PACIFIC GAS & ELECTRIC COMPANY NUCLEAR PLANT OPERATIONS

REPORT ON DISCHARGE MONITORING AT DIABLO CANYON POWER PLANT DURING THE MONTH OF DECEMBER 1988



ì

ŝ

₹.

**, 1** 

۳ بر

Y7

·

۰. ۲

. . . . .

\* <u>}</u> ñ

•

# TABLE OF CONTENTS

.

.

Page
Overview
Summary of Monitoring Program
A - Monitoring of Plant Influent and Effluent
B - Monitoring of Receiving Waters
Appendix 1 - Influent and Effluent Monitoring Data for December 1988
Appendix 2 - Surface Water Temperatures - December 13, 1988
Appendix 3 - Incident Light Measurements - Fourth Quarter, 1988



È

1

ł

л а



٠,

. .

λ.' - , • · · · · \*

#### 1 4 \*\*\*\* \*

, e ۸, •

с. <sub>в</sub>

i i

, 4 6.4 u. , I<sup>z</sup>

# **3**3

, 2 \*

ر معن e . 🤜





Ł







•

#### OVERVIEW

ሻ ካ

Ş

- A. During the month of December, discharges occurred from Discharge Paths 001 (once through cooling water), 001B, 001D, 001E, 001F, 001G, 001H, 001J, 001L, 001M, 001N, 001P, and 002 through 013. No discharges occurred from Discharge Paths 001A, 001C, 001I, and 001K.
- B. In all cases, chemical, radiochemical, and toxicity analyses were performed in accordance with chemical analysis procedures contained in the Diablo Canyon Power Plant, Units 1 and 2 Plant Manual, Volume 8, by State approved laboratories, or laboratories meeting the requirements specified in the California Regional Water Quality Control Board Central Coast Region "Standard Provisions and Reporting Requirements" dated January 25, 1985. Receiving water monitoring was performed in accordance with approved biological and oceanographic procedures.

#### SUMMARY OF MONITORING PROGRAM

- A. Monitoring of Plant Influent and Effluent
  - 1. The results of the December plant influent and effluent monitoring are reported in Appendix 1.
  - 2. A static bioassay of Discharge 001 is performed quarterly in January, April, July, and October.
- B. <u>Monitoring of Receiving Waters</u>
  - 1. Ecological Studies at Diablo Canyon

Ecological studies in the vicinity of Diablo Cove, referred to as the Diablo Canyon Marine Environmental Monitoring Program (MEM), continue.

2. <u>Sediment Analysis</u>

Sediments samples were collected and analysis reported in September.

3. <u>Aerial Photography of Kelp Beds</u>

Aerial photography (infrared film type 2443) of kelp beds in the vicinity of Diablo Canyon is required in February, June, and October.

4. <u>Surface Water Temperature</u>

Surface water temperatures are reported in Appendix 2.

5. <u>Stratified Water Temperatures</u>

Stratified water temperatures are measured in February, June, and October.





# in a statistica de la companya de la Recentra de la companya de la company

 第一 ・ ・

.

·

.

.

5

. . ς.

.

. .

#### 6. pH and Dissolved Oxygen of Receiving Waters

Sampling of pH and dissolved oxygen is scheduled in February, June, and October.

7. <u>Incident Light Measurements</u>

Incident light measurements for the fourth quarter of 1988 are reported in Appendix 3.

8. <u>In situ Bioassay</u>

٢

м У

Results of the Mussel Watch program will be reported to the Board directly from the California Department of Fish and Game in their periodic report for this program.

٦ . , . • r .

,

3

e,

### APPENDIX 1

、 ご ア

#### Influent and Effluent Monitoring December 1988

v

ķ

5

ð

ŝ, .

۲., к

4 ٠

6 Q.F ·\*\*\*} · -3 1. .....

• t s

ŕ

4 4) 2

**,** .

· · ٠

		FACILITY I 3 40200300	.D. 1	BEGINN	IING	YEAR/ HO / 88/12/01	DAY		ENDING	;	YEAR/ MO /I 88/12/31	DAY	STATE CODE 06		NPDES PERMIT CA0003751	r #	
STATION ANALYSIS UNITS SMPL TYPE FREQ.	INF TEN Dec Met	FLUENT IPERATURE GREES F IERED ITIKUOUS	EFI TEI DE( KE1 CO)	FLUENT 001 IPERATURE GREES F IERED ITINUOUS	EFF FL( NGI RE( DA)	FLUENT 001 DW D Corded Ily	IN PH PH GR KD	FLUENT UNITS Ab NTHLY	E P P G M	FF H RA	LUENT 001 UNITS B THLY	El pi pi Gi Wi	F 001P=>003 I I UNITS RAB EEKLY	EFI pH pH GRi NDI	FLUENT 002 UNITS Ab NTHLY	EFI pH pH GRI KOI	FLUENT UNITS AB ATHLY
DECEMBER	t		1		ŧ		1		1			1		1		8	
1 2 3 4 5 6 7 8 9 10 11 12 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31		51.2 52.4 53.7 53.6 52 51.3 51.4 51.5 51.3 52 52.5 52.4 53 52 52 52 52 52 52 52 52 52 52		65.4   66.6   67.1   67.1   65.5   66.7   65.8   64.6   63.1   65.6   65.7   65.8   67   65.9   68.2   68.6   69.1   69.8   71.8   72   71.8   71.7   72   71.5   71.5   71.2   70.6		2194 1863 1863 1863 1865 1865 1863 2487 2487 2487 2487 2487 2473 2493 2493 2493 2493 2493 2493 2493 249		7.68			7.79				8.05		7.6
NONTHLY AVE MONTHLY HIG MONTHLY LOW	H	52.5 54.0 51.7		68.6 72.2 63.1		2337.9 2493.0 1863.0							NO DISCHARGE				
TIMES EXCEE	DED DED DED	NO LINIT	MAX Int 22	INUN = 0 AKE PLUS DEGREES(\$\$)		MAX 2760 =	0	NO LINI			MIN 6.0 =0 Hax 9.0 =0		MIN 6.0 =0 MAX 9.0 =0		MIN 6.0 =0 MAX 9.0 =0		NIN 6.0 MAX 9.0

-----

•

•

-----

.

•

------





. .

**\*** 

\$

D•.

1



.

r

. . .

* 11.44 *	Realited and a state for an a b b	-	• - •			80as (+#) 1	197	e eren	nin mani ayan kala, 23 da 1	•			• •	a	·		
I T	CALIFGRNIA I CONTROL B CENTRÁL COA 1102A LAURE LUIS OB	REGI DARI ST I L L/ ISP(	IONAL MATER ( D Region Ane D,CA 93401	DUA	LITY		DISCHARGE S	ELF	MONITORING	REP	DRT		PACIFIC DIABLO PO BOX AVILA B	6A Can 56 Eac	S AND ELECTR Yon Nuclear I H,Calif 9342 Page (M) 2	IC C Powe	XD. IR PLANT
رمم			FACILITY 1.1 3 402003001	D.	BEGINN	ING	YEAR/ NO / 88/12/01	DAY	ENDI	NG	YEAR/ NO /D 88/12/31	AY	STATE CODE 06		NPDES PERMI Caooo3751	T #	
	STATION ANALYSIS UHITS SMPL TYPE FREQ.	EFI pH pH GRI MOI	FLUENT 004 UNITS AB NTHLY	IN TU NT GR MO	FLUENT RBIDITY J AB NTHLY	EFI TUI NTI BRI NOI	FLUENT 001 RBIDITY J AB NTHLY	EFI DI eg GR HD	FLUENT 001 L & GREASE /1 Ab NTHLY	EFI DI Øg GR	FLUENT 001F L & GREASE /1· Ab NTHLY	EF DI #9 6R KD	FLUENT 001N L & GREASE /1 AB NTHLY	EF DI eg GR WE	F001P=>003 L & GREASE /1 AB EKLY	EFI SET Og/ GR/ NEI	LUENT OOIN ITL SOLIDS 11 Ab Ekly
	DECEMBER	2		:		8		1		1		1		12		1	
	1 2 3 4 5 6 7 8		7.82		.36		.39		(3		(3		(3				<b>&lt;.1</b>
	9 10 11 12																<b>‹.</b> 1
	16 17 18 19 20 21 22		ч. т.		•		-				•		<2				<.1 <.1
	23 24 25 26 27 28 29 30 31																<b>&lt;.1</b>
	MONTHLY AVG MONTHLY HIG MONTHLY LOW	+		L		<u>1                                    </u>		<u>l</u>	<u>.</u>	<u>1</u>	1 <u></u>	<u>!</u>	<2 <3 <3	<u>1_</u>	I NO DISCHARG	<u> </u> E	<.1 <.1 <.1
	TIMES EXCEEL	DED DED DED	NIN 6.0 =0 NAX 9.0 =0		NO LINIT		NO LINIT	<u> </u>	ND LINIT	MO D	AVG 15 =0 Max 20 =0	KO D	AVG 15 =0 Max 20 =0	KO D	AVG 15 =0 Max 20 =0	KO D I	AVG 1.0 =0 KAX 3.0 =0
	REMARKS:_{*)	)_N	laber_of_Saaj	ple	s_taken_duri	ng_1	the_day										
	PRINCIPAL I	EXEC	CUTIVE OFFIC	ER								-	SIGNATURE O	FA	UTHORIZED AG	ENT	DATE
	JAMES D.	5H11	FFER										Joan R	. K	nemerg		Y11/89

١

•

<u>4</u>4 ř.

°r' € , ÷ Prit.

ħ

3

•• • . ٠

No. я

, **\*** 

.

ę.

۲.

۶

2

•

\*4 --

Č.

а<u>с</u>

\*

•	,		-	×								4	· · ·	-	۹		
ן יי ז	CALIFORNIA I CONTROL BO CENTRA2 COAS 1102A LAURE SAN LUIS OB	REGI DARI ST F L L4 ISP(	IONAL WATER ( ) Region Ane ), ca 93401	DUAI			DISCHARGE S	ELF	MONITORING	REP	DRT		PACIFIC Díablo Po Box Avila B	GAN Can 56 Eaci	S AND ELECTR Yon Huclear H,Calif 9342 Page (M) 3	IC C Powe	O. R PLANT
			FACILITY I. 3 402003001	D.	BEGIN	NINI	YEAR/ NO / 1 6 88/12/01	DAY	ENDI	NG	YEAR/ NO /D 88/12/31	AY	STATE CODE 06		NPDES PERMI CA0003751	T ŧ	
	STATION ANALYSIS UNITS SMPL TYPE FREQ.	EFI T I #9/ 6R/ MOI	FLUENT 001 NF RESIDUE /1 1st FLTR AB NTHLY	EFI T 1 #9 6Ri HOI	FLUENT 001 NF RESIDUE /1 2nd FLTR AB NTHLY	El T Gi Ki	FLUENT 001 NF RESIDUE g/1 NET RAB DNTHLY	EFI T GR HD	FLUENT 0011 NF RESIDUE /1 1st FLTR AB NTHLY	EFI T #9 6R ND	FLUENT 001I NF RESIDUE /1 2nd FLTR AB NTHLY	EFI T ( #9. 68: H0:	FLUENT 0011 NF RESIDUE /1 NET Ab NTHLY	EFI T I #94 6Ri NDI	FLUENT 001C NF RESIDUE /1 AB NTHLY	EFF T H #9/ GRA	LUENT 001D F RESIDUE 1 IB ITHLY
	DECEMBER	1		1		1:		1	*	1		1		:		:	
	1 .2 3 4 5 6 7 8 9 10 11 12 13 16 17 18 19 20 21 21 22 23 24 25 26 27 28 29 30 31		9		B		1										1
	MONTHLY AVG Monthly Hig Monthly Low	H		<u></u>				<del></del>	NO DISCHARE	E	NO DISCHARG	E	NO DISCHARG	E	NO DISCHARE	E	
	TINES EXCEE TINES EXCEE TINES EXCEE	DED DED DED	ND LINIT		NO LINIT		NO LINIT		ND LIMIT		NO LINIT	KO D	AVE 30 =0 Max 100 =0	MO D	AVE 30 =0 Max 100 =0	NO D I	AV6 30 =0 Max 100 =0
	TENARKS:_(\$	)_₩ 	umber_of_Sam	ple:	s_taken_dur:	ing 	_the_day				************************						
•	PRINCIPAL	EXE	CUTIVE OFFIC	ER			• •				ч., Н		SIGNATURE D	IF A	UTHORIZED AG	ENT	DATE
	JAKES D.	SHI	FFER								¥.		Johnk	K	nemey	<u> </u>	16/99





• • 

· · ·

•

x

\*\* 1, ι

**59** f

۴



۲.

•

.

.

.

CALIFORNIA CONTROL B CENTRÁL COA 1102A LAURE	REGIONAL WATER DARD ST REGION L LANE ISPD,CA 93401	QUALITY	DISCHARGE (	SELF MONITORING	REPORT	PACIFIC DIABLO > PO BOX AVILA B	GAS AND ELECTR Canyon Nuclear 56 Each,Calif 9342 Page (N) 4	IC CO. Power plant 4
	FACILITY I. 3 402003001	.D. BEGIN	YEAR/ NO / NING BB/12/01	DAY ENDI	YEAR/ NO /D Ng Bb/12/31	AY STATE CODE 06	NPDES PERMI CA0003751	T ŧ
STATION ANALYSIS UNITS SMPL TYPE FREQ.	EFFLUENT 001F T NF RESIDUE #9/1 GRAB NONTHLY	EFFLUENT 0016 T NF RESIDUE mg/1 GRAB Monthly	EFFLUENT OOIH T NF RESIDUE #9/1 GRAB NONTHLY	EFFLUENT 001J T NF RESIDUE mg/1 GRAB MONTHLY	EFFLUENT 001K T NF RESIDUE mg/1 GRAB MONTHLY	EFFLUENT OOIL T NF RESIDUE mg/l GRAB MONTHLY	EFFLUENT 001M T NF RESIDUE mg/1 GRAB MONTHLY	EFFLUENT OOIN T NF RESIDUE Ug/1 GRAB KONTHLY
DECEMBER	1	1	1	1	1	1	1	1
1 2 3 4 5 6	12	. 1	9	<1				20
7 B 9 10 11 12						(1		
16 17 18 19								14
20 21 22 23 24 25 26 27 28							13 15	16
29 30 31								
MONTHLY AVG Monthly High Monthly Low	<b>i</b>		*****	<u></u>	NO DISCHARG		15 17 13	16.7 20 14
TIMES EXCEEL	DED KO AVG 30 = Ded D Max 100 = Ded	0 ND AVG 30 = 0 D Max 100 =	=0 MD AVG 30 = =0 D MAX 100 =	MD AVG 30 =0 D MAX 100 =0	MD AVG 30 =0 D MAX 100 =0	10 AVG 30 =0 D HAX 100 =0	ND AVG 30 =0 D Max 100 =0	MO AV6 60 =
REMARKS:_(*)		ples_taken_duri	ing_the_day					
		50						

.



122

я 1

\*X 15-

· ••, ۰ هر . .

x

.

r

¥

3 6 1	CALIFORNIA CONTROL BI CENTRAL COA 1102A LAURE SAN LUIS DB	REGI DARI ST I L L( ISP(	IONAL WATER ( ) Region Ane ), ca 93401	BUA	LITY	1	DISCHARGE SI	ELF	MONITORING I	REPI	JRT 4		- PACIFIC DIABLO PD BOX AVILA B	GAI Can' 56 Eaci	S AND ELECTRI YOX NUCLEAR F H,CALIF 93424 PAGE (M) 5	IC C Powe	D. R PLANT
			FACILITY I.1 3 402003001	D.	BEGINN	ING	YEAR/ NO / 1 88/12/01	DAY	ENDI	NG	YEAR/ NO /D 88/12/31	AY	STATE CODE 06		NPDES PERMIT CA0003751	T #	
	STATION ANALYSIS UNITS SMPL TYPE FREQ.	EFI T I Ug. GR/ MOI	FLUENT 001P NF RESIDUE /1 AB NTHLY	EF T \$9 6R MD	FLUENT 002 NF RESIDUE /1 AB NTHLY	EFF T I #9/ GR/ NEE	: 001P=>003 IF RESIDUE 11 18 KLY	EFF T C ug/ GR/ KOI	FLUENT 001 Chronium VI Ab Athly	EFI COI Ug GRI HOI	FLUENT 001 PPER V1 AB NTHLY	EFI NII Ug GRI NOI	FLUENT 001 CKEL /1 AB NTHLY	EFI ZII Ug. GRI NDI	FLUENT 001 NC /1 AB NTHLY		
	DECEMBER	*		1		\$		\$		*		1		1		8	
·	1 2 3 4 5 6 7 8 9 10 11 12 13 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31		4		<1				2				<۶		<1		
	NONTHLY AVG	,					NO DISCHARG	E									
	MONTHLY LOW											<u></u>					
	TIMES EXCEEN	)ED )ED )ED	HO AVE 30 =( D MAX 100 =(		MD AV6 30 =( 'D MAX 100 =(	0 M	10 AV6 30 =0 1 MAX 100 =0	6H- D   I	-NEAN ,15 =0 1AX 59 =0 1AX 148 =0	6M D I I I	-MEAN 24 =0 Max 135 =0 Max 357 =0	6M D I	-NEAN 14B =0 NAX 592 =0 NAX 14B0 =0	6M D I	-HEAN 97 =0 Max 541 =0 Max 1430 =0		
•							a -/*eeaa					***				 	·
	PRINCIPAL I	EXEC	UTIVE OFFICE	ER									SIGNATURE O	FA	UTHORIZED AG	ENT	DATE
	JAKES D. S	GH1F	FER										bar	κ,	remayon		n4/89

. .



. 

.

۵ ۲۰۰۰ ۲۰۰۲ ۲۰۰۲ 



-

۰.	•		·····														
CALIFORNIA REGIONAL WATER QUALITY DISCHARGE SELF MONITORING REPORT CONTROL BOARD CENTRAL COAST REGION 1102A LAUREL LANE LUIS OBISPO,CA 93401											EPORT PACIFIC GAS AND ELECTRIC CO. DIABLO CAHYON NUCLEAR POWER PLANT PO BOX 36 AVILA BEACH,CALIF 93424 PAGE (M) 6						
			FACILITY I.D 3 402003001	•	BEGINN	ING	YEAR/ NO / 1 88/12/01	DAY	ENDI	NG	YEAR/ MD /D 88/12/31	AY	STATE CODE 06		NPDES PERMI CA0003751	T ŧ	
	STATION ANALYSIS UNITS SMPL TYPE FREQ.	EF T Ug GR 2	FLUENT 001 CHLOR RES /1 AB per CYCLE	EFI FRI Ug GRI 2	FLUENT 001 EE AVL CHL /1 AB per CYCLE	EFI CHI 1b: RE(	FLUENT 001 LORINE USED 5/day Corded NTHLY	EFI Ani ng/ BR/ HOI	LUENT 001 IONIA (N) IB ITHLY	EFI TI Ug GRi KO	FLUENT 001 TANIUN /1 Ab NTHLY	EF LT Ug Ko No	FLUENT 001D THIUN /1 NTHLY COKP. NTHLY	EFF BOF Ug/ NOI	LUENT 001D Ion Ithly comp. Ithly	EFI HYI Ug/ GR/ KOI	FLUENT OOID DRAZINE 71 AB ATHLY
	DECENBER	*		*		1		8		1		1		:		:	
	1 2 3	6	(20	6	(20		189				• .						
	4 5 6 7	2	<20	2	<20		63					11	34	**	401000		
	9 10 11 12										<50				Ţ		
															- - -		
	16 17 18 19				•				r								-
	20 21 22 23 24 25								.152								650
	28 27 29 29 30 31	2 B	<20 <20	2 8	<20 <20		7 333			6					•		
	MONTHLY AVG Monthly High Monthly Low		<20 <20 <20 <20		<20 <20 <20 <20		147.8 - 188 7									1	<u></u>
	TINES EXCEED	ED ED ED	D MAX 200 =0 1 HAX 200 =0	: : :	50 DAY AV 20( =0 ) MAX 500 =0	)	NO.LINIT	6H- D H 1 H	NEAN 4.44=0 AX 17.8 =0 AX 44.4 =0		NO LINIT		NO LINIT		NO LINIT		ND LINIT
	REMARKS:_(\$)	_Ch	lober_of_Samp	les	s_taken_durin	ng_t	the day. \$\$Bo	ron	and Lithiu	n ar	nalyzed on De	ecei	ber; 1988 m	onth	ly composite	e	
	PRINCIPAL E	XEC	UTIVE OFFICE	R									SIGNATURE DI	F AU	THORIZED AG	EHT	DATE
	JAMES D. S	HIF	FER										JORR.	Kı	remap		16/89

....

. .

----

noithean Bar I St

• **•** • • • • • • • •

2.3% (\*\*\* 4.2

• .

•

ι. .

ł

4.

• \*

\$1.**A** 

·

8

4	CALIFORNIA CONTROL BI CENTRAL COA 1102A LAUREI	REG Dari St i L Li	IDNAL WATER I D REGION ANE	DUA	LITY		DISCHARGE SI	ELF	MONITORING I	REPI	DRT	,	PACIFIC DIABLO PO BOX AVILA B	GAI Can 56 Eaci	5 AND ELECTRI Yon Nuclear F H.Calif 93424	C C Ovei	D. R Plant
	SAN LUIS OB	ISP	D,CA 93401 Facility I.1 3 402003001	).	BEGINNI	NG	YEAR/ MO / 1 BB/12/01	DAY	ENDI	16	YEAR/ MQ /DA 88/12/31	Y	STATE CODE		PAGE (N) 7 NPDES PERMIT CA0003751		•
	STATION ANALYSIS UNITS SMPL TYPE FREQ.	EFI To' Mpi Gri 4	F 001N=>003 TL COLIFORM N/100B1 AB TIMES/NEEK	EFI FEI MPI GRI 4	F 001N=>003   Cal Coliforn N/100m1   Ab   Fines/meek	EFI TO HPI GRI 4	F 001N=>INTK TL COLIFORM N/100m1 AB FIMES/WEEK	EFI FEI HPI GRI 4	F QOIN=>INTK CAL COLIFORM N/100ml AB TIMES/WEEK			•	•	•		¥.	
	DECEMBER	1		1		:		8		8	1	•		1		:	
	1 2 3 4 5 6 7 B 9 10 11 12 13 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30														•		-
	31	_											-				
	MONTHLY AVE Monthly High Monthly Low		NO DISCHARGE		ND DISCHARGE		NO DISCHARGE		ND DISCHARGE	:							£
	TIMES EXCEED	ED ED ED	BOZ SMPLS>1K = I MAX >10K=		MEAN>200= 90% SMPLS>400 #	0	BOX SHPLS>1K I MAX >10K=	: 1 5	KEAN>200= 701 ShPLS>400 .=	)							
V		_Ku	imber_of_Samp	les	_taken_during	9_t	he_day										
	PRINCIPAL E	XEC	UTIVE OFFICE	R								I	SIGNATURE DI	f Al	JTHORIZED AGE	ТΗ	DATE
	JAMES D. S	HIF	FER									Į	Joan	Kı	remay	}	16/89

;

Must Must ана 194 ала 194 i. Na

. ix ;

. 11

.

• • • •

۰ . ۲

CALIFOBNIA F CONTROL BO CENTRAL COAS TA LAURED LUIS OBJ	REGI DARI ST I L LI ISPI	IONAL NATER D Region Ane D,Ca 93401	QUAI			DISCHARGE S	ELF	MONĮTORING	REP	ORT		PACIFIC DIABLO PO BOX Avila B	i gai Can' 56 Eaci	S AND ELECTR Yon Nuclear H.Calif 9342 Page (Q) 2	IC C Powe	CO. ER PLANT
		FACILITY I. 3 402003001	D.	BEGINN	ING	YEAR/ NO / B8/12/01	DAY	ENDI	NG	YEAR/ NO /D 88/12/31	AY	STATE CODE 06		NPDES PERMI Ca0003751	T #	
STATION ANALYSIS UNITS SMPL TYPE FREQ.	EFI OII 89. GRI JA	FLUENT 001L L & GREASE /1 AB /AP/JUL/OCT	EFI OII Bg/ GRI JA/	FLUENT 001M L & GREASE /1 Ab /Ap/Jul/Oct	EF OI ag GR JA	FLUENT 001P L & GREASE /1 AB /AP/JUL/OCT	EF DI ng GR JA	FLUENT 002 L & GREASE /1 AB /AP/JUL/DCT	EF DI Bg GR JA	FLUENT 003 L & GREASE /1 AB /AP/JUL/OCT	EF DI OI GR JA	FLUENT 004 L & GREASE /1 Ab /Ap/Jul/Dct	IN T S G R J A	FLUENT NF RESIDUE /1 1st FLTR AB /AP/JUL/OCT	INF T F Bg/ GR/ JA/	FLUENT KF RESIDU /1 2nd FL AB /AP/JUL/0
DECEMBER	1		1		1		1		1		*		1		1	
2 3 4 5 6 7 8 9 10 11 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31				(3 (3 (3												
MONTHLY AVG Monthly High Monthly Lon	1			<3 <3 <3				۰								
	)ED )ED	ND AVG 15=0 D Max 20 =0		HD AVG 15=0 D Max 20 =0		NO AVG 15=0 D KAX 20 =0		NO AV6 15=0 D Max 20 =0	- <u>,</u>	ND AVG 15=0 D Max 20 =0		ND AVG 15=0 D Max 20 =0	245	NO LINIT		ND LINIT

PRINCIPAL EXECUTIVE OFFICER	SIGNATURE OF AUTHORIZED AGENT DATE
JANES D. SHIEFER	John Kneman Y16/20

, , · • .

te

APPENDIX 2

. . . . . . .

-----

a,i

(r#

.

ş

Surface Water Temperatures December 13, 1988







n de la segur de la seg

ڊ ار

ing and a second a

#### Surface Water Temperatures December 13, 1988

Surface water temperatures were measured on December 13, 1988 between 0730 and 0900 PST. The thermal discharge plume was mapped using a TSK American towable electronic bathythermograph (TOWED-BT) and a Minolta/Land infra-red radiometer. The TOWED-BT is a self contained underwater unit which uses a platinum resistance, pressure independent sensor to measure temperature. The sensor has a response time of 0.25 seconds and an accuracy of .±0.1 degrees Fahrenheit (±0.05 degrees Celsius). An oil-filled strain gauge pressure transducer accurate to 0.3% (full scale) was used to measure the instrument's depth. Temperature and depth data were recorded every five seconds. During sampling the data was stored in an internal integrated circuit memory. The data were retrieved after the survey using a photomagnetic coupler and Compag computer. The infra-red radiometer was used as an aid in navigation during the plume mapping.

On December 13 the sky was overcast with winds from the northwest at approximately 15 to 20 miles per hour. The sea was rough with 5 to 7 foot swell from the northwest and 3 foot confused wind chop.

A continuous record of the vessels position during the plume mapping was recorded using a Motorola Miniranger III range-range navigation system with an accuracy of  $\pm 0.5$  meters.

Intake and discharge temperatures were measured using three 4TR Sea-Data units with an accuracy of  $\pm 0.2$  degrees Fahrenheit ( $\pm 0.1$  degrees Celsius) and a response time of 2 seconds. The intake recorder was located 100 feet from the intake structure in 14 feet of water (MLLW). The discharge recorders were located on the side walls of the discharge structure near the end weir. Offshore ambient water temperature was defined as the lowest surface temperature measured by the TOWED-BT during the survey.

Discharge water volumes for Unit 1 and 2 are the actual circulating water pump flow volumes. During the survey all the pumps for Unit 1 and 2 were operational producing 4000 cfs of flow in the discharge structure.

Position and temperature data were merged and surface water isotherms, in degrees Fahrenheit above ambient temperature (delta T), were generated. The area covered by each two degree isotherm was measured and is presented in Table 1. A small portion of the discharge plume extended beyond the southern edge of the sampling area. If an isotherm is not completely enclosed within the boundary of the sampling area then the boundary is used as the limit in determining the area covered by the isotherm (White 1986). The area covered by the isotherms during the survey was well within the range of isotherm areas reported from 1985 through 1987 in "The Surface Buoyant Jet Characteristics of the Thermal discharge Plume at Diablo Canyon", (Tu et. al.;1986) and in the "Discharge Monitoring and Reporting Program, Diablo Canyon Power Plant" monthly reports.



ور ره برورس وجو چر وه - «مطلبه استه ا

,

v -

JAn ∞ ``

.

•

and the second se 

#### TABLE 1

CUMULATIVE ISOTHERMS AREAS (IN ACRES) December 13,1988

		20 19	OTHERMS		
20	40	60	80	100	120
407.8	265.0	57.6	26.9	8.3	1.3





# • • •

۰ . . 2. Bu ' B

л . . . .

,

٣

•

.









•

·

۰. ۲

. . .

•



- Tu, S. W., J. P. Leighton, C. O. White, and C. C. Hsu. "Surface Buoyant Jet Characteristic of the Thermal Discharge Plume at Diablo Canyon Power Plant. A Field Study of Power Ascension Testing of Unit 2 and Full Load Operation of Unit 1". In <u>Environmental Investigations at Diablo Canyon, 1986,</u> Volume 2 - Oceanographic and Environmental Engineering Studies. PG&E, 1986 (edited by C. O. White and D. W. Behrens).
- PG&E. Discharge Monitoring and Reporting Program Diablo Canyon Power Plant Monthly Reports.
- White, C. O. Measurement of Surface Temperatures and Isotherm Contour Development. In the <u>Oceanographic Procedures Manual.</u> PG&E, 1986 (edited by E. M. Kenzler).



W 5.

**,** , , .

•

.

\*

\*

.

a s

٨

ŀ

## APPENDIX 3

۰.

- 191 -

< i

• •• • ------

Incident Light Measurements Fourth Quarter, 1988

br≉ at

- •

••

alinia glanis an an India di - 4 di a

**ب** 

. ş?

ъ.,

.\*\* \*\*\* \*\*\*

、

r

• •