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Instructions for using Oceanography Form 1 (Virginia Institute of Marine Science Hydrographic Data Form)

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Oceanography Department Instruction 1
(Rev. November, 1971)
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INSTRUCTIONS FOR USING OCEANOGRAPHY FORM 1

(VIRGINIA INSTITUTE OF MARINE SCIENCE HYDROGRAPHIC DATA FORM)

DEPARTMENT OF PHYSICAL OCEANOGRAPHY
COMPUTER SERVICES
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INSTRUCTIONS

FOR

CODING

OCEANOGRAPHIC DATA

ON

FORM 1

INDEX

Form I

I, II

OCEANOGRAPHY FORM 1 (Revised June, 1971)

FILE NUMBER _____

DATE | DAY | MONTH | YEAR | STATION TIME EST hrs. & tenths | LAT. N. DEGREES | MINUTES | TENTHS | LONG. W. DEGREES | MINUTES | TENTHS | CRUISE DESIGNATION | RIVER CODE | STATION / LOCATION CODE | VESSEL CODE | DEPTH TO BOTTOM (meters) | TIDE CODE | DISK VISIBILITY meters & tenths | WIND DIRECTION tens of degrees | WIND SPEED meters/sec. | AIR TEMPERATURE degrees & tenths Celsius

FREE FORM FIELD

N = Collection Number (4 digits)
A = Cloud Amount (tenths)
D = Wave Direction (nearest 10°)
H = Wave Height (meters & tenths)
P = Wave Period (seconds)
B = Barometric Pressure (tenths MBS)
G = Wet Bulb Temperature (°C & tenths)
V = Visibility (Table 13c)
W = Present Weather (Table 13b)
S = Sea State (Table 13d)
T = Cloud Type (Table 13a)

(ENCLOSE COMMENTS IN PARENTHESES)

VIRGINIA INSTITUTE of MARINE SCIENCE
DATA FORM

CRUISE - SURVEY _____

OBSERVERS _____

DEPTH of SAMPLE meters & tenths | SAMPLE TIME hours & tenths | TEMPERATURE: PARAMETER CODE, FINAL READING | SALINITY: PARAMETER CODE, BOTTLE NO. or CONDUCTIVITY, FINAL READING | CURRENT: PARAMETER CODE, INSTRUMENT READING, DIRECTION nearest 10 degrees, INSTRUMENT READING or BOTTLE NUMBER, SPEED meters/sec. & hundredths | OXYGEN: PARAMETER CODE, BOTTLE NUMBER, FINAL READING | PARAMETER CODE, BOTTLE NUMBER, FINAL READING | PARAMETER CODE, BOTTLE NUMBER, FINAL READING | PARAMETER CODE, BOTTLE NUMBER, FINAL READING

RECORD REMARKS ON BACK

old code sheet

II

OCEANOGRAPHY FORM 1 (REVISED FEBRUARY 1966)

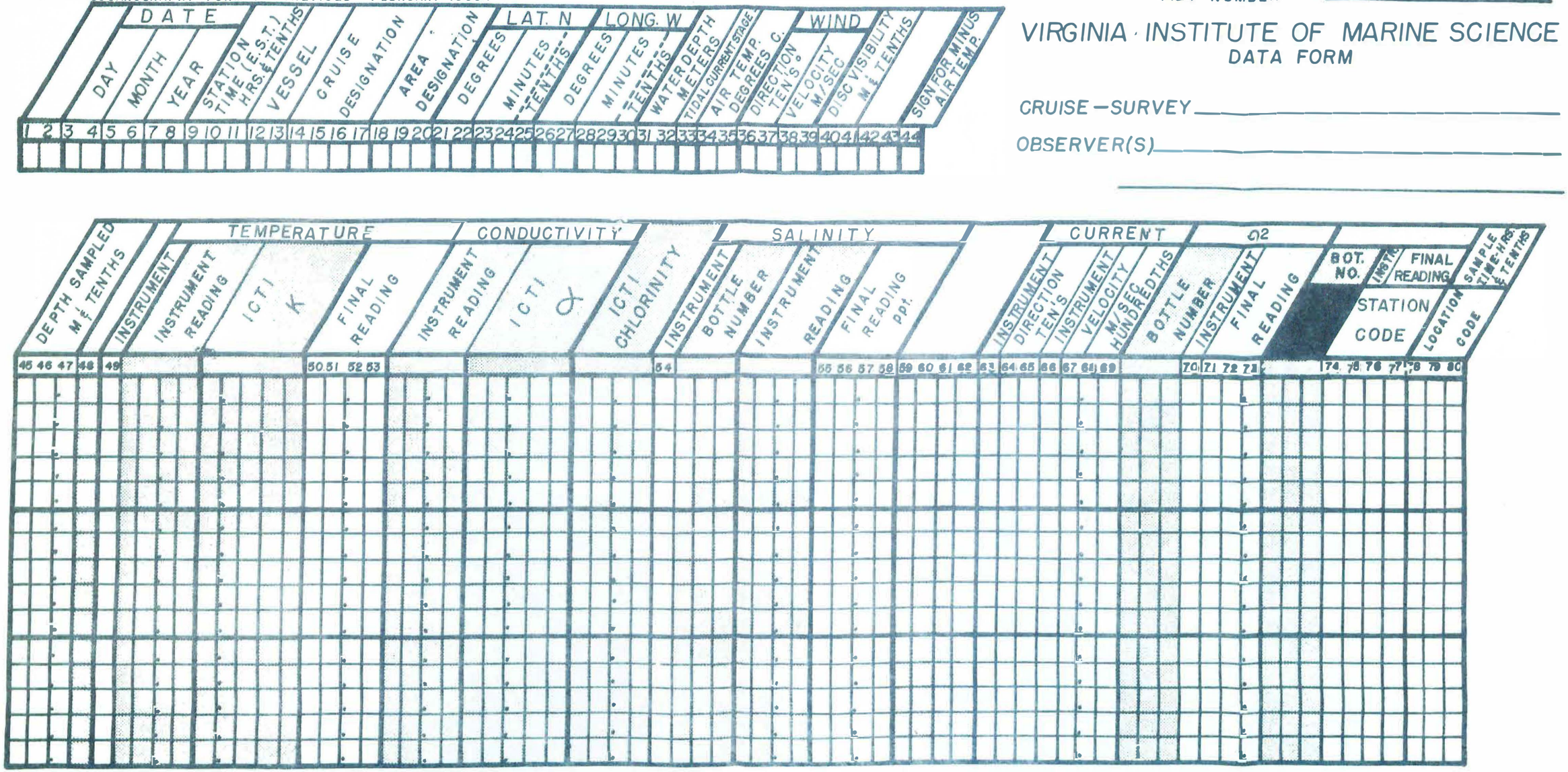
FILE NUMBER _____

VIRGINIA INSTITUTE OF MARINE SCIENCE
DATA FORM

CRUISE — SURVEY _____

OBSERVER(S) _____

_____



REMARKS:

Old Code Sheet

I. General Instructions

1. The Oceanography Form 1 has been designed to facilitate processing of Oceanographic data by means of IBM punch card and computer methods. It serves the dual purpose of providing a sheet for field notes and a form from which Oceanographic data may be entered on IBM cards.

2. The 1971 revision has increased the versatility of the Form 1 by providing for recording of chemical as well as physical characteristics of the water column. Provision has also been made for the recording of additional surface or atmospheric observations when desired. The Form 1 was originally designed for recording data from shallow water areas, and indeed this is its primary function, however, changes have been made which also allow it to be used in deep waters. Several changes have also been made which should eliminate the problems caused by reducing data in the field.

3. The Form 1 is divided into two major sections: the Header Section and the Hydrographic Section.

   a. The Header Section, located at the top of the form, is used for recording location and identification data, surface environmental data, and other data observed only once during a sampling period.

      This section contains a sub-section called the "Free Form Field". This field can be used for recording any data for which codes have been established. If you wish to record data which have not been given codes, codes will be assigned upon request. DO NOT make up your own codes, most of the valid codes are listed on the Form 1.

   b. The Hydrographic Section is used for recording information relevant to a particular depth in the water column. Data in this section are punched one card per line in columns 32 through 80. The first 31 columns are copied from the header card.

      Four major headings occur in this section: TEMPERATURE, SALINITY, CURRENT & OXYGEN. If any of these parameters are not observed, the spaces may be used for recording any valid parameter which has been assigned a parameter code. The three blank fields (cols. 63-80) may be used in a similar manner at any time.

      If there are an insufficient number of fields on one line to record all the observed parameters at one depth, then additional lines may be used as continuations as long as the sample depth is repeated on each continuation line.

4. A "one" or "two character" parameter code is used to identify the parameter observations recorded on the form. The single character parameter codes are used only in the "Free Form Field" of the Header Section. The "two character" parameter codes are used only in the Hydrographic Section of the form, and indicate the type of data recorded or the type of data and the instrument used. Each instrument should have its parameter code marked thereon. If an instrument does not have a parameter code on it or if a new instrument has been obtained, please contact Oceanography Computer Services for assignment of a code.

5. In order for observed field data to have any significant value there is certain fundamental information which must accompany the data. It is necessary to know in detail when and where the data were collected, therefore, it is required that the: DAY, MONTH, YEAR, TIME, LATITUDE, LONGITUDE, RIVER CODE and DEPTH of SAMPLE be recorded on the Form 1. It is also necessary to know what type of data have been observed and in certain instances, what instrument was used to obtain the data (parameter codes).

   If the above information is not recorded on the Form 1, the forms will be returned to the originator. It is requested that certain additional information be recorded. This information consists of: Cruise, Vessel, and Water Depth. It is not mandatory that this information be recorded.

6. There are several places on the Form 1 where codes or abbreviations are used; such as: River (location), Vessel, Tide, and parameter. These codes need not be entered in the space provided, but the information must be written in the margins, legibly and insufficient detail to allow for proper coding in the comfort and convenience of the office.

7. All columns for which NO data have been taken must be left blank.

8. Any remarks pertinent to the accuracy of the data (including instrument difficulties) should be indicated on Form 1. If there is insufficient room on the front of the sheet, use the back.

9. DO NOT write decimal points in the numbered columns. Decimal points are never punched on the IBM cards.

10. DO NOT write in Cols. 25-31. These areas are used for processing codes. The un-numbered columns are for recording such information as raw instrument readings or instrument readings not in Standard Units or bottle numbers.

11. All data recorded in the numbered squares are punched on IBM cards. These data must, however, be in Standard Units. The Standard Units for each datum type are given in the section "Specific Instructions" or in Tables 12 & 13.

12. DO NOT record latitude and longitude to the nearest tenth of a minute unless the position is known with this precision. When trawling or dredging it is quite possible that the position will change more than a tenth of a minute (about 600 feet). Under these conditions record the latitude and longitude to the nearest minute only.

SPECIFIC INSTRUCTIONS

HEADER SECTION Cols. (1-80 top of form)

DATE Cols. (1-6) (Required)
Enter the day of the month in (1-2) e.g., 01, 02, ..., 31.
Enter the month in (3-4) e.g., 01, 02, ..., 12.
Enter the last two digits of the year in (5-6), e.g., 71.

STATION TIME Cols. (7-9) (Required)
Enter the hour and tenths of an hour in EASTERN STANDARD TIME. Hours begin with 00 (midnight) and run through 23 (11 P.M.). There is no 24 hour. Determine tenths of hours from Table 2 or divide minutes by 6 and drop the fraction.

You may record time in hours and minutes in the block located under "Station Time" (not in the numbered squares). Please indicate A.M. or P.M. if not on the 24 hour scale. DO NOT convert from DST to EST, but indicate which time scale is used.

LATITUDE Cols. (10-14) and LONGITUDE Cols. (15-19) (Required)
Enter the degrees, minutes and tenths of minutes. DO NOT record tenths of minutes unless the position is known with this precision.

CRUISE DESIGNATION Cols. (20-24) (Optional)
If the originator wishes to assign his own cruise code, the first one or two characters should be the code for the department or other group responsible for taking the data (Ref. Table 3). Artificial cruise designations will be assigned by Oceanographic Computer Services where none are given by the originator.

CARD CODE Cols. (25-29)
Leave this field blank.

NUMBER OF CARDS Cols. (30-31)
Leave this field blank.

RIVER CODE Cols. (32-33) (Required)
Enter a two letter river code (Ref. Table 7a, b).

STATION/LOCATION CODE Cols. (34-38) (Optional)
These columns may be filled with any arbitrary identification code (numbers or letters) chosen by the originator, such as area designation, station number, etc.

VESSEL Cols. (39-40) (Optional)
Enter the two-letter code for the Vessel from which the data were collected. (Ref. Table 4)

Samples NOT taken from vessels, but from piers, platforms, buoys, or wading in the water are coded "FP".

DEPTH TO BOTTOM Cols. (41-44) (Optional)

Enter the depth of water at the sampling station to the nearest whole meter, e.g., a water depth of 8-1/2 meters would be coded 0009.

If the water depth was measured in units other than meters, this depth may be entered in the box below "Depth to Bottom" (Not in the numbered squares). Units of measurement must be indicated (feet, fathoms, etc.).

TIDE CODE Col. (45) (Optional)

Enter the estimated tidal current stage (Ref. Table 5). Alternatively, it is often of value to simply indicate whether the tide is flooding or ebbing or at high or low slack. (Alternate code, Table 5)

DISK VISIBILITY Cols. (46-47) (Optional)

Enter the depth of Secchi disk visibility to the nearest tenth of a meter.

WIND DIRECTION Cols. (48-49) (Optional)

Enter the direction FROM which the wind is blowing, in tens of degrees, e.g., East would be 09 (Ref. Table 6).
NOTE: If the wind is from the North, record it as 36, NOT 00. Direction is 00 only when wind speed is 00. In addition, the actual direction reading should be recorded in the box below "Wind Direction" in degrees or points (Not in the numbered squares). A direction of 99 (Variable) may be recorded, but wind speed must be recorded and must not be 0.

WIND SPEED Cols. (50-51) (Optional)

Enter the wind speed to the nearest whole meter per second, e.g., 04, 12, etc. an acceptable value for m/sec may be obtained by dividing knots by 2.

If the wind speed was measured in units other than m/sec, this speed may be entered in the box below "Wind Speed" (Not in the numbered squares). Units of measurement must be indicated (MPH, knots, etc.).

AIR TEMP. Cols. (52-55) (Optional)

Enter air temperature to the nearest tenth of a degree CELSIUS.

If temperature is measured in units other than degrees CELSIUS, then the temperature may be entered in the box below Air Temperature (Not in the numbered squares). Units of measurement must be indicated.

FREE FORM FIELDS Cols. (56-80) (Optional)

These columns are used for a variety of atmospheric and surface environmental data which are measured only once during a sampling period. (See below - "Entries for Free Form Fields")

Parameter codes and observed data may be recorded anywhere in these fields, provided the parameter code is immediately followed by the observed data (in Standard Units) or data code. (Ref. Table 13)

EXAMPLE:

60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
T	5	A	6	D	0	9	H	3	2	P	1	8	V	5	S	3	B	1	3	3

Where "T" is the parameter code for cloud type and the number which follows is the data code for nimbostratus;
"A" is the parameter code for cloud amount and the number which follows is the cloud cover in tenths;
"D" is the parameter code for wave direction and the number which follows is the direction in tens of degrees;
"H" is the parameter code for wave height and the number which follows is the wave height in meters and tenths; etc.

ENTRIES FOR FREE FORM FIELDS

WAVE DIRECTION (parameter code is D)

Enter the parameter code for wave direction followed by the direction FROM which the dominant waves are coming, in tens of degrees. (Ref. Table 6)
NOTE: If wave direction is from the North, record it as 36, NOT 00. Direction is 00 only when the sea surface is calm.

WAVE HEIGHT (parameter code is H)

Enter the parameter code for wave height followed by the approximate average wave height in meters and tenths. The average wave height (average vertical distance between trough and crest) is obtained from the larger well-formed waves.

If the sea is calm enter 00.

WAVE PERIOD (parameter code is P)

Enter the parameter code for wave period followed by the average period of the large well-formed waves in seconds. The wave period is the time of passage of two successive wave crests past a fixed point.

If the sea is calm enter 00.

CLOUD AMOUNT (parameter code is A)

Enter the parameter code for cloud amount followed by the estimated amount of sky obscured by cloud (in tenths).

EXAMPLE: clear sky enter 0; 1/10 overcast enter 1; 2/10 overcast enter 2; completely overcast enter 10.

CLOUD TYPE (parameter code is T)
Enter the parameter code for cloud type followed by the cloud type data code (Ref. Table 13a)

PRESENT WEATHER (parameter code is W)
Enter the parameter code for present weather followed by the weather data code (Ref. Table 13b)

VISIBILITY (parameter code is V)
Enter the parameter code for visibility followed by the visibility data code (Ref. Table 13c)

SEA STATE (parameter code is S)
Enter the parameter code for sea state followed by the sea state data code (Ref. Table 13d)

WATER COLOR (parameter code is C)
Enter the parameter code for water color followed by the water color data code (Ref. Table 13e)

BAROMETRIC PRESSURE (parameter code B)
Enter the parameter code for barometric pressure followed by the pressure in millibars. Only tens, units and tenths should be entered (Ref. Table 16a, b)

COLLECTION NUMBER (parameter code N)
Enter the parameter code for collection number followed by four digits.

WET BULB TEMPERATURE (parameter code G)
Enter the parameter code for wet bulb temperature followed by the temperature in tenths of degrees CELSIUS.

COMMENT (No parameter code)
Enter any pertinent comments in this field enclosed in parenthesis.

HYDROGRAPHIC SECTION Cols. (32-80 lower part of form)

DEPTH OF SAMPLE Cols. (32-35)

These columns indicate the depth from whence measurements were taken. Enter depth in meters and tenths. Sample depth may be less than the water depth (Cols. 41-44) or may exceed it by not more than 0.5 meters.

If the sample depth is measured in units other than meters, this depth must be entered in the margin to the left of "Depth of Sample". Units must be indicated.

SAMPLE TIME Cols. (36-38)

If it is desired to know the time of sampling at a given depth more accurately than is given by Station Time (Cols. 7-9), a time may be entered in these columns. This time must be in hours and tenths, EASTERN STANDARD TIME.

Alternately, the time in hours and minutes may be recorded in the box to the left of "Sample Time". Please indicate A.M. or P.M. if not on the 24 hour scale. Do not convert from DST to EST, but note which time scale is used.

TEMPERATURE Cols. (39-44)

PARAMETER CODE Cols. (39-40)

Enter a temperature parameter code (Ref. Table 9)

FINAL READING Cols. (41-44)

Enter the water temperature to the nearest hundredth of a degree CELSIUS.

If the temperature is not accurate to hundredths, record it in tenths and leave Col. 44 blank.

If instruments do not read directly in degrees CELSIUS, record the instrument reading in the space to the left of "Final Reading". Units must be indicated.

SALINITY Cols. (45-50)

PARAMETER CODE Cols. (45-46)

Enter a salinity parameter code (Ref. Table 10)

FINAL READING Cols. (47-50)

Enter the salinity to the nearest hundredth of a part per thousand. If the salinity is not accurate to hundredths, record it in tenths and leave Col. 50 blank.

If instruments do not read directly in parts per thousand or if a bottle sample was taken, record the instrument reading or bottle no. in the space to the left of "Final Reading". Units must be indicated if applicable.

CURRENT Cols. (51-57)

PARAMETER CODE Cols. (51-52)
Enter a current parameter code (Ref. Table 11)

DIRECTION Cols. (53-54)
Enter the direction TOWARD which the current is flowing to the nearest ten degrees, e.g., a direction of 25 degrees would be entered as 03 and a direction of 255 degrees would be 26 (Ref. Table 6)

In addition, please enter the actual direction reading in degrees or points in the space to the left of "Direction".

SPEED Cols. (55-57)
Enter current speed to the nearest hundredth of a meter per second. An acceptable value for meters per second may be obtained by dividing knots by 2.

If the current speed instrument does not read directly in m/sec, enter the reading in the space to the left of "Speed". Units must be indicated.

OXYGEN Cols. (58-62)

PARAMETER CODE Cols. (58-59)
Enter an oxygen parameter code (Ref. Table 12)

FINAL READING Cols. (60-62)
Enter the value for oxygen to the nearest tenth of a milligram per liter.

If a bottle sample was taken enter the bottle number to the left of "Final Reading".

REMAINDER OF FORM Cols. (63-80)
The Three Fields which remain may be used to record any chemical and many additional physical parameters.

In Table 12, there is a list of possible entries for these fields. This list is not restrictive and any additions may be made, and a code provided on request.

If Temperature, Salinity or Oxygen readings are not taken, then these fields may be used for recording parameters from Table 12.

If more than seven different parameters are measured at any depth, then these parameters may be recorded on successive lines. The sample depth must be repeated on each continuation line.

TABLE 2

CONVERSION FROM MINUTES TO TENTHS

Range of Minutes	Tenths of Hour
00 - 05	0
06 - 11	1
12 - 17	2
18 - 23	3
24 - 29	4
30 - 35	5
36 - 41	6
42 - 47	7
48 - 53	8
54 - 59	9

TABLE 3

DEPARTMENT AND OTHER GROUP CODES

GROUP	CODE
Applied Science Department	A
Crustaceology Department	C
Data Processing Department	D
Ecology-Pollution Department	E
Environmental Physiology	F
Ichthyology Department	I
Ichthyology-Crustaceology Joint Cruise	IC
Malacology Department	M
Oceanography Division	O
Physical Oceanography	OP
Chemical Oceanography	OC
Geological Oceanography	OG
Pathology-Microbiology Department	P
Student	S
Wachapreague	W

Table 4

VESSEL CODE DESIGNATIONS

Code	Vessel	LOA	Draft	Beam	Hull	Type
BN	Bernoulli	26'	2'	10'	Glass	Launch
BR	W. K. Brooks	30'	2'	8'	Wood	Launch
DR	DWR-2	38'	1'	10'	Steel	Houseboat
HO	Captain Hoxton	40'	1½'	8'	Wood	Launch
IN	Investigator	28'	2½'	8'	Wood	Launch
IV	Irma Virginia	65'	8'	12'	Wood	Trawler
JM	W. T. James Jr.	186'	10'	30'	Steel	Converted FS
LA	Langley	80'	5½'	32'	Steel	Ferry Boat
MB	Marbel	34'	3'	11½'	Wood	Launch
MA	USS Marmer	99'	12'	20'	Steel	
ML	Marmer Launch	18'	½'	6'	Wood	Launch
OB	Observer	27'	1½'	8'	Wood	Launch
PA	Pathfinder	55'	5½'	17'	Wood	Trawler
RR	Range Recoverer	186'	10'	30'	Steel	Converted FS
RE	Restless	36'	2'	8'	Wood	Launch
RY	Reynolds	23'	1½'	9'	Glass	Launch
SB	Sea Breeze	94'	9'	21'	Wood	Trawler
SQ	Sea Queen					
VA	Virginia (Second Heaven)	52'	10'	12½'	Wood	Yawl
VL	Virginia Lee	35'	2'	7'		Launch
WS	White Stone					

OTHER

FP	Fixed Position	SH	Second Heaven (obsolete)
PL	Any Airplane	TH	Any Thunderbird
SK	Any Institute Outboard Skiff	HC	Any Helicopter
TB	Any U.S. Army "T-Boat"	OPERATION KITE	
JB	Any U.S. Army "J-Boat"	LC	LCU ("Army Down")
CF	Marine Resources Commission Vessels	CU	LCU ("Army Up")
		LF	"Langley Forward"

TABLE 5

TIDAL CURRENT STAGE

Stage	Code	Alternate Code
Early flood	1	
Maximum flood	2	F
Late flood	3	
Slack before ebb	4	H
Early ebb	5	
Maximum ebb	6	E
Late ebb	7	
Slack before flood	8	L

TABLE 6

DIRECTION

Conversion of Points and Degrees to Tens of Degrees from which waves and/or winds are coming.

CODE	DEGREES	POINTS	CODE	DEGREES	POINTS
00	Calm(No Waves-No Motion)		19	185 - 194	S x W
01	005 - 014	N x E	20	195 - 204	SSW
02	015 - 024	NNE	21	205 - 214	SW x S
03	025 - 034	NE x N	22	215 - 224	SW
04	035 - 044	NE	23	225 - 234	
05	045 - 054		24	235 - 244	SW x W
06	055 - 064	NE x E	25	245 - 254	WSW
07	065 - 074	ENE	26	255 - 264	W x S
08	075 - 084	E x N	27	265 - 274	W
09	085 - 094	E	28	275 - 284	W x N
10	095 - 104	E x S	29	285 - 294	WNW
11	105 - 114	ESE	30	295 - 304	NW x W
12	115 - 124	SE x E	31	305 - 314	
13	125 - 134		32	315 - 324	NW
14	135 - 144	SE	33	325 - 334	NW x N
15	145 - 154	SE x S	34	335 - 344	NNW
16	155 - 164	SSE	35	345 - 354	N x W
17	165 - 174	S x E	36	355 - 004	N
18	175 - 184	S	99	Winds Variable or Waves Confused	

NOTE: This Table may be used for current direction, but remember: current direction is the direction TOWARD which the current is flowing; wind and wave direction is the direction FROM which wind or waves are coming.

TABLE 7a

CHESAPEAKE BAY SYSTEM
RIVER ABBREVIATIONS

MAJOR WESTERN DRAINAGE

	CHESAPEAKE			
	CU	Upper	C & GS Chart 77- N. of 38°05' N. Lat.	
	CL	Lower	C & GS Chart 78- S. of 38°05' N. Lat.	
			Latitude	Longitude of Mouth
JA	JAMES		36-59	76-20
	JE	Elizabeth	36-54	76-20
	JN	Nansemond	37-54	76-28
	JP	Pagan	37-01	76-34
	JW	Warwick	37-05	76-33
	JC	Chickahominy	37-15	76-53
	JX	Appomattox	37-19	77-17
MB	MOBJACK		37-18	76-20
	ME	East	37-22	76-21
	MN	North	37-22	76-23
	MW	Ware	37-22	76-15
	MS	Severn	37-19	76-24
PO	POTOMAC		38-00	76-20
	PS	St. Mary's	38-06	76-27
	PW	Wicomico	38-15	76-49
	PA	Anacostia	38-51	77-01
RA	RAPPAHANNOCK		37-36	76-17
	RC	Corrotoman	37-39	76-28
YK	YORK		37-15	76-23
	YP	Poropotank	37-26	76-42
	PM	Pamunkey	37-32	76-48
	MP	Mattaponi	37-32	76-47

MINOR WESTERN DRAINAGE

BK	Back River	37-07	76-18
PQ	Poquoson	37-10	76-23
PK	Piankatank	37-32	76-18
GW	Great Wicomico	37-48	76-18
PX	Patuxent	38-19	76-15

EASTERN DRAINAGE

CS	Chester	39-00	76-15
CT	Choptank	38-40	76-15
NC	Nanticoke	38-15	76-56
WC	Wicomico	38-15	76-52
MK	Manokin	38-07	75-52
BA	Big Annemessex	38-04	75-52
CP	Pocomoke Sound	37-50	75-52
TS	Tangier Sound	37-55	75-57
SH	Shelf		
AT	Atlantic		

TABLE 7b

RIVER ABBREVIATIONS

CODE	RIVER	LATITUDE	LONGITUDE
PA	Anacostia	38-51	77-01
JX	Appomattox	37-19	77-17
AT	Atlantic		
BK	Back River	27-07	76-18
BA	Big Annemessex	38-04	75-52
CL	Chesapeake Lower	38-05	
CU	Chesapeake Upper		
CS	Chester	39-00	76-15
JC	Chickahominy	37-15	76-53
CT	Choptank	38-40	76-15
RC	Corrotoman	37-39	76-28
ME	East (Mobjack)	37-22	76-21
JE	Elizabeth	36-54	76-20
GW	Great Wicomico	37-48	76-18
JA	James	36-59	76-20
MK	Manokin	38-07	75-52
MP	Mattaponi	37-32	76-47
MB	Mobjack	37-18	76-20
JN	Nansemond	37-54	76-28
NC	Nanticoke	38-15	75-56
MN	North (Mobjack)	37-22	76-23
JP	Pagan	37-01	76-34
PM	Pamunkey	37-32	76-48
PX	Patuxent	38-19	76-15
PK	Piankatank	37-32	76-18
CP	Pocomoke Sound	37-50	75-52
PQ	Poquoson	37-10	76-23
YP	Poropotank	37-26	76-42
PO	Potomac	38-00	76-20
RA	Rappahannock	37-36	76-17
MS	Severn (Mobjack)	37-19	76-24
SH	Shelf		
PS	St. Mary's	38-06	76-27
TS	Tangier Sound	37-55	75-57
MW	Ware (Mobjack)	37-22	76-15
JW	Warwick	37-05	76-33
WC	Wicomico	38-15	76-52
PW	Wicomico (Potomac)	38-15	76-49
YK	York	37-15	76-23
SH	Wachapreague		

Table 7C
River Codes

AT - Atlantic
BA - Big Annemessex
BK - Back River
CL - Chesapeake (Lower)
CP - Pocomoke Sound
CS - Chester
CT - Choptank
CU - Chesapeake (Upper)
GW - Great Wicomico
JA - James River
JC - Chickahominy
JE - Elizabeth
JN - Nansemond
JP - Pagan
JW - Warwick
JX - Appomattox
MB - Mobjack
ME - East
MK - Manokin
MN - North
MP - Mattiponi
MS - Severn
MW - Ware
NC - Nanticoke
PA - Anacostia
PK - Piankatank
PM - Pamunkey
PO - Potomac
PQ - Poquoson
PS - St. Mary's
PW - Wicomico
PX - Patuxent
RA - Rappahannock
RC - Corrotoman
SH - Shelf
TS - Tangier Sound
WC - Wachapreague
YK- York
YP - Poropotank

Table 9

TEMPERATURE CODES

INSTRUMENT	INVENTORY NO. or SERIAL NO.	PARAMETER CODE*
RS-5 Unit D	480	AD
" " E	792	AE
" " F		AF
"	I0007	AA
"		AB
"		AC

* Labeled on inside of lid.

Thermistor		BA
"		BB
"		BC
"		BD
"		BE
"		BF

* Labeled on side of cable drum.

XBT		CX

BT	H0006	CA
"	H0007	CB
"	H0458	CC
"	H0459	CD

* Labeled or etched on tail fin.

Reversing Thermometer	H0189	DA
" "	H0190	DB
" "	H0191	DC
" "	H0196	DD
" "	H0195	DE
" "	H0194	DF
" "	H0192	DG
" "	H0193	DH
" "	H0197	DI

* Labeled on glass case.

Table 9 (continued)

INSTRUMENT	INVENTORY NO. or SERIAL NO.	PARAMETER CODE*
ARA ET 100 M	I0149	EA
"	I0150	EB
"	I0151	EC
"	I0152	ED
"	I0153	EE
"	I0154	EF
* Labeled on face of dial.		
ICTI		FA
* Labeled on cable tub.		
Stem Thermometer		FB
Bathythermomonitor	I0006	FC
Infra-red Thermometer	I0014	FD
STD Unit 1	4987	GA
" " 2	4984	GB
" " 3	4989	GC
" " 4	4985	GD
" " 5	4991	GE
" " 6	4988	GF
* Labeled on sensor body.		

Table 10

SALINITY CODES

INSTRUMENT	INVENTORY NO. or SERIAL NO.	PARAMETER CODE*
RS-5 Unit D	480	JD
" " E	792	JE
" " F		JF
"	I0007	JA
"		JB
"		JC

* Labeled on inside of lid.

Hydrometer	H0130	KA
"	H0131	KB
"	H0132	KC

* Labeled on glass.

Refractometer	I0070	KJ

* Labeled on leather case.

Salinometer R 01-7	I0041	LA
" RQ 1	I0043	LB
"	I0139	LC
" RQ 1	I0147	LD
" RQ 1	I0160	LE

* Labeled on back lid with wiring instructions.

ICTI	MA

* Labeled on cable tub.

RS7a	MB
Titrated(A_gNO_3)	MC

STD Unit 1	4987	NA
" " 2	4984	NB
" " 3	4989	NC
" " 4	4985	ND
" " 5	4991	NE
" " 6	4988	NF

* Labeled on sensor body.

Table 11

CURRENT

INSTRUMENT	INVENTORY NO. or SERIAL NO.	PARAMETER CODE*
Current Meters		
Hydro-products		
Unit A	I0095	SA
" B	I0094	SB
" C	I0155	SC
" D	I0069	SD
" E	I0074	SE
" F	I0096	SF
Marine Advisors		
Unit G	I0097	SG
" H	I0082	SH
" I	I0083	SI
" J	I0084	SJ
Braincon Current Meters		
Unit A	I0161	TA
" B	I0162	TB
" C	I0163	TC
" D	I0164	TD
" E	I0165	TE
" F	I0168	TF
" G	I0169	TG
" H	I0171	TH
" I	I0172	TI
" J	I0173	TJ
" K	I0174	TK
" L	I0175	TL
" M	I0176	TM
" N	I0177	TN
" O	I0178	TO
" P	I0180	TP
" Q	I0181	TQ
" R	I0182	TR
" S	I0183	TS
" T	I0184	TT
" U	I0185	TU
" V	I9186	TV
" W	I0187	TW
" X	I0188	TX
" Y	I0189	TY
" Z	I0190	TZ
" AA	I0191	WA
" BB	I0192	WB
" CC	I0193	WC
" DD	I0194	WD
" EE	I0195	WE
" FF	I0196	WF
" GG	I0258	WG

* Labeled on inside lid of storage box or on meter body.

* Labeled on inside lid of storage box or on meter body.

Table 11 (continued)

INSTRUMENT	INVENTORY NO. or SERIAL NO.	PARAMETER CODE*
Braincon Current Meters continued		
Unit HH	I0259	WH
" II	I0260	WI
" JJ	I0261	WJ
" KK	I0262	WK
" LL	I0263	WL
" MM	I0264	WM
" NN	I0265	WN
" OO	I0266	WO
" PP	I0267	WP
" QQ	I0268	WQ
" RR	I0269	WR
" SS	I0270	WS
* All Braincon Meters are engraved at bottom of shaft.		
Richardson Current Meter(Geo-Dyne)		UA
* Labeled on body.		
Roberts Current Meter		UB
Pritchard Drag-small	H0171	VA
" " "	H0172	"
" " "	H0173	"
" " "	H0174	"
" " "	H0175	"
" " "	H0179	"
" " "	H0186	"
" " -large	H0176	VF
" " "	H0177	"
" " "	H0178	"
* Labeled on tail fin.		
Ducted Meter		VB
Price Current Meter		
Unit A		VC
" B		VE
Spar Float		VD

Table 12

WATER CHEMISTRY

PARAMETER	PARAMETER CODE	UNITS & PRECISION
Dissolved solids	1A	ppt
Dissolved CO_2	1C	ppm
H_2S	1D	ppm
Acidity	1E	meq/liter
Alkalinity	1F	meq/liter
Hardness	1G	ppm
Chlorides	1H	ppt
Sulfates	1I	ppm
Carbonates	1J	ppm
TRACE ELEMENTS		
Arsenic	2A	ppb
Barium	2B	ppb
Boron	2D	ppb
Cadmium	2E	ppb
Chromium	2G	ppb
Cobalt	2K	ppb
Copper	2C	ppb
Fluorine	2F	ppb
Iron	2I	ppb
Lead	2L	ppb
Manganese	2M	ppb
Mercury	2H	ppb
Nickel	2N	ppb
Potassium	2P	ppb
Sodium	2S	ppb
Tin	2T	ppb
Zinc	2Z	ppb
ORGANICS		
PESTICIDES		
DDT	3A	ppb
DDE	3B	ppb
DDD	3C	ppb
Dieldrin	3D	ppb
PCB'S		
1242	3J	ppb
1254	3K	ppb
BOD	3S	ppm
COD	3T	ppm
Chlorine demand	3U	
Cyanide	3V	ppm

TABLE 12 (Continued)

NUTRIENTS	PARAMETER CODE	UNITS & PRECISION
Soluble Reactive Phosphorus	4A	µg atoms/liter
Particulate Reactive Phosphorus	4B	µg atoms/liter
Soluble Unreactive Phosphorus	4C	µg atoms/liter
Particulate Unreactive Phosphorus	4D	µg atoms/liter
Total Reactive Phosphorus	4E	µg atoms/liter
Total Unreactive Phosphorus	4F	µg atoms/liter
Total Phosphorus	4G	µg atoms/liter
Soluble Organic Nitrogen	4J	µg atoms/liter
Particulate Organic Nitrogen	4K	µg atoms/liter
Ammonia Nitrogen	4L	µg atoms/liter
Nitrite Nitrogen	4M	µg atoms/liter
Nitrate Nitrogen	4N	µg atoms/liter
Total Organic Nitrogen	4O	µg atoms/liter
Total Inorganic Nitrogen	4P	µg atoms/liter
Total Nitrogen Nitrogen	4Q	µg atoms/liter
Dissolved Organic Carbon	4S	ppm
Particulate Organic Carbon	4T	ppm
Total Organic Carbon	4U	ppm
Algae DA-1	5A	#/liter
Algae DA-2	5B	#/liter
Algae DA-3	5C	#/liter
Algae DA-4	5D	#/liter
Algae DA-5	5E	#/liter
Algae DA-6	5F	#/liter
Chlorophyll "a"	5G	ppb
LOI	5H	%
DISSOLVED OXYGEN		
Titrated	6A	mg/liter & tenths
Sensor	6B	mg/liter & tenths
pH		
Meter	6J	Units & Tenths
Paper	6K	Units & Tenths
SUSPENDED SOLIDS		
Optical ratio	7A	mg/liter & tenths
Filtration	7B	mg/liter & tenths
Dye Concentration	7J	ppb

Table 13

FREE FORM PARAMETER CODES

PARAMETER	CODE	UNITS & PRECISION
Wave Direction	D	Tens of Degrees
Wave Height	H	Meters & Tenths
Wave Period	P	Seconds
Cloud Amount	A	Tenths overcast
Cloud Type	T	Codes (Table 13a)
Present Weather	W	Codes (Table 13b)
Visibility	V	Codes (Table 13c)
Sea State	S	Codes (Table 13d)
Water Color	C	Codes (Table 13e)
Barometric Pressure	B	Tens, units & tenths millibars
Collection Number	N	Four digit number
Wet Bulb Temperature	G	Degrees & Tenths Celsius
Comment		Enclosed in parenthesis

Table 13a

CLOUD TYPE (parameter code T)

Data Code	TYPE
0	Cirrus
1	Cirrocumulus
2	Cirrostratus
3	Altocumulus
4	Altostratus
5	Nimbostratus
6	Stratocumulus
7	Stratus
8	Cumulus
9	Cumulonimbus

Table 13b

PRESENT WEATHER (parameter code W)

Data Code	Condition
0	Clear (no cloud at any level)
1	Partly cloudy (scattered or broken)
2	Continuous layer(s) of cloud(s)
3	Sandstorm, duststorm, or blowing snow
4	Fog, thick dust or haze
5	Drizzle
6	Rain
7	Snow, or rain and snow mixed
8	Shower(s)
9	Thunderstorm(s)

TABLE 13c

VISIBILITY (parameter code V)

Data Code	
0	Less than 50 meters
1	50 - 200 meters
2	200 - 500 meters
3	500 - 1000 meters
4	1 - 2 kilometers (½ - 1 mile)
5	2 - 4 kilometers (1 - 2 miles)
6	4 - 10 kilometers (2 - 6 miles)
7	10 - 20 kilometers (6 - 12 miles)
8	20 - 50 kilometers (12 - 30 miles)
9	50 kilometers or more (30 miles or more)

TABLE 13d

SEA STATE (parameter code S)

Data Code	Description	Height (meters)
0	Calm-glassy	0
1	Calm-rippled	0 - 0.1
2	Smooth-wavelet	0.1 - 0.5
3	Slight	0.5 - 1.25
4	Moderate	1.25- 2.5
5	Rough	2.5 - 4
6	Very rough	4 - 6
7	High	6 - 9
8	Very high	9 - 14
9	Phenomenal	> 14

TABLE 13e

This table is under revision.

TABLE 14

Depth

Conversion from feet to meters (tenths)
(1 foot = 0.3048 meter)

Feet	0	1	2	3	4	5	6	7	8
00	0.0	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4
10	3.0	3.4	3.7	4.0	4.3	4.6	4.9	5.2	5.5
20	6.1	6.4	6.7	7.0	7.3	7.6	7.9	8.2	8.5
30	9.1	9.4	9.8	10.1	10.4	10.7	11.0	11.3	11.6
40	12.2	12.5	12.8	13.1	13.4	13.7	14.0	14.3	14.6
50	15.2	15.5	15.8	16.2	16.5	16.8	17.1	17.4	17.7
60	18.3	18.6	18.9	19.2	19.5	19.8	20.1	20.4	20.7
70	21.3	21.6	21.9	22.3	22.6	22.9	23.2	23.5	23.8
80	24.4	24.7	25.0	25.3	25.6	25.9	26.2	26.5	26.8
90	27.4	27.7	28.0	28.3	28.7	29.0	29.3	29.6	29.9
100	30.5	30.8	31.1	31.4	31.7	32.0	32.3	32.6	32.9
110	33.5	33.8	34.1	34.4	34.7	35.1	35.4	35.7	36.0
120	36.6	36.9	37.2	37.5	37.8	38.1	38.4	38.7	39.0
130	39.6	39.9	40.2	40.5	40.8	41.1	41.5	41.8	42.1
140	42.7	43.0	43.3	43.6	43.9	44.2	44.5	44.8	45.1
150	45.7	46.0	46.3	46.6	46.9	47.2	47.5	47.9	48.2
160	48.8	49.1	49.4	49.7	50.0	50.3	50.6	50.9	51.2
170	51.8	52.1	52.4	52.7	53.0	53.3	53.6	53.9	54.3
180	54.9	55.2	55.5	55.8	56.1	56.4	56.7	57.0	57.3
190	57.9	58.2	58.5	58.8	59.1	59.4	59.7	60.0	60.4
200	61.0	61.3	61.6	61.9	62.2	62.5	62.8	63.1	63.4
210	64.0	64.3	64.6	64.9	65.2	65.5	65.8	66.1	66.4
220	67.1	67.4	67.7	68.0	68 3	68.6	68.9	69.2	69.5
230	70.1	70.4	70.7	71.0	71.3	71.6	71.9	72.2	72.5
240	73.2	73.5	73.8	74.1	74.4	74.7	75.0	75.3	75.6
250	76.2	76.5	76.8	77.1	77.4	77.7	78.0	78.3	78.6
260	79.2	79.6	79.9	80.2	80.5	80.8	81.1	81.4	81.7
270	82.3	82.6	82.9	83.2	83.5	83.8	84.1	84.4	84.7
280	85.3	85.6	86.0	86.3	86.6	86.9	87.2	87.5	87.8
290	88.4	88.7	89.0	89.3	89.6	89.9	90.2	90.5	90.8

TABLE 14 (Cont'd)

Conversion from feet to meters (tenths)
(1 foot = 0.3048 meter)

Feet	00	10	20	30	40	50	60	70	80	90
300	91.4	94.5	97.5	100.6	103.6	106.7	109.7	112.8	115.8	118.9
400	121.9	125.0	128.0	131.1	134.1	137.2	140.2	143.3	146.3	149.4
500	152.4	155.4	158.5	161.5	164.6	167.6	170.7	173.7	176.8	179.8
600	182.9	185.9	189.0	192.0	195.1	198.1	201.2	204.2	207.3	210.3
700	213.4	216.4	219.5	222.5	225.6	228.6	231.6	234.7	237.7	240.8
800	243.8	246.9	249.9	253.0	256.0	259.1	262.1	265.2	268.2	271.3
900	274.3	277.4	280.4	283.5	286.5	289.6	292.6	295.7	298.7	301.8
1000	304.8	307.8	310.9	313.9	317.0	320.0	323.1	326.1	329.2	332.2
1100	335.3	338.3	341.4	344.4	347.5	350.5	353.6	356.6	359.7	362.7
1200	365.8	368.8	371.9	374.9	378.0	381.0	384.0	387.1	390.1	393.2
1300	396.2	399.3	402.3	405.3	408.4	411.5	414.5	417.6	420.6	423.7
1400	426.7	429.8	432.8	435.9	438.9	442.0	445.0	448.1	451.1	454.2
1500	457.2	460.2	563.3	466.3	469.4	472.4	475.5	478.5	481.6	484.6
1600	487.7	490.7	493.8	496.8	499.9	502.9	506.0	509.0	512.1	515.1
1700	518.2	521.2	524.3	527.3	530.4	533.4	536.4	539.5	542.5	545.6
1800	548.6	551.7	554.7	557.8	560.8	563.9	566.9	570.0	573.0	576.1
1900	579.1	582.2	585.2	588.3	591.3	594.4	597.4	600.5	603.5	606.6
2000	609.6	612.6	615.7	618.7	621.8	624.8	627.9	630.9	634.0	637.0
2100	640.1	643.1	646.2	649.2	652.3	655.3	658.4	661.4	664.5	667.5
2200	670.6	673.6	676.7	679.7	682.8	685.8	688.8	691.9	694.9	698.0
2300	701.0	704.1	707.1	710.2	713.2	716.3	719.3	722.4	725.4	728.5
2400	731.5	734.6	737.6	740.7	743.7	746.8	749.8	752.9	755.9	759.0
2500	762.0	765.0	768.1	771.1	774.2	777.2	780.3	783.3	786.4	789.4
2600	792.5	795.5	798.6	801.6	804.7	807.7	810.8	813.8	816.9	819.9
2700	823.0	826.0	829.1	832.1	835.2	838.2	841.2	844.3	847.3	850.4
2800	853.4	856.5	859.5	862.6	865.6	868.7	871.7	874.8	877.8	880.9
2900	883.9	887.0	890.0	893.1	896.1	899.2	902.2	905.3	908.3	911.4
3000	914.4	917.4	920.5	923.5	926.6	929.6	932.7	935.7	938.8	941.8
3100	944.9	947.9	951.0	954.0	957.1	960.1	963.2	966.2	969.3	972.3
3200	975.4	978.4	981.5	984.5	987.6	990.6	993.6	996.7	999.7	1002.8

TABLE 15

Depth

Conversion from fathoms to meters
(1 fathom = 1.8288 meters)

Fathoms	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
Meters	0	0	0	1	1	1	1	1	1	2
Fathoms	0	1	2	3	4	5	6	7	8	9
00	0000	0002	0004	0005	0007	0009	0011	0013	0015	0016
10	0018	0020	0022	0024	0026	0027	0029	0031	0033	0035
20	0037	0038	0040	0042	0044	0046	0048	0049	0051	0053
30	0055	0057	0059	0060	0062	0064	0066	0068	0069	0071
40	0073	0075	0077	0079	0080	0082	0084	0086	0088	0090
50	0091	0093	0095	0097	0099	0101	0102	0104	0106	0108
60	0110	0112	0113	0115	0117	0119	0121	0123	0124	0126
70	0128	0130	0132	0134	0135	0137	0139	0141	0143	0144
80	0146	0148	0150	0152	0154	0155	0157	0159	0161	0163
90	0165	0166	0168	0170	0172	0174	0176	0177	0179	0181
100	0183	0185	0187	0188	0190	0192	0194	0196	0198	0199
110	0201	0203	0205	0207	0208	0210	0212	0214	0216	0128
120	0219	0221	0223	0225	0227	0229	0230	0232	0234	0236
130	0238	0240	0241	0243	0245	0247	0249	0251	0252	0254
140	0256	0258	0260	0262	0263	0265	0267	0269	0271	0272
150	0274	0276	0278	0280	0282	0283	0285	0287	0289	0291
160	0293	0294	0296	0298	0300	0302	0304	0305	0307	0309
170	0311	0313	0315	0316	0318	0320	0322	0324	0326	0327
180	0329	0331	0333	0335	0336	0338	0340	0342	0344	0346
190	0347	0349	0351	0353	0355	0357	0358	0360	0362	0364
200	0366	0368	0369	0371	0373	0375	0377	0379	0380	0382
210	0384	0386	0388	0390	0391	0393	0395	0397	0399	0401
220	0402	0404	0406	0408	0410	0411	0413	0415	0417	0419
230	0421	0422	0424	0426	0428	0430	0432	0433	0435	0437
240	0439	0441	0443	0444	0446	0448	0450	0452	0454	0455
250	0457	0459	0461	0463	0465	0466	0468	0470	0472	0474
260	0475	0477	0479	0481	0483	0485	0486	0488	0490	0492
270	0494	0496	0497	0499	0501	0503	0505	0507	0508	0510
280	0512	0514	0516	0518	0519	0521	0523	0525	0527	0529
290	0530	0532	0534	0536	0538	0539	0541	0543	0545	0547

TABLE 15 (Cont'd)

Depth

Conversion from fathoms to meters
(1 fathom = 1.8288 meters)

Fathoms	00	10	20	30	40	50	60	70	80	90
300	0549	0567	0585	0604	0622	0640	0658	0677	0695	0713
400	0732	0750	0768	0786	0805	0823	0841	0860	0878	0896
500	0914	0933	0951	0969	0988	1006	1024	1042	1061	1079
600	1097	1116	1134	1152	1170	1189	1207	1225	1244	1262
700	1280	1298	1317	1335	1353	1372	1390	1408	1426	1445
800	1463	1481	1500	1518	1536	1554	1573	1591	1609	1628
900	1646	1664	1682	1701	1719	1737	1756	1774	1792	1811

Fathoms	000	100	200	300	400	500	600	700	800	900
1000	1829	2012	2195	2377	2560	2743	2926	3109	3292	3475
2000	3658	3840	4023	4206	4389	4572	4755	4938	5121	5304
3000	5486	5669	5852	6035	6218	6401	6584	6767	6949	7132
4000	7315	7498	7681	7864	8047	8230	8412	8595	8778	8961
5000	9144	9327	9510	9693	9876	10058	10241	10424	10607	10790

TABLE 16a

Atmospheric Pressure

Conversion from inches of mercury to millibars*
(1 inch of H_g = 33.8639 mbs)

Inches	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
27.9	44.8	45.1	45.5	45.8	46.2	46.5	46.8	47.2	47.5	47.9
28.0	48.2	48.5	48.9	49.2	49.5	49.9	50.2	50.6	50.9	51.2
28.1	51.6	51.9	52.3	52.6	52.9	53.3	53.6	53.9	54.3	54.6
28.2	55.0	55.3	55.6	56.0	56.3	56.7	57.0	57.3	57.7	58.0
28.3	58.3	58.7	59.0	59.4	59.7	60.0	60.4	60.7	61.1	61.4
28.4	61.7	62.1	62.4	62.8	63.1	63.4	63.8	64.1	64.4	64.8
28.5	65.1	65.5	65.8	66.1	66.5	66.8	67.2	67.5	67.8	68.2
28.6	68.5	68.8	69.2	69.5	69.9	70.2	70.5	70.9	71.2	71.6
28.7	71.9	72.2	72.6	72.9	73.2	73.6	73.9	74.3	74.6	74.9
28.8	75.3	75.6	76.0	76.3	76.6	77.0	77.3	77.7	78.0	78.3
28.9	78.7	79.0	79.3	79.7	80.0	80.4	80.7	81.0	81.4	81.7
29.0	82.1	82.4	82.7	83.1	83.4	83.7	84.1	84.4	84.8	85.1
29.1	85.4	85.8	86.1	86.5	86.8	87.1	87.5	87.8	88.1	88.5
29.2	88.8	89.2	89.5	89.8	90.2	90.5	90.9	91.2	91.5	91.9
29.3	92.2	92.6	92.9	93.2	93.6	93.9	94.2	94.6	94.9	95.3
29.4	95.6	95.9	96.3	96.6	97.0	97.3	97.6	98.0	98.3	98.6
29.5	99.0	99.3	99.7	00.0	00.3	00.7	01.0	01.4	01.7	02.0
29.6	02.4	02.7	03.0	03.4	03.7	04.1	04.4	04.7	05.1	05.4
29.7	05.8	06.1	06.4	06.8	07.1	07.5	07.8	08.1	08.5	08.8
29.8	09.1	09.5	09.8	10.2	10.5	10.8	11.2	11.5	11.9	12.2
29.9	12.5	12.9	13.2	13.5	13.9	14.2	14.6	14.9	15.2	15.6
30.0	15.9	16.3	16.6	16.9	17.3	17.6	17.9	18.3	18.6	19.0
30.1	19.3	19.6	20.0	20.3	20.7	21.0	21.3	21.7	22.0	22.4
30.2	22.7	23.0	23.4	23.7	24.0	24.4	24.7	25.1	25.4	25.7
30.3	26.1	26.4	26.8	27.1	27.4	27.8	28.1	28.4	28.8	29.1
30.4	29.5	29.8	30.1	30.5	30.8	31.2	31.5	31.8	32.2	32.5
30.5	32.8	33.2	33.5	33.9	34.2	34.5	34.9	35.2	35.6	35.9
30.6	36.2	36.6	36.9	37.3	37.6	37.9	38.3	38.6	38.9	39.3
30.7	39.6	40.0	40.3	40.6	41.0	41.3	41.7	42.0	42.3	42.7
30.8	43.0	43.3	43.7	44.0	44.4	44.7	45.0	45.4	45.7	46.1
30.9	46.4	46.7	47.1	47.4	47.7	48.1	48.4	48.8	49.1	49.4
31.0	49.8	50.1	50.5	50.8	51.1	51.5	51.8	52.2	52.5	52.8

*The hundreds and thousands digits are not recorded; the true range of this table is 944.8 - 1052.8 mbs.

TABLE 16b

Atmospheric Pressure

Conversion from millimeters of mercury to millibars*
(1 mm of Hg = 1.33322 mbs)

mm of Hg	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
708	43.9	44.1	44.2	44.3	44.5	44.6	44.7	44.9	45.0	45.1
709	45.3	45.4	45.5	45.7	45.8	45.9	46.1	46.2	46.3	46.5
710	46.6	46.7	46.9	47.0	47.1	47.3	47.4	47.5	47.7	47.8
711	47.9	48.1	48.2	48.3	48.5	48.6	48.7	48.9	49.0	49.1
712	49.3	49.4	49.5	49.7	49.8	49.9	50.1	50.2	50.3	50.5
713	50.6	50.7	50.9	51.0	51.1	51.3	51.4	51.5	51.7	51.8
714	51.9	52.1	52.2	52.3	52.5	52.6	52.7	52.9	53.0	53.1
715	53.3	53.4	53.5	53.7	53.8	53.9	54.1	54.2	54.3	54.5
716	54.6	54.7	54.9	55.0	55.1	55.3	55.4	55.5	55.7	55.8
717	55.9	56.1	56.2	56.3	56.5	56.6	56.7	56.9	57.0	57.1
718	57.3	57.4	57.5	57.7	57.8	57.9	58.1	58.2	58.3	58.5
719	58.6	58.7	58.9	59.0	59.1	59.3	59.4	59.5	59.7	59.8
720	59.9	60.1	60.2	60.3	60.5	60.6	60.7	60.9	61.0	61.1
721	61.3	61.4	61.5	61.7	61.8	61.9	62.1	62.2	62.3	62.5
722	62.6	62.7	62.9	63.0	63.1	63.3	63.4	63.5	63.7	63.8
723	63.9	64.1	64.2	64.3	64.5	64.6	64.7	64.9	65.0	65.1
724	65.3	65.4	65.5	65.7	65.8	65.9	66.1	66.2	66.3	66.5
725	66.6	66.7	66.9	67.0	67.1	67.3	67.4	67.5	67.7	67.8
726	67.9	68.1	68.2	68.3	68.5	68.6	68.7	68.9	69.0	69.1
727	69.3	69.4	69.5	69.7	69.8	69.9	70.1	70.2	70.3	70.5
728	70.6	70.7	70.9	71.0	71.1	71.3	71.4	71.5	71.7	71.8
729	71.9	72.1	72.2	72.3	72.5	72.6	72.7	72.9	73.0	73.1
730	73.3	73.4	73.5	73.7	73.8	73.9	74.1	74.2	74.3	74.5
731	74.6	74.7	74.9	75.0	75.1	75.3	75.4	75.5	75.7	75.8
732	75.9	76.1	76.2	76.3	76.5	76.6	76.7	76.9	77.0	77.1
733	77.3	77.4	77.5	77.7	77.8	77.9	78.1	78.2	78.3	78.5
734	78.6	78.7	78.9	79.0	79.1	79.3	79.4	79.5	79.7	79.8
735	79.9	80.1	80.2	80.3	80.5	80.6	80.7	80.9	81.0	81.1

*The hundreds digit is not recorded. The true range of this part of Table 20 is 943.9 mbs - 981.1 mbs.

TABLE 16b (Cont'd)

Atmospheric Pressure

Conversion from millimeters of mercury to millibars* (Cont'd)
(1 mm of Hg = 1.33322 mbs)

mm of Hg	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
736	81.3	81.4	81.5	81.7	81.8	81.9	82.1	82.2	82.3	82.5
737	82.6	82.7	82.9	83.0	83.1	83.3	83.4	83.5	83.7	83.8
738	83.9	84.1	84.2	84.3	84.5	84.6	84.7	84.9	85.0	85.1
739	85.3	85.4	85.5	85.7	85.8	85.9	86.1	86.2	86.3	86.5
740	86.6	86.7	86.9	87.0	87.1	87.3	87.4	87.5	87.7	87.8
741	87.9	88.1	88.2	88.3	88.5	88.6	88.7	88.9	89.0	89.1
742	89.3	89.4	89.5	89.7	89.8	89.9	90.1	90.2	90.3	90.5
743	90.6	90.7	90.9	91.0	91.1	91.3	91.4	91.5	91.7	91.8
744	91.9	92.1	92.2	92.3	92.5	92.6	92.7	92.9	93.0	93.1
745	93.3	93.4	93.5	93.7	93.8	93.9	94.1	94.2	94.3	94.5
746	94.6	94.7	94.9	95.0	95.1	95.3	95.4	95.5	95.7	95.8
747	95.9	96.1	96.2	96.3	96.5	96.6	96.7	96.9	97.0	97.1
748	97.3	97.4	97.5	97.7	97.8	97.9	98.1	98.2	98.3	98.5
749	98.6	98.7	98.9	99.0	99.1	99.3	99.4	99.5	99.7	99.8
750	99.9	00.1	00.2	00.3	00.5	00.6	00.7	00.9	01.0	01.1
751	01.3	01.4	01.5	01.7	01.8	01.9	02.1	02.2	02.3	02.5
752	02.6	02.7	02.9	03.0	03.1	03.3	03.4	03.5	03.7	03.8
753	03.9	04.1	04.2	04.3	04.5	04.6	04.7	04.9	05.0	05.1
754	05.3	05.4	05.5	05.7	05.8	05.9	06.1	06.2	06.3	06.5
755	06.6	06.7	06.9	07.0	07.1	07.3	07.4	07.5	07.7	07.8
756	07.9	08.1	08.2	08.3	08.5	08.6	08.7	08.9	09.0	09.1
757	09.3	09.4	09.5	09.7	09.8	09.9	10.1	10.2	10.3	10.5
758	10.6	10.7	10.9	11.0	11.1	11.3	11.4	11.5	11.7	11.8
759	11.9	12.1	12.2	12.3	12.5	12.6	12.7	12.9	13.0	13.1
760	13.3	13.4	13.5	13.7	13.8	13.9	14.1	14.2	14.3	14.5
761	14.6	14.7	14.9	15.0	15.1	15.3	15.4	15.5	15.7	15.8
762	15.9	16.1	16.2	16.3	16.4	16.6	16.7	16.8	17.0	17.1
763	17.2	17.4	17.5	17.6	17.8	17.9	18.0	18.2	18.3	18.4
764	18.6	18.7	18.8	19.0	19.1	19.2	19.4	19.5	19.6	19.8
765	19.9	20.0	20.2	20.3	20.4	20.6	20.7	20.8	21.0	21.1

*The hundreds and thousands digits are not recorded. The true range of this part of Table 20 is 981.3 mbs - 1021.1 mbs.

TABLE 16b(Cont'd)

Atmospheric Pressure

Conversion from millimeters of mercury to millibars* (Cont'd)
(1 mm of Hg = 1.33322 mbs)

mm of Hg	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
766	21.2	21.4	21.5	21.6	21.8	21.9	22.0	22.2	22.3	22.4
767	22.6	22.7	22.8	23.0	23.1	23.2	23.4	23.5	23.6	23.8
768	23.9	24.0	24.2	24.3	24.4	24.6	24.7	24.8	25.0	25.1
769	25.2	25.4	25.5	25.6	25.8	25.9	26.0	26.2	26.3	26.4
770	26.6	26.7	26.8	27.0	27.1	27.2	27.4	27.5	27.6	27.8
771	27.9	28.0	28.2	28.3	28.4	28.6	28.7	28.8	29.0	29.1
772	29.2	29.4	29.5	29.6	29.8	29.9	30.0	30.2	30.3	30.4
773	30.6	30.7	30.8	31.0	31.1	31.2	31.4	31.5	31.6	31.8
774	31.9	32.0	32.2	32.3	32.4	32.6	32.7	32.8	33.0	33.1
775	33.2	33.4	33.5	33.6	33.8	33.9	34.0	34.2	34.3	34.4
776	34.6	34.7	34.8	35.0	35.1	35.2	35.4	35.5	35.6	35.8
777	35.9	36.0	36.2	36.3	36.4	36.6	36.7	36.8	37.0	37.1
778	37.2	37.4	37.5	37.6	37.8	37.9	38.0	38.2	38.3	38.4
779	38.6	38.7	38.8	39.0	39.1	39.2	39.4	39.5	39.6	39.8
780	39.9	40.0	40.2	40.3	40.4	40.6	40.7	40.8	41.0	41.1
781	41.2	41.4	41.5	41.6	41.8	41.9	42.0	42.2	42.3	42.4
782	42.6	42.7	42.8	43.0	43.1	43.2	43.4	43.5	43.6	43.8
783	43.9	44.0	44.2	44.3	44.4	44.6	44.7	44.8	45.0	45.1
784	45.2	45.4	45.5	45.6	45.8	45.9	46.0	46.2	46.3	46.4
785	46.6	46.7	46.8	47.0	47.1	47.2	47.4	47.5	47.6	47.8
786	47.9	48.0	48.2	48.3	48.4	48.6	48.7	48.8	49.0	49.1
787	49.2	49.4	49.5	49.6	49.8	49.9	50.0	50.2	50.3	50.4

*The hundreds and thousands digits are not recorded. The true range of this part of Table 20 is 1021.2 mbs. - 1050.4 mbs.

APPENDIX A

INSTRUCTIONS FOR USING OCEANOGRAPHY FORM 1

The following are pages from a computer center copy of the original *Instructions for using Oceanography Form 1*, with annotations and additional parameter codes which may be needed for data interpretation.

Table 7C
River Codes

AS
AT - Atlantic
BA - Big Annemessex
BK - Back River
CL - Chesapeake (Lower)
CP - Pocomoke Sound
CS - Chester
CT - Choptank
CU - Chesapeake (Upper)
GW - Great Wicomico
JA - James River
JC - Chickahominy
JE - Elizabeth
JN - Nansemond
JP - Pagan
JW - Warwick
JX - Appomattox
MB - Mobjack
ME - East
MK - Manokin
MN - North
MP - Mattiponi
MS - Severn
MW - Ware
NC - Nanticoke
PA - Anacostia
PK - Piankatank
PM - Pamunkey
PO - Potomac
PQ - Poquoson
PS - St. Mary's
PW - Wicomico
PX - Patuxent
RA - Rappahannock
RC - Corrotoman
SH - Shelf & Wachapreague
TS - Tangier Sound
WC - ~~Wachapreague~~ Wicomico
YK - York
YP - Poropotank

PN - OCCEQUAN RIVER
CH - Hampton River Chuncatuque
LC -
~~LB~~

JH - Hampton River

MT - Metomkin Bay

Table 10

Header = SALN

SALINITY CODES

INSTRUMENT	INVENTORY NO. or SERIAL NO.	PARAMETER CODE*
RS-5 Unit D	480	JD
" " E	792	JE
" " F		JF
"	I0007	JA
"		JB
"		JC

* Labeled on inside of lid.

Hydrometer	H0130	KA
"	H0131	KB
"	H0132	KC

* Labeled on glass.

Refractometer	I0070	KJ

* Labeled on leather case.

Salinometer R 01-7	I0041	LA
" RQ 1	I0043	LB
"	I0139	LC
" RQ 1	I0147	LD
" RQ 1	I0160	LE

* Labeled on back lid with wiring instructions.

ICTI	MA

* Labeled on cable tub.

RS7a	MB
Titrated($AgNO_3$)	MC
Salinity converted from cond.	ME ← MF

Salinity Conversion

STD Unit 1	4987	NA
" " 2	4984	NB
" " 3	4989	NC
" " 4	4985	ND
" " 5	4991	NE
" " 6	4988	NF

* Labeled on sensor body.

NI ?

Table 11

CURRENT

INSTRUMENT	INVENTORY NO. or SERIAL NO.	PARAMETER CODE*
Current Meters		
Hydro-products		
Unit A	I0095	SA
" B	I0094	SB
" C	I0155	SC
" D	I0069	SD
" E	I0074	SE
" F	I0096	SF
Marine Advisors		
Unit G	I0097	SG
" H	I0082	SH
" I	I0083	SI
" J	I0084	SJ
DIRECTION INTERPOLATED		SK
VELOCITY "		
DIR & VEL "		
Braincon Current Meters		
Unit A	I0161	TA
" B	I0162	TB
" C	I0163	TC
" D	I0164	TD
" E	I0165	TE
" F	I0168	TF
" G	I0169	TG
" H	I0171	TH
" I	I0172	TI
" J	I0173	TJ
" K	I0174	TK
" L	I0175	TL
" M	I0176	TM
" N	I0177	TN
" O	I0178	TO
" P	I0180	TP
" Q	I0181	TQ
" R	I0182	TR
" S	I0183	TS
" T	I0184	TT
" U	I0185	TU
" V	I9186	TV
" W	I0187	TW
" X	I0188	TX
" Y	I0189	TY
" Z	I0190	TZ
" AA	I0191	WA
" BB	I0192	WB
" CC	I0193	WC
" DD	I0194	WD
" EE	I0195	WE
" FF	I0196	WF
" GG	I0258	WG

* Labeled on inside lid of storage box or on meter body.

* Labeled on inside lid of storage box or on meter body.

Table 11 (continued)

INSTRUMENT	INVENTORY NO. or SERIAL NO.	PARAMETER CODE*
Braincon Current Meters continued		
Unit HH	I0259	WH
" II	I0260	WI
" JJ	I0261	WJ
" KK	I0262	WK
" LL	I0263	WL
" MM	I0264	WM
" NN	I0265	WN
" OO	I0266	WO
" PP	I0267	WP
" QQ	I0268	WQ
" RR	I0269	WR
" SS	I0270	WS

*All Braincon Meters are engraved at bottom of shaft.

Richardson Current Meter(Geo-Dyne) * Labeled on body.		UA
Roberts Current Meter		UB
Pritchard Drag-small	H0171	VA
" " "	H0172	"
" " "	H0173	"
" " "	H0174	"
" " "	H0175	"
" " "	H0179	"
" " "	H0186	"
" " -large	H0176	VF
" " "	H0177	"
" " "	H0178	"
* Labeled on tail fin.		
Ducted Meter		VB
Price Current Meter		
Unit A		VC
" B		VE
Spar Float		VD

speed. flow VV E format. 9,99 F1 cu/ft

Table 12

Rev.(6/1/72)

WATER CHEMISTRY

Heads	PARAMETER	PARAMETER CODE	UNITS & PRECISION
DISOL	Dissolved solids	1A	ppt + hundredths
DCO2	Dissolved CO_2	1C	ppm + tenths
H2S	H_2S	1D	ppm + hundredths
H+	Acidity	1E	meq/liter
OH-	Alkalinity	1F	meq/liter + hundredths
HARD	Hardness	1G	ppm
CL-	Chlorides	1H	ppt + hundredths
SO4=	Sulfates	1I	ppm + hundredths
CO3=	Carbonates	1J	ppm + hundredths
	TRACE ELEMENTS		
AS	Arsenic	2A	ppb
BA	Barium	2B	ppb
B	Boron	2D	ppb
CD	Cadmium	2E	ppb
CR	Chromium	2G	ppb
CO	Cobalt	2K	ppb
CU	Copper	2C	ppb
F	Fluorine	2F	ppb
FE	Iron	2I	ppb
PB	Lead	2L	ppb
MN	Manganese	2M	ppb
HG	Mercury	2H	ppb
NI	Nickel	2N	ppb
K	Potassium	2P	ppb
NA	Sodium	2S	ppb
SN	Tin	2T	ppb
ZN	Zinc	2Z	ppb
	ORGANICS		
	PESTICIDES		
DDT	DDT	3A	ppb
DDE	DDE	3B	ppb
DDD	DDD	3C	ppb
DIELD	Dieldrin	3D	ppb
	PCB'S		
PCB	1242	3J	ppb
PCB	1254	3K	ppb
BOD	BOD	3S	ppm
COD	COD	3T	ppm
CLDEM	Chlorine demand	3U	
HCN	Cyanide	3V	ppm
	BOD-6	3N	ppm + hundredths
	BOD = BIOLOGICAL OXYGEN DEMAND	3P	ppm + hundredths
	BOD-5	3Q	ppm + hundredths
	BOD-5	3R	ppm + hundredths
	BOD-8	3O	ppm + hundredths
	BOD-9	3M	ppm + hundredths
	BOD-3		

Headers

TABLE 12 (Continued)

NUTRIENTS	PARAMETER CODE	UNITS & PRECISION
SRP Soluble Reactive Phosphorus	4A	µg atoms/liter & hundredths
PRP Particulate Reactive Phosphorus	4B	µg atoms/liter & hundredths
SUP Soluble Unreactive Phosphorus	4C	µg atoms/liter & hundredths
PUP Particulate Unreactive Phosphorus	4D	µg atoms/liter & hundredths
TRP Total Reactive Phosphorus	4E	µg atoms/liter & hundredths
TUP Total Unreactive Phosphorus	4F	µg atoms/liter & hundredths
TP Total Phosphorus	4G	µg atoms/liter & hundredths
SON Soluble Organic Nitrogen SON	4J	µg atoms/liter & hundredths
PON Particulate Organic Nitrogen	4K	µg atoms/liter & hundredths
NH4 Ammonia Nitrogen	4L	ppm µg atoms/liter & hundredths
NO2 Nitrite Nitrogen	4M	µg atoms/liter & hundredths
NO3 Nitrate Nitrogen	4N	µg atoms/liter & hundredths
TON Total Organic Nitrogen	4O	µg atoms/liter & hundredths
TIN Total Inorganic	4P	µg atoms/liter & hundredths
TN Total Nitrogen	4Q	µg atoms/liter & hundredths
TKN KJELDAHL Nitrogen-Unfiltered	4R	µg atoms/liter & hundredths ppm
SOC Soluble Organic Carbon	4S	ppm
POC Particulate Organic Carbon	4T	ppm
TOC Total Organic Carbon	4U	ppm
Algae DA-1 ALGE1	5A	Cells/liter
Algae DA-2 ALGE2	5B	Cells/liter
Algae DA-3 ALGE3	5C	Cells/liter
Algae DA-4 ALGE4	5D	Cells/liter
Algae DA-5 ALGE5	5E	Cells/liter
Algae DA-6 ALGE6	5F	Cells/liter
Chlorophyll "a" CPHYL	5G	ppb + hundredths
Loss on Ignition LOI	5H	percent
Chlorophyll "a" CPHYL	5I	mg/cubic meter & tenths
DISSOLVED OXYGEN		
Titrated O2	6A	mg/liter & tenths
YSI (Sensor) O2	6B	mg/liter & tenths
Weston & Stack D.O. Sensor O2	6C	mg/liter & tenths
pH		
Meter PH	6J	Units & tenths
Paper PH	6K	Units & tenths
SUSPENDED SOLIDS		
Optical ratio SSED	7A	mg/liter & tenths
Filtration SSED	7B	mg/liter & tenths
Filter Identification FILTR SSED	7C	
	7D	mg/liter
Dye Concentration DYE	7J	ppb + hundredths
RATIO	7L	LOG ~~SED~~ (TURBO) RATIO
~~FTU~~ TURBIDITY	7F	FTU + hundredths + tenths
	7G	JTU # whole no.

TABLE 12 (Continued)

Conductivity

From STD Readout	4987	8A	mmho/cm
Units COND	4984	8B	mmho/cm
COND	4989	8C	mmho/cm
	4985	8D	mmho/cm
	4991	8E	mmho/cm
	4988	8F	mmho/cm
	4915	8G	mmho/cm
	4916	8H	mmho/cm
	4917	8I	mmho/cm
	4918	8J	mmho/cm
	4920	8K	mmho/cm
	4921	8L	mmho/cm

+ hundredths

Bacteria

TC Total Coliform 0A most Probable No. MPN / 100 mL

FC Fecal Coliform 0B MPN / 100 mL

E notation

1.1 E ___

Table 13

FREE FORM PARAMETER CODES

PARAMETER	CODE	UNITS & PRECISION
Wave Direction	D	Tens of Degrees
Wave Height	H	Meters & Tenths
Wave Period	P	Seconds
Cloud Amount	A	Tenths overcast
Cloud Type	T	Codes (Table 13a)
Present Weather	W	Codes (Table 13b)
Visibility	V	Codes (Table 13c)
Sea State	S	Codes (Table 13d)
Water Color	C	Codes (Table 13e)
Barometric Pressure	B	Tens, units & tenths millibars
Collection Number	N	Four digit number
Wet Bulb Temperature	G	Degrees & Tenths Celsius
Comment		Enclosed in parenthesis