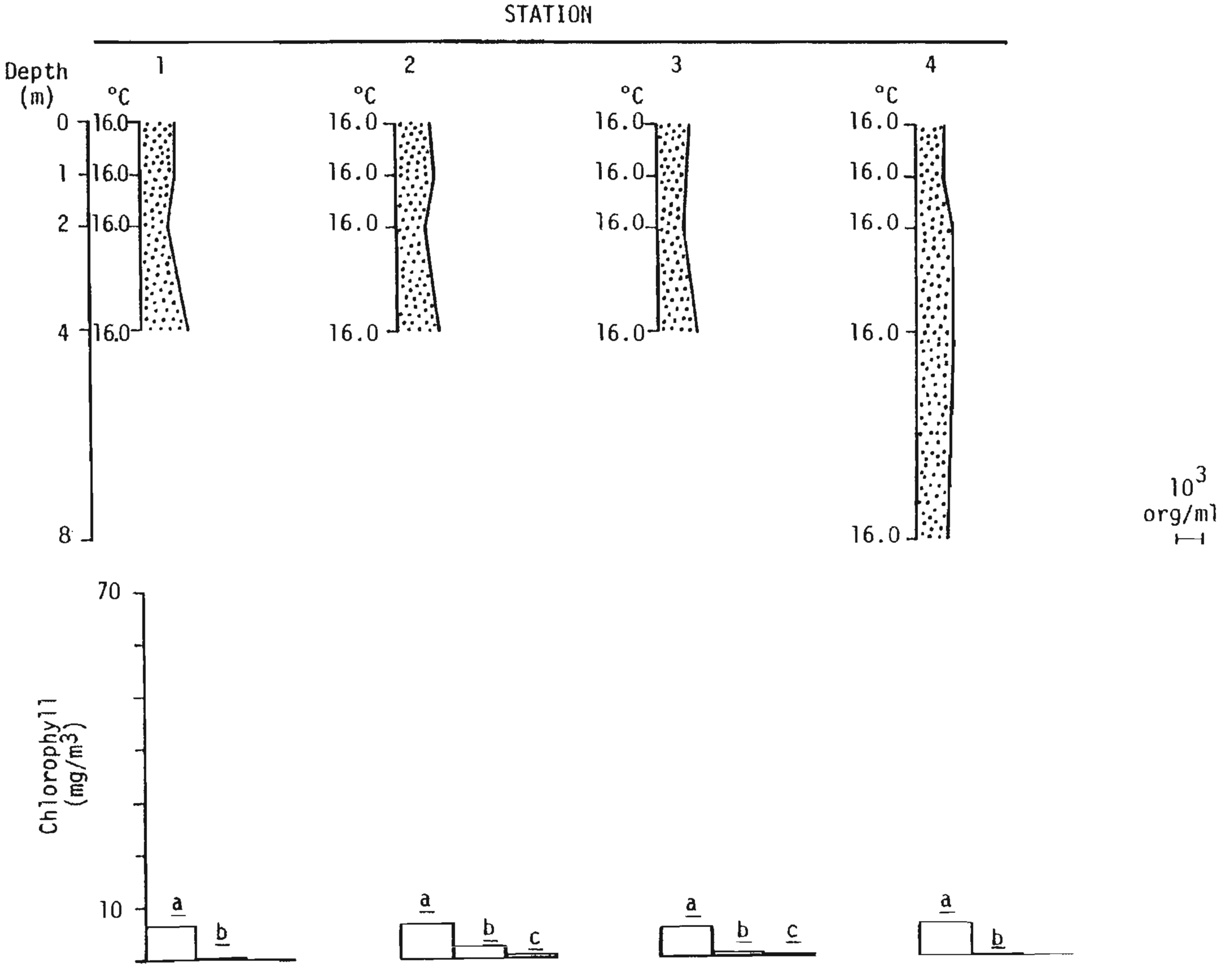


Fig. 10. Temperature profile, vertical distribution of phytoplankters (organisms/ml) and chlorophyll concentrations at each sampling station on 15 March 1982.

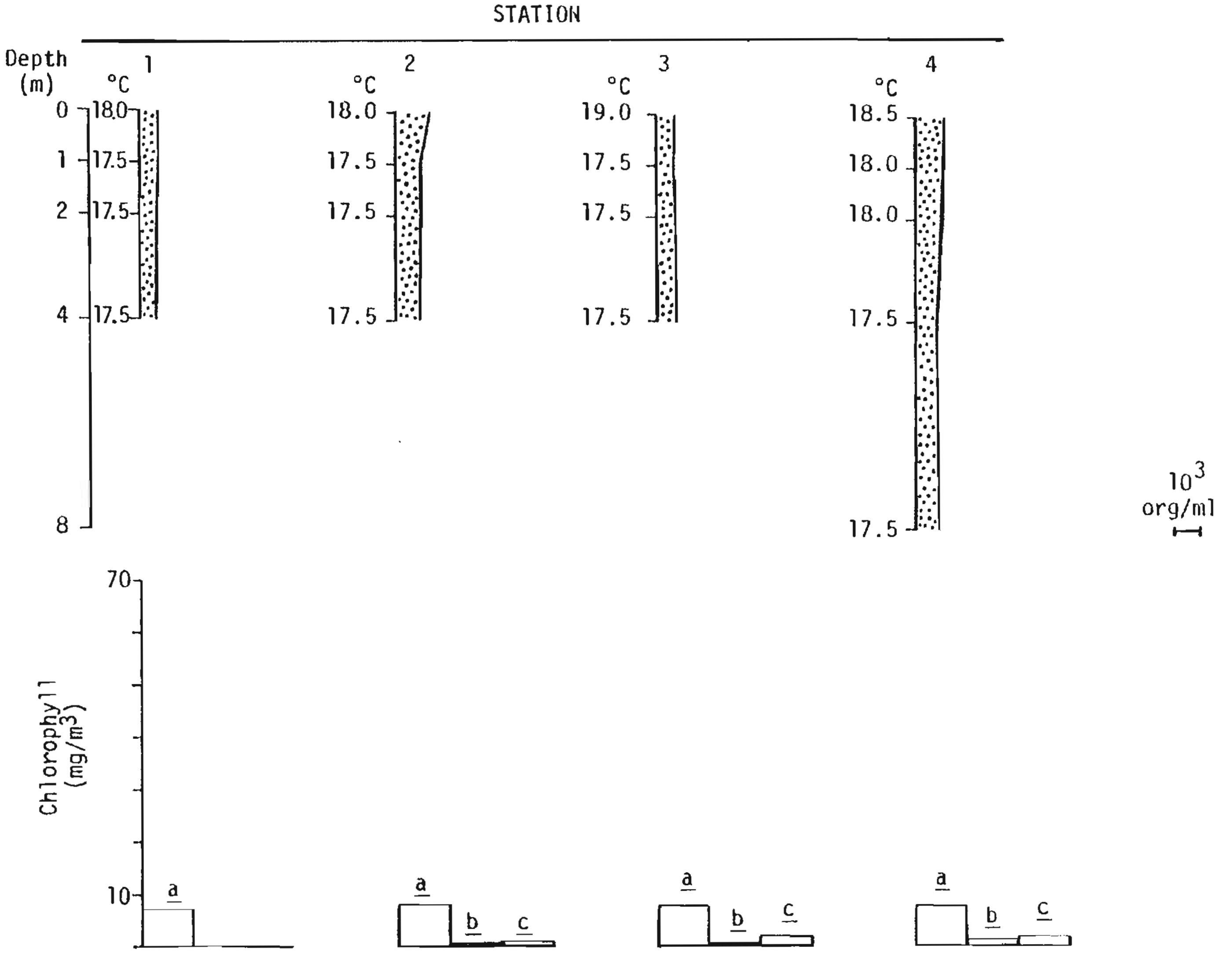


Fig. 11. Temperature profile, vertical distribution of phytoplankters (organisms/ml) and chlorophyll concentrations at each sampling station on 14 April 1982.

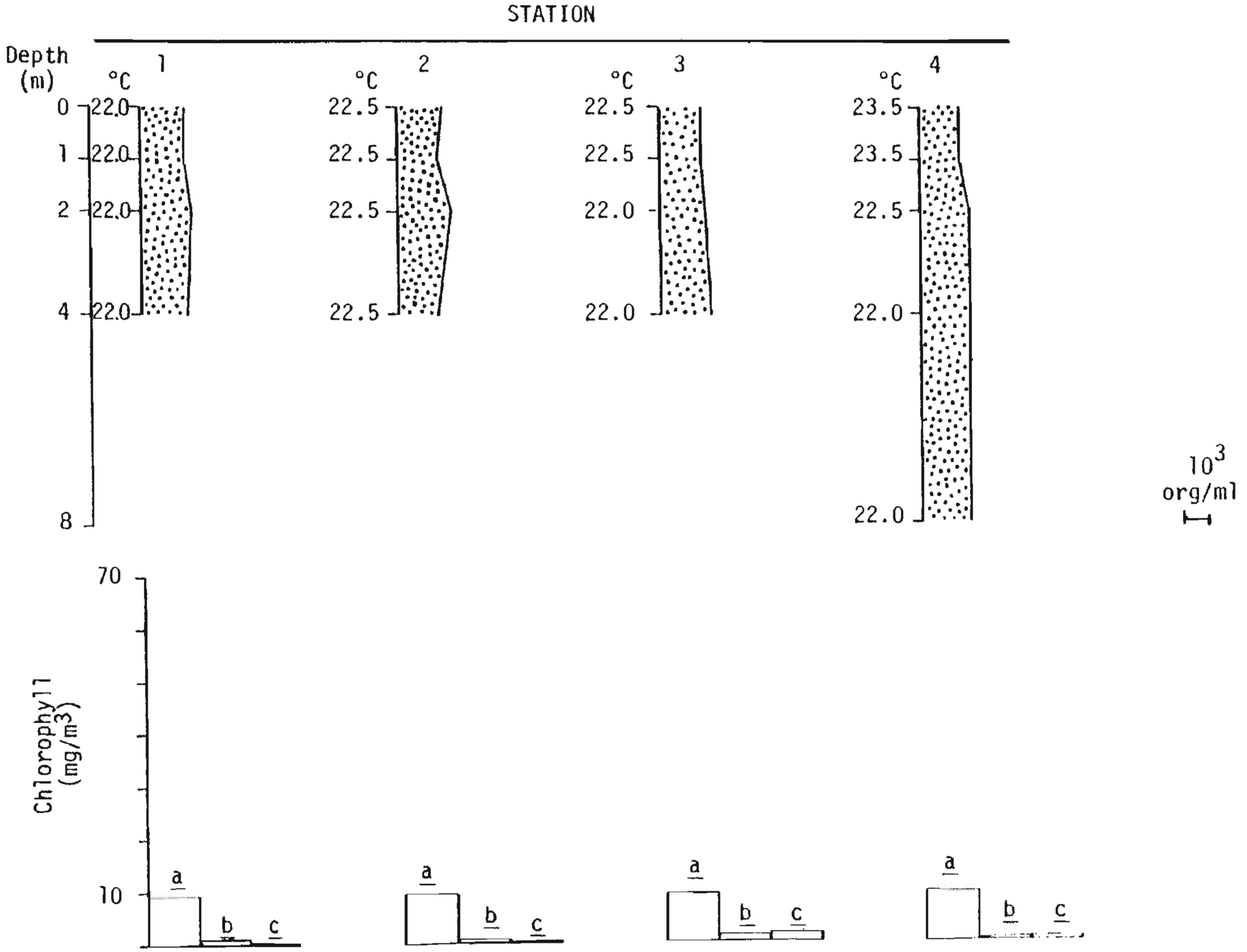


Fig. 12. Temperature profile, vertical distribution of phytoplankters (orgamisms/ml) and chlorophyll concentrations at each sampling station on 13 May 1982.

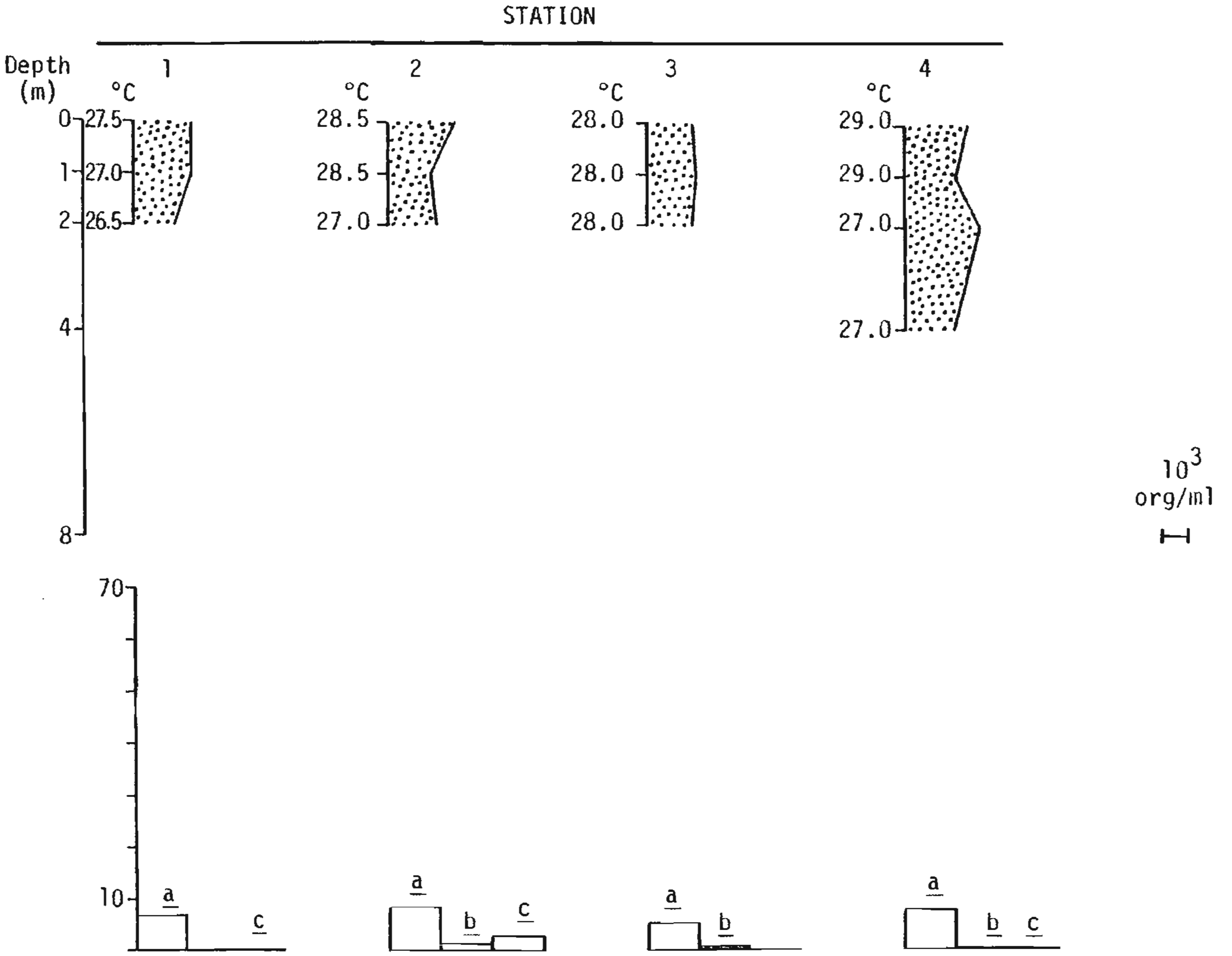


Fig. 13. Temperature profile, vertical distribution of phytoplankters (organisms/ml) and chlorophyll concentrations at each sampling station on 19 June 1982.

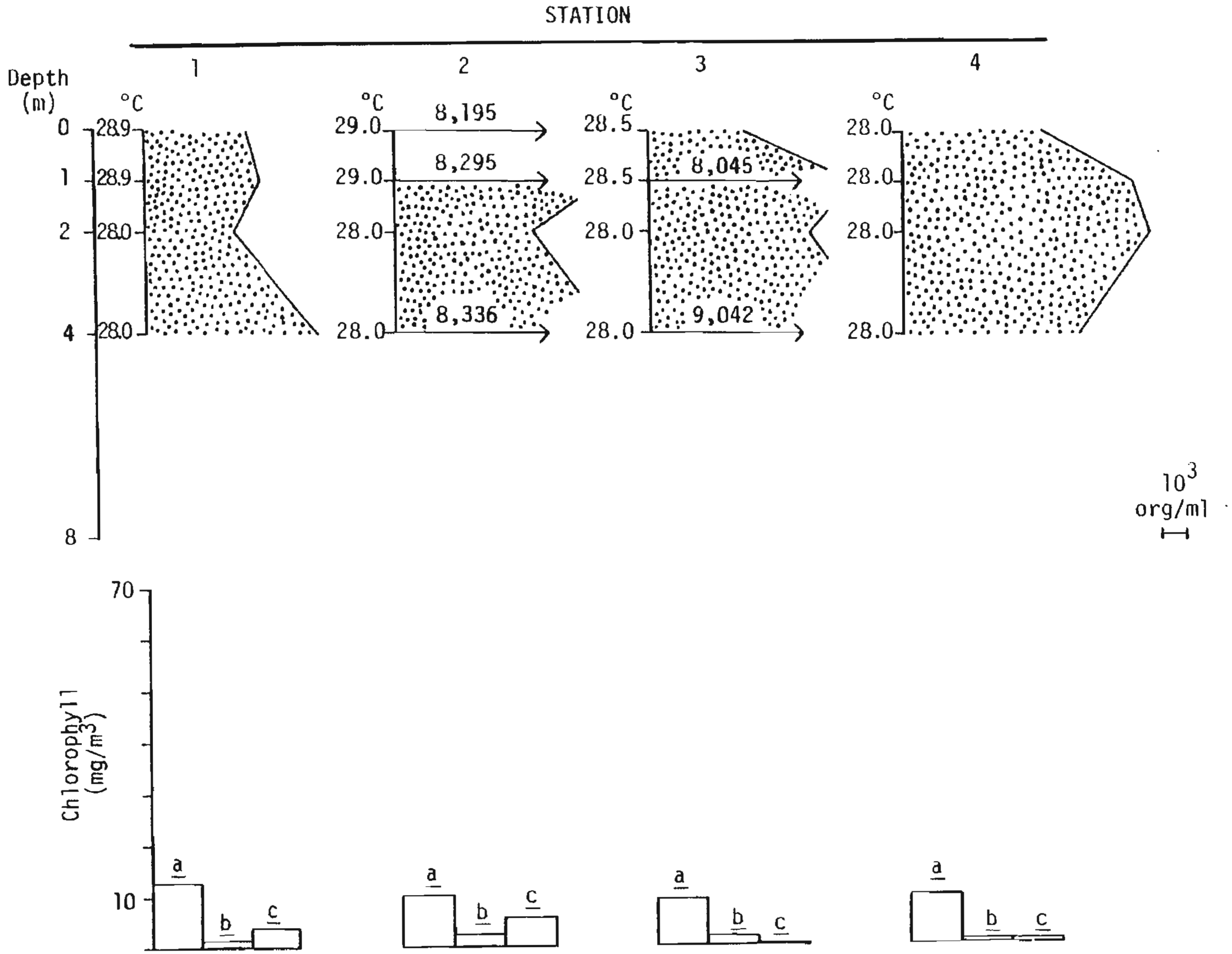


Fig. 14. Temperature profile, vertical distribution of phytoplankters (organisms/ml) and chlorophyll concentrations at each sampling station 15 July 1982.

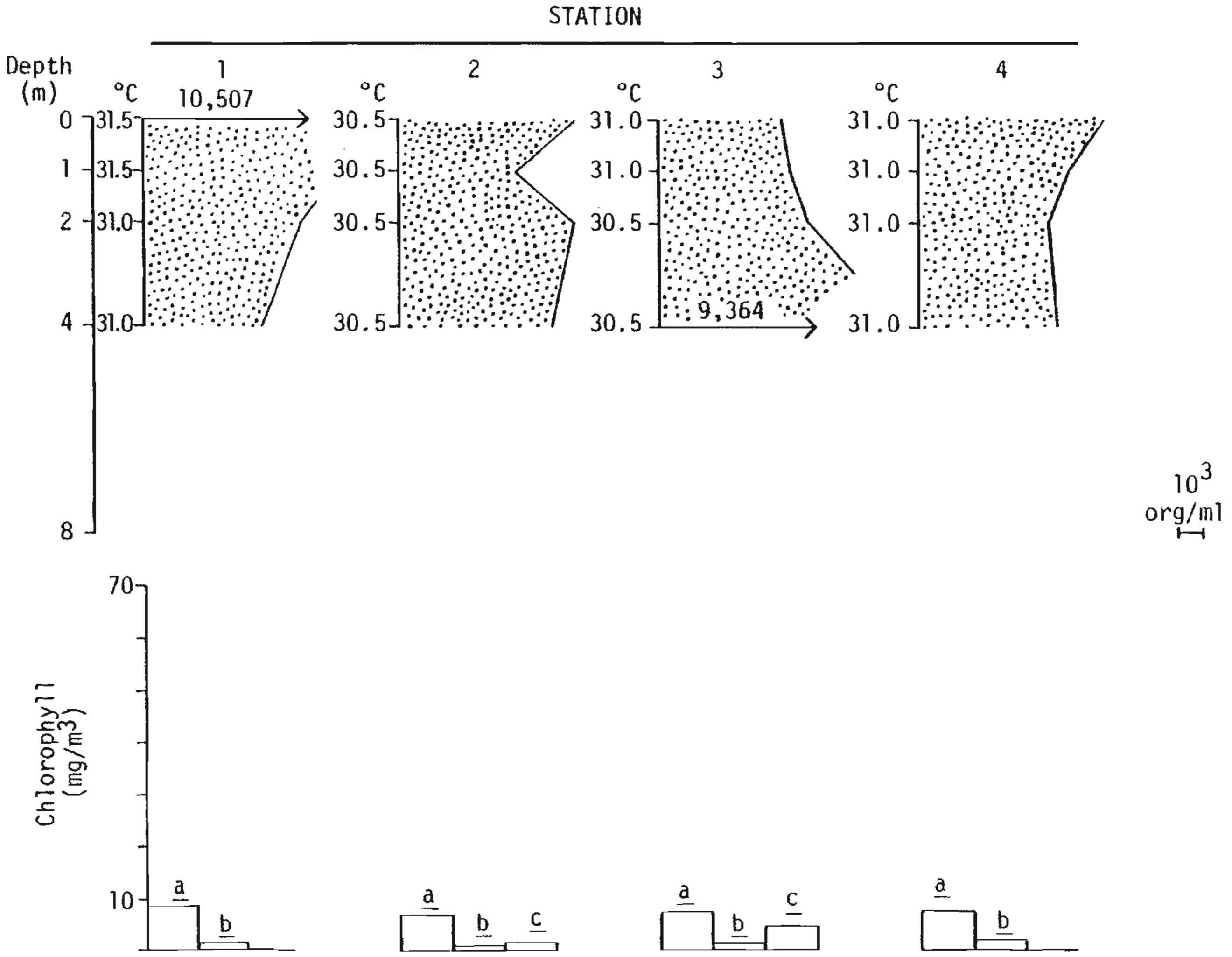


Fig. 15. Temperature profile, vertical distribution of phytoplankters (organisms/ml) and chlorophyll concentrations at each sampling station on 18 August 1982.

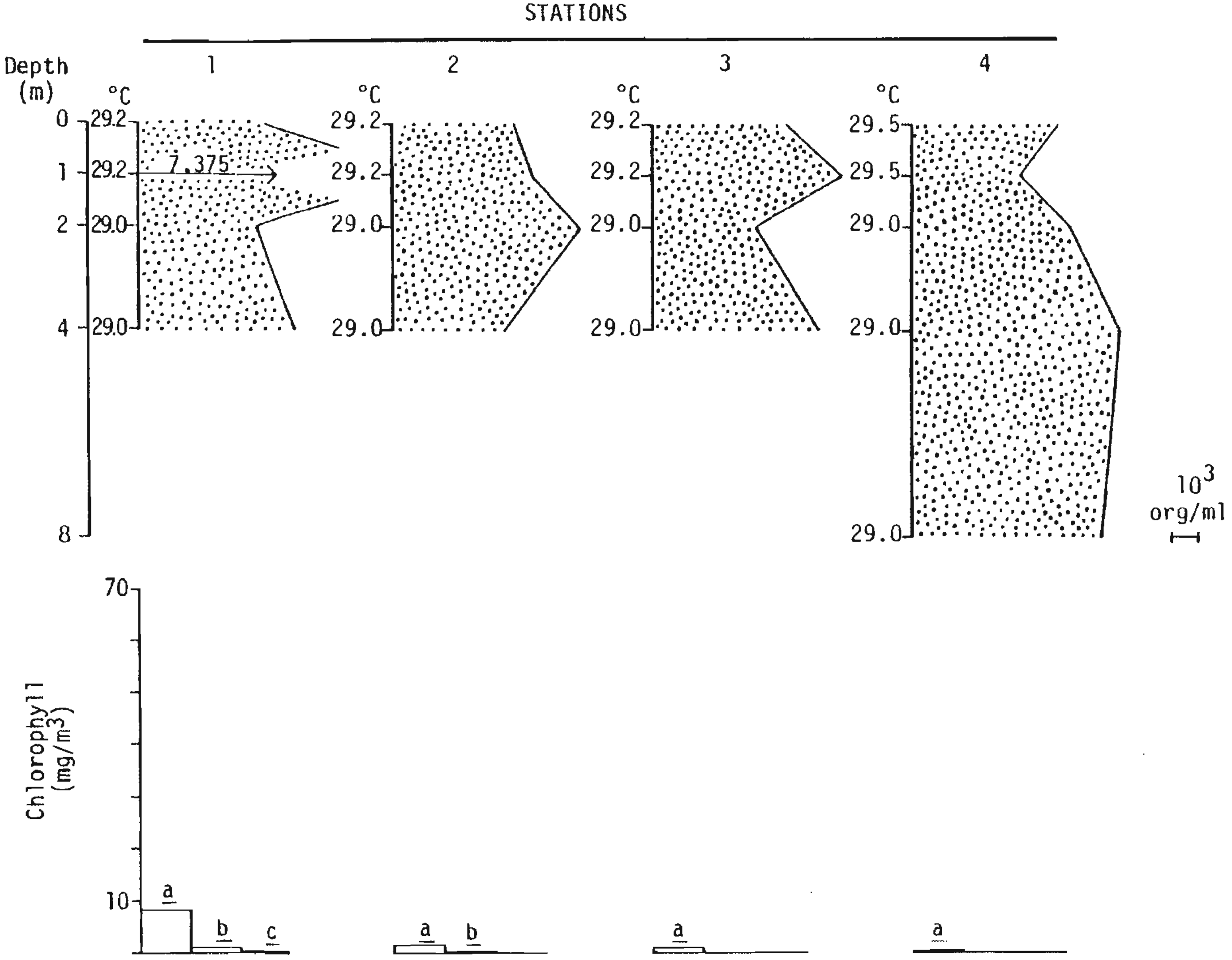


Fig. 16. Temperature profile, vertical distribution of phytoplankters (organisms/ml) and chlorophyll concentrations at each sampling station on 16 September 1982.

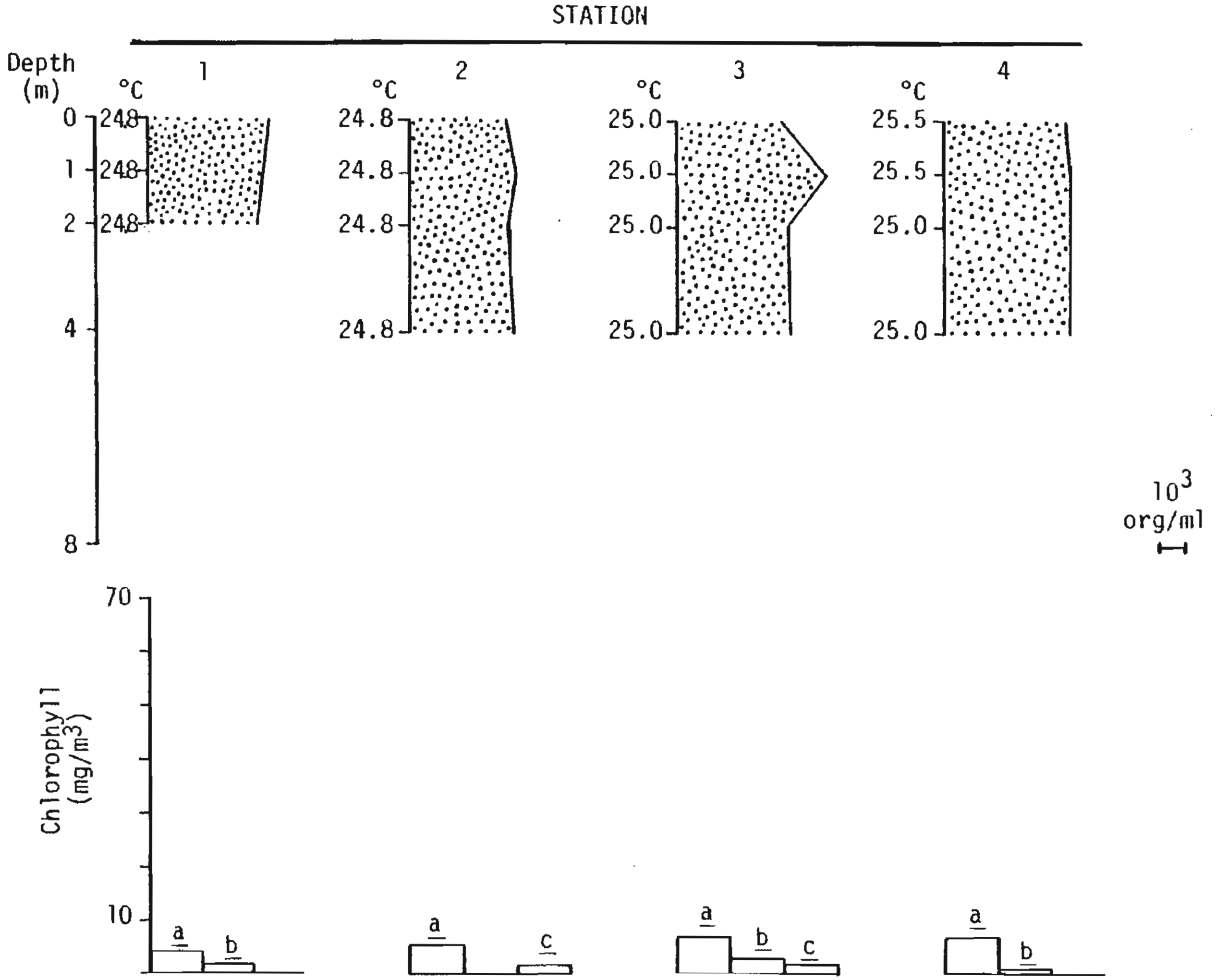


Fig. 17. Temperature profile, vertical distribution of phytoplankters (organisms/ml) and chlorophyll concentrations at each sampling station on 14 October 1982.

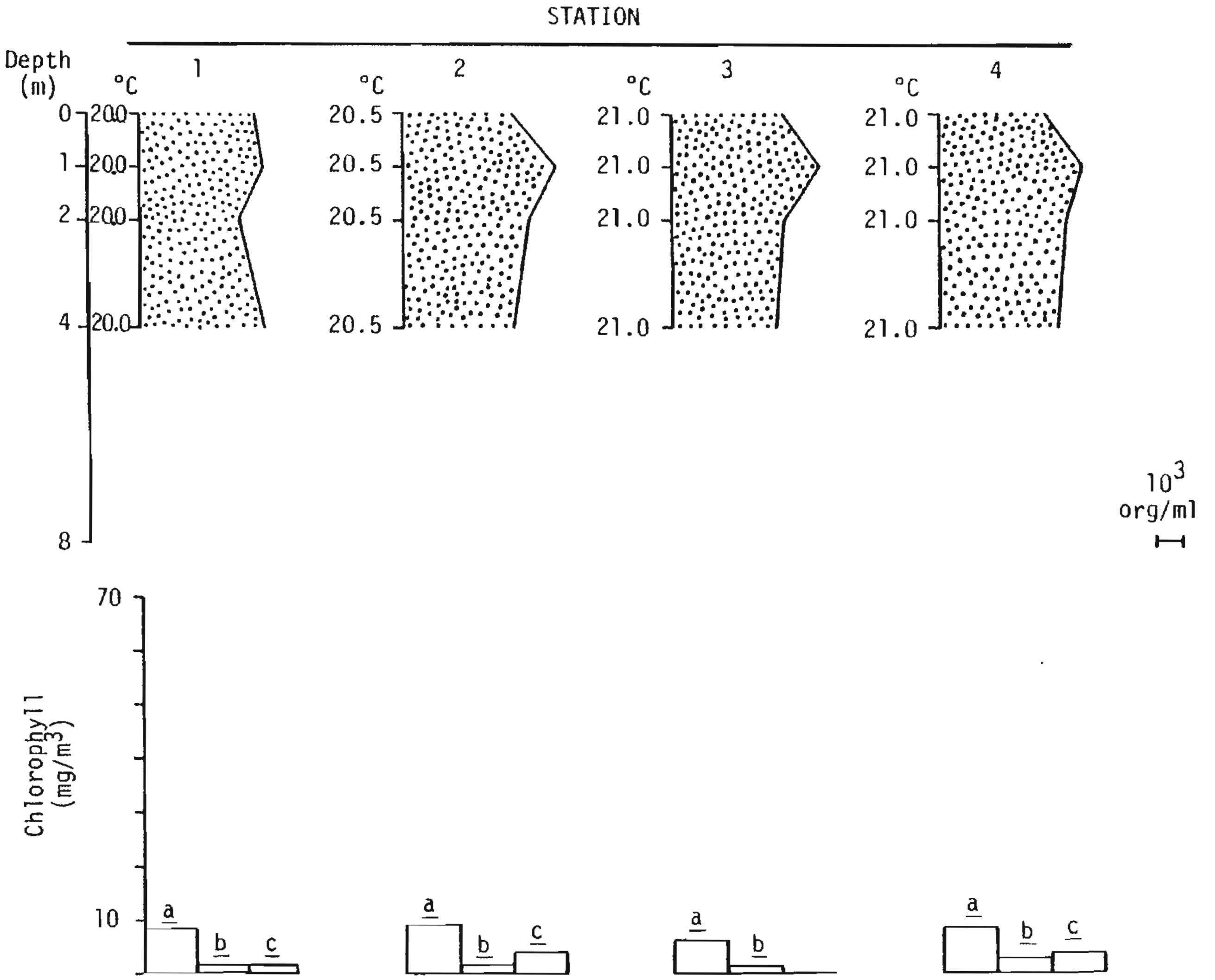


Fig. 18. Temperature profile, vertical distribution of phytoplankters (organisms/ml) and chlorophyll concentrations at each sampling station on 11 November 1982.

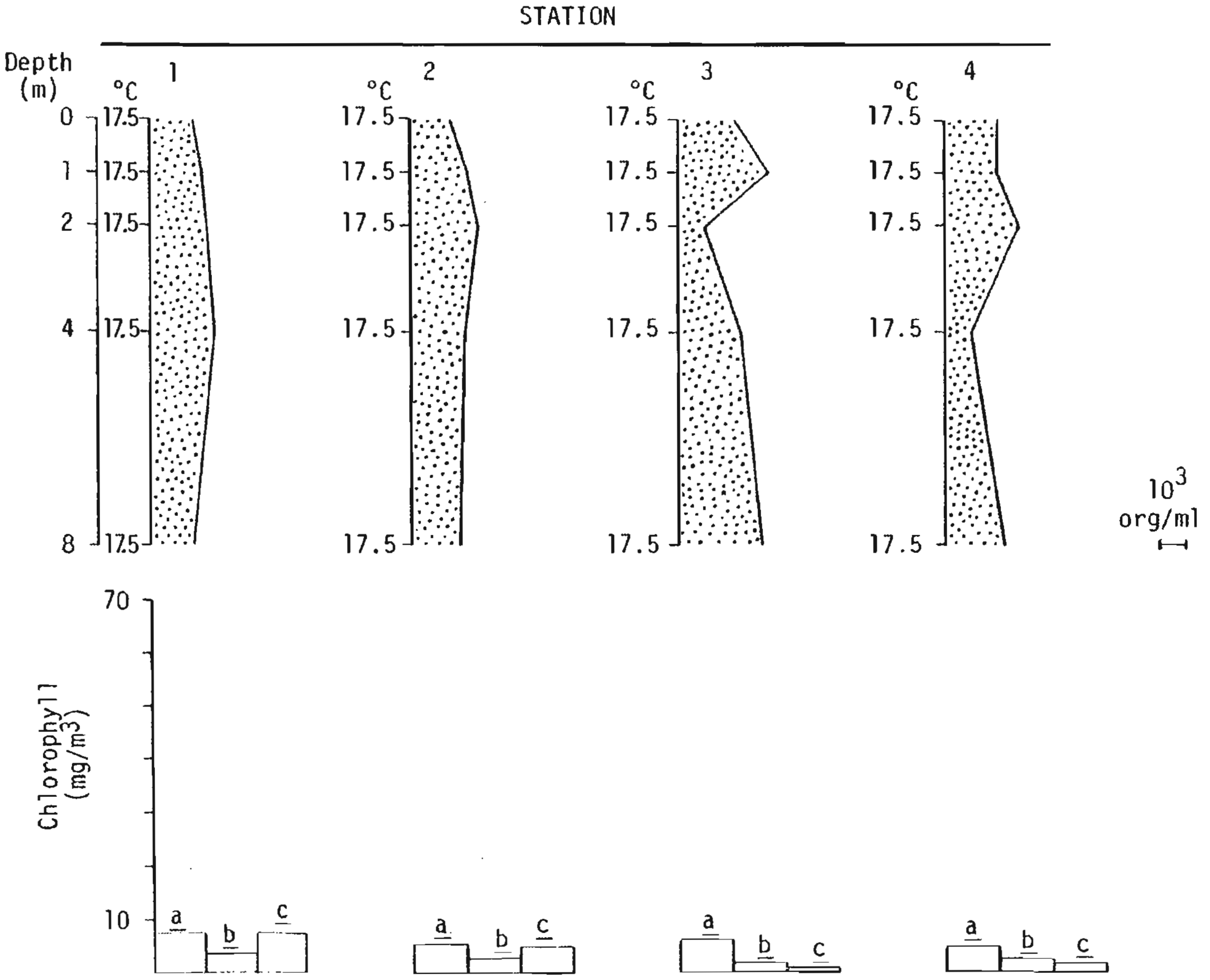


Fig. 19. Temperature profile, vertical distribution of phytoplankters (organisms/ml) and chlorophyll concentrations at each sampling station on 14 December 1982.

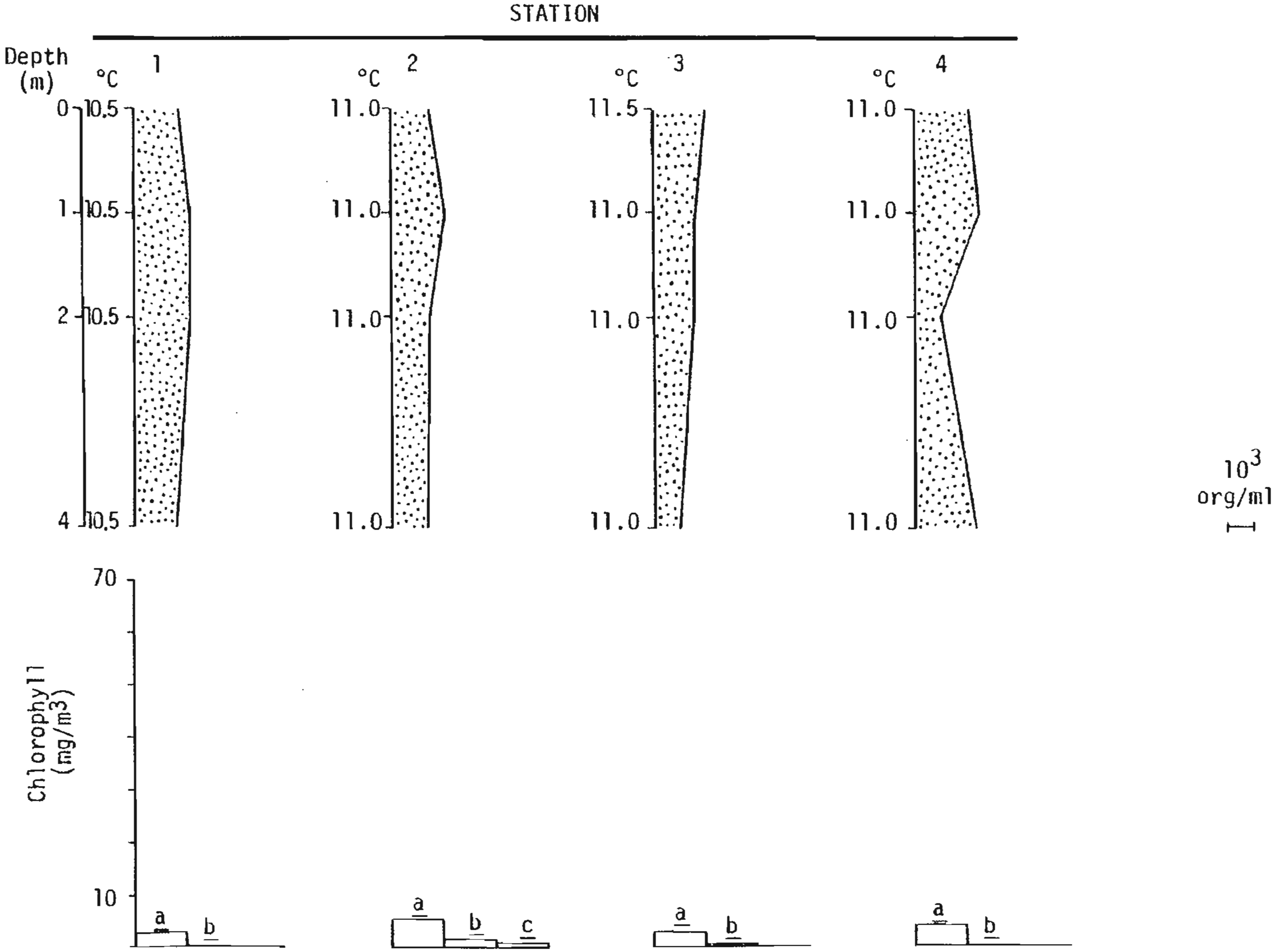


Fig. 20. Temperature profile, vertical distribution of phytoplankters (organisms/ml) and chlorophyll concentrations at each sampling station on 13 January 1983.

Table 4. Dominance ranking of phytoplankton groups by station and date. The most abundant group was assigned a value of (1).

Date		Station			
		1	2	3	4
12 Aug 1981	Diatom	2	3	3	2
	Green	1	1	1	1
	Blue-green	3	2	2	3
	Other	4	4	4	4
17 Sept	Diatom	3	3	2	3
	Green	1	1	1	1
	Blue-green	2	2	3	2
	Other	4	4	4	4
13 Oct	Diatom	3	3	3	3
	Green	1	1	1	1
	Blue-green	2	2	2	2
	Other	4	4	4	4
12 Nov	Diatom	2	2	2	2
	Green	1	1	1	1
	Blue-green	3	3	3	3
	Other	4	4	4	4
17 Dec	Diatom	1	1	1	1
	Green	2	2	2	2
	Blue-green	3	3	3	3
	Other	4	4	4	4
26 Jan 1982	Diatom	1	1	1	1
	Green	2	2	2	2
	Blue-green	3	3	3	3
	Other	4	4	4	4
18 Feb	Diatom	1	1	1	1
	Green	2	2	2	2
	Blue-green	4	4	4	4
	Other	3	3	3	3
15 Mar	Diatom	2	1	2	2
	Green	1	2	1	1
	Blue-green	4	4	3	4
	Other	3	3	4	3
14 Apr	Diatom	1	1	1	1
	Green	2	2	2	2
	Blue-green	3	3	4	3
	Other	4	4	3	4

Table 4. Continued.

Date		Station			
		1	2	3	4
13 May	Diatom	1	1	1	1
	Green	2	2	2	2
	Blue-green	3	3	3	3
	Other	4	4	4	4
14 Jun	Diatom	1	1	1	2
	Green	2	2	2	1
	Blue-green	3	3	3	3
	Other	4	4	4	4
15 Jul	Diatom	3	3	3	3
	Green	2	2	2	2
	Blue-green	1	1	1	1
	Other	4	4	4	4
18 Aug	Diatom	3	3	3	3
	Green	2	1	2	2
	Blue-green	1	2	1	1
	Other	4	4	4	4
16 Sept	Diatom	3	3	3	3
	Green	1	2	2	2
	Blue-green	2	1	1	1
	Other	4	4	4	4
14 Oct	Diatom	3	3	3	3
	Green	1	1	1	1
	Blue-green	2	2	2	2
	Other	4	4	4	4
11 Nov	Diatom	2	2	2	2
	Green	1	1	1	1
	Blue-green	3	3	3	3
	Other	4	4	4	4
14 Dec	Diatom	2	2	2	2
	Green	1	1	1	1
	Blue-green	3	3	3	3
	Other	4	4	4	4
13 Jan 1983	Diatom	1	1	1	1
	Green	2	2	2	2
	Blue-green	3	3	3	3
	Other	4	4	4	4

Table 5. Dominance ranking of phytoplankters by station and date. Most abundant organism was assigned a value of one (1).

Organism	1981																				1982			
	August 12				September 17				October 13				November 12				December 17				January 26			
Station	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
CHRYSOPHYTA																								
Melosira sp.																								
M. granulata			6			6	6		7	6	5	8	4	5	5	9	3	1	1	3	1	1	1	1
M. varians									8					8	2	10	6			6	4	3	4	4
M. distans																								
Cyclotella sp.	5		6	4			5				9	8	1	3	6	6	1	2	2	1	3	3	3	3
Synedra sp.																								
Asterionella sp.																								
A. formosa																								
Gyrosigma sp.																								
Chrysococcus sp.																								
Unid. pennate diatoms	1	2	1	1	1	3	1	2	1	2	2	1	5	2	2	4	2	2	3	2	2	2	2	2
Dinobryon sp.																								
Tabellaria sp.																								
Fragellaria sp.																	6							
CHLOROPHYTA																								
Ankistrodesmus sp.																								
A. convolutus					5	4	6	5	4	5	8	3	5	8	6	5		7		7	5	4		6
A. falcatus			6	5						7			8			8								
A. nannoselene	6	1					6				9	8	8	8		9								
Scenedesmus sp.																								
S. hystrix											9													
S. abundans							5				10	7	4		7	10	7							6
S. acuminatus	6	6				5		5			9		4	6	5	10								
S. anomalus																								
S. armatus	6	6	5		5	6				5	7	5	2	8	3	2								6
S. bijuga		6	6			6	6	5		7			8	7	7						5		5	
S. denticulatus	6		4					5	4	7	8	8	8	8	2									
S. brasiliensis														8						7				
S. dimorphus																								
S. parisiensis																		6						
S. quadricauda	5		4	3	2	4	5	5	3	6	3	6	3	1	1	1		3	4	7		4	5	5
S. opoliensis																								
Closterium sp.			6				6	5					8	8		10						6		
Chlorella sp.																								
Pediastrum sp.							6		8				3	8										
P. duplex																								
Sphaerocystis *schroeteri*							6																	
Schroederia sp.																		7						
Pandorina morum																								
P. charkowiensis																				7				
Actinastrum *hantzschii*										6														
Coelastrum sp.				3						5			8		7	10		7						
Tetraedron sp.	6	3		3	5						9			6	5	9								
T. trigonum																								
Selenastrum sp.										7														
Chlamydomonas sp.	3	3	4	3		4	3	5	5	3	4	7	4	8	4	7	4	5	7					

Table 5. Continued.

Organism	1981																				1982			
	August 12				September 17				October 13				November 12				December 17				January 26			
Station	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
CHLOROPHYTA (cont.)																								
Crucigenia sp.		6	6		4	6	6	4	7				6											
C. quadrata																								
Cosmarium sp.			5	5	5	5	6		6	5	6	5			7					7			5	
Nephrocytium sp.	5		6								8											6		
Kirchneriella sp.						6																		
Dictyosphaerium sp.			6						8		10						7						5	
D. pulchellum																								
Golenkinia sp.								5				7		8										
Closteriopsis sp.														8	6									
Eudorina sp.																								
E. elegans																								
Micratinium sp.									7									7					5	
Euastrum sp.	6					6	5		8						7		7							
Pleurotaenium sp.	6				6																			
Staurastrum sp.					5			5							7									6
Unid. green flagellates																								
Elakatothrix sp.																								
Planktosphaeria sp.																								
Oocystis sp.		6	6					5																
Tetrastrum sp.																10								
T. heteracanthum																								
Arthrodesmus sp.																								6
Unid. green coccoid																								
CYANOPHYTA																								
Merismopedia sp.						6		5		7		8				10		7						
Oscillatoria sp.							6		8	6		8			7									
O. angustissima																								
Chroococcus sp.		6				5			7	4				8	5	9		7						6
Aphanotheca sp.																10								
Anabaena sp.										7		8												
Gomphosphaeria sp.							6																	
Unid. filament.																								
Spirulina laxa	4	5	1	2	1	1	2	1	2	1	1	2	4	4	6	3				7				
Rhapidiopsis sp.	5	4	2	3	3	3	4		8															
Lyngbya sp.	2	1	3	2		5		4	8	7	8	4												
Microcystis sp.				4			6	3		7	8	6					7			6				
OTHERS																								
Peridinium sp.																								
P. aciculiferum																								
Phacus sp.			6										8	8					7					
Trachelomonas sp.	5		4	5						7	10		7			9	7	7	6	5			5	6
Euglena sp.		6	6	5					8		8					10	7							
Gymnodinium sp.																	5	4	5	4			5	
Lepocinclis sp.																								
Unid. dinoflagellates																								

Table 5. Continued.

	1982																							
Organism	February 18				March 15				April 14				May 13				June 14				July 15			
Station	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
CHRYSOPHYTA																								
Melosira sp.																								
M. granulata	2	3	4	2	4	2	3	2	1	1	1	1	1	1	1	1	3	4	3	3	8			6
M. varians								7	7			7				8								
M. distans														5	8	6		6						
Cyclotella sp.	5		6	5	7	5	5	6		5	5				8		7	7	7	8			8	
Synedra sp.																								
Asterionella sp.														6		7								
A. formosa																								
Gyrosigma sp.																								
Chrysococcus sp.																	7				6	6		
Unid. pennate diatoms	1	1	1	1	1	1	1	1	2	2	2	2	5	3	6	3	1	1	2	2	3	4	5	3
Dinobryon sp.				5																				
Tabellaria sp.	5	5																						
Fragellaria sp.																								
CHLOROPHYTA																								
Ankistrodesmus sp.																								
A. convolutus	3	4	2	3	3	3	2	4	5	3	3	5	3	2	5	2	6			8	8	5		
A. falcatus		5				6	6						7		8								7	
A. nannoselene									7				7							8		5	8	
Franceia sp.																				7				
Scenedesmus sp.																								
S. hystrix																								
S. abundans		6			6											8			6			6		
S. acuminatus															8				7		8		8	
S. anomalus																							8	
S. armatus	4									5		5	7		8	7		7	7		9		8	8
S. bijuga						7																		
S. denticulatus											6		6	7		6	3	3	7	7		6		
S. brasiliensis																								
S. dimorphus																								
S. parisiensis																								
S. quadricauda	3		2	5		5	6	7	3	5	5		2	4	2	4	4	6	7	4	4	5	6	7
S. opoliensis													7			7							8	
Closterium sp.										1	6				8		6	6						
Chlorella sp.																								
Pediastrum sp.														7		8		4		8		6	7	8
P. duplex																								
Sphaerocystis schroeteri													7							5				
Schroederia sp.															8			6	7					
Pandorina morum																								
P. charkowiensis																								
Actinastrum hantzschii																								
Coelastrum sp.														7			6		7	8			8	
Tetraedron sp.												7							7		9			7
T. trigonum																								
Selenastrum sp.																								
Chlamydomonas sp.		2	6	4	7	3	4	7	4	5	5	3	5	6	7	6	2	2	1	1		6	4	5

Table 5. Continued.

	1982																							
Organism	February 18				March 15				April 14				May 13				June 14				July 15			
Station	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
CHLOROPHYTA (cont.)																								
Crucigenia sp.					7											8			7	8	9			
C. quadrata						7					6	6												
Cosmarium sp.																	5		5				8	6
Nephrocytium sp.																								
Kirchneriella sp.													7			7		6	7	6			8	8
Dictyosphaerium sp.												7		6	8	7								
D. pulchellum																								
Golenkinia sp.		6	5													8		6	6	8				
Closteriopsis sp.																								
Eudorina sp.																								
E. elegans																								
Micratinium sp.																								
Euastrum sp.																						6		1
Pleurotaenium sp.																								
Staurastrum sp.																	6			8				8
Unid. green flagellates																								
Elakatothrix sp.																								
Planktosphaeria sp.																								
Oocystis sp.											6	7	6						7					
Tetrastrum sp.																								
T. heteracanthum																								
Arthrodesmus sp.																								
Unid. green coccoid																								
CYANOPHYTA																								
Merismopedia sp.																								
Oscillatoria sp.																								4
O. angustissima												7	4		3	5	6	6	4	8	7	3	3	8
Chroococcus sp.	5		3	4					6			6		7				7			9	6		8
Aphanotheca sp.																							8	
Anabaena sp.															8	8			7					
Gomphosphaeria sp.													7		8		5	5	7	7		5		
Unid. filament.																								
Spirulina laxa																					2	1	1	1
Rhapidiopsis sp.		6																			1	2	2	2
Lyngbya sp.														1									8	8
Microcystis sp.																								
OTHERS																								
Peridinium sp.			3		5	1	6	5	7		5	7												
P. aciculiferum																								
Phacus sp.											4													
Trachelomonas sp.	6			4	2	4	4	3	7	4	4					8	5	7		8	5			
Euglena sp.																					9			8
Gymnodinium sp.																								
Lepocinclis sp.																	7							
Unid. dinoflagellates																								

Table 5. Continued.

Organism	1982																				1983			
	August 18				September 16				October 14				November 11				December 14				January 13			
Station	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
CHRYSOPHYTA																								
Melosira sp.																								
M. granulata		7		5	7	7	4		5	6	6		4	5	4		3	4	2	4	2	2	2	2
M. varians															9							6	4	7
M. distans	9			7			6				7	7		4				7	6	5				
Cyclotella sp.			8		7	10			7	7	8						6	3	5	3	6	3	3	6
Synedra sp.																								
Asterionella sp.																								
A. formosa																								
Gyrosigma sp.																								
Chrysococcus sp.				7																				
Unid. pennate diatoms	2	2	4	1	2	3	5	3	2	4	2	3	2	2	5	4	1	1	1	2	1	1	1	1
Dinobryon sp.																								
Tabellaria sp.																								
Fragellaria sp.																								
CHLOROPHYTA																								
Ankistrodesmus sp.																								
A. convolutus	8	8	7	6	8	10	3	6	4	5	8	4	3		3	2	4	5	4	7	6	2	3	4
A. falcatus						9		4		8		7					7	7		7		4	5	7
A. nannoselene								4			8		6	6	8	7		7						
Francela sp.																7								
Scenedesmus sp.																								
S. hystrix																								
S. abundans		6	8		8	10	7	7		6			8	7	9	7	7							
S. acuminatus	8					10		7	7		8		8	6	7		6	7			5			
S. anomalus																								
S. armatus	8	9	8		6				7		8	7	5	7	9	6		6	5		6			
S. bijuga										8		7		6				6						
S. denticulatus	9	8	6	4		2	5		6	6			8		9	5	7		6	6				
S. brasiliensis																								
S. dimorphus																								
S. parisiensis																								
S. quadricauda	3	5	2	5	6	5	3	2	6	2	1	2	1	1	2	3	2	2	3	1	3	6	4	3
S. opoliensis														6			7	7		7	6		5	
Closterium sp.				7				7	7					7		7					6			
Chlorella sp.																								
Pediastrum sp.						10				7			7	6	7	6	7	7						
P. duplex		9	8																					
Sphaerocystis schroeteri																7								
Schroederia sp.			8	7				7		8			8							7	6			
Pandorina morum																								
P. charkowiensis																								
Actinastrum hantzschii																								
Coelastrum sp.	9	9		7		10		7	7			7		7		7								
Tetraedron sp.	9	7	6		7	10	6	6		7	8		6	5	8		7	7	6	6				
T. trigonum																								
Selenastrum sp.																								
Chlamydomonas sp.	7	3	5	5	6		7	6	3	3	4		5	5	6	4	6	7		6	5	5	3	5

Table 5. Continued.

	1982																				1983			
Organism	August 18				September 16				October 14				November 11				December 14				January 13			
Station	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
CHLOROPHYTA (cont.)																								
Crucigenia sp.			8		8	6		7		6	5	5		3	9	7			5				5	
C. quadrata																								
Cosmarium sp.	7	9	8		8	9	3	6	5				7	4	8	7								
Nephrocytium sp.	8									8									6					
Kirchneriella sp.		9				10	7				8	6			9	7		7						
Dictyosphaerium sp.								7		8	8	7	8											
D. pulchellum																								
Golenkinia sp.	9	3	4		8			6	7	7								7					4	
Closteriopsis sp.																								
Eudorina sp.																								
E. elegans																								
Micratinium sp.	9	8										7												
Euastrum sp.		9	8		7		6	7						7										
Pleurotaenium sp.																								
Staurastrum sp.		9			7	9				8			8											
Unid. green flagellates																								
Elakatothrix sp.																1								
Planktosphaeria sp.																								
Oocystis sp.	9				7	10		7	7		8	7	8				5	6						
Tetrastrum sp.																7		7	6	6				
T. heteracanthum																								
Arthrodesmus sp.																								
Unid. green coccoid																								
CYANOPHYTA																								
Merismopedia sp.		9								7							7				6			7
Oscillatoria sp.	8	9	8																					
O. angustissima	8			5	8	4	7	7	7	8	8	6		8		7		7			7		6	
Chroococcus sp.	8	7	8	3	4		7		5	7		7	8		9	6	5	7			6	5	4	7
Aphanotheca sp.																				7				
Anabaena sp.			3	4		8																		
Gomphosphaeria sp.		9	8	6	5	9		5	5	8	8	6	8	7		7								
Unid. filament.																								
Spirulina laxa	5	7	3	4	1	1	2	1	1	7			6	5	1	7								
Rhapidiopsis sp.	1	1	1	2	3	2	1	3	5	1	3	1												7
Lyngbya sp.	4	4			7	7	4		7		7	7		7	9			7		7				
Microcystis sp.																								
OTHERS																								
Peridinium sp.	9	9																		7	6			
P. aciculiferum																								
Phacus sp.																7			6					
Trachelomonas sp.		9			7		7	7			8	7	8				7							
Euglena sp.		7																						
Gymnodinium sp.														7										
Lepocinclis sp.																								
Unid. dinoflagellates																								

The most abundant and frequently encountered diatoms were Melosira granulata, M. varians, M. distans, Cyclotella spp. and various unidentified pennate diatoms (Table 5). Dominant green algae included Chlamydomonas sp., several species of Scenedesmus and Ankistrodesmus convolutus. Blue-green algae were dominated by Spirulina laxa, Radhidiopsis sp., Oscillatoria angustissima, Lyngbya sp. and Gomphosphaeria sp. (Table 5). Seasonal shifts in dominance were observed but no biologically significant differences between stations were detected on any given date.

Results of this study failed to demonstrate any measurable qualitative or quantitative effects of the operation of the Farley Nuclear Plant on phytoplankton communities in this reach of the Chattahoochee River.

Zooplankton

Zooplankton densities (by group) for the 18-month study appear in Figure 21. The vertical distribution of zooplankters in the water column and temperature profile for each station and date appear in Figures 22 through 36. The three numerically dominant taxa in each zooplankton group for each station and date appear in Table 6. Mean density, numbers of taxa, diversity ($\bar{d}$) and equitability (e) for zooplankton collections on each date appear in Table 7.

Rotifers dominated zooplankton communities on all dates with cladoceran and copepod density usually much lower (Fig. 21). Zooplankton density ranged from a low of 51 organisms/liter during October 1982 to a high of 560 organisms/liter the following month (November). The data in Figure 21 show that rotifer density exhibited much greater fluctuation during the 18-month study than the other two groups. Based on results of plankton studies conducted in comparable streams in Alabama, zooplankton standing crops in this reach of the Chattahoochee River were considerably higher than expected. This again was apparently due to the influence of the pools above Walter F. George and Columbia Lock and Dam upstream from the study area.

The vertical distribution of zooplankters at each station reflects the tendency of these organisms to migrate up and down in the water column (Figs. 22-36). A comparison of the data in these figures generally shows that rotifers were more uniformly distributed in the water column than copepods and cladocerans. Both copepods and cladocerans have a greater tendency to migrate vertically than do rotifers, often occurring in greater numbers well below the surface of the water. Patterns of distribution varied considerably betwen dates but variations between stations on any given date were minimal.

The most abundant and frequently occurring zooplankters in each major group were:

rotifers--*Keratella cochlearis*, *Polyarthra* spp., *Synchaeta* spp. and *Brachionus* spp.;

copepods--immature copepods and *Cyclops* spp.;

cladocerans--*Bosmina longirostris*, *Bosminopsis deitersi*, *Diaphanosoma* spp. and *Ceriodaphnia lacustris* (Table 6).

Diversity ($\bar{d}$) and equitability (e) indices were strikingly similar at all stations on any given date (Table 7). The variations in $\bar{d}$ and e between dates were apparently due to seasonal changes in environmental conditions. Diversity of a hypothetical community consisting of 100 organisms evenly divided among ten taxa would be a $\bar{d} = 3.32$ and an $e = 1.43$, whereas a community of 100 organisms with 90 in one taxon and 10 in the other would have a $\bar{d} = 0.47$ and an $e = 0.75$.

Based on the results of this study, there appears to be no evidence that the operation of the Farley Nuclear Plant has had measurable adverse effects on zooplankton communities in this reach of the Chattahoochee River.

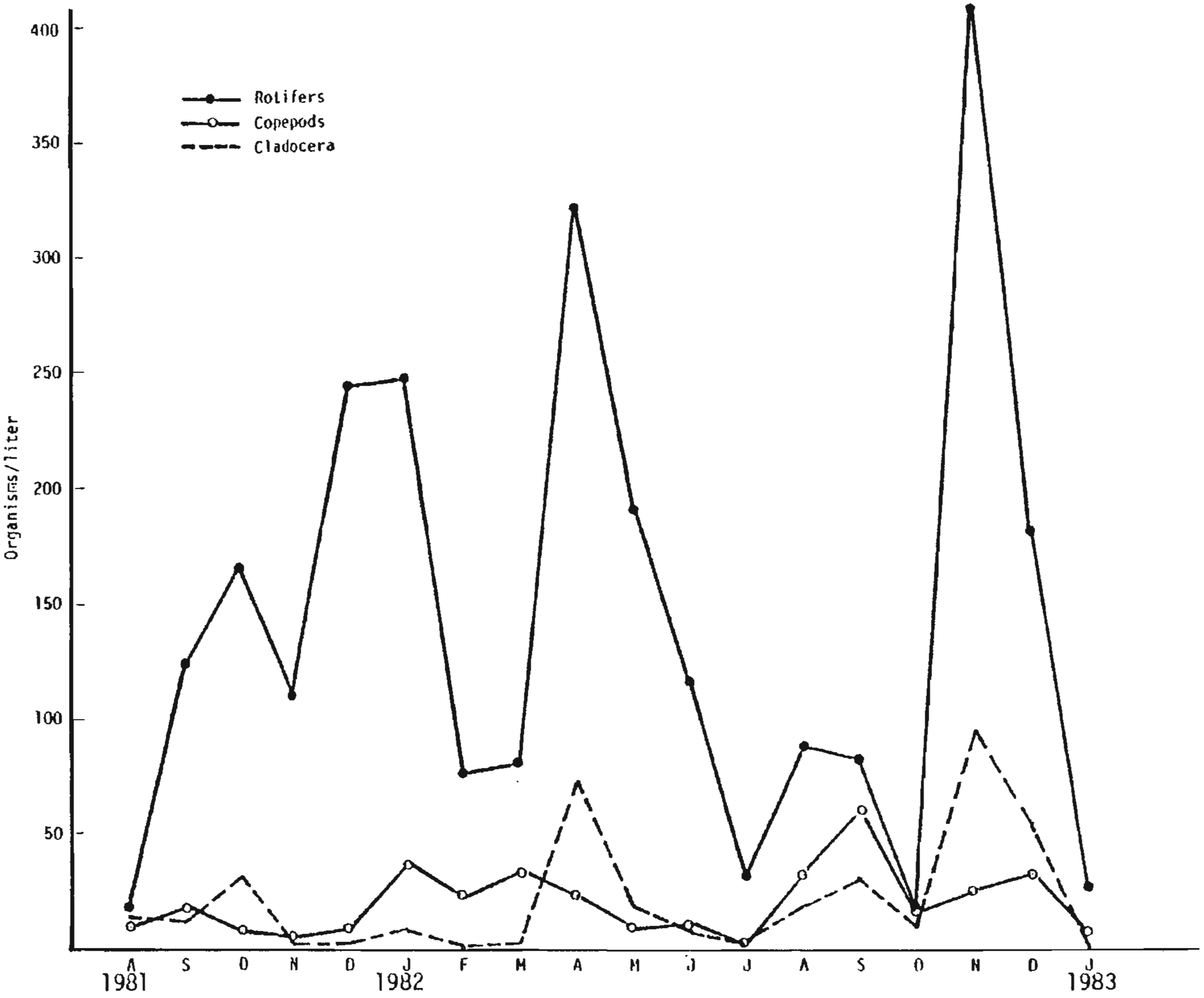


Figure 21. Mean number of zooplankters collected from the four stations on each date. Sampling extended from August 1981 through January 1983.

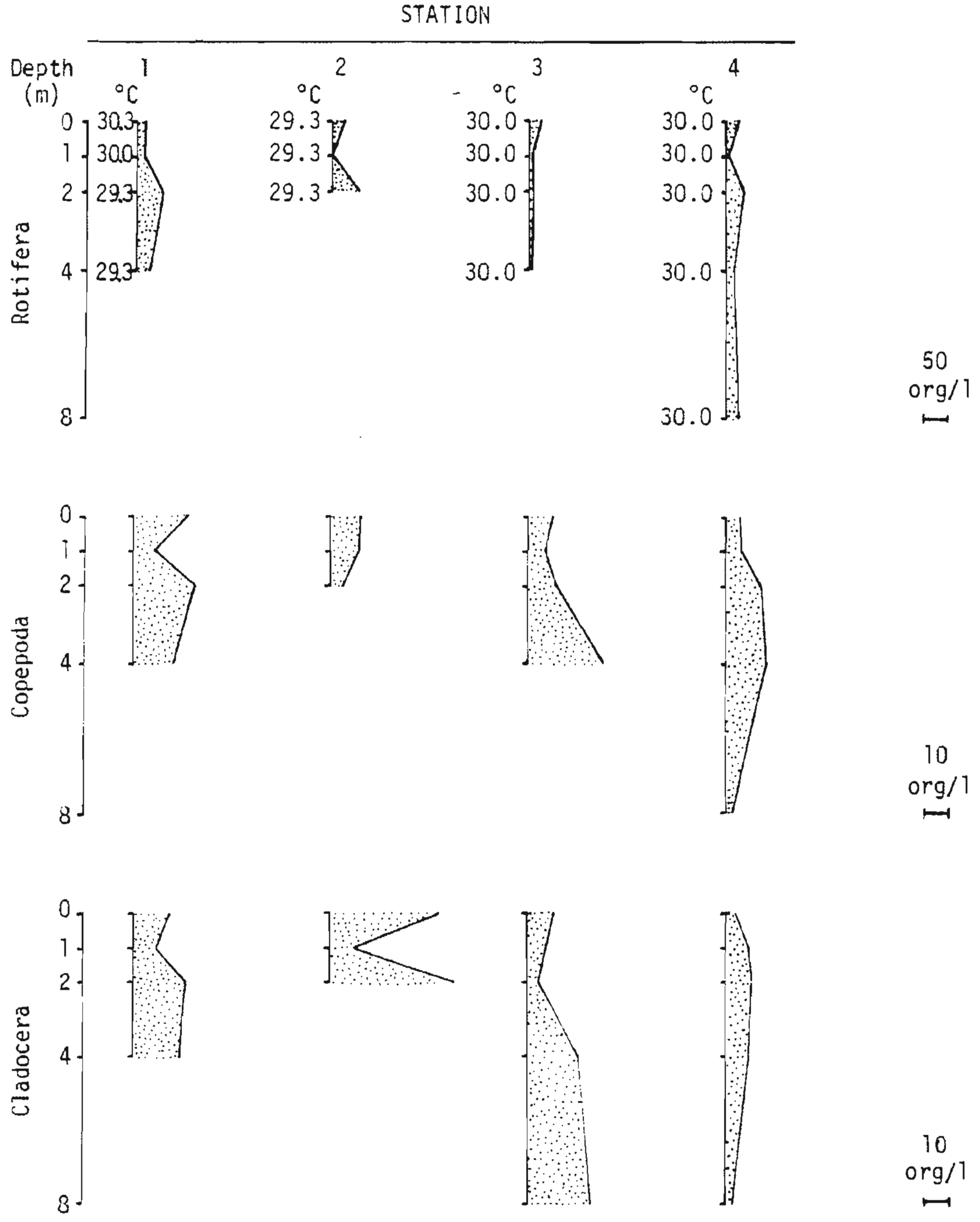


Fig. 22. Temperature profile and vertical distribution of zooplankters (organisms/l) at each sampling station on 12 August 1981.

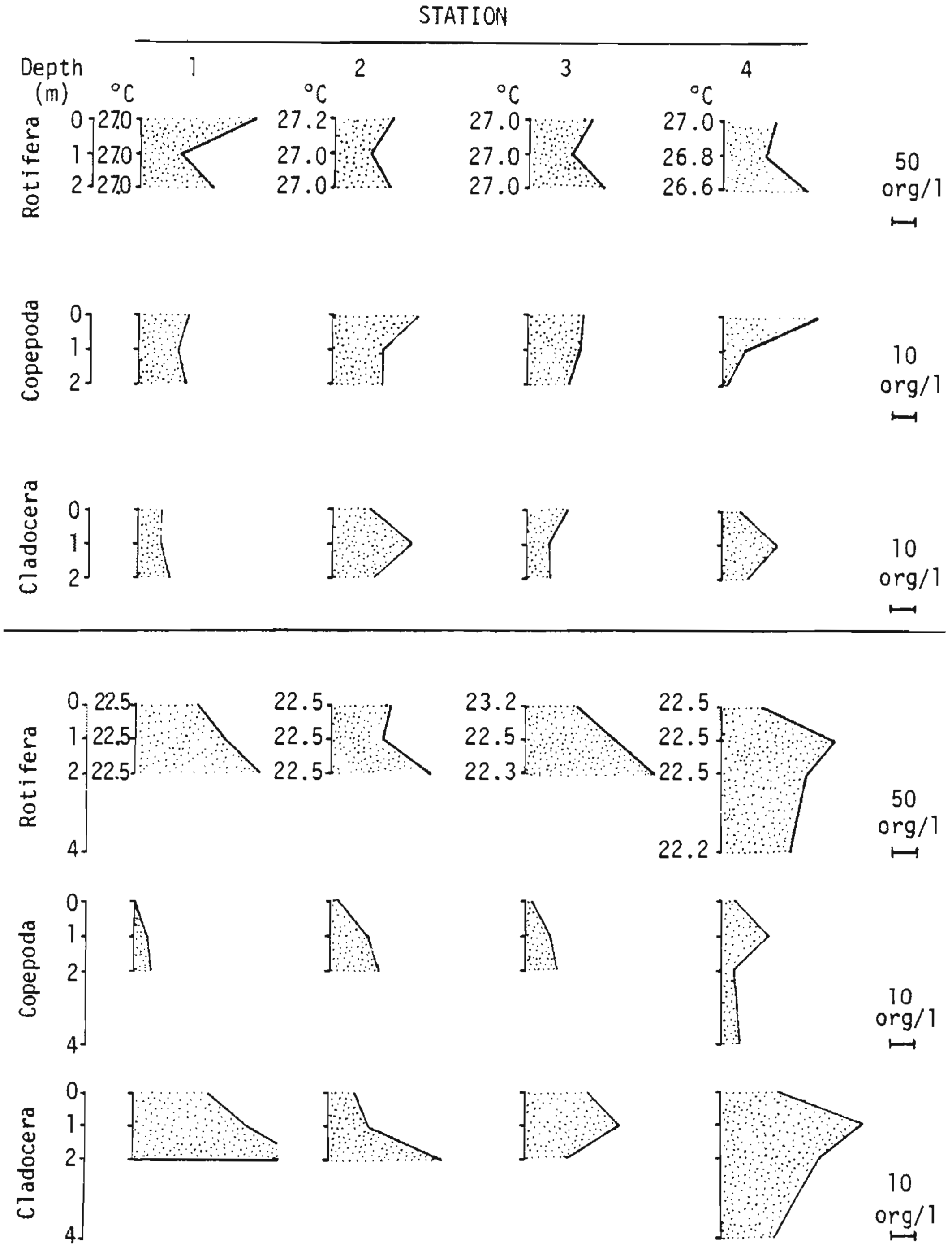


Fig. 23. Temperature profile and vertical distribution of zooplankters (organisms/1) at each sampling station on 17 September 1981 (upper) and 13 October 1981 (lower).

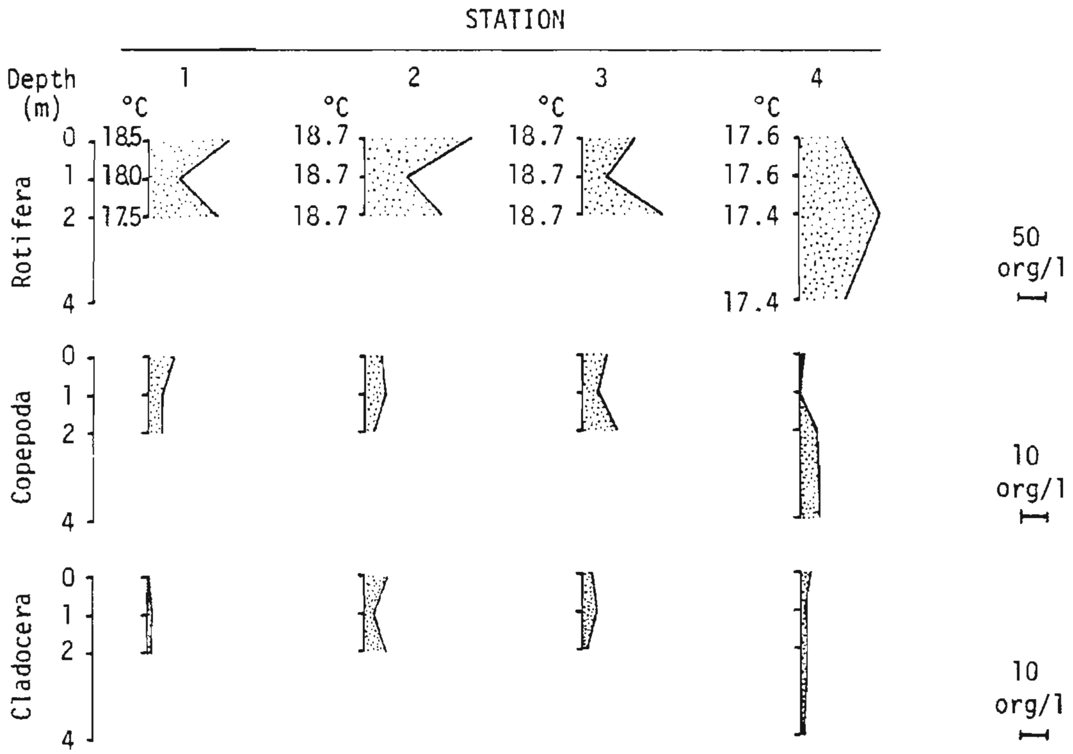


Fig. 24. Temperature profile and vertical distribution of zooplankters (organisms/l) at each sampling station on 12 November 1981.

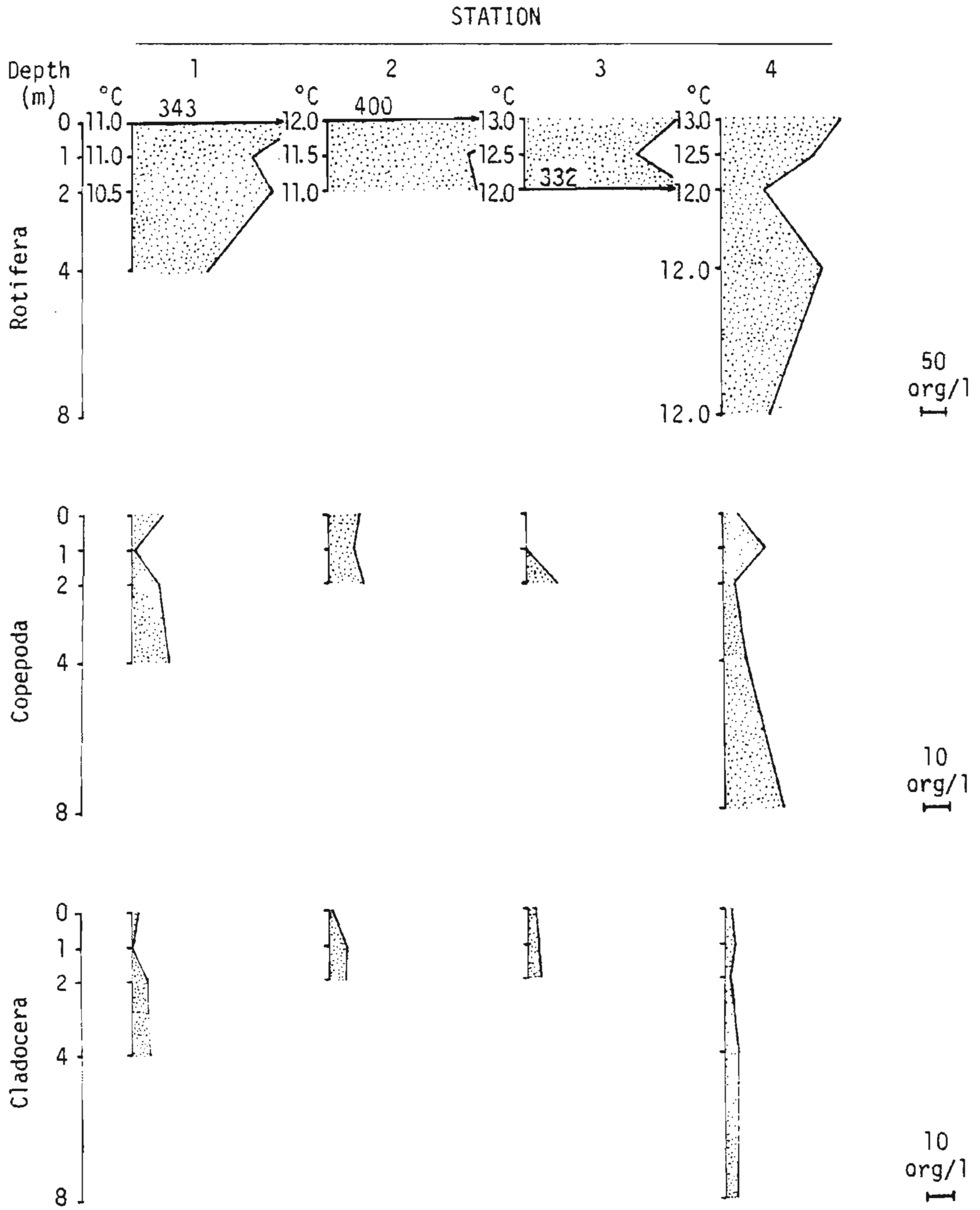


Fig. 25. Temperature profile and vertical distribution of zooplankters (organisms/l) at each sampling station on 17 December 1981.

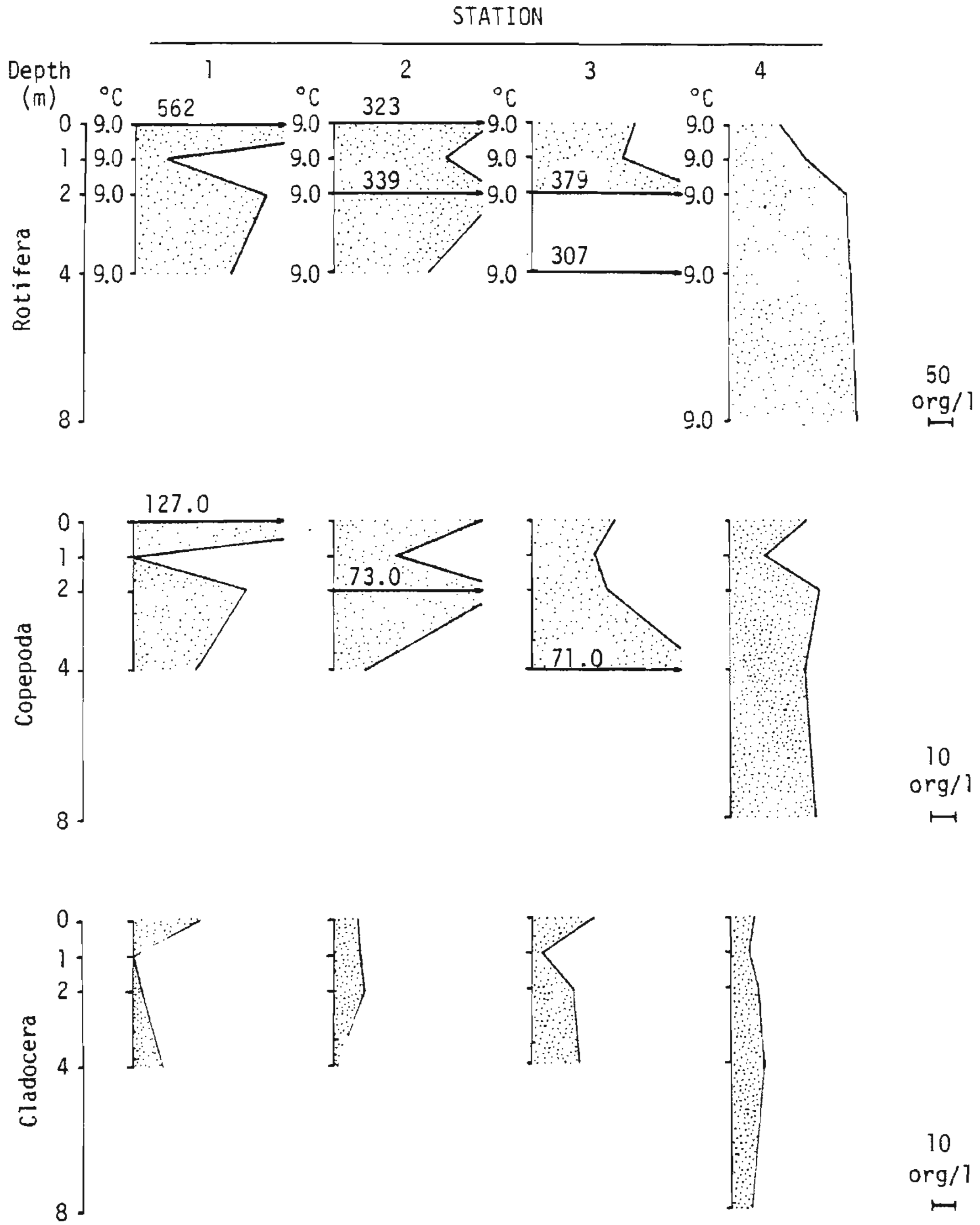


Fig. 26. Temperature profile and vertical distribution of zooplankters (organisms/l) at each sampling station on 26 January 1982.

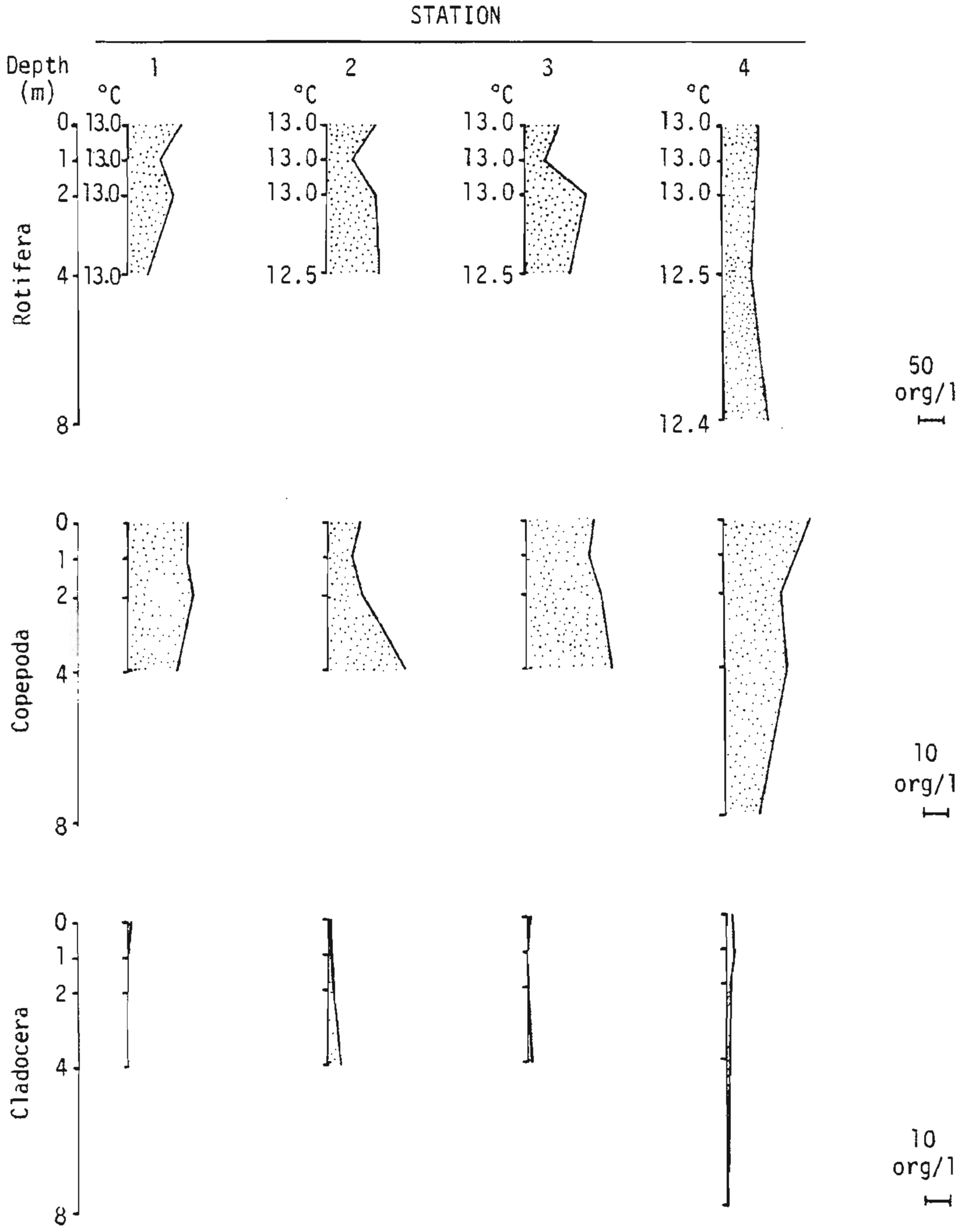


Fig. 27. Temperature profile and vertical distribution of zooplankters (organisms/l) at each sampling station on 18 February 1982.

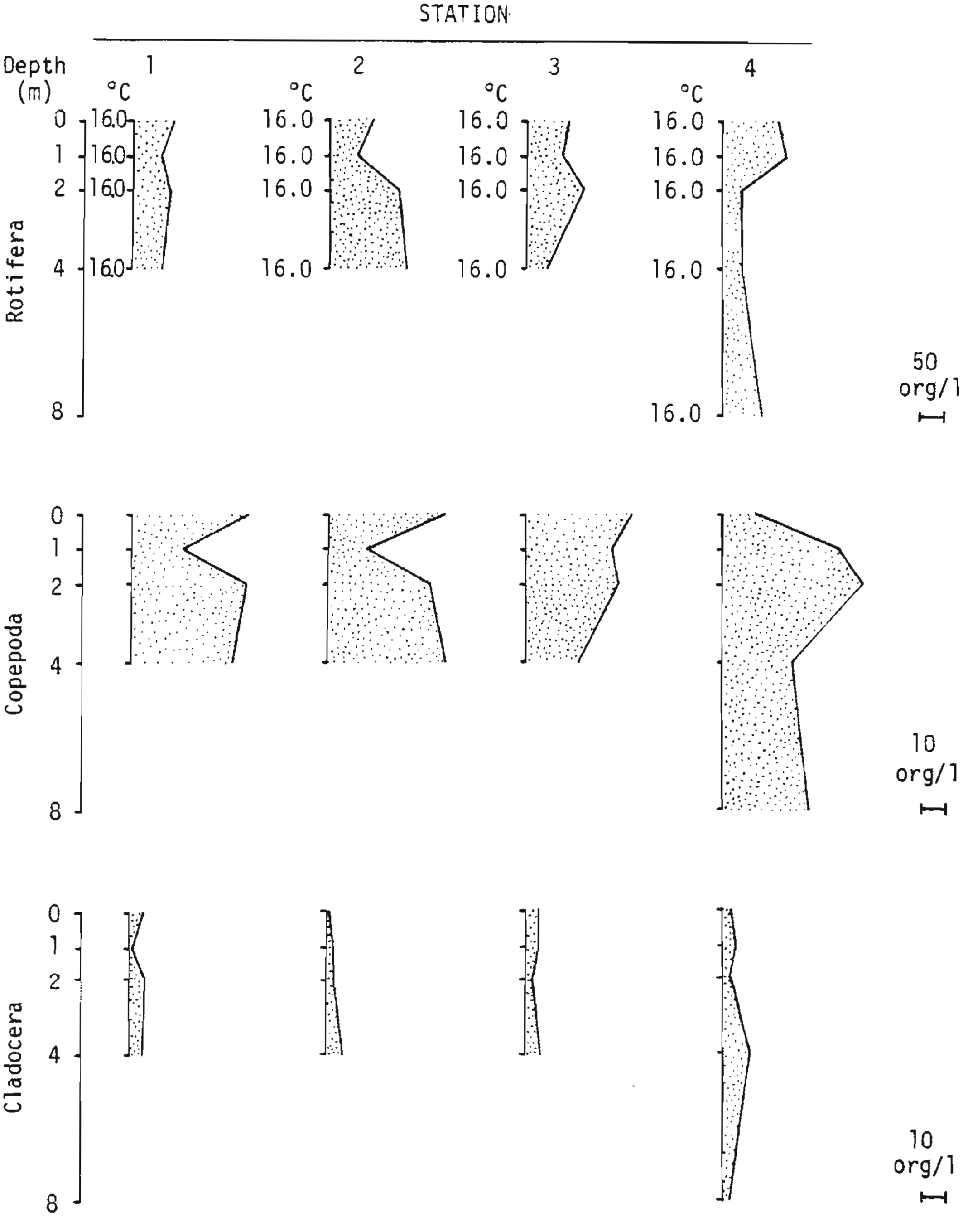


Fig. 28. Temperature profile and vertical distribution of zooplankters (organisms/l) at each sampling station on 15 March 1982.

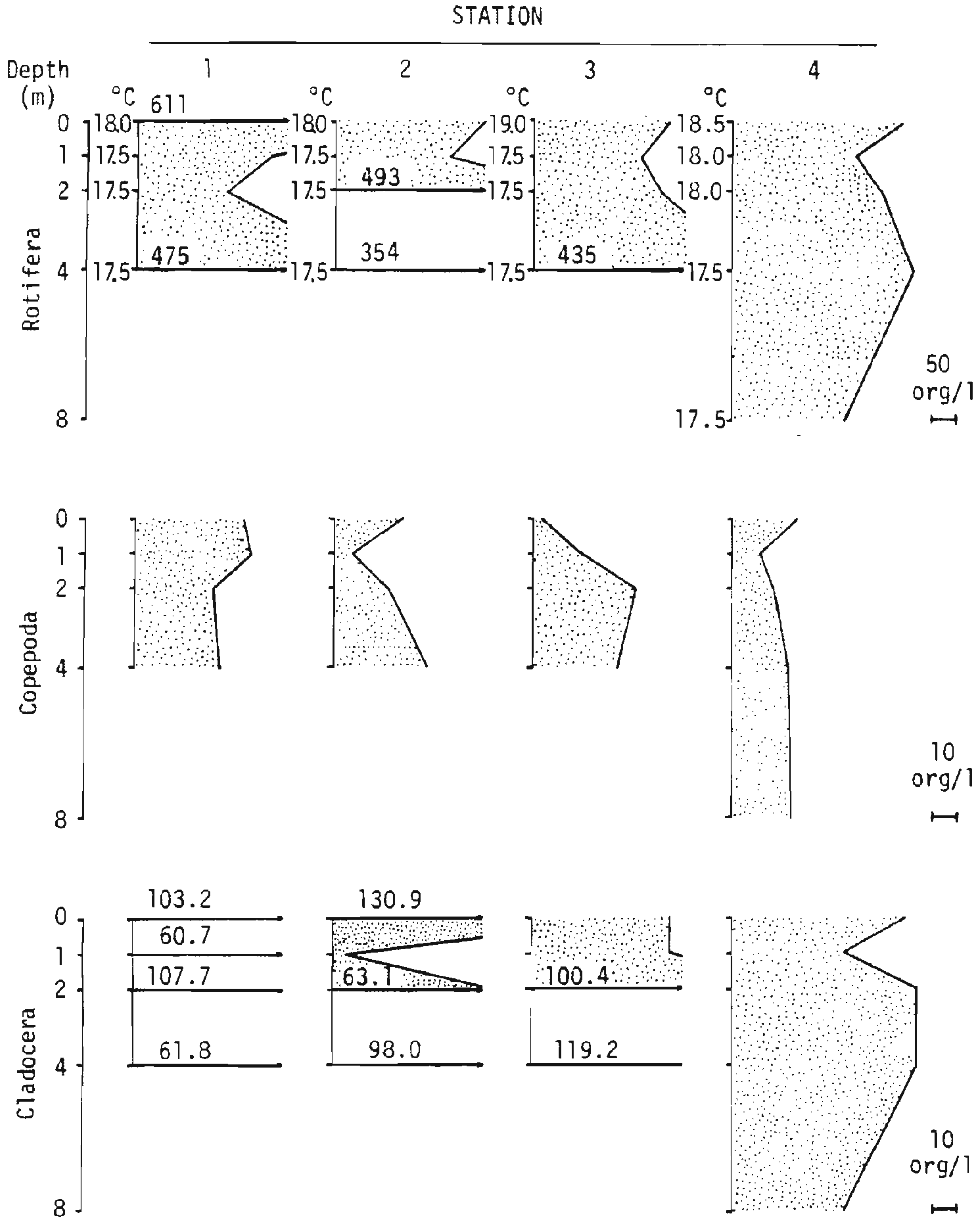


Fig. 29. Temperature profile and vertical distribution of zooplankters (organisms/l) at each sampling station on 14 April 1982.

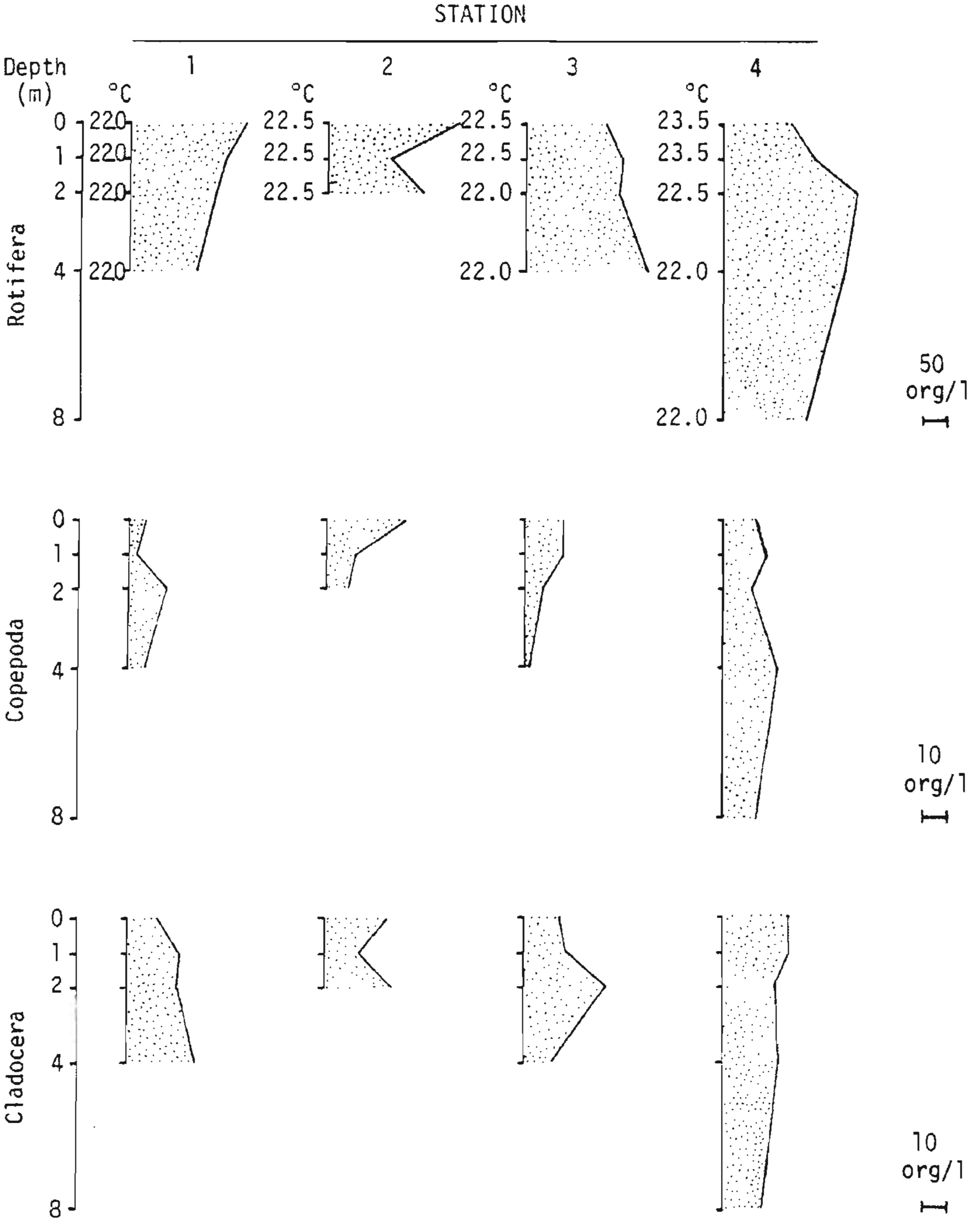


Fig. 30. Temperature profile and vertical distribution of zooplankters (organisms/l) at each sampling station on 13 May 1982.

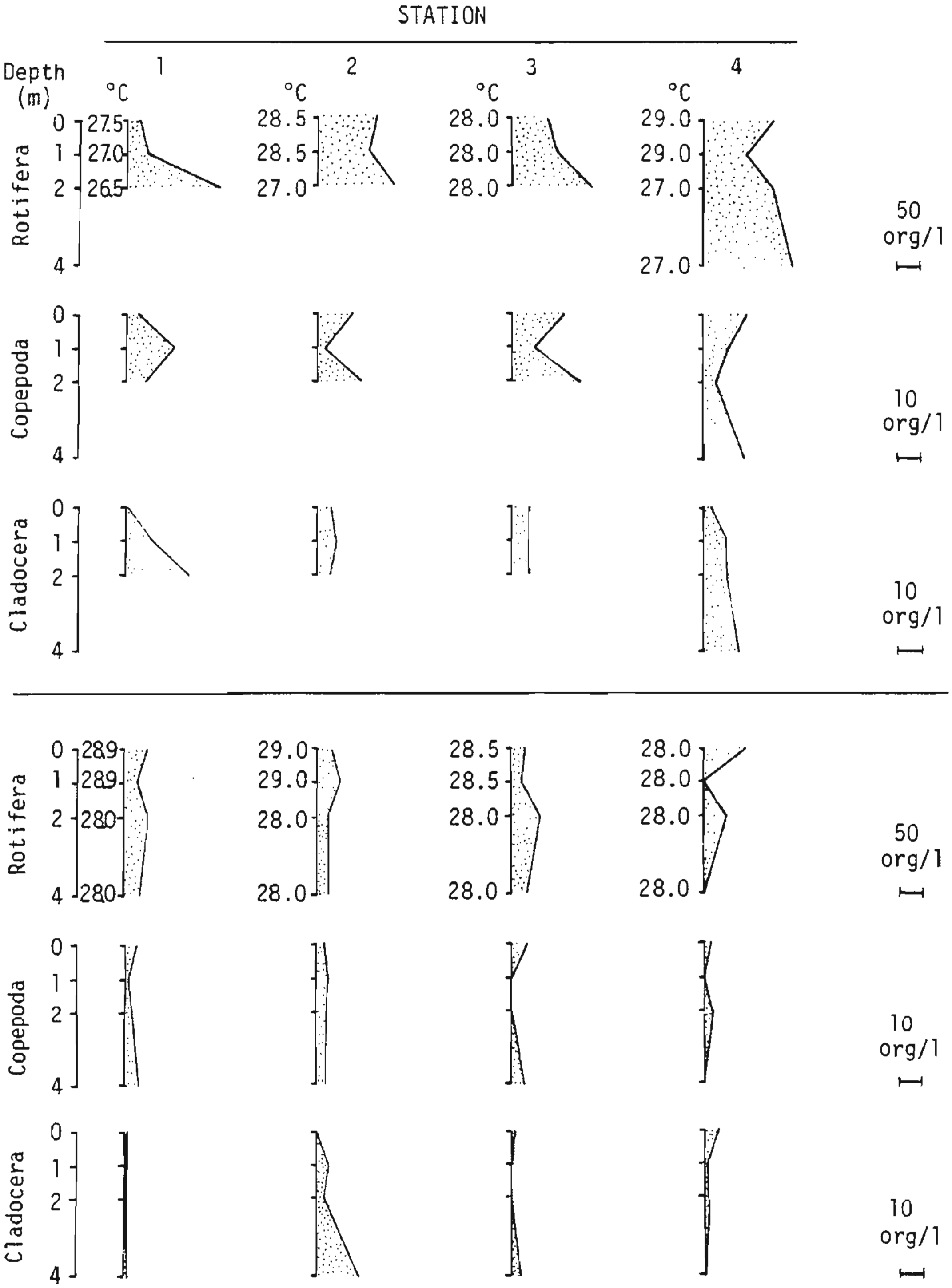


Fig. 31. Temperature profile and vertical distribution of zooplankters (organisms/l) at each sampling station on 14 June 1982 (upper) and 15 July 1982 (lower).

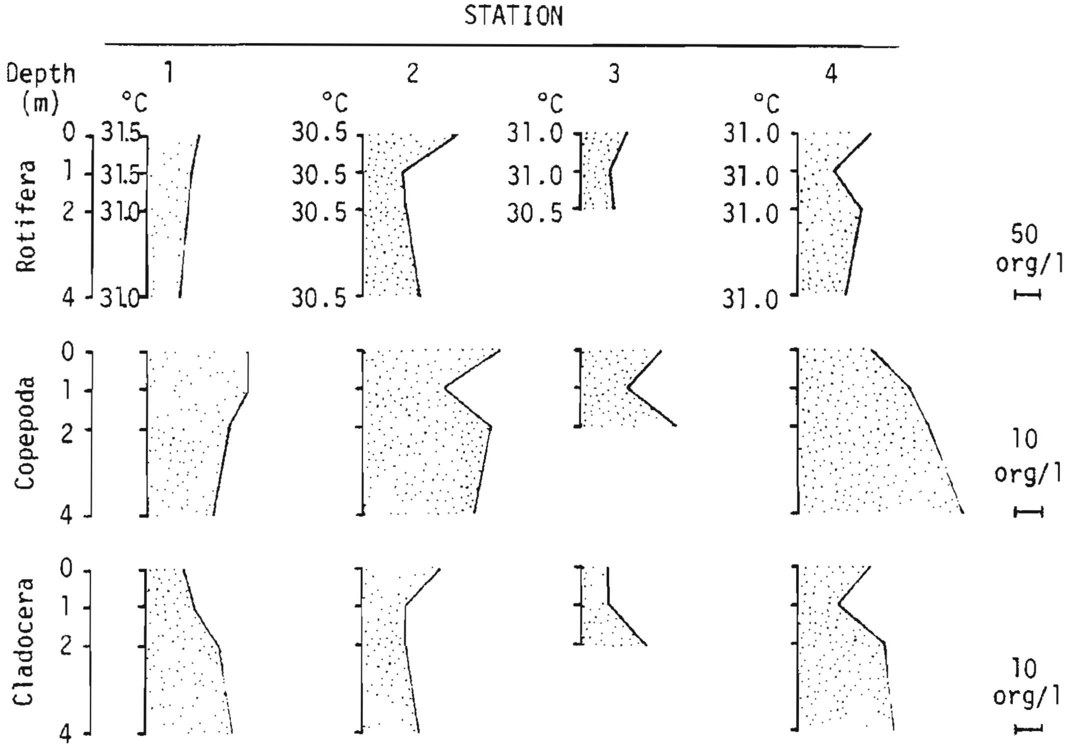


Fig. 32. Temperature profile and vertical distribution of zooplankters (organisms/l) at each sampling station on 18 August 1982.

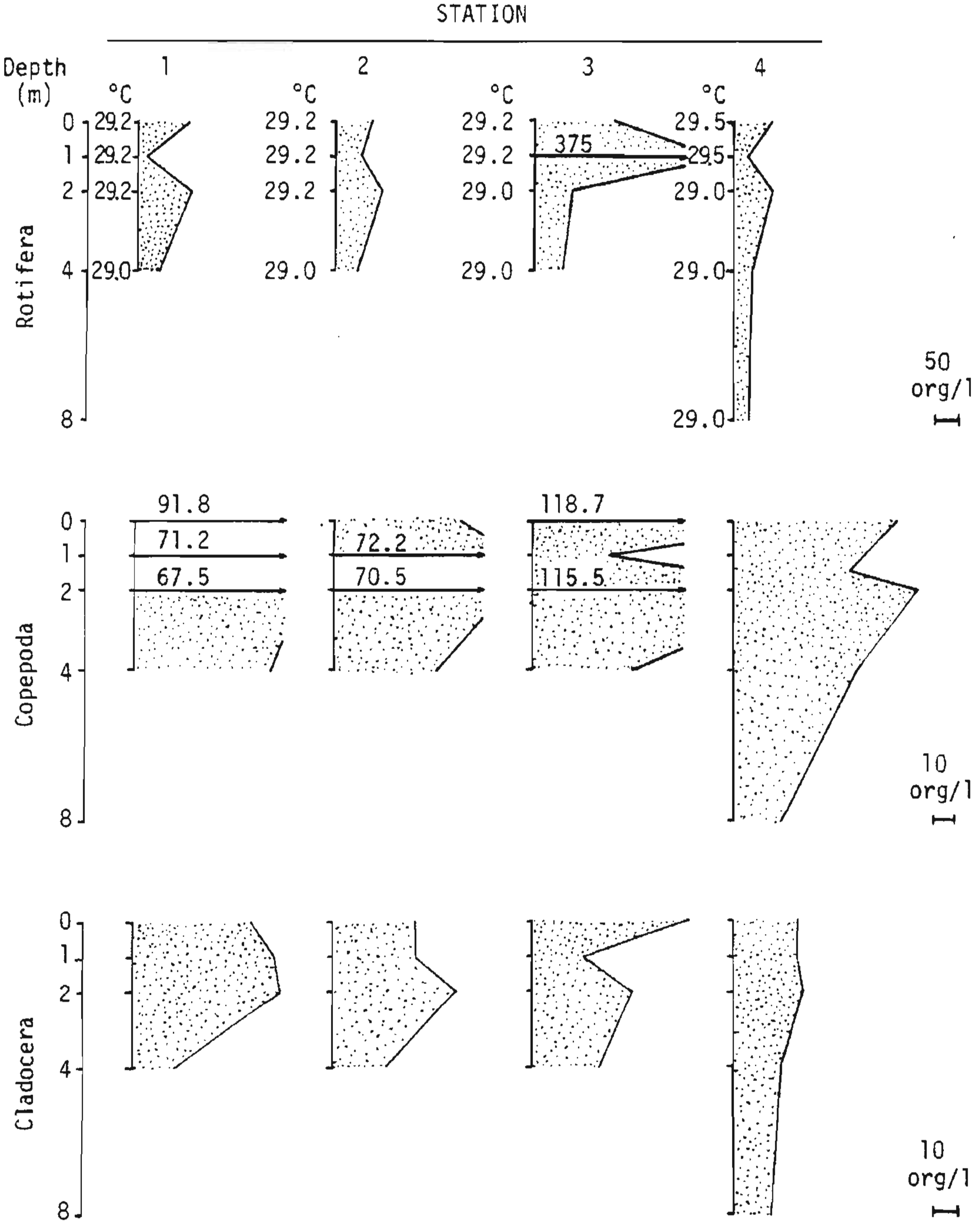


Fig. 33. Temperature profile and vertical distribution of zooplankters (organisms/l) at each sampling station on 16 September 1982.

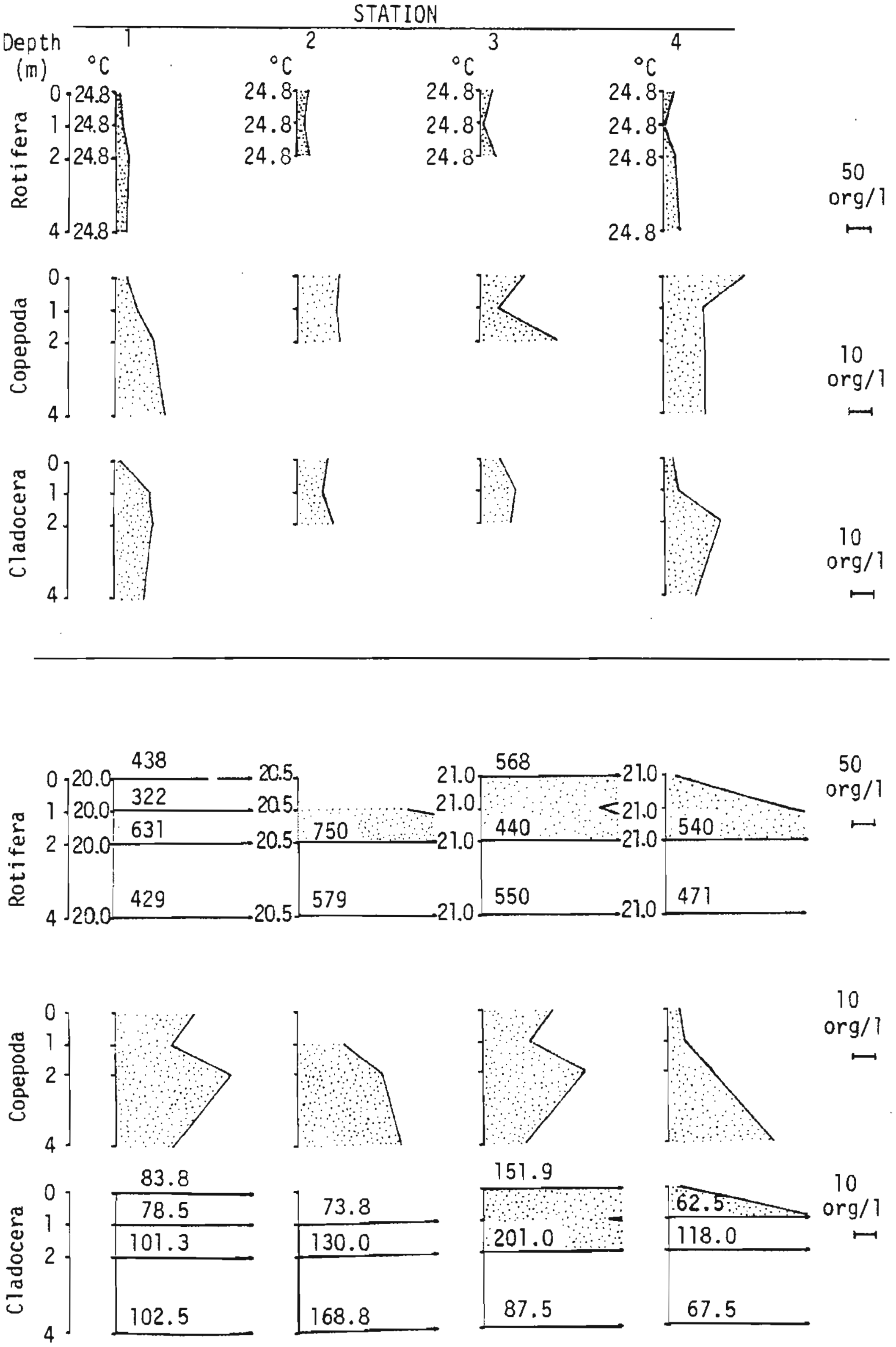


Fig. 34. Temperature profile and vertical distribution of zooplankters (organisms/l) at each sampling station on 14 October 1982 (upper) and 11 November 1982 (lower).

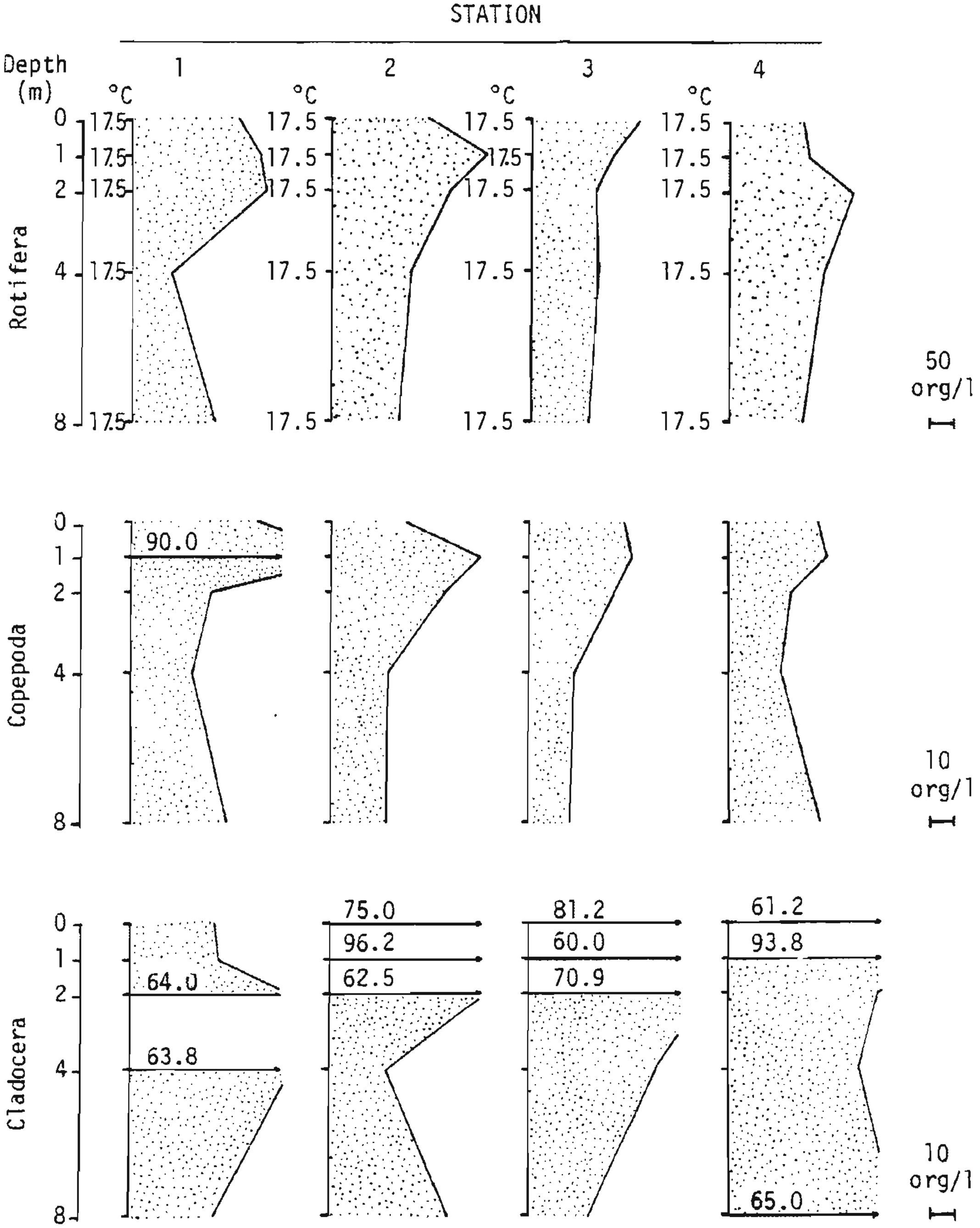


Fig. 35. Temperature profile and vertical distribution of zooplankters (organisms/1) at each sampling station on 14 December 1982.

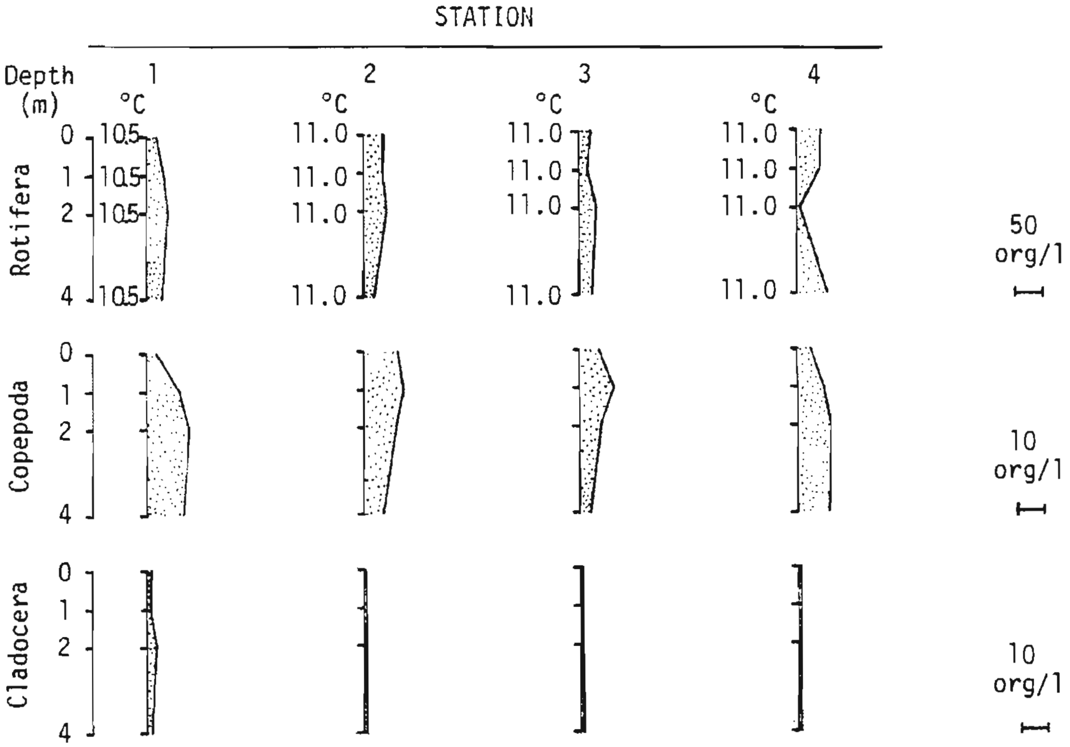


Fig. 36. Temperature profile and vertical distribution of zooplankters (organisms/l) at each sampling station on 13 January 1983.

Table 6. Dominance ranking of zooplankters by station and date. Most abundant organism was assigned a value of one (1).

Organism	1981																				1982			
	August 12				September 17				October 13				November 12				December 17				January 26			
Station	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
ROTIFERA																								
Monostyla sp.																								
Keratella sp.																					1	1	1	1
K. cochlearis													1	1	1	1	1	1	1	1				
K. americana										2	3													
Brachionus sp.	3	3	3	3	2	2	2	2				3												
Gastropus sp.																								
Polyarthra sp.									3				2	2	2	2	2	2	2	2	3	2	2	2
Trichocerca sp.					3				2	1	2	1												
Synchaeta sp.			2	2		3	3	3									3	3	3	3	2	3	3	3
Conochiloides sp.	2	2																						
Kellicottia bostoniensis																								
Hexarthra sp.																								
Pseudoploesoma formosum																								
Asplanchna sp.																								
Conochilus sp.	1	1	1	1	1	1	1	1								3								
Ploesoma sp.									1	3		2	3	3	3									
Platyias patulus																								
Euchlanis sp.																								
Lecane sp.																								
Keratella carlinae																								
Asplanchnopus sp.																								
Collotheca																								
Unid. rotifer																								
COPEPODA																								
Immature	2	2	2	2	1	1	1		2	2	2	2	1	2	2	2	1	1	1	1	1	1	1	1
Cyclops sp.	1	1	1	1	2	2	2		1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2
Diaptomus sp.																	3				3	3		
Harpacticoid copepod							3																	
CLADOCERA																								
Bosmina longirostris	1	1	1	1	2	1	1	2	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1
Ceriodaphnia sp.																								
Holopedium amazonicum																								3
H. gibberum																								
Daphnia sp.																							2	2
D. parvula																								
D. pulex																								
Chydorus sphaericus																				2				
Leptodora kindti																								
Pseudosida bidentata																								
Moina micrura																								
Ilyocryptus spinifer																								
Alona sp.																								
Simocephalus sp.																								
Diaphanosoma sp.	3	2	2	3	3	3	3	3																
Ceriodaphnia pulchella																								
Bosminopsis deitersi				2	1	2	2	1	1	2	2	1						2						
Ilyocryptus sp.																								
Scapholeberis kingi																								
Ceriodaphnia lacustris	2	3	3						3	3	3	3			2									
Alona costata																								
Moina sp.																								

Table 6. Continued.

Organism	1982																							
	February 18				March 15				April 14				May 13				June 14				July 15			
Station	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
ROTIFERA																								
Monostyla sp.																								
Keratella sp.	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1
K. cochlearis																								
K. americana																								
Brachionus sp.																					3	3	2	2
Gastropus sp.																								
Polyarthra sp.					2	2	3	2	3	2	3	2					3	1	2	2				
Trichocerca sp.													2	2	2	2					2	2	3	3
Synchaeta sp.	2	2	2	2	3	3	2	3						3										
Conochiloides sp.									2	3	2	3												
Kellicottia bostoniensis	3		3																					
Hexarthra sp.																								
Pseudoploesoma formosum																								
Asplanchna sp.																								
Conochilus sp.		3		3															3	3				
Ploesoma sp.																	2	3						
Platyias patulus																								
Euchlanis sp.																								
Lecane sp.																								
Keratella carlinae																								
Asplanchnopus sp.																								
Collotheca																								
Unid. rotifer																								
Filinia sp.													3		3	3								
COPEPODA																								
Immature	2	2	2	2	1	1	1	1	2	2	2	2	2	1	1	1	1	2	1	1	1	1	1	1
Cyclops sp.	1	1	1	1	2	2	2	2	1	1	1	1	1	2	2	2	2	1	2	2	2	2	2	2
Diaptomus sp.					3	3	3	3			3	3							3					
Harpacticoid copepod																								
CLADOCERA																								
Bosmina longirostris	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	2	2
Ceriodaphnia sp.																								
Holopedium amazonicum																		3						
H. gibberum																								
Daphnia sp.							3		2	2	2	2		2	3				2					
D. parvula																								
D. pulex																								
Chydorus sphaericus				3					3															
Leptodora kindti																								
Pseudosida bidentata																								
Moina micrura																								
Ilyocryptus spinifer																								
Alona sp.																								
Simocephalus sp.																								
Diaphanosoma sp.																	2							
Ceriodaphnia pulchella							2																	
Bosminopsis deitersi																				2	1	2	1	1
Ilyocryptus sp.																								
Scapholeberis kingi																								
Ceriodaphnia lacustris	2	2	2	2											2	2	3	2			3			3
Alona costata																								
Moina sp.																								

Table 6. Continued.

Organism	1982																				1983			
	August 18				September 16				October 14				November 11				December 14				January 13			
Station	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
ROTIFERA																								
Monostyla sp.																								
Keratella sp.	3	2	2	3					2	3	3	3	3	3	3	3	1	1	1	1	1	1	1	1
K. cochlearis	2			2																				
K. americana																								
Brachionus sp.																								
Gastropus sp.																								
Polyarthra sp.		3	3		3	3	3	3	3	2	2	2	1	1	1	2	2	3	3	3				
Trichocerca sp.	1	1	1	1	1	1	1	1	1	1	1	1												
Synchaeta sp.																					2	2	2	2
Conochiloides sp.																	3	2	2	2	3	3	3	3
Kellicottia bostoniensis																								
Hexarthra sp.																								
Pseudoploesoma formosum																								
Asplanchna sp.																								
Conochilus sp.					2	2	2	2					2	2	2	1								
Ploesoma sp.																								
Platyias patulus																								
Euchlanis sp.																								
Lecane sp.																								
Keratella carlinae																								
Asplanchnopus sp.																								
Collotheca																								
Unid. rotifer																								
COPEPODA																								
Immature	1	2	2	2	1	1	1	1	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1
Cyclops sp.	2	1	1	1	2	2	2	2	2	2	2	2	1	1	1	1	2	2	2	2	2	2	2	2
Diaptomus sp.											3		3											3
Harpacticoid copepod																								
CLADOCERA																								
Bosmina longirostris	1	1	1	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Ceriodaphnia sp.																								
Holopedium amazonicum																								
H. gibberum																								
Daphnia sp.													3	3	3	3	3	2	2	2		2		
D. parvula																								
D. pulex																								
Chydorus sphaericus																								
Leptodora kindti																								
Pseudosida bidentata																								
Moina micrura					3	3	3																	
Ilyocryptus spinifer																								
Alona sp.																								
Simocephalus sp.																								
Diaphanosoma sp.								3																
Ceriodaphnia pulchella																								
Bosminopsis deitersi	2	2	2	2	1	1	1	1	2	3	3	2												
Ilyocryptus sp.																								
Scapholeberis kingi																								
Ceriodaphnia lacustris	3	3	3	3					3	2	2	3	2	2	2	2	2	3	3	3				
Alona costata																								
Moina sp.																								

Table 7. Mean number of zooplankters, number of taxa, diversity and equitability of zooplankton communities by date and station.

Date	Station															
	1				2				3				4			
	Org/l	Taxa	$\bar{d}$	e	Org/l	Taxa	$\bar{d}$	e	Org/l	Taxa	$\bar{d}$	e	Org/l	Taxa	$\bar{d}$	e
Aug-81	50.1	13	3.07	.92	64.8	11	2.51	.73	34.7	12	3.01	1.00	31.4	13	2.98	.85
Sept	176.0	19	3.39	.79	127.3	18	3.51	.89	137.1	23	3.50	.70	138.5	19	3.26	.37
Oct	264.7	17	3.41	.88	196.5	20	3.49	.80	216.6	19	3.58	.89	198.2	17	3.40	.88
Nov	108.6	11	2.43	.64	144.6	14	2.73	.64	103.5	14	2.32	.50	108.2	16	2.87	.63
Dec	259.7	14	1.70	.14	332.8	14	1.99	.36	292.4	11	1.73	.36	168.0	14	1.91	.36
Jan-82	285.9	12	2.11	.50	282.3	15	2.08	.40	283.0	11	2.18	.55	213.6	13	2.24	.46
Feb	84.5	10	1.56	.40	94.0	10	1.78	.40	83.9	12	1.82	.42	81.8	11	1.96	.45
Mar	82.7	11	2.39	.64	115.1	16	1.99	.31	89.6	14	2.26	.43	91.4	13	2.26	.46
Apr	485.3	11	1.97	.45	429.2	13	2.04	.38	382.4	14	2.13	.43	369.5	14	1.88	.36
May	204.3	9	1.65	.44	208.6	10	1.57	.40	215.8	14	1.57	.29	222.9	14	1.93	.36
Jun	112.1	17	3.16	.76	143.7	17	2.70	.53	137.5	17	2.97	.65	144.1	15	2.93	.73
Jul	31.9	14	2.75	.64	27.7	10	2.75	.90	30.5	8	2.09	.63	24.3	11	2.99	1.09
Aug	105.2	15	3.08	.80	132.1	15	2.98	.73	101.1	13	2.55	.62	95.4	12	2.98	1.00
Sept	148.5	15	2.79	.67	106.1	13	2.39	.54	147.4	12	2.42	.58	86.4	13	2.79	.69
Oct	33.7	13	2.62	.62	42.5	14	2.35	.50	37.0	15	2.54	.53	40.6	14	2.74	.64
Nov	562.6	14	2.87	.71	611.0	13	2.88	.77	583.2	14	2.91	.79	392.0	13	2.86	.77
Dec	257.9	15	2.86	.67	265.9	17	2.72	.53	210.8	15	2.86	.67	239.6	14	2.70	.64
Jan-83	28.6	10	2.55	.80	32.4	9	2.47	.89	21.5	9	2.50	.89	39.0	11	2.35	.64

Larval Fish

Fishes in the Chattahoochee River near Farley Nuclear Plant can be classified generally as warm-water species which will spawn anywhere the habitat is suitable. Studies to determine the densities and types of larvae in the vicinity of the plant were conducted every two weeks during the period March through June, 1982.

Larval fish collected during the study were obtained from four sample areas in the vicinity of the plant. Sample stations included: (1) an upstream station located approximately 0.9 miles above the plant intake; (2) an intake canal sample station; (3) a discharge sample station; and (4) a downstream station located approximately two miles below the plant discharge. Samples were collected at depths of 1.5, 3.0 and 4.5 meters. (Sampling at the 4.5 meter depth was dependent upon sufficient water depth). Samples were obtained by towing a plankton net with attached flowmeter and represent larvae obtained from approximately 100 cubic meters of water.

Larval fish densities were computed for each sample area and sample date during the study period. Table 8 provides the number of cubic meters sampled, total larvae per cubic meter, and the taxonomic identification of larvae for each sample area and depth.

Table 8 shows that the Clupeidae (herring family), which includes the shad, represented the dominant taxonomic group in all sample areas during the study. The groups less represented during the study were the Castostomidae, Centrarchidae and Cyprinidae. A total of 184 larvae were collected during the 1982 study period. The number and percent of the total represented by each of the previously mentioned groups is as follows: Clupeidae, 175/95.1%; Catostomidae, 2/1.1%; Centrarchidae, 4/2.2%; Cyprinidae 1/0.5%; and Unidentified, 2/1.1%. An attempt to describe the distribution of larvae in each of the four sample areas, based on taxonomic differences, could only be conjectural based on the numbers and percentages listed above.

TABLE 8
FARLEY NUCLEAR PLANT
Number of Larval Fish Per Cubic Meter of Water at Each Sample Station and Depth for Each Sample Period
1982

Station	Date	Depth(M)	Cubic Meters Sampled	Total Fish Per Cubic Meters	Family	Number
Upstream[1]	3/3/82	1.5	116.4	0	-	-
	3/3/82	3.0	128.1	0	-	-
	3/3/82	4.5	118.5	0	-	-
Intake[2]	3/3/82	1.5	44.0	0	-	-
Discharge[3]	3/3/82	1.5	102.3	0	-	-
	3/3/82	3.0	104.4	0	-	-
	3/3/82	4.5	108.7	0	-	-
Downstream[4]	3/3/82	1.5	103.5	0	-	-
	3/3/82	3.0	107.1	0	-	-
	3/3/82	4.5	113.0	0	-	-
Upstream	3/16/82	1.5	123.2	0	-	-
	3/16/82	3.0	119.7	0	-	-
Intake	3/26/82	1.5	39.4	0	-	-
Discharge	3/16/82	1.5	116.1	0	-	-
	3/16/82	3.0	117.1	0	-	-
Downstream	3/16/82	1.5	109.8	0	-	-
	3/16/82	3.0	111.4	0	-	-
Upstream	3/31/82	1.5	113.3	0.018	Clupeidae	2
	3/31/82	3.0	110.4	0	-	-
Intake	3/31/82	-	-	-	-	-
Discharge	3/31/82	1.5	107.4	0	-	-
	3/31/82	3.0	105.7	0	-	-

TABLE 8
FARLEY NUCLEAR PLANT
Number of Larval Fish Per Cubic Meter of Water at Each Sample Station and Depth for Each Sample Period
1982

Station	Date	Depth(M)	Cubic Meters Sampled	Total Fish Per Cubic Meters	Family	Number
Downstream	3/31/82	1.5	102.6	0	-	-
	3/31/82	3.0	109.4	0	-	-
Upstream	4/13/82	1.5	63.4	0.158	Clupeidae	10
	4/13/82	3.0	83.1	0.024	Clupeidae	2
				0.012	Unidentified[6]	1
Intake	4/13/82	1.5	0.0[5]	0	-	-
	4/13/82	3.0	7.6	0.262	Clupeidae	2
Discharge	4/13/82	1.5	80.3	0.075	Clupeidae	6
	4/13/82	3.0	94.9	0.105	Clupeidae	10
Downstream	4/13/82	1.5	89.4	0.123	Clupeidae	11
	4/13/82	3.0	95.4	0.105	Clupeidae	10
Upstream	4/27/82	1.5	101.1	0.069	Clupeidae	7
	4/27/82	3.0	100.791	0.010	Centrarchidae	1
				0.040	Clupeidae	4
	4/27/82	4.5	118.7	0.110	Clupeidae	13
Intake	4/27/82	1.5	46.0	0	-	-
	4/27/82	3.0	0.0[5]	0	-	-
Discharge	4/27/82	1.5	100.5	0.07	Clupeidae	7
	4/27/82	3.0	97.5	0.103	Clupeidae	10
	4/27/82	4.5	102.9	0.068	Clupeidae	7
Downstream	4/27/82	1.5	100.5	0.020	Centrarchidae	2
				0.060	Clupeidae	6
	4/27/82	3.0	98.87	0.010	Clupeidae	1
				0.010	Unidentified[6]	1
	4/27/82	4.5	102.992	0	-	-

TABLE 8
FARLEY NUCLEAR PLANT
Number of Larval Fish Per Cubic Meter of Water at Each Sample Station and Depth for Each Sample Period
1982

Station	Date	Depth(M)	Cubic Meters Sampled	Total Fish Per Cubic Meters	Family	Number
Upstream	5/10/82	1.5	90.2	0.055	Clupeidae	5
	5/10/82	3.0	100.7	0.020	Clupeidae	2
Intake	5/10/82	1.5	11.3	0.444	Clupeidae	5
	5/10/82	3.0	5.5	0	-	-
Discharge	5/10/82	1.5	85.0	0.024	Clupeidae	2
	5/10/82	3.0	92.2	0.043	Clupeidae	4
Downstream	5/10/82	1.5	104.8	0.029	Clupeidae	3
				0.010	Centrarchidae	1
	5/10/82	3.0	107.2	0.028	Clupeidae	3
Upstream	5/20/82	1.5	127.1	0	-	-
Intake	5/20/82	1.5	123.2	0.016	Clupeidae	2
				0.008	Cyprinidae	1
Discharge	5/20/83	1.5	133.7	0.037	Clupeidae	5
Downstream	5/20/82	1.5	122.6	0.016	Clupeidae	2
Upstream	6/2/82	1.5	106.6	0	-	-
	6/2/82	3.0	126.1	0.048	Clupeidae	6
				0.008	Catastomidae	1
Intake	6/2/82	1.5	6.2	0	-	-
Discharge	6/2/82	1.5	105.3	0.048	Clupeidae	5
	6/2/82	3.0	126.4	0.024	Clupeidae	3
Downstream	6/2/82	1.5	105.5	0.019	Clupeidae	2
	6/2/82	3.0	120.5	0.025	Clupeidae	3

TABLE 8
FARLEY NUCLEAR PLANT
Number of Larval Fish Per Cubic Meter of Water at Each Sample Station and Depth for Each Sample Period
1982

Station	Date	Depth(M)	Cubic Meters Sampled	Total Fish Per Cubic Meters	Family	Number
Upstream	6/14/82	1.5	132.6	0.030	Clupeidae	4
Intake	6/14/82	1.5	67.5	0.015	Clupeidae	1
Discharge	6/14/82	1.5	102.3	0.040	Clupeidae	4
Downstream	6/14/82	1.5	129.7	0.008	Clupeidae	1
Upstream	6/28/82	1.5	116.7	0.009	Clupeidae	1
Intake	6/28/82	1.5	70.5	0.014	Catostomidae	1
Discharge	6/28/82	1.5	101.5	0.010	Clupeidae	1
Downstream	6/28/82	1.5	126.3	0	-	-

1. Upstream Sample Area...............CRM 44.7-45.2
2. Intake Sample Area.................CRM 43.8
3. Discharge Sample Area..............CRM 43.0-43.5
4. Downstream Sample Area.............DRM 41.0-41.5
5. Flows were too low to give a reliable meter reading.
6. Specimens unidentifiable either due to damage or early stage of development.

The low densities of non-Clupeids is probably due to lack of suitable spawning habitat in the vicinity of the plant. The extremely unstable sand and gravel bottom of the Chattahoochee River in the vicinity of the plant and the 0.6 to 0.9 meter per second velocities resulting from a narrow river channel and operation of Andrews Dam (located approximately 0.5 miles above the upstream sample station) make this portion of the river under study poor spawning habitat, especially for those species which build nests or require semi-lentic spawning conditions.

The average number of larvae collected from each sample area, during each sample period, is presented in Table 9. Temperature and dissolved oxygen data collected during each of the larval fish sample periods are presented in Table 10.

Larval fish studies conducted in the Chattahoochee River near Farley Nuclear Plant during 1982 indicated poor spawning success for fishes other than the Clupeidae. Unstable bottom conditions resulting from high river velocities and associated operation of Andrews Lock and Dam are expected to be the primary contributing factors for low larval densities. Data collected during the study did not indicate that any differences among the three areas could be attributed to plant operation, but were closely tied to variations in natural environmental conditions in that portion of the river under study. The results of the 1982 larval fish study, which was designed to evaluate the effects of two unit operation at the Farley Nuclear Plant, failed to indicate any significant effects of plant operation on larval fish in the Chattahoochee River.

TABLE 9
Average Number of Larvae at Each Sample Station for Each Sample Period on the Chattahoochee River near Farley Nuclear Plant
1982

	AVERAGE NUMBER OF LARVAE PER CUBIC METER			
SAMPLE DATE	UPSTREAM[1]	INTAKE[2]	DISCHARGE[3]	DOWNSTREAM[4]
3/3/82	0	0	0	0
3/16/82	0	0	0	0
3/31/82	0.018	0	0	0
4/13/82	0.186	0.262	0.180	0.228
4/27/82	0.179	0	0.241	0.100
5/10/82	0.075	0.444	0.067	0.067
5/20/82	0	0.024	0.037	0.016
6/2/82	0.056	0	0.072	0.044
6/14/82	0.030	0.015	0.040	0.008
6/28/82	0.009	0.014	0.010	0

1. Upstream Sample Area....................CRM 44.7-45.2
2. Intake Sample Area......................CRM 43.8
3. Discharge Sample Area...................CRM 43.0-43.5
4. Downstream Sample Area..................CRM 41.0-41.5

TABLE 10

Temperature and Dissolved Oxygen Data for Larval Fish Sample Periods on the Chattahoochee River near Farley Nuclear Plant 1982

Date	Time	Location	Temperature (C)/Dissolved Oxygen (ppm)			
			0 ft.	5 ft.	10 ft	15 ft
3/3/82	1220	Upstream	12.2/11.00	12.3/11,00	12.3/11.20	12.3/11.20
3/3/82	1530	Intake	12.3/10.80	12.3/10.80	12.3/10.80	-
3/3/82	1330	Discharge	12.3/10.80	12.3/10.80	12.3/10.80	12.5/10.6
3/3/82	1500	Downstream	12.3/10.80	12.4/10.80	12.4/10.80	12.4/10.80
3/16/82	1230	Upstream	16.0/9.70	16.0/9.70	16.0/9.70	
3/16/82	1440	Intake	15.6/9.50	15.6/9.50	15.6/9.60	
3/16/82	1400	Discharge	15.7/10.00	15.8/10.00	15.8/9.90	
3/16/82	1450	Downstream	16.2/9.50	16.2/9.50	16.2/9.50	
3/31/82	1330	Upstream	16.2/9.70	16.2/9.70	16.2/9.65	16.2/9.60
3/31/82	1630	Intake	16.7/9.60	16.9/9.70	-	-
3/31/82	1410	Discharge	16.2/9.60	16.2/9.60	16.2/9.60	-
3/31/82	1445	Downstream	16.4/9.80	16.4/9.90	16.4/9.90	-
4/13/82	1300	Upstream	17.1/9.90	17.1/9.90	17.1/9.90	17.1/9.90
4/13/82	-	Intake	-	-	-	-
4/13/82	1440	Discharge	17.2/9.90	17.3/10.00	17.1/9.90	17.3/9.80
4/13/82	1400	Downstream	17.1/10.00	17.1/10.00	17.1/10.00	17.1/10.00
4/27/82	1325	Upstream	19.2/9.40	19.2/9.40	19.2/9.40	19.2/9.40
4/27/82	-	Intake	-	-	-	-
4/27/82	1530	Discharge	19.2/9.40	19.2/9.40	19.2/9.40	19.2/9.40
4/27/82	1600	Downstream	19.2/9.40	19.2/9.40	19.2/9.40	19.2/9.40
5/10/82	1300	Upstream	20.3/9.90	20.3/9.90	20.3/9.70	
5/10/82	1410	Intake	20.4/10.1	20.4/10.0	20.4/10.1	
5/10/82	1345	Discharge	20.3/10.20	20.3/10.30	20.3/10.20	
5/10/82	1500	Downstream	20.2/10.20	20.2/10.20	20.4/10.10	

TABLE 10

Temperature and Dissolved Oxygen Data for Larval Fish Sample Periods on the Chattahoochee River near Farley Nuclear Plant 1982

Date	Time	Location	Temperature (C)/Dissolved Oxygen (ppm)			
			0 ft.	5 ft.	10 ft	15 ft
5/20/82	1340	Upstream	22.3/8.50	22.3/8.50	22.3/8.40	22.3/8.40
5/20/82	1530	Intake	22.3/8.30	22.4/8.35	22.4/8.40	-
5/20/82	1540	Discharge	22.3/8.70	22.3/8.70	22.3/8.90	22.3/8.90
5/20.82	1520	Downstream	22.5/8.20	22.5/8.20	22.5/7.80	22.5/8.30
6/2/82	1230	Upstream	22.5/7.15	22.5/7.15	22.5/7.10	
6/2/82		TEMPERATURE/OXYGEN METER STOPPED WORKING				
6/14/82	1225	Upstream	27.3/7.55	26.8/7.55	26.7/7.40	-
6/14/82	1440	Intake	27.3/7.10	27.2/7.10	-	-
6/14/82	1325	Discharge	28.8/7.25	27.4/7.05	27.1/7.00	26.9/6.95
6/14/82	1425	Downstream	29.9/8.40	28.2/8.15	27.5/7.40	27.4/7.10
6/28/82	1235	Upstream	29.4/7.85	26.1/6.70	26.2/6.65	
6/28/82	-	Intake	-	-	-	
6/28/82	1600	Discharge	28.9/7.20	26.9/6.50	26.2/6.20	
6/28/82	1555	Downstream	29.2/7.70	27.0/6.70	26.6/6.20	

TABLE 11

FARLEY NUCLEAR PLANT
IMPINGEMENT RECORD BY SAMPLING DATE

	1982																								1983		
	02-18 thru 02-19	03-03 thru 03-04	03-16 thru 03-17	03-31 thru 04-01	04-13 thru 04-14	04-27 thru 04-28	05-10 thru 05-11	05-20 thru 05-21	06-02 thru 06-03	06-14 thru 06-15	06-28 thru 06-29	07-12 thru 07-13	07-26 thru 07-27	08-10 thru 08-11	08-24 thru 08-25	09-07 thru 09-08	09-15 thru 09-16	09-29 thru 09-30	10-11 thru 10-12	10-27 thru 10-28	11-09 thru 11-10	11-22 thru 11-23	12-08 thru 12-09	12-20 thru 12-21	01-04 thru 01-05	01-17 thru 01-18	TOTALS
GAME SPECIES																											
BLUEGILL	2	0	0	3	6	3	9	1	0	1	0	1	2	0	0	0	0	0	0	0	1	1	0	1	0	0	31
	0.01	0.00	0.00	0.01	0.21	0.05	0.23	0.16	0.00	0.12	0.00	0.06	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01	0.00	0.00	0.90
GREEN SUNFISH	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	3
	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.03
REDBREAST SUNFISH	0	0	1	0	2	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
	0.00	0.00	0.08	0.00	0.14	0.00	0.01	0.00	0.00	0.03	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40
BLACK CRAPPIE	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09
REDEAR SUNFISH	0	0	0	2	2	0	0	0	0	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	7
	0.00	0.00	0.00	0.31	0.25	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.91
YELLOW PERCH	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.04
FLIER	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	4
	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.07
WARMOUTH	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
WHITE BASS	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.24
TOTAL GAME SPECIES	3	0	2	6	10	3	13	3	0	2	2	3	2	0	1	0	0	0	0	1	1	2	0	2	0	1	57
	0.02	0.00	0.09	0.38	0.60	0.05	0.32	0.19	0.00	0.15	0.13	1.44	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.22	0.01	0.02	0.00	0.05	0.00	0.04	1.74
COMMERCIAL SPECIES																											
CHANNEL CATFISH	3	1	17	13	32	5	34	4	9	15	1	4	3	3	1	2	2	6	2	12	3	3	2	3	1	4	185
	0.02	0.01	0.41	0.09	2.21	0.21	4.16	0.54	0.54	0.85	0.04	0.52	0.11	0.19	0.01	0.22	0.12	0.01	0.11	0.80	0.30	0.28	0.22	0.23	0.01	0.04	12.28
TOTAL COMMERCIAL SPECIES	3	1	17	13	32	5	34	4	9	15	1	4	3	3	1	2	2	6	2	12	3	3	2	3	1	4	185
	0.02	0.01	0.41	0.09	2.21	0.21	4.16	0.54	0.54	0.85	0.04	0.52	0.11	0.19	0.01	0.22	0.12	0.01	0.11	0.80	0.30	0.28	0.22	0.22	0.01	0.04	12.28
OTHER FISH SPECIES																											
LEPOMIS SP.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
SPECKLED BULLHEAD	0	0	1	0	3	0	3	0	1	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	11
	0.00	0.00	0.37	0.00	0.43	0.00	0.21	0.00	0.15	0.10	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	1.50
BLACK BANDED DARTER	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
GIZZARD SHAD	1	46	74	24	22	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	6	176
	0.16	8.01	14.41	5.10	4.17	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.09	0.00	0.77	32.87
THREADFIN SHAD	466	9967	1730	270	33	1	2	119	2	0	1	8	5	1	3	4	1	3	3	5	6	5	0	14	6	73	12729
	2.43	47.63	12.25	4.83	0.66	0.01	0.03	0.99	0.04	0.00	0.01	0.13	0.03	0.01	0.02	0.03	0.01	0.03	0.01	0.04	0.07	0.09	0.00	0.29	0.08	0.85	70.45
UNIDENTIFIED BULLHEAD	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
	0.00	0.00	0.00	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.59
NOTROPIS SP.	0	1	1	1	2	0	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	8
	0.00	0.01	0.01	0.01	0.02	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.09
GOLDEN SHINER	1	17	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
	0.02	0.54	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58
BROOK SILVERSIDES	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
TOTAL OTHER FISH SPECIES	469	10032	1814	302	61	1	7	110	3	1	1	10	6	1	3	4	1	3	3	6	7	6	0	15	6	79	12916
	2.63	56.19	27.05	10.53	5.29	0.01	0.40	0.99	0.19	0.10	0.01	0.16	0.03	0.01	0.02	0.03	0.01	0.03	0.01	0.05	0.30	0.10	0.00	0.38	0.08	1.62	104.12
MISCELLANEOUS NON-FISH																											
CORBICULA	0	34	17	4	3	0	6	0	21	33	518	135	7	0	11	8	3	2	1	6	7	26	40	20	0	13	915
	0.00	0.17	0.04	0.04	0.01	0.00	0.04	0.00	0.09	0.12	0.86	0.31	0.02	0.00	0.03	0.20	0.02	0.01	0.01	0.02	0.01	0.06	0.16	0.23	0.00	0.03	2.48
TOTAL MISCELLANEOUS NON-FISH	0	34	17	4	3	0	6	0	21	33	518	135	7	0	11	8	3	2	1	6	7	26	40	20	0	13	915
	0.00	0.17	0.04	0.04	0.01	0.00	0.04	0.00	0.09	0.12	0.86	0.31	0.02	0.00	0.03	0.25	0.02	0.01	0.01	0.02	0.01	0.06	0.16	0.23	0.00	0.03	2.48
TOTAL ALL SPECIES	475	10067	1850	325	106	9	60	117	33	51	522	152	18	4	16	14	6	11	6	25	18	37	42	40	7	97	14073
	2.67	56.37	27.59	11.04	8.11	0.27	4.92	1.72	0.84	1.22	1.06	2.43	0.13	0.20	0.07	0.45	0.15	0.05	0.13	1.08	0.42	0.46	0.38	0.89	0.09	1.73	124.62

Impingement Studies

Impingement monitoring at Farley Nuclear Plant began on February 18, 1982 and extended through January 17, 1983. Fish and other aquatic organisms impinged on intake screens were collected for one continuous 24-hour period every two weeks during the study. Organisms impinged during the 24-hour sample periods were obtained by passing the effluent from the screen wash system through a collection basket. Fish collected during the study were identified and individually counted, weighed and measured. The weights of fish were obtained as previously noted, with the exception of small shad (Dorosoma spp), which were weighed in aggregate in order to increase the accuracy of weight determinations for this species.

Impingement data were collected on 26 sample periods during the 12-month study. Impingement data collected during the study are presented in Table 11, which includes the number and weight of each species collected during each of the 24-hour sample periods. Impingement monitoring at Farley Nuclear Plant resulted in the collection of 14,103 aquatic organisms (see totals in Table 11). The clam Corbicula fluminea and the Clupidae (including gizzard and threadfin shad) were the most numerous of the organisms collected. The Corbicula and shad accounted for 6.49% and 91.50%, respectively, of the total organisms collected during the study. Thus, these two groups, collectively, represented 97.99% of all organisms collected during the 12-month study.

Aquatic organisms collected during the impingement study were divided into three general categories which included game species, commercial species, and other species. Organisms collected during the impingement studies, and classified as previously described, are presented in Table 12. The total number and weight of each species collected are presented, as well as the estimated daily and annual impingement rates for each species identified. The estimated annual impingement rates for game, commercial, other fish species, and Corbicula (see Table 12) were determined to be 723; 2383; 166,756 and 12,565, respectively. The estimated annual impingement rate of 166,756, as shown for the classification of other fish species, includes an impingement estimate of 166,212 for the Clupeidae. Thus, the estimated annual impingement rate for all non-Clupeid species of fish is 3,650. The estimated annual weight of fish impinged on intake screens was determined to be 50.27 pounds (22.80 kg.) for game species, 156.06 pounds (70.79 kg.) for commercial species, 1390.66 pounds (630.80 kg.) for other fish species, and 33.22 pounds (15.07 kg.) for Corbicula. The Clupeidae account for 1353.65 pounds (614.02 kg.), thus the estimated annual impingement rate for non-Clupeid species of fish is 243.34 pounds (110.38 kg.). The estimated annual weight for all organisms impinged on intake screens was determined to be 1630.21 pounds (739.46 mg.).

The distribution of fishes and shellfish over the 26 sample periods is presented in Figure 37. Most of the fish collected during the impingement study occurred during the late winter and early spring. The impingement of fish during this period has been seen at other power plants throughout the State and is thought to be related to increased movement of fishes associated with feeding and spawning behavior. Impingement rates for Corbicula were relatively constant throughout the study with the exception of the period late June to early July, during which significantly larger numbers were observed.

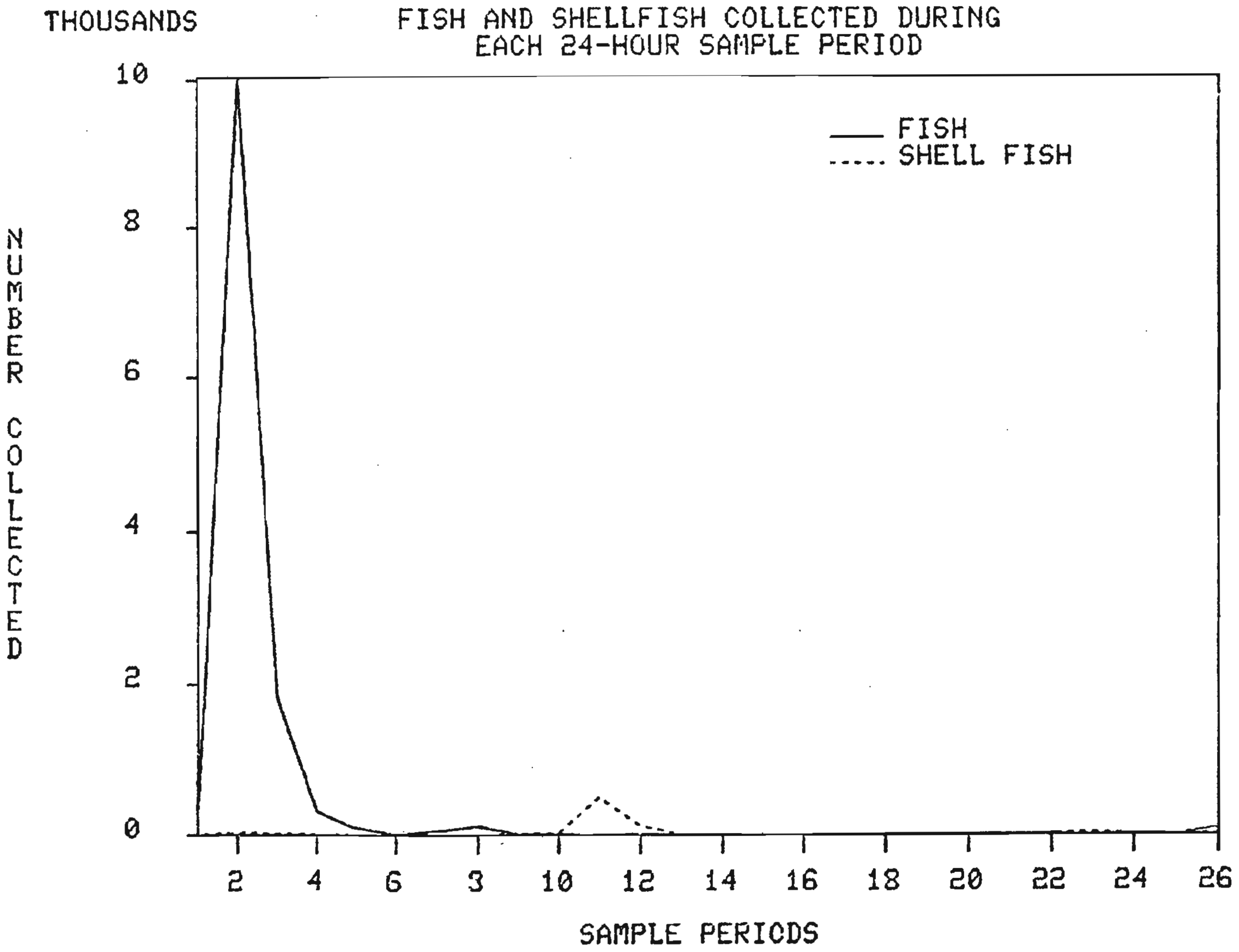
Table 13 and Figure 38 present the minimum and maximum rates of water withdrawal which could have occurred through the intake system during each of the impingement sample periods. Average flow rates for each 24-hour period could not be obtained since available information on pump operation was limited to the number of pumps running in continuous mode and the number of pumps set in the automatic mode. Thus, the data in Table 13 shows flows known to occur (minimum flows) and flows which could have occurred (maximum

TABLE 12

Summary of Impingement Data for
Farley Nuclear Plant Including Total Numbers
and Weights of Species Collected
Percent by Number, Percent by Weight and
Estimated Daily and Annual Impingement Rates
February 1982 - January 1983

		IMPINGEMENT SAMPLE DATA					ESTIMATED IMPINGEMENT RATE			
							BY NUMBER		BY WEIGHT (LBS)	
COMMON NAME	SCIENTIFIC NAME	TOTAL NUMBER	TOTAL POUNDS	WEIGHT GRAMS	% BY NUMBER	% BY WEIGHT	DAILY	ANNUAL	DAILY	ANNUAL
BLUEGILL	LEPOMIS MACROCHIRUS	31	0.90	408.2	0.22	0.72	1.17	389.	0.03	11.30
GREEN SUNFISH	LEPOMIS CYANELLUS	3	0.03	13.6	0.02	0.02	0.11	38.	0.00	0.39
REDBREAST SUNFISH	LEPOMIS AURITUS	6	0.40	181.4	0.04	0.32	0.24	80.	0.02	5.48
BLACK CRAPPIE	POMOXIS NIGROMACULATUS	3	0.09	40.8	0.02	0.07	0.11	35.	0.00	1.04
REDEAR SUNFISH	LEPOMIS MICROLOPHUS	7	0.91	412.8	0.05	0.73	0.29	98.	0.04	12.73
YELLOW PERCH		1	0.04	18.1	0.01	0.03	0.04	14.	0.00	0.54
FLIER	CENTRARCHUS MACROPTERUS	4	0.07	31.8	0.03	0.06	0.12	41.	0.00	0.60
WARMOUTH	LEPOMIS GULOSUS	1	0.06	27.2	0.01	0.05	0.04	14.	0.00	0.84
WHITE BASS	MORONE CHRYSOPS	1	1.24	562.5	0.01	1.00	0.04	14.	0.05	17.36
TOTAL GAME SPECIES		57	3.74	1696.4	0.40	3.00	2.17	723.	0.15	50.27
CHANNEL CATFISH	ICTALURUS PUNCTATUS	185	12.29	5570.2	1.31	9.95	7.16	2393.	0.47	156.06
TOTAL COMMERCIAL SPECIES		185	12.29	5570.2	1.31	9.85	7.16	2343.	0.47	156.06
	NOTURUS sp.	1	0.01	4.5	0.01	0.01	0.04	14.	0.00	0.14
SPECKLED BULLHEAD		11	1.50	680.4	0.08	1.20	0.43	142.	0.06	12.71
BLACK BANDED DARTER	PERCINA NIGROFASCIATA	1	0.02	9.1	0.01	0.02	0.02	7.	0.00	0.13
GIZZARD SHAD	DOROSOMA CEPEDIANUM	176	32.87	14909.8	1.25	26.38	7.06	2352.	1.33	442.70
THREADFIN SHAD	DOROSOMA PETENENSE	12728	70.45	31956.1	90.25	56.53	492.07	153900.	2.74	910.95
UNIDENTIFIED BULLHEAD		5	0.59	267.6	0.04	0.47	0.21	70.	0.02	8.26
	NOTROPIS sp.	8	0.09	40.8	0.06	0.07	0.32	108.	0.00	1.22
GOLDEN SHINER	NOTEMIGONUS CRYSOLEUCAS	15	0.58	263.1	0.11	0.47	0.57	190.	0.02	7.42
BROOK SILVERSIDES	LABIDESTHES SICCULUS	1	0.01	4.5	0.01	0.01	0.04	13.	0.00	0.13
TOTAL OTHER FISH SPECIES		12946	106.12	48135.9	91.80	85.15	500.77	166750.	4.18	1393.66
CORBICULA	CORBICULA FLUMINEA	915	2.48	1124.9	6.49	1.99	37.73	12565.	0.10	33.22
TOTAL NON-FISH SPECIES		915	2.48	1124.9	6.49	1.99	37.73	12565.	0.10	33.22
TOTAL ALL SPECIES		14103	124.62	56527.4	100.00	100.00	547.83	182427.	4.90	1530.21

FIRGURE 37



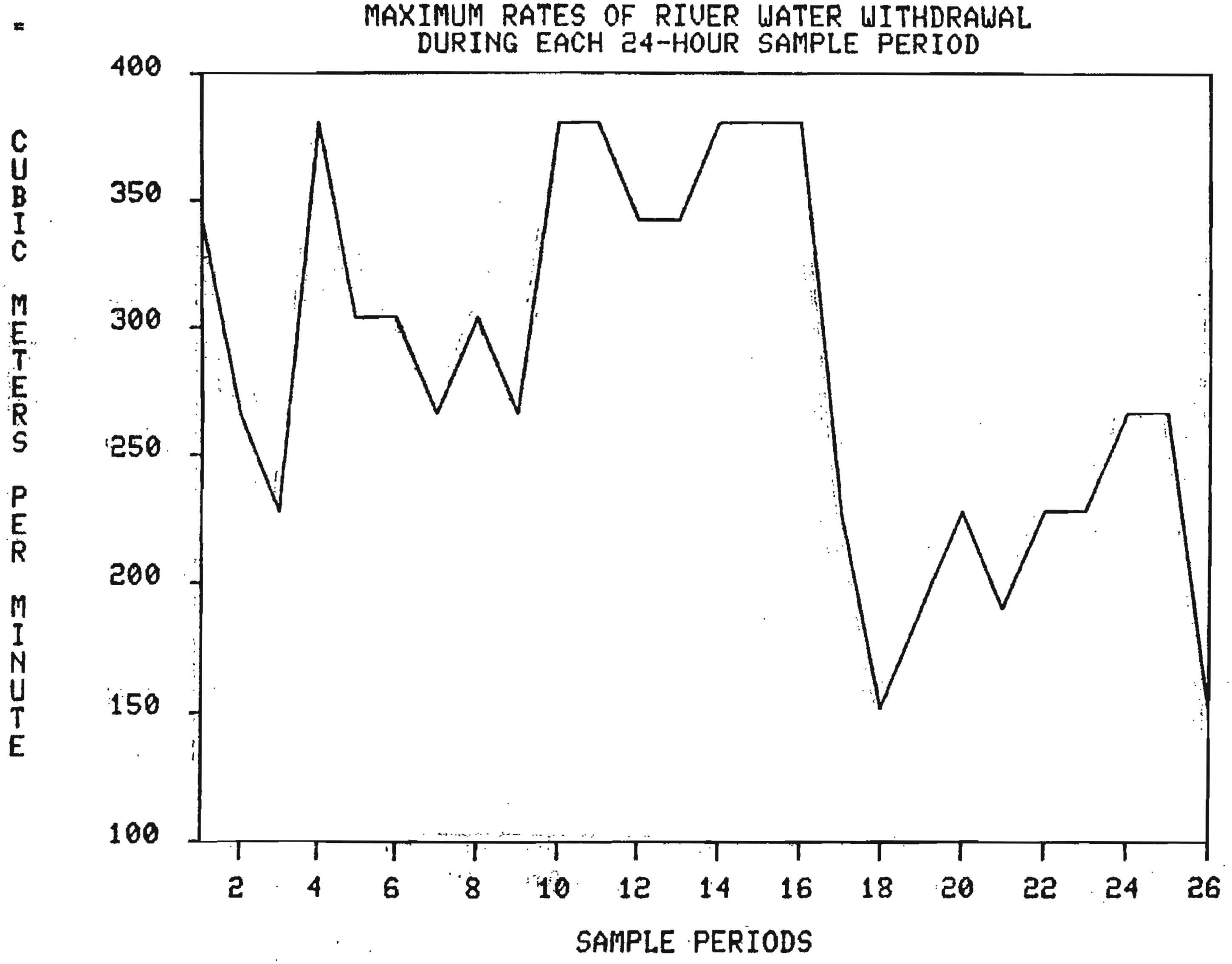
FISH AND SHELLFISH COLLECTED DURING EACH 24-HOUR SAMPLE PERIOD

TABLE 13

Minimum and Maximum Intake Flows
During Twenty-Four Hour Impingement Studies
at Farley Nuclear Plant
1982

Date Study Began	Sample Period	Minimum Flow (m^3/min)	Maximum Flow (m^3/min)
2/18/82	1	0	342
3/3/82	2	0	266
3/16/82	3	228	228
3/31/82	4	266	380
4/14/82	5	266	304
4/27/82	6	190	304
5/10/82	7	228	266
5/20/82	8	190	342
6/2/82	9	266	266
6/15/82	10	266	380
6/29/82	11	380	380
7/12/82	12	152	342
7/26/82	13	152	342
8/10/82	14	152	380
8/24/82	15	380	380
9/8/82	16	190	380
9/15/82	17	114	342
9/29/82	18	152	152
10/11/82	19	152	190
10/27/82	20	76	228
11/9/82	21	114	190
11/22/82	22	152	228
12/8/82	23	152	228
12/21/82	24	228	266
1/4/83	25	152	266
1/17/83	26	152	152

FIGURE 38



MAXIMUM RATES OF RIVER WATER WITHDRAWAL
DURING EACH 24-HOUR SAMPLE PERIOD

flows), based on the number of pumps set on automatic. The rate of water withdrawal did not appear to be related to impingement rates for fish, with the peak impingement rates occurring during a period of relatively low intake flow rates. The peak impingement rates for Corbicula did occur during a period of high flow rates. However, taking into consideration the relatively low rate of impingement for Corbicula during other periods that had equally high rates of flow, this peak was assumed to be coincidental.

The results of impingement studies at the Farley Nuclear Plant indicate that the removal of fish and other aquatic organisms from the Chattahoochee River is sufficiently low that no significant harm to aquatic communities is expected to occur. Impingement rates for game species were determined to be extremely low. The estimated daily impingement rate for game species of 2.17 is less than 5% of the daily creel limit per fishermen for sunfish, as set by the Alabama Department of Conservation & Natural Resources. The impingement rate for commercial species was also considered to be low, with an estimated daily rate of 7.16 fish. Biological studies conducted near Farley Nuclear Plant prior to and during the first year of operation of Unit #1 indicated that threadfin shad, gizzard shad, and Corbicula represent the majority of aquatic organisms living in the vicinity of the plant. Thus, impingement rates for shad and Corbicula, while appearing relatively high in comparison to impingement rates for other groups, are not considered sufficiently high to cause any detrimental effects to populations of these species.

Literature Cited

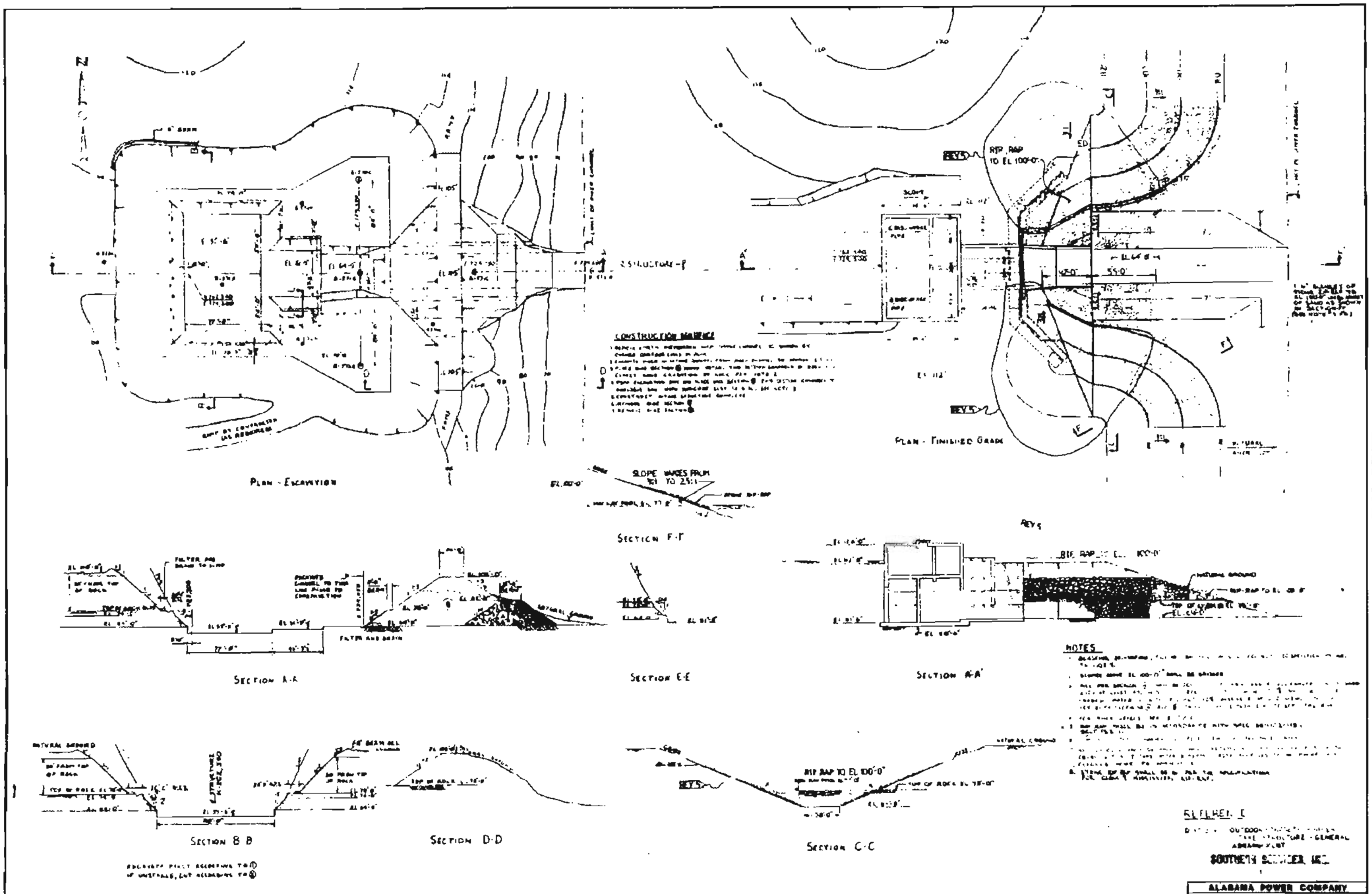
American Public Health Association. 1980. Standard Methods for the Examination of Water and Wastewater. 15th Edition, American Public Health Association, New York. 1134 pp.

Weber, C. I., ed. 1973. Biological Field and Laboratory Methods for Measuring the Quality of Surface Waters and Effluents. U. S. Environmental Protection Agency, Washington, D. C.

Attachment 8 to ADEM Form 187

Intake Map

Joseph M. Farley Nuclear Power Plant
NPDES No. AL0024619



ALABAMA POWER COMPANY

STRUCTURE - LAYOUT & EXCAVATION

D-171275

U.S. EPA Form 3510-2F
Application for Permit to Discharge Storm Water Discharges Associated with Industrial Activity

Joseph M. Farley Nuclear Power Plant
NPDES No. AL0024619

Submitted by Southern Nuclear Operating Company
December 2011

Please print or type in the unshaded areas

EPA ID Number *(copy from item I of Form 1)*
AL0024619

Form Approved. OMB No. 2040-0086
Approval expires 5-31-92

Form
2F
NPDES

United States Environmental Protection Agency
Washington, DC 20460

Application for Permit to Discharge Storm Water Discharges Associated with Industrial Activity

Paperwork Reduction Act Notice

Public reporting burden for this application is estimated to average 28.6 hours per application, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate, any other aspect of this collection of information or suggestions for improving this form, including suggestions which may increase or reduce this burden to: Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M St., SW, Washington, DC 20460, or Director, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

I. Outfall Location

For each outfall, list the latitude and longitude of its location to the nearest 15 seconds and the name of the receiving water.

A. Outfall Number *(list)*	B. Latitude			C. Longitude			D. Receiving Water *(name)*
SEE ATTACHED							

II. Improvements

A. Are you now required by any Federal, State, or local authority to meet any implementation schedule for the construction, upgrading or operation of wastewater treatment equipment or practices or any other environmental programs which may affect the discharges described in this application? This includes, but is not limited to, permit conditions, administrative or enforcement orders, enforcement compliance schedule letters, stipulations, court orders, and grant or loan conditions.

1. Identification of Conditions, Agreements, Etc.	2. Affected Outfalls		3. Brief Description of Project	4. Final Compliance Date	
	number	source of discharge		a. req.	b. proj.
N/A					

B. You may attach additional sheets describing any additional water pollution (or other environmental projects which may affect your discharges) you now have under way or which you plan. Indicate whether each program is now under way or planned, and idicate your actual or planned schedules for construction.

III. Site Drainage Map

Attach a site map showing topography (or indicating the outline of drainage areas served by the outfall(s) covered in the application if a topographic map is unavailable) depicting the facility including: each of its intake and discharge structures; the drainage area of each storm water outfall; paved areas and buildings within the drainage area of each storm water outfall, each known past or present areas used for outdoor storage or disposal of significant materials, each existing structure control measure to reduce pollutants in storm water runoff, materials loading and access areas, areas where pesticides, herbicides, soil conditioners and fertilizers are applied; each of its hazardous waste treatment, storage or disposal units (including each are not required to have a RCRA permit which is used for accumulating hazardous waste under 40 CFR 262.34); each well where fluids from the facility are injected underground; springs, and other surface water bodies which receive storm water discharges from the facility.

Continued on Page 2

Continued from the Front

IV. Narrative Description of Pollutant Sources

A. For each outfall, provide an estimate of the area (include units) of impervious surfaces (including paved areas and building roofs) drained to the outfall, and an estimate of the total surface area drained by the outfall.

Outfall Number	Area of Impervious Surface (provide units)	Total Area Drained (provide units)	Outfall Number	Area of Impervious Surface (provide units)	Total Area Drained (provide units)
	SEE ATTACHED				

B. Provide a narrative description of significant materials that are currently or in the past three years have been treated, stored or disposed in a manner to allow exposure to storm water; method of treatment, storage, or disposal; past and present materials management practices employed to minimize contact by these materials with storm water runoff; materials loading and access areas; and the location, manner, and frequency in which pesticides, herbicides, soil conditioners, and fertilizers are applied.

SEE ATTACHED

C. For each outfall, provide the location and a description of existing structural and nonstructural control measures to reduce pollutants in storm water runoff; and a description of the treatment the storm water receives, including the schedule and type of maintenance for control and treatment measures and the ultimate disposal of any solid or fluid wastes other than by discharge.

Outfall Number	Treatment	List Codes from Table 2F-1
N/A		

V. Non Stormwater Discharges

A. I certify under penalty of law that the outfall(s) covered by this application have been tested or evaluated for the presence of nonstormwater discharges, and that all nonstormwater discharges from these outfall(s) are identified in either an accompanying Form 2C or Form 2E application for the outfall.

Name of Official Title *(type or print)*	Signature	Date Signed
Bradley J. Adams, VP - Fleet Operations	Bradley J Adams	12-29-11

B. provide a description of the method used, the date of any testing, and the onsite drainage points that were directly observed during a test.

SEE ATTACHED

VI. Significant Leaks or Spills

Provide existing information regarding the history of significant leaks or spills of toxic or hazardous pollutants at the facility in the last three years, including the approximate date and location of the spill or leak, and the type and amount of material released.

THERE HAVE BEEN NO SIGNIFICANT LEAKS OR SPILLS OF TOXIC OR HAZARDOUS MATERIALS AT FARLEY NUCLEAR PLANT IN THE LAST THREE (3) YEARS.

Continued on Page 3

Continued from Page 2

EPA ID Number *(copy from Item I of Form 1)*
AL0024619

VII. Discharge Information

A,B,C, & D: See instruction before proceeding. Complete one set of tables for each outfall. Annotate the outfall number in the space provided. Tables Vii-A, VII-B, and VII-C are included on separate sheets numbered VII-1 and VII-2.

E. Potential discharges not covered by analysis - is any toxic pollutant listed in table 2F-2, 2F-3, or 2F-4, a substance or a component of a substance which you currently use or manufacture as an intermediate or final product or byproduct?

☐ Yes *(list all such pollutants below)* ☒ No *(go to Section IX)*

N/A

VIII. Biological Toxicity Testing Data

Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

☒ Yes *(list all such pollutants below)* ☐ No *(go to Section IX)*

ANNUAL BIOMONITORING AS REQUIRED BY EXISTING NPDES PERMIT ON THE MAIN COMBINED FACILITY DISCHARGE (DSN001).

IX. Contact analysis Information

Were any of the analysis reported in item VII performed by a contact laboratory or consulting firm?

☒ Yes *(list the name, address, and telephone number of, and pollutants analyzed by, each such laboratory or firm below)* ☐ No *(go to Section X)*

A. Name	B. Address	C. Area Code & Phone No.	D. Pollutants Analyzed
Alabama Power Company ***General Test Laboratory***	***Building No. 8*** ***P.O. Box 2641*** ***Birmingham, AL 35291***	***(205) 664-6194***	***All except pH and temperature***

X. Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

A. Name & Official Title *(type or print)*
Bradley J. Adams, VP - Fleet Operations

B. Area Code and Phone No.
(205) 992-5000

C. Signature
Bradly J Adams

D. Date Signed
12-29-11

EPA ID Number *(copy from Item I of Form 1)*
AL0024619

Form Approved. OMB No. 2040-0086
Approval expires 5-31-92

VII. Discharge Information *(Continued from page 3 of Form 2F)*

Part A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

Pollutant And CAS Number *(if available)*	Maximum Values *(include units)*		Average Values *(include units)*		Number Of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite		
Oil & Grease	***Not Detected***	N/A	—	—	*1*	
Biological Oxygen Demand (BOD5)	***14 mg/l***	***16 mg/l***	—	—	*1*	
Chemical Oxygen Demand (COD)	***37 mg/l***	***36 mg/l***	—	—	*1*	
Total Suspended Solids (TSS)	***98 mg/l***	***138 mg/l***	—	—	*1*	
Total Organic Nitrogen	***2.12 mg/l***	***2.34 mg/l***	—	—	*1*	
Total Phosphorus	***0.48 mg/l***	***0.35 mg/l***	—	—	*1*	
pH	Minimum ***6.59***	Maximum ***6.59***	Minimum ***6.59***	Maximum ***6.59***	*1*	

Part B - List each pollutant that is limited in an effluent guideline which the facility is subject to or any pollutant listed in the facility's NPDES permit for its process wastewater (if the facility is operating under an existing NPDES permit). Complete one table for each outfall. See the instructions for additional details and requirements.

Pollutant And CAS Number *(if available)*	Maximum Values *(include units)*		Average Values *(include units)*		Number Of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite		
N/A						

Continued from the Front

Part C - List each pollutant shown in Tables 2F-2, 2F-3, and 2F-4 that you know or have reason to believe is present. See the instructions for additional details and requirements. Complete one table for each outfall.

Pollutant And CAS Number *(if available)*	Maximum Values *(include units)*		Average Values *(include units)*		Number Of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite		
Chlorine, Total Residual	***Not Detected***	***N/A***	***Not Detected***	***N/A***	***1***	

Part D - Provide data for the storm event(s) which resulted in the maximum values for the flow weighted composite sample.

1. Date of Storm Event	2. Duration of Storm Event *(in minutes)*	3. Total rainfall during storm event *(in inches)*	4. Number of hours between beginning of storm measured and end of previous measurable rain event	5. Total flow from rain event *(gallons or specify units)*
5/19/05	***96 minutes***	***0.51 inches***	***> 72 hours***	***8,231 gallons***

7. Provide a description of the method of flow measurement or estimate.

SEE ATTACHED

Attachment 1 to U.S. EPA Form 3510-2F

Section I. Outfall Locations

Joseph M. Farley Nuclear Power Plant
NPDES No. AL0024619

Form 2F, Section I – Outfall Locations
Farley Nuclear Plant

The following outfalls located on the FNP site convey stormwater runoff from areas associated with industrial activity to the Chattahoochee River. None of the areas discharge directly to the river but discharge directly or indirectly to small tributaries, including Wilson Creek, which ultimately discharge to the Chattahoochee River. The stormwater drainages and their corresponding Discharge Serial Number (DSN) are provided below. DSN024, DSN025, and DSN029 discharge indirectly to the Chattahoochee River (31° 12' 52" Latitude, 85° 05' 55" Longitude) via unnamed tributaries on the site. DSN026, DSN027, and DSN028 discharge to Wilson Creek (31° 13' 45" Latitude, 85° 06' 45" Longitude).

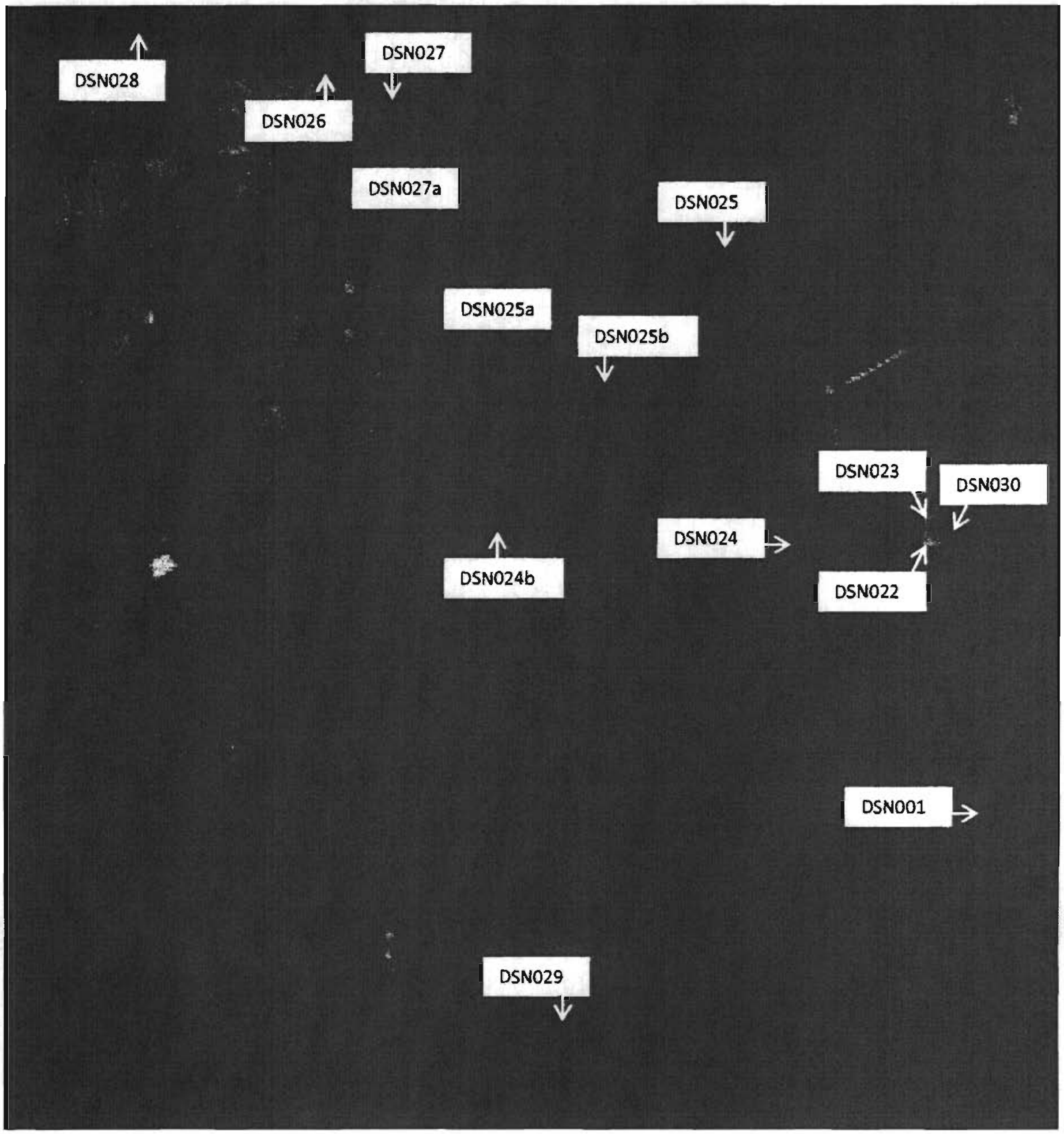
Description	**Discharge Serial Number (DSN)**
Southeast Yard Drainage	DSN024
East Yard Drainage	DSN025
Northwest Yard Drainage	DSN026
Northcentral Yard Drainage	DSN027
West Yard Drainage	DSN028
Southwest Yard Drainage	DSN029

Attachment 2 to U.S. EPA Form 3510-2F

Section III. Site Drainage Map

Joseph M. Farley Nuclear Power Plant
NPDES No. AL0024619

Farley Nuclear Plant – NPDES Permit AL0024619



NOTE – DSN012 and DSN024a are permitted as treatment processes and do not have specific outfall locations.
DSN034 and DSN035 are not tied to a specific outfall location.
DSN001a, b, c, d. e. f. g. h. I, j, k all discharge through DSN001.

Attachment 3 to U.S. EPA Form 3510-2F

Section IVA. Description of Stormwater Outfalls

Joseph M. Farley Nuclear Power Plant
NPDES No. AL0024619

Form 2F, Section IV(A) – Stormwater Outfall Description
Farley Nuclear Plant

The following outfalls are utilized to convey stormwater associated with industrial activity at FNP from the referenced drainage areas to the Chattahoochee River. The drainage areas are briefly described in the following table.

Outfall	**Description**
DSN024 Southeast Yard Drainage	The Southeast Yard Drainage receives stormwater runoff from buildings and yards in the southeast areas of the plant. The average flow is approximately 34,900,000 gallons per event from a drainage area of approximately 204 acres.
DSN025 East Yard Drainage	This drainage receives stormwater runoff from buildings and yards in the east plant areas. The average flow is approximately 684,200 gallons per event from a drainage area of approximately 4 acres.
DSN026 Northwest Yard Drainage	This drainage receives runoff from the northwest area of the plant. The average flow is approximately 684,200 gallons per event from an approximate drainage area of 4 acres.
DSN027 Northcentral Yard Drainage	This drainage receives stormwater runoff from buildings and yards in the northcentral area of the plant. The flow is approximately 855,300 gallons per event from a drainage area of approximately 5 acres.
DSN028 West Yard Drainage	This drainage receives stormwater runoff from primarily yard areas in the west portion of the site. The average flow is approximately 2,600,000 gallons per event from a drainage area of approximately 15 acres.
DSN029 Southwest Yard Drainage	This drainage receives stormwater from the southwest portion of the plant including the main parking lot and Fire Training Center. The average flow is approximately 500,000 gallons per event from a drainage area of approximately 2 acres.

Attachment 4 to U.S. EPA Form 3510-2F

Section IVB. Materials Management Practices

Joseph M. Farley Nuclear Power Plant
NPDES No. AL0024619

Form 2F, Section IV(B) – Materials Management Practices
Farley Nuclear Plant

There have been no significant quantities of hazardous materials or wastes at FNP over the past three (3) years which have been treated, stored, or disposed in a manner which would result in exposure to stormwater and / or contamination of stormwater runoff. The following FNP procedures address management of hazardous materials and hazardous wastes and provide guidance relative to prevention of contamination resulting from contact with stormwater.

FNP-0-AP-60	Oil Spill Prevention, Control, and Countermeasure Plan, Hazardous Waste Contingency Plan
FNP-0-CCP-900	Hazardous Waste Holding Area Requirements
FNP-0-CCP-901	Shipping of Hazardous Wastes
FNP-0-CCP-904	Receipt and Identification of Industrial Wastes
FNP-0-CCP-905	Chemistry Support to NMP-CH-002
NMP-CH-002	Chemical Product Control
NMP-EN-602	Hazardous Waste Program
NMP-SH-012-001	Farley Hazard Communication Program
FNP-0-SHP-30	Waste Disposal
FNP-0-ENV-25	Operation of the Farley Nuclear Plant Landfill
FNP-0-TCP-23	Hazardous Waste Training Plan

In addition to the above procedures, proactive materials management practices are employed to minimize contact of hazardous materials with stormwater including indoor storage, structural control measures, secondary containment for tanks and container storage, and materials management training. A formal Hazard Communication Program (NMP-SH-012-001) has also been implemented.

Attachment 5 to U.S. EPA Form 3510-2F

Section IVC. Structural Control Measures

Joseph M. Farley Nuclear Power Plant
NPDES No. AL0024619

Form 2F, Section IV(C) – Description of Structural Controls
Farley Nuclear Plant

Structural control methods utilized at FNP to control contact of stormwater with pollutants include:

Containments

Concrete containments are utilized around tanks and drum storage areas contain hazardous materials. Drainage from containment areas is strictly controlled by procedure to ensure accumulated rainwater is not contaminated with the stored material prior to release.

Site Drainage System

A system of pipes, concrete culverts, and spillways is utilized to collect and channel stormwater flow in areas where high flows pose significant potential for erosion.

Use of Grass Swales, Vegetation / Revegetation of Eroded Areas

Natural grass swales are utilized when appropriate for drainage of sheet flow runoff from large areas of the site. This promotes infiltration and minimizes erosion by slowing runoff velocity. Eroded or newly disturbed areas are promptly vegetated to prevent soil contamination of runoff; alternatively, rip-rap may be used to slow runoff velocity and minimize erosion.

Attachment 6 to U.S. EPA Form 3510-2F

Section VB. Description of Sampling Event

Joseph M. Farley Nuclear Power Plant
NPDES No. AL0024619

Submitted by Southern Nuclear Operating Company
December 2011

SOUTHERN COMPANY

Form 2F, Section V(B) – Description of Sampling Event
Farley Nuclear Plant

As a result of the prolonged drought conditions in southern Alabama and concerns for personnel safety during severe weather, Farley was unable to collect stormwater samples during the fall of 2011. As a result, data from the previous Form 2F sampling event (May 2005) was used to complete Form 2F for this permit renewal. There is limited stormwater exposure to industrial activity at Farley Nuclear Plant, as described in other attachments, and the quality of stormwater runoff across the facility is consistent and not subject to significantly change due to operations at the facility. Southern Nuclear believes that the analytical data obtained in May 2005 and provided in this application remains representative of the quality of stormwater runoff that occurs at Farley Nuclear Plant. If ADEM disagrees with this assertion, Southern Nuclear will resume attempts to sample a qualifying event upon request from the agency.

Stormwater can be sampled from any one of the numerous storm drains around the plant power block. Each storm drain is representative of the quality of stormwater runoff associated with industrial activity at Farley Nuclear Plant. Both manual grab and composite samples were collected in accordance with EPA methodology during a qualifying rainfall event.

The stormwater drainage system at Farley Nuclear Plant is evaluated for non-stormwater discharges by:

1. Review of drainage drawings,

2. Plant walkdowns, and

3. Interviews of maintenance, engineering, and operations personnel.