Chapter 1
Context of the project

TABLE 1-1 HISTORY OF THE SLACO BAUXITE PROJECT................................................................. 1-4
TABLE 1-2 KEY CHANGES TO SLACO MINING PROJECT AND SETTING SINCE 2009.......................... 1-6
TABLE 1-4: POTENTIAL BENEFITS ........................................................................................................ 1-11
TABLE 1-5: KEY PROJECT CONTACTS .................................................................................................. 1-13
TABLE 1-6: CORE MEMBERS OF THE ESIA PROJECT TEAM ................................................................ 1-14
TABLE 1-7: SPECIALIST STUDIES COMMISSIONED FOR THE 2009 EIA AND SIA .................................. 1-14
TABLE 1-8: RELEVANT SPECIALIST STUDIES COMPLETED FOR THE SLACO NAR PROJECT ESIA ...... 1-15
TABLE 1-9: REPORT STRUCTURE ............................................................................................................. 1-16

FIGURE 1-1 COMPONENTS AND KEY ACTIVITIES OF THE SLACO BAUXITE PROJECT ................................ 1-3
FIGURE 1-1: SITE LOCATION ..................................................................................................................... 1-7
FIGURE 1-2: MINE CONCESSION AND ORE BODIES .............................................................................. 1-8

1. **Introduction** ................................................................................................................................. 1-3
   1.1 **General** ................................................................................................................................. 1-3
   1.2 **Background to ESIA** .............................................................................................................. 1-4
       1.2.1 Project history ...................................................................................................................... 1-4
       1.2.2 Need for update of previous mining EIA and SIA ............................................................... 1-5
   1.3 **Presentation of the Project** ..................................................................................................... 1-7
       1.3.1 Site Location ....................................................................................................................... 1-7
       1.3.2 Project Summary ................................................................................................................. 1-7
       1.3.3 Project Objectives .............................................................................................................. 1-9
       1.3.4 Project costs and schedule ................................................................................................. 1-9
   1.4 **Project Justification** .............................................................................................................. 1-9
       1.4.1 Lao PDR Context ................................................................................................................ 1-9
       1.4.2 Expected Benefits of Project .............................................................................................. 1-10
1.5 Presentation of the Project Developer and the ESIA Consultants ................................................ 1-12
1.5.1 Project Developer ................................................................................................................. 1-12
1.5.2 Project Team ....................................................................................................................... 1-13
1.6 Project Developer’s Endorsement of this ESIA ........................................................................... 1-15
1.7 Structure of the ESIA .............................................................................................................. 1-16
1.8 Basis of this ESIA .................................................................................................................... 1-17
1. Introduction

1.1 General

Sino-Lao Aluminum Corporation Limited (SLACO) is proposing to develop a bauxite mine and alumina processing plant on the Bolaven Plateau in Champasack Province in the southern region of the Lao People’s Democratic Republic (Lao PDR), hereafter referred to as the SLACO Bauxite Project. SLACO is a joint venture between Italian-Thai Development Public Company Limited (ITD), REIGNWOOD Group (REIGNWOOD) and Laos Service Joint Co., Ltd (LSI). SLACO has a Board of Director which include a chairman and ten directors.

The SLACO Bauxite Project has three components; the first component is the bauxite mining project (SLACO Mining Project); the second component is the alumina processing plant (SLACO New Alumina Refinery Project (the SLACONAR Project); and the third component is the aluminum smelting project (SLACO Aluminum Smelter Project, as shown in Figure 1.1.

Development of SLACO Bauxite Project is however planned in the basis of considering the possibilities of the project schemes expansion phase by phase based on corresponding factors. It is newly confirmed by SLACO that development of the project will be newly separated into 2 phases while the Phase I will include 2 steps. The components, key activities and product scale of SLACO Bauxite Project in each development phase include:

- **Phase 1, Step 1:**
  - SLACO Mining Project with the capacity of 1500 kilotonnes per annum (kt/a) washed bauxite ore as the raw material for SLACONAR Project
  - SLACONAR Project with the capacity of 500 kt/a metallurgical grade Alumina as the final project product for export
### Phase I, Step 2:
- SLACO Mining Project with the capacity of 1500 kt/a washed bauxite ore as the raw material for SLACONAR Project
- SLACONAR Project with the capacity of 500 kt/a metallurgical grade alumina as the raw material for SLACO Aluminum Smelter Project
- SLACO Aluminum Smelter Project with the capacity of 250 kt/a remelt aluminum ingot as the final project product for export

### Phase 2: Doubly increase product capacity from Phase 1, Step 2:
- SLACO Mining Project with the capacity of 2 x 1500 kt/a washed bauxite ore as the raw material for SLACONAR Project
- SLACONAR Project with the capacity of 2 x 500 kt/a metallurgical grade Alumina as the raw material for SLACO Aluminum Smelter Project
- SLACO Aluminum Smelter Project with the capacity of 2 x 250 kt/a aluminum remelt ingot. 22.5kg aluminum remelt ingot is the final project product

The SLACO Mining Project will mine bauxite deposits on the Bolaven plateau using open pit mining methods. The mined bauxite ore will be washed at a washing workshop located at the mine site before being transported to the SLACO New Alumina Refinery Project (the SLACONAR Project) where it will be refined to produce aluminium concentrate. The mine will supply the refinery with 1.5 million tonnes per annum of wet washed ore.

This environmental and social impact assessment (ESIA) covers the development of the SLACO Mining Project. The key activities covered by the ESIA are shown in the brown boxes on the lower line in Figure 1-1.

The SLACONAR Project is covered by a separate ESIA (ESL, 2018). A potential later phase of development at the refinery site, the SLACO Aluminium Smelter, would be covered by a further ESIA to be prepared at a later date.

### 1.2 Background to ESIA

#### 1.2.1 Project history

The history of the SLACO Bauxite Project (comprising the SLACONAR Project and the SLACO Mining Project) is summarised in Table 1-7.

**Table 1-1 History of the SLACO Bauxite Project**

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>SLACO completed an initial feasibility study for the <strong>SLACO Bauxite Project</strong> in 2008. The feasibility study included the mining and refining of bauxite ore to produce alumina (aluminium oxide powder), and the smelting of the alumina to produce aluminium ingot. The company entered into a Mining Agreement with the Government of Lao PDR (GoL) and a Mining Licence was granted in December 2008.</td>
</tr>
<tr>
<td>2009</td>
<td>In 2009, Earth Systems Lao completed an Environmental Impact Assessment (EIA) and a Social Impact Assessment (SIA) for the <strong>SLACO Mining Project</strong> and a separate EIA and SIA for the <strong>SLACONAR Project</strong> (which then included a smelter) (Earth Systems Lao 2009a, 2009b, 2009c, 2009d). Environmental compliance certificates were obtained in December 2009. SLACO subsequently determined that the originally proposed site for the <strong>SLACONAR Project</strong> processing plant (in the Xe Kong valley, south of the Bolaven Plateau, Attapeu Province) was prone to inundation in extremely</td>
</tr>
</tbody>
</table>
wet weather conditions. A new site for the plant was identified, located on the plateau approximately 15 km north of the mine.

2012 In 2012, ESL (formerly Earth Systems Lao) submitted a Scoping Study and Terms of Reference (ToR) for an ESIA and an Environmental and Social Management and Monitoring Plan (ESMMP) for the new location of the SLACONAR Project refinery. The Scoping Study and ToR was approved by the MoNRE.

2013 In 2013 the Lao People’s Democratic Republic issued a Ministerial Instruction on the Process of Environmental and Social Impact Assessment of the Investment Projects and Activities dated 17 December 2013 (Reference No. 8030/MONRE). Therefore, the 2009 EIAs and SIAs for the SLACONAR Project and SLACO Mining Project needed to be updated to reflect changes in policy and ESIA report formatting.

2014 In 2014, SLACO decided to proceed with the preparation of an updated feasibility study for the SLACONAR Project. The company engaged ESL, supported by Accent Environmental (Accent), to:

- undertake the required ESIA investigations
- facilitate a program of public consultation
- prepare the documentation required to obtain project approval.

2015 The Feasibility Study Report for the SLACONAR Project was completed in October 2015 (CHALIECO (2015). The SLACONAR Project comprises the production of 1.0 million tonnes alumina per annum for export. The development of a smelter to produce aluminium ingot may be undertaken at a later date but is not part of the current SLACONAR Project.

2017 In August 2017, the amended Feasibility Report for the SLACONAR Project was completed by the China Aluminium International Engineering Corp (CHALIECO). This amended Feasibility Report changes the project design by reducing the project product from 1.0 million tonnes alumina per annum to 0.5 million tonnes alumina per annum and considers the possibility of project scale expansion after several years of project commission by adding the aluminium smelter with an installed product capacity of 0.25 million tonnes aluminium ingot for export.

2018 ESL, supported by Accent, were engaged to:

- update the 2009 EIA and SIA for the SLACO Mining Project and prepare an ESIA (this document)
- finalise the ESIA document for the SLACONAR Project (to be presented under separate cover).

In January 2018, ESL undertook additional field surveys to supplement and update the information from the 2009 EIA and SIA for the SLACO Mining Project.

1.2.2 Need for update of previous mining EIA and SIA

This ESIA for the proposed SLACO Mining Project is a revision of the 2009 EIA and SIA and follows a request from the Ministry of Natural Resources and Environment (MoNRE) to update the previous impact assessments to reflect current project conditions. In addition to being updated, the 2009 EIA and SIA have been combined into a single ESIA, consistent with the requirements of the 2012 Environmental Impact Assessment Guidelines (EIA Guidelines) (GoL 2012).

The ESIA for the SLACO Mining Project has also been updated to include a number of changes to the project and its environmental and social setting since the 2009 EIA and SIA. These changes are summarised in Table 1-2.
Due to the changes outlined in Table 1-2, there has been a need to revise and combine elements of the 2009 EIA and SIA reports into an updated ESIA, including the project description, environmental and social setting descriptions, and risk assessments.

Additionally, since the initial assessments, there have been changes to permitting regulations and reporting frameworks for the assessment of potential environmental and social impacts associated with large infrastructure projects in Lao PDR, in particular:

- the requirements for environmental and social impact assessment, as set out in the 2012 EIA Guidelines
- the requirements for monitoring and measuring of compliance with environmental and social risk mitigation and management measures.

The purpose of this report is to update the previous 2009 EIA and SIA reports to reflect the current project scope and the requirements of more recent guidelines, and to prepare a combined ESIA for the establishment, operation and closure of the mine, including ore washing and water disposal within the mine concession (but excluding the transportation of ore to the alumina processing facility). This revised ESIA is to be submitted to the MoNRE for their approval.

The management mitigation measures set out in this ESIA have been used to inform the ESMMP, which is presented under a separate cover.
1.3 Presentation of the Project

1.3.1 Site Location

The location of the SLACO mine concession area is shown in Figure 1-1 below. Included in the figure is the location of the former (2009 EIA/SIA) refinery and the proposed new refinery location. The mine concession boundary is located approximately 14 km to the south of the proposed refinery site and the ore washing plant is located approximately 25 km south of the refinery.

![Site Location Map](image)

Figure 1-2: Site Location

1.3.2 Project Summary

The proposed bauxite mining activity will occur within a 135 km² mine concession (see Figure 1-1). The plan of the site and the mining concession, including the staging of primary (phase 1) and secondary ore bodies, is shown in Figure 1-2 below.
Figure 1-3: Mine Concession and Ore Bodies

As shown in Figure 1-2, the mine concession includes 44 discrete ore bodies which cover an area of 38 km². The ore bodies are expected to have an approximate yield of 142 million tonnes of washed bauxite. The expected mine production life is approximately 50 years. However, we note that the area defined by the primary ore bodies is understood to be developed over the first 20-30 years of the mine life and is the primary focus of this ESIA.

The mining project will produce 1.5 million tonnes per annum of wet washed bauxite ore for supply to the SLACONAR Project refinery, transported via trucks along the ore transportation route.

Mining will include the following activities:

- progressive vegetation clearance and the removal of topsoil and overburden from above the ore bodies
- extraction of bauxite ore using excavators, backhoes and bulldozers
- transport of mined ore to the Ore Processing Facility (within the mine site) by trucks along newly constructed haulage roads
- washing, screening and stockpiling at the Ore Processing Facility
- disposal of waste sediments in a Tailings Slime Pond and the discharge of excess supernatant water from the pond to a local catchment.
- progressive respreading of topsoil and overburden, revegetation and rehabilitation of the discrete ore bodies once exhausted.
At the refinery, the bauxite ore will be processed to produce aluminium oxide (known as alumina) using the low temperature Bayer Process. The design service life of the refinery facilities has been estimated to be 50 years. However, subject to staging of ore production, volumes processed and development of nearby ore bodies either by SLACO or others, this refinery lifespan may change. Details regarding the processing of the ore are provided in the SLACONAR ESIA (ESL 2018).

1.3.3 Project Objectives

**Commercial Objectives**

The commercial objective of the SLACO Bauxite Project is to profit from the processing of bauxite ore to produce alumina oxide powder. The commercial objective of the SLACO Mining Project will be to produce the ore required by the refinery to enable the SLACO Bauxite Project to meet its production targets. The operation of the SLACO Mining Project will be undertaken in accordance with industry best practice and will comply with the conditions and standards prescribed by GoL.

Further, the operation will be undertaken according to the environmental, socio-economic and sustainability objectives presented in this ESIA, as set out below.

**Environmental Objectives**

The environmental objectives of the SLACO Mining Project are to identify and mitigate any potentially negative environmental impacts that may result from the project. Detrimental environmental impacts will be minimized through the use of industry best practice and adherence to GoL and international environmental standards and regulations.

**Socio-Economic Objectives**

The socio-economic objectives of the SLACO Mining Project are to contribute to the generation of sustainable development and activity within the region. To achieve this, the project will be developed in such a way as to maximize beneficial socio-economic impacts and to minimize potentially negative impacts.

**Sustainability Objectives**

SLACO will promote environmental and socio-economic sustainability by undertaking the following measures:

- The project will take all practical measures to minimize potential impacts on ecological systems, and to protect and enhance existing livelihoods.
- The project will not proceed unless it will improve the material wellbeing of investors and other stakeholders, including local communities.

1.3.4 Project costs and schedule

The total investment cost for the SLACO Mining Project, is estimated at USD 486 million which includes an engineering cost of USD 338.47 million. Construction on the project was scheduled to begin in 2019 and will take approximately 2 years. Operations are expected to begin at the start of 2021.

1.4 Project Justification

1.4.1 Lao PDR Context

Lao PDR is a land-locked, mountainous country located in the middle of mainland southeast Asia. Lao PDR has a population of just 6.5 million people (NSC, 2013). The human development index (HDI) of Lao PDR in
2015 ranks it 141st of 188 countries in the world in terms of development (United Nations Development Program (UNDP), 2015); it is one of four countries in Southeast Asia having a HDI marginally above the “Low” human development category. Notwithstanding this, the country is rich in natural resources and surrounded by industrialising countries including Thailand, Vietnam and China.

Lao PDR has had limited opportunities to boost its socio-economic development in sustainable ways. These opportunities have included the development of mineral resources, extraction and export of timber, development of hydropower plants and improving the tourism industry. However, tourism is only in the early stages of development, and the recent developments in the hydropower sector require long-term periods before investment is returned. In the period of 2011 and 2015, the value of mineral exports was over US$4 million, which contributes about 60% of the total exports of the country (National Economic Research Institute, 2015).

The Seventh Five-year National Socio-Economic Development Plan (NSEDP) (2011-2015) prepared by GoL sets out a plan to build a primary foundation for the future industrialization and modernization of the country, and to move Lao PDR away from its Least Developed Country status. The industrial sector, mainly hydropower and mineral resources development, is targeted to grow at 15% annually to form 38% of the gross domestic product (GDP) by the end of 2015 (Ministry of Planning and Investment, 2011).

An evaluation of potential bauxite resources in the Paksong region, undertaken by the China Non-ferrous Mining Group Corporation Ltd and the Central South University, showed Lao PDR boasts relatively rich resources of bauxite. Such research conclusions show that availability of high-quality bauxite reaches 160 million tonnes in Paksong region, with potential reserves amounting to 400 million tonnes.

The increasing global demand for saleable alumina, the extensive bauxite ore resources of the Bolaven Plateau, and the favourable geographic location of Lao PDR for the export of alumina, provide a competitive advantage for Laos compared with other countries seeking to develop bauxite mining industries.

### 1.4.2 Expected Benefits of Project

The SLACO Mining Project, in conjunction with the SLACONAR Project, has the potential to make a substantial contribution to the economy of Lao PDR. With an estimated 500 kilotonnes of alumina to be exported each year, valued at approximately USD 222.50 million, the project will be one of Lao PDR's biggest exporters. However, consideration is also now being given to the development of an aluminium smelter to process the alumina into aluminium. Therefore, the actual volumes of exported alumina may change and be replaced with export of aluminium (which could be expected to increase the value of the exported material).

SLACO estimates that it will invest USD 486 million during the construction of 2 year of the SLACONAR Project (CHALIECO, 2018). Much of this is for the purchase of equipment and materials, largely from outside of Lao PDR. However, it is estimated that 20% to 30% of the investment funding will be spent in Lao PDR.

During operations, wage and welfare payments to the workforce are expected to be worth over USD 6.37 million annually. Resource tax payments to GoL are estimated to be approximately USD 6.675 million annually (CHALIECO, 2018). Other benefits will accrue through the purchase of local goods and services and the flow on effects of economic stimulation at local, regional and national scales.

Revenues are expected to contribute to GoL's National Growth and Poverty Eradication Strategy by:

- expanding and improving health, education and other social services
- improving transport, communications, water supply, electrification and other infrastructure
- increasing the resources of GoL’s environmental agencies to improve the effectiveness of their environmental protection programs.

Further potential benefits resulting from the SLACO Mining Project are outlined in Table 1-4.

**Table 1-3: Potential Benefits**

<table>
<thead>
<tr>
<th>Area of Benefit</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employment</td>
<td>There is potential for direct employment of approximately 994 and 371 people during the construction and operation phases of the SLACO Mining Project, respectively. In addition, approximately 506 and 534 people will be directly employed during the SLACONAR Project construction and operation phases. SLACO will prioritize employment of local people living in the vicinity of the project area.</td>
</tr>
<tr>
<td>Direct project investment</td>
<td>Direct investment by SLACO in the project area will boost the local economy and create employment opportunities during the construction and operation of the project facilities and through procurement of goods and services from local providers during project operations.</td>
</tr>
<tr>
<td>Improvement in the Lao PDR national economy</td>
<td>The flow-on economic benefits from the project will create additional employment and increase small business and other economic opportunities. This will be particularly beneficial in rural and undeveloped areas such as Champasack Province, where the local people currently rely on unsustainable agricultural practices, forest resource collection and fishing practices for income.</td>
</tr>
<tr>
<td>Improvement of workforce skills levels</td>
<td>Lasting legacy workforce skills will be improved. SLACO is committed to training and skills development of Lao workers employed by the project and proposes to establish a technical college in Paksong to support and develop the project’s workforce.</td>
</tr>
<tr>
<td>Improved infrastructure</td>
<td>The project will also provide substantial benefit for Champasack Province and southern Lao PDR in general by improving access to a relatively remote area and constructing and upgrading roads. The southernmost section of the ore transportation route between the mine site and the refinery will require the construction of a new road which will assist with the development of the Bolaven Plateau.</td>
</tr>
<tr>
<td>Community development</td>
<td>Through SLACO’s Community Development Fund, which is to be established for the project, villages within the project impact area will also benefit from investment in community infrastructure, such as schools and health facilities.</td>
</tr>
</tbody>
</table>

The SLACO Mining Project will allow Lao PDR to generate revenue while helping meet the world market demand for alumina. Natural resources will be sustainably utilized to promote socio-economic development in Lao PDR and support the Seventh Five Year NSEDP (2011-2015).
1.5 Presentation of the Project Developer and the ESIA Consultants

1.5.1 Project Developer

Ownership of the SLACO Bauxite Project was established in September 2008 as a joint venture between the Italian-Thai Development Public Company Limited (ITD), REIGNWOOD Group (REIGNWOOD) and Laos Service Joint Co., Ltd (LSI). SLACO has a Board of Directors which include a chairman and ten directors. The chairman of the board is Dr. Chanchai Ruayrungruang. Investment in the project is held by SLACO.

ITD was established in 1958 and registered as a listed company in March 1994. ITD is the largest Thai civil and infrastructure construction contracting firm having completed 1,300 projects in Thailand and across Southeast Asia. The firm has extensive experience in Lao PDR including its role as contractor on the USD 1,200 million 681 MW Nam Theun II dam and hydroelectric power project in Khammouane province. The firm was established in 1958 and now has a registered capital of approximately USD 122 million and a staff of over 22,077 employees including 1,102 qualified engineers.

Reignwood was founded in Thailand in 1984 by Dr Chanchai Ruayrungruang. It is now headquartered in Beijing, China. Reignwood is a multinational investment corporation, active in a diversified range of industries including beverages, sports, cultural industry, tourism, recreation, real estate, property management, mineral resources, iron and steel and international trade. Reignwood has developed rapidly in the 30 years since its foundation with branches in Singapore, Canada, USA, UK, Germany and Switzerland. In 1995, Reignwood began to invest in China, and by the end of 2004 the company’s Chinese investment had reached RMB 15 billion.

LSI is the local company who is the present shareholder of SLACO.

The contact information for SLACO is as follows:

Address: c/o Italianthai Tower, 42nd floor, 2034/132-161 New Petchburi Road, Bangkapi, Huaykwang, Bangkok 10320, Thailand
E-mail: prayotec@hotmail.com
Attention: Mr Prayote Chinpinyokul
Title: Chief Executive Officer
1.5.2 Project Team

1.5.2.1 ESL Sole Co., Ltd and Accent Environmental Ltd

This EIA for the SLACO Mining Project has been jointly prepared by ESL and Accent, in conjunction with SLACO.

ESL is a wholly Lao-owned multidisciplinary consulting company specialising in environmental and socio-economic studies, monitoring and management. ESL (formerly part of Earth Systems Lao) also undertakes policy and project evaluation and provides training, research, and project management services in the environmental and social disciplines. ESL has additional expertise in geo-spatial analyses using advanced geographic information systems (GIS) and satellite image analyses.

Accent is an Australian-based multidisciplinary consulting company also specializing in environmental and socio-economic studies, monitoring and management. Accent has worked closely with ESL on many projects since its formation in 2012.

The contact details for ESL and Accent are provided in Table 1-5:

Table 1-4: Key Project Contacts

<table>
<thead>
<tr>
<th>Business Address</th>
<th>ESL Sole Co., Ltd</th>
<th>Accent Environmental Pty Ltd</th>
</tr>
</thead>
<tbody>
<tr>
<td>26 Sibounhueng Rd, 334/25 Sibounhueng Village, Vientiane, Lao PDR</td>
<td>Level 1/103 Dover St, Cremorne, Victoria, Australia</td>
<td></td>
</tr>
<tr>
<td>P.O. Box 2582, Vientiane, Lao PDR</td>
<td>PO Box 2483, Mount Waverley, VIC 3149, Australia</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Key Contact</th>
<th>Mr. Nanong Khotpathoum</th>
<th>Mr. Michael Cramer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telephone No.</td>
<td>(+ 856) 021 413 723</td>
<td>(+61) (0)417 013 078</td>
</tr>
<tr>
<td>Mobile No.</td>
<td>(+ 856) 020 555 1 6071</td>
<td></td>
</tr>
<tr>
<td>Fax No.</td>
<td>(+ 856) 021 416 563</td>
<td></td>
</tr>
<tr>
<td>Email</td>
<td><a href="mailto:nanong@esllao.com">nanong@esllao.com</a></td>
<td><a href="mailto:michael.cramer@accentenvironmental.com.au">michael.cramer@accentenvironmental.com.au</a></td>
</tr>
</tbody>
</table>

1.5.2.2 ESIA Specialists

As noted above, ESL and Accent have collaborated closely to produce this ESIA, with the project team listed in Table 1-6 below. This table includes specialists that have provided direct input into the preparation of the current mining ESIA and specialists that worked on the refinery ESIA where their work was used to supplement the mining ESIA.
Table 1-5: Core members of the ESIA project team.

<table>
<thead>
<tr>
<th>Team Member</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nanong Khotpathoum</td>
<td>Project Director</td>
</tr>
<tr>
<td>Bouavong Luangkhot</td>
<td>Project Manager / Land and water resource use specialist</td>
</tr>
<tr>
<td>Phatmany Southammavong</td>
<td>Contributing author</td>
</tr>
<tr>
<td>Vongvilay Khotpathoum</td>
<td>Socio-economic specialist</td>
</tr>
<tr>
<td>Jethro Stern</td>
<td>Socio-economic and specialist and resettlement advice</td>
</tr>
<tr>
<td>Khammanh Siphanhxay</td>
<td>Cultural heritage and archaeology specialist</td>
</tr>
<tr>
<td>Pheng Phengsintham</td>
<td>Terrestrial biodiversity and wildlife specialist</td>
</tr>
<tr>
<td>Phetnakhone Xaixongdeth</td>
<td>Water quality specialist</td>
</tr>
<tr>
<td>Vongdalone Vongsikeo</td>
<td>Hydrology and sediment specialist, air quality modelling</td>
</tr>
<tr>
<td>Phouvin Phousavanh</td>
<td>Aquatic and fishery specialist</td>
</tr>
<tr>
<td>Ashley Moule (Accent)</td>
<td>Contributing author and assessment specialist</td>
</tr>
<tr>
<td>Michael Cramer (Accent)</td>
<td>ESIA advisor and technical review</td>
</tr>
</tbody>
</table>

1.5.2.3 Specialist Studies

This ESIA draws upon the work undertaken by Earth Systems in Australia and other specialists that contributed to the 2009 EIA and SIA. The specialist studies commissioned for the original mining EIA and SIA work are listed in Table 1-7 below.

Table 1-6: Specialist studies commissioned for the 2009 EIA and SIA.

<table>
<thead>
<tr>
<th>Specialist Study</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terrestrial biodiversity &amp; forest resources survey</td>
<td>ESL in collaboration with the National University of Lao PDR</td>
</tr>
<tr>
<td>Land and water resource use study</td>
<td>Earth Systems / ESL</td>
</tr>
<tr>
<td>Stream hydrology and sediment transport study</td>
<td>Earth Systems</td>
</tr>
<tr>
<td>Air quality assessment</td>
<td>ESL in collaboration with P. Satjamanajaroen</td>
</tr>
<tr>
<td>Noise assessment</td>
<td>ESL</td>
</tr>
<tr>
<td>Transportation and road use assessment</td>
<td>Earth Systems / ESL</td>
</tr>
<tr>
<td>Health impact assessment</td>
<td>ESL in collaboration with the Ministry of Health (GoL)</td>
</tr>
<tr>
<td>Physical and cultural resources survey</td>
<td>Department of Heritage, Ministry of Information and Culture (GoL) in collaboration with ESL</td>
</tr>
<tr>
<td>Cultural heritage survey</td>
<td>Institute of Anthropology and Religion Research (GoL) in collaboration with ESL</td>
</tr>
<tr>
<td>Dry season aquatic ecosystems and fisheries survey</td>
<td>ESL in collaboration with the Living Aquatic Resources Research Centre (GoL)</td>
</tr>
</tbody>
</table>
Specialist studies relevant to the current mining ESIA were also undertaken for the SLACONAR Project and are detailed in Table 1-8.

Table 1-7: Relevant specialist studies completed for the SLACONAR Project ESIA

<table>
<thead>
<tr>
<th>Specialist Study</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline water quality and downstream impact assessment</td>
<td>Earth Systems</td>
</tr>
<tr>
<td>Socio-economic baseline survey</td>
<td>ESL</td>
</tr>
</tbody>
</table>

1.6 Project Developer’s Endorsement of this ESIA

SLACO hereto states its endorsement of this ESIA and its acceptance of responsibility for the accuracy, completeness and soundness of the data, information, assessments, mitigation measures and budget allocations presented in the ESIA report and associated ESMMP.

SLACO fully commits to implementing all measures outlined in the ESIA and ESMMP, including the provision of necessary funds and human resources.

The full terms and conditions of SLACO’s endorsement of this ESIA is made in the form of an Endorsement Letter as attached in Appendix to this report (this needs to be obtained).
1.7 Structure of the ESIA

The environmental and social approvals documentation for this report comprises three volumes:

i. ESIA Executive Summary
ii. ESIA Main Report (this report)
iii. Environmental and Social Management and Monitoring Plan (ESMMP)

The ESIA Main Report comprises 12 chapters as outlined in Table 1-9 below.

Table 1-8: Report Structure

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Context of the Project</td>
<td>Provides an overview and brief description of the project, presents the project developer and ESIA consulting firms, contains the project developer’s endorsement of the ESIA and presents the structure of the ESIA report.</td>
</tr>
<tr>
<td>2</td>
<td>Policy, Legal and Institutional Framework</td>
<td>Sets out the Lao policy and legal framework, international obligations, environmental and social guidelines and standards, and corporate policies.</td>
</tr>
<tr>
<td>3</td>
<td>Project description and alternatives</td>
<td>Describes the project including project setting, design features and alternatives considered.</td>
</tr>
<tr>
<td>4</td>
<td>Description of Natural Environment</td>
<td>Describes the existing conditions of the natural environment in the project area and surrounds, including physical, biological, and visual components.</td>
</tr>
<tr>
<td>5</td>
<td>Description of Social Environment</td>
<td>Describes existing conditions of the social environment, including socio-economic, health and cultural components.</td>
</tr>
<tr>
<td>6</td>
<td>Environmental Impact Assessment and Mitigation Measures</td>
<td>Assesses the potential environmental and social impacts of the project and sets out proposed mitigation measures.</td>
</tr>
<tr>
<td>7</td>
<td>Risk Assessment</td>
<td>Assesses the environmental and social risks of the project.</td>
</tr>
<tr>
<td>8</td>
<td>Cumulative Impact Assessment</td>
<td>Assesses the cumulative impacts of the project in combination with other development activities.</td>
</tr>
<tr>
<td>9</td>
<td>Summary of Environmental Management and Monitoring Plan</td>
<td>Summarizes the management and monitoring plan from the ESMMP volume.</td>
</tr>
<tr>
<td>10</td>
<td>Public Consultation and Disclosure</td>
<td>Describes public involvement in the ESIA process, the outcomes of public consultation, and proposals for further consultation.</td>
</tr>
<tr>
<td>11</td>
<td>Development Plans</td>
<td>Outlines reasons why development plans are not required for the SLACO Mining Project</td>
</tr>
<tr>
<td>12</td>
<td>References</td>
<td>Lists the references used in the ESIA report.</td>
</tr>
<tr>
<td></td>
<td>Appendices</td>
<td>Supporting technical studies</td>
</tr>
</tbody>
</table>
1.8 Basis of this ESIA

This ESIA has been prepared based on the information provided by SLACO. If further information is made available or changes, then the assessment outcomes may also change. If proposed methods and or the site information is not accurate or changes, then the recommendations from this report may not be valid.

It is also important to note that elements of the project as they were understood in 2009 have changed as outlined in Table 1-2. These changes have affected the scope of this ESIA. In particular, the ESIA does not address the following aspects of resettlement, which are the responsibility of PNPC:

- the environmental or social impacts associated with the ongoing resettlement of the five villages previously located close to or within the mining concession
- the socio-economic status of the community living at the re-settlement sites.

The ESIA does, however, consider the management of continued site access by the communities being resettled.

In addition, detailed design is still being conducted by SLACO and aspects of the project may change. It is therefore recommended that detailed design information be assessed as it becomes available to confirm the ongoing validity of the management and mitigation measures contained within this report, and that additional measures be proposed if necessary.

This ESIA has not considered the easements associated with the delivery of power or water to the mine as these have not yet been settled. The ESIA also excludes the transportation of ore from the mine to the SLACONAR Project, which is covered within the SLACONAR ESIA (ESL 2018).