

**AGREEMENT ON COOPERATIVE PROJECT OF SEDIMENTARY AND  
GEOCHEMISTRY COMPARISON RESEARCH OF POTASH BETWEEN**

**THE CHINA GEOLOGICAL SURVEY  
MINISTRY OF NATURAL RESOURCES  
THE PEOPLE'S REPUBLIC OF CHINA**

**AND**

**THE DEPARTMENT OF MINERAL RESOURCES  
MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT  
THE KINGDOM OF THAILAND**

According to the “Memorandum of Understanding on Geosciences cooperation between the Department of Mineral Resources (DMR), Ministry of Natural Resources and Environment of Thailand and the China Geological Survey (CGS), Ministry of Natural Resources of the People’s Republic of China”, signed in Chengdu City, Sichuan Province, China on June 29, 2016, both parties agree to conduct activities in the fields of geosciences to carry out the cooperative project entitled “**Sedimentary and geochemistry comparison research of potash**” (hereinafter as the Project) and reach the following agreement on mutual interest.

**ARTICLE 1 PARTIES OF THE AGREEMENT**

1.1 The China Geological Survey, Ministry of Natural Resources of the People’s Republic of China

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1.2 The Department of Mineral Resources, Ministry of Natural Resources and Environment of the Kingdom of Thailand.

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**ARTICLE 2 PURPOSE AND CONTENTS OF THE COOPERATION**

**2.1 Cooperation Purpose**

2.1.1 To understand the genetic relationship of the potash-bearing formation between Simao basin in China and Khorat-Sakon Nakhon Basin in Thailand.

2.1.2 To review the regularity of potash deposits in Simao and Indochina blocks.

2.1.3 To identify and review the characteristics of the tectonic events in the Simao and Indochina blocks.

2.1.4 To enhance the technical estimation of potash reserves/resources in the study

area.

- 2.1.5 To conduct the preliminary economic feasibility study on the process of potash mining, continuous industry, and industrial reconciliation.
- 2.1.6 To assess the environmental impact of potash mining.

## **2.2 Project Area**

The project will cover the land of Pu'er and Xishuangbana regions in southwestern China and Khorat-Sakon Nakhon basins in Thailand.

## **2.3 Cooperation Contents**

- 2.3.1 Tectonic evolution and formation of Simao basin and Khorat-Sakon Nakhon basin since the Cretaceous in eastern Tethys.
- 2.3.2 Correlation on the sedimentary sequences of potash-bearing formations and their paleogeography link between Simao basin in China and Khorat-Sakon Nakhon basin in Thailand.
- 2.3.3 Material sources of potash deposits and their genetic relationships of the Simao basin in China and Khorat-Sakon Nakhon basins in Thailand.
- 2.3.4 Formation model of the Cretaceous potash in eastern Tethys and its prospecting criteria.
- 2.3.5 Prospecting evaluation and reserves appraisal of the potential potash resources.
- 2.3.6 Feasibility study on the process of potash mining and other continuous industry.
- 2.3.7 Study and evaluation of the impact of potash mining on natural environment, proposing a suggestion on potash mining waste disposal.

## **ARTICLE 3 PROJECT DURATION AND ARRANGEMENT**

### **3.1 Duration of Cooperation Project**

The duration of this cooperation project is 4 years, from...2019 to...

### **3.2 Planning and preparing stage (1<sup>st</sup> year)**

Both parties shall exchange and study the existing information and data on geology, mineral resources, geophysics, geochemistry, hydrogeology, and remote sensing in the project areas and design the field investigation and sampling locations.

### **3.3 Field work stage (1<sup>st</sup> to 3<sup>rd</sup> year)**

Both parties shall jointly carry out field investigation, samples collection in the project areas, and laboratories to carry out geochemical sample analysis from 1<sup>st</sup> to 3<sup>rd</sup> year.

### **3.4 Report writing stage and seminar (4<sup>th</sup> year)**

The final reports including data and maps shall submit to both governments by the end of 2022 and organize a seminar.

### **Annual detail works are as follows:**

<b>Year</b>	<b>Tasks</b>
2019	1) Exploration and reserves/resources calculation of potash deposits in Khorat basin. Firstly, study the geophysical and geochemical exploration on potash deposits in Khorat basin. Secondly, explore and verify the potash deposit using drilling projects. Lastly, estimate and calculate reserves/resources of potash deposits in the

	<p>study area.</p> <p>2) Preliminary study of brine resources in Khorat basin.</p> <p>3) Evaluate the feasibility of potash deposits related to environmental effect. The anticipated environmental effects should be examined by a proposed project. Commonly from consideration of environmental aspects at design stage, then consultation and preparation of an Environmental Impact Assessment Report (EIAR), evaluation of the EIAR by a competent authority, the subsequent decision as to whether the project should be permitted to proceed, and encompassing public response to that decision. It is also important to study the hydrological condition in Khorat Plateau.</p> <p>4) Academic studies of potash formation mechanism, relationship and tectonic evolution in Khorat and Simao basins. Train some postgraduate students at the same time.</p> <p>5) Working group meeting.</p>
2020	<p>1) Further study of geophysical, geochemical and engineering exploration of potash deposits in Khorat basin; exploration of brine resources in Khorat basin; environmental effects during potash mining; and feasibility of potash deposits exploitation.</p> <p>2) The comprehensive studies of processing techniques of potash ores, including solid potash ores and brines.</p> <p>3) Further study of academic study of potash formation mechanism, relationship between Simao and Khorat basins, and training activities of postgraduate students, etc.</p> <p>4) Working group meeting.</p>
2021	<p>1) Work out on the sophisticated and applicable workflow for exploration and exploitation of potash deposit in Khorat basin.</p> <p>2) Estimate and calculate the reserves/resources of potash deposits in Khorat basin with more accurate data.</p> <p>3) Solve some academic questions referring to potash formation mechanism, such as formation ages of potash deposits, material resources and formation environments, relationship and tectonic evolutions of Simao and Khorat basins, with papers published.</p> <p>4) Working group meeting.</p>
2022	<p>1) Report writing.</p> <p>2) Organize a seminar or technical conference.</p>

## ARTICLE 4 OBLIGATIONS OF BOTH PARTIES

### 4.1 Obligations of CGS

- 4.1.1 To organize and coordinate the CGS's team to take part in the project work, Institute of Mineral Resources (IMR) is authorized as the organizer and implementer by CGS, Institute of Hydrogeology and Environmental Geology (IHEG, CGS) will assist IMR.
- 4.1.2 To provide DMR's team with project information as needed, such as geological maps, topographic maps, mineral deposit data, distribution of licenses, geophysical

and geochemical data, as per the requirement of this project.

- 4.1.3 To be responsible for project design and planning, sustainable operation of technology and labor on the basis of mutual agreement of both Parties.
- 4.1.4 To analyze samples of the project in China laboratories.
- 4.1.5 To provide invitation letters, safety features, and vehicles in Chinese cities and fields for participants of DMR's team.

#### **4.2 Obligations of DMR**

- 4.2.1 To provide CGS's team with project information as needed, such as geological maps, topographic maps, mineral deposit data, distribution of licenses, geophysical and geochemical data, as per requested.
- 4.2.2 To be responsible for project design and planning, sustainable operation of technology and labor on the basis of mutual agreement of both Parties.
- 4.2.3 To provide invitation letters, safety features, and vehicles in Thailand cities and fields for participants of IMR's team.

#### **4.3 Mutual Obligations**

- 4.3.1 Both parties shall collaboratively undertake the field investigations, research, and general study as well as sending each other relevant specialists and provide necessary information.
- 4.3.2 Both parties shall collaboratively implement the training courses on the mineral deposits and basin tectonics.
- 4.3.3 Both parties shall collaboratively give data interpretation and target delineation.
- 4.3.4 Both parties shall convene non-periodic project meetings as needed by the project development, discuss collaboratively problems existing in the project development and following work arrangement.
- 4.3.5 Both Parties shall share all needed information as beneficial to the project.

### **ARTICLE 5 FINANCIAL ARRANGEMENTS**

- 5.1 Both parties should provide the enough financial support for the smooth implementation of the Project.
- 5.2 Both parties will make efforts to seek funds to support the cooperative activities.
- 5.3 Unless otherwise agreed on between both parties, the international expense and daily allowances shall be borne by the sending party. The local transportation expenses in the host country shall be covered by host party.

### **ARTICLE 6 ACHIEVEMENTS**

- 6.1 The geological maps of paleogeography, structure, potash deposits in working areas.
- 6.2 The resource/ reserve of potash ores in working areas.
- 6.3 Exploitation-perspective appraisal of potash deposits in working areas.
- 6.4 The technical and economic feasibility of industrial potash mining and environmental impact in working areas.

6.5 The Final Report of the project.

#### **ARTICLE 7 WORKING LANGUAGE**

7.1 The working language of the project is English as well as training, meeting, resolutions, summaries of the meetings, exchanged information, annual and final reports, etc.

#### **ARTICLE 8 SHARING AND PROTECTION**

- 8.1 The protection and distribution rules of Intellectual Property involved in this agreement shall abide by relevant Intellectual Property laws of China and Thailand or bilateral treaty.
- 8.2 PROPERTY OF DATA AND INFORMATION CONFIDENTIALITY. All scientific and technical information and developments, as well as the data used within or derived from the research done within this Cooperation Agreement shall be exchanged between the parties.
- 8.3 THE INTELLECTUAL AUTHORSHIP - Authorship of scientific publications resulting from the research shall reflect participation of all parties in the research.

#### **ARTICLE 9 DUTIES OF NON-COMMITMENT AND TERMINATION OF THE AGREEMENT**

- 9.1 Both parties shall be free from any responsibilities concerning such factors as war, turmoil, earthquake, devastating disaster or any other natural disaster which is out of the government's control or the factors which are out of both parties' control.
- 9.2 The termination date of the project refers to finish time of the work or specified date in the agreement, whichever comes first. However, under the circumstances which are agreed upon by both parties, the publication of the work achievement reports may be extended beyond the expiration of this agreement.

#### **ARTICLE 10 PROJECT COORDINATOR**

- 10.1 Both parties shall establish a working group, formulate a road map of the project, and discuss specific cooperation details.
- 10.2 Both parties shall designate one person as a project coordinator for daily contact, exchanging documents, and organizing domestic experts to work on the project as per the confirmed plan on behalf of the country.
- 10.3 CGS Coordinator

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10.4 DMR Coordinator

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**ARTICLE 11 DISPUTE RESOLUTION**

- 11.1 Any dispute arising from the performance of duties committed by both parties in this agreement shall be settled through friendly negotiation.

**ARTICLE 12 MISCELLANEOUS**

- 12.1 Resolutions and summaries convened by both parties are significant supplements to this agreement and are equally binding to both parties.
- 12.2 This agreement is signed in English on March 23, 2019 in Beijing, China. The agreement will be signed in two copies, each copy of the agreement is equally valid, and each Party shall hold one copy respectively.
- 12.3 This agreement becomes effective since the date on which representatives of both parties approve and sign this agreement.



China Geological Survey  
Ministry of Natural Resources  
The People's Republic of China



Department of Mineral Resources  
Ministry of Natural Resources and Environment  
The Kingdom of Thailand