Deep Seabed Mining

Final Technical Guidance Document

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of Ocean Minerals and Energy
September 1981

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U.S. DEPARTMENT OF COMMERCE
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TECHNICAL GUIDANCE DOCUMENT

FOR ASSISTANCE IN ASSESSING THE ENVIRONMENTAL ASPECTS OF DEEP SEABED MINING EXPLORATION LICENSES

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1. INTRODUCTION

The Deep Seabed Hard Mineral Resources Act (P.L. 96-283, "The Act") authorizes the National Oceanic and Atmospheric Administration (NOAA), to issue licenses for exploration for manganese nodules from the deep ocean seabed beginning in the next few years, followed by commercial mining under NOAA permits to begin no earlier than 1988 and continuing indefinitely. The present area of interest is the Pacific Ocean (about 4,500 m or 15,000 ft deep) in a 13 million km^2 (3.8 million nmi^2) area of the equatorial high seas roughly between Central America and Hawaii. Four strategic metals (nickel, cobalt, manganese, and copper) will be produced by this new U.S. industry.

Environmental impacts from deep seabed mining occur in the water-column and on the seafloor. In the water column, one effect with potential for significant adverse impact involves effects on fish larvae. On the seafloor, organisms will be lost during the collection of nodules from the ocean floor. Neither of these impacts is expected to be significant during the exploration phase.

Over the past seven years, NOAA has studied the environmental impacts of deep seabed mining through the Deep Ocean Mining Environmental Study (DOMES) program. The DOMES work is summarized in NOAA's Programmatic Environmental Impact Statement (PEIS), which comprehensively assesses impacts expected from seabed mining operations using presently foreseeable technology. Congress directed NOAA to prepare a site specific EIS (as prescribed by the National Environmental Policy Act of 1969 and implementing directives) on the issuance of each license for exploration and each permit for commercial recovery.

This document supplements the NOAA PEIS and regulations (15 CFR Part 970, Deep Seabed Mining Regulations for Exploration Licenses) on deep seabed mining prepared to implement the Act. While the legal requirements for information to

be submitted to NOAA are set forth in the regulations or in license terms, conditions, and restrictions (TCR), this document is intended to provide more detailed technical guidance for use by applicants for licenses and by licensees. It is addressed primarily to the environmental specialists in the mining consortia who will be compiling information to submit to NOAA at the time of request for an exploration license, and later, so that NOAA can:

1) assess the environmental aspects of the exploration activities proposed in a license application and prepare a site-specific EIS for each license (§109(d) of the Act, 15 CFR 970.204), including possible supplements as exploration activities evolve, and develop appropriate TCR (§109(b) of the Act, 15 CFR 970.518 et seq.) needed to assure protection of the environment;
2) develop TCR, or plans, for each applicant, following review of plans prepared by industry to monitor environmental effects (§114(3) of the Act, 15 CFR 970.203(b) (7), 970.522, and 970.702), as well as monitor compliance with an NPDES permit from EPA (in the event that EPA does not issue a final general NPDES permit for license phase mining system tests) under the Clean Water Act (§109(e) of the Act, in order to assure that effects of mining tests are consistent with effects predicted in the site specific EIS and to assure the detection of any unanticipated significant adverse effects;
3) further refine estimates of the potential effects of commercial mining, based on system testing, in order to prepare environmentally sound regulations and guidance for commercial recovery under NOAA permit; and
4) relate the new data to the objectives of NOAA's "Deep Seabed Mining Marine Environmental Research Plan 1981-85" which will serve as a mechanism to synthesize findings on effects on benthic fauna,

improve plume dispersion models, and develop a data management system.

The document does not address data submissions during permit phase commercial recovery activities. Like the regulations, it is limited in scope to exploration activities. Prior to commercial mining, this document will be revised to encompass commercial mining. As PEIS estimates are compared to the results of test monitoring and research, the list of data needs during exploration also may be modified.

The guidance is based upon the sampling and test monitoring strategies of the DOMES project and the analyses in the PEIS. Although methods of measurement and sampling are not prescribed, the DOMES methods are included in Appendix 1 for ease of reference. Alternative methods judged by NOAA to be the equivalent or better than those used in DOMES will be acceptable and are encouraged. Documentation of comparability would be useful to NOAA.

Suggested formats for the submission of data are shown in Appendix 2. While the data are not legally required by NOAA to be in this format, to assure timely consideration by NOAA it will be in an applicant's or licensee's interest to provide data as suggested here (preferably on magnetic tape) to be used as input to NOAA's plume dispersion models. The document is geared to models and environmental analyses previously prepared by NOAA and discussed in the PEIS.

NOAA's plume dispersion models will be used as one basis to assess impacts for site-specific EISs. This includes predicting the volume of the mixing zone (NPDES Factor #1) within which certain unavoidable effects may occur, such as zooplankton mortality from the amount of sediment in suspension following discharge to the ocean surface; and to estimate roughly the volume of ocean within which impacts (unresolved concerns #2 and #3, page 4) might occur, as discussed in the PEIS. NOAA does not wish to imply that the existing models

of mining plumes are final results. They are instead the first results of attempts to describe mathemathically the mining particulate dispersion phenonoma like that observed during the 1978 mining tests (Lavelle and Ozturgut, 1981; Lavelle et al., 1980; and Lavelle et al., 1981). The models must evolve to incorporate what is learned during future research and monitoring especially of full scale mining system tests. NOAA welcomes industrial participation in the continuing refinement of this predictive capability. When and if future findings reveal these potential effects no longer to be concerns, model development can halt.

If an applicant submits information in a format that can be used in NOAA's models, or if the applicant runs the models and provides analyses of the data, NOAA can then prepare the required site-specific EIS in a manner that maximizes the benefits of assessments and conclusions previously prepared, and thus reduce the time necessary. The more complete and technically accurate the data, the greater the assurance of a technically and legally sufficient EIS and monitoring process. Data submitted in a format not readily consistent with that of Appendix 2 will be accepted, but the cumulative level of utility of the applicant's and NOAA's data will suffer. This would slow down and add greater uncertainty to the environmental review and licensing processes.

Section 2 of this document deals with information to be furnished in the license application on the proposed exploration area; section 3 deals with proposed test plans to be furnished in the license application. Environmental parameters to be measured relate mainly to the three unresolved concerns with potential for significant or adverse impacts (PEIS, p. 80): 1) collector contact that will cause destruction of benthos; 2) creation of a benthic plume that may blanket the benthos and dilute the food supply away from the collector; and 3) surface discharges that may affect fish larvae. Although currently judged probably not a concern with potentially significant or adverse impact,

additional measurements are addressed to the unresolved question of whether or not surface discharged particulates may collect in a layer at the pycnocline. The status of important concerns identified in the PEIS as having a low probability of significant impact also will be verified by NOAA by comparing the DOMES data base to the applicant's data.

NOAA encourages applicants to submit with exploration applications information on certain environmental characteristics of the proposed exploration area (discussed in section 2.3 below), including interpretations where relevant (e.g., general circulation of upper water column in the proposed site, depth of pycnocline), and on proposed mining system test and monitoring plans to the extent known. This information will be used by NOAA to prepare a site-specific EIS to cover the proposed activities taking place in the proposed exploration area, and TCR covering monitoring.

NOAA will need information with the application on location and boundaries (Section 2.1 below), plans for delineation of features of the exploration area (Section 2.2 below) including baseline data (Section 2.3 below) or plans for acquiring them, and (at least) preliminary plans for equipment testing and monitoring (Section 3 below). The applicant may at its option delay submission of baseline data as well as detailed equipment data and test and monitoring plans until at least 365 days prior to the initial test (15 CFR 970.204) to allow time for any required supplement to the site-specific EIS to be prepared by NOAA, circulated, reviewed by the public and other concerned parties, and filed with the EPA. These more detailed data also can form a basis as to how TCR on monitoring should be carried out for each system test. However, the submission of this information with the application is strongly encouraged to minimize the possibility that a supplement will be required.

In summary, three categories of information are needed with the application: location and boundaries (Section 2.1); delineation plans (Section 2.2), and

preliminary plans for testing and monitoring (Section 3). The additional information discussed in this document is desired with the application but may be submitted any time up to 365 days prior to the initial mining system test to be conducted under a NOAA license:

- ° selected environmental characteristics (Section 2.3);
- ° detailed proposed test plans (Sections 3.1, 3.2, and 3.3),
- ° further details on the proposed test monitoring plan,* including pre-test and post-test aspects (Section 3.4),
- ° detailed onshore processing tests in U.S. (Section 3.5); and
- ° detailed ocean disposal test plans (Section 3.6).

* Pursuant to the statute, and as implemented by Section 970.203(b)(7) of the regulations, at least a general description of monitoring plans must be included in an application, and requirements included as TCR at time of issuing a license.

2. PROPOSED EXPLORATION AREA

The environmental information which the regulations require to be submitted by an applicant may be included in the application and the exploration plan. If the material submitted is in accordance with the guidance below, it will be pertinent to the environmental impact concerns identified in the PEIS and to NPDES permit compliance monitoring requirements. It is not the intent of NOAA, however, to require a duplication of the DOMES Program. The information may be gathered as measurements of individual parameters or as observations, e.g., for the sighting of any endangered species in the exploration area. This will assist NOAA to resolve or verify the concerns and effects, addressed in the PEIS, both with and without the potential for significant or adverse impact. These data also should provide sufficient information to fulfill the NPDES requirement of describing the characteristics of the mining discharge; the physical, chemical and biological nature of the mixing zone; and the potential for the transport of any pollutant in the discharge. No baseline information is needed by NOAA if the proposed site coincides with one of the DOMES sites. The information submitted to NOAA should include the following elements:

2.1 Location and Boundaries of Applicant's Proposed License Site

2.2 Plans for Delineation of Features of the Exploration Area

Plans for the delineation of important features of the license area over the term of the license, with respect to types of equipment to be used and approximate frequency of use, would be useful to NOAA. This description can be submitted as part of the applicant's exploration plan. In particular, a description of the following types of equipment and activities is important because if they are used as discussed in the PEIS (pp. 255-258) the activities are judged to have no potential for significant environmental impact.

° Navigation and positioning -
Seafloor transponder emplacement

° Remote sensing -
Acoustic imaging, television, photography

° Seafloor sampling -
Drag dredging, core sampling, boomerang sampling, grab sampling, box coring, instrumentation emplacement for determining physical properties

° Subsystem testing -
Towing collector on a cable

2.3 Environmental Characteristics (baseline information for EIS)

Information desired by NOAA on the pre-testing environmental characteristics of the proposed exploration area is fairly modest in scope, as suggested by the relatively few parameters listed in Table 1. The information consists of selected characteristics of the upper water column and the seafloor and lower water column. These characteristics will provide a description of the affected environment (to augment the description in the PEIS, pp. 17-57) for site-specific EIS purposes and serve as a data base for measuring the environmental consequences associated with mining. Each parameter is discussed below in terms of the three main PEIS concerns with the potential for significant or adverse impact (PEIS, page 80), satisfaction of the National Pollutant Discharge Elimination System (NPDES) Permit requirements (Appendix 3; also PEIS, pp. 116-124), and the verification of the remaining PEIS concerns (PEIS, p. 80). The information will be unnecessary for NPDES purposes if EPA issues a final general permit for license phase mining system tests.

2.3.1 Upper Water Column

Characterization of the surface waters including seasonal changes should be adequate to allow detailed predictions of surface plume dispersion and consequent extrapolation to potential biological effects. Such effects are related to the composition as it may affect bioavailability and

Table 1 - Specific Environmental Parameters Relevant to Assessment of Deep Seabed Mining License Phase Activities

Affected Environment	Relevant Parameters	Applicable section in this document	
		Environmental Characteristics (For EIS) 2.3	Environmental Monitoring During Mining Test(s) 3.4
Upper Water Column (2.3.1 and 3.4.1)	Nutrients	2.3.1.1	3.4.1.1
	Endangered species	2.3.1.2	3.4.1.2
	Salinity, temperature, density	2.3.1.3	3.4.1.3
	Currents	2.3.1.4	
	Currents & Shear		3.4.1.4
	Vertical light		3.4.1.5
	SPM dispersion		3.4.1.6
	In-situ settling-velocity		3.4.1.7
	Zooplankton & Trace Metals		3.4.1.8
	Fish larvae		3.4.1.9
	Behaviour		3.4.1.10
Lower Water Column and Seafloor (2.3.2 and 3.4.2)	Currents	2.3.2.1	3.4.2.1
	SPM dispersion	2.3.2.2	3.4.2.2
	Benthos	2.3.2.3	
	Sediment	2.3.2.4	
	Topography	2.3.2.5	
	In-situ settling velocity		3.4.2.3
	Benthic impact & recovery		3.4.2.4
	Blanketing		3.4.2.5
	Mining Efficiency		3.4.2.6

the dispersion rate and pattern of the surface plume. Baseline and mining system data, as outlined below, will be used as inputs to NOAA's surface plume model to predict the fate in space and time of the surface discharge for site specific EIS preparation.

2.3.1.1 Nutrients

Certain nutrients (phosphates and nitrates) in the DOMES area upper water layer affect the marine food chain by controlling the abundance and species composition of the phytoplankton. The nutrient levels are therefore relevant to NPDES factor 3 (Appendix 3) because of the critical importance of the phytoplankton to the oceanic food chain and ecosystem. Nutrient concentrations will help verify the conclusion of low probability in the PEIS pertaining to the concern of a nutrient increase due to bottom water introduction causing a phytoplankton bloom (PEIS, p. 90) or species alteration in the surface plume (PEIS, p. 84).

2.3.1.2 Endangered species

Although ten threatened or endangered species of marine mammals and turtles recognized by Federal law could inhabit the DOMES area (PEIS, Appendix 8), there has only been one reported sighting of an endangered species in this area. This solitary sighting (in 1968) was of one yearling male monk seal in the vicinity of Johnston Island. This sighting occurred outside of the monk seal's normal range. Nevertheless, because of the possibility of threatened or endangered species occurring in the exploration/test mining area or along the ship transit route to and from port, it is suggested that observations be made to include the following: identification of the species; location of sighting; number of individuals; and numbers of adults, pups, males and females. This information is relevant to NPDES factor 3. Endangered species migration routes and habitats should be compared to routes of

ships to and from ports to determine whether any takings of the animals or destruction or modification of critical habitat would occur.

2.3.1.3 Salinity, temperature, density

Salinity and temperature values and their spatial and temporal variations are input for the determination of water mass characteristics, density, and the vertical stratification in the ocean, e.g., the location of the thermocline and pycnocline. The change in density due to temperature differences in the pycnocline is important to the surface plume model because of its effect on the settling rates of discharged particulates. The residence time of the particulates in the mixed layer affects the length of exposure of zooplankton to the abraded nodule fragments and bottom sediment. This has implications for one PEIS concern with unresolved significance: the effect of suspended particulate matter (SPM) on fish larvae (PEIS, pages 108-109). NPDES factors 1, 4, and 6 are also affected because of the potential for trace metal bioaccumulation and persistence, the effect of trace metals on human health, and the presence of fish spawning sites in the DOMES area. These parameters are also important for verifying the preliminary determination of no significance for SPM accumulation at the pycnocline (PEIS, page 91-92) and low probability of entry of trace metals into the food web via surface discharge (PEIS, pages 87-88).

2.3.1.4 Currents

The velocity and spatial and temporal variability in the upper layer currents directly affect the concentration, dispersion and settling of the surface plume. These values are important in the modeling of the surface plume. The residence time of the surface plume in the mixed layer controls the amount of exposure of zooplankton to the mining discharge. This relates to the PEIS concern of effect of the SPM on fish larvae (PEIS, pages 108-109). NPDES factors 1, 4, and 6 are also affected because of the

potential for trace metal bioaccumulation and persistence, the effect of trace metals on human health, and the presence of fish spawning sites in the DOMES area. These parameters are also important for verifying the preliminary determination of no significance for SPM accumulation at the pycnocline (PEIS, page 84) and low probability of entry of trace metals into the food web via surface discharge (PEIS, pages 87-88).

2.3.2 Lower water column and seafloor

This deals with the potential for benthic impact which is directly related to the contact of the collector with the seafloor and to the dispersion rate and pattern of the benthic plume. Baseline and mining system data will be used as inputs to NOAA's benthic plume dispersion model to predict the time and space fate of the benthic discharge for the site-specific EIS. This section parallels the format used in section 2.3.1.

2.3.2.1 Currents

The velocity and spatial and temporal variability in the bottom currents directly affect the concentration, dispersion and settling of the benthic plume. Bottom current measurements are input for the benthic plume model and for addressing the unresolved PEIS main concern of blanketing of the benthos and the dilution of their food supply away from the mine-site sub-area (PEIS, pages 103-108). The effect that the currents have on the transport of the benthic plume is relevant to NPDES factor 2.

2.3.2.2 Suspended particulate matter (SPM)

The concentration and the temporal and spatial variability of SPM concentration in the bottom water is important in tracking the dispersion pattern of the benthic plume and in establishing the natural range of variability of the SPM experienced by the benthic organisms. SPM values will help to resolve the PEIS main concern of the blanketing of the benthos and the dilution of their food supply away from the mine-site sub-area

(PEIS, pages 103-108). The effect of the resedimentation of the benthic plume on the composition and vulnerability of the biological community is relevant to NPDES factor 1.

2.3.2.3 Benthos

In order to predict the impact of mining on the benthos (both epifauna and infauna, macrofauna and meiofauna) it is necessary to know the species, spatial variability, species diversity, density, biomass, and the relation to topography of the organisms present. This information, obtained from box cores, photos, and videotape, plus existing information, will provide data to help determine the biological comparability of the proposed exploration site with DOMES sites, and will help to resolve the questions on the potential for repopulation and the significance of the benthos to the oceanic ecosystem. Data on the benthos are applicable to the main PEIS concerns of benthos mortality in the collector track (PEIS, pages 100-103) the blanketing of the benthos and their food supply (PEIS, pages 103-108) and NPDES factor 3.

2.3.2.4 Sediment

Particle density, shape, and size distribution of the sediment affects the dispersion pattern and settling rates of the benthic plume. Data on the sedimentology is input to the model and is applicable to the main PEIS concern of the blanketing of the benthos and their food supply (PEIS, pages 103-108) and NPDES factor 3.

2.3.2.5 Topography

Information on the topographic features of the entire license area will be used as input to the NOAA benthic plume model and for stable reference area purposes. The information relates to the main PEIS concern of blanketing of the benthos, the relation of the biota to topography, and their food supply (PEIS, pages 103-108) and NPDES factor 3.

3. PROPOSED EQUIPMENT TEST AND MONITORING PLANS

In addition to the information needs outlined in section 2, it is important for the applicant to provide with the application an early characterization of equipment tests and monitoring plans proposed to be conducted during the life of the applicant's exploration license, to be incorporated in the site-specific EIS. NOAA recognizes that details of the tests, which may range from mining demonstrations to ocean disposal of processing wastes generated during onshore processing of the test-mined nodules, are likely to be unique to the applicant. Therefore, details, including possible mitigation measures, can be proposed by the applicant, reviewed by NOAA on a case-by-case basis, and worked out with the applicant/licensee as activities evolve. Preliminary descriptions of tests and monitoring plans must be submitted to NOAA with the application; details must be submitted within one year before testing begins.

3.1 Mining System Characteristics

Each of the following characteristics of the system to be tested relates to collector contact and/or benthic discharge and/or surface discharge. The reason for NOAA's interest in certain characteristics of the mining system is twofold: first, to evaluate the degree to which the proposed system falls within the PEIS analysis of first generation technology so that NOAA can determine whether or not the PEIS need be supplemented. Any important differences can best be assessed if NOAA has an early awareness of them. Second, many of the characteristics serve either directly or indirectly as input to NOAA's plume models.

- Nodule collection technique (e.g., tines, blade, water jets)
- Depth of "cut" into sediment
- Running gear (skis, wheels, bearing plate)

- ° Seafloor sediment separation scheme (including height of discharge above seafloor)
- ° Seafloor nodule washing scheme (including height of discharge above seafloor)
- ° Nodule crushing plan
- ° Method(s) for pumping to surface
- ° Mine ship nodule/fines separation system
- ° Plans for retention of abraded nodule fines
- ° Average nodule recovery rate

3.2 Mining system tests

- ° Test site location and boundaries
- ° Test plans (e.g. mining pattern and velocity of collector)
- ° Transportation corridors to shore

3.3 Estimated characteristics of surface and benthic discharges

- ° Discharge point geometry
- ° Flow rate and variations with time
- ° Composition and density
- ° Discharge temperature
- ° Size distribution of particulates

3.4 Environmental monitoring during mining test(s)

The purpose of environmental monitoring during mining tests is to determine if effects are consistent with those predicted in the site-specific EIS and to insure the detection of any unanticipated significant adverse effects. Monitoring results will be used to determine compliance with TCR, and with general or individual NPDES Permits, to determine if they require change and to refine NOAA's plume models. The findings also will be useful to NOAA in the development of an initial framework for environmentally sound regulations for commercial mining.

Although this section deals with parameters measured during a test, NOAA recognizes that it might be prudent to begin certain measurements prior to test monitoring to insure that sensors are working and to aquire additional data on pre test environmental conditions.

Parameters are discussed in a fashion parallel to that of section 2.3.

3.4.1 Surface waters

3.4.1.1 Nutrients

(See section 2.3.1.1 for applicable text).

3.4.1.2 Endangered species

(See section 2.3.1.2 for applicable text).

3.4.1.3 Salinity, temperature, density

(See section 2.3.1.3 for applicable text).

3.4.1.4 Currents and direct current shear

Section 2.3.1.4 text is applicable here. In addition, knowledge of the variation with depth of the upper layer is important during test monitoring.

3.4.1.5 Vertical light

The vertical distribution of light directly affects the amount of primary productivity in the euphotic zone. Vertical light intensity profiles will show the effect of discharged particulates on light attenuation and spectral bands (photosynthetically active radiation - 400-700 nm, and blue light - 475 nm) over time, depth, and distance from the mining ship. These values will be used to confirm preliminary conclusions in the PEIS regarding concern of the accumulation of the SPM at the pycnocline (PEIS, page 91-92). They are also relevant to NPDES factor 3 because of the effect of light intensity on phytoplankton productivity and the importance of phytoplankton to the food chain and ecosystem.

3.4.1.6 SPM dispersion in the upper waters

Data on the dispersion of mining particulates will refine existing dispersion models to make accurate predictions of plume behavior and to assist in extrapolating from test-mining to commercial scale mining. The dispersion of the surface plume is relevant to the PEIS concern with unresolved impact: the effect of SPM on fish larvae (PEIS, pages 108-109). The dispersion of the plume also affects NPDES factors 1 and 2 because of the potential for trace metal bioaccumulation, persistence, or transport by biological, chemical, or physical processes. It is also relevant to the verification of the PEIS predictions about the following concerns: accumulation of SPM at the pycnocline (PEIS, pages 91-92); reduction in primary productivity (PEIS, pages 95-96); depletion of oxygen by bacteria growth (PEIS, pages 83-84); effects on fish (PEIS, pages 85-86); mortality of and changes in zooplankton species composition (PEIS, pages 86-87); effects on phytoplankton from trace metals (PEIS, pages 89-90); increased food supply of bacteria for zooplankton (PEIS, pages 93-94); cleaning up of the surface plume by filter-feeding zooplankton (PEIS, pages 94-95); and the entry of trace metals into the food web via surface discharge (PEIS, pages 87-88).

3.4.1.7 In-situ settling velocity

Knowledge of in-situ settling velocities for mining discharge particulates will help verify and improve the predictive capacity of the plume model for accurately predicting the dispersion of the surface plume. This information is relevant to a main PEIS concern: the effect of the plume on fish larvae (PEIS, pages 108-109). It is also relevant to NPDES factor 2 because of the potential for the transport of trace metals and SPM by biological,

physical, or chemical processes. Preliminary conclusions pertaining to the unresolved PEIS concern of SPM accumulation at the pycnocline (PEIS, pages 91-92) and the low probability concern of zooplankton mortality and species abundance changes (PEIS, pages 86-87) and the entry of trace metals into the food web via surface discharge (PEIS, pages 87-88) are also affected.

NOAA recognizes that there is no standard procedure for the accurate or consistent measurement of in-situ settling velocity. Nevertheless, methods are under development as noted on page 27 and NOAA and industry should keep apprised of them.

3.4.1.8 Zooplankton and trace metals

An analysis has been undertaken by NOAA to address the low probability concern of entry of trace metals into the food web via surface discharge (PEIS, pages 87-88). If this concern is not resolved before test mining, a combination of monitoring and shipboard and laboratory experimentation may be necessary to completly resolve the issue prior to commercial mining. This information is also applicable to NPDES factors 1, 2, 3 and 6. Sampling will also help to verify the PEIS low probability concern of zooplankton mortality or species abundance changes in the plume (PEIS, pages 86-87).

3.4.1.9 Fish larvae

Prior to field tests NOAA will also conduct a study on the potential effect of the surface plume on fish larvae. Should the issue be unresolved, information on the attraction of adult fish (such as tuna) and subsequent occurrence and health of the fish larvae in and out of the plume will help resolve the PEIS concern as to whether the physical and chemical characteristics of the plume have any adverse effect on the larvae (PEIS, pages 108-109). This information is also applicable to NPDES factors 3, 4, and 7.

3.4.1.10 Behavior of upper-water biota

Information on other effects of the plume on the upper-water biota can be gathered by observations for phenomena such as fish kills from air embolism in the area of the mining discharge zone (PEIS, page 91), or the surface plume acting as an attraction site for tuna (PEIS, pages 108-109). Of additional relevance is the effect of mine-ship-generated noise on whale and dolphin activities such as feeding behaviour and use of migration routes.

3.4.2 Lower water column and seafloor

3.4.2.1 Currents

(See section 2.3.2.1)

3.4.2.2 SPM

(See section 2.3.2.2)

3.4.2.3 In-situ settling velocity

Knowledge of in-situ settling velocities for the particulates in the benthic plume will help verify and improve the predictive capability of the benthic plume model for accurately predicting its dispersion rate and pattern. This information is important for the PEIS concern of the blanketing of the benthos and dilution of their food supply (PEIS, pages 103-108). It is also relevant to NPDES factor 3 because of the vulnerability of the biological community to the sediment blanketing. Section 3.4.1.7 comments on in-situ settling velocity also apply here.

3.4.2.4 Benthic impact and recovery

Information from box cores, photos, or videotape will assist in determining the impact on the benthos. The impact on the benthos is one of the PEIS main concerns (PEIS, pages 100-103) and it is clearly adverse; however, additional information will help to resolve the questions on the significance of the impact and assist in developing any appropriate mitigation strategies for commercial recovery operations. Information on the repopulation

of a test-mined area will help to determine the potential for the recovery of the benthic population from the effects of mining. Data should include samples in the immediate test area after mining, at selected distances away from the mined area to determine the effect of the benthic plume, and at selected times after mining.

3.4.2.5 Blanketing

Information on the thickness of the sediment blanket will help to determine the optimum mining pattern necessary to minimize the adverse effects of the dispersion and resulting deposition of the benthic plume (PEIS, pages 103-108).

3.4.2.6 Efficiency of mining pattern

Information on the efficiency of nodule recovery will help determine the optimum mining pattern to ensure the recovery of the highest percentage of the nodules present (PEIS, page 136), and its relationship to the effects on benthic organisms and their recovery. Information that will assist NOAA in this regard includes a record of the actual path of the collector during the test, a comparison of the nodule density in the test area to the nodule tonnage recovered, and information on benthic impact and blanketing as noted above.

3.5 Onshore Processing

It would be useful to NOAA if the applicant or licensee notifies NOAA as early as possible of process testing, at a pilot plant or demonstration scale plant in the U.S., for which other agency licenses or permits may be required (PEIS, pages 259-260). Such information should be included in the license application if at all possible. NOAA's role as informal facilitator with other agencies decisions and lead agency under NEPA would mean that NOAA would address the issue of onshore processing in the site-specific EIS required prior to the issuance of a license which could serve as NEPA compliance for other agencies' actions, such as EPA NPDES permits, Corps of Engineers dredge

and fill permits, and potentially many others. An early submission of such information would enable the applicant, NOAA and other Federal agencies to coordinate with relevant state and local units of government and affected and interested members of the public as efficiently as possible. NOAA will facilitate the issuance of these permits as appropriate within the circumstances of a particular case.

If any currently existing onshore facilities are to be significantly modified or operations significantly increased, or if new facilities are to be built for testing of refining processes, the applicant is encouraged to submit data to the extent possible which would assist NOAA in its role in license facilitation and as lead agency for EIS purposes. Information needs to assist in this function are listed below:

- The location and affected environment of port, transport, processing and waste disposal facilities (e.g., maps, aerial photos, land use and layout, process description);
- A brief description of the environmental consequences of construction and operation of the facilities; (e.g., effects on environmentally sensitive areas, significant cultural effects);
- Any mitigating measures that may be proposed; and,
- The status of compliance with any required Federal, State, or local permits, licenses, or coordination processes relating to protection of the environment. (e.g., see PEIS, pages 173-177).

If the information can not be furnished in the license application then it should be supplied by the applicant no later than one year prior to operations so that if a supplementary EIS is deemed necessary, NOAA can prepare it in a timely manner. Appropriate time should be programmed by the licensee in accordance with the degree of controversy or problems anticipated in licensing the processing facility through other units of government.

3.6 Ocean disposal

This subject area currently is receiving research attention by NOAA, EPA, the U.S. Department of the Interior's Bureau of Mines and Fish and Wildlife Service, and industry. Nevertheless, early notice on the part of an applicant or licensee of an intent to experiment with ocean disposal would be useful. If ocean dumping is proposed, an EPA permit would be required under the Marine Protection, Research, and Sanctuaries Act. The applicant would have to demonstrate that there would be no unreasonable degradation of the marine environment and that there are no reasonable alternative disposal choices if the material is hazardous or toxic.

Proposed nearshore ocean disposal by use of an outfall pipe would require an NPDES permit from EPA under the Clean Water Act. Wastes would have to meet the discharge criteria established by EPA for marine waters.

DOMES METHODS

APPENDIX 1

The methods of measurement and sampling described here are provided for ease of reference. Their inclusion does not necessarily imply NOAA endorsement as the state of art has advanced since the mid-1970's DOMES investigations. Alternative methods judged by NOAA to be the equivalent or better than those used in DOMES will be acceptable and are encouraged. Documentation of comparability would be useful to NOAA.

Suspended Particulate Matter (SPM)

SPM concentrations in the water column during the DOMES were investigated with an integrating nephelometer (described in Sternberg, R. W., Baker, E. T., McManus, D. A., Smith, S., and Morrison, D. R., (1974) An integrating nephelometer for measuring particle concentrations in the deep sea, (Deep-Sea Res. 21, 887-892), and with discrete samples collected concurrently with the nephelometer casts. The nephelometer consists of a flashing light source, a scattered light detector system, and necessary battery power mounted in a self-contained deep-sea housing. The nephelometer output is calibrated in terms of the mass concentration of particles.

During the DOMES, a discrete sample collection occurred concurrently with CTD-nephelometer rosette casts so that the SPM distributions could be related to the hydrography. Water samples were collected in 30-liter PVC sampling bottles and filtered through preweighed 0.4 um pore size Nuclepore filters. The filters were washed with three 10-ml aliquots of deionized, buffered (to pH 8), filtered water, dried in a desiccator, stored in plastic petri dishes, and returned to the laboratory. At the laboratory, the filters were reweighed on a seven-place electrobalance. (E. T. Baker, R. A. Feely and K. Takahashi, 1979, "Chemical composition, size distribution, and particulate morphology of suspended particulate matter at DOMES sites A, B, and C: Relationship with local sediment composition." In: Marine Geology and Oceanography of the Pacific Manganese Nodule Province, J. L. Bischoff and D. Z. Piper editors).

An average of seventeen nephelometer profiles were taken and one-hundred and eight water samples were analyzed for each station during baseline studies. During test mining, eight transects with nephelometer profiling were made across the surface plume and sixteen shallow CTD/nephelometer casts were made. Four nephelometers were moored on the seafloor and seventeen deep CTD/nephelometer casts were made near the seafloor on the periphery of the mine area.

Although nephelometers were widely used in the DOMES Program, both in the baseline and mining test monitoring investigations, for future observations the use of beam transmissometers is recommended. The beam transmissometers can operate at very low power consumption levels and unlike nephelometers, they are not affected by the daylight in the upper layer. An instrument package containing a beam transmissometer and a current meter, similar to that used by Karl, et al. (Karl, H. A., D. E. Drake, D. A. Cacchione, 1979, Variability of currents and sediment transport on continental shelves: optical and current meter studies of the bottom boundary layer, SPIE Vol. 208 Ocean Optics VI) but adopted for deep ocean use and DOMES concentration levels would be ideal for future deep ocean mining studies.

Vertical Distribution of Solar Radiation

During the DOMES the incoming solar radiation and the vertical distribution of solar radiation were measured with:

- quantum sensors with a visible bandpass filter and [Biggs, W. W., Edison, A. R., Eastin, J. D., Brown, K. W., Maranville, J. W., and Clegg, M. D. (1971) "Photosynthesis light sensor and meter" (Ecology 52, 125-131)]
- a blue-light sensor at 475 nm [Carpenter, D. J., Jitts, H. R. (1973) "A remote operating submarine irradiance meter" Deep Sea Res. 20, 859-865].

The DOMES baseline light penetration studies using the above sensors are given in Franceschini, G. A. (1979) ("The solar radiation environment in the Eastern tropical north Pacific Ocean" In: Marine Geology and Oceanography of the Pacific Manganese Nodule Province (J. L. Bischoff and D. Z. Piper editors). Four light penetration profiles were taken to a depth of 150 m at each station.

The measurement of vertical distribution of solar radiation during the monitoring of mining tests are given in Ozturgut, E., J. W. Lavelle J. W. and R. E. Burns, "Impacts of Manganese Nodule Mining on the Environment: Results from Pilot-scale Mining Tests in the North Equatorial Pacific," in press, Elsevier Oceanography Series, Vo. 27B, Chap. 15. Twelve light profiles to a depth of 90 m were obtained in ambient water and one profile was obtained in a one-hour old surface plume.

Nutrients

During the DOMES an autoanalyzer (Technicon II) equipment was used to determine the concentrations of nutrients. Phosphate ions were determined by the method of Murphy and Riley (Murphy, J., and J. P. Riley. 1962. A modified single solution method for the determination of phosphate in natural water. Analytica Chemica Acta 27: 31-36). Nitrate ions were determined by the method of Armstrong et al. (Armstrong, F. A. J., C. R. Stearns, and J. D. H. Strickland. 1967. The measurement of upwelling and subsequent biological processes by means of the autoanalyzer and associated equipment. Deep-Sea Res. 14: 381-389). Continuous vertical profiles of nutrients to 200 meters were obtained from the five to ten pump casts taken at DOMES sites A, B, and C. One pump cast was taken at each of the six additional stations on the transects north and south of sites A, B, and C. Niskin bottle samples were collected between the surface and 1000 meters at all stations. At DOMES sites A, B, and C, deep water Niskin samples were taken every 500 meters between 1500 meters and the bottom. During the mining tests, the shipboard discharge was sampled at random intervals (fifty samples during OMI test). Sampling of the surface plume was conducted with a pumping system at depths of 3, 8, 12, and 17 m during 8 transects across the plume. Vertical casts in the surface plume were taken with Niskin bottles every 20 m to 200 m depth during the OMI test and every 5 m to 85 m depth at 3 stations during the OMA test.

Bottom Currents

Moored arrays of vector averaging current meters were used during the DOMES program. Mooring, sampling frequency, data processing technique and other pertinent information are given in S. P. Hayes (1979) "The DOMES benthic currents"

In: Marine Geology and Oceanography of the Pacific Manganese Nodule Province (J. L. Bischoff and D. Z. Piper editors). One current meter array was moored for baseline studies at sites A, B, and C for six months duration. Four arrays with current meters were moored near the mine site prior to test mining.

Box Cores

A modified U.S. Naval Electronics Laboratory 0.25 m^2 box-corer, as described by Hessler and Jumars ("Abyssal community analysis from replicate box cores in the Central North Pacific" Deep Sea Res. 21, 185-209, 1974) was used in the DOMES. The details of lowering speed near the bottom and pinger attachment are also given in this reference. The number of box cores taken at each site during DOMES I baseline studies ranged from twenty to thirty-eight. During the mining test at Site A, twenty-five pre-test and twenty-eight post-test box cores were obtained.

Only relatively undisturbed box cores were retained for biological examination. As soon as the corer was back on deck, the overlying water was drained off and passed through a 300 um mesh screen. Some cores were subsampled for sediment analysis and future meiofaunal study. The area sampled by the core was reduced accordingly. The epifauna on the sediment and the nodules were removed and preserved in 10% buffered formalin and sea water. The top 20 cm. of sediment was transferred to a sediment washer with 300 um mesh sides. The sediment was then washed with sea water, while compressed air was bubbled through it, for approximately two hours. This process aided in suspending and removing the fine particles. This procedure was used in an attempt to recover the infauna but it also resulted in a 45% loss in polychaetes. The residuum was preserved in 10% buffered formalin and sea water. Further details of sampling, laboratory processing and statistical analyses techniques are given in Hecker and Paul (Hecker, B. and A. Z. Paul, 1979, "DOMES benthic fauna" In: Marine Geology and Oceanography of the Pacific Manganese Nodule Province [J. L. Bischoff and D. Z. Piper editors] and in Jumars, P. A. ("Limits in Predicting and Detecting Benthic Community Responses to Manganese Nodule Mining," in press, Marine Mining Vol. 4, Series 1 and 2 add.) and references therein.

Temperature, Salinity and Density

During the DOMES, the vertical profiles of temperature and conductivity were measured with a Plessey model 9040 Conductivity/Temperature/Depth (CTD) instrument and were recorded in digital format on a Plessey model 8114A Digital Data Logger. The time for a complete digitizer scan was 0.5 seconds. Data were not recorded during the ascent of the instrument. The CTD descent rate was approximately 30 m min^{-1} between the surface and 500 m depth and 45 m min^{-1} between depths of 500 m to 1000 m. Conductivity data were converted to salinity data using a subroutine obtained from the Woods Hole Oceanographic Institution. Field calibration of the CTD was made by comparing Niskin bottle temperatures and salinities with CTD temperatures and computed salinities. The processing of the recorded data and presentation of the 1-m averaged salinity, temperature and depth (pressure) measurements followed procedures and formats developed in previous reports (e.g., see Holbrook, J. R. and D. Halpern [1974] STD measurements off the Oregon coast, July/August 1973. CUEA/IDOE Data Rept. 12, Department of Oceanography, University of Washington, Seattle, 397 pp.).

Approximately seventy-five CTD casts were made in the upper 1000 m at each station on the three DOMES north south transects during baseline studies. During test mining, sixteen shallow CTD casts were taken before and during mining activity in the upper 200 m. Seventeen deep casts near the seafloor were made near the periphery of the mine area.

Surface Currents

NOAA does not believe that the surface moored current arrays used in DOMES are necessary for gathering information on the surface currents in the mining area. The applicant may propose alternate methods for measuring this parameter.

Current Shear Measurements

Direct measurements of current shear were not conducted in DOMES; however, the DOMES results indicated that current shear data is essential for modeling of mining plume dispersion and for understanding of the mixing mechanisms affecting the fate of mining plume.

Shear measurements are technically difficult and there are few commercially available units capable of making the measurements. Some possible measurement systems include the following:

- Current meter lowered on a wire. This is probably the most available type of instrument. Heave contamination could be a problem.

- Expendable current profiler. These units are manufactured by Sippican Corporation and are similar in design to an XBT. Their most serious limitation for this application is that the readings are unreliable in close proximity to a metal ship. In practice, the upper 20 m or more of the profile often cannot be used. (Sanford, T.B., R.G. Drever, and J. H. Dunlap (1978): A Velocity Profiler Based on the Principles of Geomagnetic Induction, Deep-Sea Research, 25:183:210).

- Acoustic profiling current meter. This system uses a modified Doppler navigation sonar which is normally used as a precision speed log. AMETEK of Straza manufactures such a system which gives a 100-meter current profile with 3-meter resolution depth. If the ship's velocity over the bottom is accurately known, then the absolute current velocity profile can also be obtained by this method. (F. D. Rowe and J. W. Young, 1979, "An Ocean Current Profiler using Doppler Sonar," Offshore Technology Conference Proceedings.)

- Specialized instrumentation. Most of the shear measurements that have been reported in the literature have been made with specialized instumentation. One such system is SCIMP of Woods Hole Oceanographic Institution, which is a free-sinking instrument that measures the two normal channels of horizontal velocity as it slowly sinks. This system is capable of resolving shears with scales between tens of meters and tens of centimeters. (Williams, A. J., III [1974]: Free-sinking temperature and salinity profiler for ocean microstructure studies. Oceans '74 IEEE Intl. Conf. on Engineering in the Ocean Environment, 2, IEEE, 345 East 79th St., New York, N.Y., 279-283.).

Assessment of in-situ Settling Velocity of Mining Particulates

Accurate settling velocity is essential for accurate plume dispersion predictions. During the monitoring of pilot scale mining tests, a mean effective settling velocity of the mining particulates were inferred from nephelometer profiles taken in the surface plume (R. E. Burns, B. Erickson, J. W. Lavelle and E. Ozturgut, "Observations and Measurements during the Monitoring of Deep Ocean Manganese Nodule Mining Tests in the North Pacific, March-May 1978," NOAA Technical Memorandum ERL MESA-47, April 1980).

Direct methods of measuring in situ settling distributions for suspended particulates are under development through the NAVY-funded High Energy Benthic Boundary Layer Experiment (HEBBLE) (P. Jumars, Office of Naval Research, personal communication).

APPENDIX 2 National Oceanographic Data Center Formats

Data submitted to the National Oceanographic Data Center for archival must meet minimum data format requirements. The information needed to meet these submission requirements is included in the accompanying documents:

1. Minimum Data Format Requirements for archival - Pages 29-34
2. Data Documentation Form - Pages 35-45
3. Report of Observations/Samples Collected by Oceanographic Programs (ROSCOP) - Pages 47-54
4. File type parameter formats

The National Oceanographic Data Center does not presently have a file type format for each parameter that is relevant to NOAA's site-specific EIS information needs. The file type formats that are available are included here. It should be noted that many of the data records within each format are not pertinent to NOAA's information needs. Therefore only those records that are pertinent to the data collected should be completed.

MINIMUM DATA FORMAT REQUIREMENTS FOR ARCHIVAL

INTRODUCTION

Magnetic tape is the standard medium for submission of Project data to the Environmental Data and Information Service for archival. The organization of the data sets on the tape shall meet minimum Project format requirements. Standard formats meeting these requirements are developed jointly by the Project Data Manager and the Principal Investigators for each type of data. EDIS/NODC assigns to each format a "file type" designator which shall be used for submission of all data of the same type. Any additions to standardized formats shall be discussed with the Project Data Manager prior to approval for use.

GENERAL FORMAT FOR MAGNETIC TAPES

- Each magnetic tape shall contain only one file.
- Records shall be blocked with a maximum block size of 4500 characters.
- All blocks shall be the same size, with the last block blank-filled to standard block size.
- Each block shall be composed of a series of logical records, all of which shall be the same size.
- Only one EOF may be on the tape, and this shall be placed at the end of the data.

LOGICAL RECORD TYPES

Data files submitted for archival are composed of three basic record types:

- A File Header is a record type used to report information common to all data on that particular file (e.g. cruise dates). If a station header (see below) contains adequate information to describe the type of data, a particular standardized format need not use a file header record.
- A Station Header is a record type used to report information common to the station or sample (e.g. sea conditions, weather, etc.) Two or more different station header record types may be used to describe a station if logical record length does not allow adequate space within a single station header.

- A Data Record is a record type used to report data associated with the previous station header. If many variables are to be listed, two or more data record types may be employed within a standardized format.

Several possibilities for combination of the above-mentioned record types within a format exist; but once a format is approved and given a file type designator, only that combination may be employed for all submissions of that file type. Within an approved format, record types (or parts of record types) may be optional as indicated within the format description.

LOGICAL RECORD COMPOSITION

The first ten bytes of each logical record shall contain identical information: file type, file identifier, and record type. The arrangement within the remainder of each logical record shall be coordinated between the Project Data Manager and each Principal Investigator; and once standardized within an approved format, the arrangement shall remain constant. The following information shall be contained within each data file:

- File Type: NODC assigns a unique file type for each approved format.

  Length: 3 bytes

  Location: bytes 1 - 3

  Contents: 3 numerals. (Leading zeros are required. No blanks or letters)

  Example: 019

  Record Types: all (file header, station header, and data record).

- File Identifier: A unique file identifier establishes commonality throughout a data file and distinguishes that file from all other submissions of similar file types. Recommended file identifiers are cruise numbers or tape creation dates.

  Length: 6 bytes

  Location: bytes 4 - 9

  Contents: any alphanumeric characters

  Example: MESA-1 or PS5601

  Record Types: all

- Record Type: Each logical record shall be identified as to whether it is a file header, station header, or data record. Typically, within a standardized format the file header will be assigned "1", the station header "2", and the data record "3". Variations exist, however, such as in the case where there is no file header, but more than one station header and data record. (Example: where two station header types and two data record types exist, the station headers possibly would be numbered "1" and "2" and the data records "3" and "4".)

  Length: 1 byte

  Location: byte 10

  Contents: any alphanumeric characters

  Example: 1

  Record Types: all

- Station (or Sample) Number: This number uniquely identifies stations within a file. "Station" can be defined as one or more observations at a particular geographic location, or between geographic locations. The data originator shall decide the logical grouping of data into stations. If the data originator generally does not designate station numbers, then sequential sample or station numbers which differentiate between one station and another shall be used.

  Length: as required

  Location: anywhere in the logical record

  Contents: any alphanumerics, right justified

  Example: 41B75

  Record Types: station header and data record

- Sequence Number: This element enables EDIS to reconstruct the order of the data records during retrieval and within processing. The sequence number is required in either the data records or the data records plus station header records. The sequence number permits investigators to order their records within a station or any other desired scheme. The sequence number is required in the data record whenever ordering of the data records is required.

Length: any set length, large enough to accomodate the largest data set conceivable

Location: anywhere in the logical record

Contents: numerals, starting with 1, right justified

Record Types: as required

o Geographic Position:

Length: latitude: 7 characters, and
longitude: 8 characters

Location: anywhere in the logical record

Contents: degrees-minutes-seconds (or hundredths of minutes), and the hemisphere (N, S, E, or W)

Example: 423556N

Record Types: station header

o Date-Time Group: All time shall be recorded in GMT.

Length: 10 bytes (12 if time resolution is needed to seconds)

Location: anywhere in the logical record

Contents: year-month-day-hour-minute (seconds or hundredths of minutes, if necessary)

Example: 751231140000

Record Types: station header (and data record for time-series data)

ADDITIONAL NOTES

With the exception of the file type field, all fields may be either zero or blank prefixed at the discretion of the processor. The file type field, however, must contain leading zeros. For fields which might contain a negative indicator, blanks cannot be employed to the right of that indicator.

All decimal points shall be implied rather than physically included.

When any information is not available, these bytes shall be blank filled.

SAMPLE DATA FILE

A sample record is shown below. The block length was chosen as 50 logical records. With a logical record length of 60 characters, the block length is within the 4500 character limit.

Block 1	Block 2	Block N (last)
file header	data record 49	data record 82
station header 1	. . .	. . .
data record 1	data record 75	data record 92
. . .	station header 2	blank filled as required
. . .	data record 1	
data record 48	. . .	. . .
	data record 22	. . .

50 logical records

AVOIDING SOME COMMON DIGITAL DATA SUBMISSION PROBLEMS

For data submissions such as current meter, pressure and wind gauge measurements, each meter location and measurement depth should be submitted with a unique file identifier. (Problems both in inventories and in data retrieval may occur if current meter data are submitted with a single file identifier for meters located in different areas and for a series of depths.)

Each station number should be unique within a file identifier. To indicate repeated occupations of a station, it is suggested that a scheme employed by several investigators might be used; that is, the station number is preceded by some other letter or number for repeated visits (A20, B20, C20, etc., or 1-14, 2-14, 3-14, etc.). (Problems with data validation, correct inventories, and data retrievals may occur when duplicate station numbers occur within a file identifier.)

Blanks should be employed for any parameter not measured, whereas zeros should be included where legitimate numerical values are expected, such as time (0430) or geographical position (473020N).

Where precision is being reported at less than that specified in the format, the reported precision should be annotated in the format portion of the DDF to allow for proper checking during data processing.

For taxonomic codes, blanks should be used for those levels that cannot be identified (e.g., 921802------). Also, noting on the DDF the version of the taxonomic code being submitted is most helpful, since the use of the Alaskan codes is being phased out and all data eventually will be converted to the newer NODC taxonomic codes by NODC.

	ACCESSION NUMBER

DATA DOCUMENTATION FORM

NOAA FORM 24-13
(4-72)

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEANOGRAPHIC DATA CENTER
RECORDS SECTION
ROCKVILLE, MARYLAND 20852

FORM APPROVED
O.M.B. No. 41-R2651

This form should accompany all data submissions to NODC. Section A, Originator Identification, must be completed when the data are submitted. It is highly desirable for NODC to also receive the remaining pertinent information at that time. This may be most easily accomplished by attaching reports, publications, or manuscripts which are readily available describing data collection, analysis, and format specifics. Readable, handwritten submissions are acceptable in all cases. All data shipments should be sent to the above address.

A. ORIGINATOR IDENTIFICATION

THIS SECTION MUST BE COMPLETED BY DONOR FOR ALL DATA TRANSMITTALS

1. NAME AND ADDRESS OF INSTITUTION, LABORATORY, OR ACTIVITY WITH WHICH SUBMITTED DATA ARE ASSOCIATED

2. EXPEDITION, PROJECT, OR PROGRAM DURING WHICH DATA WERE COLLECTED

3. CRUISE NUMBER(S) USED BY ORIGINATOR TO IDENTIFY DATA IN THIS SHIPMENT

4. PLATFORM NAME(S)	5. PLATFORM TYPE(S) *(E.G., SHIP, BUOY, ETC.)*	6. PLATFORM AND OPERATOR NATIONALITY(IES)		7. DATES	
		PLATFORM	OPERATOR	FROM: MO/DAY/YR	TO: MO/DAY/YR

8. ARE DATA PROPRIETARY?

☐ NO ☐ YES

IF YES, WHEN CAN THEY BE RELEASED FOR GENERAL USE? YEAR____ MONTH____

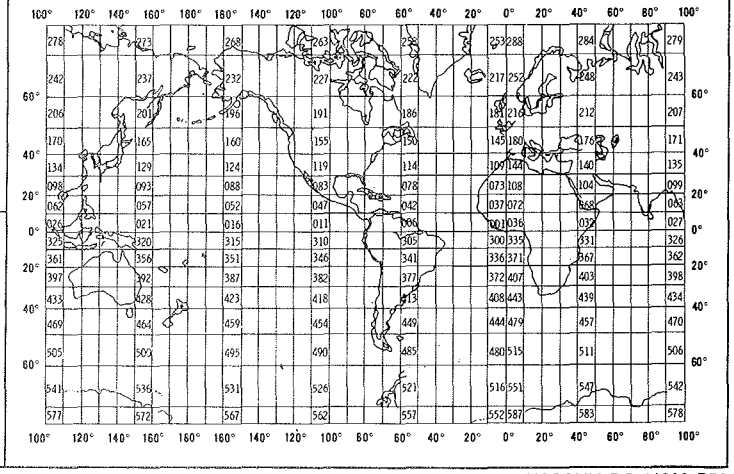
9. ARE DATA DECLARED NATIONAL PROGRAM (DNP)?
(I.E., SHOULD THEY BE INCLUDED IN WORLD DATA CENTERS HOLDINGS FOR INTERNATIONAL EXCHANGE?)

☐ NO ☐ YES ☐ PART *(SPECIFY BELOW)*

10. PERSON TO WHOM INQUIRIES CONCERNING DATA SHOULD BE ADDRESSED WITH TELEPHONE NUMBER *(AND ADDRESS IF OTHER THAN IN ITEM-1)*

11. PLEASE DARKEN ALL MARSDEN SQUARES IN WHICH ANY DATA CONTAINED IN YOUR SUBMISSION WERE COLLECTED.

GENERAL AREA



NOAA FORM 24-13

USCOMM-DC 44289-P72

B. SCIENTIFIC CONTENT

Include enough information concerning manner of observation, instrumentation, analysis, and data reduction routines to make them understandable to future users. Furnish the minimum documentation considered relevant to each data type. Documentation will be retained as a permanent part of the data and will be available to future users. Equivalent information already available may be substituted for this section of the form (i.e., publications, reports, and manuscripts describing observational and analytical methods). If you do not provide equivalent information by attachment, please complete the scientific content section in a manner similar to the one shown in the following example.

EXAMPLE (HYPOTHETICAL INFORMATION)

NAME OF DATA FIELD	REPORTING UNITS OR CODE	METHODS OF OBSERVATION AND INSTRUMENTS USED (SPECIFY TYPE AND MODEL)	ANALYTICAL METHODS (INCLUDING MODIFICATIONS) AND LABORATORY PROCEDURES	DATA PROCESSING TECHNIQUES WITH FILTERING AND AVERAGING
Salinity	7oo	Nansen bottles	Inductive salinometer (Hytech model S 510)	N/A (Not applicable)
		STD Bissett-Berman Model 9006	N/A	Values averaged over 5-meter intervals
Water color	Forel scale	Visual comparison with Forel bottles	N/A	N/A
Sediment size	ϕ units and percent by weight	Ewing corer	Standard sieves. Carbonate fraction removed by acid treatment	Same as "Sedimentary Rock Manual," Folk '65

(SPACE IS PROVIDED ON THE FOLLOWING TWO PAGES FOR THIS INFORMATION)

B. SCIENTIFIC CONTENT

NAME OF DATA FIELD	REPORTING UNITS OR CODE	METHODS OF OBSERVATION AND INSTRUMENTS USED (SPECIFY TYPE AND MODEL)	ANALYTICAL METHODS (INCLUDING MODIFICATIONS) AND LABORATORY PROCEDURES	DATA PROCESSING TECHNIQUES WITH FILTERING AND AVERAGING

NOAA FORM 24-13 (3-72)

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B. SCIENTIFIC CONTENT

NAME OF DATA FIELD	REPORTING UNITS OR CODE	METHODS OF OBSERVATION AND INSTRUMENTS USED (SPECIFY TYPE AND MODEL)	ANALYTICAL METHODS (INCLUDING MODIFICATIONS) AND LABORATORY PROCEDURES	DATA PROCESSING TECHNIQUES WITH FILTERING AND AVERAGING

NOAA FORM 24-13 (3-72)

USCOMM-DC 44289-P72

C. DATA FORMAT

This information is requested only for data transmitted on punched cards or magnetic tape. Have one of your data processing specialists furnish answers either on the form or by attaching equivalent readily available documentation. Identify the nature and meaning of all entries and explain any codes used.

1. List the record types contained in your file transmittal (e.g., tape label record, master, detail, standard depth, etc.).

2. Describe briefly how your file is organized.

3-13. Self-explanatory.

14. Enter the field name as appropriate (e.g., header information, temperature, depth, salinity.

15. Enter starting position of the field.

16. Enter field length in number columns and unit of measurement (e.g., bit, byte, character, word) in unit column.

17. Enter attributes as expressed in the programming language specified in item 3 (e.g., "F 4.1," "BINARY FIXED (5.1)").

18. Describe field. If sort field, enter "SORT 1" for first, "SORT 2" for second, etc. If field is repeated, state number of times it is repeated.

C. DATA FORMAT

COMPLETE THIS SECTION FOR PUNCHED CARDS OR TAPE, MAGNETIC TAPE, OR DISC SUBMISSIONS.

1. LIST RECORD TYPES CONTAINED IN THE TRANSMITTAL OF YOUR FILE
GIVE METHOD OF IDENTIFYING EACH RECORD TYPE

2. GIVE BRIEF DESCRIPTION OF FILE ORGANIZATION

3. ATTRIBUTES AS EXPRESSED IN ☐ PL-1 ☐ ALGOL ☐ COBOL ☐ FORTRAN ☐ _____ LANGUAGE

4. RESPONSIBLE COMPUTER SPECIALIST:
NAME AND PHONE NUMBER _____
ADDRESS _____

COMPLETE THIS SECTION IF DATA ARE ON MAGNETIC TAPE

5. RECORDING MODE ☐ BCD ☐ BINARY ☐ ASCII ☐ EBCDIC ☐ _____

6. NUMBER OF TRACKS (CHANNELS) ☐ SEVEN ☐ NINE ☐ _____

7. PARITY ☐ ODD ☐ EVEN

8. DENSITY ☐ 200 BPI ☐ 1600 BPI ☐ 556 BPI ☐ 800 BPI ☐ _____

9. LENGTH OF INTER-RECORD GAP (IF KNOWN) ☐ 3/4 INCH ☐ _____

10. END OF FILE MARK ☐ OCTAL 17 ☐ _____

11. PASTE-ON-PAPER LABEL DESCRIPTION *(INCLUDE ORIGINATOR NAME AND SOME LAY SPECIFICATIONS OF DATA TYPE, VOLUME NUMBER)*

12. PHYSICAL BLOCK LENGTH IN BYTES

13. LENGTH OF BYTES IN BITS

RECORD FORMAT DESCRIPTION

RECORD NAME _____

14. FIELD NAME	15. POSITION FROM - 1 MEASURED IN _____ (e.g., bits, bytes)	16. LENGTH		17. ATTRIBUTES	18. USE AND MEANING
		NUMBER	UNITS		

RECORD FORMAT DESCRIPTION

RECORD NAME _____

14. FIELD NAME	15. POSITION FROM-1 MEASURED IN _____ *(e.g., bits, bytes)*	16. LENGTH		17. ATTRIBUTES	18. USE AND MEANING
		NUMBER	UNITS		

RECORD FORMAT DESCRIPTION

RECORD NAME _____

14. FIELD NAME	15. POSITION FROM - 1 MEASURED IN _____ (e.g., bits, bytes)	16. LENGTH		17. ATTRIBUTES	18. USE AND MEANING
		NUMBER	UNITS		

NOAA FORM 24-13

USCOMM-DC 44289-P72

RECORD FORMAT DESCRIPTION

RECORD NAME _____

14. FIELD NAME	15. POSITION FROM - 1 MEASURED IN _____ (e.g., bits, bytes)	16. LENGTH		17. ATTRIBUTES	18. USE AND MEANING
		NUMBER	UNITS		

NOAA FORM 24-13

USCOMM-DC 44289-P72

D. INSTRUMENT CALIBRATION

This calibration information will be utilized by NOAA's National Oceanographic Instrumentation Center in their efforts to develop calibration standards for voluntary acceptance by the oceanographic community. Identify the instruments used by your organization to obtain the scientific content of the DDF (i.e., STD, temperature and pressure sensors, salinometers, oxygen meters, velocimeters, etc.) and furnish the calibration data requested by completing and/or checking ("✓") the appropriate spaces. Add the interval time (i.e., 3 months, 6 months, 9 months, etc.) if the fixed interval calibration cycle is checked.

INSTRUMENT TYPE (MFR., MODEL NO.)	DATE OF LAST CALIBRATION	INSTRUMENT WAS CALIBRATED BY		CHECK ONE: INSTRUMENT IS CALIBRATED					INSTRUMENT IS NOT CALIBRATED
		YOUR ORGANIZATION (√)	OTHER ORGANIZATION (GIVE NAME)	AT FIXED INTERVALS (√)	BEFORE OR AFTER USE (√)	BEFORE AND AFTER USE (√)	ONLY AFTER REPAIR (√)	ONLY WHEN NEW (√)	(√)

NOAA FORM 24-13

USCOMM-DC 44289-P72

INTRODUCTION

The Report of Observations/Samples Collected by Oceanographic Programs (ROSCOP) is intended as an important new mechanism in support of the international oceanographic data exchange system. Compilation of ROSCOP forms will provide the basis for timely inventories of data and samples resulting from on-going programs available for international exchange. ROSCOP is thus intended to fill the gap between the first announcement of an oceanographic program to the Intergovernmental Oceanographic Commission (IOC) and the eventual cataloging of data actually received by the World Data Centers (WDC's) or National Data Centers. Further, the ROSCOP inventory could be used by the international scientific community to provide a referral service to data which may not be routinely exchanged through the WDC system.

The ROSCOP form has been recommended for immediate use and will be kept under constant review by the Intergovernmental Oceanographic Commission's Working Group on International Oceanographic Data Exchange.

All U.S. activities should send the form as soon as practicable after completion of a cruise or observational program to:

National Oceanographic Data Center
National Oceanic and Atmospheric Administration
Department of Commerce
Rockville, Maryland 20852

LIMITS OF OCEANS AND SEAS
(IHB Special Publication No. 23)

1 Baltic Sea
- 1A Gulf of Bothnia
- 1B Gulf of Finland
- 1C Gulf of Riga

2 Kattegat, Sound and Belts
3 Skagerrak
4 North Sea
5 Greenland Sea
6 Norwegian Sea
7 Barents Sea
8 White Sea
9 Kara Sea
10 Laptev (or Nordenskjold) Sea
11 East Siberia Sea
12 Chukchi Sea
13 Beaufort Sea
14 Northwest Passage
- 14A Baffin Bay

15 Davis Strait
- 15A Labrador Sea

16 Hudson Bay
- 16A Hudson Strait

17 Arctic Ocean
- 17A Lincoln Sea

18 Inland Sea off the West Coast of Scotland
19 Irish Sea and St. George's Channel
20 Bristol Channel
21 English Channel
22 Bay of Biscay
23 North Atlantic Ocean*
- 23A NE Atlantic (Limit 40°W)
- 23B NW Atlantic (Limit 40°W)

24 Gulf of St. Lawrence
25 Bay of Fundy
26 Gulf of Mexico
27 Caribbean Sea
28 Mediterranean Sea
- 28A Western Basin
- 28B Eastern Basin
- 28C Strait of Gibraltar
- 28D Alboran Sea
- 28E Balearic Sea (or Iberian Sea)
- 28F Ligurian Sea
- 28G Tyrrhenian Sea
- 28H Ionian Sea
- 28I Adriatic Sea
- 28J Aegean Sea

29 Sea of Marmara
30 Black Sea
31 Sea of Azov
32 South Atlantic Ocean*
- 32A SE Atlantic (Limit 20°W)
- 32B SW Atlantic (Limit 20°W)

33 Rio de la Plata
34 Gulf of Guinea
35 Gulf of Suez
36 Gulf of Aqaba
37 Red Sea
38 Gulf of Aden
39 Arabian Sea
40 Gulf of Oman
41 Gulf of Iran (Persian Gulf)
42 Laccadive Sea
43 Bay of Bengal
44 Andaman or Burma Sea
45 Indian Ocean
- 45A Mozambique Channel

46 Malacca and Singapore Straits
- 46A Strait of Malacca
- 46B Strait of Singapore

47 Gulf of Thailand (Siam)
48 East Indian Archipelago (Indonesia)
- 48A Sulu Sea
- 48B Celebes Sea
- 48C Molucca Sea
- 48D Gulf of Tomini
- 48E Halmahra Sea
- 48F Ceram Sea
- 48G Banda Sea
- 48H Arafura Sea
- 48I Timor Sea
- 48J Flores Sea
- 48K Gulf of Boni
- 48L Bali Sea
- 48M Makassar Strait
- 48N Java Sea
- 48O Savu Sea

49 South China Sea (Nan Hai)
50 East China Sea (Tung Hai)
51 Yellow Sea (Hwang Hai)
52 Sea of Japan
53 Inland Sea (Seto Naikai)
54 Sea of Okhotsk
55 Bering Sea
56 Philippine Sea
57 North Pacific Ocean*
- 57A NW Pacific (Limit 180°)
- 57B NE Pacific (Limit 180°)

58 Gulf of Alaska
59 Coastal Waters of SE Alaska and
- 59A British Columbia

60 Gulf of California
61 South Pacific Ocean*
- 61A SE Pacific (Limit 140°W)
- 61B SW Pacific (Limit 140°W)

62 Great Australian Bight
- 62A Bass Strait

63 Tasman Sea
64 Coral Sea
65 Solomon Sea
66 Bismarck Sea

* Indicated subdivisions do not appear in publication IHB No. 23.

INSTRUCTIONS FOR COMPLETING ROSCOP ENTRIES

(Please use black ink or black pencil to facilitate reproduction)

A - GENERAL INFORMATION

A00 This section is reserved for the "Responsible" Data Center, which will enter therein its own reference to be used in future exchanges of data between centers.

A01/ A11 Enter the name, acronym and cruise number which the body in charge uses to designate the expedition or project.

A02/ A12 Enter the full name and international radio call sign of the ship or platform from which the measurements were made. Specify the type of ship or platform using table 1:

TABLE 1

01	research ship
02	non-specialized ship
03	satellite
04	balloon
05	aircraft
06	anchored buoy
07	drifting buoy
08	submerged float (anchored)
09	submerged float (drifting)
10	fixed platform
11	fixed coastal station
12	drifting ice
13	submersible
14	other

A03 Enter the name of the country to which the body financing or in charge of the operation belongs.

A04 Enter the name of the organization financing or in charge of the operation.

A05 Enter the name of the person in charge of the scientific work (chief scientist) during the period covered by the report.

A06 Enter the names and addresses of the bodies or individuals responsible for the measurements (A1, B1, ... Z1) and the bodies or individuals who may be requested to supply the original measurements (A2, B2, ... Z2). In columns i and I on the following pages enter respectively the letters/numbers designating those responsible for and those in possession of the measurements indicated.

A07/ A17 Enter the dates (day, month, year) of the beginning and end of the period covered by the report (generally from the time of setting sail to the return to a port).

A08 Enter the codes for the names of the oceans and seas in which the ship operates, using the definition of their limits supplied by the International Hydrographic Organization, Monaco - special publication No. 23 (see above).

A09 Enter the codes(s) for the type of marine zone(s) covered during the period to which the report applies. All cases encountered for all disciplines should be entered using table 2:

TABLE 2

01	river mouth, estuary
02	zone connected with the sea (harbors, lagoons, salt-water pools)
03	intertidal or nearshore zone
04	coastal zone
05	offshore zone in inland sea
06	open sea (ocean)
07	continental shelf
08	continental margin
09	major ridges, fractures
10	seamounts, guyots and atolls
11	abyssal plain
12	troughs
13	Great Lakes (U.S., Canada)
14	Lakes (other)
99	other

A15 Enter the Federal supporting agency (NSF, ONR, ERDA, NOAA Sea Grant, etc.).

A25 The "remarks" space should be used to supplement or clarify the information provided. A separate sheet to be submitted with this report, may be used for additional notes.

A91 Check box "yes" or box "no" according to whether the operation is or is not a part of a "Declared National Program" (DNP). If only parts of it are DNP, check box "part" in this section. In the latter case further details should be given for each type of data in the form of a note in REMARKS. No entry should be made in this section if DNP status has not been determined at the time of preparation of the form.

A81 If the exchange of all or of certain data is subject to conditions, indicate this by checking box "yes" or box "no."

A92 Check box "yes" or box "no" according to whether the operation is or is not part of a co-operative program.

A72 If "yes," give its name in the space provided.

A82 Check box "yes" or box "no" according to whether the operation is or is not part of an internationally co-ordinated program.

A62 If "yes," give the name of the co-ordinator in the space provided.

B - INFORMATION TO BE SUPPLIED FOR EACH HEADING IN THE VARIOUS CATEGORIES

Number of stations: the manner in which the quantity of observations obtained is to be shown depends on the type of data collected. Enter the following as appropriate, in the "number" column corresponding to each type of data:

1. *Number of stations:* the number of stations at which one or more measurements or samples of the type have been obtained. Do not report the total number of discrete measurements or samples obtained unless only one measurement was made at each station.

2. *A number* (in the appropriate units) for certain types of data to indicate such information as the nautical miles steamed while the particular measurement was being made or the number of samples. The number of stations involved in the measurement may, however, also be shown, if necessary, indicating this by "station."

3. *An "X"*, if the number of stations cannot be given and if it is desired to indicate that information of this type has been obtained at some time during the cruise.

i - I: see explanations under A06.

FORMAT: specify, in the "format" column, the form of the original raw data by entering the appropriate code(s) from table 3:

TABLE 3

1	manuscript or publication
2	automatic printing
3	graph recording
4	punched card
5	punched tape
6	analogue recording on magnetic tape
7	digital recording on magnetic tape
8	photograph
9	samples
0	other or unspecified

C - LOCALIZATION

Information concerning the localization of the areas in which observations have been collected may be given on the form in three different levels of details, of which one is compulsory.

(a) *Level one* (optional) is shown under heading A08 concerning general information on the cruise. It is a matter of merely indicating the name or names of the oceans and seas frequented (using the nomenclature of the International Hydrographic Organization - see table 2);

(b) *Level two* (compulsory) corresponds to the marking, in respect of each category of measurement, of the 10° latitude x 10° longitude squares in which these measurements have been carried out (10° x 10° index);

(c) *Level three* (recommended) supplies further details relating to level two information. Information is given, in respect to each category of data or measurement, and in each 10° x 10° square, as to the 1° x 1° squares to which the measurements (1° x 1° index) in fact apply.

The 10° x 10° and 1° x 1° indices ((b) (c)) are determined in the following manner:

Index 10° x 10°

1. *Discipline and type of measurements:* Enter in this column the name or abbreviation (HC for chemistry, for example) of the discipline concerned. If measurements of several parameters have been taken within the same square, enter these on the same line. If not, record them separately (in the example shown, table 4, HC appears twice).

Remarks.
In certain cases an annotated chart showing the route followed and the points where measurements were obtained may replace the 1° x 1° index.

TABLE 4

Discipline and type of measurements	Index 10° x 10°				Index 1° x 1°
	Qc	L	G	G	
P, M, HC	3	3	1	4	
	3	3	1	5	
	3	3	1	6	
HC	3	3	1	7	
D	3	3	0	7	

2. *10° squares:* In the Qc column, give the quadrant of the globe (Qc) according to World Meteorological Organization Code 3333 reproduced schematically in table 5. In column L indicate the latitude in tens of degrees of the 10° square concerned, and in the G G columns the hundreds and the tens digits for the longitude in degrees of the same square; e.g. the 10° square from 30°N to 40°N and 40°W to 50°W would be coded 7304.

TABLE 5

Qc - Quadrant of the globe						
Code figure	Latitude	Longitude		N		
			Qc = 7			Qc = 1
1	North	East	W	Equator	Greenwich meridian	E
3	South	East				
			Qc = 5			Qc = 3
5	South	West				
7	North	West		S		

Index 1° x 1° (optional)

1. *Discipline and type of measurements:* Give either discipline concerned or a specific type of data of that discipline (represented by its abbreviated reference).

2. *1° squares:* In this column indicate, on the line corresponding to the appropriate discipline (or specific type of data) and after the entry for the 10° x 10° square concerned, the two-figure numbers made up of the unit figures of the latitude and longitude relating to the 1° x 1° squares in which observations have been made (see table 6).

TABLE 6

Discipline and type of measurements	Index 10° x 10°				Index 1° x 1°
	Qc	L	G	G	
D, HP	1	2	0	6	23;32:42
M03	7	3	0	4	27;28;29
M03	7	3	0	5	42;53

This shows:

Dynamics and Physical Oceanography in squares
22° (to 23°) N, 063° (to 064°) E
23° (to 24°) N, 062° (to 063°) E
and 24° (to 25°) N, 062° (to 063°) E

Meteorology (air-sea interface) in squares
32° (to 33°) N, 047° (to 048°) W
32° (to 33°) N, 048° (to 049°) W
etc.

FORM APPROVED: OMB NO. 41-R2765 - EXPIRES : 12-31-79

NOAA FORM 24-23
(1-76)

U. S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
ENVIRONMENTAL DATA SERVICE
NATIONAL OCEANOGRAPHIC DATA CENTER

A00 DATA CENTER

A40 REFERENCE NUMBER

OCEANOGRAPHY - GENERAL CRUISE INVENTORY
(ROSCOP - II)

		YES	NO	PART	
A01 EXPEDITION/PROJECT					
A11 CRUISE NUMBER OR NAME	A91 Declared national program?				
	A81 Exchange restricted?				
A02 SHIP OR PLATFORM	A92 Co-operative program?			A72 NAME	
A12 PLATFORM TYPE	A82 Co-ordinated internationally?			A62 BY WHOM?	

A03 COUNTRY | A04 ORGANIZATION

A05 CHIEF SCIENTIST(S)

A06 NAME AND ADDRESSES OF ORGANIZATIONS AND PERSONS WHOM TO QUERY	FINAL DISPOSITION OF DATA
A1	A2
B1	B2
C1	C2
D1	D2
E1	E2

DATE	DAY	MONTH	YEAR
A07 FROM			
A17 TO			

A08 GENERAL OCEAN AREAS

A09 TYPE(S) OF MARINE ZONE(S)

GEOGRAPHIC AREA
If all data were collected at a fixed station, fill in the co-ordinates

A10 LATITUDE ° ' '' N/S

A20 LONGITUDE ° ' '' E/W

A15 FEDERAL SUPPORT

A25 REMARKS

DISCIPLINE AND TYPE OF MEASUREMENTS	Index 10° x 10° Qc	L	G	G	INDEX 1° x 1°	DISCIPLINE AND TYPE OF MEASUREMENTS	Index 10° x 10° Qc	L	G	G	INDEX 1° x 1°
A B						A B					
A B						A B					
A B						A B					
A B						A B					
A B						A B					
A B						A B					
A B						A B					

G – GEOLOGY GEOPHYSICS

GL MEASUREMENTS MADE AT A SPECIFIC LOCATION	NUMBER	i	I	FORMAT
G01 Dredge				
G02 Grab				
G03 Core rock *(no. of cores)*				
G04 Core–soft bottom *(no. of cores)*				
G05 Sampling by divers				
G06 Sampling by submersible				
G07 Drilling				
G08 Bottom photography				
G09 Sea floor temperature *(≤ 1 m from bottom)*				
G10 Accoustical properties of the sea floor				
G11 Engineering properties of the sea floor				
G12 Magnetic properties of the sea floor				
G13 Gravimetric properties of the sea floor				
G14 Radioactivity measurements				
G70 Other measurements				

GU MEASUREMENTS UNDERWAY				
G21 Motion picture of sea floor *(No. of nautical miles)*				
G22 Bathymetry-wide beam *(no. of nautical miles)*				
G23 Bathymetry-narrow beam *(no. of nautical miles)*				
G24 Side scan sonor *(no. of nautical miles)*				
G25 Seismic reflection *(no. of nautical miles)*				
G26 Seismic refraction *(no. of nautical miles)*				
G27 Gravimetry				
G28 Magnetism				
G29 Other measurements				

G – GEOLOGY GEOPHYSICS *(Continued)* GS TYPES OF STUDIES	NUMBER	i	I	FORMAT
G31 Physical analysis of sediments				
G32 Chemical analysis of sediments				
G33 Paleothermy				
G34 Paleomagnetism and rock magnetism				
G35 Paleontology				
G36 Geothermy				
G37 Geochronology				
G38 Mineral and fossil resources				
G39 Litteral zone studies				
G90 Other measurements				

D – DYNAMICS

D01 Current meters *(no. of stat.)*				
D02 Current meters *(Average duration of measurement days)*				
D03 Currents measured from ship drift				
D04 GEK				
D05 Drifters *(number)*				
D06 Swallow floats *(number)*				
D07 Drift cards *(no. released)*				
D08 Bottom drifters *(no. released)*				
D09 Tidal observation *(duration)*				
D10 Sea and swell *(no. of observations)*				
D90 Other measurements				

M – METEOROLOGY

M01 Upper air observations				
M02 Incident radiation				
M03 Air–sea interface studies				
M04 Ice observations				
M05 Occasional standard measurements				
M06 Systematic standard measurements				
M90 Other measurements				

B – BIOLOGY

	NUMBER	i	l	FORMAT		NUMBER	i	l	FORMAT
B01 Primary productivity					B31 Vitamin concentrations				
B02 Phytoplankton pigments					B32 Amino acid concentration				
B03 Seston					B33 Hydrocarbon concentrations				
B04 Particulate organic carbon					B34 Lipid concentrations				
B05 Particulate organic nitrogen					B35 ATP–ADP–AMP concentrations				
B06 Dissolved organic matter					B36 DNA–RNA concentrations				
B07 Bacterial and pelagic micro–organisms					B37 Taggings				
B08 Phytoplankton					B80 Other measurements				
B09 Zooplankton									
B10 Neuston					**B5 TYPES OF STUDIES**				
B11 Nekton					B51 Identification				
B12 Invertebrate nekton					B52 Spatial and temporal distribution				
B13 Pelagic eggs and larvae					B53 Monitoring and surveillance				
B14 Pelagic fish					B54 Biomass determination				
B15 Amphibians					B55 Description of communities				
B16 Benthic bacteria and micro–organisms					B56 Food chains energy transfers				
B17 Phytobenthos					B57 Population and environments				
B18 Zoobenthos					B58 Population structures				
B19 Commercial demersal fish					B59 Taxonomy, systematics, classification				
B20 Commercial benthic molluscs					B60 Physiology				
B21 Commercial benthic crustacean					B61 Behaviour				
B22 Attached plants and algae					B62 Pathology, parasitology				
B23 Intertidal organisms					B63 Toxicology				
B24 Borers and foulers					B64 Gear research				
B25 Birds					B65 Exploratory fishing				
B26 Mammals and reptiles					B66 Commercial fishing				
B27 Deep scattering layers					B67 Aquaculture				
B28 Acoustical reflections on marine organisms					B90 Other measurements				
B29 Biologic sounds									
B30 Bioluminescence									

H – HYDROGRAPHY

HS SURFACE	NUMBER	i	l	FORMAT
H01 Continuous temperature recording				
H02 Continuous salinity recording				
H03 Discrete temperature measurements				
H04 Discrete salinity measurements				
NEAR SEA FLOOR (≤ 10 m)				
H05 Continuous temperature recording				
H06 Continuous salinity recording				
H07 Discrete temperature measurements				
H08 Discrete salinity measurements				
HP PHYSICAL				
H09 Classical oceanographic stations				
H10 Vertical profiles (STD/CTD)				
H11 Sub–surface measurements underway				
H12 Mechanical bathythermograph (No. of drops)				
H13 Bathythermograph–expendable (No. of drops)				
H14 Sound velocity stations				
H15 Acoustic stations				
H16 Transparency				
H17 Optics				
H18 Diffusion (Dynamic)				
H80 Other measurements				
HC CHEMICAL				
H21 Oxygen				
H22 Phosphates				
H23 Total–P				
H24 Nitrates				
H25 Nitrites				

HC CHEMICAL	NUMBER	i	l	FORMAT
H26 Silicates				
H27 Alkalinity				
H28 pH				
H29 Chlorinity				
H30 Trace elements				
H31 Radioactivity				
H32 Isotopes				
H33 Dissolved gases				
H90 Other measurements				

P – POLLUTION				
P01 Suspended solids				
P02 Heavy metals				
P03 Petroleum residues				
P04 Chlorinated hydrocarbons				
P05 Other dissolved substances				
P06 Thermal pollution				
P07 Waste water: BOD				
P08 Waste water: Nitrates				
P09 Waste water: Microbiology				
P10 Waste water: Other				
P11 Discolored water				
P12 Bottom deposits				
P13 Contaminated organisms				
P90 Other measurements				

FILE TYPE 022 - SALINITY/TEMPERATURE/DENSITY MEASUREMENTS (STD/CTD)
3/30/79 VERSION

NOTES AND CORRECTIONS

THIS FORMAT IS DESIGNED TO RECORD MICROSTRUCTURE MEASUREMENTS OF SALINITY OR CONDUCTIVITY, TEMPERATURE AND SIGMA-T VALUES VS DEPTH TO SUPPORT STUDIES OF TRANSPORT AND ALTERATION OF CONTAMINANTS BY THE ENVIRONMENT.

THIS FORMAT CONSISTS OF FIVE RECORDS WHICH INCLUDE, IN ADDITION TO FIVE ENTRIES OF TEMPERATURE, SALINITY, SIGMA-T PER RECORD, EXTENSIVE SEA SURFACE AND CLIMATOLOGY FIELDS, POSITION, DATE, TIME AND DEPTH INFORMATION AND A TEXT RECORD.

DATA CAN BE RECORDED AT DIFFERENT DEPTH INTERVALS WHICH ARE IDENTIFIED IN THE SCAN FIELD. A RECENT ADDITION TO THE FORMAT IS A RECORD WITH DISSOLVED OXYGEN AND TRANSMISSIVITY FIELDS FORMATTED SIMILAR TO THE TEMPERATURE/SALINITY DATA RECORD.

ALL RECORDS IN THIS FORMAT ARE 120 COLUMNS IN LENGTH. THIS FILE IS SORTED BY STATION NUMBER (CAST NUMBER), RECORD TYPE AND SEQUENCE NUMBER TO OBTAIN THE PROPER SEQUENCE OF RECORDS.

*****FILETYPE 022 - 3/30/79 - ADDED NEW DETAIL RECORD 3 -RECORD *****
*****TYPE '5' *****

NOTES AND CORRECTIONS

PARAMETER	DESCRIPTION	SC
TEXT RECORD	ALWAYS '1'	10
CAST NUMBER	FIVE-CHARACTER FIELD ASSIGNED BY THE ORIGINATOR - ALSO INCLUDED ON RECORD TYPES 2,3 AND 4	11
TEXT	100-CHARACTER FIELD - USED FOR COMMENTS OR PERTINENT INFORMATION	16
SEQUENCE NUMBER	XXXXX - USED FOR SORTING TEXT RECORDS	116
MASTER RECORD	ALWAYS '2'	10
CAST NUMBER	SEE RECORD '1'	11
LATITUDE	DDMMXX PLUS HEMISPHERE 'N' OR 'S' - MINUTES TO HUNDREDTHS	16
LONGITUDE	DDDMMXX PLUS HEMISPHERE 'E' OR 'W' - MINUTES TO HUNDREDTHS	23
CRUISE IDENTIFICATION	TEN-CHARACTER FIELD ASSIGNED BY THE ORIGINATOR	31
NUMBER OF SCANS	XXXXX - USED TO INDICATE NUMBER OF SCANS PER STATION (FIVE/RECORD)	41
DATE (GMT)	YYMMDD	46
TIME (GMT)	XXXX (HOURS AND MINUTES)	52
DEPTH INTERVAL INDICATOR	ONE-DIGIT CODE - USE CODE 0216	56
DEPTH INTERVAL	XXX - WHEN INDICATOR CODE=1 (EQUAL SPACED DEPTHS) - (METERS TO TENTHS)	57
BAROMETRIC PRESSURE	XXXXX (MILLIBARS TO TENTHS)	60
WET BULB TEMPERATURE	XXXX NEGATIVE TEMPERATURES ARE PRECEDED BY A MINUS SIGN ADJACENT TO TEMPERATURE VALUE - DEG C TO TENTHS	65
DRY BULB TEMPERATURE	XXXX NEGATIVE TEMPERATURES ARE PRECEDED BY A MINUS SIGN ADJACENT TO TEMPERATURE VALUE - DEG C TO TENTHS	69
WIND DIRECTION	XX - TWO-DIGIT CODE - WMO 885/887 - DIRECTION FROM - USE CODE 0110	73
WIND SPEED	XX (WHOLE KNOTS)	75
WEATHER	ONE-DIGIT CODE - WMO 4501 - USE CODE 0108	77
SEA STATE	ONE-DIGIT CODE - WMO 3700 - USE CODE 0109	78
VISIBILITY	ONE-DIGIT CODE - WMO 4300 - USE CODE 0157	79
CLOUD TYPE	ONE-DIGIT CODE - WMO 0500 - USE CODE 0053	80
CLOUD AMOUNT	ONE-DIGIT CODE - WMO 2700 - USE CODE 0105	81
INSTRUMENT INFORMATION	TWENTY-CHARACTER FIELD FOR TYPE OF INSTRUMENT, SERIAL NUMBER, ETC	82
LOCATION NAME	SIX-CHARACTER NAME DETERMINED BY THE ORIGINATOR	102
DEPTH TO BOTTOM	XXXXX (WHOLE METERS)	108
MAXIMUM DEPTH OF CAST	XXXX (WHOLE METERS)	113
BLANKS		117

NOTES AND CORRECTIONS

DETAIL RECORD 1	ALWAYS '3'	10
CAST NUMBER	SEE RECORD '1'	11
DEPTH	XXXXX (METERS TO TENTHS)	16
TEMPERATURE	XXXXX NEGATIVE TEMPERATURES ARE PRECEDED BY A MINUS SIGN ADJACENT TO TEMPERATURE VALUE - DEG C TO THOUSANDTHS	21
SALINITY	XXXXX - PARTS PER THOUSAND TO THOUSANDTHS	26
SIGMA-T	XXXX - TO HUNDREDTHS	31
SCAN CONDITION	ONE-CHARACTER CODE INDICATING METHOD OF SCANNING DATA - USE CODE 0080	35
DEPTH	XXXXX (METERS TO TENTHS)	36
TEMPERATURE	XXXXX NEGATIVE TEMPERATURES ARE PRECEDED BY A MINUS SIGN ADJACENT TO TEMPERATURE VALUE - DEG C TO THOUSANDTHS	41
SALINITY	XXXXX - PARTS PER THOUSAND TO THOUSANDTHS	46
SIGMA-T	XXXX - TO HUNDREDTHS	51
SCAN CONDITION	ONE-CHARACTER CODE INDICATING METHOD OF SCANNING DATA - USE CODE 0080	55
DEPTH	XXXXX (METERS TO TENTHS)	56
TEMPERATURE	XXXXX NEGATIVE TEMPERATURES ARE PRECEDED BY A MINUS SIGN ADJACENT TO TEMPERATURE VALUE - DEG C TO THOUSANDTHS	61
SALINITY	XXXXX - PARTS PER THOUSAND TO THOUSANDTHS	66
SIGMA-T	XXXX - TO HUNDREDTHS	71
SCAN CONDITION	ONE-CHARACTER CODE INDICATING METHOD OF SCANNING DATA - USE CODE 0080	75
DEPTH	XXXXX (METERS TO TENTHS)	76
TEMPERATURE	XXXXX NEGATIVE TEMPERATURES ARE PRECEDED BY A MINUS SIGN ADJACENT TO TEMPERATURE VALUE - DEG C TO THOUSANDTHS	81
SALINITY	XXXXX - PARTS PER THOUSAND TO THOUSANDTHS	86
SIGMA-T	XXXX - TO HUNDREDTHS	91
SCAN CONDITION	ONE-CHARACTER CODE INDICATING METHOD OF SCANNING DATA - USE CODE 0080	95
DEPTH	XXXXX (METERS TO TENTHS)	96
TEMPERATURE	XXXXX NEGATIVE TEMPERATURES ARE PRECEDED BY A MINUS SIGN ADJACENT TO TEMPERATURE VALUE - DEG C TO THOUSANDTHS	101
SALINITY	XXXXX - PARTS PER THOUSAND TO THOUSANDTHS	106
SIGMA-T	XXXX - TO HUNDREDTHS	111
SCAN CONDITION	ONE-CHARACTER CODE INDICATING METHOD OF SCANNING DATA - USE CODE 0080	115
SEQUENCE NUMBER	XXXXX - USED FOR SORTING DATA RECORDS	116

NOTES AND CORRECTIONS

DETAIL RECORD 2	ALWAYS '4'	10
CAST NUMBER	SEE RECORD '1'	11
DEPTH	XXXXX (METERS TO TENTHS)	16
DISSOLVED OXYGEN	XXXXX - ML/L TO THOUSANDTHS	21
TRANSMISSIVITY	XXXXX (PERCENT TO THOUSANDTHS)	26
BLANKS		31
SCAN CONDITION	ONE-CHARACTER CODE INDICATING METHOD OF SCANNING DATA - USE CODE 0080	35
DEPTH	XXXXX (METERS TO TENTHS)	36
DISSOLVED OXYGEN	XXXXX - ML/L TO THOUSANDTHS	41
TRANSMISSIVITY	XXXXX (PERCENT TO THOUSANDTHS)	46
BLANKS		51
SCAN CONDITION	ONE-CHARACTER CODE INDICATING METHOD OF SCANNING DATA - USE CODE 0080	55
DEPTH	XXXXX (METERS TO TENTHS)	56
DISSOLVED OXYGEN	XXXXX - ML/L TO THOUSANDTHS	61
TRANSMISSIVITY	XXXXX (PERCENT TO THOUSANDTHS)	66
BLANKS		71
SCAN CONDITION	ONE-CHARACTER CODE INDICATING METHOD OF SCANNING DATA - USE CODE 0080	75
DEPTH	XXXXX (METERS TO TENTHS)	76
DISSOLVED OXYGEN	XXXXX - ML/L TO THOUSANDTHS	81
TRANSMISSIVITY	XXXXX (PERCENT TO THOUSANDTHS)	86
BLANKS		91
SCAN CONDITION	ONE-CHARACTER CODE INDICATING METHOD OF SCANNING DATA - USE CODE 0080	95
DEPTH	XXXXX (METERS TO TENTHS)	96
DISSOLVED OXYGEN	XXXXX - ML/L TO THOUSANDTHS	101
TRANSMISSIVITY	XXXXX (PERCENT TO THOUSANDTHS)	106
BLANKS		111
SCAN CONDITION	ONE-CHARACTER CODE INDICATING METHOD OF SCANNING DATA - USE CODE 0080	115
SEQUENCE NUMBER	XXXXX - USED FOR SORTING DATA RECORDS	116
DETAIL RECORD 3	ALWAYS '5'	10
CAST NUMBER	SEE RECORD '1'	11
DEPTH	XXXXX (METERS TO TENTHS)	16
TEMPERATURE	XXXXX NEGATIVE TEMPERATURES ARE PRECEDED BY A MINUS SIGN ADJACENT TO TEMPERATURE VALUE - DEG C TO THOUSANDTHS	21
CONDUCTIVITY	XXXXX (MMHO/CM TO THOUSANDTHS)	26
BLANKS		31
SCAN CONDITION	ONE-CHARACTER CODE INDICATING METHOD OF SCANNING DATA - USE CODE 0080	35
DEPTH	XXXXX (METERS TO TENTHS)	36
TEMPERATURE	XXXXX NEGATIVE TEMPERATURES ARE PRECEDED BY A MINUS SIGN ADJACENT TO TEMPERATURE VALUE - DEG C TO THOUSANDTHS	41
CONDUCTIVITY	XXXXX (MMHO/CM TO THOUSANDTHS)	46
BLANKS		51
SCAN CONDITION	ONE-CHARACTER CODE INDICATING METHOD OF SCANNING DATA - USE CODE 0080	55
DEPTH	XXXXX (METERS TO TENTHS)	56

TEMPERATURE	XXXXX NEGATIVE TEMPERATURES ARE PRECEDED BY A MINUS SIGN ADJACENT TO TEMPERATURE VALUE - DEG C TO THOUSANDTHS	61
CONDUCTIVITY	XXXXX (MMHO/CM TO THOUSANDTHS)	66
BLANKS		71
SCAN CONDITION	ONE-CHARACTER CODE INDICATING METHOD OF SCANNING DATA - USE CODE 0080	75
DEPTH	XXXXX (METERS TO TENTHS)	76
TEMPERATURE	XXXXX NEGATIVE TEMPERATURES ARE PRECEDED BY A MINUS SIGN ADJACENT TO TEMPERATURE VALUE - DEG C TO THOUSANDTHS	81
CONDUCTIVITY	XXXXX (MMHO/CM TO THOUSANDTHS)	86
BLANKS		91
SCAN CONDITION	ONE-CHARACTER CODE INDICATING METHOD OF SCANNING DATA - USE CODE 0080	95
DEPTH	XXXXX (METERS TO TENTHS)	96
TEMPERATURE	XXXXX NEGATIVE TEMPERATURES ARE PRECEDED BY A MINUS SIGN ADJACENT TO TEMPERATURE VALUE - DEG C TO THOUSANDTHS	101
CONDUCTIVITY	XXXXX (MMHO/CM TO THOUSANDTHS)	106
BLANKS		111
SCAN CONDITION	ONE-CHARACTER CODE INDICATING METHOD OF SCANNING DATA - USE CODE 0080	115
SEQUENCE NUMBER	XXXXX - USED FOR SORTING DATA RECORDS	116

THE FOLLOWING CODES ARE USED IN FILE TYPE 022

0053 CLOUD TYPE (WMO500)

0 -- CIRRUS
1 -- CIRROCUMULUS
2 -- CIRROSTRATUS
3 -- ALTOCUMULUS
4 -- ALTOSTRATUS
5 -- NIMBOSTRATUS
6 -- STRATOCUMULUS
7 -- STRATUS
8 -- CUMULUS
9 -- CUMULONIMBUS
X -- CLOUD NOT VISIBLE OWING TO DARKNESS, FOG, DUSTSTORM, SANDSTORM, OR OTHER ANALOGOUS PHENOMENA

0080 STD-SCAN CONDITION

0 -- DATA PROCESSED PRIOR TO IMPLEMENTATION OF CODE. ALL VALUES FOR ALL PARAMETERS WILL BE LABELED THE SAME.
1 -- VALUE OBTAINED FROM RAW DATA AT THAT DEPTH INTERVAL. PROCESSING TO OBTAIN THIS VALUE MUST BE SPECIFIED IN A DDF. EXAMPLE: THE VALUE FOR SALINITY MAY BE THE RESULT OF AVERAGING OVER ONE METER INTERVAL AND APPLYING A FIELD CORRECTION BASED UPON DISCRETE SAMPLES. (OTHER TYPES OF PROCESSING MAY BE USED, BUT MUST BE SPECIFIED IN DDF.)
2 -- VALUES ARE LINEARLY INTERPOLATED FROM ADJACENT DEPTH INTERVALS. EXAMPLE: IF THE TEMPERATURE VALUES FROM 49 AND 50 METERS ARE MISSING, THESE VALUES WILL BE OBTAINED BY LINEAR INTERPOLATION BETWEEN THE VALUES AT 48 AND 51 METERS.
3 -- VALUES ARE OBTAINED BY "VERTICAL EXTRAPOLATION" FROM THE FIRST DEPTHS FOR WHICH A VALUE IS FOUND THAT FALLS WITHIN SENSOR LIMITS. EXAMPLE: IF SALINITY FALLS BELOW SENSOR LIMITS BECAUSE OF FRESH SURFACE WATER, THOSE DEPTHS AFFECTED WILL BE ASSIGNED THE SALINITY OF THE FIRST REAL VALUE OBTAINED (SALINITY SENSORS WILL BE AFFECTED TO A MUCH GREATER EXTENT THAN CONDUCTIVITY SENSORS.)
4 -- AVERAGED
9 -- TEMPERATURE, SALINITY, AND SIGMA-T NOT GIVEN

0105 CLOUD AMT (WMO[illegible])

0 -- 0 (ZERO)
1 -- 1 OKTA OR LESS, BUT NOT ZERO (1/10 OR LESS, BUT NOT ZERO)
2 -- 2 OKTAS 2/10-3/10
3 -- 3 OKTAS 4/10
4 -- 4 OKTAS 5/10
5 -- 5 OKTAS 6/10
6 -- 6 OKTAS 7/10-8/10
7 -- 7 OKTAS OR MORE, BUT NOT 8 OKTAS (9/10 OR MORE, BUT NOT 10/10)
8 -- 8 OKTAS 10/10

9 -- SKY OBSCURED, OR CLOUD AMOUNT CANNOT BE ESTIMATED

0108 WEATHER (WMO4501)

0 -- CLEAR (NO CLOUD AT ANY LEVEL)
1 -- PARTLY CLOUDY (SCATTERED OR BROKED)
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)

0109 SEA STATE (WMO3700)

0 -- CALM-GLASSY 0 FT (0 METERS)
1 -- CALM-RIPPLED 0-1/3 FT (0-.1METERS)
2 -- SMOOTH-WAVELET 1/3-1 2/3 FT (.1-.5 METERS)
3 -- SLIGHT 1 2/3 - 4 FT(.5-1.25 METERS)
4 -- MODERATE 4-8 FT(1.25-2.50 METERS)
5 -- ROUGH 8-13 FT(2.50-4.0 METERS)
6 -- VERY ROUGH 13-20 FT(4-6 METERS)
7 -- HIGH 20-30 FT(6-9 METERS)
8 -- VERY HIGH 30-45 FT(9-14 METERS)
9 -- PHENOMENAL >45 FT (>14 METERS)

0110 WIND-WAVE DIRECTION

00 -- CALM (NO WAVES-NO MOTION)
01 -- 5 DEGREES - 14 DEGREES
02 -- 15 DEGREES - 24 DEGREES
03 -- 25 DEGREES - 34 DEGREES
04 -- 35 DEGREES - 44 DEGREES
05 -- 45 DEGREES - 54 DEGREES
06 -- 55 DEGREES - 64 DEGREES
07 -- 65 DEGREES - 74 DEGREES
08 -- 75 DEGREES - 84 DEGREES
09 -- 85 DEGREES - 94 DEGREES
10 -- 95 DEGREES - 104 DEGREES
11 -- 105 DEGREES - 114 DEGREES
12 -- 115 DEGREES - 124 DEGREES
13 -- 125 DEGREES - 134 DEGREES
14 -- 135 DEGREES - 144 DEGREES
15 -- 145 DEGREES - 154 DEGREES
16 -- 155 DEGREES - 164 DEGREES
17 -- 165 DEGREES - 174 DEGREES

18 -- 175 DEGREES - 184 DEGREES
19 -- 185 DEGREES - 194 DEGREES
20 -- 195 DEGREES - 204 DEGREES
21 -- 205 DEGREES - 214 DEGREES
22 -- 215 DEGREES - 224 DEGREES
23 -- 225 DEGREES - 234 DEGREES
24 -- 235 DEGREES - 244 DEGREES
25 -- 245 DEGREES - 254 DEGREES
26 -- 255 DEGREES - 264 DEGREES
27 -- 265 DEGREES - 274 DEGREES
28 -- 275 DEGREES - 284 DEGREES
29 -- 285 DEGREES - 294 DEGREES
30 -- 295 DEGREES - 304 DEGREES
31 -- 305 DEGREES - 314 DEGREES
32 -- 315 DEGREES - 324 DEGREES
33 -- 325 DEGREES - 334 DEGREES
34 -- 335 DEGREES - 344 DEGREES
35 -- 345 DEGREES - 354 DEGREES
36 -- 355 DEGREES - 4 DEGREES
49 -- WAVES CONFUSED, DIRECTION INDETERMINATE (WAVES EQUAL TO OR LESS THAN 4 3/4 METERS)
99 -- WAVES CONFUSED, DIRECTION INDETERMINATE (WAVES GEATER THAN 4 3/4 METERS) WINDS VARIABLE,OR ALL DIRECTIONS OR UNKNOWN

0157 VISIBILITY (WMO4300)

0 -- LESS THAN 50 M (LESS THAN 55 YARDS)
1 -- 50-200 M (APPROX. 55-220 YARDS)
2 -- 200-500 M (APPROX. 220-550 YARDS)
3 -- 500-1000 M (APPROX. 550 YARDS-5/8 N.M.)
4 -- 1-2 KM (APPROX. 5/8-1 N.M.)
5 -- 2-4 KM (APPROX. 1-2 N.M.)
6 -- 4-10 KM (APPROX. 2-6 N.M.)
7 -- 10-20 KM (APPROX. 6-12 N.M.)
8 -- 20-50 KM (APPROX. 12-30 N.M.)
9 -- 50 KM OR MORE (30 N.M. OR MORE)

0216 DEPTH INTERVAL

0 -- UNEQUALLY SPACED DEPTHS
1 -- EQUALLY SPACED DEPTHS TO TENTHS OF METERS REPORTED.

0500 LAT HEMISPHERE

N -- NORTH
S -- SOUTH

0501 LON HEMISPHERE

E -- EAST
W -- WEST

FILE TYPE 069 - CHEMISTRY - 03/30/81 VERSION

NOTES AND CORRECTIONS

THIS FORMAT IS DESIGNED TO SUPPORT CHEMISTRY STUDIES OF THE OCEANS. THERE ARE SIX DATA RECORD TYPES INCLUDED TO: 1) IDENTIFY THE CRUISE, 2) IDENTIFY THE TIME AND POSITION OF THE STATION, 3) IDENTIFY THE REPORTED PHYSICAL PROPERTIES AND NUTRIENT LEVELS, AND 4) REPORT BIOCHEMICAL PARAMETERS.

EACH DATA RECORD IS 80 CHARACTERS IN LENGTH, SORTED BY STATION AND SEQUENCE NUMBERS TO MAIN .IN THE PROPER ORDER.

*****3/31/81 - ADDED RECORD TYPES '5' AND '6'

NOTES AND CORRECTIONS

PARAMETER	DESCRIPTION	SC
FILE HEADER RECORD	ALWAYS '1'	10
VESSEL	ELEVEN-CHARACTER FIELD FOR VESSEL NAME	11
CRUISE	SIX-CHARACTER ORIGINATOR'S CRUISE IDENTIFICATION (LEFT ALLIGNED)	22
BEGIN CRUISE DATE	MM/DD/YY	28
END CRUISE DATE	MM/DD/YY	37
SENIOR SCIENTIST	19-CHARACTER FIELD FOR SCIENTIST NAME	45
INVESTIGATOR/INSTITUTION	17-CHARACTER FIELD FOR INVESTIGATOR OR INSTITUTION NAME	64
FIRST SAMPLE HEADER RECORD	ALWAYS '2'	10
SEQUENCE	XXX - ASCENDING NUMERIC	11
CAST NUMBER	THREE-CHARACTER STATION IDENTIFIER	14
NUMBER OF CASTS	SIX-CHARACTERS USED TO REPRESENT THE NUMBER OF CASTS USED TO MAKE UP A STATION. EX. 35-37 REPRESENTS 3 CASTS	17
LATITUDE	DDMMT PLUS HEMISPHERE 'N' OR 'S'	23
LONGITUDE	DDDMMT PLUS HEMISPHERE 'E' OR 'W'	29
DATE (GMT)	YYMMDD	36
TIME (GMT)	XXX - HOURS TO TENTHS	42
DEPTH TO BOTTOM	XXXX - WHOLE METERS	45
BLANKS		49
DATA RECORD I	ALWAYS '3'	10
SEQUENCE	SEE RECORD '2'	11
CAST NUMBER	SEE RECORD '2'	14
SAMPLE DEPTH	XXXX - WHOLE METERS	17
TEMPERATURE	XXXX NEGATIVE TEMPERATURES ARE PRECEDED BY A MINUS SIGN ADJACENT TO TEMPERATURE VALUE - DEG C TO TENTHS	21
SALINITY	XXXX - PARTS PER THOUSAND TO HUNDREDTHS	25
SIGMA-T	XXXXX - TO THOUSANDTHS	29
DISSOLVED OXYGEN	XXXXX - UG-AT/L TO HUNDREDTHS	34
NITRATE	XXXX - UG-AT/L TO HUNDREDTHS	39
NITRITE	XXXX - UG-AT/L TO HUNDREDTHS	43
AMMONIA	XXXXX - UG-AT/L TO HUNDREDTHS	47
INORGANIC PHOSPHATE	XXXX - UG-AT/L TO HUNDREDTHS	52
SILICATE	XXXXX - UG-AT/L TO HUNDREDTHS	56
RELATIVE CHLOROPHYLL FLUORESCENCE	XXXX - TO HUNDREDTHS	61
DISSOLVED ORGANIC CARBON	XXXX - UG C/L TO HUNDREDTHS	65
PARTICULATE ORGANIC CARBON	XXXX - UG C/L TO HUNDREDTHS	69
PARTICULATE ORGANIC NITROGEN	XXXX - UG N/L TO HUNDREDTHS	73
BLANKS		77

NOTES AND CORRECTIONS

DATA RECORD II	ALWAYS '4'	10
SEQUENCE	SEE RECORD '2'	11
CAST NUMBER	SEE RECORD '2'	14
DEPTH	XXXX - WHOLE METERS	17
APPARENT OXYGEN UTILIZATION	XXXXX - MG-AT/L TO THOUSANDTHS	21
PERCENT OXYGEN SATURATION	XXX - WHOLE PERCENT	26
ELECTRON TRANSPORT SYSTEM	XXXXX - UL O(2)/L/HR TO TEN THOUSANDTHS	29
ADENOSINE TRIPHOSPHATE	XXXXX - NANOGRAM/L TO HUNDREDTHS	34
NANOPLANKTON CARBON UPTAKE	XXXXX - MG C/CUBIC M/HR TO TEN THOUSANDTHS	39
TOTAL PHAEOPHYTON	XXXXX - MG/CUBIC M TO TEN THOUSANDTHS	44
NANOPLANKTON CHLOROPHYLL	XXXXX - MG/CUBIC M TO TEN THOUSANDTHS	49
NANOPLANKTON PHAEOPHYTON	XXXXX - MG/CUBIC M TO TEN THOUSANDTHS	54
TOTAL CARBON UPTAKE	XXXXX - MG C/CUBIC M/DAY TO TEN THOUSANDTHS	59
TOTAL CHLOROPHYLL	XXXXX - MG/CUBIC M TO TEN THOUSANDTHS	64
DRY WEIGHT OF PARTICULATE MATTER	XXXXX - UG/L TO HUNDREDTHS	69
NEPHELS	XXXXXXX - KILOHERTZ TO HUNDREDTHS	74

DATA RECORD III	ALWAYS '5'	10
SEQUENCE	SEE RECORD '2'	11
CAST NUMBER	SEE RECORD '2'	14
SAMPLE DEPTH	XXXXX - M TO TENTHS	17
TEMPERATURE	XXXX - DEG C TO HUNDREDTHS	22
SALINITY	XXXX - PPT TO HUNDREDTHS	26
PH	XXXX - TO THOUSANDTHS	30
DISSOLVED OXYGEN GAS	XXXXXX - ML/L TO THOUSANDTHS	34
DISSOLVED ORGANIC CARBON	XXXXXX - MG/L TO THOUSANDTHS	40
PARTICULATE ORGANIC CARBON	XXXXXX - MG/L TO THOUSANDTHS	46
PARTICULATE ORGANIC NITROGEN	XXXXXX - MG/L TO THOUSANDTHS	52
TOTAL SUSPENDED MATTER	XXXXXX - MG/L TO THOUSANDTHS	58
TOTAL RECOVERABLE PETROLEUM HYDROCARBONS	XXXXXX - MG/L TO THOUSANDTHS	64
TOTAL RESOLVED LIGHT HYDROCARBONS	XXXXXX - MG/L TO THOUSANDTHS	70
BLANKS		76

NOTES AND CORRECTIONS

DATA RECORD IV	ALWAYS '6'	10
SEQUENCE	SEE RECORD '2'	11
CAST NUMBER	SEE RECORD '2'	14
SAMPLE DEPTH	XXXXX - M TO TENTHS	17
NITRATE	XXXXXX - MG/L TO THOUSANDTHS	22
NITRATE	XXXXXX - MG/L TO THOUSANDTHS	28
AMMONIA	XXXXXX - MG/L TO THOUSANDTHS	34
SILICON DIOXIDE	XXXXXX - MG/L TO THOUSANDTHS	40
TOTAL PHOSPHORUS IN PHOSPHATE	XXXXXX - MG/L TO THOUSANDTHS	46
ORGANIC PHOSPHORUS IN PHOSPHATE	XXXXXX - MG/L TO THOUSANDTHS	52
CHLOROPHYLL A	XXXXXX - MG/M3 TO THOUSANDTHS	58
PHAEOPHYTIN A	XXXXXX - MG/M3 TO THOUSANDTHS	64
SULFATE	XXXXXX - MG/L TO THOUSANDTHS	70
NITRATE-NITRITE RATIO	XXXX - TO HUNDREDTHS	76
BLANK		80

THE FOLLOWING CODES ARE USED IN FILE TYPE 069

0500	LAT HEMISPHERE
N	-- NORTH
S	-- SOUTH

0501	LON HEMISPHERE
E	-- EAST
W	-- WEST

Chemistry Format

6-19-80

Data II

- File Type 069
- File Identifier
- Record Type #4
- Sequence Number
- Cast Number
- Sample Depth (m.)
- Apparent Oxygen Utilization (mg-at./l. to 1/1000)
- Percent Oxygen Saturation
- Electron Transport System (ETS) (ul O_2/l./hr to 1/1000)
- Adenosine Triphosphate (ATP) (Nanogram/l. to 1/100)
- Nanoplankton Carbon Uptake (mg C/m³/hr to 1/10,000)
- Total Phaeophytin (mg/m³ to 1/10,000)
- Nanoplankton Chlorophyll (mg/m³ to 1/10,000)
- Nanoplankton Phaeophytin (mg/m³ to 1/10,000)
- Total Carbon Uptake (mg C/m³/day to 1/1000)
- Total Chlorophyll (mg/m³ to 1/10,000)
- Dry Weight of Particulate Matter (ug/l. to 1/100)
- Nephels (Kilohertz to 1/100)

Data III

- File Type 069
- File Identifier
- Record Type #5
- Sequence Number
- Cast Number
- Sample Depth (m. to 1/10)
- Temp. (°C to 1/100)
- Salinity (‰ to 1/100)
- pH (to 1/1000)
- Dissolved Oxygen (ml/l. to 1/1000)
- Dissolved Organic Carbon (ml./l. to 1/1000)
- Particulate Organic Carbon (ml/l. to 1/1000)
- Particulate Organic Nitrogen (ml/l. to 1/1000)
- Total Suspended Matter (mg./l. to 1/1000)
- Total Recoverable Petroleum Hydrocarbons (mg./l. to 1/1000)
- Total Resolved Light Hydrocarbons (mg/l. to 1/1000)
- Blank

Data IV

- File Type 069
- File Identifier
- Record Type #6
- Sequence Number
- Cast Number
- Sample Depth (m. to 1/10)
- Nitrate (mg./l. to 1/1000)
- Nitrite (mg/l. to 1/1000)
- Ammonia (mg/l. to 1/1000)
- Silicon Dioxide (mg./l. to 1/1000)
- Total Phosphorous in Phosphate (T-PO_4-P) (mg./l. to 1/1000)
- Organic Phosphorous in Phosphate (O-PO_4-P) (mg./l. to 1/1000)
- Chlorophyll-a (mg./m³ to 1/1000)
- Phaeophytin-a (mg./m³ to 1/1000)
- Sulfate (mg/l. to 1/1000)
- Nitrate-Nitrite Ratio (to 1/100)
- Blank

AF FORM FEB 74 1530 PREVIOUS EDITION WILL BE USED

PUNCH CARD TRANSCRIPT

FILE TYPE 127 - MARINE ANIMAL SIGHTING AND CENSUS - 02/25/80 VERSION

NOTES AND CORRECTIONS

THIS FORMAT IS DESIGNED TO SUPPORT STUDIES OF BIOLOGICAL POPULATIONS AND ECOSYSTEMS THAT ARE SUBJECT TO IMPACT FROM OIL AND GAS DEVELOPMENT, MARINE POLLUTION AND OTHER ENVIRONMENTAL DISTURBANCES. INFORMATION ON MARINE ANIMAL POPULATIONS, ACTIVITIES, MIGRATORY ROUTES AND BREEDING LOCALES OBTAINED FROM EITHER SURFACE SHIP OR AIRCRAFT SURVEYS CAN BE DERIVED FROM INFORMATION SUBMITTED IN THIS FORMAT.

THE FORMAT CONSISTS OF SEVEN RECORDS FOR REPORTING CRUISE AND PLATFORM INFORMATION AND RELATED ENVIRONMENTAL AND LOCATION DATA FOR EACH SIGHTING. SIGHTINGS CAN BE DESCRIBED FOR ENTIRE TRANSITS OR FOR INDIVIDUAL OBSERVATIONS. FIELDS ARE INCLUDED FOR REPORTING TOTAL COUNTS AND NUMBER OF ADULTS, JUVENILES, MALES, FEMALES, ETC FOR EACH TAXONOMIC SPECIES. A RECORD IS INCLUDED FOR REPORTING ONLY TOTAL COUNTS OF ANIMALS FOR EACH SIGHTING IN CONTRAST WITH THE RECORD WHICH PERMITS GROUPING OF SUBSETS OF THE ANIMALS SIGHTED BY BEHAVIOR, SEX, ETC. A TEXT RECORD ALSO IS AVAILABLE FOR COMMENTS.

ALL RECORDS IN THIS FORMAT ARE 80 CHARACTERS IN LENGTH. THE FILE IS SORTED BY STATION NUMBER AND SEQUENCE NUMBER TO OBTAIN THE PROPER SEQUENCE OF RECORDS. A SIGHTING NUMBER FIELD CAN BE USED TO SORT THE DATA FURTHER WHERE APPROPRIATE.

THIS FORMAT IS DESIGNED TO ACCOMMODATE ALL MARINE ANIMAL SIGHTING AND CENSUS SURVEY DATA FOR INCORPORATION IN THE NODC MARINE ENVIRONMENTAL DATA BASE. IT IS CONTEMPLATED THAT MOST DATA SUBMITTED IN EARLIER MARINE ANIMAL SIGHTING FORMATS (FILE TYPES 026 AND 027) EVENTUALLY WILL BE CONVERTED TO FILE TYPE 127 AND THAT MOST INVESTIGATORS WILL USE FILE TYPE 127 FOR FUTURE DATA SUBMISSIONS TO THE DATA CENTER.

IT IS PREFERRED FOR PURPOSES OF DATA RETRIEVAL AND PRODUCT REQUESTS THAT EACH FILE ID CONSIST OF ONLY ONE TYPE OF SURVEY, I.E. TRANSIT DATA OR RANDOM INDIVIDUAL SIGHTINGS. HOWEVER, IF THESE TWO TYPES OF OBSERVATIONS ARE TO BE INCLUDED WITHIN ONE FILE ID, DATA MUST BE DIFFERENTIATED BY STATION NUMBER WITHIN A DATA SET AND THE APPROPRIATE TRANSIT OR SIGHTING RECORDS USED AS DESCRIBED BELOW.

NOTES AND CORRECTIONS

PARAMETER	DESCRIPTION	SC
CRUISE HEADER RECORD	ALWAYS 'A' - SHOULD BE USED ONLY ONCE FOR EACH FILE ID - INFORMATION SHOULD AGREE WITH THAT IN THE DOCUMENTATION THAT ACCOMPANIES THE DATA	10
VESSEL/PLATFORM NAME	ELEVEN-CHARACTER FIELD	11
CRUISE ID	SIX-CHARACTER FIELD ASSIGNED BY ORIGINATOR	22
START DATE OF SURVEY	YYMMDD	28
END DATE OF SURVEY	YYMMDD	34
INVESTIGATOR, SCIENTIST OR DATA SOURCE	FIFTEEN-CHARACTER FIELD IDENTIFYING DATA SOURCE	40
INSTITUTION OR AGENCY	FIFTEEN-CHARACTER FIELD IDENTIFYING ORGANIZATION	55
PLATFORM ID	THREE-DIGIT CODE - USE CODE 0063(SHIPS) OR CODE 0217(AIRCRAFT) - MAY BE USED INSTEAD OF PLATFORM NAME FIELD	70
PLATFORM TYPE	ONE-CHARACTER CODE - USE CODE 0100	73
BLANKS		74
TRANSIT RECORD	ALWAYS 'B' - SHOULD BE USED TO DESCRIBE COMPLETE TRANSIT OR ANY PORTION OF TRANSIT OR SURVEY LEG TRAVELED ALONG A RELATIVELY STRAIGHT LINE. IF INCIDENTAL SIGHTINGS ARE MADE OUTSIDE OF THE DESCRIBED TRANSIT AREA, CARE SHOULD BE TAKEN TO CORRECT ELAPSED TIME FIELDS OR TRANSITS SHOULD BE DIVIDED INTO SEGMENTS AT THE POINTS OF DEPARTURE FROM THE TRANSIT PATH AND TIMES/DISTANCES DIVIDED UP APPROPRIATELY.	10
STATION NUMBER	FIVE-CHARACTER FIELD ASSIGNED BY THE ORIGINATOR - MAY REPRESENT A LEG OF A CRUISE OR A SIGHTING OF ONE OR MORE GROUPS AT THE SAME TIME AND PLACE - ALSO USED IN RECORD TYPES C THROUGH F AND T	11
BEGIN LATITUDE	DDMMSS PLUS HEMISPHERE 'N' OR 'S'	16
BEGIN LONGITUDE	DDDMMSS PLUS HEMISPHERE 'E' OR 'W'	23
END LATITUDE	DDMMSS PLUS HEMISPHERE 'N' OR 'S'	31
END LONGITUDE	DDDMMSS PLUS HEMISPHERE 'E' OR 'W'	38
BEGIN DATE (GMT)	YYMMDD	46
BEGIN TIME (GMT)	XXXX (HOURS AND MINUTES-24 HOUR CLOCK)	52
END TIME (GMT)	XXXX (HOURS AND MINUTES-24 HOUR CLOCK) - END TIME IS ASSUMED TO BE WITHIN THE SAME DAY. CONVERSION TO GMT MAY CAUSE A CHANGE IN DAYS AND AN APPARENT END TIME LESS THAN START TIME.	56

NOTES AND CORRECTIONS

WIDTH OF TRACK	XXXX - KILOMETERS TO HUNDREDTHS	60
PLATFORM DIRECTION	XXX (DEGREES TOWARD)	64
PLATFORM SPEED	XXX (WHOLE KNOTS) - ENTER FOR SHIP OR AIRCRAFT SPEEDS	67
PLATFORM ALTITUDE (OBSERVER HEIGHT)	XXXX (WHOLE METERS)	70
LEG MADE GOOD	ONE-CHARACTER CODE - USE CODE 0117	74
COMPLETENESS	ONE-CHARACTER CODE - USE CODE 0002	75
BLANK		76
SEQUENCE NUMBER	FOUR-DIGIT FIELD USED TO SORT RECORDS WITHIN A STATION AND A FILE ID - ALSO INCLUDED IN RECORDS C THROUGH E AND T	77
ENVIRONMENT RECORD	ALWAYS 'C' - TO BE REPORTED FOR EACH SIGHTING WHERE FEASIBLE AND ONLY ONE RECORD PER SIGHTING NUMBER	10
STATION NUMBER	SEE RECORD 'B'	11
SIGHTING NUMBER	XXXXX - A UNIQUE NUMBER WITHIN EACH STATION - IT IS SUGGESTED THAT SIGHTINGS BE NUMBERED SEQUENTIALLY WITHIN EACH DATA SET	16
WATER DEPTH	XXXX - (WHOLE METERS)	21
CURRENT DIRECTION	XXX - (DEGREES TOWARD)	25
CURRENT SPEED	XX - (WHOLE KNOTS)	28
WIND DIRECTION	XXX - (DEGREES FROM)	30
WIND SPEED	XX - (WHOLE KNOTS)	33
CLOUD TYPE	ONE-CHARACTER CODE - USE CODE 0053	35
CLOUD AMOUNT	ONE-CHARACTER CODE - USE CODE 0105	36
WEATHER	TWO-CHARACTER CODE - USE CODE 0159	37
AIR TEMPERATURE	XXXX - NEGATIVE TEMPERATURES PRECEDED BY MINUS SIGN ADJACENT TO THE VALUE - (DEG C TO TENTHS)	39
SEA SURFACE TEMPERATURE	XXXX - NEGATIVE TEMPERATURES PRECEDED BY MINUS SIGN ADJACENT TO THE VALUE - (DEG C TO HUNDREDTHS)	43
SEA STATE	ONE-CHARACTER CODE - USE CODE 0052 - USE BEAUFORT SCALE TO DESCRIBE SEA CONDITIONS - ONLY CODES 0-9 SHOULD BE APPROPRIATE FOR OBSERVATIONAL DATA	47
WATER COLOR	TWO-CHARACTER CODE - USE CODE 0051	48
SURFACE VISIBILITY	ONE-CHARACTER CODE - USE CODE 0006	50
GLARE AMOUNT	ONE-CHARACTER CODE - USE CODE 0035	51
GLARE LOCATION	ONE-CHARACTER CODE - USE CODE 0355	52
DEBRIS	ONE-CHARACTER CODE - USE CODE 0116	53
ICE TYPE	ONE-CHARACTER CODE - USE CODE 0064	54
OCTAS OF THIN ICE	ONE-CHARACTER CODE - USE CODE 0065	55
CHARACTERISTICS OF THIN ICE	ONE-CHARACTER CODE - USE CODE 0066	56

NOTES AND CORRECTIONS

OCTAS OF MODERATE ICE	ONE-CHARACTER CODE - USE CODE 0065	57
CHARACTERISTICS OF MODERATE ICE	ONE-CHARACTER CODE - USE CODE 0066	58
OCTAS OF HEAVY ICE	ONE-CHARACTER CODE - USE CODE 0065	59
CHARACTERISTICS OF HEAVY ICE	ONE-CHARACTER CODE - USE CODE 0066	60
DEFORMATION	ONE-CHARACTER CODE - USE CODE 0067	61
TRANSECT WIDTH (ICE)	ONE-CHARACTER CODE - USE CODE 0068	62
PLATFORM ACTIVITY	TWO-CHARACTER CODE TO DESCRIBE SURVEY PLATFORM ACTIVITY - USE CODE 0005	63
HUMAN ACTIVITY	TWO-CHARACTER CODE TO DESCRIBE THE PRINCIPAL ACTIVITY NEAR THE SIGHTING LOCATION - USE CODE 0354	65
BLANKS		67
SEQUENCE NUMBER	SEE RECORD 'B'	77

LOCATION RECORD	ALWAYS 'D' - SHOULD BE USED TO INDICATE EACH SIGHTING POSITION - MULTIPLE RECORDS MAY BE USED FOR EACH STATION. SIGHTINGS MAY BE WITHIN A TRANSIT OR FOR INCIDENTAL RANDOM SIGHTINGS. FOR STUDIES WHERE SPECIFIC LOCATIONS ARE SEARCHED AND NO SPECIES SIGHTED, THE ANIMAL SIGHTED CODE SHOULD INDICATE THE ABSENSE OF ANIMALS. IT IS SUGGESTED THAT ALL SIGHTINGS AND SEARCHES BE NUMBERED SEQUENTIALLY WITHIN EACH STATION.	10
STATION NUMBER	SEE RECORD 'B'	11
SIGHTING NUMBER	SEE RECORD 'C' - NUMBERS SHOULD AGREE WITH ASSOCIATED ENVIRONMENT RECORDS	16
SIGHTING LATITUDE	DDMMSS PLUS HEMISPHERE 'N' OR 'S'	21
SIGHTING LONGITUDE	DDDMMSS PLUS HEMISPHERE 'E' OR 'W' - IF ANIMAL IS SIGHTED AND POSITION IS SIGNIFICANTLY DIFFERENT FROM SHIP OR AIRCRAFT POSITION (GREATER THAN ONE MILE OR TWO KILOMETERS), ANIMAL POSITION RATHER THAN SHIP POSITION SHOULD BE REPORTED IF POSSIBLE	28
SIGHTING DATE	YYMMDD	36
SIGHTING TIME	XXXX (HOURS AND MINUTES)	42
ANIMAL SIGHTED CODE	ONE-CHARACTER CODE - USE TO INDICATE IF ANIMALS WERE SIGHTED - IF YES, ONE OR MORE ANIMAL SIGHTING RECORDS SHOULD BE INCLUDED FOR THIS STATION AND SIGHTING NUMBER - USE CODE 0117	46

DISTANCE OF ANIMAL(S) FROM PLATFORM	XXXX (WHOLE METERS)	47
BEARING TO ANIMAL(S)	XXX (WHOLE DEGREES TRUE)	51
DISTANCE OF ANIMAL(S) TO SHORE	XXXX (KILOMETERS TO TENTHS)	54
DISTANCE OF ANIMAL(S) TO ICE EDGE	XXXX (KILOMETERS TO TENTHS)	58
ANIMAL OR GROUP HEADING	XXX (WHOLE DEGREES TOWARD)	62
PLATFORM ALTITUDE	XXXX (WHOLE METERS) - THIS ENTRY SHOULD AGREE WITH TRANSIT VALUE IF TRANSIT RECORD IS USED	65
BLANKS		69
SEQUENCE NUMBER	SEE RECORD 'B'	77

SUMMARY SIGHTING RECORD	ALWAYS 'E' - THIS RECORD IS USED TO INDICATE THE TOTAL NUMBER OF ANIMALS SIGHTED AT EACH STATION REGARDLESS OF BEHAVIOR, SEX OR OTHER SUBGROUPS. THE SUM OF THE ADULTS, SUBADULTS AND UNKNOWN (IF REPORTED) SHOULD EQUAL THE TOTAL NUMBER OF INDIVIDUALS. THERE SHOULD BE ONE RECORD PER SPECIES SIGHTED AND SIGHTING NUMBERS SHOULD RELATE TO RECORD 'C' AND 'D' INFORMATION WITH THE SAME STATION AND SIGHTING NUMBERS.	10
STATION NUMBER	SEE RECORD 'B'	11
SIGHTING NUMBER	SEE RECORDS 'C' AND 'D'	16
TAXONOMIC CODE	TWELVE-CHARACTER CODE FOR EACH SIGHTED SPECIES - USE NODC TAXONOMIC CODES - EACH SPECIES SIGHTED SHOULD BE REPRESENTED BY A SINGLE RECORD 'E' FOR EACH SIGHTING	21
IDENTIFICATION RELIABILITY	ONE-CHARACTER CODE - USE CODE 0141	33
TOTAL NUMBER OF INDIVIDUALS	XXXXX - TOTAL NUMBER OF A SPECIES FOR THE INDIVIDUAL SIGHTING	34
CONFIDENCE	ONE-CHARACTER CODE - USE CODE 0003	39
COLLECTION METHOD	ONE-CHARACTER CODE - USE CODE 0001	40
NUMBER OF ADULTS	XXXXX - NUMBER OF ADULTS AS PART OF THE TOTAL NUMBER OF INDIVIDUALS	41

NOTES AND CORRECTIONS

NUMBER OF SUBADULTS	XXXX - NUMBER OF SUBADULTS OR IMMATURE - THOSE ANIMALS THAT HAVE NOT YET REACHED THE REPRODUCTIVE STAGE AND ARE PAST THE NURSING STAGE	46
NUMBER OF JUVENILES	XXXX - NUMBER OF PUPS, CALVES OR HATCHLINGS - THOSE ANIMALS THAT STILL REQUIRE NURSING	50
NUMBER OF UNKNOWN	XXXXX - THE NUMBER OF ANIMALS THAT CANNOT BE IDENTIFIED BY AGE GROUP	54
BLANKS		59
SEQUENCE NUMBER	SEE RECORD 'B'	77
DETAIL SIGHTING RECORD	ALWAYS 'F' - SHOULD HAVE AT LEAST ONE RECORD FOR EACH SPECIES SIGHTED - SIGHTING NUMBERS SHOULD BE THE SAME AS ASSOCIATED RECORD D AND E (AND C WHERE ENVIRONMENT DATA ARE AVAILABLE)	10
STATION NUMBER	SEE RECORD 'B'	11
SIGHTING NUMBER	SEE RECORDS 'C', 'D' AND 'E'	16
TAXONOMIC CODE	TWELVE-CHARACTER CODE FOR EACH SIGHTED SPECIES - USE NODC TAXONOMIC CODES - DIFFERENT RECORDS MUST BE USED IF MORE THAN ONE SPECIES IS SIGHTED AT A STATION OR INDIVIDUALS ARE SPECIFIED FOR SPECIAL MARKS, BEHAVIORS, ETC	21
IDENTIFICATION RELIABILITY	ONE-CHARACTER CODE - USE CODE 0141	33
NUMBER OF INDIVIDUALS	XXXXX - NUMBER FOR THE SIGHTINGS FOR EACH BEHAVIOR CHARACTERISTIC, SEX, ETC	34
CONFIDENCE	ONE-CHARACTER CODE - USE CODE 0003	39
COLLECTION METHOD	ONE-CHARACTER CODE - USE CODE 0001	40
PREDOMINANT BEHAVIOR OF ANIMAL OR GROUP	THE FOLLOWING BEHAVIOR CODES USED TO DESCRIBE UP TO THREE MOST PREDOMINANT BEHAVIORS DURING THE TIME AND POSITION OF SIGHTING - CODE FROM LEFT TO RIGHT IN THE ORDER OF DECREASING IMPORTANCE	
BEHAVIOR I	TWO-CHARACTER CODE - USE CODE 0139	41
BEHAVIOR II	TWO-CHARACTER CODE - USE CODE 0139	43
BEHAVIOR III	TWO-CHARACTER CODE - USE CODE 0139	45
NUMBER OF GROUPS	XX - THE NUMBER OF DISCRETE SUBUNITS OF THE NUMBER OF EACH SPECIES SIGHTED, IF ANIMALS ARE DIVIDED INTO GROUPS. USE 01 IF NO DEFINITE DIVISION IS OBSERVED	47

NOTES AND CORRECTIONS

GROUP SIZE	ONE-CHARACTER CODE - USE THE CODE TO FIT THE MODAL OR MOST COMMONLY OBSERVED GROUP SIZE IF FEASIBLE - USE CODE 0356	49
NUMBER OF ADULTS	XXXXX - NUMBER OF ADULTS AS PART OF THE NUMBER OF INDIVIDUALS FOR THIS RECORD	50
NUMBER OF SUBADULTS	XXXX - SAME AS ABOVE FOR SUBADULTS OR IMMATURE - THOSE ANIMALS THAT HAVE NOT YET REACHED THE REPRODUCTIVE STAGE AND ARE PAST THE NURSING STAGE	55
NUMBER OF JUVENILES	XXXX - SAME AS ABOVE FOR PUPS, CALVES OR HATCHLINGS - THOSE INDIVIDUALS THAT STILL REQUIRE NURSING	59
NUMBER OF ADULT MALES	XXXX - SAME AS ABOVE FOR ADULT MALES	63
NUMBER OF ADULT FEMALES	XXXX - SAME AS ABOVE FOR ADULT FEMALES -	67
SPECIAL MARKS OR TAGS	ONE-CHARACTER CODE TO INDICATE THE TYPE OF TAGS OR MARKINGS - GENERALLY WOULD REFER TO INDIVIDUAL ANIMAL - FURTHER INFORMATION MAY BE INCLUDED IN TEXT RECORDS USE CODE 0062	71
DECOMPOSITION	ONE-CHARACTER CODE - USE CODE 0004	72
PHOTOS TAKEN	ONE-CHARACTER CODE - USE TEXT RECORDS FOR MORE DETAILED INFORMATION ON PHOTOS - USE CODE 0117	73
DIVE TIME	XX - TIME TO NEAREST WHOLE MINUTE - DATA SHOULD REFER TO THE INDIVIDUAL ANIMAL SPECIFIED IN THE TAXONOMIC CODE FIELD OF THIS DATA RECORD	74
BLANK		76
SEQUENCE NUMBER	SEE RECORD 'B'	77
TEXT RECORD	ALWAYS 'T' - THIS RECORD CAN BE USED FOR COMMENTS PERTAINING TO INDIVIDUAL SIGHTINGS OR FOR GENERAL COMMENTS BY LEAVING THE SIGHTING NUMBER BLANK AND PLACING THE TEXT RECORD OR RECORDS IN THE PROPER SEQUENCE WITHIN THE FILE ID	10
STATION NUMBER	SEE RECORD 'B'	11
SIGHTING NUMBER	SEE RECORD 'C' AND 'D'	16
TEXT	57-CHARACTER FIELD FOR COMMENTS - MULTIPLE RECORDS MAY BE USED	21
SEQUENCE NUMBER	SEE RECORD 'B'	77

NOTES AND CORRECTIONS

THE FOLLOWING CODES ARE USED IN FILE TYPE 127

0001 COLLECTION METHOD

1 -- VISUAL COUNT - THE OBSERVER COUNTED EACH ANIMAL VISUALLY AT THE TIME OF SIGHTING. NUMBERS IN A FEW SMALL GROUPS MAY HAVE BEEN ESTIMATED BUT THE NUMBER RECORDED IS BELIEVED TO BE QUITE CLOSE TO THE NUMBER SEEN.
2 -- VISUAL ESTIMATE - USUALLY USED ONLY FOR GROUPS OF ANIMALS WHEN A VISUAL COUNT IS IMPOSSIBLE. THIS METHOD MAY BE VERY INACCURATE PARTICULARLY FOR LARGE GROUPS OF ANIMALS AND THE COUNTS SHOULD BE USED CAUTIOUSLY.
3 -- PHOTOGRAPHIC COUNT - ALSO USED FOR GROUPS OF ANIMALS. GROUPS ARE PHOTOGRAPHED AND THE NUMBER DETERMINED BY COUNTING INDIVIDUALS ON THE PHOTOS AT A LATER DATA. IN SOME CASES THE PHOTO COUNT MAY BE SUPPLEMENTED BY A VISUAL COUNT OF ANIMALS NOT PHOTOGRAPHED. PHOTOGRAPHIC COUNTS ARE MORE RELIABLE THAN VISUAL ESTIMATES BUT SOME ERRORS DUE TO TECHNICAL PROBLEMS ARE POSSIBLE.
4 -- ACOUSTIC COUNT

0002 COMPLETENESS

1 -- AREA OR STATION COMPLETELY SURVEYED(FOR SEA OTTER SURVEYS,PLATFORM LOCATED SO THAT ALL SHORELINE, OFFSHORE ROCKS, ETC. WITHIN SURVEY TRACKS).
2 -- AREA OR STATION PARTIALLY SURVEYED(FOR SEA OTTER SURVEYS, SOME PORTION OF SHORELINE, ETC NOT WITHIN SURVEY TRACKS.

0003 CONFIDENCE

0 -- NO ERROR
1 -- +1
2 -- +2
3 -- +5
4 -- +10
5 -- +25
6 -- +50
7 -- +100
8 -- +1000
9 -- INDICATES "AT LEAST" FOR GROUP COUNT. USUALLY FOR SMALL GROUPS OF LESS THAN 10 INDIVIDUALS WHERE A CERTAIN NUMBER MIGHT SURFACE SIMULTANEOUSLY BUT MORE ARE SUSPECTED.
A -- ESTIMATE - NO INDICATION OF CONFIDENCE LEVEL
B -- NUMBER OF ANIMALS UNKNOWN

0004 DECOMPOSITION STAGE

-- BLANK - NO INFORMATION
0 -- INDETERMINABLE
1 -- LESS THAN 3 MONTHS
2 -- MORE THAN 6 MONTHS

3 -- BETWEEN 3 AND 6 MONTHS
4 -- SHELL AND BODY INTACT (TURTLES) - LITTLE OR NO FOUL ODOR OR BLOATING
5 -- SHELL FALLING APART (TURTLES) - BODY BLOATING AND DISCOLORED, STRONG FOUL ODOR
6 -- SKELETON

0005 PLAT ACTIV (MAMMALS)

01 -- TOP QUALITY TRANSECT WORK-WATCH EFFORT, POSITIONS(+1NM)AND SPECIES I.D. AS RELIABLE AS POSSIBLE
02 -- TRANSECT WORK - GOOD POSITION (+ 1NM) AND TRANSIT DATA. SPECIES I.D. FAIR.
03 -- TRANSECT WORK - GOOD POSITION (+ 1NM) AND TRANSIT DATA. SPECIES I.D. POOR.
04 -- TRANSECT WORK - TIMES ARE RELIABLE, POSITIONS ACCURATE TO + 5 NAUTICAL MILES. SPECIES I.D. GOOD.
05 -- TRANSECT WORK - TIMES RELIABLE, POSITIONS ACCURATE TO + 5 NAUTICAL MILES. SPECIES I.D. FAIR.
06 -- TRANSECT WORK - TIMES ARE RELIABLE, POSITIONS ACCURATE TO + 5 NAUTICAL MILES. SPECIES I.D. POOR.
09 -- PLATFORM IN TRANSIT, MMO (MARINE MAMMAL OBSERVER) ABOARD, TRANSECT DATA.
10 -- PLATFORM IN TRANSIT, NO MMO ABOARD, TRANSECT DATA.
11 -- PLATFORM IN TRANSIT WITH MMO ABOARD.
12 -- PLATFORM IN TRANSIT WITH NO MMO ABOARD.
13 -- PLATFORM ENGAGED IN LOCALIZED WORK WITH MMO ABOARD(OCEANOGRAPHIC, TRAWLING, ETC.).
14 -- PLATFORM ENGAGED IN LOCALIZED WORK WITH NO MMO ABOARD.
15 -- MIGRATION WATCH FROM STATIONARY PLATFORM BY MMO.
16 -- BEHAVIORAL WATCH FROM STATIONARY PLATFORM BY MMO.
17 -- PLATFORM AT ANCHOR OR MOORED, MMO.
18 -- PLATFORM AT ANCHOR OR MOORED, NO MMO.
19 -- ROOKERY AND HAULING AREA CENSUS WORK.
98 -- SINGLE SIGHTING REPORTS BY NON MMO.

0006 SURFACE VISIBILITY

1 -- EXCELLENT - SURFACE OF WATER CALM, USUALLY A HIGH OVERCAST SKY WITH NO SUN GLARE. SEA OTTERS APPEAR DARK AGAINST A UNIFORMLY LIGHT GRAY BACKGROUND OF THE WATER'S SURFACE. INDIVIDUALS EASILY DISTINGUISHED AT A DISTANCE.
2 -- VERY GOOD - MAY BE LIGHT RIPPLE ON WATER'S SURFACE OR SLIGHTLY UNEVEN LIGHTING BUT STILL RELATIVELY EASY TO DISTINGUISH INDIVIDUALS AT A DISTANCE.
3 -- GOOD - MAY BE LIGHT CHOP, SOME SUN GLARE OR SHADOWS. INDIVIDUALS AT A DISTANCE MAY BE DIFFICULT TO DISTINGUISH BUT INDIVIDUALS NEARBY AND SMALL GROUPS AT A DISTANCE ARE READILY IDENTIFIED.
4 -- FAIR - USUALLY CHOPPY WAVES AND STRONG SUN GLARE OR DARK SHADOWS IN PART OF THE SURVEY TRACK. INDIVIDUALS IN KELP BEDS, IN THE LEE OF ROCKS, OR NEAR THE OBSERVER AND MOST PODS READILY IDENTIFIED BUT MOST INDIVIDUALS AND SOME PODS IN AREAS OF POOR LIGHTING OR AT A DISTANCE DIFFICULT TO DISTINGUISH.
5 -- POOR - INDIVIDUALS DIFFICULT TO DISTINGUISH UNLESS VERY CLOSE AND SOME PODS AT A DISTANCE MAY BE MISSED, HOWEVER CONDITIONS STILL GOOD ENOUGH TO GIVE A VERY ROUGH IMPRESSION OF THE DISTRIBUTION OF ANIMALS.
6 -- UNACCEPTABLE - HEAVY CHOP WITH MANY WHITECAPS, LIGHTING POOR OR LARGE WAVES BREAKING ON ROCKS. NO SURVEYS SHOULD BE CONDUCTED UNDER THESE CONDITIONS BUT OCCASIONALLY A SIGHTING OF SIGNIFICANCE MAY BE MADE IN THE COURSE OF OTHER ACTIVITIES.

0035 GLARE INTENSITY

0 -- SLIGHT SUN GLARE
1 -- MODERATE SUN GLARE
2 -- INTENSE SUN GLARE
3 -- SLIGHT CLOUD GLARE
4 -- MODERATE CLOUD GLARE
5 -- INTENSE CLOUD GLARE
6 -- SLIGHT MOON GLARE
7 -- MODERATE MOON GLARE
8 -- INTENSE MOON GLARE
9 -- NO GLARE

0051 WATER COLOR

01 -- PERCENT YELLOW 0 FOREL-ULE SCALE I
02 -- PERCENT YELLOW 2 FOREL-ULE SCALE II
03 -- PERCENT YELLOW 5 FOREL-ULE SCALE III
04 -- PERCENT YELLOW 9 FOREL-ULE SCALE IV
05 -- PERCENT YELLOW 14 FOREL-ULE SCALE V
06 -- PERCENT YELLOW 20 FOREL-ULE SCALE VI
07 -- PERCENT YELLOW 27 FOREL-ULE SCALE VII
08 -- PERCENT YELLOW 35 FOREL-ULE SCALE VIII
09 -- PERCENT YELLOW 44 FOREL-ULE SCALE IX
10 -- PERCENT YELLOW 54 FOREL-ULE SCALE X
11 -- PERCENT YELLOW 65 PERCENT BROWN 0 FOREL-ULE SCALE XI
12 -- PERCENT BROWN 2 FOREL-ULE SCALE XII
13 -- PERCENT BROWN 5 FOREL-ULE SCALE XIII
14 -- PERCENT BROWN 9 FOREL-ULE SCALE XIV
15 -- PERCENT BROWN 14 FOREL-ULE SCALE XV
16 -- PERCENT BROWN 20 FOREL-ULE SCALE XVI
17 -- PERCENT BROWN 27 FOREL-ULE SCALE XVII
18 -- PERCENT BROWN 35 FOREL-ULE SCALE XVIII
19 -- PERCENT BROWN 44 FOREL-ULE SCALE XIX
20 -- PERCENT BROWN 54 FOREL-ULE SCALE XX
21 -- PERCENT BROWN 65 FOREL-ULE SCALE XXI
31 -- GREEN
32 -- BLUE
33 -- GREY
34 -- RED
35 -- CHALKY
36 -- BROWN
37 -- LUMINESCENT

0052 WIND FORCE(BEAUFORT)

0 -- CALM MEAN VELOCITY IN KNOTS <1 IN METERS/SEC 0-0.2 IN KM/H <1 IN M.P.H. <1 /WAVE HT < .25 FT

0063 PLATFORM ID-SHIP

001 -- OCEANOGRAPHER
002 -- DISCOVERER
003 -- SURVEYOR
004 -- FAIRWEATHER
005 -- RAINIER
006 -- MILLER FREEMAN
007 -- MACARTHUR
008 -- DAVIDSON
009 -- DAVID STARR JORDAN
010 -- OREGON
011 -- COBB
012 -- KELEZ
013 -- PRIBILOF
014 -- TOWNSEND CROMWELL
051 -- MV E.L. BARTLETT
052 -- MV TUSTUMENA
053 -- MV WICKERSHAM
054 -- MV MATANUSKA
055 -- MV TAKU
056 -- MALASPINA
057 -- MV COLUMBIA
071 -- RV ALPHA HELIX
072 -- RV RESOLUTION
073 -- RV ACONA
074 -- RV THOMAS G. THOMPSON
075 -- RV TORDENSKJOLD
076 -- RV MOANA WAVE
077 -- TONQUIN
078 -- MONTAGUE
079 -- PROF. SEIDLICH
080 -- S.P. LEE (USGS)
201 -- NEW ST. JOSEPH
202 -- MARK I
203 -- DISCOVERY
204 -- TRINITY
205 -- TACOMA
206 -- HARMONY
207 -- MORNINGSTAR
208 -- LYNN ANN
209 -- G.B. REED
210 -- NORDIC PRINCE
211 -- ALEUTIAN TERN
212 -- SURFBIRD
213 -- LINDBLAD EXPLORER
214 -- GLACIER QUEEN

215 -- BARTLETT
216 -- SHELBY D
217 -- YANKEE CLIPPER
218 -- AIKANE
219 -- ORIENT
220 -- CARTER
221 -- DIAKAN
222 -- LINDY
223 -- ST.MICHAEL
224 -- YAQUINA
225 -- WINDWARD
226 -- PAT SAN MARIE
227 -- CHINA BEAR
228 -- ANNA MARIE
229 -- SUSETTA
230 -- FLYING CLOUD
301 -- USCGC POLAR STAR
302 -- USCGC CONFIDENCE
303 -- USCGC BOUTWELL
304 -- USCGC STORIS
305 -- USCGC GLACIER
306 -- USCGC WINONA
307 -- USCGC IRIS
308 -- USCGC MINNETONKA
310 -- USCGC IRONWOOD
311 -- USCGC MIDGETT
312 -- USCGC RUSH
313 -- USCGC MODOC
314 -- USCGC MELLON
315 -- USCGC RESOLUTE
316 -- USCGC CAMPBELL
317 -- USCGC YOCONA
318 -- USCGC JARVIS
319 -- USCGC BURTON ISLAND
320 -- USCGC MORGENTHAU
401 -- MARANATHA
402 -- OLE B
499 -- UNIDENTIFIED TROLLER
520 -- ALERT
521 -- VIGILANT
522 -- UNIMAK
523 -- VIGOROUS
524 -- USCG INGHAM
525 -- ACTIVE
526 -- TAMAROA
527 -- TANEY
528 -- CHILULA
529 -- DECISIVE

530 -- ALBATROSS IV
531 -- MT. MITCHELL
532 -- DELAWARE
533 -- ADVANCE
534 -- WIECZNO
535 -- ANTON DOHRN
536 -- ARGUS
537 -- ALLIOT
538 -- HENLOPEN
539 -- OCEANUS
540 -- ANNANDALE
541 -- ENDEAVOR
542 -- CHALLENGE
543 -- MISS OCEAN CITY
544 -- DOLPHIN III
545 -- CAPTAIN APPLEGATE
546 -- FLYING SORCERESS
547 -- BLOCK ISLAND FERRY
548 -- MARINE EVANGELINE
549 -- ALASKAN SEAHORSE
550 -- SUB SIG
551 -- WALTER E. PHIPPS
552 -- SUNBEAM (MARINE SEACOAST MISSION)
553 -- EDGERTON
554 -- EASTWARD
555 -- MISC. OPPORTUNISTIC/HISTORICAL SHIP
556 -- COAST GUARD THERMOGRAPHY
557 -- FISHERIES PATROL-USCG-CAPE COD
558 -- FISHERIES PATROL-USCG-CAPE HATTERAS
559 -- CHEROKEE
560 -- DUANE
561 -- SHERMAN
562 -- RELIANCE
563 -- BELAGORSK
564 -- BELUGA
565 -- JERE A. CHASE
566 -- R/V TRIDENT
567 -- R/V REGINA MARIS
568 -- R/V WESTWARD
569 -- STONE HORSE
570 -- R/V THREE OF A KIND
571 -- M/V WHEN AND IF
572 -- CHRISTINA M
573 -- F/V TWO BROTHERS
574 -- YANKEE CAPT'S
575 -- SEA DOLL MEDITATION
576 -- CARIBE
577 -- BLUE NOSE FERRY

578 -- ELIZABETH
579 -- ATLANTIC TWIN
580 -- TIOGA
581 -- BAGATELLE
582 -- STATE OF MAINE
583 -- VIKING QUEEN
584 -- VIKING STARSHIP
585 -- BELAGORSK
→586 -- EVRIKA
→587 -- BLUE FIN
655 -- MISC NON-SHIP NON-AIRCRAFT SOURCES
950 -- MR. RODNEY JUDY (AERIAL)
990 -- UNIDENTIFIED ALASKAN FERRY
991 -- UNIDENTIFIED ALASKA ENFORCEMENT
992 -- UNIDENTIFIED U.S. COAST GUARD
993 -- MR TERRY WAHL
994 -- NMFS FOREIGN VESSEL PROGRAM
995 -- IPHC (HALIBUT COMMISSION)
→997 -- U.S. FISH AND WILDLIFE SERVICE
998 -- MISC.-TO HANDLE SINGLE REPORTS FROM ONE VESSEL WHICH IS NOT EXPECTED TO REPORT AGAIN. VESSEL SHOULD BE IDENTIFIED ON COMMENTS CARD.
999 -- NMFS MARINE MAMMAL DIVISION

0064 ICE TYPE

1 -- DRIFTING ICE
2 -- LAND FAST OR ANCHORED ICE
3 -- OPEN WATER

0065 ICE COVERAGE

0 -- 0 OCTAS (NO COVERAGE)
1 -- 1 OCTAS (1/8)
2 -- 2 OCTAS (2/8)
3 -- 3 OCTAS (3/8)
4 -- 4 OCTAS (4/8)
5 -- 5 OCTAS (5/8)
6 -- 6 OCTAS (6/8)
7 -- 7 OCTAS (7/8)
8 -- 8 OCTAS (8/8)

0066 ICE CHARACTERISTICS

1 -- GREASE ICE
2 -- SLUSH OR BRASH ICE
3 -- PANCAKE ICE
4 -- FLOES LESS THAN 10 M.
5 -- FLOES BETWEEN 10 AND 30 M.

6 -- FLOES BETWEEN 30 AND 100 M.
7 -- FLOES BETWEEN 100 AND 200 M.
8 -- FLOES GREATER THAN 200 M.

0067 ICE DEFORMATION

1 -- LESS THAN FIVE PERCENT OF AREA DEFORMED
2 -- FIVE TO TWENTY PERCENT DEFORMED
3 -- TWENTY TO FIFTY PERCENT DEFORMED
4 -- FIFTY PERCENT OR GREATER DEFORMED

0068 ICE TRANSECT WIDTH

1 -- LESS THAN 1/8 NAUTICAL MILE
2 -- 1/8 TO 1/4 NAUTICAL MILE
3 -- 1/4 TO 1/2 NAUTICAL MILE
4 -- 1/2 TO 1 NAUTICAL MILE
5 -- 1 TO 4 NAUTICAL MILES
6 -- GREATER THAN 4 NAUTICAL MILES

0100 PLATFORM TYPE

1 -- RESEARCH SHIP
2 -- NON-SPECIALIZED SHIP
3 -- SATELLITE
4 -- BALLOON
5 -- AIRPLANE
6 -- ANCHORED BUOY
7 -- DRIFTING BUOY
8 -- SUBMERGED FLOAT, ANCHORED
9 -- SUBMERGED FLOAT, DRIFTING
A -- FIXED PLATFORM
B -- FIXED COASTAL STATION/FIXED SHORE STATION
C -- DRIFTING ICE
D -- SUBMERSIBLE
E -- HELICOPTER
F -- SHORE OBSERVER (AUTO OR FOOT)
G -- ICE STATION
H -- GOOSE (AMPHIBIOUS AIRCRAFT)
J -- P2V (AIRCRAFT)
K -- SMALL BOAT
L -- FISHING SHIPS
M -- FERRYS
N -- TUGS OR WORK BOATS
P -- PRIVATE YACHTS
Q -- CHARTER BOATS

0105 CLOUD AMT (WMO2700)

0 -- 0 (ZERO)
1 -- 1 OKTA OR LESS, BUT NOT ZERO (1/10 OR LESS, BUT NOT ZERO)
2 -- 2 OKTAS 2/10-3/10
3 -- 3 OKTAS 4/10
4 -- 4 OKTAS 5/10
5 -- 5 OKTAS 6/10
6 -- 6 OKTAS 7/10-8/10
7 -- 7 OKTAS OR MORE, BUT NOT 8 OKTAS (9/10 OR MORE, BUT NOT 10/10)
8 -- 8 OKTAS 10/10
9 -- SKY OBSCURED, OR CLOUD AMOUNT CANNOT BE ESTIMATED

0116 DEBRIS

-- BLANK - NO INFORMATION
0 -- INDETERMINABLE
1 -- WOOD
2 -- SEAWEED
3 -- FUCUS
4 -- FOAM LINE
5 -- OFFAL
6 -- OTHER SHIP - ACTIVITY NOT NOTED
7 -- OTHER SHIP - FISHING
8 -- OTHER SHIP - DUMPING
9 -- NONE
A -- OIL SLICK - UNIDENTIFIED
B -- OIL SLICK - WHALE/FISH
C -- OIL SLICK - PROCESSING BY-PRODUCT
D -- OIL SLICK - PETROLEUM
E -- OWN SHIP-DUMPING
F -- FLOTSAM (NATURAL ORIGIN)
G -- JETSAM (HUMAN ORIGIN)
H -- COMBINATION OF DEBRIS

0117 DECISION

-- BLANK - NO INFORMATION
N -- NO
Y -- YES

0139 BEHAVIOR (027)

-- BLANK - NULL CODE - NO BEHAVIOR INFORMATION AVAILABLE
01 -- NO SPECIFIC BEHAVIOR OTHER THAN IN THE WATER(USE 01-30 FOR BEHAVIOR IN THE WATER)
02 -- SLEEPING
03 -- COURTSHIP OR BREEDING BEHAVIOR

04 -- FEEDING
05 -- MOTHER WITH YOUNG
06 -- AGGRESSIVE
07 -- NON-SPECIFIC CONTACT/PLAY
08 -- BOW RIDING
09 -- PORPOISING
10 -- FOLLOWING VESSEL (E.G., SEA LIONS FOLLOWING A FISHING VESSEL)
11 -- ROBBING FISH NETS
12 -- ASSOCIATED WITH CETACEA
13 -- ASSOCIATED WITH PINNIPED
14 -- ASSOCIATED WITH BIRDS
15 -- ASSOCIATED WITH CETACEA AND BIRDS
16 -- ASSOCIATED WITH PINNIPEDS AND BIRDS
17 -- ASSOCIATED WITH PINNIPEDS AND CETACEANS
18 -- ASSOCIATED WITH PINNIPEDS, CETACEANS AND BIRDS
19 -- ASSOCIATED WITH KELP
20 -- AASSOCIATED WITH SHRIMP, EUPHAUSIDS, ETC.
21 -- ASSOCIATED WITH SCHOOL OF BAITFISH (LENGTH<18 IN.)
22 -- ASSOCIATED WITH LARGER FISH (LENGTH > 18 IN.)
23 -- ASSOCIATED WITH CONCENTRATION OF SQUID
24 -- ASSOCIATED WITH VESSEL AND CETACEAN
25 -- ASSOCIATED WITH VESSEL AND PINNIPED
26 -- SYNCHRONOUS DIVING
27 -- DEAD ANIMAL
28 -- BREACHING
29 -- AVOIDANCE
30 -- TAIL LOBING
31 -- NO SPECIFIC BEHAVIOR NOTED(USE 31-60 FOR BEHAVIOR ON LAND)
32 -- SLEEPING
33 -- BREEDING AND PUPPING (ROOKERY)
34 -- FEEDING
35 -- MOTHER WITH YOUNG
36 -- MOTHER WITH YOUNG NURSING
37 -- AGGRESSIVE
38 -- NON-SPECIFIC CONTACT/PLAY
39 -- THERMOREGULATORY
40 -- DEAD ANIMAL
50 -- CRAWLING UP BEACH
51 -- DIGGING HOLE
52 -- LAYING EGGS
53 -- COVERING HOLE
54 -- CRAWLING TOWARDS SEA
55 -- YOUNG HATCHING
56 -- HAULED OUT ON BEACH
57 -- HAULED OUT ON ROCKS
61 -- NO SPECIFIC BEHAVIOR NOTED (USE 61-80 FOR BEHAVIOR ON ICE)
62 -- SLEEPING
63 -- BREEDING AND PUPPING ROOKERY

64 -- FEEDING
65 -- MOTHER WITH YOUNG NURSING
66 -- MOTHER WITH YOUNG
67 -- AGGRESSIVE
68 -- NON-SPECIFIC CONTACT/PLAY
69 -- DEAD ANIMAL
81 -- HAULED ON FLOATING DEBRIS (NOT ICE)
90 -- SPYHOPPING - A PASSIVE BEHAVIOR OF CETACEANS IN WHICH THE HEAD IS HELD OUT OF THE WATER IN A VERTICAL POSITION
91 -- ROOSTER-TAILING
A1 -- AEROBATICS
A2 -- SWIMMING UPSIDE DOWN
A3 -- SWIMMING ON SIDE
A4 -- SWIMMING AT SURFACE
A5 -- SWIMMING BELOW SURFACE
A6 -- FLIPPERING
A7 -- DEEP DIVE - FLUKES NOT VISIBLE
A8 -- DEEP DIVE - FLUKES VISIBLE
A9 -- VISIBLE BLOW
B1 -- BLOW NOT VISIBLE
B2 -- RESPIRATION INTERVALS RECORDED
B3 -- DIVE INTERVALS RECORDED
B4 -- MOTIONLESS BELOW THE SURFACE ANIMAL LYING ON SIDE
B5 -- STRANDED
B6 -- APPARENTLY INFLUENCED BY VESSEL
B7 -- MOTIONLESS AT SURFACE
B8 -- APPARENT VESSEL AVOIDANCE
B9 -- APPARENTLY ATTRACTED BY VESSEL
C1 -- APPARENTLY NOT INFLUENCED BY VESSEL
C2 -- IN TRANSIT
C3 -- CIRCULAR MOVEMENTS
C4 -- DEFECATION
C5 -- SEEN CLOSE TO FISHING GEAR
C6 -- MOTIONLESS BELOW THE SURFACE VENTRAL SIDE UP
C7 -- APPARENT CALVING
C8 -- PENIS OBSERVED
C9 -- BODY CONTACT NOT BELLY TO BELLY
D1 -- DOLPHIN(S) BOWRIDING WHALE ROSTRUM
D2 -- SYNCHRONOUS SWIMMING
D3 -- SYNCHRONOUS BREATHING
D4 -- SHALLOW DIVE
D5 -- ANIMAL ATTRACTED BY OTHER VESSEL
D6 -- BUBBLES OBSERVED
D7 -- BELLY TO BELLY SWIMMING (MATING?)
D8 -- ASSOCIATED WITH JELLYFISH
D9 -- ASSOCIATED WITH SHARKS
E1 -- DISTINCT SUBGROUPS
E2 -- APPARENT COOPERATION BETWEEN INDIVIDUALS

E3 -- SOUNDS PRODUCED
E4 -- OBSERVED IN OIL SLICK
E5 -- ABNORMAL BEHAVIOR
F1 -- ASSOCIATED WITH A PHYSICAL OCEANOGRAPHIC FEATURE
F2 -- SOUND RECORDINGS MADE
F3 -- APPARENT OIL AVOIDANCE
F4 -- APPARENT OIL ATTRACTION
F5 -- ANIMALS IN CONTACT WITH OIL
F6 -- APPARENTLY NOT INFLUENCED BY OIL
F7 -- CHANGE IN HEADING OF GROUP
F8 -- CHANGE IN GROUP STRUCTURE
F9 -- DIVING TURTLES
G1 -- APPARENT SPEED OF MOVEMENT-FAST SWIM (>10 KNOTS)
G2 -- APPARENT SPEED OF MOVEMENT-MODERATE SWIM (1-10 KNOTS)
G3 -- APPARENT SPEED OF MOVEMENT-SLOW SWIM (LT OR EQ TO 1 KNOT)
G4 -- OBVIOUS CHANGE IN SPEED
G5 -- SWIMMING STEADILY IN ONE DIRECTION
G6 -- MILLING
G7 -- THRASHING-VIOLENT BEHAVIOR
G8 -- TANGLED IN FISHING GEAR
G9 -- UNCODEABLE BEHAVIOR (DESCRIPTION IN TEXT RECORD)

0141 IDENT. RELIABILITY

0 -- UNSURE
1 -- PROBABLE
2 -- SURE

0159 WEATHER (WMO4677)

00 -- CLOUD DEVELOP. NOT OBSERVED OR NOT OBSERVABLE-CHAR. CHANGE OF THE STATE OF SKY DURING PAST HOUR
01 -- CLOUDS GENERALLY DISSOLVING OF BECOMING LESS DEVELOPED-CHAR. CHANGE OF STATE OF SKY DURING PAST HR.
02 -- STATE OF SKY ON THE WHOLE UNCHANGED-CHAR. CHANGE OF THE STATE OF SKY DURING THE PAST HOUR
03 -- CLOUDS GENERALLY FORMING OR DEVELOPING-CHAR. CHANGE OF THE STATE OF SKY DURING THE PAST HOUR
04 -- VISIBILTY REDUCED BY SMOKE, E.G. VELDT OF FOREST FIRES, INDUSTRIAL SMOKE OR VOLCANIC ASHES
05 -- HAZE
06 -- WIDESPREAD DUST IN SUSPENSION IN THE AIR, RAISED BY WIND AT OR NEAR THE STATION AT TIME OF OBS.
07 -- DUST OR SAND RAISED BY WIND AT OR NEAR THE STATION AT THE TIME OF OBSERVATION, BUT NO WELL DEVELOPED DUST WHIRL(S) OR SAND WHIRL(S), AND NO DUSTSTORM OR SANDSTORM SEEN
08 -- WELL DEVELOP. DUST WHIRL(S) OR SAND WHIRL(S) SEEN AT OR NEAR STATION DURING THE PRECEDING HOUR OR AT THE TIME OF OBSERVATION, BUT NO DUSTSTORM OR SANDSTORM
09 -- DUSTSTORM OR SANDSTORM WITHIN SIGHT AT THE TIME OF OBSERVA., OR AT STATION DURING PRECEDING HOUR
10 -- MIST
11 -- PATCHES OF SHALLOW FOG OR ICE FOG AT THE STATION, WHETHER ON LAND OR SEA, NOT DEEPER THAN ABOUT 2 METERS ON LAND OR 10 METERS AT SEA
12 -- MORE OR LESS CONTINUOUS SHALLOW FOG OR ICE FOG AT THE STATION, WHETHER ON LAND OR SEA, NOT DEEPER THAN ABOUT 2 M ON LAND OR 10 M AT SEA
13 -- LIGHTNING VISIBLE, NO THUNDER HEARD

14 -- PRECIPITATION WITHIN SIGHT, NOT REACHING THE GROUND OR THE SURFACE OF THE SEA
15 -- PRECIPITATION WITHIN SIGHT, REACHING THE GROUND OR THE SURFACE OF THE SEA, BUT DISTANT(I.E. ESTIMATED TO BE MORE THAN 5 KM) FROM THE STATION
16 -- PREC. WITHIN SIGHT, REACHING GROUND OR SURFACE OF THE SEA, NEAR TO, BUT NOT AT THE STATION
17 -- THUNDERSTORM, BUT NO PRECIPITATION AT THE TIME OF OBSERVATION
18 -- SQUALLS AT OR WITHIN SIGHT OF THE STATION DURING THE PRECEDING HOUR OR AT TIME OF OBSERVATION
19 -- FUNNEL CLOUD(S) AT OR WITHIN SIGHT OF STATION DURING PRECEDING HOUR OR AT THE TIME OF OBSERVATION
20 -- DRIZZLE (NOT FREEZING) OR SNOW GRAINS - NOT FALLING AS SHOWER(S)
21 -- RAIN (NOT FREEZING) - NOT FALLING AS SHOWER(S)
22 -- SNOW - NOT FALLING AS SHOWER(S)
23 -- RAIN AND SNOW OR ICE PELLETS, TYPE (A) - NOT FALLING AS SHOWER(S)
24 -- FREEZING DRIZZLE OR FREEZING RAIN - NOT FALLING AS SHOWER(S)
25 -- SHOWER(S) OF RAIN - NOT FALLING AS SHOWER(S)
26 -- SHOWER(S) OF SNOW, OR OF RAIN AND SNOW - NOT FALLING AS SHOWER(S)
27 -- SHOWER(S) OF HAIL, OR OF RAIN AND HAIL - NOT FALLING AS SHOWER(S)
28 -- FOG OR ICE FOG - NOT FALLING AS SHOWER(S)
29 -- THUNDERSTORM (WITH OR WITHOUT PRECIPITATION)
30 -- SLIGHT OR MODERATE DUSTSTORM OR SANDSTORM-HAS DECREASED DURING THE PRECEDING HOUR
31 -- SLIGHT OR MODERATE DUSTSTORM OR SANDSTORM-NO APPRECIABLE CHANGE DURING THE PRECEDING HOUR
32 -- SLIGHT OR MODERATE DUSTSTORM OR SANDSTORM-HAS BEGUN OR HAS INCREASED DURING THE PRECEDING HOUR
33 -- SEVERE DUSTSTORM OR SANDSTORM-HAS DECREASED DURING THE PRECEDING HOUR
34 -- SEVERE DUSTSTORM OR SANDSTORM-NO APPRECIABLE CHANGE DURING THE PRECEDING HOUR
35 -- SEVERE DUSTSTORM OR SANDSTORM-HAS BEGUN OR HAS INCREASED DURING THE PRECEDING HOUR
36 -- SLIGHT OR MODERATE BLOWING SNOW-GENERALLY LOW (BELOW EYE LEVEL)
37 -- HEAVY DRIFTING SNOW-GENERALLY LOW (BELOW EYE LEVEL)
38 -- SLIGHT OR MODERATE BLOWING SNOW-GENERALLY HIGH (ABOVE EYE LEVEL)
39 -- HEAVY BLOWING SNOW-GENERALLY HIGH (ABOVE EYE LEVEL)
40 -- FOG OR ICE FOG AT A DISTANCE AT TIME OF OBSERVATION, BUT NOT AT THE STATION DURING THE PRECEDING HOUR, THE FOG OR ICE FOG EXTENDING TO A LEVEL ABOVE THAT OF THE OBSERVER
41 -- FOG OR ICE FOG IN PATCHES
42 -- FOG OR ICE FOG, SKY VISIBLE-HAS BECOME THINNER DURING THE PRECEDING HOUR
43 -- FOG OR ICE FOG, SKY INVISIBLE-HAS BECOME THINNER DURING THE PRECEDING HOUR
44 -- FOG OR ICE FOG SKY VISIBLE-NO APPRECIABLE CHANGE DURING THE PRECEDING HOUR
45 -- FOG OR ICE FOG, SKY INVISIBLE-NO APPRECIABLE CHANGE DURING THE PRECEDING HOUR
46 -- FOG OR ICE FOG, SKY VISIBLE-HAS BEGUN OR HAS BECOME THICKER DURING THE PRECEDING HOUR
47 -- FOG OR ICE FOG, SKY INVISIBLE-HAS BEGUN OR HAS BECOME THICKER DURING THE PRECEDING HOUR
48 -- FOG, DEPOSITING RIME, SKY VISIBLE
49 -- FOG, DEPOSITING RIME, SKY INVISIBLE
50 -- DRIZZLE, NOT FREEZING, INTERMITTENT-SLIGHT AT TIME OF OBSERVATION
51 -- DRIZZLE, NOT FREEZING, CONTINUOUS-SLIGHT AT TIME OF OBSERVATION
52 -- DRIZZLE, NOT FREEZING, INTERMITTENT-MODERATE AT TIME OF OBSERVATION
53 -- DRIZZLE, NOT FREEZING, CONTINUOUS-MODERATE AT TIME OF OBSERVATION
54 -- DRIZZLE, NOT FREEZING, INTERMITTENT-HEAVY (DENSE) AT TIME OF OBSERVATION
55 -- DRIZZLE, NOT FREEZING, CONTINUOUS-HEAVY (DENSE) AT TIME OF OBSERVATION
56 -- DRIZZLE, FREEZING, SLIGHT
57 -- DRIZZLE, FREEZING, MODERATE OR HEAVY (DENSE)
58 -- DRIZZLE AND RAIN, SLIGHT
59 -- DRIZZLE AND RAIN, MODERATE OR HEAVY

60 -- RAIN, NOT FREEZING, INTERMITTENT-SLIGHT AT TIME OF OBSERVATION
61 -- RAIN, NOT FREEZING, CONTINUOUS-SLIGHT AT TIME OF OBSERVATION
62 -- RAIN, NOT FREEZING, INTERMITTENT-MODERATE AT TIME OF OBSERVATION
63 -- RAIN, NOT FREEZING, CONTINUOUS-MODERATE AT TIME OF OBSERVATION
64 -- RAIN, NOT FREEZING, INTERMITTENT-HEAVY AT TIME OF OBSERVATION
65 -- RAIN, NOT FREEZING, CONTINUOUS-HEAVY AT TIME OF OBSERVATION
66 -- RAIN, FREEZING, SLIGHT
67 -- RAIN, FREEZING, MODERATE OR HEAVY
68 -- RAIN OR DRIZZLE AND SNOW, SLIGHT
69 -- RAIN OR DRIZZLE AND SNOW, MODERATE OR HEAVY
70 -- INTERMITTENT FALL OF SNOW FLAKES-SLIGHT AT TIME OF OBSERVATION
71 -- CONTINUOUS FALL OF SNOW FLAKES-SLIGHT AT TIME OF OBSERVATION
72 -- INTERMITTENT FALL OF SNOW FLAKES-MODERATE AT TIME OF OBSERVATION
73 -- CONTINUOUS FALL OF SNOW FLAKES-MODERATE AT TIME OF OBSERVATION
74 -- INTERMITTENT FALL OF SNOW FLAKES-HEAVY AT TIME OF OBSERVATION
75 -- CONTINUOUS FALL OF SNOW FLAKES-HEAVY AT TIME OF OBSERVATION
76 -- ICE PRISMS (WITH OR WIHTOUT FOG)
77 -- SNOW GRAINS (WITH OF WITHOUT FOG)
78 -- ISOLATED STARLIKE SNOW CRYSTALS (WITH OR WITHOUT FOG)
79 -- ICE PELLETS, TYPE (A)
80 -- RAIN SHOWER(S), SLIGHT
81 -- RAIN SHOWER(S), MODERATE OR HEAVY
82 -- RAIN SHOWER(S), VIOLENT
83 -- SHOWER(S) OF RAIN ANS SNOW MIXED, SLIGHT
84 -- SHOWER(S) OF RAIN AND SNOW MIXED, MODERATE OR HEAVY
85 -- SNOW SHOWER(S), SLIGHT
86 -- SHOW SHOWER(S), MODERATE OR, HEAVY
87 -- SHOWER(S) OF SNOW PELLETS OR ICE PELLETS, TYPE(B), WITH/WITHOUT RAIN AND SNOW MIXED-SLIGHT
88 -- SHOWER(S) OF SNOW PELLETS OR ICE PELLETS, TYPE(B), WITH/WITHOUT RAIN OR RAIN AND SNOW MIXED-
MODERATE OR HEAVY
89 -- SHOWER(S) OF HAIL, WITH OR WITHOUT RAIN OR RAIN AND SNOW MIXED, NOT ASSOC. WITH THUNDER-SLIGHT
90 -- SHOWER(S)OF HAIL, WITH/WITHOUT RAIN OR RAIN AND SNOW MIXED, NOT ASSOC. W/THUNDER-MODERATE OR HEAVY
91 -- SLIGHT RAIN AT TIME OF OBSERVATION-THUNDERSTORM DURING THE PRECEDING HOUR BUT NOT AT TIME OF OBS.
92 -- MODERATE OR HEAVY RAIN AT TIME OF OBSER.-THUNDERSTORM DURING PRECEDING HR. BUT NOT AT TIME OF OBS.
93 -- SLIGHT SNOW, OR RAIN AND SNOW MIXED OR HAIL AT TIME OF OBSER.-THUNDERSTORM DURING THE PRECEDING
HOUR BUT NOT AT TIME OF OBSERVATION
94 -- MODERATE OR HEAVY SNOW, OR RAIN AND SNOW MIXED OR HAIL AT TIME OF OBSERVATION-THUNDERSTORM DURING
THE PRECEDING HOUR BUT NOT AT TIME OF OBSERVATION
95 -- THUNDERSTORM, SLIGHT OR MODERATE, WITHOUT HAIL, BUT W/RAIN AND/OR SNOW AT TIME OF OBSERVATION
-THUNDERSTORM AT TIME OF OBSERVATION
96 -- THUNDERSTORM, SLIGHT OR MODERATE, WITH HAIL AT TIME OF OBSERVATION-THUNDERSTORM AT TIME OF OBS.
97 -- THUNDERSTORM, HEAVY, WITHOUT HAIL, BUT WITH RAIN AND/OR SNOW AT TIME OF OBSER.-THUNDERSTORM AT TIME
OF OBSERVATION
98 -- THUNDERSTORM COMBINED WITH DUSTSTORM OR SANDSTORM AT TIME OF OBSER.-THUNDERSTORM AT TIME OF OBS.
99 -- THUNDERSTORM, HEAVY, WITH HAIL AT TIME OF OBSERVATION-THUNDERSTORM AT TIME OF OBSERVATION

0217 PLATFORM-AIRCRAFT

001 -- OAS P-2V N49347
002 -- GRUMMAN SUPER GOOSE
003 -- NARL TWIN OTTER
004 -- WIDGEON
005 -- CESSNA 180
006 -- TURBO BEAVER
007 -- UNITED HELICOPTER (J. BALINT)
008 -- SKYMASTER (AERO-MARINE)
009 -- AT-11 (AERO-MARINE)
010 -- NEW ENGLAND AIRWAYS
011 -- POP/USCG BASED HELICOPTERS
012 -- SKYMASTER (KATONA)
013 -- CESSNA 150 (KATONA)
014 -- CESSNA 206 (RECON)
→015 -- CESSNA 172
050 -- MISC OPPORTUNISTIC/HISTORICAL AIRCRAFT

0354 HUMAN ACTIVITIES

0 -- COMMERCIAL FISHING FLEET SEEN
1 -- AIRCRAFT: SUPERSONIC
2 -- AIRCRAFT: SUBSONIC
3 -- AIRCRAFT: TURBOPROP
4 -- AIRCRAFT: PROPELLER
5 -- HELICOPTER
6 -- DIVERS PRESENT
7 -- SWIMMERS PRESENT
8 -- MULTIPLE ACTIVITIES
9 -- SEVERAL COMMERCIAL FISHING BOATS SEEN
A -- SONAR IN USE
B -- BUOY TENDING
C -- TENDING OIL RIG
D -- RESEARCH ACTIVITY
E -- EXPLOSIVE DISCHARGED
F -- CABLE/PIPE LAYING
G -- DRILLING
H -- DREDGING
I -- DUMPING: GARBAGE
J -- DUMPING: TOXIC WASTE
K -- OIL SEEPAGE
L -- COMMERCIAL FISHING: LONGLINE
M -- COMMERCIAL FISHING: NET
N -- COMMERCIAL FISHING: SINGLE BOAT
O -- SPORT FISHING
P -- COMMERCIAL SHIP: LARGE, SINGLE

Q -- COMMERCIAL SHIP: LARGE, MORE THAN ONE
R -- COMMERCIAL SHIP: SMALL, SINGLE
S -- COMMERCIAL SHIP: SMALL, MORE THAN ONE
T -- SAILBOAT: SINGLE
U -- SAILBOAT: MORE THAN ONE
V -- RECREATIONAL MOTOR BOAT: SINGLE
W -- RECREATIONAL MOTOR BOAT: MORE THAN ONE
X -- BOAT TRAFFIC: LIGHT
Y -- BOAT TRAFFIC: HEAVY
Z -- SUBMARINE
10 -- OIL DRILL SHIP
11 -- FIXED FISHING GEAR
12 -- OIL RIG
13 -- UNIDENTIFIED FISHING VESSEL

0355 GLARE LOCATION

B -- BOTH PORT AND STARBOARD
P -- PORT
S -- STARBOARD
U -- UNKNOWN

0356 GROUP SIZE

-- BLANK - ONLY ONE GROUP
0 -- NO MODAL GROUP SIZE - ALL GROUPS OBSERVED ARE DIFFERENT SIZES
1 -- ONE-TWO ANIMALS PER GROUP
2 -- THREE ANIMALS PER GROUP
3 -- FOUR ANIMALS PER GROUP
4 -- FIVE THRU TEN ANIMALS PER GROUP
5 -- ELEVEN THRU TWENTY ANIMALS PER GROUP
6 -- TWENTY-ONE THRU ONE HUNDRED ANIMALS PER GROUP
7 -- NUMBERS IN EXCESS OF ONE HUNDRED ANIMALS PER GROUP

0500 LAT HEMISPHERE

N -- NORTH
S -- SOUTH

0501 LON HEMISPHERE

E -- EAST
W -- WEST

File Type 127 - Marine Animal Sighting and Census

2/25/80

Cruise Header (A)

FTP	File ID		Vessel or Platform Name	Cruise ID	Cruise/Survey Dates From			To			Senior Scientist, Investigator or Data Source	Institution or Agency	Platform ID	Plat. Type
127		A			YR	MO	DAY	YR	MO	DAY				(c)

Transit Record (B)

FTP	File ID		Station Number	Begin Position Latitude				Longitude				End Position Latitude				Longitude				Begin Date (GMT)			Begin Time (GMT)		End Time (GMT)		Width of Track (km to 1/100)	Platform Dir. (Whole Deg)	Platform Speed (Whole Knots)	Platform Altitude (Whole Meters)	Leg Good	Complete	Seq. Number
127		B		DEG	MIN	SEC	N/S	DEG	MIN	SEC	E/W	DEG	MIN	SEC	N/S	DEG	MIN	SEC	E/W	YR	MO	DAY	HR	MIN	HR	MIN					(c)	(c)	

Environment Record (C)

FTP	File ID		Station Number	Sighting Number	Water Depth (meters)	Curr. Dir. - Toward (whole deg.)	Curr. Speed (whole kn.)	Wind Dir. - From (whole deg)	Wind Speed (whole kn.)	Cloud Type	Cloud Art.	Weather	Air Temp. (Deg. C to 1/10)	Sea Surface Temp. (Deg. C to 1/100)	Sea Cond.	Water Color	Surf. Vis.	Glare Amt.	Glare Loc.	Debris	Ice Type	Thin Octas	Thin Char	Mod. Octas	Mod. Char	Heavy Octas.	Heavy Char.	Def.	Team	Platform	Activity	Human Activity	Seq Number
127		C								(c)	(c)	(c)			(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)		(c)	

AF FORM FEB 74 1530

PUNCH CARD TRANSCRIPT

File Type 127 - Marine Animal Sighting and Census

2/25/80

Location Record FTP	File ID	D	Station Number	Sighting Number	Sighting Position Latitude DEG	MIN	SEC	N/S	Longitude DEG	MIN	SEC	E/W	Date (GMT) YR	MO	DAY	Time (GMT) HR	MIN	Anim. Situ. Code	Distance of Animals from Platform (whole meters)	Bearing to Animals (deg. true)	Distance of Animals to Shore (km to 1/10)	Distance of Animals to Ice Edge (km to 1/10)	Animal or Group Heading (deg. true)	Platform Height or Altitude (whole meters)	Seq. Number
127																									

Summary Sighting Record FTP	File ID	E	Station Number	Sighting Number	NODC Taxonomic Code	Ident. Rec. Code (c)	Total Number of Individuals	Conf. Ind. (c)	Color Ind. (c)	Total Number of Adults	Total Number of Sub-Adults	Total Number of Juveniles	Total Number of Unknowns	Seq. Number
127														

Detail Sighting Record FTP	File ID	F	Station Number	Sighting Number	NODC Taxonomic Code	Ident. Rec. Code (a)	Number of Individuals	Conf. Ind. (c)	Color Ind. (c)	Predominant Behavior of Individual or Group I (c)	II (c)	III (c)	Num. of Groups Sighted	Number of Adults	Number of Subadults	Number of Juveniles	Number of Adult Males	Number of Adult Females	Lact. Ind. (c)	Decomp. (c)	Photo (c)	Date Time (whole mn.)	Seq. Number
127																							

Text Record FTP	File ID	T	Station Number	Sighting Number	Text / Comments	Seq. Number
127						

AF FORM FEB 74 1530

PUNCH CARD TRANSCRIPT

FILE TYPE 156 - LAGRANGIAN CURRENT MEASUREMENTS II - 3/30/81 VERSION

NOTES AND CORRECTIONS

THIS FORMAT IS DESIGNED TO SUPPORT STUDIES OF CIRCULATION PATTERNS THROUGH PERIODIC TRACKING OF DRIFTING BUOYS,DROGUES, OR OTHER INSTRUMENTS WHOSE MOVEMENTS CAN BE REPORTED BY SHORE-BASED,SURFACE SHIP, AIRCRAFT OR SATELLITE OBSERVATIONS. MOVEMENT CAN BE DESCRIBED OVER PERIODS RANGING FROM MINUTES TO MONTHS. ICE MOVEMENT AS WELL AS CURRENT PATTERNS MAY BE REPORTED USING THIS FORMAT.

THE FORMAT CONSISTS OF FOUR RECORDS FOR REPORTING INVESTIGATOR AND PLATFORM INFORMATION,LAUNCH SUMMARY INFORMATION,POSITION,DATE AND TIME OF INDIVIDUAL OBSERVATIONS,SUPPLEMENTARY CLIMATOLOGICAL AND SEA SURFACE OCEANOGRAPHIC DATA AS WELL AS TEXT RECORDS THAT CAN BE RELATED TO EACH DROGUE OR BOUY. MOVEMENT IS REPORTED AS POINT-TO-POINT GEOGRAPHIC LOCATIONS; DIRECTIONS AND SPEEDS BETWEEN INDIVIDUAL OBSERVATIONS ARE COMPUTED BY THE DATA CENTER AS REQUIRED FOR SPECIFIC DATA SUMMARIES OR GRAPHIC PRODUCTS.

ALL RECORDS IN THIS FORMAT ARE 80 COLUMNS IN LENGTH. THIS FILE TYPE IS SORTED BY DROGUE OR BUOY NUMBER WITH SEQUENCE NUMBERS USED TO RETAIN THE PROPER SEQUENCE OF DATA AND TEXT RECORDS FOR EACH DROGUE.

THIS FORMAT WAS DEVELOPED PRINCIPALLY TO SUPPORT THE OCEAN THERMAL ENERGY CONVERSION (OTEC) PROGRAM. IT IS ALSO INTENDED TO REPLACE AN EARLIER LAGRANGIAN CURRENT,FORMAT (FTP 056) FOR OTHER MARINE CIRCULATION STUDIES.

NOTES AND CORRECTIONS

PARAMETER	DESCRIPTION	SC
HEADER RECORD	ALWAYS 'A'	10
DROGUE NUMBER	FIVE-CHARACTER FIELD ASSIGNED BY INVESTIGATOR - ANALOGOUS TO STATION NUMBER	11
DROGUE TYPE	FIVE CHARACTER FIELD FOR INDICATING TYPE OF DROGUE - DETERMINED BY INVESTIGATOR	16
PRINCIPAL INVESTIGATOR	15-CHARACTER FIELD FOR NAME OF PRINCIPAL INVESTIGATOR	21
INSTITUTION OR AGENCY	15-CHARACTER FIELD FOR NAME OF INSTITUTION OR AGENCY	36
PLATFORM NAME	12-CHARACTER FIELD FOR NAME OF PLATFORM ACQUIRING DATA OR DEPLOYING BUOY	51
BUOY NUMBER	4-CHARACTER FIELD FOR IDENTIFYING THE BUOY ASSOCIATED WITH DROGUE	63
BLANKS		67
LAUNCH SUMMARY RECORD	ALWAYS 'B' - ONLY ONE OF THESE RECORDS SHOULD BE SUBMITTED WITH EACH DROGUE DEPLOYMENT	10
DROGUE NUMBER	SEE RECORD 'A'	11
LAUNCH POSITION: LATITUDE	POSITION AT DEPLOYMENT DDMMSS PLUS HEMISPHERE 'N' OR 'S'	16
LONGITUDE	DDMMSS PLUS HEMISPHERE 'E' OR 'W'	23
END POSITION:	POSITION AT PICKUP OR TERMINATION OF OBSERVATIONS	
LATITUDE	DDMMSS PLUS HEMISPHERE 'N' OR 'S'	31
LONGITUDE	DDDMMSS PLUS HEMISPHERE 'E' OR 'W'	38
LAUNCH DATE(GMT)	YYMMDD	46
LAUNCH TIME(GMT)	XXXX-HOURS AND MINUTES	52
END DATE (GMT)	YYMMDD	56
END TIME (GMT)	XXXX-HOURS AND MINUTES	62
DROGUE DEPTH	XXXX-DEPTH IN METERS	66
OBSERVATION FREQUENCY	XXXX-HOURS AND MINUTES - USE WHEN BUOY POSITIONS ARE REPORTED AT SPECIFIC TIME INTERVALS	70
BLANKS		74

NOTES AND CORRECTIONS

DATA RECORD	ALWAYS 'C' - EACH RECORD CONTAINS INDIVIDUAL DROGUE POSITION AND ASSOCIATED SEA SURFACE CONDITIONS	10
DROGUE NUMBER	SEE RECORD 'A'	11
OBSERVED POSITION		
LATITUDE	DDMMSS PLUS HEMISPHERE 'N' OR 'S'	16
LONGITUDE	DDDMMSS PLUS HEMISPHERE 'E' OR 'W'	23
OBSERVED DATE (GMT)	YYMMDD	31
OBSERVED TIME (GMT)	XXXX-HOURS AND MINUTES	37
SURFACE TEMPERATURE	XXX-DEG C (TO TENTHS)	41
SURFACE SALINITY	XXXX-PARTS PER THOUSAND (TO HUNDREDTHS)	44
ATMOSPHERIC PRESSURE	XXXXXX-MILLIBARS (TO HUNDREDTHS)	48
WIND SPEED	XX-METERS PER SECOND	54
WIND DIRECTION	XX-TENS OF DEGREES	56
WIND FORCE	ONE-CHARACTER CODE- USE CODE 0052	58
WAVE HEIGHT	ONE-CHARACTER CODE - USE CODE 0104	59
WAVE PERIOD	ONE-CHARACTER CODE - USE CODE 0378	60
SEA STATE	ONE-CHARACTER CODE - USE CODE 0109	61
BOTTOM DEPTH	XXXX-BOTTOM DEPTH AT REPORTED BUOY POSITION (DEPTH IN METERS)	62
BLANKS		66
SEQUENCE NUMBER	XXXX-USE TO SORT RECORDS FOR EACH DROGUE/BUOY - SEQUENCE NUMBERS SHOULD BE IN ASCENDING ORDER	77

TEXT RECORD	ALWAYS 'T' - USE FOR COMMENTS AND OTHER INFORMATION	10
DROGUE NUMBER	SEE RECORD 'A'	11
TEXT	61-CHARACTER FIELD FOR COMMENTS- MULTIPLE TEXT RECORDS MAY BE USED TO DESCRIBE INDIVIDUAL DROGUE OBSERVATIONS OR FOR GENERAL COMMENTS	16
SEQUENCE NUMBER	TEXT RECORDS MAY BE INSERTED BETWEEN OR FOLLOW DATA RECORDS DEPENDING ON THE NATURE OF THE COMMENTS. THE ORDER OF SEQUENCE NUMBERS SHOULD REFLECT THE PROPER SORTING OF COMBINED DATA AND TRACK RECORDS FOR EACH DROGUE/BUOY.	77

THE FOLLOWING CODES ARE USED IN FILE TYPE 156

0378	WAVE PERIOD
0	-- 20 OR 21 SECONDS
1	-- OVER 21 SECONDS
2	-- 5 SECONDS OR LESS
3	-- 6 OR 7 SECONDS
4	-- 8 OR 9 SECONDS
5	-- 10 OR 11 SECONDS
6	-- 12 OR 13 SECONDS
7	-- 14 OR 15 SECONDS
8	-- 16 OR 17 SECONDS
9	-- 18 OR 19 SECONDS
X	-- CALM, OR PERIOD NOT DETERMINED

100

FILE TYPE 005 - AANDERAA CURRENT METER - 6/17/80 VERSION

NOTES AND CORRECTIONS

THIS FORMAT IS DESIGNED TO SUPPORT CIRCULATION STUDIES OF THE OCEANS USING AN AANDERAA TYPE CURRENT METER. THESE CURRENT METERS USE THE EULERIAN METHOD TO MEASURE SIMULTANEOUSLY THE DIRECTION AND SPEED OF THE WATER MOVEMENT AT A FIXED POINT.

THE FORMAT CONTAINS FOUR DATA RECORD TYPES TO: 1) IDENTIFY THE BUOY STATION AND PROVIDE SPACE FOR COMMENTS, 2) TO IDENTIFY THE POSITION AND DEPTH OF THE INSTRUMENT, AND 3) TO PROVIDE CURRENT SPEED, DIRECTION AND ENVIRONMENTAL DATA.

EACH RECORD IS 60 CHARACTERS LONG AND IS SORTED BY STATION NUMBER, SEQUENCE NUMBER, AND RECORD TYPE.

****6/17/80 ADDED NEW DETAIL RECORD '2' - RECORD TYPE '4'*****

NOTES AND CORRECTIONS

PARAMETER	DESCRIPTION	SC
FILE HEADER RECORD	ALWAYS '1'	10
STATION	FIVE-CHARACTER BUOY STATION IDENTIFIER	11
SEQUENCE	X - FILE HEADER NUMBER	16
TEXT	44-CHARACTERS FOR OPTIONAL COMMENTS	17
STATION HEADER RECORD	ALWAYS '2'	10
STATION	SEE RECORD '1'	11
LATITUDE	DDMMSS PLUS HEMISPHERE 'N' OR 'S'	16
LONGITUDE	DDDMMSS PLUS HEMISPHERE 'E' OR 'W'	23
SENSOR DEPTH	XXXX - METERS TO TENTHS	31
WATER DEPTH	XXXX - METERS TO TENTHS	35
SENSOR SERIAL NUMBER	FOUR-CHARACTER SERIAL NUMBER	39
BLANKS		43
DATA RECORD 1	ALWAYS '3'	10
STATION	SEE RECORD '1'	11
DATE	YYMMDD OBSERVED	16
TIME	XXXX - HOURS TO HUNDREDTHS	22
CURRENT DIRECTION	XXX - WHOLE DEGREES FROM TRUE NORTH	26
CURRENT SPEED	XXXX - WHOLE CM/SEC	29
TEMPERATURE	XXX NEGATIVE TEMPERATURES ARE PRECEDED BY A MINUS SIGN ADJACENT TO TEMPERATURE VALUE - DEG C TO TENTHS	33
PRESSURE	XXXX - WATER (KG/SQ CM TO HUNDREDTHS)	36
CONDUCTIVITY	XXXX - MILLIMHOS/CM TO HUNDREDTHS	40
INCLINOMETER ANGLE	XX - METER TILT OFF VERTICAL (WHOLE DEGREES)	44
WIND DIRECTION	XXX - TRUE DIRECTION FROM WHICH WIND IS BLOWING (IN WHOLE DEGREES)	46
WIND SPEED	XXXX - CM/SEC	49
SEA DIRECTION	XXX - TRUE DIRECTION FROM WHICH DOMINANT WAVES ARE COMING (WHOLE DEGREES)	53
SEA HEIGHT	XXX - DOMINANT WAVES (CM)	56
SEA PERIOD	XX - DOMINANT WAVES (SECONDS)	59

NOTES AND CORRECTIONS

DATA RECORD 2	ALWAYS '4'	10
STATION	SEE RECORD '1'	11
DATE	YYMMDD OBSERVED	16
TIME	XXXX - HOURS TO HUNDREDTHS	22
CURRENT DIRECTION	XXX - WHOLE DEGREES FROM TRUE NORTH	26
CURRENT SPEED	XXXX - WHOLE CM/SEC	29
TEMPERATURE	XXX NEGATIVE TEMPERATURES ARE PRECEDED BY A MINUS SIGN ADJACENT TO TEMPERATURE VALUE - DEG C TO TENTHS	33
SALINITY	XXXXX - PPT TO THOUDANDTHS	36
BLANKS		41

N O D C F I L E T Y P E C O D E S

81/04/15

THE FOLLOWING CODES ARE USED IN FILE TYPE 005

NO CODES FOR THIS FILE TYPE

Aanderaa Current Data Format

9-6-78

File Header (S)

File Type 005	File Identifier (YY/MM/DD)	Record Type #1	Station Number	Comment No.	Text (Optional)

Station Header

File Type 005	File Identifier (YY/MM/DD)	Record Type #2	Station Number	Latitude: Degrees	Minutes	Seconds	"N" or "S"	Longitude: Degrees	Minutes	Seconds	"E" or "W"	Sensor Depth: Meters	Tenths	Water Depth: Meters	Tenths	Sensor Serial Number	Blank

Data Record (1)

File Type 005	File Identifier (YY/MM/DD)	Record Type #3	Station Number	Observed Date and Time (GMT): Year	Month	Day	Hour	Hundredths of Hour	Current Dir.: Degrees from True North	Current Velocity: Centimeters per Second	Temp.: Degrees Celsius	Tenths	Pressure: Kilograms per cm²	Hundredths of Kg/cm²	Conductivity: Millimhos per cm.	Hundredths	Incl. Ang.: Degrees from Vert.	Wind Dir.: True Direction in Degrees	Wind Speed: Centimeters Per Second	Sea Dir.: True Direction in Degrees	Sea Height: Dominant Waves in Centimeters	Sea Per.: Dominant Waves in Seconds

AF FORM FEB 74 1530 PREVIOUS EDITION WILL BE USED.

PUNCH CARD TRANSCRIPT

GPO : 1974 O - 552 [illegible]

Aanderaa Current Data Format (cont.)

Data Record (2)

Columns	1–3	4–9	10	11–15	16–17	18–19	20–21	22–23	24–25	26–28	29–32	33–34	35	36–40	41–80
Group					Observed Date and Time (GMT)					Current Dir	Current Velocity	Temp.		Salinity	
Field	File Type 005	File Identifier (YY/MM/DD)	Record Type #4	Station Number	Year	Month	Day	Hour	Hundredths of Hour	Degrees from True North	Centimeters per Second	Degrees Celsius	Tenths	Parts per thousand to thousandths	Blank

AF FORM FEB 74 1530

PUNCH CARD TRANSCRIPT

FILE TYPE 015 - CURRENT METER (EULERIAN) - 3/30/79 VERSION

NOTES AND CORRECTIONS

THIS FORMAT IS DESIGNED TO RECORD TIME SERIES MEASUREMENTS FOR ARCHIVED OR FIXED CURRENT METER ARRAYS FOR ANY WATER DEPTH. THESE MEASUREMENTS SUPPORT STUDIES TO DETERMINE CIRCULATION AND TRANSPORT PATTERNS IN OFFSHORE AND NEARSHORE OCEAN REGIMES.

THE FORMAT CONSISTS OF FOUR DATA RECORDS FOR REPORTING CURRENT COMPONENTS, TEMPERATURE, PRESSURE AND SALINITY OR CONDUCTIVITY AS WELL AS METER POSITION AND METER DEPTH, DATES OF OPERATION, WATER DEPTH, METER NUMBER, INSTITUTION AND OTHER SUPPLEMENTARY INFORMATION INCLUDING A RECORD FOR TEXT.

DATA CAN BE REPORTED OVER ANY ACTUAL OR FILTERED TIME INTERVAL AND IS EXPRESSED IN HOURS AND MINUTES. DIRECTION AND SPEED ARE EXPRESSED IN TERMS OF U AND V COMPONENTS IN CM/SEC WITH POSITIVE DIRECTIONS EAST AND NORTH AND NEGATIVE DIRECTIONS WEST AND SOUTH.

ALL RECORDS IN THIS FORMAT ARE 60 COLUMNS IN LENGTH. THIS FILE IS SORTED BY STATION NUMBER (METER NUMBER), RECORD TYPE AND SEQUENCE NUMBER TO OBTAIN THE PROPER SEQUENCE OF RECORDS.

*****FILETYPE 015 - 3/30/79 - SALINITY FIELD (SC 50) EXTENDED TO*****
***** 5 BYTES *****

NOTES AND CORRECTIONS

PARAMETER	DESCRIPTION	SC
TEXT RECORD	ALWAYS '1'	10
METER NUMBER	FIVE-CHARACTER FIELD ASSIGNED BY THE ORIGINATOR - ALSO INCLUDED ON RECORD TYPES 2 AND 3	11
TEXT	THIRTY-EIGHT CHARACTER FIELD FOR COMMENTS OR PERTINENT INFORMATION	16
BLANK		54
SEQUENCE NUMBER	XXXXXX - USED FOR SORTING TEXT INFORMATION	55
MASTER RECORD	ALWAYS '2'	10
METER NUMBER	SEE RECORD '1'	11
LATITUDE	DDMMXX PLUS HEMISPHERE 'N' OR 'S' - MINUTES TO HUNDREDTHS	16
LONGITUDE	DDDMMXX PLUS HEMISPHERE 'E' OR 'W' - MINUTES TO HUNDREDTHS	23
DEPTH OF BOTTOM	XXXXX (WHOLE METERS)	31
DEPTH OF CURRENT METER	XXXXX (METERS TO TENTHS)	36
METER USAGE SEQUENCE NUMBER	XXX - USED FOR INDICATING NUMBER OF TIMES METER HAS BEEN USED	41
INSTITUTION	TWO-CHARACTER NODC INSTITUTION CODE - USE CODE 0218	44
AXIS ROTATION	XXX - DEGREES CLOCKWISE FROM TRUE NORTH OF V AXIS - VALUES SHOULD BE 0 WHEN FINAL PROCESSED TO PROVIDE TRUE DIRECTION INFORMATION	46
LOCATION NAME	SIX-CHARACTER NAME DETERMINED BY ORIGINATOR	49
NUMBER OF DETAIL RECORDS	XXXXXX - USED TO INDICATE NUMBER OF DETAIL RECORDS (3) TO FOLLOW THE MASTER RECORD (2)	55
DETAIL RECORD 1	ALWAYS '3'	10
METER NUMBER	SEE RECORD '1'	11
DATE (GMT)	YYMMDD	16
TIME (GMT)	XXXXXX (HOURS, MINUTES TO HUNDREDTHS)	22
EAST-WEST CURRENT COMPONENT (U)	XXXXXX - CM/SEC TO HUNDREDTHS WITH POSITIVE DIRECTIONS (EAST AND NORTH) INDICATED WITHOUT PLUS SIGN - NEGATIVE DIRECTIONS (WEST AND SOUTH) PRECEDED BY MINUS SIGN	28

NOTES AND CORRECTIONS

NORTH-SOUTH CURRENT COMPONENT (V)	XXXXXX - CM/SEC TO HUNDREDTHS WITH POSITIVE DIRECTIONS (EAST AND NORTH) INDICATED WITHOUT PLUS SIGN - NEGATIVE DIRECTIONS (WEST AND SOUTH) PRECEDED BY MINUS SIGN	34
TEMPERATURE	XXXXX WITH NEGATIVE TEMPERATURES PRECEDED BY MINUS SIGN (DEG C TO THOUSANDTHS)	40
PRESSURE	XXXXX (DECIBARS TO TENTHS)	45
CONDUCTIVITY	XXXX - MMHOS/CM TO HUNDREDTHS	50
BLANK		54
SEQUENCE NUMBER	XXXXXX - USED FOR SORTING DATA RECORDS ORIGINATOR	55

DETAIL RECORD 2	ALWAYS '4'	10
METER NUMBER	SEE RECORD '1'	11
DATE (GMT)	YYMMDD	16
TIME (GMT)	XXXXXX (HOURS, MINUTES TO HUNDREDTHS)	22
EAST-WEST CURRENT COMPONENT (U)	XXXXXX - CM/SEC TO HUNDREDTHS WITH POSITIVE DIRECTIONS (EAST AND NORTH) INDICATED WITHOUT PLUS SIGN - NEGATIVE DIRECTIONS (WEST AND SOUTH) PRECEDED BY MINUS SIGN	28
NORTH-SOUTH CURRENT COMPONENT (V)	XXXXXX - CM/SEC TO HUNDREDTHS WITH POSITIVE DIRECTIONS (EAST AND NORTH) INDICATED WITHOUT PLUS SIGN - NEGATIVE DIRECTIONS (WEST AND SOUTH) PRECEDED BY MINUS SIGN	34
TEMPERATURE	XXXXX WITH NEGATIVE TEMPERATURES PRECEDED BY MINUS SIGN (DEG C TO THOUSANDTHS)	40
PRESSURE	XXXXX (DECIBARS TO TENTHS)	45
SALINITY	XXXXX PARTS PER THOUSAND TO THOUSANDTHS	50
SEQUENCE NUMBER	XXXXXX - USED FOR SORTING DATA RECORDS	55

THE FOLLOWING CODES ARE USED IN FILE TYPE 015

0218 DATA SOURCE

09 -- UNIVERSITY OF WASHINGTON(SEATTLE)
3F -- PMEL-UNIVERSITY OF WASHINGTON(SEATTLE)
CI -- UNIV. OF ALASKA
I7 -- UNIVERSITY OF ALASKA-IMS (FAIRBANKS)
T8 -- NATIONAL OCEAN SURVEY, PMC (SEATTLE)

0500 LAT HEMISPHERE

N -- NORTH
S -- SOUTH

0501 LON HEMISPHERE

E -- EAST
W -- WEST

110

CURRENT METER 4-9-79

DATA RECORD 1

FILE TYPE (015)	FILE IDENTIFIER	RECORD TYPE	METER NUMBER	TEXT	BLANK	SEQUENCE NUMBER

FILE TYPE (015)	FILE IDENTIFIER	RECORD TYPE	METER NUMBER	LATITUDE: DEG.	MIN.	1/100	N OR S	LONGITUDE: DEG.	MIN.	1/100	E OR W	BOTTOM DEPTH (M)	METER DEPTH (M TO 1/10)	METER USAGE SEQ. NO.	INSTITUTION CODE	AXIS ROTATION	LOCATION NAME	NUMBER OF DETAIL RECORDS

DATA RECORD 2

FILE TYPE (015)	FILE IDENTIFIER	RECORD TYPE	METER NUMBER	DATE: YEAR (GMT)	MON. (GMT)	DAY (GMT)	TIME: HR. (GMT)	MIN.	1/100	(U) EAST-WEST COMPONENT (TO 1/100)	(V) NORTH-SOUTH COMPONENT (TO 1/100)	TEMP. °C (TO 1/1000)	PRESSURE (DECIBARS TO 1/10)	CONDUCTIVITY (MMHO/CM TO 1/100)	BLANK	SEQUENCE NUMBER

FILE TYPE (015)	FILE IDENTIFIER	RECORD TYPE	METER NUMBER	DATE: YEAR (GMT)	MON. (GMT)	DAY (GMT)	TIME: HR. (GMT)	MIN.	1/100	(U) EAST-WEST COMPONENT (TO 1/100)	(V) NORTH-SOUTH COMPONENT (TO 1/100)	TEMP. °C (TO 1/1000)	PRESSURE (DECIBARS TO 1/10)	SALINITY (‰ TO 1/1000)	SEQUENCE NUMBER

AF FORM 1530 JAN 73 PUNCH CARD TRANSCRIPT

FILE TYPE 032 - BENTHIC ORGANISMS -12/15/80 VERSION

NOTES AND CORRECTIONS

THIS FORMAT IS DESIGNED TO SUPPORT STUDIES CONCERNING THE IMPACT OF OCS PETROLEUM DEVELOPMENT ON EXISTING BIOLOGICAL POPULATIONS. INFORMATION ON DISTRIBUTION, ABUNDANCE, DIVERSITY AND PRODUCTIVITY OF THE BENTHIC COMMUNITY CAN BE DERIVED FROM PARAMETERS IN THIS FORMAT.

THE FORMAT CONSISTS OF SIX RECORDS FOR RECORDING CRUISE AND STATION INFORMATION, POSITION, TIME AND DATE, CHARACTERISTICS OF THE SEDIMENT AT EACH SAMPLING SITE, SAMPLING GEAR INFORMATION, ENVIRONMENTAL INFORMATION ON THE SAMPLE AREA AND DATA FOR EACH SPECIES INCLUDING NUMBER OF INDIVIDUALS AND TOTAL WEIGHT. DATA CAN BE REPORTED FOR SEPARATE SEGMENTS OF A SAMPLE. A TEXT RECORD ALSO IS AVAILABLE.

ALL RECORDS IN THIS FORMAT ARE 86 COLUMNS IN LENGTH. THIS FILE IS SORTED BY STATION NUMBER, SEGMENT SEQUENCE NUMBER, RECORD TYPE AND TEXT SEQUENCE NUMBER TO OBTAIN THE PROPER RECORD SEQUENCE.

*****12/15/80 STATION HEADER RECORD (REC '2') - ADDED BOTTOM TYPE CODE - BYTE 81-82

NOTES AND CORRECTIONS

PARAMETER	DESCRIPTION	SC
HEADER RECORD	ALWAYS '1'	10
SHIP NAME	SIX-CHARACTER FIELD FOR VESSEL NAME ASSIGNED BY THE ORIGINATOR	11
TEXT	62-CHARACTER FIELD FOR COMMENTS OR PERTINENT INFORMATION	17
SEQUENCE NUMBER	XX - USED TO SORT TEXT RECORDS	79
BLANKS		81
STATION HEADER RECORD	ALWAYS '2'	10
STATION NUMBER	XXXXX - FIVE-DIGIT FIELD ASSIGNED BY THE ORIGINATOR - ALSO INCLUDED ON RECORDS 3,5 AND 6	11
START DEPTH	XXXX (WHOLE METERS)	16
START DATE (GMT)	YYMMDD	20
START TIME (GMT)	XXX (HOURS TO TENTHS)	26
START LATITUDE	DDMMSS PLUS HEMISPHERE 'N' OR 'S'	29
START LONGITUDE	DDDMMSS PLUS HEMISPHERE 'E' OR 'W'	36
END DEPTH	XXXX (WHOLE METERS)	44
END DATE (GMT)	YYMMDD	48
END TIME (GMT)	XXX (HOURS)	54
END LATITUDE	DDMMSS PLUS HEMISPHERE 'N' OR 'S'	57
END LONGITUDE	DDDMMSS PLUS HEMISPHERE 'E' OR 'W'	64
DISTANCE OFFSHORE	XXX (WHOLE KILOMETERS)	72
TOW DIRECTION	XXX - DIRECTION TOWARD - WHOLE DEGREES	75
BLANKS		78
→ BOTTOM TYPE	TWO-CHARACTER CODE - USE CODE 0077	81
BLANKS		83
SEGMENT DETAIL RECORD	ALWAYS '3'	10
STATION NUMBER	SEE RECORD '2'	11
SAMPLE SEGMENT START DEPTH	XX - START DEPTH OF SEGMENT WITHIN SAMPLE - (WHOLE CENTIMETERS)	16
SAMPLE SEGMENT END DEPTH	XX - END DEPTH OF SEGMENT WITHIN SAMPLE WHOLE CENTIMETERS	18
PENETRATION DEPTH	XXX - CORE PENETRATION IN MILLIMETERS	20
AREA SAMPLED	XXXXXXX (SQ METERS TO THOUSANDTHS)	23
BOTTOM SALINITY	XXXXX - PARTS PER THOUSAND TO THOUSANDTHS	30
BOTTOM TEMPERATURE	XXXX NEGATIVE TEMPERATURES ARE PRECEDED BY A MINUS SIGN ADJACENT TO TEMPERATURE VALUE - DEG C TO HUNDREDTHS	35
BOTTOM OXYGEN	XXX - MILLILITERS PER LITER (TO TENTHS)	39
SEDIMENT ORGANIC CARBON	XXXX - PERCENT BY WEIGHT (TO HUNDREDTHS)	42
SEDIMENT TOTAL CARBON	XXXX - PERCENT BY WEIGHT (TO HUNDREDTHS)	46
SAND	XXX - PERCENT BY VOLUME (TO TENTHS)	50
SILT	XXX - PERCENT BY VOLUME (TO TENTHS)	53
CLAY	XXX - PERCENT BY VOLUME (TO TENTHS)	56
MINIMUM SIEVE SIZE	XXXX - MILLIMETERS TO HUNDREDTHS	59

WIRE LENGTH	XXXX	63
WIRE ANGLE	XX - IN WHOLE DEGREES FROM THE VERTICAL	67
AVERAGE PHI SIZE	XXX - AVERAGE PHI SIZE OF SEDIMENT	69
EQUIPMENT	THREE-CHARACTER CODE - USE CODE 0185	72
SAMPLE NUMBER	XXXX - SAMPLE NUMBER ASSIGNED BY THE ORIGINATOR	75
SEGMENT SEQUENCE	XX - SEQUENTIAL NUMBER INDICATING AN INDIVIDUAL SEGMENT OF A SAMPLE. THE NUMBERS SHOULD BE CONSECUTIVE (01,02, 03,ETC)	79
SAMPLE VOLUME	XXXX - LITERS TO TENTHS	81
NUMBER OF GRABS	XX - TOTAL NUMBER OF GRABS MAKING UP SAMPLE VOLUME	85

SPECIES RECORD	ALWAYS '5'	10
STATION NUMBER	SEE RECORD '2'	11
TAXONOMIC CODE	TWELVE-CHARACTER CODE - USE NODC TAXONOMIC CODES	16
NUMBER OF INDIVIDUALS	XXXXX - TOTAL NUMBER OF INDIVIDUALS PER SPECIES	28
SPECIES TOTAL WEIGHT	XXXXXXXXXX (GRAMS TO THOUSANDTHS)	33
QUALITATIVE CODE	ONE-CHARACTER CODE - USE CODE 0012	43
BLANKS		44
SEGMENT SEQUENCE NUMBER	XX - THE NUMBER CORRESPONDS TO THE SAMPLE SEQUENCE NUMBER IN WHICH THE SEGMENT IS FOUND. FOR EXAMPLE, WHEN RECORD 3 HAS A SEGMENT OF 06, ALL RECORD 5'S ASSOCIATED WILL HAVE SEGMENT SEQUENCE NUMBER OF 06	79
BLANKS		81

TEXT RECORD	ALWAYS '6'	10
STATION NUMBER	SEE RECORD '2'	11
TEXT SEQUENCE NUMBER	XXX - NUMERICALLY ASCENDING WITHIN A SEGMENT SEQUENCE NUMBER	16
TEXT	65-CHARACTER FIELD FOR COMMENTS OR PERTINENT INFORMATION	19
SEGMENT SEQUENCE NUMBER*	XX	79

*THIS FIELD ALLOWS TEXT RECORDS TO BE WRITTEN FOR A STATION AND FOR A PARTICULAR SEGMENT OF A STATION. IF ALL TEXT RECORDS ARE ASSOCIATED WITH A STATION, THIS FIELD WOULD BE LEFT BLANK. IF THE TEXT PERTAINS TO A PARTICULAR SEGMENT OF A SAMPLE, THAT SEGMENT(S) WILL BE CODED. IN BOTH CASES THE TEXT SEQUENCE NUMBER WILL BE USED TO SEQUENCE THE TEXT RECORDS

BLANKS		81

THE FOLLOWING CODES ARE USED IN FILE TYPE 032

0012 QUALITATIVE

1 -- ORGANISM PRESENT IN THE SAMPLE, BUT NOT COUNTED
2 -- FRAGMENTS OF AN ORGANISM, BUT NO WHOLE ORGANISM
3 -- COLONIAL ORGANISMS THAT CAN NOT BE INDIVIDUALLY COUNTED
4 -- TO SMALL TO WEIGH: ORGANISM WEIGHS < 1/1000 GRAM
5 -- ENCRUSTED:IMPOSSIBLE TO WEIGH ORGANISM AS IT IS ENCRUSTED ON SUBSTRATE

0077 BOTTOM TYPE

01 -- MUD
02 -- GREEN MUD
03 -- GREY MUD AND SAND
10 -- GREY MUD
11 -- GREY CLAY
12 -- MUD AND CLAY
13 -- GREY MUD AND CLAY
14 -- MUD, CLAY, AND SAND
15 -- SAND,MUD, AND GRAVEL.
20 -- DENSE GROWTH OF LARGE MARINE PLANTS (MACROSYSTIS, ALERIA, LAMINARIA, ETC.)
21 -- DENSE GROWTH OF SMALL MARINE PLANTS (FUCUS, ZOSTERA, AND/OR ULVA) BOTTOM OCCLUDED
22 -- DENSE GROWTH OF SMALL MARINE PLANTS (E.G. FUCUS) ON ROCKS
30 -- GREEN MUD AND SAND
31 -- MUD AND SAND
32 -- MUD AND CLAY-PIPES (WORM TUBES)
33 -- GREEN MUD -- BLACK SAND
34 -- SANDY - MUD
35 -- MUDDY - SAND
36 -- SANDY - GRAVEL
37 -- GRAVELLY - SAND
48 -- GREEN SAND AND MUD
49 -- GREY SAND AND WORM TUBES
50 -- GREEN SAND
51 -- SANDY
52 -- GREY SAND
53 -- GREEN SAND AND CLAY
54 -- BLACK SAND
55 -- GREY SAND, MUD GRAVEL
56 -- GREEN SAND, MUD, STONES
57 -- GREEN SAND, MUD, GRAVEL
58 -- GREEN SAND, GRAVEL OR PEBBLES
59 -- GRAVEL AND SAND
60 -- ROCK AND MUD

61 -- GRAVEL AND MUD
62 -- ROCKY
63 -- GRAVEL
64 -- GRAVEL AND SHELL
65 -- ROCKY AND GRAVEL
66 -- GREEN SAND AND SHELL
67 -- STONES AND SAND
68 -- STONES
69 -- STONES AND GRAVEL
70 -- HARD CLAY WITH SAND AND MUD
71 -- CLAY AND ROCK
72 -- HARD CLAY
73 -- HARD CLAY AND ROCK
74 -- HARD ROCK
75 -- ROCK AND GREY MUD
76 -- GRAVEL AND GREY MUD
77 -- BLUE-GREY MUD AND SAND
78 -- ROCK, GREEN SAND
79 -- BLUE MUD
83 -- CORAL AND GREY MUD
84 -- CORAL, GREEN SAND
85 -- CORAL, GRAVEL AND GREY MUD
86 -- CORAL AND STONES
90 -- SHELLS, ROCKS
91 -- SHELLS, GREY MUD AND SAND
92 -- SHELLS,MUD, AND SAND
93 -- SHELLS, SHALE, AND MUD
95 -- BOULDERS

0185 EQUIPMENT

AGT -- AGASSIZ TRAWL
BMT -- BEAM TRAWL
CCD -- CLAM DREDGE
CLU -- CLUTTER NET
DRI -- DRIFT NET
DRO -- DROP NET
DSC -- DEEP SEA CAMERA
FAB -- FABER NET
GMB -- 1/10 METER SQ. BOX CORE
MCB -- MULTIPLE CORE
OTB -- OTTER TRAWL
PPD -- PIPE DREDGE
QMB -- 1/4 METER SQ. BOX CORE
SMG -- SMITH-MACINTYRE GRAB
TRY -- TRY-NET
VVG -- VAN VEEN GRAB

0500 LAT HEMISPHERE

N -- NORTH
S -- SOUTH

0501 LON HEMISPHERE

E -- EAST
W -- WEST

Benthic Organisms

2/11/77

Header (Text) (032)

FILE TYPE	CRUISE NUMBER	RECORD TYPE	VESSEL NAME	TEXT	SEQUENCE NUMBER	BLANK

Station (Sample) (032)

FILE TYPE	CRUISE NUMBER	RECORD TYPE	STATION NUMBER	START DEPTH (M)	START DATE (GMT) YR.	MO.	DY.	START TIME (GMT) HR.	1/10	START LATITUDE DEG.	MIN.	SEC.	N or S	START LONGITUDE DEG.	MIN.	SEC.	E or W	END DEPTH (M)	END DATE YR.	MO.	DY.	END TIME (GMT) HR.	1/10	END LATITUDE DEG.	MIN.	SEC.	N or S	END LONGITUDE DEG.	MIN.	SEC.	E or W	DISTANCE OFF-SHORE (KM)	TOW DIRECTION (DEG.)	BLANK	BOTTOM TYPE CODE	BLANK
(032)																																		

Segment Detail (032)

FILE TYPE	CRUISE NUMBER	RECORD TYPE	STATION NUMBER	SAMPLE SEGMENT (CM) START DEPTH	SAMPLE SEGMENT (CM) END DEPTH	CORE PENETRATION DEPTH (MM)	AREA SAMPLED (M² TO THOUSANDTHS)	BOTTOM SALINITY (‰ TO THOUSANDTHS)	BOTTOM TEMPERATURE (°C TO HUNDREDTHS)	BOTTOM OXYGEN CONC. (ML/L TO TENTHS)	SEDIMENT CARBON ORGANIC (% BY WEIGHT TO HUNDREDTHS)	SEDIMENT CARBON TOTAL (% BY WEIGHT TO HUNDREDTHS)	PERCENT SAND (TO TENTHS)	PERCENT SILT (TO TENTHS)	PERCENT CLAY (TO TENTHS)	MINIMUM SIEVE SIZE (MM. TO HUNDREDTHS)	WIRE LENGTH OUT (M)	WIRE ANGLE (DEG.)	AVG. PHI SIZE (TO TENTHS)	EQUIPMENT CODE	SAMPLE NUMBER	SEGMENT	SEQUENCE NO.	VOLUME OF SAMPLE (LITERS TO TENTHS)	NO. OF GRABS IN SAMPLE VOLUME
(032)																										

Species (032)

FILE TYPE	CRUISE NUMBER	RECORD TYPE	STATION NUMBER	SPECIES CODE	SUB SPECIES CODE	NUMBER OF INDIVIDUALS	SPECIES TOTAL WEIGHT (GRAMS TO THOUSANDTHS)	FACILITATIVE CODE	BLANK	SEGMENT	SEQUENCE NO.	BLANK
(032)												

Comment (032)

FILE TYPE	CRUISE NUMBER	RECORD TYPE	STATION NUMBER	TEXT SEQUENCE NUMBER	TEXT	SEGMENT	SEQUENCE NO.	BLANK
(032)								

AF [illegible] 1539 [illegible] PUNCH CARD TRANSCRIPT PUNCH

FILE TYPE 073 - GRAIN SIZE ANALYSIS - 03/30/81 VERSION

NOTES AND CORRECTIONS

THIS FORMAT IS DESIGNED TO SUPPORT STUDIES CONCERNING SEDIMENT TYPE AND CHARACTERISTICS IN OFFSHORE AND NEARSHORE AREAS THAT MAY BE AFFECTED BY OCS ACTIVITIES SUCH AS CONTAMINANT DISCHARGE OR ALTERATION BY PHYSICAL , CHEMICAL OR BIOLOGICAL PRESSURES. BOTTOM SAMPLES AND OTHER SEDIMENT COLLECTIONS CAN BE REPORTED USING THIS FORMAT.

A CUSTOMIZED SET OF DATA RECORDS CAN BE SELECTED BY THE INVESTIGATOR TO CODE THE DATA. FOR EXAMPLE, IF THE ANALYTICAL RANGE FOR A GIVEN SAMPLE IS -1 PHI TO 4 PHI AT ONE-HALF PHI INCREMENTS AND 4 PHI TO 11 PHI AT 1 PHI INCREMENTS, DATA WOULD BE ENTERED IN THE APPROPRIATE DATA FIELDS FOR SELECTED RECORDS (J,K AND I FOR THE ABOVE EXAMPLE). THE DATA RECORDS G THRU W ALLOW FOR EXPRESSING WEIGHT PERCENTS BY DIFFERENT PHI INCREMENTS. ALL PERCENTAGE FIELDS CONTAIN TWO IMPLIED DECIMAL PLACES WITH CODE 9999 FOR 100 PERCENT AND 0000 FOR TRACE (LESS THAN .005 PERCENT).

THE BASIC UNIT OF ANALYSIS FOR THIS FORMAT IS THE REPLICATE, WHICH MAY BE EQUIVALENT TO A CORE INTERVAL OR GRAB SAMPLE OR MAYBE ONE OF SEVERAL SAMPLE SPLITS. IN EITHER CASE, EACH REPLICATE ANALYZED IS REPRESENTED IN THE DATA BY A SAMPLE HEADER RECORD FOLLOWED BY ONE OR MORE DATA RECORDS. IF ONLY ONE SPLIT WAS ANALYZED FOR EACH SAMPLE, THE REPLICATE NUMBER WILL ALWAYS BE ONE. FIELDS THAT ARE NOT APPLICABLE, SUCH AS SUB-CORE AND INTERVAL NUMBER IN THE CASE OF GRAB SAMPLES ARE LEFT BLANK. SUB-CORE NUMBERS ARE USED ONLY FOR SMALL CORES OR SPOT SAMPLES EXTRACTED FROM BOX CORES.

THE FORMAT CONSISTS OF A TOTAL OF 24 RECORDS, MANY OF WHICH WILL NOT BE USED FOR INDIVIDUAL SAMPLE ANALYSIS. IN ADDITION, RECORDS FOR WEATHER AND SEA SURFACE CONDITIONS (C), SIZE DISTRIBUTION BY SIZE CLASS (F), SIZE ANALYSIS SUMMARY STATISTICS (X) AND A TEXT RECORD (E) MAY BE CONSIDERED OPTIONAL.

ALL RECORDS IN THIS FORMAT ARE 80 COLUMNS IN LENGTH. THIS FILE IS SORTED BY STATION NUMBER, SEQUENCE NUMBER, SAMPLE NUMBER AND SAMPLE TYPE FOLLOWED BY SUB-CORE AND INTERVAL NUMBERS IF APPLICABLE TO OBTAIN THE PROPER SEQUENCE OF RECORDS.

NOTES AND CORRECTIONS

PARAMETER	DESCRIPTION	SC
FILE HEADER RECORD	ALWAYS 'A'	10
VESSEL	11-CHARACTER FIELD FOR VESSEL NAME	11
CRUISE OR PROJECT IDENTIFICATION	8-CHARACTER FIELD FOR CRUISE/PROJECT ID	22
BEGIN DATE (GMT)	YYMMDD	30
END DATE (GMT)	YYMMDD	36
SENIOR SCIENTIST	15-CHARACTER FIELD FOR SCIENTIST NAME	42
INVESTIGATOR/INSTITUTION	24-CHARACTER FIELD FOR INVESTIGATOR/ INSTITUTION NAME	57
STATION HEADER RECORD 1	ALWAYS 'B'	10
SEQUENCE NUMBER WITHIN STATION	XXX - ALWAYS '1' FOR STATION HEADER '1' ALSO INCLUDED IN RECORDS C THRU X WHEN USED AND INCREASING NUMERICALLY FOR ALL RECORDS USED FOR EACH STATION	11
STATION NUMBER	6-CHARACTER FIELD ASSIGNED BY THE ORIGINATOR - ALSO INCLUDED IN RECORDS C THRU X	14
STATION DATE (GMT)	YYMMDD	20
STATION TIME (GMT)	XXXX (HOURS AND MINUTES)	26
LATITUDE	DDMMXX PLUS HEMISPHERE 'N' OR 'S' - MINUTES TO HUNDREDTHS	30
LONGITUDE	DDDMMXX PLUS HEMISPHERE 'E' OR 'W' - MINUTES TO HUNDREDTHS	37
NAVIGATIONAL ACCURACY	XXXX - IN WHOLE METERS	45
WATER DEPTH	XXXXXX (METERS TO TENTHS)	49
DEPTH CORRECTION	ONE-CHARACTER CODE - USE CODE 0243	55
NUMBER OF SAMPLES	XX - NUMBER OF SAMPLES COLLECTED AT THIS STATION	56
NUMBER OF BOTTOM PHOTOS	XX - NUMBER OF BOTTOM PHOTOS TAKEN AT THIS STATION	58
UNDERWATER TV TIME	XXX (WHOLE METERS)	60
BLANKS		63
STATION HEADER RECORD 2	ALWAYS 'C' - METEOROLOGY RECORD	10
SEQUENCE NUMBER WITHIN STATION	XXX - SEE RECORD 'B'	11
STATION NUMBER	SEE RECORD 'B'	14
BAROMETRIC PRESSURE	XXX (MILLIBARS TO TENTHS)	20
DRY BULB AIR TEMPERATURE	XXXX NEGATIVE TEMPERATURES ARE PRECEDED BY A MINUS SIGN ADJACENT TO TEMPERATURE VALUE - DEG C TO TENTHS	23
WET BULB AIR TEMPERATURE	XXXX NEGATIVE TEMPERATURES ARE PRECEDED BY A MINUS SIGN ADJACENT TO TEMPERATURE VALUE - DEG C TO TENTHS	27

WIND DIRECTION	TWO-CHARACTER CODE - USE CODE 0110 - DIRECTION FROM	31
WIND SPEED	XX (WHOLE KILOMETERS)	33
SEA DIRECTION	TWO-CHARACTER CODE - USE CODE 0110 - DIRECTION FROM	35
SEA HEIGHT	ONE-CHARACTER CODE - USE CODE 0104	37
SEA PERIOD	XX - EXPRESSED IN WHOLE SECONDS	38
SWELL DIRECTION	TWO-CHARACTER CODE - USE CODE 0110 - DIRECTION FROM	40
SWELL HEIGHT	ONE-CHARACTER CODE - USE CODE 0104	42
SWELL PERIOD	XX - EXPRESSED IN WHOLE SECONDS	43
WEATHER	ONE-CHARACTER CODE - USE CODE 0108	45
CLOUD TYPE	ONE-CHARACTER CODE - USE CODE 0053	46
CLOUD COVER	ONE-CHARACTER CODE - USE CODE 0105	47
VISIBILITY	ONE-CHARACTER CODE - USE CODE 0157	48
SECCHI DISK DEPTH	XXXX (METERS TO TENTHS)	49
BLANKS		53

SAMPLE HEADER RECORD	ALWAYS 'D'	10
SEQUENCE NUMBER WITHIN STATION	XXX - SEE RECORD 'B'	11
STATION NUMBER	SEE RECORD 'B'	14
SAMPLE NUMBER	6-CHARACTER FIELD ASSIGNED BY THE ORIGINATOR	20
SAMPLE TYPE	THREE-CHARACTER CODE - USE CODE 0255	26
SUB-CORE NUMBER	X - BOX CORES ONLY	29
INTERVAL NUMBER	XX - ALL CORE SAMPLES	30
REPLICATE NUMBER	X - DIFFERENTIATES BETWEEN REPLICATES OF THE SAME INTERVAL	32
TOTAL LENGTH OF CORE	XXXX (METERS TO HUNDREDTHS)	33
DEPTH TO TOP OF SAMPLED INTERVAL	XXXX (METERS TO HUNDREDTHS)	37
DEPTH TO BOTTOM OF SAMPLED INTERVAL	XXXX (METERS TO HUNDREDTHS)	41
TOTAL WEIGHT OF REPLICATE ANALYZED	XXXXXX (GRAMS TO HUNDREDTHS)	45
GRAIN SIZE ANALYSIS FOR COARSE FRACTION	ONE-CHARACTER CODE - LEAVE COLS 52-56 BLANK IF USED FOR ENTIRE SIZE RANGE - USE CODE 0253	51
GRAIN SIZE ANALYSIS FOR FINE FRACTION	SAME AS ABOVE - USE CODE 0254	52
SIZE BOUNDARY	XXXX - BOUNDARY BETWEEN COARSE AND FINE FRACTIONS IN PHI UNITS TO 2 DECIMAL PLACES - LEAVE BLANK IF ENTIRE SAMPLE WAS ANALYZED WITHOUT SPLITTING INTO COARSE AND FINE FRACTIONS - TO HUNDREDTHS	53

PHI MINIMUM	XXXX - PHI BOUNDARY AT COARSE END OF ANALYZED RANGE (TO HUNDREDTHS)	57
PHI MAXIMUM	XXXX - PHI BOUNDARY AT FINE END OF ANALYZED RANGE (TO HUNDREDTHS)	61
WEIGHT % COARSER THAN PHI MIN	XXXX (PERCENT TO HUNDREDTHS)	65
WEIGHT % FINER THAN PHI MAX	XXXX (PERCENT TO HUNDREDTHS)	69
BLANKS		73

TEXT RECORD	ALWAYS 'E'	10
SEQUENCE NUMBER WITHIN STATION	XXX - SEE RECORD 'B'	11
STATION NUMBER	SEE RECORD 'B'	14
SAMPLE NUMBER	SEE RECORD 'D'	20
SAMPLE TYPE	X - SEE RECORD 'D'	26
SUB-CORE NUMBER	SEE RECORD 'D'	29
INTERVAL NUMBER	XX - SEE RECORD 'D'	30
REPLICATE NUMBER	X - SEE RECORD 'D'	32
TEXT	48-CHARACTER FIELD FOR ANY ADDITIONAL INFORMATION THE SCIENTIST WISHES TO INCLUDE FOR THE SAMPLE. THIS RECORD TYPE MAY BE REPEATED AS MANY TIMES AS NECESSARY. IF OTHER DATA SETS HAVE BEEN (OR WILL BE) SUBMITTED WHICH INCLUDE OTHER TYPES OF DATA FOR THE SAMPLE, THIS FIELD CAN BE USED TO INDICATE FILE TYPE AND FILE IDENTIFICATION	33

SIZE ANALYSIS RECORD	ALWAYS 'F' - DISTRIBUTION BY SIZE CLASS	10
SEQUENCE NUMBER WITHIN STATION	XXX - SEE RECORD 'B'	11
STATION NUMBER	SEE RECORD 'B'	14
SAMPLE NUMBER	SEE RECORD 'D'	20
SAMPLE TYPE	SEE RECORD 'D'	26
SUB-CORE NUMBER	X - SEE RECORD 'D'	29
INTERVAL NUMBER	XX - SEE RECORD 'D'	30
REPLICATE NUMBER	X - SEE RECORD 'D'	32
WEIGHT % - GRAVEL	XXXX - DIAMETER GREATER THAN 2 MM - WENTWORTH SYSTEM - ALL DIAMETERS PERCENT TO HUNDREDTHS	33
WEIGHT % - SAND	XXXX - 2 TO 0.0625 MM	

WEIGHT % - SILT	XXXX - 0.0625 TO 0.0039 MM	41
WEIGHT % - CLAY	XXXX - DIAMETER LESS THAN 0.0039 MM	45
WEIGHT % - MUD	XXXX - SILT AND CLAY, IF UNDIFFERENTIATED	49
WEIGHT % - GRAVEL	XXXX - RETAINED ON NO. 4 - UNIFIED SOIL CLASSIFICATION SYSTEM	53
WEIGHT % - SAND	XXXX - PASSING NO. 4 SIEVE AND RETAINED ON NO. 200 SIEVE - USC SYSTEM	57
WEIGHT % - FINES	XXXX - PASSING NO. 200 SIEVE - USC SYSTEM	61
BLANKS		65
WEIGHT % - CARBONATE	XXXX	73

SIZE ANALYSIS RECORD	ALWAYS 'G' - 2 PHI INCREMENT, -8 PHI TO 12 PHI	10
SEQUENCE NUMBER WITHIN STATION	XXX - SEE RECORD 'B'	11
STATION NUMBER	SEE RECORD 'B'	14
SAMPLE NUMBER	SEE RECORD 'D'	20
SAMPLE TYPE	SEE RECORD 'D'	26
SUB-CORE NUMBER	X - SEE RECORD 'D'	29
INTERVAL NUMBER	XX - SEE RECORD 'D'	30
REPLICATE NUMBER	X - SEE RECORD 'D'	32
-8 TO -6 PHI	XXXX - 256 TO 64 MM	33
-6 TO -4 PHI	XXXX - 64 TO 16 MM	37
-4 TO -2 PHI	XXXX - 16 TO 4 MM	41
-2 TO 0 PHI	XXXX - 4 TO 1 MM	45
0 TO 2 PHI	XXXX - 1.00 TO 0.25 MM	49
2 TO 4 PHI	XXXX - 0.25 TO 0.0625 MM	53
4 TO 6 PHI	XXXX - 0.0625 TO 0.0156 MM	57
6 TO 8 PHI	XXXX - 0.0156 TO 0.0039 MM	61
8 TO 10 PHI	XXXX - 0.0039 TO 0.00098 MM	65
10 TO 12 PHI	XXXX - 0.00098 TO 0.00024 MM	69
BLANKS		73

SIZE ANALYSIS RECORD	ALWAYS 'H' - 1 PHI INCREMENTS, -8 PHI TO 4 PHI	10
SEQUENCE NUMBER WITHIN STATION	XXX - SEE RECORD 'B'	11
STATION NUMBER	SEE RECORD 'B'	14
SAMPLE NUMBER	SEE RECORD 'D'	20
SAMPLE TYPE	SEE RECORD 'D'	26
SUB-CORE NUMBER	X - SEE RECORD 'D'	29

NOTES AND CORRECTIONS

INTERVAL NUMBER	XX - SEE RECORD 'D'	30
REPLICATE NUMBER	X - SEE RECORD 'D'	32
-8 TO -7 PHI	XXXX - 256 TO 128 MM	33
-7 TO -6 PHI	XXXX - 128 TO 64 MM	37
-6 TO -5 PHI	XXXX - 64 TO 32 MM	41
-5 TO -4 PHI	XXXX - 32 TO 16 MM	45
-4 TO -3 PHI	XXXX - 16 TO 8 MM	49
-3 TO -2 PHI	XXXX - 8 TO 4 MM	53
-2 TO -1 PHI	XXXX - 4 TO 2 MM	57
-1 TO 0 PHI	XXXX - 2 TO 1 MM	61
0 TO 1 PHI	XXXX - 1.0 TO 0.5 MM	65
1 TO 2 PHI	XXXX - 0.5 TO 0.25 MM	69
2 TO 3 PHI	XXXX - 0.25 TO 0.125 MM	73
3 TO 4 PHI	XXXX - 0.125 TO 0.0625 MM	77

SIZE ANALYSIS RECORD	ALWAYS 'I' - 1 PHI INCREMENTS, 4 PHI TO 12 PHI	10
SEQUENCE NUMBER WITHIN STATION	XXX - SEE RECORD 'B'	11
STATION NUMBER	SEE RECORD 'B'	14
SAMPLE NUMBER	SEE RECORD 'D'	20
SAMPLE TYPE	SEE RECORD 'D'	26
SUB-CORE NUMBER	X - SEE RECORD 'D'	29
INTERVAL NUMBER	XX - SEE RECORD 'D'	30
REPLICATE NUMBER	X - SEE RECORD 'D'	32
4 TO 5 PHI	XXXX - 0.0625 TO 0.031 MM	33
5 TO 6 PHI	XXXX - 0.031 TO 0.0156 MM	37
6 TO 7 PHI	XXXX - 0.0156 TO 0.0078 MM	41
7 TO 8 PHI	XXXX - 0.0078 TO 0.0039 MM	45
8 TO 9 PHI	XXXX - 0.0039 TO 0.0020 MM	49
9 TO 10 PHI	XXXX - 0.0020 TO 0.00098 MM	53
10 TO 11 PHI	XXXX - 0.00098 TO 0.00049 MM	57
11 TO 12 PHI	XXXX - 0.00049 TO 0.00024 MM	61
BLANKS		65

SIZE ANALYSIS RECORD	ALWAYS 'J' - 1/2 PHI INCREMENTS, -6 PHI TO 0 PHI	10
SEQUENCE NUMBER WITHIN STATION	XXX - SEE RECORD 'B'	11
STATION NUMBER	SEE RECORD 'B'	14
SAMPLE NUMBER	SEE RECORD 'D'	20

NOTES AND CORRECTIONS

SAMPLE TYPE	SEE RECORD 'D'	26
SUB-CORE NUMBER	X - SEE RECORD 'D'	29
INTERVAL NUMBER	XX - SEE RECORD 'D'	30
REPLICATE NUMBER	X - SEE RECORD 'D'	32
-6.0 TO -5.5 PHI	XXXX - 64 TO 45 MM	33
-5.5 TO -5.0 PHI	XXXX - 45 TO 32 MM	37
-5.0 TO -4.5 PHI	XXXX - 32 TO 23 MM	41
-4.5 TO -4.0 PHI	XXXX - 23 TO 16 MM	45
-4.0 TO -3.5 PHI	XXXX - 16 TO 11.3 MM	49
-3.5 TO -3.0 PHI	XXXX - 11.3 TO 8 MM	53
-3.0 TO -2.5 PHI	XXXX - 8 TO 5.66 MM	57
-2.5 TO -2.0 PHI	XXXX - 5.66 TO 4 MM	61
-2.0 TO -1.5 PHI	XXXX - 4 TO 2.83 MM	65
-1.5 TO -1.0 PHI	XXXX - 2.83 TO 2 MM	69
-1.0 TO -0.5 PHI	XXXX - 2 TO 1.41 MM	73
-0.5 TO 0 PHI	XXXX - 1.41 TO 1 MM	77

SIZE ANALYSIS RECORD	ALWAYS 'K' - 1/2 PHI INCREMENTS, 6 PHI TO 12 PHI	10
SEQUENCE NUMBER WITHIN STATION	XXX - SEE RECORD 'B'	11
STATION NUMBER	SEE RECORD 'B'	14
SAMPLE NUMBER	SEE RECORD 'D'	20
SAMPLE TYPE	SEE RECORD 'D'	26
SUB-CORE NUMBER	X - SEE RECORD 'D'	29
INTERVAL NUMBER	XX - SEE RECORD 'D'	30
REPLICATE NUMBER	X - SEE RECORD 'D'	32
0.0 TO 0.5 PHI	XXXX - 1.0 TO 0.71 MM	33
0.5 TO 1.0 PHI	XXXX - 0.71 TO 0.5 MM	37
1.0 TO 1.5 PHI	XXXX - 0.5 TO 0.35 MM	41
1.5 TO 2.0 PHI	XXXX - 0.35 TO 0.25 MM	45
2.0 TO 2.5 PHI	XXXX - 0.25 TO 0.177 MM	49
2.5 TO 3.0 PHI	XXXX - 0.177 TO 0.125 MM	53
3.0 TO 3.5 PHI	XXXX - 0.125 TO 0.088 MM	57
3.5 TO 4.0 PHI	XXXX - 0.088 TO 0.0625 MM	61
4.0 TO 4.5 PHI	XXXX - 0.0625 TO 0.044 MM	65
4.5 TO 5.0 PHI	XXXX - 0.044 TO 0.031 MM	69
5.0 TO 5.5 PHI	XXXX - 0.031 TO 0.022 MM	73
5.5 TO 6.0 PHI	XXXX - 0.022 TO 0.0156 MM	77

NOTES AND CORRECTIONS

SIZE ANALYSIS RECORD	ALWAYS 'L' - 1/2 PHI INCREMENTS, 6 PHI TO 12 PHI	10
SEQUENCE NUMBER WITHIN STATION	XXX - SEE RECORD 'B'	11
STATION NUMBER	SEE RECORD 'B'	14
SAMPLE NUMBER	SEE RECORD 'D'	20
SAMPLE TYPE	SEE RECORD 'D'	26
SUB-CORE NUMBER	X - SEE RECORD 'D'	29
INTERVAL NUMBER	XX - SEE RECORD 'D'	30
REPLICATE NUMBER	X - SEE RECORD 'D'	32
6.0 TO 6.5 PHI	XXXX - 0.156 TO 0.0110 MM	33
6.5 TO 7.0 PHI	XXXX - 0.0110 TO 0.0078 MM	37
7.0 TO 7.5 PHI	XXXX - 0.0078 TO 0.0055 MM	41
7.5 TO 8.0 PHI	XXXX - 0.0055 TO 0.0039 MM	45
8.0 TO 8.5 PHI	XXXX - 0.0039 TO 0.0028 MM	49
8.5 TO 9.0 PHI	XXXX - 0.0028 TO 0.0020 MM	53
9.0 TO 9.5 PHI	XXXX - 0.0020 TO 0.00138 MM	57
9.5 TO 10.0 PHI	XXXX - 0.00138 TO 0.00098 MM	61
10.0 TO 10.5 PHI	XXXX - 0.00098 TO 0.00069 MM	65
10.5 TO 11.0 PHI	XXXX - 0.00069 TO 0.00049 MM	69
11.0 TO 11.5 PHI	XXXX - 0.00049 TO 0.00039 MM	73
11.5 TO 12.0 PHI	XXXX - 0.00039 TO 0.00024 MM	77

SIZE ANALYSIS RECORD	ALWAYS 'M' - 1/3 PHI INCREMENTS, -6 PHI TO -2 PHI	10
SEQUENCE NUMBER WITHIN STATION	XXX - SEE RECORD 'B'	11
STATION NUMBER	SEE RECORD 'B'	14
SAMPLE NUMBER	SEE RECORD 'D'	20
SAMPLE TYPE	SEE RECORD 'D'	26
SUB-CORE NUMBER	X - SEE RECORD 'D'	29
INTERVAL NUMBER	XX - SEE RECORD 'D'	30
REPLICATE NUMBER	X - SEE RECORD 'D'	32
-6.00 TO -5.67 PHI	XXXX - 64 TO 51 MM	33
-5.67 TO -5.33 PHI	XXXX - 51 TO 40 MM	37
-5.33 TO -5.00 PHI	XXXX - 40 TO 32 MM	41
-5.00 TO -4.67 PHI	XXXX - 32 TO 25.5 MM	45
-4.67 TO -4.33 PHI	XXXX - 25.5 TO 20.2 MM	49
-4.33 TO -4.00 PHI	XXXX - 20.2 TO 16 MM	53
-4.00 TO -3.67 PHI	XXXX - 16 TO 12.7 MM	57
-3.67 TO -3.33 PHI	XXXX - 12.7 TO 10.1 MM	61
-3.33 TO -3.00 PHI	XXXX - 10.1 TO 8 MM	65
-3.00 TO -2.67 PHI	XXXX - 8 TO 6.35 MM	69
-2.67 TO -2.33 PHI	XXXX - 6.35 TO 5.04 MM	73
-2.33 TO -2.00 PHI	XXXX - 5.04 TO 4 MM	77

NOTES AND CORRECTIONS

SIZE ANALYSIS RECORD	ALWAYS 'N' - 1/3 PHI INCREMENTS, -2 PHI TO 2 PHI	10
SEQUENCE NUMBER WITHIN STATION	XXX - SEE RECORD 'B'	11
STATION NUMBER	SEE RECORD 'B'	14
SAMPLE NUMBER	SEE RECORD 'D'	20
SAMPLE TYPE	SEE RECORD 'D'	26
SUB-CORE NUMBER	X - SEE RECORD 'D'	29
INTERVAL NUMBER	XX - SEE RECORD 'D'	30
REPLICATE NUMBER	X - SEE RECORD 'D'	32
-2.00 TO -1.67 PHI	XXXX - 4 TO 3.17 MM	33
-1.67 TO -1.33 PHI	XXXX - 3.17 TO 2.52 MM	37
-1.33 TO -1.00 PHI	XXXX - 2.52 TO 2 MM	41
-1.00 TO -0.67 PHI	XXXX - 2 TO 1.59 MM	45
-0.67 TO -0.33 PHI	XXXX - 1.59 TO 1.26 MM	49
-0.33 TO 0.00 PHI	XXXX - 1.26 TO 1 MM	53
0.00 TO 0.33 PHI	XXXX - 1 TO 0.79 MM	57
0.33 TO 0.66 PHI	XXXX - 0.79 TO 0.63 MM	61
0.66 TO 1.00 PHI	XXXX - 0.63 TO 0.5 MM	65
1.00 TO 1.33 PHI	XXXX - 0.5 TO 0.4 MM	69
1.33 TO 1.67 PHI	XXXX - 0.4 TO 0.31 MM	73
1.67 TO 2.00 PHI	XXXX - 0.31 TO 0.25 MM	77

SIZE ANALYSIS RECORD	ALWAYS 'O' - 1/3 PHI INCREMENTS, 2 PHI TO 6 PHI	10
SEQUENCE NUMBER WITHIN STATION	XXX - SEE RECORD 'B'	11
STATION NUMBER	SEE RECORD 'B'	14
SAMPLE NUMBER	SEE RECORD 'D'	20
SAMPLE TYPE	SEE RECORD 'D'	26
SUB-CORE NUMBER	X - SEE RECORD 'D'	29
INTERVAL NUMBER	XX - SEE RECORD 'D'	30
REPLICATE NUMBER	X - SEE RECORD 'D'	32
2.00 TO 2.33 PHI	XXXX - 0.25 TO 0.20 MM	33
2.33 TO 2.67 PHI	XXXX - 0.20 TO 0.157 MM	37
2.67 TO 3.00 PHI	XXXX - 0.157 TO 0.125 MM	41
3.00 TO 3.33 PHI	XXXX - 0.125 TO 0.099 MM	45
3.33 TO 3.67 PHI	XXXX - 0.099 TO 0.079 MM	49
3.67 TO 4.00 PHI	XXXX - 0.079 TO 0.0625 MM	53
4.00 TO 4.33 PHI	XXXX - 0.0625 TO 0.05 MM	57
4.33 TO 4.67 PHI	XXXX - 0.05 TO 0.039 MM	61
4.67 TO 5.00 PHI	XXXX - 0.039 TO 0.031 MM	65
5.00 TO 5.33 PHI	XXXX - 0.031 TO 0.025 MM	69
5.33 TO 5.67 PHI	XXXX - 0.025 TO 0.020 MM	73
5.67 TO 6.00 PHI	XXXX - 0.020 TO 0.0156 MM	77

NOTES AND CORRECTIONS

SIZE ANALYSIS RECORD	ALWAYS 'P' - 1/3 PHI INCREMENTS, 6 PHI TO 10 PHI	10
SEQUENCE NUMBER WITHIN STATION	XXX - SEE RECORD 'B'	11
STATION NUMBER	SEE RECORD 'B'	14
SAMPLE NUMBER	SEE RECORD 'D'	20
SAMPLE TYPE	SEE RECORD 'D'	26
SUB-CORE NUMBER	X - SEE RECORD 'D'	29
INTERVAL NUMBER	XX - SEE RECORD 'D'	30
REPLICATE NUMBER	X - SEE RECORD 'D'	32
6.00 TO 6.33 PHI	XXXX - 0.0156 TO 0.0124 MM	33
6.33 TO 6.67 PHI	XXXX - 0.0124 TO 0.0098 MM	37
6.67 TO 7.00 PHI	XXXX - 0.0098 TO 0.0078 MM	41
7.00 TO 7.33 PHI	XXXX - 0.0078 TO 0.0062 MM	45
7.33 TO 7.67 PHI	XXXX - 0.0062 TO 0.0049 MM	49
7.67 TO 8.00 PHI	XXXX - 0.0049 TO 0.0039 MM	53
8.00 TO 8.33 PHI	XXXX - 0.0039 TO 0.0031 MM	57
8.33 TO 8.67 PHI	XXXX - 0.0031 TO 0.0025 MM	61
8.67 TO 9.00 PHI	XXXX - 0.0025 TO 0.0020 MM	65
9.00 TO 9.33 PHI	XXXX - 0.0020 TO 0.00155 MM	69
9.33 TO 9.67 PHI	XXXX - 0.00155 TO 0.00123 MM	73
9.67 TO 10.00 PHI	XXXX - 0.00123 TO 0.00098 MM	77

SIZE ANALYSIS RECORD	ALWAYS 'Q' - 1/3 PHI INCREMENTS, 10 PHI TO 12 PHI	10
SEQUENCE NUMBER WITHIN STATION	XXX - SEE RECORD 'B'	11
STATION NUMBER	SEE RECORD 'B'	14
SAMPLE NUMBER	SEE RECORD 'D'	20
SAMPLE TYPE	SEE RECORD 'D'	26
SUB-CORE NUMBER	X - SEE RECORD 'D'	29
INTERVAL NUMBER	XX - SEE RECORD 'D'	30
REPLICATE NUMBER	X - SEE RECORD 'D'	32
10.00 TO 10.33 PHI	XXXX - 0.00098 TO 0.00078 MM	33
10.33 TO 10.67 PHI	XXXX - 0.00078 TO 0.00062 MM	37
10.67 TO 11.00 PHI	XXXX - 0.00062 TO 0.00049 MM	41
11.00 TO 11.33 PHI	XXXX - 0.00049 TO 0.00039 MM	45
11.33 TO 11.67 PHI	XXXX - 0.00039 TO 0.00031 MM	49
11.67 TO 12.00 PHI	XXXX - 0.00031 TO 0.00024 MM	53
BLANKS		57

NOTES AND CORRECTIONS

SIZE ANALYSIS RECORD	ALWAYS 'R' - 1/4 PHI INCREMENTS, -6 PHI TO -3 PHI	10
SEQUENCE NUMBER WITHIN STATION	XXX - SEE RECORD 'B'	11
STATION NUMBER	SEE RECORD 'B'	14
SAMPLE NUMBER	SEE RECORD 'D'	20
SAMPLE TYPE	SEE RECORD 'D'	26
SUB-CORE NUMBER	X - SEE RECORD 'D'	29
INTERVAL NUMBER	XX - SEE RECORD 'D'	30
REPLICATE NUMBER	X - SEE RECORD 'D'	32
-6.00 TO -5.75 PHI	XXXX - 64 TO 54 MM	33
-5.75 TO -5.50 PHI	XXXX - 54 TO 45 MM	37
-5.50 TO -5.25 PHI	XXXX - 45 TO 38 MM	41
-5.25 TO -5.00 PHI	XXXX - 38 TO 32 MM	45
-5.00 TO -4.75 PHI	XXXX - 32 TO 26.9 MM	49
-4.75 TO -4.50 PHI	XXXX - 26.9 TO 22.6 MM	53
-4.50 TO -4.25 PHI	XXXX - 22.6 TO 19 MM	57
-4.25 TO -4.00 PHI	XXXX - 19 TO 16 MM	61
-4.00 TO -3.75 PHI	XXXX - 16 TO 13.5 MM	65
-3.75 TO -3.50 PHI	XXXX - 13.5 TO 11.3 MM	69
-3.50 TO -3.25 PHI	XXXX - 11.3 TO 9.5 MM	73
-3.25 TO -3.00 PHI	XXXX - 9.5 TO 8 MM	77

SIZE ANALYSIS RECORD	ALWAYS 'S' - 1/4 PHI INCREMENTS, -3 PHI TO 0 PHI	10
SEQUENCE NUMBER WITHIN STATION	XXX - SEE RECORD 'B'	11
STATION NUMBER	SEE RECORD 'B'	14
SAMPLE NUMBER	SEE RECORD 'D'	20
SAMPLE TYPE	SEE RECORD 'D'	26
SUB-CORE NUMBER	X - SEE RECORD 'D'	29
INTERVAL NUMBER	XX - SEE RECORD 'D'	30
REPLICATE NUMBER	X - SEE RECORD 'D'	32
-3.00 TO -2.75 PHI	XXXX - 8 TO 6.73 MM	33
-2.75 TO -2.50 PHI	XXXX - 6.73 TO 5.66 MM	37
-2.50 TO -2.25 PHI	XXXX - 5.66 TO 4.76 MM	41
-2.25 TO -2.00 PHI	XXXX - 4.76 TO 4 MM	45
-2.00 TO -1.75 PHI	XXXX - 4 TO 3.36 MM	49
-1.75 TO -1.50 PHI	XXXX - 3.36 TO 2.83 MM	53
-1.50 TO -1.25 PHI	XXXX - 2.83 TO 2.38 MM	57
-1.25 TO -1.00 PHI	XXXX - 2.38 TO 2 MM	61
-1.00 TO -0.75 PHI	XXXX - 2 TO 1.68 MM	65
-0.75 TO -0.50 PHI	XXXX - 1.68 TO 1.41 MM	69
-0.50 TO -0.25 PHI	XXXX - 1.41 TO 1.19 MM	73
-0.25 TO 0.00 PHI	XXXX - 1.19 TO 1 MM	77

NOTES AND CORRECTIONS

SIZE ANALYSIS RECORD	ALWAYS 'T' - 1/4 PHI INCREMENTS, 0 PHI TO 3 PHI	10
SEQUENCE NUMBER WITHIN STATION	XXX - SEE RECORD 'B'	11
STATION NUMBER	SEE RECORD 'B'	14
SAMPLE NUMBER	SEE RECORD 'D'	20
SAMPLE TYPE	SEE RECORD 'D'	26
SUB-CORE NUMBER	X - SEE RECORD 'D'	29
INTERVAL NUMBER	XX - SEE RECORD 'D'	30
REPLICATE NUMBER	X - SEE RECORD 'D'	32
0.00 TO 0.25 PHI	XXXX - 1 TO 0.84 MM	33
0.25 TO 0.50 PHI	XXXX - 0.84 TO 0.71 MM	37
0.50 TO 0.75 PHI	XXXX - 0.71 TO 0.59 MM	41
0.75 TO 1.00 PHI	XXXX - 0.59 TO 0.50 MM	45
1.00 TO 1.25 PHI	XXXX - 0.50 TO 0.42 MM	49
1.25 TO 1.50 PHI	XXXX - 0.42 TO 0.35 MM	53
1.50 TO 1.75 PHI	XXXX - 0.35 TO 0.30 MM	57
1.75 TO 2.00 PHI	XXXX - 0.30 TO 0.25 MM	61
2.00 TO 2.25 PHI	XXXX - 0.25 TO 0.21 MM	65
2.25 TO 2.50 PHI	XXXX - 0.21 TO 0.177 MM	69
2.50 TO 2.75 PHI	XXXX - 0.177 TO 0.149 MM	73
2.75 TO 3.00 PHI	XXXX - 0.149 TO 0.125 MM	77

SIZE ANALYSIS RECORD	ALWAYS 'U' - 1/4 PHI INCREMENTS, 3 PHI TO 6 PHI	10
SEQUENCE NUMBER WITHIN STATION	XXX - SEE RECORD 'B'	11
STATION NUMBER	SEE RECORD 'B'	14
SAMPLE NUMBER	SEE RECORD 'D'	20
SAMPLE TYPE	SEE RECORD 'D'	26
SUB-CORE NUMBER	X - SEE RECORD 'D'	29
INTERVAL NUMBER	XX - SEE RECORD 'D'	30
REPLICATE NUMBER	X - SEE RECORD 'D'	32
3.00 TO 3.25 PHI	XXXX - 0.125 TO 0.105 MM	33
3.25 TO 3.50 PHI	XXXX - 0.105 TO 0.088 MM	37
3.50 TO 3.75 PHI	XXXX - 0.088 TO 0.074 MM	41
3.75 TO 4.00 PHI	XXXX - 0.074 TO 0.0625 MM	45
4.00 TO 4.25 PHI	XXXX - 0.0625 TO 0.053 MM	49
4.25 TO 4.50 PHI	XXXX - 0.053 TO 0.044 MM	53
4.50 TO 4.75 PHI	XXXX - 0.044 TO 0.037 MM	57
4.75 TO 5.00 PHI	XXXX - 0.037 TO 0.031 MM	61
5.00 TO 5.25 PHI	XXXX - 0.031 TO 0.026 MM	65
5.25 TO 5.50 PHI	XXXX - 0.026 TO 0.022 MM	69
5.50 TO 5.75 PHI	XXXX - 0.022 TO 0.0186 MM	73
5.75 TO 6.00 PHI	XXXX - 0.0186 TO 0.0156 MM	77

SIZE ANALYSIS RECORD	ALWAYS 'V' - 1/4 PHI INCREMENTS, 6 PHI TO 9 PHI	10
SEQUENCE NUMBER WITHIN STATION	XXX - SEE RECORD 'B'	11
STATION NUMBER	SEE RECORD 'B'	14
SAMPLE NUMBER	SEE RECORD 'D'	20
SAMPLE TYPE	SEE RECORD 'D'	26
SUB-CORE NUMBER	X - SEE RECORD 'D'	29
INTERVAL NUMBER	XX - SEE RECORD 'D'	30
REPLICATE NUMBER	X - SEE RECORD 'D'	32
6.00 TO 6.25 PHI	XXXX - 0.0156 TO 0.0131 MM	33
6.25 TO 6.50 PHI	XXXX - 0.0131 TO 0.0110 MM	37
6.50 TO 6.75 PHI	XXXX - 0.0110 TO 0.0093 MM	41
6.75 TO 7.00 PHI	XXXX - 0.0093 TO 0.0078 MM	45
7.00 TO 7.25 PHI	XXXX - 0.0078 TO 0.0066 MM	49
7.25 TO 7.50 PHI	XXXX - 0.0066 TO 0.0055 MM	53
7.50 TO 7.75 PHI	XXXX - 0.0055 TO 0.0046 MM	57
7.75 TO 8.00 PHI	XXXX - 0.0046 TO 0.0039 MM	61
8.00 TO 8.25 PHI	XXXX - 0.0039 TO 0.0033 MM	65
8.25 TO 8.50 PHI	XXXX - 0.0033 TO 0.0028 MM	69
8.50 TO 8.75 PHI	XXXX - 0.0028 TO 0.0023 MM	73
8.75 TO 9.00 PHI	XXXX - 0.0023 TO 0.0020 MM	77

SIZE ANALYSIS RECORD	ALWAYS 'W' - 1/4 PHI INCREMENTS, 9 PHI TO 12 PHI	10
SEQUENCE NUMBER WITHIN STATION	XXX - SEE RECORD 'B'	11
STATION NUMBER	SEE RECORD 'B'	14
SAMPLE NUMBER	SEE RECORD 'D'	20
SAMPLE TYPE	SEE RECORD 'D'	26
SUB-CORE NUMBER	X - SEE RECORD 'D'	29
INTERVAL NUMBER	XX - SEE RECORD 'D'	30
REPLICATE NUMBER	X - SEE RECORD 'D'	32
9.00 TO 9.25 PHI	XXXX - 0.0020 TO 0.00164 MM	33
9.25 TO 9.50 PHI	XXXX - 0.00164 TO 0.00138 MM	37
9.50 TO 9.75 PHI	XXXX - 0.00138 TO 0.00116 MM	41
9.75 TO 10.00 PHI	XXXX - 0.00116 TO 0.00098 MM	45
10.00 TO 10.25 PHI	XXXX - 0.00098 TO 0.00082 MM	49
10.25 TO 10.50 PHI	XXXX - 0.00082 TO 0.00069 MM	53
10.50 TO 10.75 PHI	XXXX - 0.00069 TO 0.00058 MM	57
10.75 TO 11.00 PHI	XXXX - 0.00058 TO 0.00049 MM	61
11.00 TO 11.25 PHI	XXXX - 0.00049 TO 0.00041 MM	65
11.25 TO 11.50 PHI	XXXX - 0.00041 TO 0.00035 MM	69
11.50 TO 11.75 PHI	XXXX - 0.00035 TO 0.00029 MM	73
11.75 TO 12.00 PHI	XXXX - 0.00029 TO 0.00024 MM	77

SIZE ANALYSIS RECORD	ALWAYS 'X' - SUMMARY STATISTICS	10
SEQUENCE NUMBER WITHIN STATION	XXX - SEE RECORD 'B'	11
STATION NUMBER	SEE RECORD 'B'	14
SAMPLE NUMBER	SEE RECORD 'D'	20
SAMPLE TYPE	SEE RECORD 'D'	26
SUB-CORE NUMBER	X - SEE RECORD 'D'	29
INTERVAL NUMBER	XX - SEE RECORD 'D'	30
REPLICATE NUMBER	X - SEE RECORD 'D'	32
MEAN GRAIN SIZE	XXXX - PHI UNITS (TO HUNDREDTHS)	33
MEDIAN GRAIN SIZE	XXXX - PHI UNITS (TO HUNDREDTHS)	37
MODAL GRAIN SIZE	XXXX - PHI UNITS AT MIDPOINT OF PRINCIPAL MODE (TO HUNDREDTHS)	41
STANDARD DEVIATION	XXXX - PHI UNITS (TO HUNDREDTHS)	45
SKEWNESS	XXXX - PHI UNITS (TO HUNDREDTHS)	49
KURTOSIS	XXXX - PHI UNITS (TO HUNDREDTHS)	53
BLANKS		57

THE FOLLOWING CODES ARE USED IN FILE TYPE 073

0053 CLOUD TYPE (WMO500)

0 -- CIRRUS
1 -- CIRROCUMULUS
2 -- CIRROSTRATUS
3 -- ALTOCUMULUS
4 -- ALTOSTRATUS
5 -- NIMBOSTRATUS
6 -- STRATOCUMULUS
7 -- STRATUS
8 -- CUMULUS
9 -- CUMULONIMBUS
X -- CLOUD NOT VISIBLE OWING TO DARKNESS, FOG, DUSTSTORM, SANDSTORM, OR OTHER ANALOGOUS PHENOMENA

0104 WAVE HT (WMO1555)

-- NOTE-50 ADDED TO DIRECTION FIELD (CODE 110) TO INDICATE HEIGHTS > 4 1/2 METERS.
0 -- LESS THAN 1/4 M (1 FT) OR 5 M (16 FT)
1 -- 1/2 M (1 1/2 FT) OR 5 1/2 M (17 1/2 FT)
2 -- 1 M (3 FT) OR 6 M (19 FT)
3 -- 1 1/2 M (5 FT) OR 6 1/2 M (21 FT)
4 -- 2 M (6 1/2 FT) OR 7 M (22 1/2 FT)
5 -- 2 1/2 M (8 FT) OR 7 1/2 M (24 FT)
6 -- 3 M (9 1/2 FT) OR 8 M (25 1/2 FT)
7 -- 3 1/2 M (11 FT) OR 8 1/2 M (27 FT)
8 -- 4 M (13 FT) OR 9 M (29 FT)
9 -- 4 1/2 M (14 FT) OR 9 1/2 M (30 1/2 FT)
X -- HEIGHT NOT DETERMINED

0105 CLOUD AMT (WMO2700)

0 -- 0 (ZERO)
1 -- 1 OKTA OR LESS, BUT NOT ZERO (1/10 OR LESS, BUT NOT ZERO)
2 -- 2 OKTAS 2/10-3/10
3 -- 3 OKTAS 4/10
4 -- 4 OKTAS 5/10
5 -- 5 OKTAS 6/10
6 -- 6 OKTAS 7/10-8/10
7 -- 7 OKTAS OR MORE, BUT NOT 8 OKTAS (9/10 OR MORE, BUT NOT 10/10)
8 -- 8 OKTAS 10/10
9 -- SKY OBSCURED, OR CLOUD AMOUNT CANNOT BE ESTIMATED

0108 WEATHER (WMO4501)

0 -- CLEAR (NO CLOUD AT ANY LEVEL)
1 -- PARTLY CLOUDY (SCATTERED OR BROKED)
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)

0110 WIND-WAVE DIRECTION

00 -- CALM (NO WAVES-NO MOTION)
01 -- 5 DEGREES - 14 DEGREES
02 -- 15 DEGREES - 24 DEGREES
03 -- 25 DEGREES - 34 DEGREES
04 -- 35 DEGREES - 44 DEGREES
05 -- 45 DEGREES - 54 DEGREES
06 -- 55 DEGREES - 64 DEGREES
07 -- 65 DEGREES - 74 DEGREES
08 -- 75 DEGREES - 84 DEGREES
09 -- 85 DEGREES - 94 DEGREES
10 -- 95 DEGREES - 104 DEGREES
11 -- 105 DEGREES - 114 DEGREES
12 -- 115 DEGREES - 124 DEGREES
13 -- 125 DEGREES - 134 DEGREES
14 -- 135 DEGREES - 144 DEGREES
15 -- 145 DEGREES - 154 DEGREES
16 -- 155 DEGREES - 164 DEGREES
17 -- 165 DEGREES - 174 DEGREES
18 -- 175 DEGREES - 184 DEGREES
19 -- 185 DEGREES - 194 DEGREES
20 -- 195 DEGREES - 204 DEGREES
21 -- 205 DEGREES - 214 DEGREES
22 -- 215 DEGREES - 224 DEGREES
23 -- 225 DEGREES - 234 DEGREES
24 -- 235 DEGREES - 244 DEGREES
25 -- 245 DEGREES - 254 DEGREES
26 -- 255 DEGREES - 264 DEGREES
27 -- 265 DEGREES - 274 DEGREES
28 -- 275 DEGREES - 284 DEGREES
29 -- 285 DEGREES - 294 DEGREES
30 -- 295 DEGREES - 304 DEGREES
31 -- 305 DEGREES - 314 DEGREES

32 -- 315 DEGREES - 324 DEGREES
33 -- 325 DEGREES - 334 DEGREES
34 -- 335 DEGREES - 344 DEGREES
35 -- 345 DEGREES - 354 DEGREES
36 -- 355 DEGREES - 4 DEGREES
49 -- WAVES CONFUSED, DIRECTION INDETERMINATE (WAVES EQUAL TO OR LESS THAN 4 3/4 METERS)
99 -- WAVES CONFUSED, DIRECTION INDETERMINATE (WAVES GEATER THAN 4 3/4 METERS) WINDS VARIABLE,OR ALL DIRECTIONS OR UNKNOWN

0157 VISIBILITY (WMO4300)

0 -- LESS THAN 50 M (LESS THAN 55 YARDS)
1 -- 50-200 M (APPROX. 55-220 YARDS)
2 -- 200-500 M (APPROX. 220-550 YARDS)
3 -- 500-1000 M (APPROX. 550 YARDS-5/8 N.M.)
4 -- 1-2 KM (APPROX. 5/8-1 N.M.)
5 -- 2-4 KM (APPROX. 1-2 N.M.)
6 -- 4-10 KM (APPROX. 2-6 N.M.)
7 -- 10-20 KM (APPROX. 6-12 N.M.)
8 -- 20-50 KM (APPROX. 12-30 N.M.)
9 -- 50 KM OR MORE (30 N.M. OR MORE)

0243 CORRECTION

C -- CORRECTED
U -- UNCORRECTED

0253 GRAIN SIZE-COURSE

1 -- SIEVES
2 -- SETTLING TUBE
3 -- RAPID SEDIMENT ANALYZER

0254 GRAIN SIZE-FINE

1 -- PIPETTE
2 -- HYDROMETER
3 -- SEDIMENTATION BALANCE
4 -- HYDROPHOTOMETER
5 -- COULTER COUNTER

0255 SAMPLE TYPE

100 -- GRAB SAMPLE (UNDIFFERENTIATED)
101 -- ORANGE PEEL GRAB
102 -- CLAMSHELL GRAB
103 -- VAN VEEN GRAB
104 -- SHIPEK GRAB

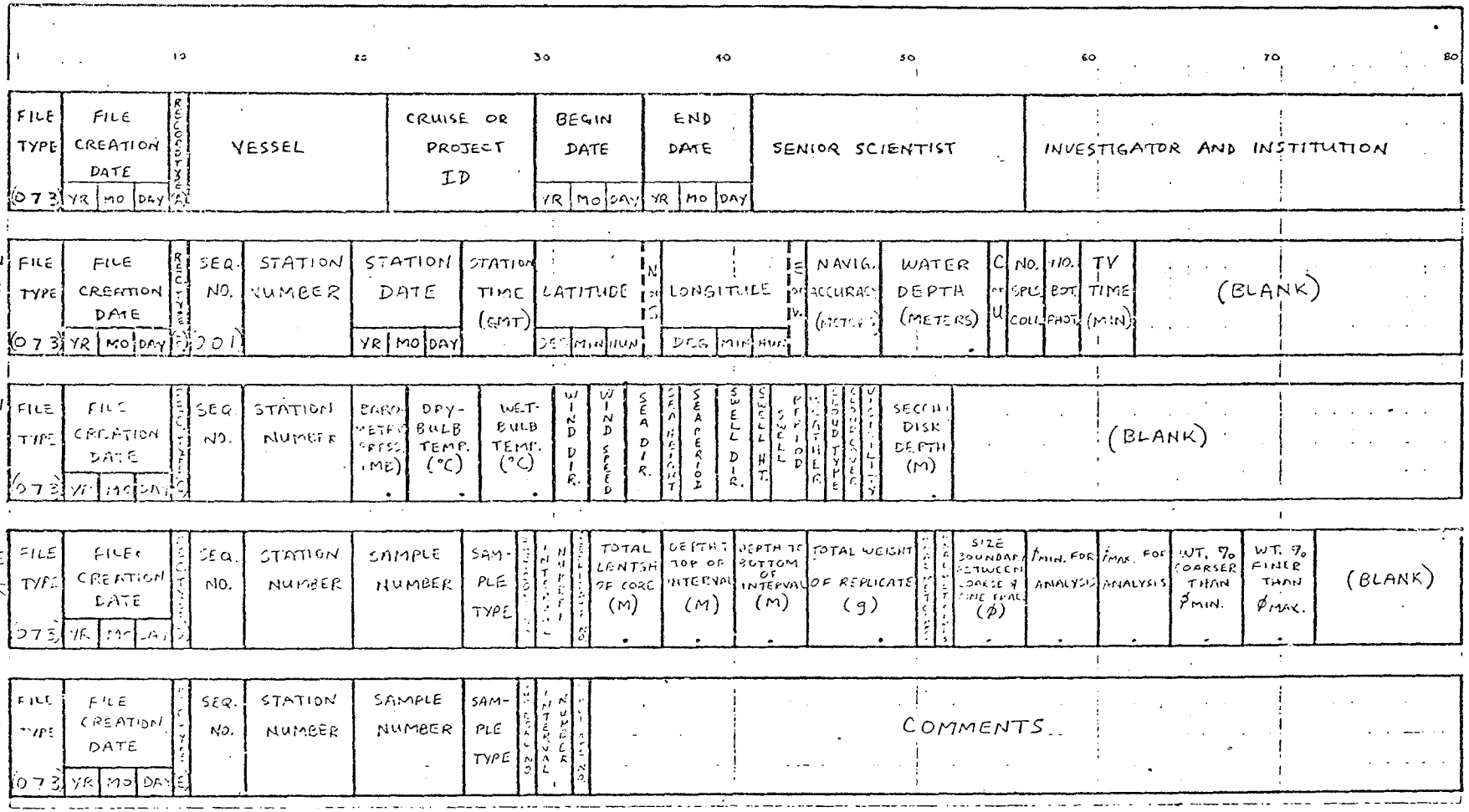
105 -- PETERSON GRAB
106 -- CAMPBELL GRAB
107 -- SMITH-MCINTYRE GRAB
108 -- FREE FALL GRAB
109 -- PONAR GRAB
110 -- SCOOPFISH (GRAB)
111 -- DIETZ-LAFOND GRAB
112 -- BOOMERANG GRAB
200 -- DREDGE SAMPLE (UNDIFFERENTIATED)
201 -- CHAIN DREDGE
202 -- PIPE DREDGE
203 -- BOX DREDGE
300 -- BOX CORE
400 -- GRAVITY CORE (UNDIFFERENTIATED)
401 -- PHLEGER CORER (GRAVITY)
402 -- DART CORER (GRAVITY)
403 -- BOOMERANG CORER
404 -- HYDROPLASTIC (PVC) GRAVITY CORER
405 -- KULLENBERG GRAVITY CORER
406 -- EWING GRAVITY CORER
500 -- PISTON CORE (UNDIFFERENTIATED)
501 -- KULLENBERG PISTON CORER
502 -- EWING PISTON CORER
503 -- HYDROPLASTIC (PVC) PISTON CORER
600 -- VIBRATING CORER
700 -- DRIVE SAMPLER (UNDIFFERENTIATED)
701 -- HAND CORER
800 -- DRILLED SAMPLE

0500 LAT HEMISPHERE

N -- NORTH
S -- SOUTH

0501 LON HEMISPHERE

E -- EAST
W -- WEST



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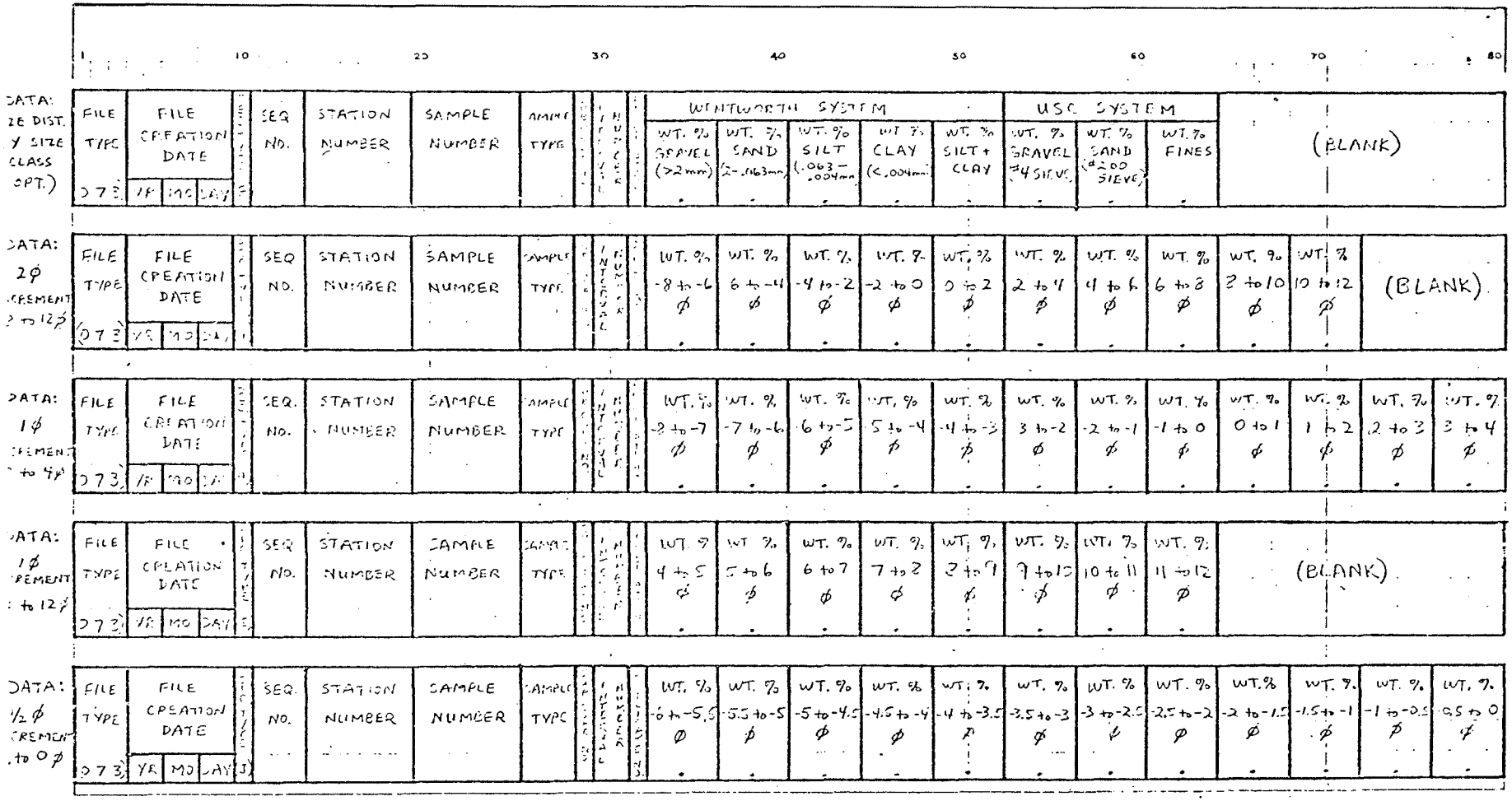

NOAA FORM 59-530
(Rev 5/73)

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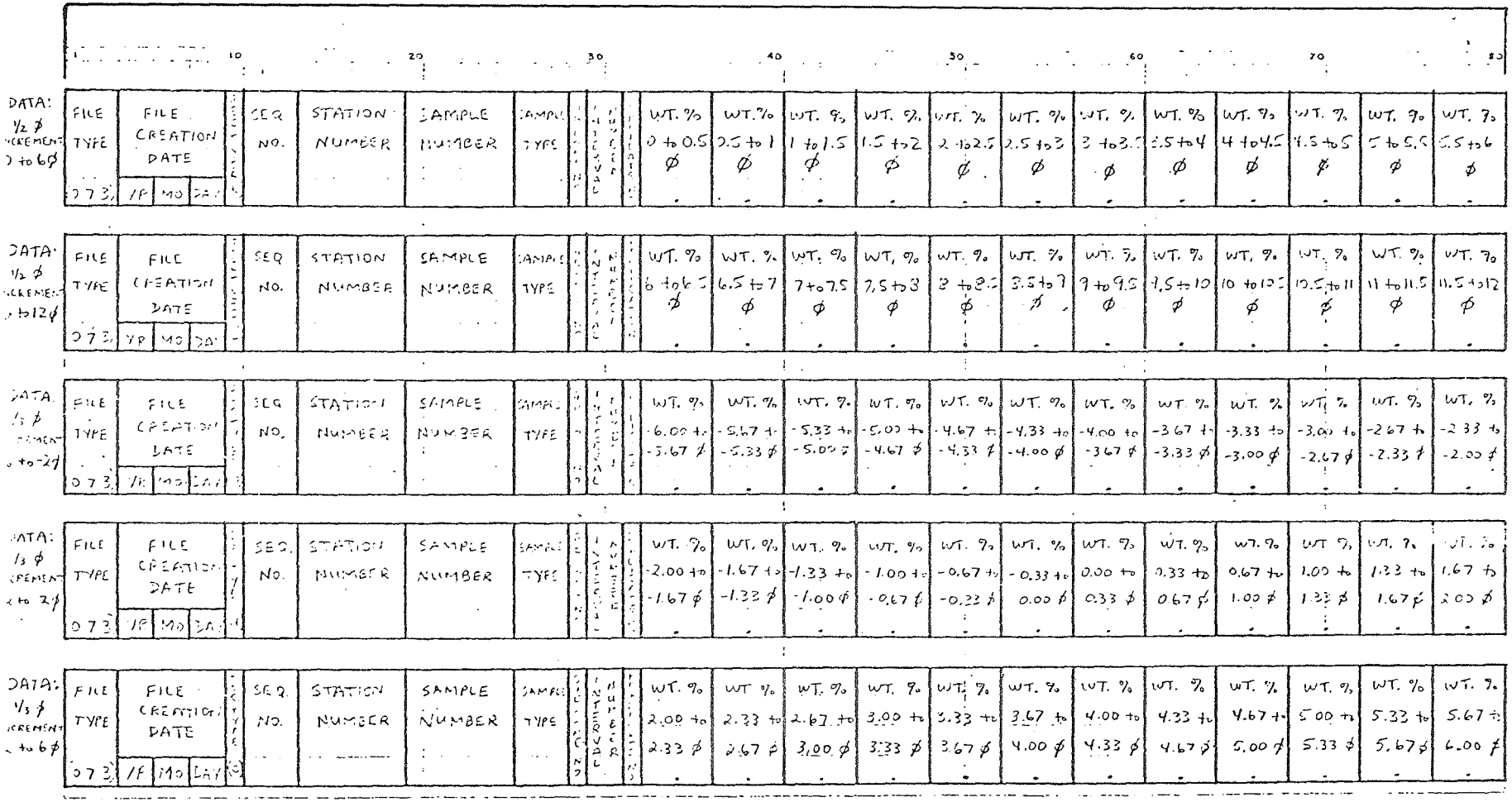

DATA: ½ ϕ INCREMENT 0 to 6ϕ

FILE TYPE	FILE CREATION DATE				SEQ NO.	STATION NUMBER	SAMPLE NUMBER	SAMPLE TYPE			WT. % 0 to 0.5 ϕ	WT. % 0.5 to 1 ϕ	WT. % 1 to 1.5 ϕ	WT. % 1.5 to 2 ϕ	WT. % 2 to 2.5 ϕ	WT. % 2.5 to 3 ϕ	WT. % 3 to 3.5 ϕ	WT. % 3.5 to 4 ϕ	WT. % 4 to 4.5 ϕ	WT. % 4.5 to 5 ϕ	WT. % 5 to 5.5 ϕ	WT. % 5.5 to 6 ϕ
073	YR	MO	DAY																			

DATA: ½ ϕ INCREMENT 6 to 12ϕ

FILE TYPE	FILE CREATION DATE				SEQ NO.	STATION NUMBER	SAMPLE NUMBER	SAMPLE TYPE			WT. % 6 to 6.5 ϕ	WT. % 6.5 to 7 ϕ	WT. % 7 to 7.5 ϕ	WT. % 7.5 to 8 ϕ	WT. % 8 to 8.5 ϕ	WT. % 8.5 to 9 ϕ	WT. % 9 to 9.5 ϕ	WT. % 9.5 to 10 ϕ	WT. % 10 to 10.5 ϕ	WT. % 10.5 to 11 ϕ	WT. % 11 to 11.5 ϕ	WT. % 11.5 to 12 ϕ
073	YR	MO	DAY																			

DATA: ½ ϕ INCREMENT 0 to -2ϕ

FILE TYPE	FILE CREATION DATE				SEQ NO.	STATION NUMBER	SAMPLE NUMBER	SAMPLE TYPE			WT. % -6.00 to -5.67 ϕ	WT. % -5.67 to -5.33 ϕ	WT. % -5.33 to -5.00 ϕ	WT. % -5.00 to -4.67 ϕ	WT. % -4.67 to -4.33 ϕ	WT. % -4.33 to -4.00 ϕ	WT. % -4.00 to -3.67 ϕ	WT. % -3.67 to -3.33 ϕ	WT. % -3.33 to -3.00 ϕ	WT. % -3.00 to -2.67 ϕ	WT. % -2.67 to -2.33 ϕ	WT. % -2.33 to -2.00 ϕ
073	YR	MO	DAY																			

DATA: ⅓ ϕ INCREMENT 0 to 2ϕ

FILE TYPE	FILE CREATION DATE				SEQ NO.	STATION NUMBER	SAMPLE NUMBER	SAMPLE TYPE			WT. % -2.00 to -1.67 ϕ	WT. % -1.67 to -1.33 ϕ	WT. % -1.33 to -1.00 ϕ	WT. % -1.00 to -0.67 ϕ	WT. % -0.67 to -0.33 ϕ	WT. % -0.33 to 0.00 ϕ	WT. % 0.00 to 0.33 ϕ	WT. % 0.33 to 0.67 ϕ	WT. % 0.67 to 1.00 ϕ	WT. % 1.00 to 1.33 ϕ	WT. % 1.33 to 1.67 ϕ	WT. % 1.67 to 2.00 ϕ
073	YR	MO	DAY																			

DATA: ⅓ ϕ INCREMENT 2 to 6ϕ

FILE TYPE	FILE CREATION DATE				SEQ NO.	STATION NUMBER	SAMPLE NUMBER	SAMPLE TYPE			WT. % 2.00 to 2.33 ϕ	WT. % 2.33 to 2.67 ϕ	WT. % 2.67 to 3.00 ϕ	WT. % 3.00 to 3.33 ϕ	WT. % 3.33 to 3.67 ϕ	WT. % 3.67 to 4.00 ϕ	WT. % 4.00 to 4.33 ϕ	WT. % 4.33 to 4.67 ϕ	WT. % 4.67 to 5.00 ϕ	WT. % 5.00 to 5.33 ϕ	WT. % 5.33 to 5.67 ϕ	WT. % 5.67 to 6.00 ϕ
073	YR	MO	DAY																			

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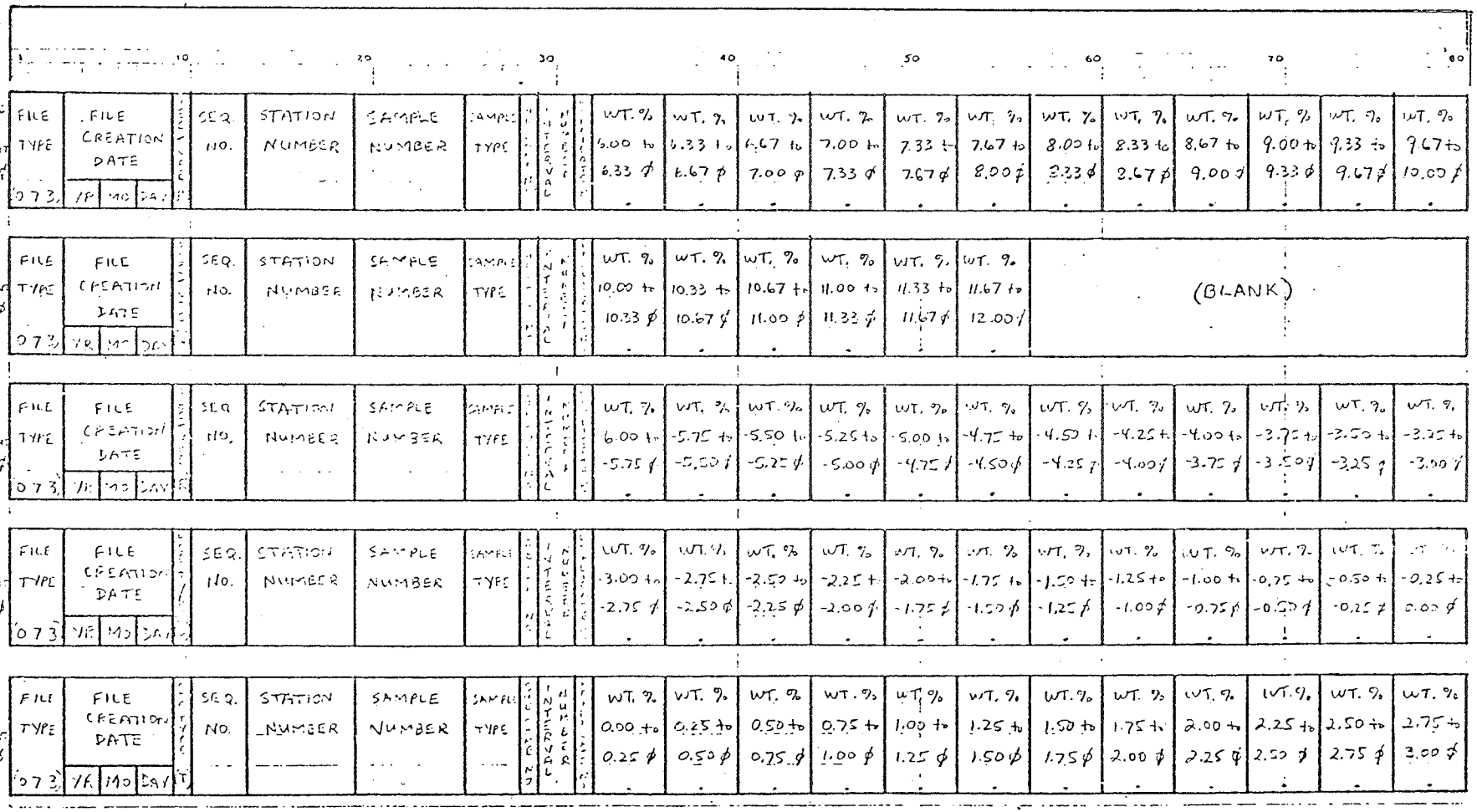

DATA: 3 ϕ ELEMENT -10 ϕ	FILE TYPE	FILE CREATION DATE			REC TYPE	SEQ. NO.	STATION NUMBER	SAMPLE NUMBER	SAMPLE TYPE	SIEVE NUMBER	CUMULATIVE PERCENT		WT. % 6.00 to 6.33 ϕ	WT. % 6.33 to 6.67 ϕ	WT. % 6.67 to 7.00 ϕ	WT. % 7.00 to 7.33 ϕ	WT. % 7.33 to 7.67 ϕ	WT. % 7.67 to 8.00 ϕ	WT. % 8.00 to 8.33 ϕ	WT. % 8.33 to 8.67 ϕ	WT. % 8.67 to 9.00 ϕ	WT. % 9.00 to 9.33 ϕ	WT. % 9.33 to 9.67 ϕ	WT. % 9.67 to 10.00 ϕ
	073	YR	MO	DAY	T																				
DATA: 3 ϕ ELEMENT to 12 ϕ	FILE TYPE	FILE CREATION DATE			REC TYPE	SEQ. NO.	STATION NUMBER	SAMPLE NUMBER	SAMPLE TYPE	SIEVE NUMBER	CUMULATIVE PERCENT		WT. % 10.00 to 10.33 ϕ	WT. % 10.33 to 10.67 ϕ	WT. % 10.67 to 11.00 ϕ	WT. % 11.00 to 11.33 ϕ	WT. % 11.33 to 11.67 ϕ	WT. % 11.67 to 12.00 ϕ	(BLANK)					
	073	YR	MO	DAY	T																				
DATA: ϕ ELEMENT -3 ϕ	FILE TYPE	FILE CREATION DATE			REC TYPE	SEQ. NO.	STATION NUMBER	SAMPLE NUMBER	SAMPLE TYPE	SIEVE NUMBER	CUMULATIVE PERCENT		WT. % 6.00 to -5.75 ϕ	WT. % -5.75 to -5.50 ϕ	WT. % -5.50 to -5.25 ϕ	WT. % -5.25 to -5.00 ϕ	WT. % -5.00 to -4.75 ϕ	WT. % -4.75 to -4.50 ϕ	WT. % -4.50 to -4.25 ϕ	WT. % -4.25 to -4.00 ϕ	WT. % -4.00 to -3.75 ϕ	WT. % -3.75 to -3.50 ϕ	WT. % -3.50 to -3.25 ϕ	WT. % -3.25 to -3.00 ϕ
	073	YR	MO	DAY	T																				
DATA: ϕ ELEMENT -0 ϕ	FILE TYPE	FILE CREATION DATE			REC TYPE	SEQ. NO.	STATION NUMBER	SAMPLE NUMBER	SAMPLE TYPE	SIEVE NUMBER	CUMULATIVE PERCENT		WT. % -3.00 to -2.75 ϕ	WT. % -2.75 to -2.50 ϕ	WT. % -2.50 to -2.25 ϕ	WT. % -2.25 to -2.00 ϕ	WT. % -2.00 to -1.75 ϕ	WT. % -1.75 to -1.50 ϕ	WT. % -1.50 to -1.25 ϕ	WT. % -1.25 to -1.00 ϕ	WT. % -1.00 to -0.75 ϕ	WT. % -0.75 to -0.50 ϕ	WT. % -0.50 to -0.25 ϕ	WT. % -0.25 to 0.00 ϕ
	073	YR	MO	DAY	T																				
DATA: ϕ ELEMENT -3 ϕ	FILE TYPE	FILE CREATION DATE			REC TYPE	SEQ. NO.	STATION NUMBER	SAMPLE NUMBER	SAMPLE TYPE	SIEVE NUMBER	CUMULATIVE PERCENT		WT. % 0.00 to 0.25 ϕ	WT. % 0.25 to 0.50 ϕ	WT. % 0.50 to 0.75 ϕ	WT. % 0.75 to 1.00 ϕ	WT. % 1.00 to 1.25 ϕ	WT. % 1.25 to 1.50 ϕ	WT. % 1.50 to 1.75 ϕ	WT. % 1.75 to 2.00 ϕ	WT. % 2.00 to 2.25 ϕ	WT. % 2.25 to 2.50 ϕ	WT. % 2.50 to 2.75 ϕ	WT. % 2.75 to 3.00 ϕ
	073	YR	MO	DAY	T																				

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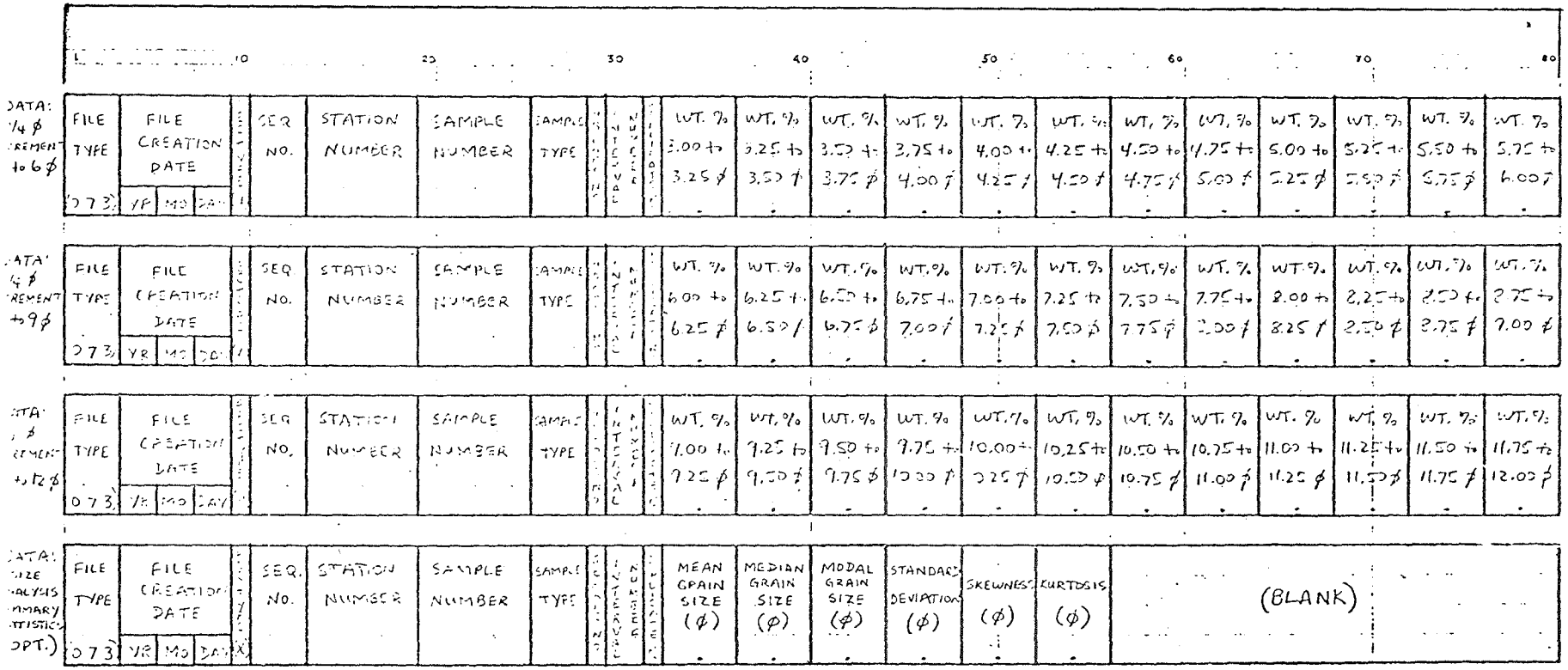
1 10 20 30 40 50 60 70 80
DATA: 1/4 ϕ INCREMENT to 6 ϕ
FILE TYPE
FILE CREATION DATE
YR MO DAY
073
SEQ NO.
STATION NUMBER
SAMPLE NUMBER
SAMPLE TYPE
WT. % 3.00 to 3.25 ϕ
WT. % 3.25 to 3.50 ϕ
WT. % 3.50 to 3.75 ϕ
WT. % 3.75 to 4.00 ϕ
WT. % 4.00 to 4.25 ϕ
WT. % 4.25 to 4.50 ϕ
WT. % 4.50 to 4.75 ϕ
WT. % 4.75 to 5.00 ϕ
WT. % 5.00 to 5.25 ϕ
WT. % 5.25 to 5.50 ϕ
WT. % 5.50 to 5.75 ϕ
WT. % 5.75 to 6.00 ϕ
DATA: 1/4 ϕ INCREMENT to 9 ϕ
FILE TYPE
FILE CREATION DATE
YR MO DAY
073
SEQ NO.
STATION NUMBER
SAMPLE NUMBER
SAMPLE TYPE
WT. % 6.00 to 6.25 ϕ
WT. % 6.25 to 6.50 ϕ
WT. % 6.50 to 6.75 ϕ
WT. % 6.75 to 7.00 ϕ
WT. % 7.00 to 7.25 ϕ
WT. % 7.25 to 7.50 ϕ
WT. % 7.50 to 7.75 ϕ
WT. % 7.75 to 8.00 ϕ
WT. % 8.00 to 8.25 ϕ
WT. % 8.25 to 8.50 ϕ
WT. % 8.50 to 8.75 ϕ
WT. % 8.75 to 9.00 ϕ
DATA: 1/4 ϕ INCREMENT to 12 ϕ
FILE TYPE
FILE CREATION DATE
YR MO DAY
073
SEQ NO.
STATION NUMBER
SAMPLE NUMBER
SAMPLE TYPE
WT. % 7.00 to 7.25 ϕ
WT. % 7.25 to 7.50 ϕ
WT. % 7.50 to 7.75 ϕ
WT. % 7.75 to 8.00 ϕ
WT. % 8.00 to 8.25 ϕ
WT. % 8.25 to 8.50 ϕ
WT. % 8.50 to 8.75 ϕ
WT. % 8.75 to 9.00 ϕ
WT. % 9.00 to 9.25 ϕ
WT. % 9.25 to 9.50 ϕ
WT. % 9.50 to 9.75 ϕ
WT. % 9.75 to 10.00 ϕ
WT. % 10.00 to 10.25 ϕ
WT. % 10.25 to 10.50 ϕ
WT. % 10.50 to 10.75 ϕ
WT. % 10.75 to 11.00 ϕ
WT. % 11.00 to 11.25 ϕ
WT. % 11.25 to 11.50 ϕ
WT. % 11.50 to 11.75 ϕ
WT. % 11.75 to 12.00 ϕ
DATA: SIZE ANALYSIS SUMMARY STATISTICS (OPT.)
FILE TYPE
FILE CREATION DATE
YR MO DAY
073
SEQ. NO.
STATION NUMBER
SAMPLE NUMBER
SAMPLE TYPE
MEAN GRAIN SIZE (ϕ)
MEDIAN GRAIN SIZE (ϕ)
MODAL GRAIN SIZE (ϕ)
STANDARD DEVIATION (ϕ)
SKEWNESS (ϕ)
KURTOSIS (ϕ)
(BLANK)

APPENDIX 3. National Pollutant Discharge Elimination System Factors

The Deep Seabed Hard Mineral Resources Act requires that applicants for a license or permit also must obtain an Environmental Protection Agency National Pollutant Discharge Elimination System (NPDES) permit under Section 402 of the Clean Water Act. The NPDES permit applies to discharges from mining ships either as a result of mining (Section II.B.1.1 of the PEIS) or process waste disposal (Section II.B.1.4. of the PEIS). In deciding whether or not an NPDES permit will be issued, EPA under its Ocean Discharge Criteria regulations (40CFR 125.122) must first determine whether or not a discharge will cause unreasonable degradation of the marine environment. In making this determination, EPA must consider the following 10 factors:

Factor 1 - The quantities, composition, potential for bioaccumulation, and persistence of the pollutants to be discharged.

Factor 2 - The potential transport of such pollutants by biological, physical, or chemical processes.

Factor 3 - The composition and vulnerability of the biological communities which may be exposed to such pollutants, including the presence of unique species or communities of species, the presence of species identified as endangered or threatened pursuant to the Endangered Species Act, or the presence of those species critical to the structure or function of the ecosystem, such as those important for the food chain.

Factor 4 - The importance of the receiving water area to the surrounding biological community, including the presence of spawning sites, nursery/forage areas, migratory pathways, or areas necessary for other functions or critical stages in the life cycle of an organism.

Factor 5 - The existence of special aquatic sites including, but not limited to marine sanctuaries and refuges, parks, national and historic monuments, national seashores, wilderness areas, and coral reefs.

Factor 6 - The potential impacts on human health through direct and indirect pathways.

Factor 7 - Existing or potential recreational and commercial fishing, including finfishing and shellfishing.

Factor 8 - Any applicable requirements of an approved Coastal Zone Management plan.

Factor 9 - Such other factors relating to the effects of the discharge as may be appropriate.

Factor 10- Marine water quality criteria developed pursuant to Section 304(a)(1).

*U S GOVERNMENT PRINTING OFFICE: 1981 352-031/8650

NOAA--S/T 81-229