


## I. ANNEX

# ISA Contract for Exploration – Public Information Template

	Type of resource: Polymetallic nodules
	Name of Contractor: China Minmetals Corporation
Sponsoring State: China	Contract Start: 12 May 2017
	Contract End: 11 May 2032
	Location: Clarion-Clipperton Fracture Zone (reserved area)

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## Introduction

The information contained in this ISA Contract for Exploration – Public Information Template is made available to the public in response to the request by the Council of the ISA to make contracts publicly available, subject to restrictions on confidential information, industrial secrets and proprietary data.

The content of the present template is in accordance with the Regulations on Prospecting and Exploration for [*Polymetallic Nodules in the Area*] [*ISBA/19/C/17*] (the “Regulations”).

## 1. Contract Information

Annex III of the Regulations.

<b>Type of resource</b>	Polymetallic nodules
<b>Name of Contractor</b>	China Minmetals Corporation
<b>Contract Start</b>	12 May 2017
<b>Contract End</b>	11 May 2032
<b>Location</b>	Clarion-Clipperton Fracture Zone (reserved area)
<b>Contract Area (km<sup>2</sup>)</b>	72,745

## 2. Coordinates and Illustrative Chart of the Exploration Area

Schedule 1 of Annex III of the Regulations.

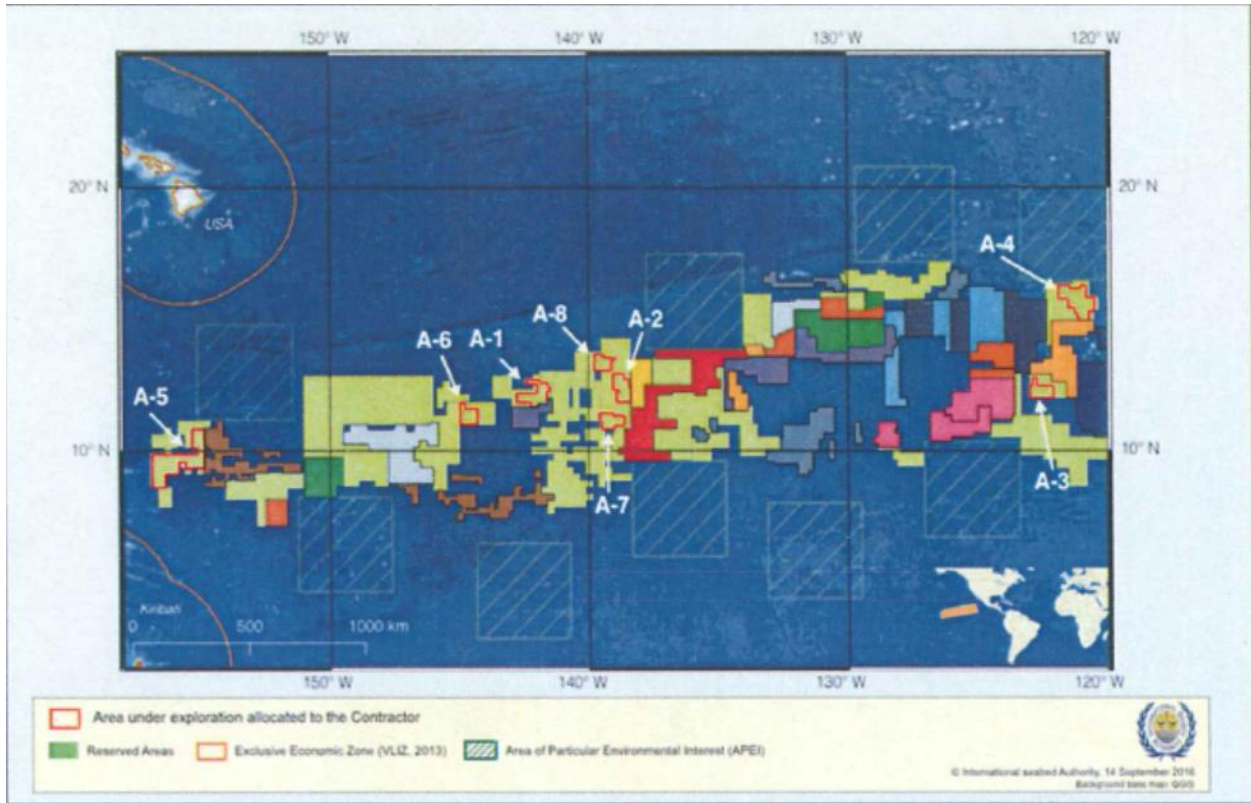
Exploration area located between [coordinates]

Block Number	Turning point	Longitude West			Latitude North		
		(degrees)	(minutes)	(seconds)	(degrees)	(minutes)	(seconds)
A-1	1	141	55	0.12	12	35	27.96
	2	141	37	49.44	12	35	27.96
	3	141	37	49.44	12	25	35.40
	4	141	30	59.76	12	25	35.40
	5	141	30	59.76	12	16	33.60
	6	141	40	27.12	12	16	33.60
	7	141	40	27.12	11	58	32.88
	8	141	37	21.72	11	58	32.88
	9	141	37	21.72	11	47	22.56
	10	142	0	20.52	11	47	22.56
	11	142	0	20.52	11	40	58.44
	12	142	16	35.40	11	40	58.44
	13	142	16	35.40	11	51	42.84
	14	142	50	17.88	11	51	42.84
	15	142	50	17.88	12	11	37.32
	16	142	2	6.00	12	11	37.32
	17	142	2	6.00	12	32	36.96
	18	142	26	5.28	12	32	36.96
	19	142	26	5.28	12	42	10.44
	20	141	55	0.12	12	42	10.44
A-2	1	138	38	43.08	12	44	9.24
	2	138	27	51.84	12	44	7.80
	3	138	27	51.84	12	26	22.56
	4	138	22	26.40	12	26	22.56
	5	138	22	26.40	11	51	57.24
	6	138	56	29.04	11	51	57.24
	7	138	56	29.04	12	13	41.88
	8	138	50	42.36	12	13	41.88
	9	138	50	42.36	12	19	51.60
	10	139	5	4.20	12	19	51.60
	11	139	5	4.20	12	52	30.90
	12	138	38	43.08	12	52	30.90
A-3	1	122	44	20.04	12	28	22.08
	2	122	5	45.60	12	28	22.08
	3	122	5	45.60	12	0	0.00

Block Number	Turning point	Longitude West			Latitude North		
		(degrees)	(minutes)	(seconds)	(degrees)	(minutes)	(seconds)
	4	123	0	0.00	12	0	0.00
	5	123	0	0.00	12	28	13.80
	6	122	54	11.16	12	28	13.80
	7	122	54	11.16	12	46	57.00
	8	122	44	20.04	12	46	57.00
	1	121	28	28.20	16	9	18.00
	2	121	2	29.76	16	9	18.00
	3	121	2	29.76	16	16	42.60
	4	120	49	51.96	16	16	42.60
	5	120	49	51.96	15	49	50.88
	6	120	30	8.28	15	49	50.88
	7	120	30	8.28	15	18	10.80
	8	120	42	53.28	15	18	10.80
	9	120	42	53.28	14	56	6.00
A-4	10	121	5	51.36	14	56	6.00
	11	121	5	51.36	15	5	9.96
	12	121	10	24.24	15	5	9.96
	13	121	10	24.24	15	16	11.28
	14	121	16	32.52	15	16	11.28
	15	121	16	32.52	15	26	18.24
	16	121	30	55.44	15	26	18.24
	17	121	30	55.44	15	46	56.64
	18	121	53	52.80	15	46	56.64
	19	121	53	52.80	16	16	49.44
	20	121	28	28.20	16	16	49.44
	1	154	52	30.00	9	21	30.96
	2	155	7	30.00	9	21	30.96
	3	155	7	30.00	9	22	30.00
	4	155	22	30.00	9	22	30.00
	5	155	22	30.00	9	20	45.60
	6	155	37	6.60	9	20	29.76
	7	155	37	6.60	9	35	28.68
A-5	8	155	52	30.00	9	35	28.68
	9	155	52	30.00	9	7	30.00
	10	156	22	30.00	9	7	30.00
	11	156	22	30.00	9	37	30.00
	12	156	52	30.00	9	37	30.00
	13	156	52	30.00	9	52	30.00
	14	155	7	30.00	9	52	30.00

Block Number	Turning point	Longitude West			Latitude North		
		(degrees)	(minutes)	(seconds)	(degrees)	(minutes)	(seconds)
	15	155	7	30.00	10	7	30.00
	16	155	22	28.20	10	7	30.00
	17	155	22	28.20	10	50	20.40
	18	154	52	30.00	10	50	20.40
A-6	1	144	49	6.60	11	36	24.48
	2	144	20	19.32	11	36	24.48
	3	144	20	19.32	11	0	0.00
	4	145	0	0.00	11	0	0.00
	5	145	0	0.00	11	49	59.88
	6	144	49	6.60	11	49	59.88
A-7	1	139	5	20.40	11	20	36.24
	2	138	38	2.04	11	20	36.24
	3	138	38	2.04	10	58	25.68
	4	139	1	32.88	10	58	25.68
	5	139	1	32.88	10	49	59.52
	6	139	30	0.00	10	49	59.52
	7	139	30	0.00	11	7	30.00
	8	139	35	60.00	11	7	30.00
	9	139	35	60.00	11	26	21.84
	10	139	5	20.40	11	26	21.84
A-8	1	139	26	0.24	13	32	33.72
	2	138	58	48.00	13	32	33.72
	3	138	58	48.00	13	26	52.80
	4	139	8	24.00	13	26	52.80
	5	139	8	24.00	13	3	28.80
	6	139	48	0.00	13	3	28.80
	7	139	48	0.00	13	40	8.76
	8	139	26	0.24	13	40	8.76

[insert shapefile format]



(shapefile format as shown in the ISA <https://www.isa.org.jm/maps>)

### 3. Plan of Work

Summary of Plan of Work for Exploration including the Programme of Activities for the first and/or the current 5-year period (Regulation 18).

During the period of the Contract, the exploration activities will take place in three five-year phases.

The aim of the planned surveys is to obtain basic information and data required for mineral resource estimation, environment assessments and mining and metallurgical processing system and tests.

With respect to mineral resource or reserve assessments, activities will include a study of the quality, quantity and distribution of polymetallic nodules in the area under exploration, the estimation of inferred resources, the conduct of feasibility studies and the estimation of mineral reserves in order to prove and evaluate mine sites for commercial exploitation.

The Contractor will carry out environmental studies and impact assessments with the following objectives: establishing environmental baselines of the area under exploration and of adjacent areas; delineating impact reference zones and preservation reference zones; analyzing the distribution and characteristics of communities and species of the area under exploration; and assessing the potential environmental impact of polymetallic nodule mining.

The Contractor will carry out mining and metallurgical processing technology activities, research on, and upgrading of, key components which include: the design of a commercial mining system; environmental impact assessment tests; monitoring of possible impacts during and after testing; development of new processing technology; and the utilization of new methods for polymetallic nodules and polymetallic nodule estimation and commercial exploitation. The Contractor will, also, carry out research and tests on key mining and ore processing technology. This will provide basic data for technical economic analysis through various equipment tests in the mining system to develop the exploitation and design technology of large-scale ocean engineering.

During the first 5-year period, the Contractor will:

- Conduct geological sampling polymetallic mineralized zones, and geophysical surveys in order to delineate and estimate inferred resources;
- Conduct an environmental baseline survey within the area under exploration and collect and analyze environmental baseline data;
- Set up laboratory and offshore platforms for testing key technologies of polymetallic nodules mining and equipment performance, conduct research and validation experiments for key technologies and equipment of the mining system, develop and improve the polymetallic nodules mining techniques and overall programme, as well as establish a preliminary mining system for polymetallic nodules exploitation based on engineering principles and practices;
- Carry out laboratory research on the metallurgical processing technology of polymetallic nodules; and
- Conduct a scoping study as well as a commercial prospect analysis of the development and utilization of polymetallic nodule resources.

## 4. Programme of Activities

Section 4.1 of Annex IV of the Regulations and Schedule 2 of Annex III of the Regulations.

### I. Agreed 5-year Programme of Activities

5-year Programme of Activities	First	Second	Third	Extension
General Objectives	<b>Objective</b>	<b>Description</b>		
	Investigation and evaluation of resources	To carry out surveys through several cruises in the area under exploration and conduct research during the general exploration phase by means of geological sampling and geophysical surveys. Moreover, the Contractor will use seabed acoustic and optical exploration, and dense geological sampling methods. The Contractor will endeavour to identify the features of distribution and geology of polymetallic nodules in the area under exploration, delineate mineralized zones, and estimate inferred resources.		
	Environmental survey and assessment	To conduct a preliminary survey of environmental baselines for physics, biology, chemistry and geology in the area under exploration by means of water extraction, biological sampling, sediments sampling, deep sea video (photography) system, and other appropriate technology, preliminarily establish environmental baselines.		
	Development and testing of mining technology	To set up laboratory and offshore platforms for testing key technologies of polymetallic nodule mining and equipment performance; conduct research and experimental validation of key technologies; develop and improve the polymetallic nodule mining techniques and overall programme; and establish a preliminary mining system for polymetallic nodule exploitation based on sound engineering principles and practices.		
	Development and assessment of metallurgical processing technology	To carry out the research and laboratory tests for the development of new methods for smelting and processing of the polymetallic nodules.		
Comprehensive assessment of the development and utilization of resources	To develop appropriate software for the economic evaluation and analysis of polymetallic nodules' development; conduct scoping studies on the resource development in the mining area; and establish a deep-sea polymetallic nodule mining and			



		processing technology and economic evaluation system.
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**II. Results achieved during reported year [#]: [year]**

Annual objectives and activities			
Year	No.	Agreed Objectives	Objective: Completed, Modified, Postponed or Replaced
Year 1	2017	Resource exploration and assessment Environmental survey and assessment Mining technology Processing technology Prospect of commercial exploitation	Completed Completed Completed Completed Completed
Year 2	2018	Resource exploration and assessment Environmental survey and assessment Mining technology Processing technology Prospect of commercial exploitation Training programme	Completed Completed Completed Completed Completed Postponed to 2019
Year 3	2019	Resource exploration and assessment Environmental survey and assessment Mining technology Processing technology Prospect of commercial exploitation Training programme	Completed Completed Completed Completed Completed Three international trainees were trained on the sea for a period of 43 days. The other one will be postponed to 2021.

## 5. Training Programme

Schedule 3 of Annex III of the Regulations.

### I. Training Programme

Type of training	at-sea exploration training programme	fellowship programme	engineering training programme
<b>Institutions</b>	China Minmetals Corporation	China Minmetals Corporation	China Minmetals Corporation
<b>Duration</b>	one leg of a cruise, approximately 40 days	approximately three months	approximately one month
<b>Scope</b>	The training will be conducted on environmental and geological survey methods, sample processing technology, and geophysical survey methods on board the research vessels.	This training will be carried out on basic knowledge of marine geology, biology and environment.	The training will be conducted on mining and metallurgical processing technology of polymetallic nodules.
<b>Fields</b>	on board R/V HAIYANG LIUHAO, R/V XIANGYANGHONG SHIHAO or other research vessels for the research campaign in CCZ.	at Guangzhou Marine Geological Survey (in Guangzhou), the Second Institute of Oceanography (in Hangzhou), Sun Yat-sen University (in Guangzhou), or Central South University (in Changsha).	at Beijing General Research Institute of Mining and Metallurgy (in Beijing), Changsha Research Institute of Mining and Metallurgy (in Changsha) or Central South University (in Changsha).
<b>Qualification required</b>	Candidates for the at-sea exploration training programme should hold either a bachelor's or master's degree in geology, geophysics, marine environment (including biology or ecology), or have similar educational background. Experienced young scientists and marine	The candidates for the fellowship programme should hold a bachelor's degree in geology geophysics, biology or environment, or have a similar educational background.	Candidates for the engineering training programme shall hold either a bachelor's or master's degree in minerals processing or mining engineering.

	managers will priority for admission.		
<b>Financing</b>	The Contractor will cover all relevant costs associated with the training of the trainees. This will include medical insurance, meals, accommodation and living allowance, and travel costs for transportation to and within China.	The Contractor will cover the trainee's tuition fees, the costs of travel to and from the institution, as well as accommodation while they are being trained.	The Contractor will cover the trainee's tuition fees. the costs of travel to and from the institution, as well as accommodation while they are being trained.

## II. Trainings conducted up to reported year [#]: [year]

Start year	End Year	Name of Trainee	Nationality	Gender	Type of Programme	Details	Durati on
2019	2019	Mohamad Abu Hassan	Malaysia	Male	at-sea exploration training programme	Training on environmental survey methods and sample processing technology on board R/V XIANGYANGHO NG SHIHAO	lasted 43 days, from Sept. 6 to Oct. 16, 2019
2019	2019	Kyaw Win Thet Paing	Myanmar	Female	at-sea exploration training programme	Training on geological survey methods and sample processing technology on board R/V XIANGYANGHO NG SHIHAO	lasted 43 days, from Sept. 6 to Oct. 16, 2019
2019	2019	Warsame Atteyeh	Somalia	Male	at-sea exploration training programme	Training on geological survey methods and sample processing technology on board R/V XIANGYANGHO NG SHIHAO	lasted 43 days, from Sept. 6 to Oct. 16, 2019

**III. Completed Trainings per Year**

	<b>at-sea exploration training programme</b>	<b>fellowship programme</b>	<b>engineering training programme</b>
Year 1 (2017)	/	/	/
Year 2 (2018)	/	/	/
Year 3 (2019)	3 trainees	/	/
Year 4 (2020)	/	/	/
Year 5 (2021)	2 trainees	3 trainees	4 trainees

## **6. Standard clauses**

Annex IV of the Regulations.