

## GENERAL SPECIFICATION

### SURVEYS

#### GS EP GEO 401

**GIS requirements for engineering site surveys and studies**

|      |         |                                                                                                                 |
|------|---------|-----------------------------------------------------------------------------------------------------------------|
|      |         |                                                                                                                 |
|      |         |                                                                                                                 |
|      |         |                                                                                                                 |
| 02   | 10/2012 | Revision                                                                                                        |
| 01   | 01/2012 | Revision: geophysical data deliverables review, creation of deliverables for Topographical and Metocean surveys |
| 00   | 01/2011 | First issue                                                                                                     |
| Rev. | Date    | Purpose of the revision                                                                                         |

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|                                                           |                         |                      |
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## 1. Scope

This specification defines the minimum standards required by Company, applicable to the Geographic Information System (GIS) data delivery for engineering site survey and studies.

This particularly applies to spatial data provided with the following investigations or studies:

- Site surveys: geophysical engineering survey, debris survey, bathymetric survey, geotechnical survey, metocean survey, and topographical survey.
- Desktop studies: all synthesis or integrated studies dealing with geology, geophysics, geotechnics, meteorology and oceanography, remote sensing, seismicity and natural risks assessment, etc.

This document only provides detailed requirements for the geophysical, the geotechnical, the metocean, the remote sensing and the topographical surveys. These requirements have to be considered as a minimum. Contractor may propose to provide data slightly modified or more detailed, this has to be approved by the Company before the final data delivery. Specific cases where data requirements are not covered in this document need also to be approved by Company.

For the other investigations and studies, Contractor shall provide a detailed proposition or data example to Company for approval before the delivery of the final dataset.

## 2. Reference documents

The reference documents listed below form an integral part of this General Specification.

### External Documents

Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the effective date of this document.

| Reference               | Title                                                                                                                                                           |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EPSG Guidance Note 5.12 | Coordinate Reference System Definition                                                                                                                          |
| ESRI Glossary           | <a href="http://support.esri.com/index.cfm?fa=knowledgebase.gisDictionary.gateway">http://support.esri.com/index.cfm?fa=knowledgebase.gisDictionary.gateway</a> |
| GIS Glossary            | <a href="http://www.gisdevelopment.net/glossary/">http://www.gisdevelopment.net/glossary/</a>                                                                   |
| SIMORC website          | <a href="http://www.gis.com/resources/library/dictionaries.html">http://www.gis.com/resources/library/dictionaries.html</a>                                     |
| ISO 19115               | <a href="http://www.simorc.org">http://www.simorc.org</a>                                                                                                       |
| ISO 19119               | Geographic Information MetaData                                                                                                                                 |
| ISO 19137               | Geographic Information Services                                                                                                                                 |
|                         | Geographic information - Core profile of the spatial schema                                                                                                     |

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Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published in the applicable yearly collection.

| Reference      | Title |
|----------------|-------|
| Not applicable |       |

## 3. Deliverables

### 3.1 Documents provided by Company

The following documents shall be transmitted to Contractor:

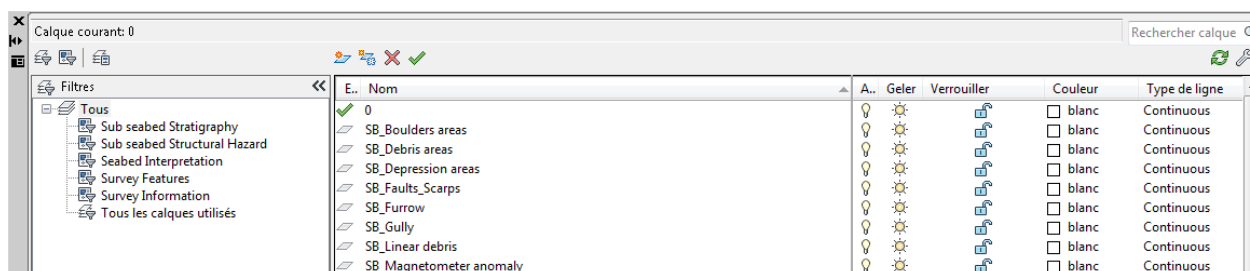
- The official geodesy and its parameters to be applied for the project,
- All the project cultural data,
- Deliverable folder including the empty geodatabase,
- An example of GIS report summary,
- An AutoCad file with layers standardized.

### 3.2 Documents to be provided by Contractor

#### 3.2.1 Intermediate delivery for validation

Contractor shall provide an intermediate delivery of its cartographic work, using the autoCAD file template provided by Company, with layers name corresponding to layers planned in ArcGIS, in order to ease import into GIS format.

The CAD cartographic representation (line types, colors, hatches, etc...) shall be the same as requested for the final GIS delivery.



| Calque courant: 0       | Rechercher calque | A. | Geler | Verrouiller | Couleur | Type de ligne |
|-------------------------|-------------------|----|-------|-------------|---------|---------------|
| 0                       |                   |    |       |             | blanc   | Continuous    |
| SB_Boulders areas       |                   |    |       |             | blanc   | Continuous    |
| SB_Debris areas         |                   |    |       |             | blanc   | Continuous    |
| SB_Depression areas     |                   |    |       |             | blanc   | Continuous    |
| SB_Faults_Scarps        |                   |    |       |             | blanc   | Continuous    |
| SB_Furrow               |                   |    |       |             | blanc   | Continuous    |
| SB_Gully                |                   |    |       |             | blanc   | Continuous    |
| SB_Linear debris        |                   |    |       |             | blanc   | Continuous    |
| SB_Magnetometer anomaly |                   |    |       |             | blanc   | Continuous    |

Figure 1: Example of CAD layers list

#### 3.2.2 GIS summary

Contractor shall fill in the GIS summary Excel file for submission to Company. Any new layer shall be proposed by Contractor and submitted to Company for approval prior building datasets.

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### 3.2.3 GIS structural report

Contractor shall provide a GIS structural report aiming to:

- Describe all the data identified from the interpretation
- Present the data organization in accordance with this document' specifications.

### 3.2.4 Final data delivery

Data import into GIS shall only occur once the exchange Excel file is completed and agreed and once the final survey report is validated by Company.

The final data delivery shall consist of the following:

- Rasters and hyperlinks in the directories of the same name.
- All data as Geodatabase (or ESRI shapefiles) formats.
- Project (\*.mxd), projection (\*.prj), templates (\*.mxt), style (\*.style), layer (\*.lyr), queries and scripts files or any other GIS file.
- Raster data shall be added to the mosaic dataset in the geo-database. A mosaic dataset is a collection of raster datasets (images) stored as a catalog and viewed as a mosaicked image that is dynamic. The properties of the original imagery are maintained, and overlapping imagery can be ordered as required.

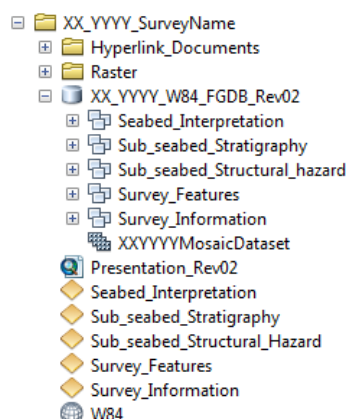


Figure 2 : Typical geophysics survey folder

#### 3.2.4.1 Report delivery

As a separate document, the GIS report shall be delivered in paper and digital copy. A Draft GIS Report shall be provided to the Company for approval.

The report shall at least contain the following information:

##### 3.2.4.1.1 General information

- **Title:** the report shall be entitled:  
Name of the recipient - TOTAL affiliate/subsidiary/project  
Block reference and location name, Country

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Title of the survey (defined in Contract)

Survey Contractor name

Start/end dates of work offshore and vessel.

- **Certification:** the first page of the report shall show the Contractor's certification, and shall specify:

Name(s) of person(s) responsible(s) for GIS data preparation

Name and signature of QA/QC issuing Authority

Date of issue.

### 3.2.4.1.2 Project summary

- **Abstract:** giving a brief description of the survey:

Survey dates

Vessel

Site(s) and location(s) surveyed with key co-ordinates and situation plan

Summary of all the project reports.

Project Geodesy

Listing of all the data sets and description.

### 3.2.4.1.3 Data description

The description of the directories shall be included in the report.

For each data set the following elements shall be described:

- **Content:** meaning of the layer
- Type of **geometry** (raster, vector, point, polyline Z, polyline M, etc.)
- **Attributes:** name, significance, type, values, domains, etc.
- A brief description of the **origin** of the data: excel file, CAD drawing, software export, etc.
- **Method** applied for the data conversion (Example: raster bathymetry from multibeam echo sounder interpolated with kriging method).

### 3.2.4.1.4 Others

Where applicable: any significant scripts, queries, etc. used for the project.

## 4. General requirements

### 4.1 Software compatibility

Contractor's deliverable shall be compliant with Total's GIS software **ArcGis Desktop 10**, from ESRI.

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## 4.2 Data compatibility

Data shall be stored in folders organized as described section 5.5.

Any geo-referenced data can be imported into GIS. The preferred formats, however, are as follow:

- Raster files: Geotiff, tiff or Jpg (associated with \*.Tfw or \*.Jwg world file, and spatial index saved). Vector files: a geo-database (GDB).
- Grid data: Digital Terrain Model, ASCII, Microsoft Excel files (etc.) with geodesy description appended.

## 4.3 Language

The English language shall be used.

## 4.4 Data QA/QC

It is the responsibility of the Contractor to apply QA/QC procedures for producing the GIS datasets.

Any anomaly or discrepancies between the datasets detected by the Contractor will be brought to the attention of the Company.

In particular, the following items are of primary importance:

- Georeferencing
- Geometry
- Topology
- Content (attributes metadata...).

## 4.5 Units

International System shall be used.

## 4.6 Geodesy applicable

All files must be geo-referenced in the official geodetic system specified by Company at the beginning of the project unless otherwise specified by Company.

Every shapefile or feature class created should have its own \*.prj file and a spatial index completed. All raster files provided should be given with the spatial index completed. The geodetic description of the data shall be attached to the ASCII file except the UKOOA files.

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## 5. Data generalities

### 5.1 Conventional naming of the files

For the layers already available in the geodatabase provided by company, all feature class names and layer names shall remain the same. Names are given in appendix 2 and already applied in gdb.

For any new layer identified, the conventional naming shall be approved by Company.

As a general comment, datasets should have an explicit name, containing the type of the data. Fields names shall be in capital with no space and no hyphen.

However, in the .mxd, it is preferable that layers names are written in any letter for more understanding, quite as in the .dwg.

For example:

| Group layer                  | Layer         | Feature Class | CAD/GIS Layer name |
|------------------------------|---------------|---------------|--------------------|
| Survey information           | Survey limits | GP_SI_LIM     | SI_Survey limits   |
| Sub seabed structural hazard | Gas anomalies | GP_SS_GSA     | SS_Gas anomalies   |

### 5.2 Metadata

Any data imported into the GIS shall be traceable, meaning that it should be possible to easily track the source and history of the data. This is achieved by ensuring the inclusion of the relevant metadata.

At least, it is required to fill in metadata covering the following information:

- Data source (Contractor name, project name, creation date, report, conversion type, etc.)
- File ID (name, revision, date, type, etc.)
- Geodesy (geodetic system, transformation parameters, etc.)?

For this aim, nine attributes have been added (Name of the subsidiary Company, Name of the Contractor, Date of the survey, Contractor project reference, Name of the GIS Contractor, Date of the GIS deliver, Number of GIS revision, Name of GIS officer, Geodesy). These attributes have to be completed.

Metadata shall be in accordance with [ISO 19115 - ISO 19119 - ISO 19137](#).

For the specific case of the SIMORC Project (System of Industry Metocean data for the Offshore and Research Communities) needs, metadata shall be as defined in Appendix 1 for the following datasets:

- Meteorological and Oceanographic survey datasets
- Tidal and CTD measures.

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### 5.3 Symbology

Contractor shall refer to the appendices for the datasets symbology.

The symbol nomenclature should be:

- As simple as possible (use symbols predefined by ESRI or given in \*.style file if necessary)
- Stored in all the \*.mxd and \*.lyr files.

Some AutoCAD symbologies are provided by Company to facilitate the import into GIS. If a datasets symbology is not defined, a new symbology shall be proposed by Contractor and submitted to Company for approval prior building the datasets.

### 5.4 Associated documents (hyperlinks)

Survey projects may contain some attached documents (image, log, report, Microsoft Excel spreadsheet...) that require to be linked to geographical datasets; this enables users of the GIS project to open and visualize information and files associated with.

The relative file path names shall be given in the hyperlink field of the attribute data. And the layer name has to indicate the hyperlink existence (with “\_HYP” at the end of the layer name).

All linked documents have to be stored in a Hyperlink\_Documents directory (Figure 2 : Typical geophysics survey folder).

### 5.5 Organisation

Data shall be organized in a ESRI geodatabase.

The folder directory should be compliant with all the data and associated documents identified.

#### 5.5.1 Geophysical site survey

**This section of the document describes the minimum data and fields to be provided. Datasets depend on survey type and interpretation performed (add/removal of data sets can be proposed by Contractor).**

Here is below an example of data organized with the minimum information required:

- **Survey information:** survey limits, sampling locations, Conductivity Temperature Density (CTD) or Sound Velocity Profile (SVP) record location, navigation trackplots and shotpoints, etc.
- **Survey features:** bathymetry, backscatter, etc.
- **Seabed interpretation:** seabed geology, slope, side scan sonar mosaic, sonar contacts, debris, scars, pockmarks, depressions, disturbed seabed areas, outcrops, scarps, gullies, faults, etc.
- **Sub-seabed interpretation**
  - Structural hazard: faults, salt domes, buried depressions, etc.
  - Stratigraphy: isopachs, seismic reflectors, etc.

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Contractor shall refer to Appendix 2 for the geophysical datasets detailed description.

As an example, the following table could be datasets deliverables on a particular survey.

| Group Layer           | Layer                      | Format    | Geometry |
|-----------------------|----------------------------|-----------|----------|
| Survey information    | Survey limits              | FC, lyr   | Polyline |
|                       | Coring locations           | FC, lyr   | Point    |
|                       | SVP locations              | FC, lyr   | Point    |
|                       | CTD locations              | FC, lyr   | Point    |
|                       | Reference points           | FC, lyr   | Point    |
|                       | Navigation track plots     | FC, lyr   | Polyline |
|                       | Navigation shot points     | FC, lyr   | Point    |
|                       | Proposed well location     | FC, lyr   | Point    |
| Survey features       | Bathymetry                 | FC, lyr   | Polyline |
|                       |                            | Tiff, lyr | Raster   |
|                       | Backscatter                | Tiff, lyr | Raster   |
|                       | Hillshade                  | Tiff, lyr | Raster   |
|                       | Seabed slopes              | Tiff, lyr | Raster   |
|                       | Side scan sonar            | Tiff, lyr | Raster   |
|                       | Soundings                  | FC, lyr   | Point    |
| Seabed interpretation | Seabed geology             | FC, lyr   | Polygon  |
|                       | Sonar contacts             | FC, lyr   | Point    |
|                       | Debris areas               | FC, lyr   | Polygon  |
|                       | Linear debris              | FC, lyr   | Polyline |
|                       | Boulders areas             | FC, lyr   | Polygon  |
|                       | Scars                      | FC, lyr   | Polyline |
|                       | Faults, scarps             | FC, lyr   | Polyline |
|                       | Pockmarks                  | FC, lyr   | Polygon  |
|                       | Depression areas           | FC, lyr   | Polygon  |
|                       | Depression axes            | FC, lyr   | Polyline |
|                       | Possible gas leak          | FC, lyr   | Point    |
|                       | Slumps                     | FC, lyr   | Polygon  |
|                       | Observed jackup footprints | FC, lyr   | Polygon  |
|                       | Observed pipelines         | FC, lyr   | Polyline |
|                       | Observed cables            | FC, lyr   | Polyline |
|                       | Observed wrecks            | FC, lyr   | Point    |
|                       | Observed wells             | FC, lyr   | Point    |
|                       | Mass Transport Deposit     | FC, lyr   | Polygon  |
|                       | Mounds                     | FC, lyr   | Polygon  |
|                       | Ridge                      | FC, lyr   | Polygon  |
|                       | Magnetometer anomaly       | FC, lyr   | Point    |

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| Group Layer                                    | Layer                    | Format    | Geometry |
|------------------------------------------------|--------------------------|-----------|----------|
| Sub-seabed interpretation<br>Structural hazard | Buried Faults            | FC, lyr   | Polyline |
|                                                | Fracture zone            | FC, lyr   | Polygon  |
|                                                | Hydrocarbon accumulation | FC, lyr   | Polygon  |
|                                                | Gas anomalies            | FC, lyr   | Polygon  |
|                                                | Buried depressions       | FC, lyr   | Polygon  |
|                                                | Acoustic mask            | FC, lyr   | Polygon  |
|                                                | Disturbed sediments      | FC, lyr   | Polygon  |
|                                                | High amplitude reflector | Tiff, lyr | Raster   |
|                                                | Reflector boundary       | FC, lyr   | Polygon  |
|                                                | Channel axis             | FC, lyr   | Polyline |
| Sub-seabed interpretation<br>Stratigraphy      | Isopachs                 | FC, lyr   | Polyline |
|                                                |                          | Tiff, lyr | Raster   |
|                                                | Isobaths                 | FC, lyr   | Polyline |
|                                                |                          | Tiff, lyr | Raster   |
|                                                | Isochrons                | FC, lyr   | Polyline |
|                                                |                          | Tiff, lyr | Raster   |
|                                                | Isohyps                  | FC, lyr   | Polyline |
|                                                |                          | Tiff, lyr | Raster   |

One track plot or shot point layer per equipment type and one raster per seismic reflector shall be done. Common fields can be described and shall be in the following order:

- Automatic attributes (ID, Shape...) are not mentioned in this document
- Minimum particular attributes details are given in Appendix 2. New fields can be added for labelling purposes
- Geometry common attributes can be used for all the data:
  - Points files: Geodetic system, Easting and Northing coordinates, accuracy
  - Polyline files: length (2D / 3D)
  - Polygons files: perimeter, area.
- Common fields regarding the survey performed in order to improve the traceability (Company name, Contractor name, Date of survey, Project reference, Hyperlink to the report, etc.).

In case of a very wide area survey, it could be difficult to provide only one raster for the whole coverage area. Contractor shall try to provide only one bathymetry DTM for the entire survey. If many rasters are provided, a polygon feature class should also be provided, showing the perimeter and the name of the raster as attribute.

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### 5.5.2 Geotechnical survey

The geotechnical data to be provided shall be arranged in two Microsoft Excel spreadsheets:

- Locations: giving information per borehole, or individual test location basis, e.g. penetration, water depth, soil synopsis, borehole/ testing method (e.g., CPT test, vane test or else) etc.
- Laboratory test results: giving detailed laboratory test results and geotechnical descriptions versus depth, for every borehole.

Attributes detail of both excel files are given in Appendix 3.

Template of the Microsoft Excel spreadsheets can be provided on request by Company to Contractor.

Hyperlink data: the borehole / in-situ test logs shall be provided as a hyperlink attached to the Location table, in PDF format, and by full-profile CPT ASCII data (where available) in Excel format.

Benchmark or reference points used for the survey shall be mentioned in the report and provided in a Microsoft Excel spreadsheet and with a point description sheet file.

### 5.5.3 Topographic survey

Any of the data used or issued from a topographical survey shall be provided in GIS format even if also requested in CAD format, either from LIDAR or conventional technology. As a minimum, the following layers shall be provided:

- Survey limits: Represents the boundaries of the survey performed
- Geodetic points: Represented in point vector format, this layer shall include existing Ground Control Points used for tie-in and new ones materialized and measured during the survey
- Surveyed points: Points name and elevation value as attributes, in case of conventional surveys
- Digital Terrain Model in raster format: Generated using either the surveyed points here-above mentioned or the ground filtered points from LIDAR point cloud.
- Contours lines in polyline vector format: Contour type (minor or major contour) and elevation value as attributes, issued from the DTM here-above mentioned
- Topographic features (roads, buildings, lakes, etc.) in point, polyline and polygon vector formats

Details level for cartographic work required and symbology to apply shall be agreed with Company prior commencement.

Contractor shall refer to Appendix 4 for the topographical datasets detailed description.

### 5.5.4 Remote sensing

This section includes satellite images acquisitions, either optical or radar, and aerial acquisitions. As a minimum, the following layers shall be provided:

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- Image limits: Represents the boundaries of the survey performed
- Acquired images: Represented in raster format, this data shall be subject to radiometric corrections, orthorectified and tiled.

Images shall be provided in both GeoTIFF and ECW formats. (associated with \*.tfw and spatial index saved)

In case of large area coverage, an ortho-mosaic will be provided and the generated tiles shall not exceed 5000 pixels x 5000 pixels. The tiles shall be joined with no pixel gap but shall also not overlap.

For areas included in the tiles but outside the survey limits, the pixels shall be tagged as "NoData".

Contractor shall refer to Appendix 5 for the topographical datasets detailed description.

A report shall be delivered to the company containing all the images characteristics and processes realized (accuracy, georeferencing, geoprocessing, etc.).

### 5.5.5 Metocean surveys

Company contributes to the System of Industry Metocean data for the Offshore and Research Communities - **SIMORC** service.

To facilitate insertion into **SIMORC**, Metocean data sets shall undergo a standard quality control and shall be converted to unified file formats (such as NetCDF and ODV ASCII).

The **SIMORC** system consists of an index metadatabase and a database of actual data sets, that together are accessible through the Internet.

A checklist of important metadata is given in Appendix 1.

For purposes of standardization and international exchange it was decided to adopt the **ISO 19115** metadata standard and to prepare the **SIMORC** metadata as a dedicated subset of this standard to make it ISO compliant. For exchange of files the **SIMORC** metadata format is translated into a **SIMORC** XML format, which is fully described in the following documents:

- [http://www.simorc.org/content/content.asp?menu=0020014\\_000000#007](http://www.simorc.org/content/content.asp?menu=0020014_000000#007)
- [http://www.simorc.org/documents/simorc/html\\_page/07-29\\_SIMORC\\_XML\\_metadata\\_description\\_V1\\_01.doc](http://www.simorc.org/documents/simorc/html_page/07-29_SIMORC_XML_metadata_description_V1_01.doc)

As an alternative **SIMORC** metadata can also be delivered in a **SIMORC** Excel metadata format, which is also described in [http://www.simorc.org/documents/simorc/html\\_page/07-31\\_simorc-metadata\\_excel\\_exchange\\_format.xls](http://www.simorc.org/documents/simorc/html_page/07-31_simorc-metadata_excel_exchange_format.xls).

The SeaDataNet Geospatial Feature Types shall be used and is given in Appendix 6.

### 5.5.6 Other surveys

The delivery of spatial data in GIS format is also required for the following surveys:

- Environmental Baseline Study (EBS).

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### 5.5.7 Studies

The delivery of spatial data in GIS format is also required for all synthesis or integrated studies dealing with geology, geophysics, geotechnics, meteorology and oceanography, seismicity and natural risks assessment, etc.

In particular, any chart provided in the study shall be delivered in GIS format.

## 6. Glossary

|              |                                        |
|--------------|----------------------------------------|
| <b>CAD</b>   | Computer Assisted Design               |
| <b>CPT</b>   | Cone Penetration Test                  |
| <b>CTD</b>   | Conductivity Temperature Density       |
| <b>DGPS</b>  | Differential Global Positioning System |
| <b>DTM</b>   | Digital Terrain Model                  |
| <b>EBS</b>   | Environmental Baseline Study           |
| <b>GDB</b>   | Geodatabase                            |
| <b>GIS</b>   | Geographic Information System          |
| <b>QA/QC</b> | Quality Assessment / Quality Control   |
| <b>SHP</b>   | Shapefile                              |
| <b>SSS</b>   | Side Scan Sonar                        |
| <b>SVP</b>   | Sound Velocity Profile                 |
| <b>WD</b>    | Water Depth                            |

## 7. Other references

Following document is applicable: [EPSG Guidance Note 5.12](#), [ESRI Glossary](#), [GIS Glossary](#)

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## Appendix 1 **SIMORC** Project required Metadata

### Information requested in the report describing the data provided

As data values can't be used without clear information about what was measured, how and when (known as metadata), the collection of this metadata is crucial. The British Oceanographic Data Center (BODC) requests and stores this metadata in a database linked to the data series in order to keep as much information as possible for a long term.

In order to maintain deployment information, each series processed by BODC contains only one deployment and data coming from one instrument. In order to do so, information about the instrument, deployments, position, parameters and time reference and originator processing are essential. As these metadata can be simply reported during the measurement, originators are especially asked to help by providing the following basic list of metadata. In order to understand these requests, their goals are described following each category of metadata.

#### **Owner Details**

Contact details of the originator which collected the data

Project Name (if applicable)

Data Type (e.g. current, wave, sea level, met)

*Goal: These metadata allow gathering several series from the same project and same originator and to double check the type of data.*

#### **Mooring/Instrument Details**

Instrument category (e.g. current meter, wave recorder)

Instrument model and Manufacturer

Instrument Serial number

Latitude of mooring (degrees)

Longitude of mooring (degrees)

Site Area and Name of Site

Method of position fix (e.g. GPS)

Water column Depth (m)

Sea Floor Depth Qualifier (e.g. echo sounder, GEBCO)

Instrument depth or height

Operation history:

- Principle of measurement?
- Any instrument modifications?
- Date and Time of Deployment and Recovery of the instrument
- Date and Time of start and end of usable data

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- Additional notes on deployment
- Additional notes on performance (e.g. high frequency cut-off).

Name of the vessel used if applicable

Cruise information if applicable

Cruise departure date and harbour if applicable

Cruise arrival date and harbour if applicable

*Goal: These metadata allow a clear description of the mooring and allow checking and comparing data from the same mooring or location.*

#### Timing Details

Time zone (GMT, UTC)

Type of sampling (e.g. instantaneous, averaged)

Precise time interval between successive data cycles in series (seconds) (optional)

*Goal: These metadata allow comparing data series measured at the same time and allow us to estimate the precision of time measurement.*

#### Parameter Details

Parameter definition (description including convention like direction to/from, formulae if possible)

Parameter units

*Goal: These metadata allow a clear description of the values measured for the user.*

#### Data Processing Details

Description of calibrations

Description of any data processing done by the originator

List and description of the data folder provided

Originator's Data Format (optional)

*Goal: These metadata help data processing and documenting screening observation for the user.*

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## Appendix 2

## Appendix 2 Geophysical Data detail

### 1. Survey information

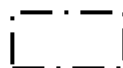
#### 1.1 Survey limits

- Limits represent the site surveyed. There is one limit per site studied and type of equipment used (Analogue, Digital, Refraction, etc.).
- GP\_SI\_LIM: vector** data is represented by **polylines**
- Minimum attributes:**

| Field name | Signification                | Type | Other                                                                                                                                                                    |
|------------|------------------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LOCATION   | Name of the location studied | Text | No predefined values                                                                                                                                                     |
| TYPE       | Type of survey perimeter     | Text | Possible values: <ul style="list-style-type: none"> <li>Analogue</li> <li>Digital</li> <li>Refraction</li> <li>Resistivity</li> <li>Gravimetry</li> <li>Other</li> </ul> |
| COMMENTS   | Comments                     | Text | No predefined values                                                                                                                                                     |

- Symbology:**

- Type of line: dash-dot line
- Thickness of the line: 1.5pt
- Color: vary with TYPE



## 1.2 Coring locations

- Represents all the coring locations. There is one item <XY of seabed position> per location studied. Main results (sample descriptions) need to be described in the attributes.
- **GP\_SI\_LOC: vector** data represented by **points**
- **Minimum attributes:**

| Field name  | Signification                                                   | Type            | Other                                                                                                                                                                                 |
|-------------|-----------------------------------------------------------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LOCATION    | Name of the location                                            | Text            | No predefined values                                                                                                                                                                  |
| TYPE        | Type of test                                                    | Text            | Possible values: <ul style="list-style-type: none"> <li>• Drop core</li> <li>• Box core</li> <li>• Piston core</li> <li>• Grab sample</li> <li>• Vibro-core</li> <li>• CPT</li> </ul> |
| WATER_DEPTH | Water depth at location                                         | Numeric (float) | No predefined values                                                                                                                                                                  |
| WD_UNIT     | Water depth unit                                                | Text            | Meters                                                                                                                                                                                |
| WD_DATUM    | Water depth datum                                               | Text            | Possible values: <ul style="list-style-type: none"> <li>• LAT</li> <li>• MSL</li> <li>• CD</li> <li>• Other</li> </ul>                                                                |
| WD_METHOD   | Equipment used for the water depth measurement                  | Text            | Possible values: <ul style="list-style-type: none"> <li>• Multibeam Echo-sounder</li> <li>• Other</li> </ul>                                                                          |
| PENETRATION | Penetration in meters                                           | Numeric (float) | No predefined values                                                                                                                                                                  |
| RECOVERY    | Recovery in meters                                              | Numeric (float) | No predefined values                                                                                                                                                                  |
| HYPERLINK   | Link to the Excel spread sheet, ascii file and/or pdf data file | Text            | No predefined values                                                                                                                                                                  |
| COMMENTS    | Comments                                                        | Text            | No predefined values                                                                                                                                                                  |

In case of a sample, log data and pictures shall be hyperlinked.

- **Symbology:**

- Type shown here:
- Size: 10

|                              |                     |
|------------------------------|---------------------|
| ⚡ Borehole (sampling)        | ⊙ Jumbo Piston Core |
| ⚡ Borehole (in-situ testing) | ⚡ STACOR            |
| ⚡ Borehole (combined)        | ⚡ Dissipation Test  |
| □ Box core                   | ▼ Seabed CPT        |
| △ Drop / Gravity core        | ▼ Seabed Vane Shear |
| △ Jumbo Drop / Gravity core  | ▼ Seabed T-bar      |
| ⊙ Piston core                |                     |

### 1.3 CTD or SVP locations

- Represents all the CTD or SVP locations. There is one item <XY of seabed position> per location. Main results need to be described in the attributes.
- **GP\_SI\_CTD or SVP: vector data represented by points**
- **Minimum attributes:**

| Field name | Signification                                                   | Type            | Other                                                                                                                  |
|------------|-----------------------------------------------------------------|-----------------|------------------------------------------------------------------------------------------------------------------------|
| LOCATION   | Name of the location                                            | Text            | No predefined values                                                                                                   |
| WD_TOP     | Minimum water depth for CTD or SVP record                       | Numeric (float) | No predefined values                                                                                                   |
| WD_BOTTOM  | Maximum water depth for CTD or SVP record                       | Numeric (float) | No predefined values                                                                                                   |
| WD_UNIT    | Water depth unit                                                | Text            | Meters                                                                                                                 |
| WD_DATUM   | Water depth datum                                               | Text            | Possible values: <ul style="list-style-type: none"> <li>• LAT</li> <li>• MSL</li> <li>• CD</li> <li>• Other</li> </ul> |
| WD_METHOD  | Equipment used for the water depth measurement                  | Text            | Possible values: <ul style="list-style-type: none"> <li>• Multibeam Echo-sounder</li> <li>• Other</li> </ul>           |
| HYPERLINK  | Link to the Excel spread sheet, ascii file and/or pdf data file | Text            | No predefined values                                                                                                   |
| COMMENTS   | Comments                                                        | Text            | No predefined values                                                                                                   |

- **Symbology:**

- Green filled circle with a black dot in the center
- Size: 10



## 1.4 Reference points

- Represents all the onshore reference points locations used during the survey for the equipment calibration (gyroscope, DGPS check, Patch test location, Position check). There is one item <XY> per location. Main information shall be described in the attributes.
- GP\_SI\_REF: vector** data represented by **points**
- Minimum attributes:**

| Field name | Signification                 | Type | Other                |
|------------|-------------------------------|------|----------------------|
| NAME       | Name of the reference point   | Text | No predefined values |
| HYPERLINK  | Link to the description sheet | Text | No predefined values |
| DATE       | Date of the calibration       | Date | No predefined values |
| COMMENTS   | Comments                      | Text | No predefined values |

- Symbology:**

- Blue circle
- Size: 10

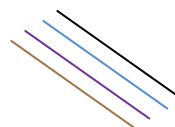


## 1.5 Navigation track plots

- Represents all the trackplots of the survey. One file shall be created per type of equipment (AUV, 2DHR...). There is one feature per line.
- GP\_SI\_NAVTP: vector** data represented by **polylines**
- Minimum attributes:**

| Field name | Signification          | Type            | Other                                                                                                            |
|------------|------------------------|-----------------|------------------------------------------------------------------------------------------------------------------|
| LINE_NB    | Line number            | Numeric (float) | No predefined values                                                                                             |
| TYPE       | Type of equipment used | Text            | Possible values: <ul style="list-style-type: none"> <li>AUV</li> <li>UHR</li> <li>2DHR</li> <li>Other</li> </ul> |
| COMMENTS   | Comments               | Text            | No predefined values                                                                                             |

- Hyperlinks:** Analogue and digital seismic lines shall have a hyperlink to the SEG-Y line. Main seismic lines may have a hyperlink to the \*.pdf file.
- Symbology:**
  - Type of line: continuous line
  - Thickness of the line: 1pt
  - Color: vary with TYPE of equipment:
    - AUV: Blue



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- . UHR: Black
- . 2DHR: dark purple
- . Other equipments: a color for each equipment.

### 1.6 Navigation shot points

- Represents all the shot points of the survey. One file shall be created per type of equipment (AUV, 2DHR, etc.).
- **GP\_SI\_NAVSP: vector** data represented by **points**
- **Minimum attributes:**

| Field name | Signification          | Type            | Other                                                                                                                    |
|------------|------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------|
| SHOTPT_NB  | Shotpoint number       | Numeric (float) | No predefined values                                                                                                     |
| LINE_NB    | Line number            | Text            | No predefined values                                                                                                     |
| TYPE       | Type of equipment used | Text            | Possible values: <ul style="list-style-type: none"> <li>• AUV</li> <li>• UHR</li> <li>• 2DHR</li> <li>• Other</li> </ul> |
| COMMENTS   | Comments               | Text            | No predefined values                                                                                                     |

- **Symbols and labels** shall have predefined scales in order to improve the visibility:
  - Type of line: circle with a continuous line
  - Thickness of the line: 1pt
  - Size of the symbol: 8
  - Color: vary with type of equipment:

○
○
○
○

    - . AUV: Blue
    - . UHR: Black
    - . 2DHR: dark purple
    - . Other equipments: a color for each equipment.

### 1.7 Proposed well location

- Represents all the proposed well location.
- **GP\_SI\_PWL: vector** data represented by **points**

- **Minimum attributes:**

| Field name | Signification    | Type | Other                |
|------------|------------------|------|----------------------|
| NAME       | Name of the well | Text | No predefined values |
| COMMENTS   | Comments         | Text | No predefined values |

- **Symbology:**

- Green filled circle with 2 continuous lines
- Size of the symbol: 15



## 2. Survey features

### 2.1 Bathymetry

- Represents the final bathymetry in meters (negative values). Water Depth Datum shall be mentioned in the attributes.
- The name of the layer shall have the equidistance.
- **GP\_SF\_BAT: Raster** data (depth value)
- **GP\_SF\_BAT\_ZZZ: vector** data represented by **3D polylines**, where “ZZZ” means the equidistance of the isobaths.
- **Minimum attributes:**

| Field name  | Signification                                  | Type            | Other                                                                                                                  |
|-------------|------------------------------------------------|-----------------|------------------------------------------------------------------------------------------------------------------------|
| WATER_DEPTH | Depth value                                    | Numeric (float) | No predefined values<br>+ NoData                                                                                       |
| WD_UNIT     | Water depth unit                               | Text            | Meters                                                                                                                 |
| WD_DATUM    | Water depth datum                              | Text            | Possible values: <ul style="list-style-type: none"> <li>• LAT</li> <li>• MSL</li> <li>• CD</li> <li>• Other</li> </ul> |
| WD_METHOD   | Equipment used for the water depth measurement | Text            | Possible values: <ul style="list-style-type: none"> <li>• Multibeam Echo sounder</li> <li>• Other</li> </ul>           |
| TYPE        | Type of contours                               | Text            | Possible values: <ul style="list-style-type: none"> <li>• Minor</li> <li>• Major</li> </ul>                            |
| COMMENTS    | Comments                                       | Text            | No predefined values                                                                                                   |

- **Label:** Bathymetry contours shall be with a label of the depth and unit. Visualization scales of the labels can be adjusted.

- **Symbology:**

- Type of line: continuous
- Thickness of the line: 1pt for minor contours, 1.7pt for major contours
- Color: to be adapted for a better visibility.



## 2.2 Backscatter

- Represents the backscatter display (from multibeam sounder data)
- **GP\_SF\_BAK: Raster data** (amplitude value).

## 2.3 Seabed slopes

- Represents the computed seabed slopes in degrees (unit mentioned in the name of the layer).
- **GP\_SB\_SLO\_ZZZ: Raster data**, where “ZZZ” is the slope unit.
- **Symbology:**

☒ Slopes in degree

&lt;VALUE&gt;

☐ 0 - 4

☐ 4 - 6

☐ 6 - 8

☐ 8 - 10

☐ 10 - 20

☐ > 20

## 2.4 Hillshade

- Represents the hillshade display
- **GP\_SF\_HIL: Raster data**

## 2.5 Side scan sonar mosaic

- Represents the side scan sonar mosaic
- **GP\_SF\_SSS: Raster data**
- **Resolution:** the highest workable resolution possible.

## 2.6 Soundings

- Represents the soundings
- **GP\_SF\_SDG: vector** data represented by **points**
- **Minimum attributes:**

| Field name  | Signification                                  | Type            | Other                                                                                                                  |
|-------------|------------------------------------------------|-----------------|------------------------------------------------------------------------------------------------------------------------|
| WATER_DEPTH | Depth value                                    | Numeric (float) | No predefined values + NoData                                                                                          |
| WD_UNIT     | Water depth unit                               | Text            | Meters                                                                                                                 |
| WD_DATUM    | Water depth datum                              | Text            | Possible values: <ul style="list-style-type: none"> <li>• LAT</li> <li>• MSL</li> <li>• CD</li> <li>• Other</li> </ul> |
| WD_METHOD   | Equipment used for the water depth measurement | Text            | Possible values: <ul style="list-style-type: none"> <li>• Multibeam Echo sounder</li> <li>• Other</li> </ul>           |
| TYPE        | Type of contours                               | Text            | Possible values: <ul style="list-style-type: none"> <li>• Minor</li> <li>• Major</li> </ul>                            |
| COMMENTS    | Comments                                       | Text            | No predefined values                                                                                                   |

- **Symbology:**
  - Red filled circle
  - Size of the symbol: 2

## 3. Seabed interpretation

### 3.1 Seabed geology

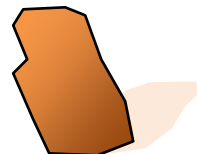
- Represents seabed geology.
- **GP\_SB\_GEOL: Vector** data represented by **polygons**.
- **Minimum attributes:**

| Field name | Signification   | Type | Other                |
|------------|-----------------|------|----------------------|
| TYPE       | Type of geology | Text | No predefined values |
| COMMENTS   | Comments        | Text | No predefined values |

- **Example:** outcrops

- **Symbology:**

- Continuous outline
- Color to be adapted with the TYPE



### 3.2 Sonar contacts

- Represents sonar contacts.
- **GP\_SB\_SNC: Vector data represented by points.**
- **Minimum attributes:**

| Field name | Signification                             | Type            | Other                |
|------------|-------------------------------------------|-----------------|----------------------|
| CONTACT_NB | Sonar contact number                      | Numeric (float) | No predefined values |
| TYPE       | Type of sonar contact                     | Text            | No predefined values |
| HEIGHT     | Height of the sonar contact               | Numeric (float) | No predefined values |
| LENGTH     | Length of the sonar contact               | Numeric (float) | No predefined values |
| WIDTH      | Width of the sonar contact                | Numeric (float) | No predefined values |
| UNITS      | Unit of above measurements                | Text            | Meters               |
| HYPERLINK  | Link to the .pdf contact description file | Text            | No predefined values |
| COMMENTS   | Comments                                  | Text            | No predefined values |

- **Symbology:**

- Point with a continuous outline in black
- Symbol size: 8
- Fill-in color: Red for sonar contact with a least one dimension greater than 5 meters, otherwise in black for minor contact.



### 3.3 Debris areas

- Represents debris (side scan sonar areas of multiple minor contacts, well cuttings, etc.).
- **GP\_SB\_DEB: Vector** data represented by **polygons**
- **Minimum attributes:**

| Field name | Signification  | Type | Other                |
|------------|----------------|------|----------------------|
| TYPE       | Type of debris | Text | No predefined values |
| COMMENTS   | Comments       | Text | No predefined values |

- **Symbology** (TYPE field)

- Drilling cutting: grey with a dark continuous outline (1pt) 
- Oil at seabed: black hatches with a dark continuous outline (1pt) 
- Cemented patches:
  - . Light brown (R-204, G-153, B-102) with a dark continuous outline (1pt) 
  - . When associated with seabed mounds, Very light brown (R-210, G-180, B-164) with a dark continuous outline (1pt) 
  - . When associated with seabed depressions, Light brownish green (R-216, G-204, B-153) with a dark continuous outline (1pt) 
- Hydrocarbon accumulation: single red hatch with a red continuous outline (1pt) 
- Debris areas (when a lot of sonar contacts): black dots with a black continuous outline (1pt) 

### 3.4 Linear Debris

- Represents linear debris
- **GP\_SB\_DEB\_LIN: Vector** data represented by **polylines**
- **Minimum attributes:**

| Field name | Signification              | Type            | Other                |
|------------|----------------------------|-----------------|----------------------|
| TYPE       | Type of debris             | Text            | No predefined values |
| HEIGHT     | Height of the debris       | Numeric (float) | No predefined values |
| LENGTH     | Length of the debris       | Numeric (float) | No predefined values |
| UNITS      | Unit of above measurements | Text            | Meters               |
| COMMENTS   | Comments                   | Text            | No predefined values |

- **Symbology :**

- Type of the line : continuous
- Thickness of the line : 1pt
- Color: to be adapted for a better visibility.

### 3.5 Boulders areas

- Represents boulders.
- **GP\_SB\_BLD: Vector** data represented by **polygons**
- **Minimum attributes:**

| Field name | Signification | Type | Other                |
|------------|---------------|------|----------------------|
| COMMENTS   | Comments      | Text | No predefined values |

- **Symbology:** black dots on a white background with a black continuous outline (1pt)



### 3.6 Scars

- Represents seabed scars.
- **GP\_SB\_SCA: Vector** data represented by **polylines**
- **Minimum attributes:**

| Field name | Signification | Type | Other                |
|------------|---------------|------|----------------------|
| TYPE       | Type of scar  | Text | No predefined values |
| COMMENTS   | Comments      | Text | No predefined values |

- **Symbology:** black continuous line (1pt)



### 3.7 Faults, scarps

- Represents the seabed faults or scarps with indication of the downthrown side.
- **GP\_SB\_FLT: Vector** data represented by **polylines**
- **GP\_SB\_FLT\_g:** data represented by **polygons**
- **Minimum attributes:**

| Field name | Signification                          | Type            | Other                |
|------------|----------------------------------------|-----------------|----------------------|
| TYPE       | Type                                   | Text            | No predefined values |
| HEIGHT     | Maximum height along the fault segment | Numeric (float) | No predefined values |
| COMMENTS   | Comments                               | Text            | No predefined values |

- **Symbology:**

- Polylines: black continuous line (1pt) with official symbol (downthrow side, etc.)



- Area: single black hatch with a black continuous outline (1pt)



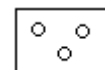
### 3.8 Pockmarks

- Represents individual pockmarks or a zone of dense accumulation of very small pockmarks.
- **GP\_SB\_PCK: Vector** data represented by **polygons**
- **Minimum attributes:**

| Field name     | Signification                        | Type            | Other                                                                                           |
|----------------|--------------------------------------|-----------------|-------------------------------------------------------------------------------------------------|
| TYPE           | Type of pockmark                     | Text            | No predefined values                                                                            |
| RELATIVE_DEPTH | Relative depth in meters             | Numeric (float) | No predefined values                                                                            |
| ACTIVITY       | Presence of activity in the pockmark | Text            | Possible values: <ul style="list-style-type: none"> <li>• Active</li> <li>• Inactive</li> </ul> |
| COMMENTS       | Comments                             | Text            | No predefined values                                                                            |

- **Symbology:**

- Single pockmarks: Circle with a continuous outline as drawn:
- Color: red when active, otherwise blue.
- Area with a continuous black line and black circles



### 3.9 Depression areas

- Represents depression areas.
- **GP\_SB\_DEP: Vector data represented by polygons**
- **Minimum attributes:**

| Field name     | Signification                                           | Type            | Other                |
|----------------|---------------------------------------------------------|-----------------|----------------------|
| RELATIVE_DEPTH | Relative maximum depth in meters                        | Numeric (float) | No predefined values |
| ORIGIN         | Origin of the depression area (geological, man made...) | Text            | No predefined values |
| COMMENTS       | Comments                                                | Text            | No predefined values |

- **Symbology:**

Polygon with a continuous outline as drawn:

Color: light blue.



### 3.10 Depression axes

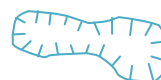
- Represents depression axes.
- **GP\_SB\_DAX: Vector data represented by polylines**
- **Minimum attributes:**

| Field name     | Signification                                           | Type            | Other                |
|----------------|---------------------------------------------------------|-----------------|----------------------|
| RELATIVE_DEPTH | Relative maximum depth in meters                        | Numeric (float) | No predefined values |
| ORIGIN         | Origin of the depression axes (geological, man made...) | Text            | No predefined values |
| COMMENTS       | Comments                                                | Text            | No predefined values |

- **Symbology:**

Polyline with a continuous outline as drawn:

Color: light blue.



### 3.11 Possible gas leak

- Represents possible gas leak location.
- **GP\_SB\_PGL: Vector** data represented by **points**
- **Minimum attributes:**

| Field name | Signification | Type | Other                |
|------------|---------------|------|----------------------|
| COMMENTS   | Comments      | Text | No predefined values |

- **Symbology:** Pink dot at the possible gas leak location.



### 3.12 Slumps

- Represents the slumps
- **GP\_SB\_SMP: Vector** data represented by **polygons**
- **Minimum attributes:**

| Field name | Signification | Type | Other                |
|------------|---------------|------|----------------------|
| COMMENTS   | Comments      | Text | No predefined values |

- **Symbology:** yellow with a dark continuous outline (1pt)



### 3.13 Mass Transport deposit

- Represents mass transport deposit
- **GP\_SB\_MTD: Vector** data represented by **polygons**
- **Minimum attributes:**

| Field name    | Signification                                   | Type    | Other                |
|---------------|-------------------------------------------------|---------|----------------------|
| TYPE          | Type of the MTD                                 | Text    | No predefined values |
| MIN_DEPTH     | Minimal depth in meters below seabed of the MTD | Numeric | No predefined values |
| INTERP_SOURCE | Interpreted source of the MTD                   | Text    | No predefined values |
| COMMENTS      | Comments                                        | Text    | No predefined values |

- **Symbology:**

Single red hatch with a red dashed outline  
Color: to be adapted with TYPE attribute



### 3.14 Mounds

- Represents mounds
- **GP\_SB\_MND: Vector** data represented by **polygons**
- **Minimum attributes:**

| Field name | Signification | Type | Other                |
|------------|---------------|------|----------------------|
| COMMENTS   | Comments      | Text | No predefined values |

- **Symbology:**

Polygon with a continuous outline as drawn



Color: black.

### 3.15 Ridge

- Represents ridge
- **GP\_SB\_RDG: Vector** data represented by **polygons**
- **Minimum attributes:**

| Field name | Signification | Type | Other                |
|------------|---------------|------|----------------------|
| COMMENTS   | Comments      | Text | No predefined values |

- **Symbology:**

Polygon with dashed outlines as drawn



Color: red.

### 3.16 Magnetometer anomaly

- Represents magnetometer anomaly
- **GP\_SB\_MGC: Vector** data represented by **points**
- **Minimum attributes:**

| Field name | Signification | Type | Other                |
|------------|---------------|------|----------------------|
| COMMENTS   | Comments      | Text | No predefined values |

- **Symbology:**

Star as drawn



Color: red

Symbol size: 18

### 3.17 Observed jackup footprints

- Represents observed jackup footprints
- **GP\_SB\_JFP: Vector** data represented by **polygons**
- **Minimum attributes:**

| Field name | Signification | Type | Other                |
|------------|---------------|------|----------------------|
| COMMENTS   | Comments      | Text | No predefined values |

- **Symbology:**

Polygon with a blue continuous outline as drawn

Color: light blue.



### 3.18 Observed pipelines

- Represents observed pipelines
- **GP\_SB\_OPL: Vector** data represented by **polylines**
- **Minimum attributes:**

| Field name | Signification | Type | Other                |
|------------|---------------|------|----------------------|
| COMMENTS   | Comments      | Text | No predefined values |

- **Symbology:**

Type of the line : continuous

Thickness of the line : 2 pt

Color: red.



### 3.19 Observed cables

- Represents observed cables
- **GP\_SB\_OCB: Vector** data represented by **polylines**
- **Minimum attributes:**

| Field name | Signification | Type | Other                |
|------------|---------------|------|----------------------|
| COMMENTS   | Comments      | Text | No predefined values |

- **Symbology:**

Continuous line

Thickness of the line : 1pt

Color: brown.



### 3.20 Observed wrecks

- Represents observed wrecks
- **GP\_SB\_OWK: Vector** data represented by **points**
- **Minimum attributes:**

| Field name | Signification               | Type            | Other                |
|------------|-----------------------------|-----------------|----------------------|
| TYPE       | Type of sonar contact       | Text            | No predefined values |
| HEIGHT     | Height of the sonar contact | Numeric (float) | No predefined values |
| LENGTH     | Length of the sonar contact | Numeric (float) | No predefined values |
| WIDTH      | Width of the sonar contact  | Numeric (float) | No predefined values |
| UNITS      | Unit of above measurements  | Text            | Meters               |
| COMMENTS   | Comments                    | Text            | No predefined values |

- **Symbology:**

Symbol as drawn

Symbol size : 20



### 3.21 Observed wells

- Represents observed wells
- **GP\_SB\_OWH: Vector** data represented by **points**
- **Minimum attributes:**

| Field name | Signification | Type | Other                |
|------------|---------------|------|----------------------|
| COMMENTS   | Comments      | Text | No predefined values |

- **Symbology:**

Symbol as drawn

Symbol size : 10



## 4. Sub-seabed interpretation

All sub-seabed interpretation features shall state, as attribute, the burial depth in meters below seabed and / or the relative depth to sea level.

### 4.1 Structural sub-bottom hazard

#### 4.1.1 Faults

- Represents buried faults, identifying the down-thrown side.
- **GP\_SS\_FLT: Vector** data represented by **polylines**
- **Minimum attributes:**

| Field name   | Signification                                                            | Type    | Other                                                                                           |
|--------------|--------------------------------------------------------------------------|---------|-------------------------------------------------------------------------------------------------|
| TYPE         | Type of the burial fault (normal, reverse, compression, low angle, etc.) | Text    | No predefined values                                                                            |
| BURIAL_DEPTH | Burial depth of the fault                                                | Numeric | No predefined values                                                                            |
| CATEGORY     | Category of the fault (Tectonic, syn-sedimentary, etc.)                  | Text    | No predefined values                                                                            |
| SEISMICITY   | Seismicity of the fault (active, inactive)                               | Text    | Possible values: <ul style="list-style-type: none"> <li>• Active</li> <li>• Inactive</li> </ul> |
| ORIGIN       | Origin of the fault (structural, dewatering, etc.)                       | Text    | No predefined values                                                                            |
| V_OFFSET     | Vertical offset: value in meters at the level of reflector 1             | Numeric | No predefined values                                                                            |
| H_OFFSET     | Horizontal offset: value in meters at the level of reflector 1           | Numeric | No predefined values                                                                            |
| COMMENTS     | Comments                                                                 | Text    | No predefined values                                                                            |

There is as many V\_OFFSET and H\_OFFSET fields than the number of reflector interpreted.

- **Symbology:**

- Polyline: grey continuous line (1pt) with official symbol (downthrow side, etc.).



#### 4.1.2 Fracture zone

- Represents Fracture zone.
- **GP\_SS\_FRC: Vector** data represented by **polygons**
- **Minimum attributes:**

| Field name    | Signification                                             | Type    | Other                |
|---------------|-----------------------------------------------------------|---------|----------------------|
| TYPE          | Type of the fracture zone                                 | Text    | No predefined values |
| MIN_DEPTH     | Minimal depth in meters below seabed of the fracture zone | Numeric | No predefined values |
| INTERP_SOURCE | Interpreted source of the fracture zone                   | Text    | No predefined values |
| COMMENTS      | Comments                                                  | Text    | No predefined values |

- **Symbology:**

- Polygon with continuous outline (1pt)
- Color:

Fill-in color is function of the type.

#### 4.1.3 Hydrocarbon accumulation

- Represents areas featuring interpreted hydrocarbon accumulation.
- **GP\_SS\_HYA: Vector** data represented by **polygons**
- **Minimum attributes:**

| Field name | Signification                                                        | Type    | Other                |
|------------|----------------------------------------------------------------------|---------|----------------------|
| NATURE     | Nature of hydrocarbon accumulation                                   | Text    | No predefined values |
| MIN_DEPTH  | Minimal depth in meters below seabed of the hydrocarbon accumulation | Numeric | No predefined values |
| COMMENTS   | Comments                                                             | Text    | No predefined values |

Depth values (below seabed and from sea level)

- **Symbology:** single red hatch with a red continuous outline (1pt)



#### 4.1.4 Gas anomalies

- Represents areas featuring interpreted gas anomalies.
- **GP\_SS\_GSA: Vector** data represented by **polygons**
- **Minimum attributes:**

| Field name | Signification                                           | Type    | Other                |
|------------|---------------------------------------------------------|---------|----------------------|
| NATURE     | Nature of gas anomaly                                   | Text    | No predefined values |
| MIN_DEPTH  | Minimal depth in meters below seabed of the gas anomaly | Numeric | No predefined values |
| COMMENTS   | Comments                                                | Text    | No predefined values |

- Depth values (below seabed and from sea level)
- **Symbology:**
  - Polygon with continuous outline (1pt)
  - Color:
    - . Fill in color is function of the depth or level of the anomaly
    - . Outline color is a bit darker.

#### 4.1.5 Buried depressions

- Represents areas featuring channels and/or buried depressions.
- **GP\_SS\_BDP: Vector** data represented by **polygons**
- **Minimum attributes:**

| Field name | Signification                                                  | Type    | Other                |
|------------|----------------------------------------------------------------|---------|----------------------|
| TYPE       | Type of the burial depression (channel, fossil pockmark, etc.) | Text    | No predefined values |
| MIN_DEPTH  | Minimal depth in meters below seabed of the buried depression  | Numeric | No predefined values |
| COMMENTS   | Comments                                                       | Text    | No predefined values |

- **Symbology:** to be define with TYPE attribute.

#### 4.1.6 Acoustic Mask

- Represents acoustic masks
- **GP\_SS\_AMK: Vector** data represented by **polygons**
- **Minimum attributes:**

| Field name    | Signification                                             | Type    | Other                |
|---------------|-----------------------------------------------------------|---------|----------------------|
| TYPE          | Type of the acoustic mask (carbonate, etc.)               | Text    | No predefined values |
| MIN_DEPTH     | Minimal depth in meters below seabed of the acoustic mask | Numeric | No predefined values |
| INTERP_SOURCE | Interpreted source of the acoustic mask                   | Text    | No predefined values |
| COMMENTS      | Comments                                                  | Text    | No predefined values |

- **Symbology:** to be define with TYPE attribute.
  - Polygon with continuous outline (1pt)
  - Color: pink



#### 4.1.7 Disturbed Sediments

- Represents disturbed sediments
- **GP\_SS\_DSM: Vector** data represented by **polygons**
- **Minimum attributes:**

| Field name    | Signification                                                  | Type    | Other                |
|---------------|----------------------------------------------------------------|---------|----------------------|
| TYPE          | Type of the disturbed sediment (carbonate, etc.)               | Text    | No predefined values |
| MIN_DEPTH     | Minimal depth in meters below seabed of the disturbed sediment | Numeric | No predefined values |
| INTERP_SOURCE | Interpreted source of the disturbed sediment                   | Text    | No predefined values |
| COMMENTS      | Comments                                                       | Text    | No predefined values |

- **Symbology:** to be define with TYPE attribute.

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### 4.1.8 High amplitude reflector

- Represents high amplitude reflector
- **GP\_SS\_HAR: Raster** data (depth in meters below seabed value)

### 4.1.9 Reflector boundary

- Represents reflector boundary
- **GP\_SS\_RBD: Vector** data represented by **polygons**
- **Minimum attributes:**

| Field name    | Signification                                              | Type    | Other                |
|---------------|------------------------------------------------------------|---------|----------------------|
| TYPE          | Type of boundary reflector                                 | Text    | No predefined values |
| MIN_DEPTH     | Minimal depth in meters below seabed of reflector boundary | Numeric | No predefined values |
| INTERP_SOURCE | Interpreted source of the reflector boundary               | Text    | No predefined values |
| REFLECTOR     | Reflector unit                                             | Text    | No predefined values |
| COMMENTS      | Comments                                                   | Text    | No predefined values |

- **Symbology:** Polygon with continuous outline, color to be define with TYPE attribute.

### 4.1.10 Channel Axis

- Represents channel axis
- **GP\_SS\_CAX: Vector** data represented by **polyline**
- **Minimum attributes:**

| Field name | Signification | Type | Other                |
|------------|---------------|------|----------------------|
| COMMENTS   | Comments      | Text | No predefined values |

- **Symbology:**

Continuous line

Thickness of the line : 2pt

Color: Dark blue



## 4.2 Stratigraphy

### 4.2.1 Isopachs

- An isopach is an isoline that connects points of equal thickness of a geological stratum formation or group of formations.
- This layer represents the different identified isopachs. One file per isopach is represented with the equidistance contours value in the name of the layer. Thickness values shall be in meters.
- **GP\_ST\_ISP:** Raster data (thickness value in meters)
- **GP\_ST\_ISP\_Zm:** Isovalues as Vector data represented by 3D polylines (with Zm intervals).
- **Minimum attributes:**

| Field name | Signification | Type | Other                |
|------------|---------------|------|----------------------|
| COMMENTS   | Comments      | Text | No predefined values |

### 4.2.2 Isobaths

- An isobath is an isoline that connects points of equal underwater depth
- This layer represents the different identified isobaths. One file per isobath is represented with the equidistance contours value in the name of the layer. Depth values shall be in meters.
- **GP\_ST\_ISB:** Raster data
- **GP\_ST\_ISB\_Zm:** Isovalues as Vector data represented by 3D polylines (with Zm intervals).
- **Minimum attributes:**

| Field name | Signification | Type | Other                |
|------------|---------------|------|----------------------|
| COMMENTS   | Comments      | Text | No predefined values |

### 4.2.3 Isochrons

- An isochron is an isoline that connects points of identical age.
- This layer represents the different identified isochrons. One file per isochron is represented with the age interval value in the name of the layer.
- **GP\_ST\_ISCH:** Raster data
- **GP\_ST\_ISCH\_A:** Isovalues as Vector data represented by 3D polylines (with A intervals).
- **Minimum attributes:**

| Field name | Signification | Type | Other                |
|------------|---------------|------|----------------------|
| COMMENTS   | Comments      | Text | No predefined values |

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### 4.2.4 Isohyps

- An isohyps is the line joining points of equal elevation
- This layer represents the different identified isohyps. One file per isohyp is expected. Elevation values shall be in meters from sea level but have to be mentioned in the name of the dataset and layer.
- **GP\_ST\_ISH**: Raster data (values in meters).
- **GP\_ST\_ISH\_Zm**: Isovalues as Vector data represented by 3D polylines (with Zm intervals).
- **Minimum attributes:**

| Field name | Signification | Type | Other                |
|------------|---------------|------|----------------------|
| COMMENTS   | Comments      | Text | No predefined values |

## Appendix 3 Geotechnical data details

Two tables are expected for the geotechnical deliverables.

### 1. GT\_LOC: Location table

- Represents the geotechnical test location.
- **Minimum attributes:**

| Field name       | Name Explanation                                            | Units |
|------------------|-------------------------------------------------------------|-------|
| Location ID      | Unique Location ID                                          |       |
| Location Name    | Site and Project Name                                       |       |
| Borehole Type    | Test Type: sampling, in situ testing (CPT, Vane test, etc.) |       |
| Penetration      | Penetration                                                 | m     |
| Local Easting    | Easting coordinate in local datum                           | m     |
| Local Northing   | Northing coordinate in local datum                          | m     |
| Horizontal Datum | Horizontal datum name                                       |       |
| Water Depth      | Water Depth                                                 | m     |
| Vertical Datum   | Vertical datum name                                         |       |
| Log hyperlink    | Log hyperlink: directory path name                          |       |

### 2. GT\_RES: Lab results table

- Represents the results of the test.
- **Minimum attributes:**

| Field name                     | Name Explanation      | Units             |
|--------------------------------|-----------------------|-------------------|
| Result ID                      | Unique result         | ID                |
| Location ID                    | Unique location ID    |                   |
| Location Name                  | Location name         |                   |
| Depth                          | Depth below mudline   | m                 |
| Geotechnical Description       | Soil type             |                   |
| Moisture Content (%)           | Moisture content      | %                 |
| SUW (kN/m <sup>3</sup> )       | Submerged unit weight | kN/m <sup>3</sup> |
| Bulk Dens (Mg/m <sup>3</sup> ) | Bulk density          | Mg/m <sup>3</sup> |
| LL (%)                         | Liquid limit          | %                 |
| PL (%)                         | Plastic limit         | %                 |
| PI (%)                         | Plastic index         | %                 |
| LI                             | Liquid index          |                   |
| Fines (%)                      | Fines content (clay)  | %                 |

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| Field name                     | Name Explanation                                    | Units        |
|--------------------------------|-----------------------------------------------------|--------------|
| Silt                           | Silt content                                        | %            |
| PP (kPa)                       | Shear strength from pocket penetrometer             | kPa          |
| TV (kPa)                       | Shear strength from torvane                         | kPa          |
| MV (kPa)                       | Shear strength from undisturbed minivane            | kPa          |
| MV Rem (kPa)                   | Shear strength from remoulded minivane              | kPa          |
| MV Res (kPa)                   | Residual shear strength from minivane               | kPa          |
| FC (kPa)                       | Shear strength from undisturbed fallcone            | kPa          |
| FC Rem (kPa)                   | Shear strength from remoulded fallcone              | kPa          |
| UU (kPa)                       | Shear strength from undisturbed UU triaxial         | kPa          |
| UU Rem (kPa)                   | Shear strength from remoulded UU triaxial           | kPa          |
| UU e50 (%)                     | Epsilon 50 (UU triaxial)                            | %            |
| UU ef (%)                      | Failure strain (UU triaxial)                        | %            |
| UU Failure Type                | Failure type (UU triaxial)                          |              |
| UU QI                          | Quality Index (UU Triaxial)                         |              |
| UU QI Category                 | Quality Index Category (UU Triaxial)                |              |
| Gs                             | Particle specific density                           |              |
| CaCO <sub>3</sub> (%)          | Calcium carbonate content                           | %            |
| Salt (kg/kg)                   | Salt content                                        | kg/kg        |
| Organic Type                   | Organic content test type                           |              |
| Organic (%)                    | Organic content                                     | %            |
| TOC (%)                        | Total Organic Carbon                                | %            |
| SRB (log cells/ml)             | Sulphate Reducing Bacteria                          | log cells/ml |
| TXL Type                       | Triaxial test type                                  |              |
| TXL Vert Cons (kPa)            | Vertical consolidation (Triaxial)                   | kPa          |
| TXL Rad Cons (kPa)             | Radial consolidation (Triaxial)                     | kPa          |
| Measured K0 (-)                | Measured K0 value (Triaxial)                        | -            |
| TXL Pk Shear (kPa)             | Measured peak shear (Triaxial)                      | kPa          |
| TXL XS PWP at Pk Shear (kPa)   | Excess pore water pressure at peak shear (Triaxial) | kPa          |
| TXL Vol Change at Pk Shear (%) | Volume change at peak shear (Triaxial)              | %            |
| TXL ef (%)                     | Failure strain (Triaxial)                           | %            |
| TXL Phi Pk (°)                 | Peak effective friction angle (Triaxial)            | Degree       |
| TXL Phi Res (°)                | Residual effective friction angle (Triaxial)        | Degree       |
| TXL e50 (%)                    | Epsilon 50 (Triaxial)                               | %            |
| TXL Youngs Mod (kPa)           | Youngs Modulus (Triaxial)                           | kPa          |
| TXL QI                         | Quality Index (Triaxial)                            |              |
| TXL QI Category                | Quality Index Category (Triaxial)                   |              |
| DSS Cons (kPa)                 | Direct simple shear (DSS) consolidation pressure    | kPa          |

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| Field name                       | Name Explanation                                                         | Units    |
|----------------------------------|--------------------------------------------------------------------------|----------|
| DSS Pk Shear (kPa)               | Measured peak shear (DSS)                                                | kPa      |
| DSS XS PWP at Pk Shear (kPa)     | Excess pore water pressure at peak shear (DSS)                           | kPa      |
| DSS Shear Strain at Pk Shear (%) | Shear strain at peak shear (DSS)                                         | %        |
| Oed Type                         | Oedometer test type                                                      |          |
| Oed Prev Max Vert Press (kPa)    | Oedometer test previous maximum vertical pressure                        | kPa      |
| Oed Coeff of Cons ( $m^2/yr$ )   | Oedometer test coefficient of consolidation                              | $m^2/yr$ |
| Oed Test Comp Index              | Oedometer test compression index                                         |          |
| Oed Test Swelling Index          | Oedometer test swelling index                                            |          |
| Oed e0                           | Oedometer test initial voids ratio                                       |          |
| Oed Perm (m/yr)                  | Oedometer test permeability                                              | m/yr     |
| Oed Prec                         | Oedometer pre-consolidation pressure                                     | (kPa)    |
| Oed OCR                          | Oedometer OCR                                                            |          |
| Oed YSR                          | Oedometer test yield stress ratio                                        |          |
| Oed QI                           | Oedometer test quality index                                             |          |
| Oed QI Category                  | Oedometer test quality index category                                    |          |
| Measured Permeability (m/yr)     | Measured permeability                                                    | m/yr     |
| ResCol Cons1 (kPa)               | Resonant column consolidation pressure 1                                 | kPa      |
| ResCol Gmax1 (kPa)               | Small-strain shear modulus at consolidation pressure 1 (Resonant column) | kP       |
| ResCol Cons2 (kPa)               | Resonant column consolidation pressure 2                                 | kPa      |
| ResCol Gmax2 (kPa)               | Small-strain shear modulus at consolidation pressure 2 (Resonant column) | kPa      |
| ResCol Cons3 (kPa)               | Resonant column consolidation pressure 3                                 | kPa      |
| ResCol Gmax3 (kPa)               | Small-strain shear modulus at consolidation pressure 3 (Resonant column) | kPa      |
| Cyclic Type                      | Cyclic triaxial type                                                     |          |
| Cyc Vert Cons (kPa)              | Vertical consolidation (Cyclic triaxial)                                 | kPa      |
| Cyc Rad Cons (kPa)               | Radial consolidation (Cyclic triaxial)                                   | kPa      |
| Av Shear Stress (kPa)            | Average shear stress (Cyclic triaxial)                                   | kPa      |
| Cyc Shear Stress (kPa)           | Cyclic shear stress (Cyclic triaxial)                                    | kPa      |
| Frequency (Hz)                   | Load frequency (Cyclic triaxial)                                         | Hz       |
| No Cycles                        | Number of cycles (Cyclic triaxial)                                       |          |
| Cyc XS PWP at N (kPa)            | Excess pore water pressure after completing cycles (Cyclic triaxial)     | kPa      |
| Av Shear Strain at N (%)         | Average shear strain after completing cycles (Cyclic triaxial)           | %        |
| Post Cyc Strength (kPa)          | Post cyclic shear strength (Cyclic triaxial)                             | kPa      |
| Cyclic QI                        | Quality Index (Cyclic triaxial)                                          |          |
| Cyclic QI Category               | Quality Index Category (Cyclic triaxial)                                 |          |

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| Field name              | Name Explanation                                          | Units    |
|-------------------------|-----------------------------------------------------------|----------|
| Ring Interface          | Ring Interface (Ring shear)                               |          |
| Shear Speed             | Rate of shear (Ring shear)                                | Deg/hour |
| Norm Stress (kPa)       | Normal stress (Ring shear)                                | kPa      |
| Phi Pk (°)              | Peak effective friction angle (Ring shear-soil/soil)      | Degree   |
| Phi Res (°)             | Residual effective friction angle (Ring shear-soil/soil)  | Degree   |
| Delta Pk (°)            | Peak effective friction angle (Ring shear-soil/steel)     | Degree   |
| Delta Res (°)           | Residual effective friction angle (Ring shear-soil/steel) | Degree   |
| Therm Con (W/mk)        | Thermal conductivity - undisturbed sample                 | W/mk     |
| Therm Con Rem (W/mk)    | Thermal conductivity - remoulded sample                   | W/mk     |
| Elec Resistivity (ohmm) | Electrical resistivity                                    | Ohmm     |
| InSitu Vane (kPa)       | Peak shear strength from undisturbed in-situ vane shear   | kPa      |
| InSitu Vane Rem (kPa)   | Shear strength from remoulded in-situ vane shear          | kPa      |
| Thixotropy Start        | Thixotropy ratio at start                                 |          |
| Thixotropy End          | Thixotropy ratio at end                                   |          |
| Test Length (days)      | Duration of test                                          | days     |

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## Appendix 4 Topographic data

### 1. Survey and geodetic information

#### 1.1 Survey limits

Limits represent the site surveyed. There is one limit per site studied and type of equipment used (GPS, Conventional, LIDAR, etc.).

- **TOPO\_LIM:** Vector data is represented by polygons
- **Minimum attributes:**

| Field name | Signification                | Type | Other                                                                                                                           |
|------------|------------------------------|------|---------------------------------------------------------------------------------------------------------------------------------|
| LOCATION   | Name of the location studied | Text | No predefined values                                                                                                            |
| TYPE       | Type of survey perimeter     | Text | Possible values: <ul style="list-style-type: none"> <li>• GPS Survey</li> <li>• GPS + Total Station</li> <li>• LIDAR</li> </ul> |
| COMMENTS   | Comments                     | Text | No predefined values                                                                                                            |

- **Symbology:**
  - Type of line: dash-dot line
  - Thickness of the line: 1.5pt
  - Color: vary with TYPE



## 1.2 Geodetic Control Points

This Feature Class covers all the Geodetic Points used for tie-in and new ones materialized and measured during the survey.

- **GEOD\_PTS:** Vector data is represented by points
- **Minimum attributes:**

| Field name | Signification              | Type             | Other                                                                                                                  |
|------------|----------------------------|------------------|------------------------------------------------------------------------------------------------------------------------|
| NAME       | Name of the geodetic point | Text             | No predefined values                                                                                                   |
| TYPE       | Geodetic or leveling point | Text             | Possible values: <ul style="list-style-type: none"> <li>• GEOD</li> <li>• NIVEL</li> </ul>                             |
| ORDER      | Accuracy classification    | Text             | Possible values: <ul style="list-style-type: none"> <li>• C1</li> <li>• C2</li> <li>• C3</li> <li>• Unknown</li> </ul> |
| STATUS     | Usage status of the point  | Text             | Possible values: <ul style="list-style-type: none"> <li>• Usable</li> <li>• Damaged</li> </ul>                         |
| DATE       | Date of measurements       | Date             | No predefined values                                                                                                   |
| EASTING    | Easting value (m)          | Numeric (double) | Meters                                                                                                                 |
| NORTHING   | Northing value (m)         | Numeric (double) | Meters                                                                                                                 |
| ALTITUDE   | Altitude value (m MSL)     | Numeric (double) | Meters                                                                                                                 |
| LAT_W84    | Latitude in WGS84 datum    | Numeric (double) | Decimal degrees                                                                                                        |
| LON_W84    | Longitude in WGS84 datum   | Numeric (double) | Decimal degrees                                                                                                        |
| ELL_HEIGHT | Ellipsoid height (m)       | Numeric (double) | Meters                                                                                                                 |
| COMMENTS   | Comments                   | Text             | No predefined values                                                                                                   |

- **Symbology:**
  - Type of point: Triangle
  - Size: 12
  - Color: varies with ORDER



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### 1.3 Surveyed Points

This Feature Class covers any individual point acquired during the topographical survey. Points acquired during LIDAR surveys are not part of that Feature Class.

- **TOPO\_PTS:** Vector data is represented by points
- **Minimum attributes:**

| Field name | Signification          | Type             | Other                |
|------------|------------------------|------------------|----------------------|
| EASTING    | Easting value (m)      | Numeric (double) | Meters               |
| NORTHING   | Northing value (m)     | Numeric (double) | Meters               |
| ALTITUDE   | Altitude value (m MSL) | Numeric (double) | Meters               |
| COMMENTS   | Comments               | Text             | No predefined values |

- **Symbology:**
  - Type of point: Circle
  - Size: 6
  - Color: Light orange



## 2. Elevation data

### 2.1 Digital Terrain Model

Represents the ground surface cleaned from any external elevated objects such as buildings, trees, etc.

- **DTM\_ZZZ: Raster** data (elevation value) in GeoTIFF format (32bits floating point samples)  
Where “ZZZ” could be any further relevant information including the DTM grid spatial resolution.

## 2.2 Contour lines

Represents the elevation contours generated from the Digital Terrain Model

- **CONTOURS\_ZZZ: Vector** data is represented by polylines  
Where “ZZZ” could be any further relevant information including the contours interval.
- **Minimum attributes:**

| Field name | Signification          | Type             | Other                                                                                       |
|------------|------------------------|------------------|---------------------------------------------------------------------------------------------|
| ELEVATION  | Elevation value        | Numeric (double) | Meters                                                                                      |
| TYPE       | Major or Minor contour | Text             | Possible values: <ul style="list-style-type: none"> <li>• Major</li> <li>• Minor</li> </ul> |

- **Symbology:**
  - Type of line: continuous and dashed
  - Thickness of the line: 1.7pt for major contours, 1pt for minor contours
  - Color: brown for major and dark green for minor lines



## 2.3 Topographic features

Represents the cartographic work interpreted from the topographic survey.

- **CARTO\_TYPE:**

Where "TYPE" is the group of data like "Roads", "Buildings", "Fields", etc.

**Linear** data represented by **polylines**

**Areas** data represented by **polygons**

- **Minimum attributes:**

| Field name | Signification                                             | Type             | Other                |
|------------|-----------------------------------------------------------|------------------|----------------------|
| TYPE       | Type of feature                                           | Text             | No predefined values |
| HEIGHT     | Element average height for buildings, woods, poles, lines | Numeric (double) | Meters               |
| COMMENTS   | Comments                                                  | Text             | No predefined values |

TYPE value will depend on the area of interest and the detail level required:

Roads could be: Highway, national road, tarmac road, track, etc.

Buildings could be: Habitation, warehouse, shelter, church, mosque, school, etc.

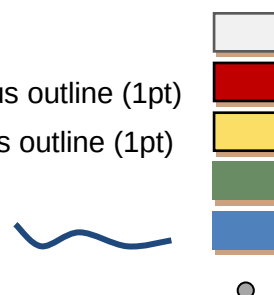
Fields could be: Crop, pasture, fallow, wood, forest, etc.

Watercourses could be: River, stream, wadi, lake, pond, pool, etc.

Others features shall be mentioned: Electric and telecom poles, electric and telecom lines, walls, fences, ditches, barriers, manholes, sewages, etc.

- **Symbology:**

- Roads: Light grey with dark grey continuous outline (1pt)
- Buildings: Red levels (depending on type) with a dark continuous outline (1pt)
- Fields: Yellow levels (depending on type) with a dark continuous outline (1pt)
- Woods: Green levels (depending on type) without outline
- Rivers: Blue levels (depending on type) without outline
- Poles: Grey with a dark continuous outline (1pt)



Others features symbologies shall be agreed prior to the start of cartographic work.

## Appendix 5 Remote sensing

### 1. Image limits

Limits represent the site surveyed. There is one limit per site studied and type of equipment used (GPS, Conventional, LIDAR, etc.).

- **IMAGE\_LIM:** Vector data is represented by polygons
- **Minimum attributes:**

| Field name         | Signification                | Type             | Other                                                                                         |
|--------------------|------------------------------|------------------|-----------------------------------------------------------------------------------------------|
| LOCATION           | Name of the location studied | Text             | No predefined values                                                                          |
| TYPE               | Image type                   | Text             | Possible values: <ul style="list-style-type: none"> <li>• Optical</li> <li>• Radar</li> </ul> |
| SENSOR             | Sensor name                  | Text             | Ex: Orbview, Aster ...                                                                        |
| PLATFORM           | Platform name                | Text             | Ex: Orbview, Aster ...                                                                        |
| ACQUISITION_DATE   | Acquisition date             | Date             | No predefined values                                                                          |
| SPATIAL_RESOLUTION | Ground Spatial Resolution    | Numeric (double) | No predefined values                                                                          |
| COMMENTS           | Comments                     | Text             | No predefined values                                                                          |

- **Symbology:**
  - Type of line: dash-dot line
  - Thickness of the line: 1.5pt
  - Color: varies with SPATIAL\_RESOLUTION



### 2. Image

Represents the image acquired

- **IMAGE\_ZZZ:** Raster data in GeoTIFF, where “ZZZ” could be any further relevant information including the spatial resolution.
- **Minimum attributes:** Spatial Index

## Appendix 6 Metocean SeaDataNet description

[http://seadatanet.maris2.nl/v\\_bodc\\_vocab/browse\\_export.asp?l=L021&all=&description=1&x=41&y=16](http://seadatanet.maris2.nl/v_bodc_vocab/browse_export.asp?l=L021&all=&description=1&x=41&y=16)

| entrykey | entryterm | entrytermdef                                                                                                   |
|----------|-----------|----------------------------------------------------------------------------------------------------------------|
| 3        | curve     | Bounded, 1-dimensional geometric primitive, representing the continuous image of a line                        |
| 4        | point     | Zero-dimensional geometric primitive, representing a position but not having an extent                         |
| 6        | surface   | Bounded, connected 2-dimensional geometric primitive, representing the continuous image of a region of a plane |

The minimum fields which follow must be filled, to answer the question "WHERE?". Note that if the data comes from an onshore or offshore meteorological station, the instrument "depth" shall be replaced by its "height".

| FIELD                          | COMMENTS                                                                                                                                                                                                                                   |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Measuring area type</i>     | Point, Curve (=Track) or Surface (=Area) measurement. Supported by controlled list (vocabulary L021 - SeaDataNet Geospatial Feature Types), that is based upon the ISO list B.5.15 (see <a href="#">ISO 19115</a> standard). Use Entrykey. |
| <i>Bounding Box Latitude1</i>  | Geographical coordinate (Mercator projection). Latitude of point measurement or most left coordinate of bounding box in case of a curve or polygon shaped surface measurement.                                                             |
| <i>Bounding Box Longitude1</i> | Geographical coordinate (Mercator projection). Longitude of point measurement or most lower coordinate of bounding box in case of a curve or polygon shaped surface measurement.                                                           |
| <i>Bounding Box Latitude2</i>  | Geographical coordinate (Mercator projection). Filled in case measurement data were collected along a curve or over a polygon shaped surface. Latitude of most right coordinate of bounding box.                                           |
| <i>Bounding Box Longitude2</i> | Geographical coordinate (Mercator projection). Filled in case measurement data were collected along a curve or over a polygon shaped surface. Longitude of most upper coordinate of bounding box.                                          |
| <i>Datum Coordinate system</i> | CDI uses Geographical coordinates, preferably with Datum = WGS84. Other Datums might be used. Supported by controlled list (vocabulary L101 - SeaDataNet geographic co-ordinate reference frames). Use Entrykey                            |

| FIELD                      | COMMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Multi Curve ID</i>      | This element including the following 4 elements can be used in case of a curve measurement to detail the geographical location of the curve. The ID must be a unique identifier for the curve or set of multiple curves, that are described by the following 4 elements or repeated sets of these 4 elements.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <i>Line String ID</i>      | Identifies an individual curve.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <i>Line Description</i>    | Gives a description for an individual curve.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <i>Line name</i>           | Gives a name for an individual curve.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <i>Position List</i>       | Lists the geographical coordinates of the curve in sequential order. The coordinates are filled in as Longitude1 Latitude1 Longitude2 Latitude2 ... with the coordinates separated by spaces and not by commas. Eastern longitudes (from 0.0000 to 180.0000 (decimal [4.4]) and Northern latitudes (from 0.0000 to 90.0000 (decimal [3.4]) are entered as positive and Western longitudes (from 0.0000 to -180.0000 (decimal [4.4]) and Southern latitudes (from 0.0000 to -90.0000 (decimal [3.4]) are entered as negative.                                                                                                                                                                                                                                                                                |
| <i>MultiSurface ID</i>     | This element including the following 4 elements can be used in case of a polygon shaped surface measurement to detail the geographical location of the surface. The ID must be a unique identifier for the surface or set of multiple surfaces, that are described by the following 4 elements or repeated sets of these 4 elements.                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <i>Polygon ID</i>          | Identifies an individual surface.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <i>Polygon Description</i> | Gives a description for an individual surface.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <i>Polygon Name</i>        | Gives a name for an individual surface.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <i>Pos List</i>            | <p>Lists the geographical coordinates of the surface in sequential order. The coordinates are filled in as Longitude1 Latitude1 Longitude2 Latitude2 ... with the coordinates separated by spaces and not by commas. Eastern longitudes (from 0.0000 to 180.0000 (decimal [4.4]) and Northern latitudes (from 0.0000 to 90.0000 (decimal [3.4]) are entered as positive and Western longitudes (from 0.0000 to -180.0000 (decimal [4.4]) and Southern latitudes (from 0.0000 to -90.0000 (decimal [3.4]) are entered as negative.</p> <p>The coordinate pairs should describe the polygon in a direction against the clock and the first coordinate pair must be repeated as last coordinate pair! Only convex polygons are to be described, which is indicated by the tag <b>&lt;gml:exterior&gt;</b>.</p> |

| <b>FIELD</b>                     | <b>COMMENTS</b>                                                                                                                                                                                                                            |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Water depth</i>               | Water depth at location of measurement. In case of tracks or polygons can be left empty or completed with an average waterdepth. Depth in metres in respect to the specified vertical datum.                                               |
| <i>Vertical datum</i>            | Vertical reference of water depth. Supported by controlled list (vocabulary L111 - Vertical Co-ordinate Reference System Origins). Use Entrykey                                                                                            |
| <i>Minimum observation depth</i> | Minimum observation or data depth. The minimum instrument depth is an acceptable approximation, if no further details are available. Depth in metres in respect to the specified vertical datum.<br>If not available (unknown), use -9999. |
| <i>Maximum observation depth</i> | Maximum observation or data depth. The maximum instrument depth is an acceptable approximation, if no further details are available. Depth in metres in respect to the specified vertical datum.<br>If not available (unknown), use -9999. |
| <i>Unit of Min and Max depth</i> | Default specified as 'metres'                                                                                                                                                                                                              |