REPORTING FORMAT FOR SEDIMENT DATA

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1 OVERVIEW OF THE SEDIMENT SYSTEM

The sediment reporting format is used for reporting data on the physico-chemical characteristics of the sediment, grain size distribution, etc., and contaminants in sediments, and for reporting data on biological effects techniques involving sediment samples – data type 'CS'. Although the reporting system is intended to be generally applicable for reporting data on biological effects associated with sediments, it is, at present, only defined for reporting information for the biological effects technique 'Oyster embryo (sediment elutriate) bioassay'.

Each data type has a number of record types associated with it. The record types available for sediment are:

The *Sediment Sampling Methods Record* (RECID: 20), the *Contaminant Analytical Methods Record* (RECID: 21), the *Oyster Embryo Bioassay Methods Record* (RECID: 23), the *Sample Master Record* (RECID: 01), the *Parameter/Contaminant Data Record* (RECID: 10), and the *Plain Language Comment Record* (RECID: 13).

The sediment format description includes sections explaining sample definitions, explanations of data file structure, short descriptions of data record types, sections on the reporting of core samples and oyster embryo bioassay data, tables describing layouts for each data record type, and specific examples of the use of the reporting format.

2 SEDIMENT DATA FILE

2.1 Data file structure

The data file consists of two parts, the methods section and the results section.

The first section, comprising a series of (one or more) *Sediment Sampling Methods Records*, followed by a series of (one or more) *Contaminant Analytical Methods Records* and/or (one or more) *Oyster Embryo Bioassay Methods Records*, defines the methods involved in obtaining any particular measurement of a parameter or contaminant in the sediment. The 'methods part' of the data file generally summarizes the methods used by the various laboratories involved in the collection and analysis of the sediment samples in a given year. Reporting institutes are encouraged to pay careful attention to the methods information reported each year, and should not simply assume that the information entered in the previous year's data file can be repeated. The information reported on the various '*Methods Records*' should form the basis for a historical record of changes in the procedures applied in the monitoring programmes, which is of relevance both in relation to data assessment activities and to the long-term archiving of environmental data.

The second section in the data file includes the actual results of the monitoring activity. This part of the data file comprises a series of (one or more) *Sample Master Records*, each followed by a series of *Parameter/Contaminant Data Records*. Each *Sample Master Record* defines a new sediment sample (station); each *Parameter/Contaminant Data Record* associated with a given *Sample Master Record* details the measurements made for a given parameter in that sample. The *Parameter/Contaminant Data Record* is also used to supplement the 'sampling occasion' information found in the master record coordinates by defining a third dimension, the 'depth' at which the sediment sample was taken. By reporting the 'sediment depth – upper' parameter (code SDEPU) and the 'sediment depth – lower' parameter (code SDEPL) in the specified order, the depth records are then used as *depth cycle* control records (cf. Section 2.3).

Links between the information contained on the *Sample Master* and *Parameter/Contaminant Data Records* and that contained on the *Sediment Sampling Methods* and *Contaminant Analytical Methods Records* and/or *Oyster Embryo Bioassay Methods Records* are established using link-keys (cf. Section 2.4).

2.2 Data records included in the sediment format

The format for reporting data on contaminants and/or biological effects in sediments utilizes the following types of data records:

- The *Sediment Sampling Methods Record* (RECID: 20)

The *Sediment Sampling Methods Record* records information on the type of sediment sampler used, the method of sample storage or preservation, the method of grain size analysis, and the method of structural analysis of a sediment core. The number of *Sediment Sampling Methods Records* included in the data file will depend on the number of combinations of methods used. Each sediment sample reported later in the data file on a *Sample Master Record* is unambiguously associated with a specific *Sediment Sampling Methods Record* by means of a 'Sampling methods link' (SMLNK) identifier.

- The *Contaminant Analytical Methods Record* (RECID: 21)

  The *Contaminant Analytical Methods Record* is a general purpose record for recording information on analytical methodologies employed in the contaminant monitoring programmes for sediment, seawater and biota. The record is used for reporting information on the method of dissolution or extraction used on a sediment sample, and the method of analysis for a particular contaminant or parameter by the analytical laboratory involved, for the year concerned. In addition, it includes information on aspects of the laboratory quality assurance programme relevant to the analysis concerned, on the detection limit for the analysis, and on the laboratory's participation in relevant intercomparison exercises. A series of *Contaminant Analytical Methods Records* should be included at the beginning of the data file, describing the methods associated with any contaminant subsequently reported. Each record reports a particular combination of dissolution/extraction procedures and analytical methods used within a given laboratory for a single contaminant. Thus, the number of records will depend on the number of laboratory-contaminant-extraction-analysis combinations used in the data being reported. Each contaminant analysis reported later in the data file on a *Parameter/Contaminant Data Record* is unambiguously associated with a specific *Contaminant Analytical Methods Record* by means of an 'Analytical methods link' (AMLNK) identifier.

- The *Oyster Embryo Bioassay Methods Record* (RECID: 23)

  The *Oyster Embryo Bioassay Methods Record* is specifically designed for recording information on the method(s) used to obtain oyster embryo bioassay data. The record is used for recording information on the sediment elutriation procedure, the source of the reference seawater used, characteristics of the oysters used, details of the analytical procedure, etc., for the analytical laboratory involved, for the year concerned. In addition, it includes information on aspects of the laboratory quality assurance programme relevant to the bioassay technique. Each bioassay result reported later in the data file on a *Parameter/Contaminant Data Record* is unambiguously associated with a specific *Oyster Embryo Bioassay Methods Record* by means of an 'Analytical methods link' (AMLNK) identifier.

- The *Sample Master Record* (RECID: 01)

  The *Sample Master Record* serves as the master record for the series of data deriving from a particular sediment sample. The information on this record defines a sediment sample in terms of a 'sampling occasion', i.e., it locates the sediment sample in space (sampling area coordinates) and time (sampling date/time) and also supplies administrative information in relation to the intended use of the data.

- The *Parameter/Contaminant Data Record* (RECID: 10)

  The *Parameter/Contaminant Data Record* is used for recording data on a range of parameters for the sediment sample. Each record included in the data file is associated with a particular *Sample Master Record* which defines the sediment sample concerned. Each *Parameter/Contaminant Data Record* includes information on a particular parameter or contaminant.

- The *Plain Language Comment Record* (RECID: 13)

  Plain Language Comment Records can be inserted at any point in the data file to supply additional information or comments to aid the interpretation of the data reported on the preceding data record. If the explanatory text does not fit on a single *Plain Language Comment Record*, several of these records can be included in a block. It should be noted that, whilst information reported as plain language text will be stored at the data centre, and where possible retrieved and presented together with the data, data handling systems do not generally take account of plain language text. The comments are likely to become dissociated from the coded data, for example during exchange of data in non-ICES format for import into software packages used for data evaluation purposes. Thus, *Plain Language Comment Records* should be avoided unless they are specifically required by the reporting format.

2.3 Depth cycles

The *Parameter/Contaminant Data Records* following any given *Sample Master Record* should be arranged in *depth cycles*, i.e., all records reporting observations within a given depth range in the sediment should be grouped together. The first records following a *Sample Master Record* must always be two *Parameter/ Contaminant Data Records* reporting the parameters 'SDEPU' (sediment depth – upper) which defines the upper depth in the sediment 'slice', and 'SDEPL' (sediment depth – lower) which defines the lower depth in the sediment 'slice'. These are mandatory parameters within each *depth cycle* included in the data file; if the depth range information is undefined (or missing), it should either be estimated (and the values qualified accordingly), or the entire set of data for that *depth cycle* should be omitted from the file. When the sampling depth is not well defined, or for samples where only the nominal 'surface' sediment has been analysed, the values entered for SDEPU and SDEPL should be a 'nominal depth range' associated with 'surface sediments', for example, an estimate of the depth of sediment sampled by the sampling device concerned.

Figure A is schematic representation of the data file structure, illustrating the *depth cycle* in the data part of the file.

Figure A – Sediment data file structure

20 – Sediment sampling methods record .....METHODS PART
    13 – Plain language comment record
    :
20 – Sediment sampling methods record
:
21 or 23 – Analytical or oyster embryo methods record
    13 – Plain language comment record
    :
21 or 23 – Analytical or oyster embryo methods record
:
01 – Sample master record .....DATA PART
    13 – Plain language comment record
    10 – Parameter/contaminant data record (**PARAM = SDEPU**) .....Depth cycle
        13 – Plain language comment record
    10 – Parameter/contaminant data record (**PARAM = SDEPL**)
    10 – Parameter/contaminant data record
    :
    10 – Parameter/contaminant data record (**PARAM = SDEPU**) .....Depth cycle
    10 – Parameter/contaminant data record (**PARAM = SDEPL**)
    10 – Parameter/contaminant data record
    :
01 – Sample master record
    10 – Parameter/contaminant data record (**PARAM = SDEPU**) .....Depth cycle
    10 – Parameter/contaminant data record (**PARAM = SDEPL**)
    10 – Parameter/contaminant data record
    :
End of file

2.4 Linking methods records to data records

The sediment data reporting format involves two link-keys to relate information items appearing on different data records within the data file:

- The **sampling methods link-key** associates any given sample (as defined by a particular *Sample Master Record*) with the information on the methods used to collect that sample, as reported on a *Sediment Sampling Methods Record*.

  The link-key is constructed by concatenating the following data fields, which appear on both the *Sediment Sampling Methods Record* and the *Sample Master Record*:

  RLABO + SMLNK

  The resulting key must be unique for each *Sediment Sampling Methods Record* included in the data file. The same key can, however, appear on any number of *Sample Master Records* included in the data file. Typically, only one

method of sediment sampling is employed by a given institute in a given year; in this case only one *Sediment Sampling Methods Record* would need to be included in the data file and the same sampling methods link-key would appear on all the *Sample Master Records* in the data file.

- The **analytical methods link-key** associates a given measurement (as reported on a particular *Parameter/Contaminant Data Record*) with the information on the methods used to obtain that measurement, as reported on a *Contaminant Analytical Methods Record* or an *Oyster Embryo Bioassay Methods Record*.

  The link-key is constructed by concatenating the following data fields, which appear on both the *Contaminant Analytical Methods Records*/*Oyster Embryo Bioassay Methods Record* and the *Parameter/Contaminant Data Records*:

  ALABO + PARAM + AMLNK

  The resulting key must be unique for each *Contaminant Analytical Methods Record* and/or *Oyster Embryo Bioassay Methods Record* included in the data file. The same key can, however, appear on any number of *Parameter/Contaminant Data Records* included in the data file.

3 SEDIMENT SAMPLE AND SUB-SAMPLE DEFINITIONS

3.1 Definitions

For the purposes of reporting data using this format, a sediment sample is considered to be the sample material collected at one sampling station on one sampling occasion. This is, however, not a rigorous definition, and a number of interpretations can be applied depending on the method of collecting sediment and the subsequent handling of the sample(s). To ensure some degree of consistency in the use of the reporting format, the following operational definitions are employed:

3.1.1 Core samples for depth profiles

Each **sediment core taken to investigate the vertical structure of the sediment** should be reported as a distinct sample, i.e., the data for each individual sediment core should be reported under its own *Sample Master Record*. This would be the case when reporting data for sediment cores collected in order to conduct detailed investigations of the sediment profile, for example, for the purpose of temporal trend studies using the sediment core to reflect historical contamination in sediment accumulation areas. Even if several cores are taken at the same location at the same time, each should be reported as a separate sample. Each 'slice' in the core should be reported as a sub-sample using the 'Sub-sample number' (SUBNO) data field on the *Parameter/Contaminant Data Records*.

When samples have been obtained using a box-corer, note that a distinction is made between 'cores' which have been obtained to investigate a depth profile and those obtained from areas characterized by sediment bioturbation, mobilization, or dispersion, where the primary objective is generally not to investigate the sediment profile. When the purpose is to investigate the depth profile, and a cylindrical 'core' has been taken from the box-core sample using another core sampling method, the second sediment sampler type should be reported in the 'Sediment sampler type' (SSTYP) field with an accompanying *Plain Language Comment Record* explaining the sampling of the box-core.

3.1.2 Grab sampler and box-corer samples

For sediment samples collected with grab samplers or box-corers, etc., the reporting formats can be used in different ways. Typically, a series of grab samples are collected in a grid within the sampling station in order to investigate local variability or reproducibility of the grab samples, etc.; similarly, a box core may be 'sub-sampled' to study the homogeneity of the sample collected.

In such cases, a *Sample Master Record* is used to define a 'sampling occasion' (i.e., sampling at a given location at a given time), rather than an individual physical sample, and the concept of a sub-sample is used to distinguish data associated with a particular physical sample. Thus, for example, if nine grab samples are collected in a grid around a nominal sampling station, the data for the parameters in each of the nine samples could be reported under a single

Sample Master Record, using the 'Sub-sample number' (SUBNO) on the *Parameter/Contaminant Data Records* to relate the data from each physical sample. That is, insert

SUBNO = '01' for all data concerning analysis of the sample from the first grid point, SUBNO = '02' on all records concerning analysis of the sample from the second grid point, etc., up to SUBNO = '09'. Similarly, if six 'sub-samples' are taken from a box-core, the data for each of these should be identified within the series reported under a single *Sample Master Record* by inserting the appropriate identifier ('01', '02',.., '06') in the SUBNO field on the *Parameter/Contaminant Data Records*.

3.2 Reporting average values

For some studies, the objectives of the monitoring programme may not warrant reporting the data at the 'sub-sample' level. It may be appropriate to simply report a single average value for each of the parameters for the series of grab samples around a given station, or for the box-core 'sub-samples'. It is the responsibility of the data originator to ensure that the correct level of detail is available in the information reported; it should be noted that such averaged values may subsequently be used in calculations, e.g., to derive normalized values.

3.2.1 Replicate analyses vs. replicate sub-samples

The purpose of the 'Replicate number' (REPNO) data field on the *Parameter/Contaminant Data Record* should be noted. The REPNO field is used to distinguish **replicate analyses** of a given contaminant in a particular 'analytical sample', the purpose of which is to provide information on analytical reproducibility. The 'Sub-sample number' (SUBNO) field is used to 1) distinguish 'slices' taken within a sediment core sample or 2) distinguish **replicate sub-samples**, the purpose of which is to provide information on sampling reproducibility or the homogeneity of material collected within a given sample. The concepts and purposes of reporting data on a replicate 'sub-sample', as identified in the 'Sub-sample number' (SUBNO) data field, and data for replicate analyses, as identified in the 'Replicate number' (REPNO) data field, should not be confused.

4 DATA ON BIOLOGICAL EFFECTS MEASUREMENTS IN SEDIMENT

4.1 Oyster embryo bioassay (sediment elutriate)

Although the oyster embryo bioassay is a water bioassay rather than a true sediment bioassay, it can be applied to sediment elutriates. The reporting formats incorporate 'oyster embryo bioassay' measurements by using the parameter 'percent net response' (PNR). This parameter and its associated values are recorded on the *Parameter/Contaminant Data Record*.

The only modification to the reporting format for contaminants in sediments, when using it to report oyster embryo bioassay data, involves the inclusion of an additional record type. This record, the *Oyster Embryo Bioassay Methods Record*, is used to describe the methods used to obtain the bioassay results. One (or more) of these records are placed in the 'methods part' of the data file after the *Contaminant Analytical Methods Records*, if any.

When reporting oyster embryo bioassay data, a number of items of information appearing on the various data records, which may be optional in the context of reporting contaminants data, are considered mandatory. The *Oyster Embryo Bioassay Methods Record* defines data fields for information concerning the methodology employed. On the *Sample Master Record*, the 'Water depth' (WADEP) should be recorded. In each sediment *depth cycle* including oyster embryo bioassay results, the parameters 'Redox potential' (REDOX), 'Organic carbon' (CORG), and grain size distribution (as a series of 'Amount in grain size fraction' (GSAMT) records) should be reported in addition to the mandatory parameters sediment depth, moisture content, etc.

4.2 Linking biological effects data and contaminants data

An important consideration in relation to biological effects data is the ability to compare them with chemistry data in order to correlate results. To achieve this, it is necessary to consider mechanisms for 'linking' samples/sub-samples analysed for biological effects with appropriate contaminants data. In the case of the oyster embryo bioassay, it is only

appropriate to relate bioassay data on a particular elutriate with data on contaminants measured using the same sediment sample/sub-sample.

When the same sediment sample/sub-sample is used for both biological effects measurements and contaminant analyses, the *Parameter/Contaminant Data Records* report a combination of contaminant and bioassay data. In such cases, the data is recorded under the same sub-sample. See example 2 in Section 6.2.

5 RECORD LAYOUT DESCRIPTIONS FOR SEDIMENT DATA

5.1 File headers

The first record of every file must be a file header, i.e., a 00–record, specifying the version numbers of the reporting format, the screening program, and the valid code list file (for example: **00 RF2.2 SV1.34 LR1)**. The header numbers should coincide with the latest updates.

5.2 General field specifications

The following sections describe the layout of each record type found in the sediment data reporting format. Each record is presented in the form of a table where the following are described for each data field of the record: the data field code, the data field name, the field column numbers, the valid values for the field, the format for the field, and whether the field is mandatory.

The data **field codes** and the data **field names** are described in detail in the section on Data Field Descriptions of this manual.

The **column** numbers refer to the column placement of the field in a given record.

The **valid values** for the field describe predefined values and ranges, and refer to Environmental reference codes found on the web at www.ices.dk/env/ (choose Codes).

The **format** column for the field indicates the type of variable included in the indicated data field according to one of the following:

SPC*n* a ‘space filled’ character field, consisting of *n* spaces.

CHAR*n* a character field of *n* characters. Character fields are formatted as left-justified, space filled.

NUM*n* a numeric (integer) field of width *n*. Integer fields are formatted as right justified, zero filled – e.g., the number 43 in a field NUM4:

0	0	4	3

NUM*nim* a numeric field of width *n*, including an **implied** decimal point; the rightmost *m* positions in the field are decimal positions. Values are formatted as decimal justified, zero filled – e.g., the number 3.7 in a field NUM4i2:

0	3.	7	0

NUM*nem* a numeric field of width *n*, including an **exponent**: the mantissa occupies the leftmost *n* – 4 positions, including an implied decimal point; the rightmost *m* positions in the mantissa are decimal positions. The exponent occupies the rightmost 4 positions (‘E±dd’). Values are formatted as decimal justified, space filled – e.g., the number 56.1 in a field NUM9e4:

5.	6	1			E	+	0	1

The **mandatory**, or 'M', column indicates those data fields which are mandatory in the context of the reporting formats, i.e., data which **must be reported**; the following codes apply:

m	mandatory;
m?	mandatory in some cases, e.g., when reporting data for a specific programme;
mH	mandatory when reporting data to HELCOM (BMP/COMBINE);
mO	mandatory when reporting data to OSPARCOM (JMP/JAMP);
x	mandatory and predefined (i.e., insert the characters specified in the valid values column).

5.3 Sediment Sampling Methods Record (20)

RECORD: Sediment Sampling Methods Record					
Code	Field name	Columns	Valid values	Format	M
RECID	Record identifier	1–2	'20'	NUM2	x
DTYPE	Data type	3–4	'CS'	CHAR2	x
CNTRY	Country code	5–6	cf. CNTRY	CHAR2	m
RLABO	Reporting institute code	7–10	cf. RLABO	CHAR4	m
MYEAR	Monitoring year	11–12	'74' to present year	NUM2	m
SMLNK	Sampling methods link	13–14	01–99	NUM2	m
SSTYP	Sediment sampler type	15–16	cf. SSTYP	CHAR2	m
SSDIA	Sediment sampler diameter	17–19	001–999	NUM3	m
METSP	Method of storage / preservation of sample	20–21	A–z, 0–9	CHAR2	m
METGS	Method of sediment sample grain size analysis	22–23	A–z, 0–9 or spaces	CHAR2	
METSA	Method of sediment sample structural analysis	24–25	A–z, 0–9 or spaces	CHAR2	
		26–120	spaces	SPC	x

5.4 Contaminant Analytical Methods Record (21)

RECORD: Contaminant Analytical Methods Record					
Code	Field name	Columns	Valid values	Format	M
RECID	Record identifier	1–2	'21'	NUM2	x
DTYPE	Data type	3–4	'CS'	CHAR2	x
RLABO	Reporting institute code	5–8	cf. RLABO	CHAR4	m
ALABO	Analytical laboratory code	9–12	cf. RLABO	CHAR4	m
MYEAR	Monitoring year	13–14	'74' to present year	NUM2	m
PARAM	Parameter code	15–19	cf. PARAM	CHAR5	m
AMLNK	Analytical methods link	20–21	01–99	NUM2	m
METSW	*Field not used in sediment data*	22–23	spaces	SPC2	x
METPT	*Field not used in sediment data*	24–25	spaces	SPC2	x
METEX	Method of sediment extraction	26–29	cf. METEX	CHAR4	m
COSED	Condition of sediment when extracted	30–30	cf. COSED	CHAR1	m
METSP	*Field not used in sediment data*	31–32	spaces	SPC2	x
METAN	Method of analysis of parameter/ contaminant	33–35	A–z, 0–9	CHAR3	m
DETLB	*Field not used in sediment data*	36–36	spaces	SPC1	x
DETLI	Detection limit value	37–45	–0000 to 99999 plus 'E' plus –99 to +99	NUM9e4	m
ICCOD	Intercomparison exercise code	46–47	cf. ICCOD	CHAR2	m?
	Control chart information				
CONCH	Control chart basis	48–50	cf. CONCH and. Data Field Descriptions	CHAR3	mO
CRMCO	Control chart reference material code	51–58	cf. CRMCO and Data Field Descriptions	CHAR8	mO
CRMMB	*Field not used in sediment data*	59–59	space	SPC1	x
CRMMV	Control chart RM mean value – value	60–68	–0000 to 99999 plus 'E' plus –99 to +99, or spaces	NUM9e4	mO
CRMSD	Control chart reference material – standard deviation	69–77	–0000 to 99999 plus 'E' plus –99 to +99, or spaces	NUM9e4	mO
CRMNM	Control chart reference material – number of measurements	78–79	01–99 or spaces	NUM2	mO
CRMPE	Control chart reference material – period	80–81	01–99 or spaces	NUM2	mO
RBMEA	Robust mean	82–90	–0000 to 99999 plus 'E' plus –99 to +99, or spaces	NUM9e4	
ZSCOR	Z-score	91–99	–0000 to 99999 plus 'E' plus –99 to +99, or spaces	NUM9e4	
PSCOR	P-score	100–108	–0000 to 99999 plus 'E' plus –99 to +99, or spaces	NUM9e4	
		109–120	spaces	SPC	x

5.5 Oyster Embryo Bioassay Methods Record (23)

RECORD: Oyster Embryo Bioassay Methods Record					
Code	Field name	Columns	Valid values	Format	M
RECID	Record identifier	1–2	'23'	NUM2	x
DTYPE	Data type	3–4	'CS'	CHAR2	x
RLABO	Reporting institute code	5–8	cf. RLABO	CHAR4	m
ALABO	Analytical laboratory code	9–12	cf. RLABO	CHAR4	m
MYEAR	Monitoring year	13–14	'74' to present year	NUM2	m
PARAM	Parameter code	15–19	'PNR' (cf. PARAM)	CHAR5	m
AMLNK	Analytical methods link	20–21	01–99	NUM2	m
OELWA	Origin of elutriation water	22–22	cf. OELWA	CHAR1	m
VOLRA	Volume ratio of dry sediment to elutriation water	23–25	001–999	NUM3i2	m
DUREL	Duration of sediment elutriation	26–27	01–99	NUM2	m
METOB	Method of oyster embryo bioassay	28–30	'T11', A–z or 0–9	CHAR3	m
SPECI	Species (RUBIN) code	31–38	cf. SPECI	CHAR8	m
OOYST	Origin of oysters	39–40	cf. OOYST	CHAR2	m
MOYST	Month of collecting oysters	41–42	01–12	NUM2	m
COYST	Conditioning of oysters	43–43	'Y' or 'N'	CHAR1	m
SREFW	Source of reference seawater	44–44	cf. SREFW	CHAR1	m
MWTOY	Mean live weight of oysters (g)	45–47	001–999	NUM3	m
NUMCR	Number of control replicates	48–49	01–99	NUM2	m
NUMSR	Number of sample replicates	50–51	01–99	NUM2	m
VEGGS	Volume of egg suspension (ml)	52–54	001–999	NUM3i1	m
AEREP	Aeration of replicates	55–55	'Y' or 'N'	CHAR1	m
DURSE	Duration of storage of embryos	56–58	001–999 or spaces	NUM3	
		59–120	spaces	SPC	x

5.6 Sample Master Record (01)

RECORD: Sample Master Record					
Code	Field name	Columns	Valid values	Format	M
RECID	Record identifier	1–2	'01'	NUM2	x
DTYPE	Data type	3–4	'CS'	CHAR2	x
RLABO	Reporting institute code	5–8	cf. RLABO	CHAR4	m
MYEAR	Monitoring year	9–10	'74' to present year	NUM2	m
SEQNO	Sample sequence number	11–14	0001–9999	NUM4	m
CNTRY	Country code	15–16	cf. CNTRY	CHAR2	m
SHIPC	Ship code	17–18	cf. SHIPC	CHAR2	m
CRUIS	Cruise identifier	19–22	A–z, 0–9	CHAR4	m
SDATE	Sampling date	23–28	000000–999999	CHAR6	m
STIME	Sampling time	29–32	0000–2359 or spaces	CHAR4	
	Sampling area coordinates				
LATDG	Latitude degrees	33–34	00–90 (north)	NUM2	m
LATMI	Latitude minutes	35–36	00–59	NUM2	m
LATMF	Latitude decimal minutes	37–38	00–99	NUM2	m
LONDG	Longitude degrees	39–40	00–99	NUM2	m
LONMI	Longitude minutes	41–42	00–59	NUM2	m
LONMF	Longitude decimal minutes	43–44	00–99	NUM2	m
QEORW	Quadrant	45–45	'E', 'e', 'W' or 'w' (cf. Data Field Descriptions)	CHAR1	m
JMPAR	JMP area code	46–54	cf. JMPAR and Data Field Descriptions, or spaces	CHAR9	mO
ICEAR	ICES statistical rectangle	55–59	cf. ICEAR	CHAR5	m
OTHAR	Other area or station code	60–64	A–z, 0–9 or spaces	CHAR5	mH
SPECI	*Field not used in sediment data*	65–72	spaces	SPC8	x
NOINS	*Field not used in sediment data*	73–75	spaces	SPC3	x
WADEP	Water depth	76–79	0000–9999 or spaces	NUM4	m?
COREL	Core length (cm)	80–82	000–999 or spaces	NUM3	m?
ESTSR	Estimated sedimentation rate	83–85	000–999 or spaces	NUM3	m?
SMLNK	Sampling methods link	86–87	01–99	NUM2	m
ORGNZ	Organization codes	88–92	cf. ORGNZ	CHAR5	m
PURPM	Purpose of monitoring codes	93–97	cf. PURPM	CHAR5	m
RLIST	*Field not used in sediment data*	98–99	spaces	SPC2	x
VESSL	Vessel type	100–100	cf. VESSL	CHAR1	m
GEART	*Field not used in sediment data*	101–103	spaces	SPC3	x
NOHAU	*Field not used in sediment data*	104–105	spaces	SPC2	x
SPSEA	*Field not used in sediment data*	106–106	spaces	SPC1	x
TOTIN	*Field not used in sediment data*	107–110	spaces	SPC4	x
ASTSA	*Field not used in sediment data*	111–111	spaces	SPC1	x
STTYP	Station type	112–112	cf. STTYP	CHAR1	m
PTSRC	Point source of contamination	113–113	cf. PTSRC	CHAR1	
		114–120	spaces	SPC	x

5.7 Parameter/Contaminant Data Record (10)

RECORD: Parameter/Contaminant Data Rec					
Code	Field name	Columns	Valid values	Format	M
RECID	Record identifier	1–2	'10'	NUM2	x
DTYPE	Data type	3–4	'CS'	CHAR2	x
RLABO	Reporting institute code	5–8	cf. RLABO	CHAR4	m
MYEAR	Monitoring year	9–10	'74' to present year	NUM2	m
SEQNO	Sample sequence number	11–14	0001–9999	NUM4	m
INORB	*Field not used in sediment data*	15–15	space	SPC1	x
SUBNO	Sub-sample number	16–17	01–99	NUM2	m
	Field reserved	18–25	spaces	SPC8	x
MATRX	Matrix analysed	26–27	cf. MATRX	CHAR2	m
PARAM	Parameter code	28–32	cf. PARAM	CHAR5	m
VFLAG	Validity flag	33–33	cf. VFLAG	CHAR1	
QFLAG	Qualifier flag	34–34	'<' or space	CHAR1	
VALSN	Value in scientific notation	35–43	–0000 to 99999 plus 'E' plus –99 to +99	NUM9e4	m
BASIS	*Field not used in sediment data*	44–44	space	SPC1	x
SFRAC	Sediment fraction analysed (µm)	45–48	0001–2000	NUM4	m
REPNO	Replicate number	49–50	01–99 or spaces	NUM2	
PERCR	*Field not used in sediment data*	51–54	space	SPC4	x
AMLNK	Analytical methods link	55–56	01–99	NUM2	m
ALABO	Analytical laboratory code	57–60	cf. RLABO	CHAR4	m
		61–120	spaces	SPC	x

5.8 Plain Language Comment Record (13)

RECORD: Plain Language Comment Record					
Code	Field name	Columns	Valid values	Format	M
RECID	Record identifier	1–2	'13'	NUM2	x
PTEXT	Plain text	3–87		CHAR85	
		88–120	spaces	SPC	x

6 SEDIMENT EXAMPLES

6.1 Example 1 – Core depth slices

A sediment core sample has been taken, and divided into three depth slices (0–2 cm, 2–4 cm and 4–6 cm, respectively). Each slice has been analysed for contaminant P1 and P2. The arrangement of records in the 'data part' of the data file would be as follows:

01 – Sample master record (defines a sample/sampling occasion)

10 – Data record for upper depth of first slice	(PARAM = **SDEPU**;VALSN = 0E+00;SUBNO = 01)
10 – Data record for lower depth of first slice	(PARAM = **SDEPL**;VALSN = 2E+00;SUBNO = 01)
10 – Data record for contaminant P1 of first slice	(PARAM = P1;SUBNO = 01)
10 – Data record for contaminant P2 of first slice	(PARAM = P2;SUBNO = 01)
10 – Data record for upper depth of second slice	(PARAM = **SDEPU**;VALSN = 2E+00;SUBNO = 02)
10 – Data record for lower depth of second slice	(PARAM = **SDEPL**;VALSN = 4E+00;SUBNO = 02)
10 – Data record for contaminant P1 of second slice	(PARAM = P1;SUBNO = 02)
10 – Data record for contaminant P2 of second slice	(PARAM = P2;SUBNO = 02)
10 – Data record for upper depth of third slice	(PARAM = **SDEPU**;VALSN = 4E+00;SUBNO = 03)
10 – Data record for lower depth of third slice	(PARAM = **SDEPL**;VALSN = 6E+00;SUBNO = 03)
10 – Data record for contaminant P1 of third slice	(PARAM = P1;SUBNO = 03)
10 – Data record for contaminant P2 of third slice	(PARAM = P2;SUBNO = 03)

In the above example, each slice is reported under a separate *depth cycle*.

6.2 Example 2 – Grab samples + oyster embryo bioassay (OEB) data

Three grab samples have been taken at the same position. The grab was estimated to go 5 cm into the sediment. All samples were analysed for the contaminant P1. In addition, the third sample was analysed for the oyster embryo bioassay (OEB).

The arrangement of records in the 'data part' of the data file would be as follows:

01 – Sample master record (defines a sample/sampling occasion)

10 – Data record for upper depth of first grab	(PARAM = **SDEPU**;VALSN = 0E+00;SUBNO = 01)
10 – Data record for lower depth of first grab	(PARAM = **SDEPL**;VALSN = 5E+00;SUBNO = 01)
10 – Data record for contaminant P1 of first grab	(PARAM = P1;SUBNO = 01)
10 – Data record for upper depth of second grab	(PARAM = **SDEPU**;VALSN = 0E+00;SUBNO = 02)
10 – Data record for lower depth of second grab	(PARAM = **SDEPL**;VALSN = 5E+00;SUBNO = 02)
10 – Data record for contaminant P1 of second grab	(PARAM = P1;SUBNO = 02)
10 – Data record for upper depth of third grab	(PARAM = **SDEPU**;VALSN = 0E+00;SUBNO = 03)
10 – Data record for lower depth of third grab	(PARAM = **SDEPL**;VALSN = 5E+00;SUBNO = 03)
10 – Data record for contaminant P1 of third grab	(PARAM = P1;SUBNO = 03)
10 – Data record for oyster embryo bioassay of third grab	(PARAM = OEB;SUBNO = 03)

In the above example, each grab is considered a separate sub-sample under the same *Sample Master Record*. Each sub-sample is reported under a separate *depth cycle*.