

## **Annex I**

### **Content, format and structure of annual reports for exploration under contract for polymetallic nodules**

#### **I, Executive summary**

1. The Contractor is requested to provide a summary of major achievements and challenges in 20xx [indicate year] (maximum four pages).

#### **II. General**

2. The contractor is requested to provide:

(a) Information on adjustments made to the programme of activities, if any, for 20xx [indicate year].

(b) A response to the comments of the International Seabed Authority, if any, on the previous annual report.

#### **III. Result of exploration work**

3. Intended programme and actual completion

The contractor is requested to report on the annual work programme that has been carried out and to provide information on any deviation from the intended programme.

4. Methods and equipment

The contractor is requested to list and describe the methods applied and equipment used for mapping, sampling or the conduct of any other activities for the exploration of the seabed and its subsoil during its survey cruises.

(a) Mapping

The contractor is requested to give a general description of the methods, acquisition equipment and procedures (calibration, installation details etc.) used for mapping the exploration area. The Authority is aware that these methods include, but are not restricted to, the following:

(i) Single beam and multibeam echo sounding (hull-mounted and/or from remotely operated vehicles, autonomous underwater vehicles);

(ii) side-scan sonar profiling (towed from the vessel, from remotely operated vehicles, autonomous underwater vehicles or other);

(iii) subbottom profiling;

(iv) Photography and video recording done by TV grab, sledge, remotely operated vehicles, autonomous underwater vehicles, submersibles or other;

(b) Sampling

The contractor is requested to give a general description of the sampling programme that has been completed, including the sampling equipment and the procedures for the use thereof, namely corers, grabs, dredges or other methods and equipment. This description should be formulated with a view to support the reporting of geological and environmental data on polymetallic nodules in the appropriate templates (see Annex IV);

(c) Other activities

The contractor is requested to give a general description of any other activities conducted to obtain relevant seabed or subsurface information and data.

5. Data obtained

The contractor is requested to report the data collected during mapping, sampling or the conduct of any other activities for the exploration of the seabed and its subsoil during its survey cruises.

(a) Navigation data

Full information on the navigation by geographical coordinates should be reported as part of all data sets. However, for easy reference, the contractors are asked to also provide separate electronic files with the coordinates of each of the following items:

- (i) Station locations;
- (ii) Multibeam, sonar and seismic track lines;
- (iii) Ship track.

(b) Bathymetry

The Authority expects the contractor to deliver the collected and processed bathymetric data as digital xyz files in the American standard code for information interchange (ASCII) format or a common geographic information system (GIS) format. The processing sequence must be fully described.

(c) Side-scan sonar and seismic data

The Authority expects the contractor to deliver the collected data as digital files (SEG-Y or XTF) and/or as high-resolution images (JPG, PDF, TIFF).

(d) Photographs and videos

The Authority expects the contractor to deliver the photographs and videos as high-resolution representative images (JPG, PDF, TIFF, etc.).

(e) Nodule characteristics

The nodules are characterized by their abundance, morphology, mineralogy, chemistry and physical properties. The contractor is requested to give a general description of those characteristics and of the analytical methods applied. The specific results of the analyses of the nodules and substrate at each sampling station

should be reported in a table in the format of the template for geological data on polymetallic nodules (see Annex IV).

6. Interpretations and assessments

The contractor is requested to report the results of the interpretations of the geology of the mineral deposit and the resource assessments made on the basis of the data that have been collected.

(a) Interpretations of the mineral deposit

The interpretations made by the contractor regarding the different aspects of the mineral deposit may be reported as a set of commented maps, for instance on bathymetry, seabed morphology, geology or lithology, nodule abundance, metal distribution, resource distribution, etc. (as shapefiles and digital images).

(b) Mineral resource estimates

If the contractor has reached the stage of making resource estimates of the mineral deposits, the following items should be reported on in detail:

(i) The estimation method;

(ii) The Resource/Reserve classification, reported in accordance with the Authority's reporting standard (see Annex V).

(c) The report should also contain a statement of the quantity of nodules recovered as samples or for the purpose of testing (even if the quantity is null).

7. Future strategy for exploration work

The contractor is requested to report on any development in its future strategy for exploration work.

#### **IV. Environmental baseline studies (monitoring and assessment)**

8. For guidance on environmental baseline studies, the contractor should refer to the recommendations for the guidance of contractors for the assessment of the possible environmental impacts arising from exploration for marine minerals in the Area ([ISBA/19/LTC/8](#), sect. III).

##### **A. Environmental monitoring**

9. Information should be provided under each of the following headings:

(a) Objectives during the reporting period (intended, ongoing and completed);

(b) Technical equipment and methodologies used at depth, on board and in the laboratory (including analysis software);

(c) Results (also summarized as graphic representations of data on which the results are based);

(d) Interpretation of the findings, including comparisons with published data from other studies.

10. The contractor is also requested to provide:

(a) Information on physical oceanography (characteristics of water column and near-bed currents, including current speed and direction, temperatures, turbidity at different water depths, as well as any hydrodynamic modelling). Data should be linked to long-term mooring-based observations;

(b) Information on chemical oceanography (characteristics of sea water, including pH value, dissolved oxygen, total alkalinity, nutrient concentrations, dissolved and particulate organic carbon, estimation of mass flux, heavy metals, trace elements and chlorophyll a);

(c) Information on biological communities and biodiversity studies (including megafauna, macrofauna, meiofauna, microflora, nodule fauna, demersal scavengers and pelagic communities);

(d) Information on ecosystem functioning (such as measures of bioturbation, stable isotopes and sediment community oxygen consumption).

## **B. Environmental assessment**

11. The contractor is requested to provide:

(a) Information on the environmental impact of exploration activities including information on a monitoring programme before, during and after specific activities with the potential for causing serious harm;

(b) A statement that activities undertaken in the contract area in the year covered by the annual report have not caused serious harm and the evidence of how this has been determined.

(c) Information on the environmental impact of test-mining activities, if any, as measured in the impact reference zones;

(d) An assessment of statistical robustness/power, taking into account sample sizes, sample number and, for biological communities, the abundance of individual species (with evidence for statistical significance);

(e) A gap analysis and future strategy to achieve the goals of the five-year programme of activities and the requirements contained in [ISBA/19/LTC/8](#);

(f) An examination of the recovery over time of seabed communities following disturbance experiments conducted on the sea floor;

(g) An evaluation of the advantages and disadvantages of different sampling and analysis methods, including quality control;

(h) A comparison of environmental results in similar areas to understand species ranges and dispersal on the scale of ocean basins.

12. All data used in the report (figures, graphs and pictures) should be reported using the Excel template for environmental data on polymetallic nodules (see Annex IV).

## **V. Mining tests and proposed mining technologies**

13. The contractor is requested to provide:

(a) Data and information on the nature of the mining equipment designed and tested, where applicable, as well as data on the use of equipment not designed by the contractor;

(b) A description of the equipment, the operations and the results of the mining tests;

(c) A description of the nature and results of the technical experiments (where applicable);

(d) With regard to mining technologies: Information on the technological progress made by the contractor with its mining system (e.g. collectors, riser, production vessel, other) development programme;

(e) With regard to processing technologies:

(i) Information on the mineral processing and metallurgical testing and processing routes, for instance whether three metals, five metals, rare earth elements or other;

(ii) Information on other methods.

## **VI. Training programme**

14. The contractor is requested to provide detailed information on the implementation of the training programme, in accordance with schedule 3 of the contract, bearing in mind the requirements contained in the recommendations for the guidance of contractors and sponsoring States to training programmes under plans of work for exploration ([ISBA/19/LTC/14](#)).

## **VII. International cooperation**

15. The contractor is requested to provide information on:

(a) Participation in cooperative programmes sponsored by the Authority;

(b) Cooperation with other contractors;

(c) Other international cooperation.

## **VIII. Certified financial statement of actual and direct exploration expenditure**

16. The contractor is requested to provide a detailed financial statement that complies with the recommendations for the guidance of contractors for the reporting of actual and direct exploration expenditure ([ISBA/21/LTC/11](#)), as required under Annex 4, section 10, of the Regulations.

## **IX. Programme of activities for the following year**

17. The contractor is requested:

- (a) To briefly indicate the work proposed to be carried out in the following year;
- (b) To describe the proposed adjustments to the original programme of activities for the following year under the contract;
- (c) To explain the reasons for such adjustments.

## **X. Additional information provided by the contractor**

18. The contractor is requested to provide:

- (a) A list of relevant publications in peer-reviewed journals published during the reporting year;
- (b) Complete references to all relevant documents, press releases and scientific publications cited in the report.