

Environmental Management Plan 2007 Edition

1.0 Introduction

1.1 Project Overview

1.1.1 Background

Ramu NiCo Management (RNML) Limited is developing the Ramu Nickel Project (hereafter known as 'the project'), which is located approximately 75 km west-southwest of Madang, in Madang Province, Papua New Guinea (PNG) (Figure 1.1). The project will mine and refine lateritic ores to produce mixed nickel and cobalt hydroxide for sale on world markets.

Mining is proposed within four separate zones. The Ramu East, Ramu Central and Ramu Central Extended zones are located on the Kurumbukari Plateau and together form the Kurumbukari resource block. The Ramu West resource block is the fourth zone in which mining is proposed.

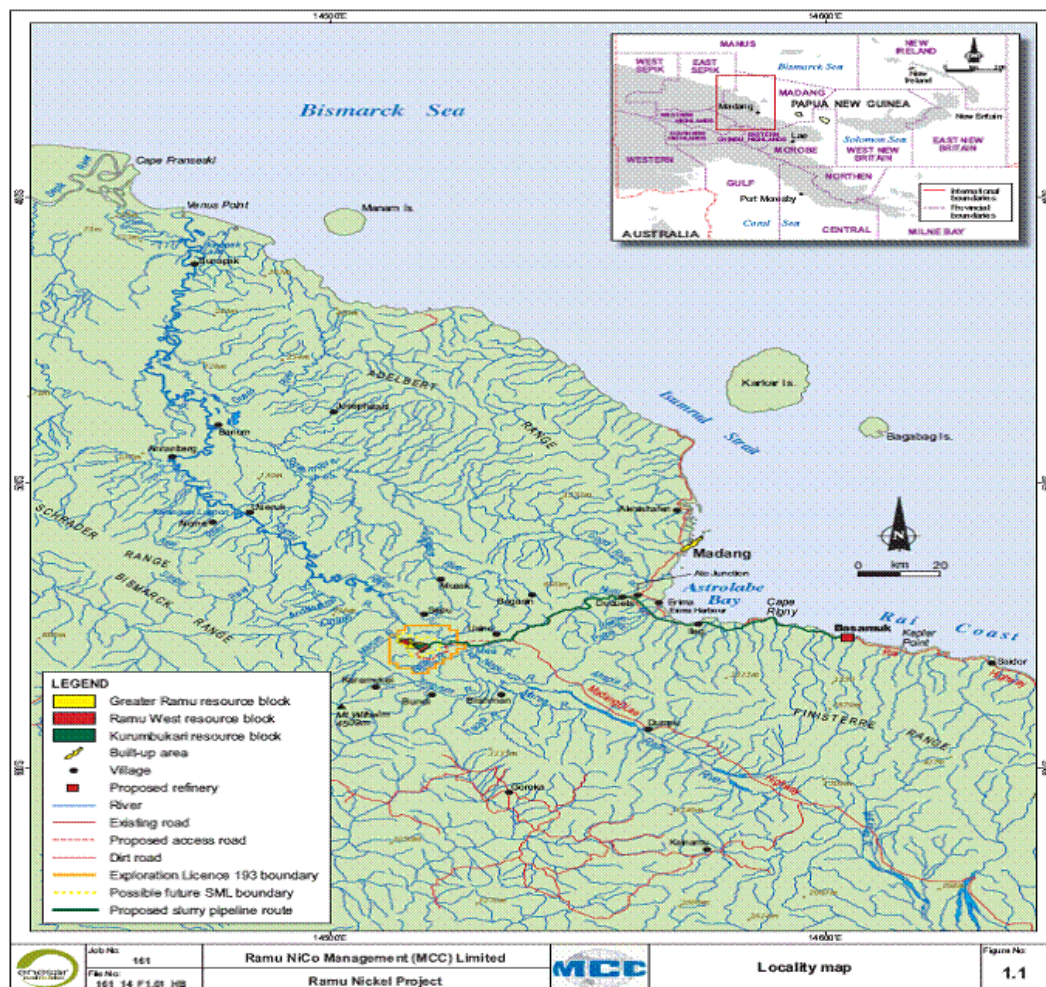
Preliminary construction of the project infrastructure took place between October 2006 and April 2007, while construction of the mine and refinery plant will commence later this year (2007). Production is scheduled to commence in Q4 2009 with a project life of approximately 20 years, however, there is significant potential to substantially extend the life of the overall project by further exploration and development in areas of known mineralisation at Kurumbukari.

The project involves the development of a nickel-cobalt deposit using open pit techniques over a nominal mine life of 20 years.

1.1.2 Project Activity

The project will comprise (Figure 1.2):

- A series of shallow open-cut mine pits and a beneficiation plant to produce ore slurry feedstock at Kurumbukari.
- A slurry pipeline of approximately 135 km long to transport the ore slurry from the Kurumbukari mine site eastwards to the refinery plant at Basamuk on the Rai Coast.
- At Basamuk, a refinery to produce a mixed nickel-cobalt hydroxide as an intermediate product. Components of this refinery include: acid plant, lime plant, power station, wharf, limestone quarry and accommodation area.



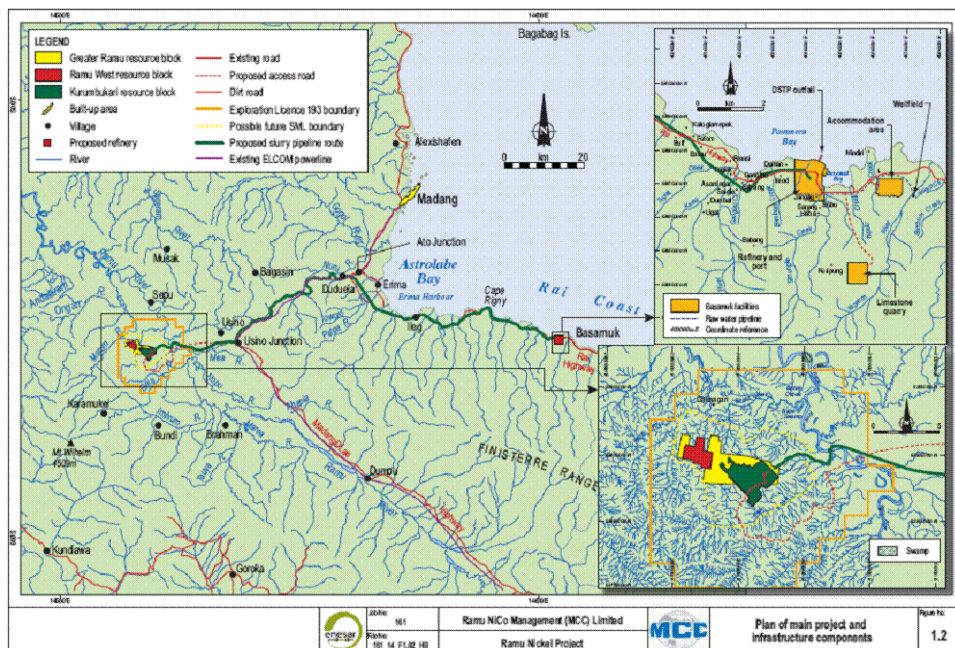
Tailing will be disposed by deep sea tailing placement (DSTP) on the ocean floor of the Vitiaz Basin immediately north of the refinery site.

1.2 Rationale for Environmental Management Plan

1.2.1 Regulatory Requirement

Ramu Nickel Limited was granted an Environmental Plan Approval on 21 March 2000 under the Environmental Planning Act 1978 by the Minister for Environment and Conservation (MEC, 2000).

RNML has prepared this Environmental Management Plan (EMP) in accordance



with the principles set out in Chapter 10, Volume B of the approved Environmental Plan (NSR, 1999), to:

- Fulfill conditions of approval for the Environmental Plan set by the Department of Environment and Conservation (DEC).
- Detail how construction activities will be managed to minimise their potential environmental impact.
- Provide a framework for the management of environmental matters associated with the project, in line with the requirements of the International Standards Organization (ISO) 14001.

This EMP has been prepared for the 'major' construction phase of the project only. Chapter 3 outlines the activities that will occur during these early works.

1.2.2 Purpose

This EMP documents the proposed management and mitigation measures developed during the EIA process.

The main objectives for this EMP are to:

- Provide clear and concise procedures to be followed to minimise the potential for material environmental harm as a result of early works construction.
- Identify the structure of management for the project.
- Identify responsibilities, reporting and monitoring requirements for this EMP.
- Provide a monitoring program to verify implementation of proposed management and mitigation measures.
- Provide the basis for further guidelines, procedures and plans to be developed for other phases of the project.

1.3 Environmental Management Plan (EMP)

Condition 4 of the Environmental Plan Approval provides that the Developers shall submit an Environmental Management Plan for the construction phase of the project to the Director, DEC, for approval three months before the start of construction. The construction phase for the project has been defined by the DEC as 'the construction and installation of mine facilities including the pipeline ROW, the laying of pipes, construction of the refinery and associated facilities'.

RNML have prepared the early works construction phase EMP and submitted to DEC at the earlier date. This document and its associated management sub-plans is progressively revised to reflect the requirements of the EMP for the major construction phase of the project and submitted in support of the Environmental Permit for Construction.

An EMP for the operational phase of the project will be submitted to the Director, DEC, six months before the start of operations.

1.4 EMP Implementation

1.4.1 Responsible Personnel

All RNML employees and its contractors are responsible for carrying out the construction works in accordance with the procedures and such that any potential impact on the environment is avoided or minimized.

1.4.1.1 Environment Manager

The Project Environment Manager will:

- Report to the Chief Technical Director on compliance of the EMP

(Construction) and issue any necessary instruction to the construction contractors.

- Ensuring that all site personnel have relevant environmental training and awareness so that they have a clear understanding of the environmental requirements and their responsibilities within their areas of work.
- Ensuring the weekly and monthly inspections reports are maintained; follow up and ensuring non-conformances are recorded and actioned.

1.4.1.2 Site Environment Officers (Engineers) and Field Environment Assistants

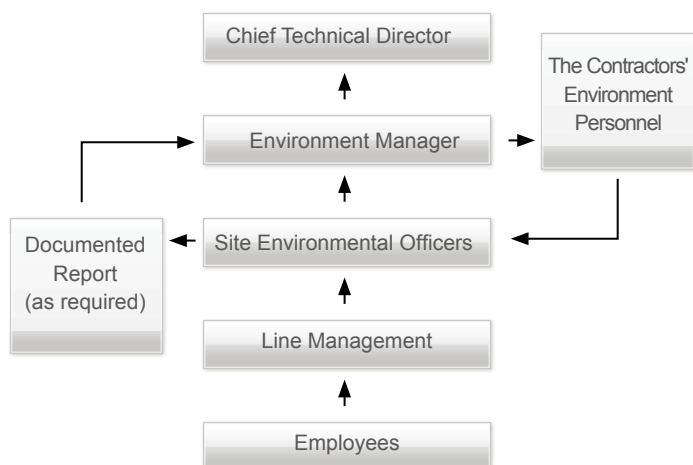
The Site Environment Representatives (Officers) is the RNML management representative on site and will:

- Report to the Project Environment Manager on any site environmental issues and compliance of the EMP.
- Ensuring weekly inspection is conducted and performing internal environmental audits.
- Ensuring all necessary training and awareness are conducted appropriately and implemented
- Ensuring appropriate environmental control measures are practiced.
- Ensuring that all site personnel are aware of appropriate environment control measures.

1.4.1.3 Contractors

The major contractors (ENFI) and its sub-contractors, and any party regarded as contractors will:

- Appoint Contractors Environmental Representative
- Ensuring that all its employees complying with acceptable safe environmental practices.
- Ensure that all its employees are given environmental awareness (including induction) of environmental requirement and appropriate procedures.
- Report to the RNML Environmental Manager and senior management on the environment performance and breaches.



The RNML Project Manager and the Environmental Manager will be responsible for ensuring that all project activities are undertaken in full compliance with statutory regulations.

The RNML Construction Manager will be responsible for this document and its implementation. RNML Environment Department personnel will ensure that all contractor personnel comply with this document.

1.5 Environmental Setting

1.5.1 Location

The Kurumbukari mine site is located approximately 75 km west-southwest of Madang, in Madang Province (see Figure 1.1). The mine site is located on a dissected plateau bounded to the northeast by the extensive floodplain of the Ramu River and to the southwest by the foothills of the Bismarck Range.

The pipeline route initially descends the eastern slope of the Kurumbukari Plateau to cross the expansive Ramu floodplain, which is approximately 15 km wide. The pipeline crosses over the eastern extension of the Finisterre Range to a maximum altitude of 500 m above sea-level (following an existing road route), to Duduela on the coastal plain of Astrolabe Bay. The pipeline then traverses the coastal plain of the Rai Coast, crossing several river deltas to reach the refinery site at Basamuk.

The refinery site is located on the southwestern side of Basamuk Bay approximately 52 km southeast of Madang on the narrow coastal plain and foothills bordering the Finisterre Range. The limestone quarry site is located in the foothills approximately 3 km southeast of the refinery.

1.5.2 Climate

Kurumbukari

The climate at Kurumbukari is defined as Premontane Perhumid (McAlpine et al. 1983), a category which includes regions with elevations between 500 and 1,400 m and rainfall in excess of 3,500 mm/a. Southeast trade winds blow from May until October (the dry season) and the wet season is characterised by northwesterly monsoonal winds from November to April. Wind velocities at Kurumbukari are light and variable.

Available records of rainfall at Kurumbukari indicate a mean annual rainfall in excess of 6,000 mm with about 60% falling during the wet season. Evaporation is about 1,400 mm per year. From November to April, the mean maximum and minimum daily temperatures are 28.5°C and 17.5°C, while from May to October the means are only slightly less at 27.5°C and 16°C respectively.

Basamuk

Basamuk has a similar climate to Madang, which is defined as Lowland Humid. Madang has a mean annual rainfall of about 3,500 mm and a mean annual evaporation of about 1,780 mm. The mean daily maximum and minimum temperatures are 30.2°C and 23.2°C respectively and these vary little throughout the year. Winds at Madang are dominantly from the northeast to east.

1.5.3 Land Uses

Subsistence Gardening

Subsistence gardening using the 'shifting cultivation system' is practiced, however gardens occupy only a small percentage of the total available land. Sweet potato is the staple food crop and is usually supplemented by other garden produce such as yam, taro, banana, tapioca, sugarcane, watermelon, pawpaw and a variety of other vegetables and fruits.

Bush land Resources

Plant Resources. The intact forests of the Kurumbukari Plateau provide abundant plant resources for use by the local people. Some are collected for use as food, such as wild yams (*Dioscorea* spp.), sago (*Metroxylon* spp.), bamboo (*Bambusa* spp.) shoots, ferns, breadfruit (*Artocarpus communis*), galip nut (*Canarium indica*), taun tree nut (*Pometia pinnata*) and a variety of creepers.

Virtually all houses in the Kurumbukari area are built from materials readily available from nearby forest and regrowth areas. All houses in riparian villages along the Ramu River are built on stilts to be above the floodwater during the wet season.

Wildlife Resources. Wildlife is typically hunted for meat, eggs, skins and plumage. The more common fauna exploited include wild pigs, wallabies, bandicoots, cuscuses, tree kangaroos, lizards, goannas, flying foxes, and a variety of forest bird species such as birds-of-paradise, Goura pigeons, parrots, cockatoos and hornbills.

1.6 Structure of EMP

This EMP has two main sections as described below.

1.6.1 Introduction and Context

The first section contains introductory and contextual information and is comprised of Chapters 1 to 5:

- Chapter 1—provides information on the purpose of this document and project background.
- Chapter 2—describes the regulatory framework for the project.
- Chapter 3—provides a description of the construction activities.
- Chapter 4—describes the environmental management framework for implementing the procedures outlined in this EMP.

- Chapter 5—describes the environmental monitoring of the project.

1.6.2 Management Plans

The second section of this report contains the environmental management sub-plans for the construction activities (Chapter 6), which describe how environmental issues will be managed during early works construction and include:

- Chemical Spill and Control Sub-Plan.
- Cultural, Historical and Archaeological Sub-Plan.
- Dust Control Management Sub-Plan.
- Emergency Procedures and Response Sub-Plan.
- Prohibited Activities Sub-Plan.
- Slurry Pipeline Routing Sub-Plan.
- Soil Erosion, Sedimentation and Progressive Rehabilitation Sub-Plan.
- Waste Management Sub-Plan.
- Water Resources Management Sub-Plan.

Each management sub-plan:

- Defines the element/ issue that are being addressed.
- Provides a brief background to the plan.
- RNML statement of principals and intentions in relation to overall environmental performance, which provides a framework for action.
- Nominates the responsible person(s) for undertaking specific tasks/ actions.
- Express the performance goals/ requirements against which the statement of principals and intentions can be measured.
- Outlined the procedures to be undertaken to meet the objectives.
- Documents procedures (outline form) monitor, measure and record performance.
- Details any reporting requirements of the tasks/ actions and the responsible parties.
- State the procedures to be undertaken if performance objectives are not met and details the responsible parties.

Please contact HSE Department at hse@mccgrd.com for more details in EMP Construction Phase of Ramu Nickel Project.