

Esso Highlands Limited



Papua New Guinea LNG Project

**Kutubu to Kantobo KP 80-153
Communal Resource Plan**

PGHU-EH-SPZZZ-490009

CONTENTS

1.0	Introduction	8
1.1	Background	8
1.2	Resettlement Goal	9
1.3	Sources of Information and Compliance Protocols	10
1.4	Project Description	10
1.4.1	Construction	10
1.4.2	Operations	12
2.0	Institutional and Legal Framework	13
3.0	Social, Economic and Cultural Environment	14
3.1	Population	14
3.2	Cultural Context	15
3.2.1	Social Organization of Clans	15
3.2.2	Subsistence Patterns	15
3.2.3	Types of Land Rights and Land Ownership	16
3.3	Land Disputes in ROW Environs	17
3.3.1	Land Ownership	17
3.3.2	Tamadigi Village	18
3.3.3	Mano Village	18
3.3.4	Ai'io Village	19
3.3.5	Hedinia Village	19
3.3.6	Soroga	19
3.3.7	Lower Foe: Kaibutage (Suruwabo) Village	19
3.4	IPCA's and Project Socio-Cultural Context	19
3.5	Land Requirements	20
3.5.1	Land Needs	20
3.5.2	Minimizing Resettlement	22
3.6	Cultural Heritage Sites	23
4.0	Consultation and Disclosure	25
4.1	Stakeholder Engagement	25
4.2	Resettlement Engagement	25
4.3	Summary of Issues by Communities	26
5.0	Project Impacts	29
6.0	Eligibility and Entitlements	32
7.0	Livelihood Restoration Program	34
8.0	Grievance Management Framework	35
9.0	Organizational Roles and Responsibilities	36
10.0	Monitoring and Evaluation	37
11.0	Implementation Schedule	38
12.0	Cost and Budget Estimate	39

FIGURES

Figure 1-1: Kutubu-Kantobo ROW	9
Figure 5-1: Social Sites KP 80 - 102	30
Figure 5-2: Social Sites KP 102 – 128.....	31
Figure 5-3: Social Sites KP 128 – 153 (including Tamadigi).....	31

TABLES

Table 3-1: CRP Impact Area Households, Population, ILGs and Survey Status.....	14
Table 3-2: Kutubu-Kantobo ROW Principal Clans	18
Table 3-3: Status of IPCAs.....	20
Table 3-4: ROW Land Need.....	20
Table 3-5: Compensation Rates.....	21
Table 3-6: Initial Cultural Heritage sites Kutubu-Gobe ROW	23
Table 3-7: Cultural Heritage Sites	24
Table 4-1: Summary of Stakeholder Engagement Consultations along ROW	25
Table 4-2: Summary of Kutubu-Kantobo Consultation Interactions for Affected Communities	26
Table 4-3: Summary of Issues by Communities	26
Table 5-1: Principal Impacts Likely to be Experienced by Kutubu- Kantobo Landowners	29
Table 6-1: Eligibility and Entitlements for Kutubu-Kantobo Landowners.....	32
Table 11-1: CRP Implementation Schedule	38

APPENDICIES

- Appendix 1: Detailed Maps of Kantobo-Kutubu ROW
- Appendix 2: List of Social Findings
- Appendix 3: Typical Camp Layout

ACRONYMS

Acronym	Definition
CRP	Communal Resource Plan
EHL	Esso Highlands Limited
EIS	Environmental Impact Statement
ELC	Environmental Law Centre
FRV	Full Replacement Value
HGCP	Hides Gas Conditioning Plant
IFC	International Finance Corporation
ILG	Incorporated Land Group
IPCA	In-Principle Compensation Agreement
KP	Kilometer Point
Lanco	Landowner Company
LBBSA	License-Based Benefit Sharing Agreement
LNG	Liquefied Natural Gas
M&E	Monitoring and Evaluation
O&GA	Oil and Gas Act
OSL	Oil Search Limited
PNG	Papua New Guinea
PNG LNG	Papua New Guinea Liquefied Natural Gas Project
PS	Performance Standard
RAP	Resettlement Action Plan
RIT	Resettlement Implementation Team
ROW	Right of Way
RPF	Resettlement Policy Framework
SIA	Social Impact Assessment
SMLI	Social Mapping and Landowner Identification
UBSA	Umbrella Benefits Sharing Agreement

EXECUTIVE SUMMARY

Introduction

Esso Highlands Limited (Company) proposes to develop the Papua New Guinea Liquefied Natural Gas (PNG LNG) Project (Project) to commercialize gas reserves within the PNG Southern Highlands and Western Provinces. An onshore gas pipeline and liquid condensate pipeline are required as part of the upstream infrastructure development for the Project.

The upstream onshore gas pipeline extends 292 km and will transport natural gas from gas fields at Hides, Angore and South East Hedinia to the Omati Landfall. The onshore liquid condensate pipeline will transport condensate from the Hide Gas Conditioning Plant for approximately 109 km to the Oil Search Limited's Kutubu Central Processing Facility.

Scope

This Communal Resource Plan focuses on economic displacement, there being no physical resettlement resulting from:

- Pipeline construction between KP 80 (Kutubu) and KP 153 (14 km south, southeast of Tamadigi - 336 ha inclusive of cathodic protection areas); and
- Construction of a lay down and camp area at Tamadigi (KP 148–24 ha)..

The landscape along this section of Right of Way (ROW) can be broadly characterized as follows:

- KP 153 to KP 147 - lowland open forest located within flat terrain of flood plains associated with the Mubi and Digimu Rivers (at the headwater of the Kikori River);
- KP 147 to KP 125 - medium to small-crowned forest on undulating terrain and with numerous small watercourses;
- KP 125 to KP 119.8 - sago swamp forest interspersed with small-crowned forest in dry or elevated terrain;
- KP119.8 to KP 85 - narrow ridgelines, valleys and swamps including numerous limestone outcrops, karst, gullies and minor meandering waterways. The area is characterized by shallow soils supporting medium-crowned lowland forest, large crowned montane forest, pandanus swamp and sago swamp lands; and
- KP 85 to KP 80 - narrow ridges, undulating terrain, steep slopes (greater than 25°) and dense vegetation.

Resettlement Goal

The Project's overall resettlement goal is to minimize resettlement where possible, but where unavoidable, to design and implement resettlement in a manner that improves, or at least restores, livelihoods and standards of living of physically and economically displaced persons. This CRP is consistent with goals, principles, and processes described in the Project's October 2009 Resettlement Policy Framework (RPF).

There is loss of communal forest resources on clan land and 17 gardens, some of which are abandoned and some containing mixed crops and trees. There is no physical resettlement required. Should additional gardens and structures be identified during the construction period the protocols defined in this CRP will be applied.

Institutional and Legal Framework

The resettlement process complies with legal requirements and criteria such as the following: those specified in the PNG Oil and Gas Act, key PNG National Government institution guidelines, legislation governing both provincial and local governments, and the International Finance Corporation's Performance Standards on Social and Environmental Sustainability.

Social, Economic and Cultural Environment

The following linguo-cultural groups have been identified within the Kutubu-Kantobo pipeline Right of Way (ROW):

- The **Fasu**, who occupy the western and southeastern fringes of Lake Kutubu down to Tamadigi, and who claim land on both the eastern and western borders of the Hegegio/Tagari River; and
- The **Foi(e)** who inhabit the northeastern fringes of Lake Kutubu extending along the Pimaga to Poroma Road.

The majority of the Kutubu-Kantobo ROW landowners are resident in the villages of Mano, Ai'o, Tamadigi, Inu, Soro, Kantobo, Kaipu #1 and #2, Waro, Hedinia, Tubage, Kaimari and Surawabo.

In-Principle Compensation Agreements (IPCAs) have been signed by landowners for Tamadigi lay down and camp areas (KP 148) in addition to the Mubi-Keno-Moro and Tubage environs, which are within the KP 80-153 impact area.

Consultation and Disclosure

Extensive stakeholder engagement sessions have been conducted through the pipeline ROW sector covered by this document with additional sessions planned just prior to commencement of construction activities within specific areas. Topics covered by these sessions include: road safety, pipeline construction, general Project scope, and ROW access both during and post construction phase.

Initial resettlement public consultations were conducted 14–17 December 2010 in Ai'o, Mano, Tamadigi, Tubage and Waro. Communication mediums included oral presentations, flip charts, booklets and flyers in English and Pidgin.

The Company Land and Community Affairs (L&CA) team conducted land access consultations and IPCAs with affected landowners between August-October 2009, and January 2011.

Documents disclosure will include public dissemination/distribution of this CRP document.

Project Impacts

The ROW, camp and laydown area at Tamadigi are expected to result in the following impacts and mitigation measures:

- Approximately 336 ha of communal forestland. This includes 240 large trees identified during surveys. Compensation will be paid according to IPCA negotiated rates. No physical resettlement is expected;
- Approximately 24 cultural heritage sites. These will be moved or compensated according to culturally acceptable practices;
- Seventeen (17) gardens of various ages and conditions will be compensated at Full Replacement Values;
- No businesses or employment is lost because of the Project;

- Infrastructure owned and operated by OSL is evident throughout much of the ROW. It includes a crude oil export pipeline, associated facilities and the Agogo petroleum production facilities. ROW villages have already sustained long-term impact from existing petroleum activities. The project landowners will have incremental increases in cash benefits (royalty and equity, seed capital) and business opportunities as pipeline license landowners;
- Since commencement of the petroleum project in 1990, population influx by Huli into the northern Fasu villages of Sisibia, Kaipu #1 and #2 and Tubage has been extensive and continuous. Inter-ethnic marriage has increased in part to take advantage of the contiguous oil developments of Kutubu, Mananda, Moran and NW Moran;
- Some 30–40% of these northern Fasu communities now speak Huli, and a creeping extension of traditional Huli ethnic boundaries into the Lake Kutubu area has occurred; and
- The ROW generally follows the existing OSL oil pipeline and existing roads. These are areas of previous and ongoing disturbance. As such, this section supports mainly secondary regrowth forest, sago swamps and grassy sections. The anticipated loss of land will have minimal adverse impact on livelihoods or subsistence activities.

Eligibility and Entitlements

Those individual households subject to economic displacement due to loss of economic trees or gardens are eligible to receive damage and deprivation compensation as well as livelihood restoration, if required. Landowners will also be entitled to once off and rental payments for damage and deprivation, including loss of access to traditional hunting grounds. This will be paid out through clan representatives as per IPCA agreements.

Livelihood Restoration Program

Loss of individual gardens is not significant as landowners have other subsistence garden areas. No other loss of livelihoods is expected within the Kutubu-Kantobo Project area. However, if needed a livelihoods' restoration program will be implemented for affected landowners as per the CRP protocols.

Grievance Management Framework

A Project Grievance Mechanism has been implemented to receive, respond and address any grievances made to the Project.

Organizational Roles and Responsibilities

Overall responsibility for the planning, implementation, and monitoring of economic displacement rests with the Company as specified in the RPF. The Company's Land & Community Affairs Team will undertake these activities.

Monitoring and Evaluation

Monitoring and evaluation will provide information on whether clan and individual compensation, resettlement and development investments are providing positive inputs, and indicate if corrective action may be required to achieve Project goals.

Resettlement Implementation Schedule

A schedule of tasks has been developed to plan and implement the major components of CRP implementation through the middle of 2011.

Cost and Budget Estimate

The cost of the Kutubu-Kantobo CRP is estimated at approximately US\$1.4 million, including IPCA clan payments. In addition, landowning clans will receive an annual rental of K400/ha for the duration of the Project (20-30 years).

1.0 INTRODUCTION

1.1 Background

This Communal Resource Plan (CRP) focuses on economic displacement, there being no physical resettlement, resulting from:

- Pipeline construction between KP 80 (Kutubu) and KP 153 (14 km south, southeast of Tamadigi — 336 ha inclusive of cathodic protection areas); and
- Construction of a lay down and camp area in Tamadigi (KP 148 — 24 ha).

It is not anticipated that any additional borrow pits or quarries are required as aggregate will be sourced from construction sites along the ROW. If this changes, an addendum will be prepared.

The Kutubu to Kantobo pipeline section is ~80 km of the 294 km long Right of Way (30 m ROW)¹ between Hides and Moro. The ROW may be widened to 50 m in some locations for workspaces and to avoid side casting.

The ROW is variously characterized by:

- KP 153 to KP 147 — lowland open forest located within flat terrain of flood plains associated with the Mubi and Digimu Rivers (at the headwater of the Kikori River);
- KP 147 to KP 125 — medium to small-crowned forest on undulating terrain and with numerous small watercourses;
- KP 125 to KP 119.8 — sago swamp forest interspersed with small-crowned forest in dry or elevated terrain;
- KP 119.8 to KP 85 — narrow ridgelines, valleys and swamps including numerous limestone outcrops, karst, gullies and minor meandering waterways. The area is characterized by shallow soils supporting medium-crowned lowland forest, large crowned montane forest, pandanus swamp and sago swamp lands; and
- KP 85 to KP 80 — narrow ridges, undulating terrain, steep slopes (greater than 25°) and dense vegetation.

The laydown yard and camp will be used for the construction of a 1,000-man camp and storage of construction materials, equipment and line pipe. A preliminary outline of the proposed campsite is provided in Appendix 3. Additional support facilities that will make up the lay down include a mechanic yard and mobile waste management facilities. The Tamadigi Campsite and Lay down Area construction footprint covers approximately 24 ha which includes an existing 0.5 ha cleared helipad.

Vegetation throughout the Kutubu and Middle Kikori regions consists almost entirely of climax forest, broken only by small areas of anthropogenic clearing and sago swamps. The climate is strongly seasonal, with a marked wet season between March and September. This corresponds to the southeasterly monsoons with lower temperatures and increased cloud cover, and a clear and warmer dry season from October until February. This seasonality was formerly reflected in contrasting seasonal settlement patterns, with people dispersed in hunting shelters for much of the wet season before gathering at communal settlements and gardens for the dry season.

Figure 1-1 illustrates the overall impacted area from Kantobo KP 153 to Kutubu PDL 2 boundary close to Tubage KP 80. The map shows proposed cathodic protection (CP) sites,

¹ Typically, the nominal ROW width of 30 m is required for the pipeline construction spread including storage areas (topsoil, subsoil, and trench spoil), vehicular access/running track and work area for stringing, welding and pipeline installation.

borrow pits (BP) and main valves (MV/MLV) along the ROW. Quarries outside the ROW are also illustrated. However, there were no plans to access or use these at the time this document was prepared.

Figure 1-1 also illustrates a dotted line linking the Agogo production facility with the LNG gas pipeline. No decision has been reached on this proposed future project and is not part of this CRP. Similarly, camp IDT 10, south-east of Agogo production facility was a small temporarily used OSL camp

Stakeholders will be notified of any future additions to this CRP and an addendum submitted.

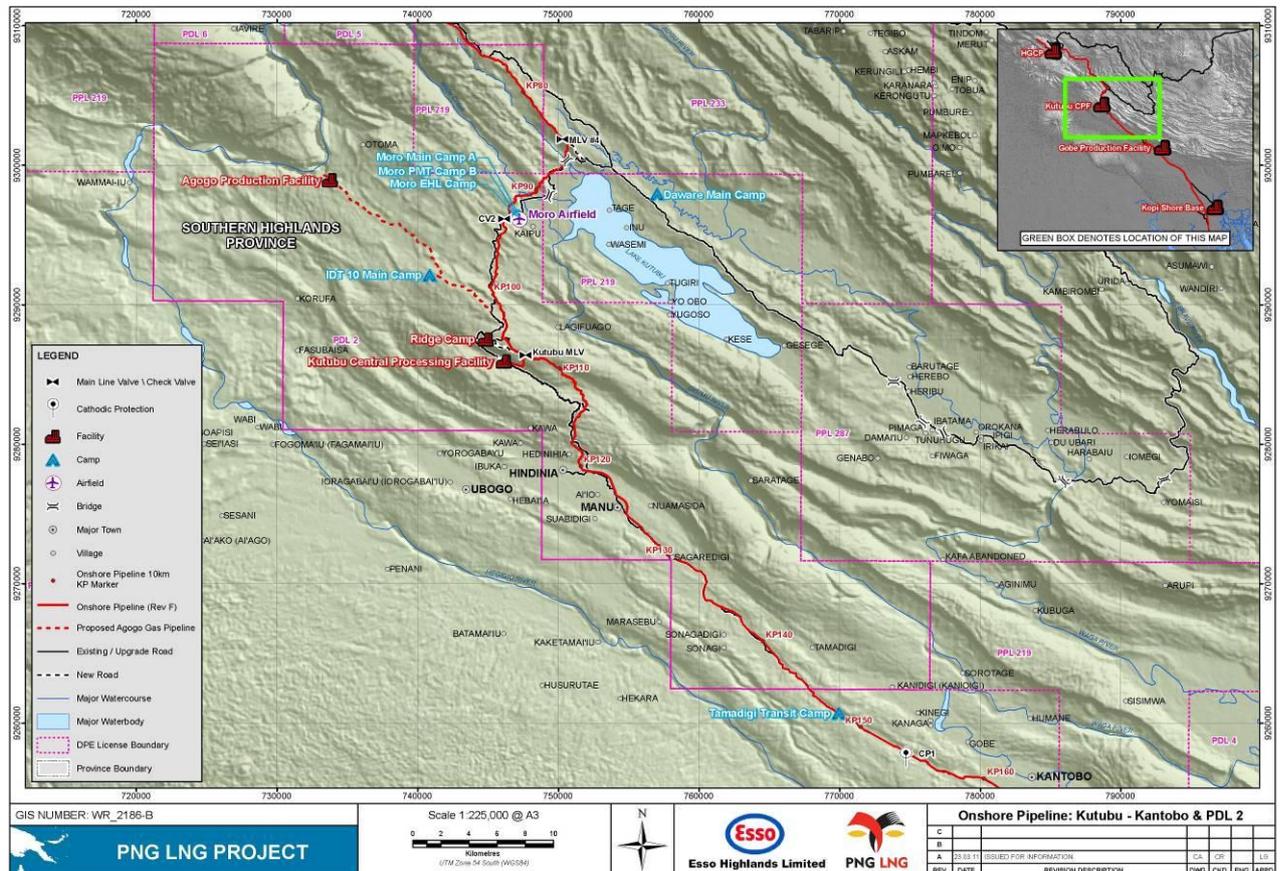


Figure 1-1: Kutubu-Kantobo ROW

1.2 Resettlement Goal

The Project's overall resettlement goal is to minimize resettlement where possible, but where unavoidable, to design and implement resettlement in a manner that improves, or at least restores, livelihoods and standards of living of physically and economically displaced persons. This Communal Resource Plan (CRP) (referred to as the Kutubu-Kantobo CRP) is consistent with the goals, principles and processes set out in the Resettlement Policy Framework (October 2009).

Whilst no physical relocation is anticipated along the ROW and Tamadigi Camp, should any activities covered by this CRP result in a need to relocate households, RAPs commensurate with the scale and complexity of resettlement will be prepared in accordance with the RPF.

1.3 Sources of Information and Compliance Protocols

Key sources for compilation of this CRP include:

Document	Reference
PNG Oil and Gas Act	1998/2001
PNG LNG Environmental and Social Management Plans	PGGP-EH-SPENV-000018
PNG LNG Company National Content Plan	PGGP-EH-SPENV-000018-13-
PNG LNG Project Resettlement Policy Framework	PGGP-EH-SPENV-000018-030
PNG LNG Environmental Impact Statement	
PNG LNG Social Impact Statement	
Pre-Construction Survey Report for Upstream ROW: KP 153 to KP 120.2	PGHU-SC-SRZZZ-000023
Pre-Construction Survey Report for Upstream ROW: KP 120.2 to KP 85.4	PGHU-SC-SRZZZ-000019
Pre-Construction Survey Report for Upstream ROW: KP 85.4 to KP 69	PGHU-SC-SRZZZ-000028
Pre-Construction Survey Report for Tamadigi Camp and Laydown Area	
International Finance Corporation's Performance Standards on Social & Environmental Sustainability – April 30, 2006 <ul style="list-style-type: none"> ▪ Performance Standard 1 – Social and Environmental Assessment and Management Systems ▪ Performance Standard 5 – Land Acquisition and Involuntary Resettlement ▪ Performance Standard 4 – Community Health, Safety and Security ▪ Performance Standard 7 – Indigenous People 	
PNG – Full Scale Social Mapping & Landowner Identification: Kantobo to Kaiam	James F Weiner (2005)
Company Operations Integrity Management Systems (Element of Community Awareness on Property Rights and Resettlement)	
Company Policy on Human Rights	
PNG LNG Project EPC5A Onshore Pipeline In country Contract	A2173038

This CRP is compliant with all the Lenders Environmental and Social Requirements.

1.4 Project Description

1.4.1 Construction

A 30 m wide ROW is required for most of the pipeline construction spread. Storage areas (topsoil, subsoil and trench spoil), vehicular access/running tracks and work areas for stringing, welding and pipeline installation are included within this ROW. Occasionally, additional workspace outside the 30 m ROW will be required due to minor shifts in pipeline alignment due to geotechnical and engineering constraints. In two sections, 40m and 50m ROWS are required:

1.4.1.1 KP 80 to KP 85.4 (40-m ROW)

To provide a safe working platform, an additional 5 m of workspace is required on both sides of the ROW; creating a 40 m wide footprint. The wider ROW is needed to due to narrow ridges, undulating terrain, steep slopes (greater than 25°) and dense vegetation, which will result in increased evacuation and material storage requirements during construction.

1.4.1.2 KP 85.4 to KP 120 (50-m ROW)

The section traverses highly undulating ridgelines. Because of these topographic features, a 50 m ROW has been surveyed for environmental, cultural heritage and social sensitivities (30 m wide nominal ROW plus an additional 10 m extra workspace either side). The extra workspace is necessary to create a safe working platform and prevention of side casting on steep slopes and ridges while reducing environmental, cultural heritage and social disruption.

The Project will work within the ROWs defined above. However, should unexpected sidelaying or spoil dumping arise then the Project undertakes to survey this area within 30 days² and to calculate additional clan payments, as per the Clan Agency Agreement rates. Deprivation payments will be made within 30 days of the survey and payments for damage and annual rental will be included with subsequent scheduled payments. Payment receipts will be included as addenda to each agreement.

The pipeline route has been continually redefined to avoid cultural heritage (Section 3.6), geotechnical and social sensitivities highlighted during the pre-construction survey of the area. In particular, avoidance of sago and pandanus groves was a prime consideration in final routing decisions. Between KP 91.6 and 93.2 mature *Nathofaus* and *Syzygium* were identified. The ROW was rerouted to avoid them.

1.4.1.3 Quarries / Borrow Areas

No quarry or borrow areas outside the ROW were planned at the time this document was prepared. The contractor's practice is to utilize existing quarries and material from the ROW prior to opening new aggregate sources. Required aggregate will be obtained for construction activities (grading, etc.) within the defined ROW footprint between KP 80 and KP 153 and Tamadigi Camp and laydown site area.

1.4.1.4 Construction near Waterways

As per the Company's Water Management Plan, prior to commencement of construction work, people living downstream of watercourse crossings will be informed through community consultation of the type, location, timing and duration of construction activities.

For watercourses, which are the sole source of water for downstream users, community consultation will be undertaken prior to construction works to assess appropriate alternative drinking supplies, which may include:

- Trucking water to the community for the duration of construction activities which disturb water supply,
- Rainwater tanks; or
- Other alternatives.

Pre-construction surveys incorporated social surveys. This process provides early identification of communities whose access to a clean, ready supply of water could be potentially affected because of the temporary construction works. This early identification allows the Project to adopt a proactive approach to ensure communities will always have access to clean water supplies.

All water crossings within the area covered by this CRP are classified as being 'minor water crossings.' Standard forms of water crossings will be implemented at every water crossing for the purpose of ensuring minimal reduction in water quality and ensuring minimal community disruption including:

² Timing is dependent on normal operating and climatic conditions.

Open cut method (dam): Method used for pipeline crossing of small rivers, stream and creeks watercourse in which a small dam is constructed and water is redirected to an area past the crossing area. This allows the work footprint to dry out whilst maintaining a supply of water to the local community. Silting, erosion and flooding is managed through the construction period. Once construction activities are completed, the dam is removed and the natural flow of the stream is reconnected.

Open cut method (channel): Method used for pipeline crossing of small river stream and creeks watercourses in which the watercourse is redirected around the work front through the construction of an alternative channel, which reconnects to the river past the crossing point. This allows the work footprint to dry out whilst maintaining a supply of water to the local community.

Silting, erosion and flooding is managed through the construction period. Once construction activities are completed, the original watercourse is reconnected and the channel filled in and reinstated as required.

1.4.1.5 Side-Casting

Through application of a prudent and careful approach to the identification of cultural heritage and social assets, the Project has attempted to ensure the risk associated with side casting is minimized. Extra workspaces have been included as part of the construction footprint to assist in the management of spoil and minimization of side casting. In the area covered under this CRP, there are no risks to houses, structures or settlements due to side casting activities outside the ROW.

1.4.2 Operations

Under the Project's licensing conditions (O&GA 1998), the Project is given the right to enter the land, erect buildings, construct roads and install machinery. This provides Project operations the right to maintain vegetation (including removal of trees) to ensure a canopy gap to allow surveillance activities. Post construction access to the Project ROW is required periodically for patrol and inspection of the pipeline to identify erosion and subsidence, checking of cathodic protection, general repairs and performance of maintenance and monitoring.

Upon finalization of construction, measures will be put in place to enable access control as defined under Company's Induced Access Management Plan (PGGP-EH-SPENV-000018-014). The final pipeline easement between HGCP and Omati consists of a 15 m corridor that is interspersed with Mainline Valve sites, Anode Beds and Blowdown Vents, which are located at strategic positions.

At handover to Operations, as per the Environmental Impact Statement Chapter 18 Table 18.21, the ROW will be allowed to naturally regenerate except for a 15 m ROW easement with controlled vehicular access, which will be maintained to provide a gap in the canopy to allow aerial surveillance and general ground maintenance of the pipeline route.

Stakeholder engagement sessions completed and scheduled for this area include communication of the operation based 15 m requirement to the local community. These sessions have advised communities that houses and trees cannot be planted within the 15m corridor but that gardens (shallow rooted crops) are permitted.

2.0 INSTITUTIONAL AND LEGAL FRAMEWORK

The principal PNG legislations relating to land and compensation are the 1996 Land Act and 1998 O&GA. PNG has no formal resettlement policies or statutes.

The resource planning process will comply with all legal requirements and criteria, such as those specified in the O&GA, various key PNG National Government institution guidelines, legislation governing both provincial and local governments and the International Finance Corporation's (IFC) Performance Standards on Social and Environmental Sustainability³.

³ Further details are available in Section 2 of the Esso Highlands Limited PNG LNG Project Komo Airstrip Resettlement Action Plan, November 2009 (revised November 2010).

3.0 SOCIAL, ECONOMIC AND CULTURAL ENVIRONMENT

This section of Project infrastructure is within the Southern Highlands Province and traverses licenses PDL 2 and PPL 287.

3.1 Population

Two linguo-cultural groups have been identified within the Kutubu-Kantobo ROW:

- The **Fasu**, who occupy the western and southeastern fringes of Lake Kutubu down to Tamadigi, and who claim land on both the eastern and western borders of the Hegegio/Tagari River; and
- The **Foi(e)** who inhabit the northeastern fringes of Lake Kutubu extending along the Pimaga to Poroma Road.

The Foe and Fasu occupied a position in the middle of a polyethnic network of trade in items important to subsistence, ritual and exchange activities. With such a crisscrossing network of trade, it is hardly surprising that inter-cultural marriages flowed along these same routes.

The Fasu living near Kaipu are referred to as Aporo Uri, or 'mountain people,' while the Fasu of the Hedinia Valley are called Aporo Hegari, or 'lower people.' The Aporo Uri clearly has marriage and trade links with Huli, which predate the inception of the oil project.

The Foe inhabit the broad valley of the Mubi River and the area to the east of Lake Kutubu. All Foe villages are located on the Mubi River or around the shores of the lake, while the area to the north of the Mubi is uninhabited and used mainly for hunting. The Foe view themselves as comprising three main subdivisions:

1. The lake inhabitants are known as the **Ibumena** ('Lake People') or **Gurubumena**;
2. The Foe along the upper Mubi are called **Awamena**; and
3. Foe along the southern Mubi and Soro Rivers are the 'true' Foe or **Foemena**.

In contrast to the Upper Foe and Lake Kutubu Villages, where many clans acknowledge their foreign origin, the clans of the Lower Foe area insisted that they did not come from somewhere else, that they were the original landowners of the place. The origins of the Foe in the Mubi Valley are from somewhere to the south and west of the Mubi Valley, probably by way of the Turama River system.

Table 3-1 provides demographic data for immediately impacted and surrounding villages within the catchment area covered by this CRP.

Table 3-1: CRP Impact Area Households, Population, ILGs and Survey Status

Ethnic Groups – Census Units	Pop. 1990 Gov Census	No. of HS 1990	Pop. 1994 Chevron	Pop. 2000	No. of HS 2000	No. of ILGs 2005
KUTUBU CATCHMENT						
FOE						
Hegeso	223	40	390	395	36	8
Inu	226	70	556	137	21	4
Tubage	-	-	140	132	22	3
FASU						
Kaipu 1	-	-	184	254	63	10
Kaipu 2	-	-	44	63		2
Hedinia	220	39	200	312	46	6
Ai'io	-	-	85	104	16	2
Mano	218	38	192	259	48	8
Tamadigi	58	13	81	114	22	3

Ethnic Groups – Census Units	Pop. 1990 Gov Census	No. of HS 1990	Pop. 1994 Chevron	Pop. 2000	No. of HS 2000	No. of ILGs 2005
TOTALS	945	200	1,872	1,770	274	45

3.2 Cultural Context

3.2.1 Social Organization of Clans

Fasu social organization is based on patrilineal descent⁴ principles with clans (*aporo ira*, ‘man line’) and sub-clans having headmen (*uni ha*) as corporate representatives. Fasu did not traditionally maintain long genealogies and their groups would segment or fission after a few generations⁵ into distinct self-contained communities.

Fasu clans are often represented in more than one village and, because of their small size, prone to erratic population fluctuations. The clans are totemic in the sense of recognizing descent from some animal or plant species.

The intersection of descent and kinship (i.e., consanguineal relations) articulates a range of relationships between people; between people and the supernatural; and between these spheres and the land. This web of relations provides a degree of flexibility for any person as to where they choose to live and garden, though rights are strongest where one’s descent group has their primary locus of ritual and social interests.

Nevertheless, because one may work land in one’s mother’s, father’s or wife’s land, all of these different lines of kinship obligations provides a person with a portfolio of rights often in more than one territory at a time.

The Fasu residential pattern has undergone a degree of change. The longhouse no longer retains its traditional function as an exclusive abode of men, or a reflection of the social ordering of component sub-clan lineages in the village. Rather, it serves as a symbol of Fasu culture and identity, a clubhouse for public meetings and a guesthouse for visitors.

Co-residential households are now the norm in Sisibia and Kaipu, which are adequately serviced by reticulated water and a predominance of iron roofs, solar panel power and good road networks.

Like the Fasu, the Foe too have agnatic descent and lived traditionally in longhouse (*hua*) communities. The most important social groups to which an individual belongs are the totemic patrilineal clans (*amenadoba* — ‘man-line’) and the longhouse village. Most clans have representatives in more than one village — i.e., the totemic named clans are dispersed—so that what one encounters in each place is in effect a local clan.

Each longhouse community comprises between three and 11 different local clans. This is organized as a central communal men’s dwelling flanked by smaller individual women’s houses on each side. Community sizes vary between 36 and 300 people.

3.2.2 Subsistence Patterns

Both Fasu and Foe are traditionally dependent on three forms of subsistence strategy:

1. Sago Palm cultivation;
2. Swidden (shifting) gardening or horticulture, and

⁴ **Patrilineal (or agnatic) descent** - by this is meant that people are born into, or become members of, named groups commonly called **clans** by virtue of their capacity to demonstrate an unbroken line of descent to founding ancestors through successive generations of male links.

⁵ Few Fasu clans have more than thirty members. Units lead by senior men hive off after a few generations and constitute themselves as separate primary landholding groups.

3. Hunting, gathering, fishing and pig husbandry.

Swidden horticulture (slash and burn/shifting) utilizes a bush-fallow technique where sweet potato is supplemented by taro, sugarcane, bananas, various leaf vegetables, choko, pumpkin, cassava and a variety of pandanus. During the period when gardens are left fallow to regenerate, crops such as *marita* (*Pandanus conoideus*) continue to grow so that fallow (old) garden sites remain an important source of food. There were ten such active and seven fallow/abandoned gardens along the ROW. Some of these subsistence goods may be traded in local markets such as Moro providing a small source of income.

The main source of protein for Kutubuans is fish. WWF has estimated that as much as 70 tons of fish from the lake are consumed annually (SIA 2007/8, Coffey International). Villages not located on the lake rely on protein from pigs and from small game.

3.2.3 Types of Land Rights and Land Ownership

Fasu and Foe land use and tenure are determined by descent group membership. There are common clan segment territories and distinct hunting districts as well. These clan segments are normatively corporate groups whose members define themselves in terms of common and collective responsibilities for each other's bride wealth obligations.

Whilst the clan segment acts as a landholding unit, and is commonly registered as an independent ILG, individuals hold separate land parcels by exploiting them for productive purposes. Such rights are passed from father to son. Access to land use can also be extended to others based on cognatic kinship or affinal ties.

A domestic group, in order to function, must have access to all the different types of resource territory — water, hillside, garden land, sago swamp, hunting ground, pandanus swamp, bamboo grove, and so on — or else it cannot provide itself with the necessities of life. These different types of land are found in different ecological zones and by definition geographically spread out.

If a land-holding unit's total holdings begin to exclude necessary types of land, it will not function well as a basis for the maintenance of domestic life, (e.g., Tugiri Village lacked conveniently close sago swamp near its village site and had to make complex arrangements to obtain access to sago swamps on Gesege Village land).

In addition, permanent and semi-permanent tree crops including sago palms, pandanus, kara'o (tigaso) trees and a variety of others are individually owned. A man may request permission to plant such permanent trees on another man's land and sometimes this is granted. Men, however, are reluctant to grant this permission because it would then give the grantee an ongoing right in the spot on which the tree is planted. When usufruct rights are granted, men often insist that no permanent tree crops be planted by the user.

Gilberthorpe (2002:63) indicates that the ownership of permanent tree crops is the defining feature of Fasu ownership of land by a totemic named clan, and suggests that the granting of ownership of such tree crops to immigrants is central to the permanent acquisition of allies and numerical enhancement of the local clan.

However, the availability of sago swamps at convenient locations is a different matter, and most large sago swamps contain palms belonging to a number of men, not all of them members of the clan that technically own the swampland itself.

Although the local clan owns territory communally, individuals within the clan stake their claims to particular places within the communal territory, and commonly these men's sons continue to live at these places and utilize resources around them. These men acquire rights over the places that are considered proprietary and can even prevent other local clan members from encroaching on the land.

It is not demonstrable that the local clan acts collectively to further the interests of the clan as a collective unit. In traditional times, the local clan rarely acted as a single unit, except ceremonially in bride-wealth distributions. Land decisions were relegated to those directly involved.

3.3 Land Disputes in ROW Environs

Most of the disputes and grievances in this section of the Project ROW have concerned distribution of petroleum revenues and not disputes over ownership of land per se. The only recorded land issue was between Yaferaga clan of Ubogo and the Badi Sanemahia clan of Yorogobaiyu over ownership of land near lagifu 7x–9x.

A submission was heard by a local land court in 1992 at Pimaga, and the matter resolved in favor of the Badi Sanemahia clan. The SMLI for Kutubu-Kantobo (Weiner 2005) contains a history of all land disputes to that juncture in time. No other land disputes have been recorded since that date for these environs.

The precedent process for resolution of all such issues is for the parties to either:

- Hold a moot and settle the matter in accordance with custom;
- The Operator to offer the disputing sides a chance to settle their differences by third-party mediation; or
- In the event that (a) and (b) prove unsuccessful or unacceptable.

Then in accordance with O&GA Section 121, the parties or DPE may refer the issue for resolution to the Local Land Court under the Lands Dispute Settlement Act.

3.3.1 Land Ownership

Fasu are sub-divided now into some 90 clans residing in over 13 villages. There is a locally recognized division in the sense that Fasu categorize themselves into three distinct social and geographic groups. The three groups are known as Uri (mountain), the Yasuku (*yao*=bush, *suku*=top) and the Hekari (*he*=water, *kari*=head).

- Uri group comprises five Longhouse communities inhabiting the northern, mountainous region;
- Yasuku group inhabits five Longhouse communities in the southern region; and
- Hekari live in the area now more popularly referred to as Waro comprising three Longhouse communities.

Fasu also perceive these groupings as having differences at the dialect level (Kurita 1994).

The problem of disparity in size of clans and in size of landholdings among Foe clans is well known in the ethnographic literature. The clans of Lower Foe are small compared with the very large clans of Upper Foe. The 'names' of Foe social groups aggregate people on the basis of territory.

Hence, sub-divisions of clans are referred to as, for example, Mubiga So'onedobo ('the So'onedobo who live near the head of the Mubi River), as opposed to Baibu So'onedobo ('the So'onedobo who live near Baibu Creek'). Individual lines within a clan are likewise differentiated and often named according to their land.

Table 3-2 lists the main landowning clans along the Kutubu-Kantobo ROW providing a comparison against the findings for the similarly routed PNG Gas pipeline ROW given in Weiner's (2005) SMLI report. All clans variously reside in the villages of Mano, Ai'o, Tamadigi, Inu, Soro, Kantobo, Kaipu, Waro, Hedinia, Tubage, Kaimari and Surawabo.

Table 3-2: Kutubu-Kantobo ROW Principal Clans

CLAN	CLAN	CLAN
KP-120	TAMADIGI laydown/camp	MUBI-KENO
Yafafeka [Yaferaga] ⁶	Amarunawano (Amaruru)	Isabu [Isabu]
Kawai Mahia	TUBAGE	Muti
Lai Sirigi	Waidobo	Imawi
Lobosa	Orodobo	Kanewepi
Murubayu [Murubaiyu]	Haiyadobo	Yasi
Orasanamahia	Ufuma	Amururu Nuano
Orodobo	Konagedobo	Hetake
Ufama [Ufuma]	Fomaahu	Sukuri Hagu Sirigi
KP 153-120.2	Baamadobo	Gegenno [Kekeno]
Lobosa [Lobosa]	Egadobo	Isabu
Hebaiya [Hegege- Hebaia]	Sanamahia	Gobe [Gobe]
Hegeso [Hegiso- Nauano(sc)]	KENO-MORO	Augaturidi [Augaturidi]
Akaturubi [Augaturubi]	Sanemiah [Sanamahia]	Sisibu
Tetukaia Ai'io	Sirigi	Amururu Gobe [Amuru-Nauano]
Kikisuru [Kikisuru]	Hedinia	Hegeso
Hetake	Datukaya	Enapo Kikiri [Enabo]
Segehe [Segahe-Ai'io]	Ai'io [Ai'io]	Ufama
Sikuriaku sirigi [Sukuriagu- Nauano]		Murubaiyu
Amarunawano		Laboso/Taiya
		Segahe
		Kikisuru

3.3.2 Tamadigi Village

Tamadigi is the southernmost Fasu village and has traditionally close ties with the Foe of Kaibutage village (this name means 'the end of the Kaibu River' after its original location. This village is now called Suruwabo, the westernmost of Lower Foe villages). Men of Augaturibi clan of Kaibutage have resided at Tamadigi for a long time.

In Tamadigi, Amururu Nauwano and Hegeso Nauwano are the two main clans, and although they are both 'Nauwano,' no higher-order discrete entity (such as a 'Nauwano' clan), exists. Amururu and Hegeso do not differentiate between landholdings and can thus be described as a 'duplex' clan. Representatives of these lines maintain that Amururu and Hegeso have always been at Tamadigi and did not originally come from another place.

3.3.3 Mano Village

The land of Mano village lies between the Digimu and Hegigio Rivers. Eight named *aporo ira* were identified in the first clan boundary map of PDL 2 in 1998: Kaburi Enabo, Ufama Enabo, Hagi Enabo, Gioiburu, Hegehebaya, Sugurihagu, Nigima and Segahae~ Ai'o.⁷ The eventual ILG names of Mano did not correspond entirely to these named land-owning clans and the following ILGs were subsequently added to the original eight: Hegege Hebaya, Iwa Hebaya, Fogoteri Sugurihabu, Umayu, Iwa Segehae, Bubiayu, Juniayu and Asi Enabo.

⁶ Kutubu Social Mapping Report 2005 (Weiner). PNG Gas Project.

⁷ I use the symbol '~' to indicate nasalization of the preceding vowel.

Men at Mano maintained that the new ILGs are a response to increasing population and the tendency for Fasu clans to fission. It should be noted that there is no shortage of land in Fasu and therefore pressure on land cannot be a contributing factor to group re-organization.

3.3.4 Ai'io Village

In 1998, the only clan listed from Ai'io village was Tatukaiya Ai'io. However, Tatukaiya Ai'io, like all other Fasu clans, has grown in population and segmented over time. This has evidently occurred in three stages since 1992 spawning units such as Kakaribu, Yaferaga Ai'io and Ai'io. None of these 'buddings' have affected the stability of the village nor the primacy of the Tatukaiya Ai'io clan as the major patrilineal land-holding group of Ai'io.

3.3.5 Hedinia Village

The following six clans, Sirigi, Ufuma, Kawai Sanemahia, Muribaiyu, Hedinia Lobosa and Yurage Kikiri, were originally registered as ILGs for Hedinia Village in 1992 by Chevron Niugini. The subsequent history of this village indicates absorption by many clans of other units, and most particularly, where land access became a problem. Peter Heno and John Kolip for Chevron Niugini noted:

The Kigiri clan of Hedinia led by Hefau Hauga has been absorbed into Lobosa clan due to no land parcel in Hedinia [sic]... they have the usufruct rights [sic] in handling the affairs of the land [given to them by Lobosa]. . . .

While Fasu have rarely experienced land shortage problems, the constant fissioning of groups has made for a high degree of flexibility in respect to movements across the area. Given the shallow genealogies of usually 6 – 8 generations, it was evidently easy for groups to be absorbed into others and come to assume permanent land rights.

3.3.6 Soroga

The Hora Sanemahia clan has their ILG property list under the name 'Kororadigi Sirigi/Hora Sanemahia' which indicates their provenance and relationship to Sirigi land further north. Atatemaiyu clan also receives royalties in PDL 5 (Moran) under the Hora Sanemahia.

3.3.7 Lower Foe: Kaibutage (Suruwabo) Village

Kaibutage has moved from its old longhouse site to another site called Suruwabo along the banks of the Mubi. They are accessible only by river, which will make it difficult to participate in gas development business opportunities given their difficulty in accessing the local road system.

Auguturubi clan is the main group in the village and contains the remains of a dwindling Asabu clan, which agreed to become Auguturubi members.

3.4 **IPCA's and Project Socio-Cultural Context**

The objective of IPCA's was to obtain agreement with all clans, within the development area, on compensation payments that will be made for losses, damages or deprivations that may arise from Project development. Table 3-3 summarizes the status of IPCA's signed along the ROW.

Table 3-3: Status of IPCAs

Item	IPCA
KP 148	An IPCA has been signed (1.2.2011) for the Tamadigi camp and laydown area adjacent to KP148. The Amarunawano clan claims ownership of this area. Consent has been given by the clan for use of the land and construction. Management of Ana Ano creek, Kekeno Wasaki creek and Mubi River road will be maintained to allow landowners free access during construction.
KP 80	Tubage Junction IPCA signed (12.08.2009). Clans impacted are Waidobo, Orodobo. Haiyadobo, Ufuma, Konagedobu, Foma'Ahu, Ba'Amodobo, Egadobo, and Sanemahia
KP 85-120	Keno to Moro IPCA signed (29.07.2009). Clans impacted are Hora Sanemiah, Lai Sirigi, Kuragawa Sirigi, Hakuri Yaferaga, Ufuma, Hedinia Murubaiyu, Ako Hedinia, Kawayi Sanemahia, Lobosa/Taiya, Aioo Datukaya, Segahe, Habaya Yuni Aioo, Nonora Aioo, and Kikisiru
KP 120-153	Mubi to Keno section of ROW IPCA signed (4.11.2009). All landowners part of the Iru, Kekeno, Isabu Muti, Imawi, Gobe, Augaturidi, Imuai, Kanawepi, Sisibu, Yasi, Amuru-Gobe, Amorusu Nuano, Sukuri Sirigi, hegeso, Hetake, Enapo Kikiri clans.

The IPCA has an attached Schedule 1, which describes compensation types and rates to be paid to impacted Project landowners. It references the O&GA section, which proscribes these payments. Compensation for the use of the surface of the land, and any loss or restriction on rights of way is thus covered by the deprivation payments.

The licensee, its agents and workmen, are granted full and exclusive rights to occupy land within a license area for the purposes of processing petroleum over the life of the Project. Occupying such land as is used for these purposes or interfering with licensee rights may be deemed as an offence of the O&GA legislation and trespass (O&GA sections 113, 122) for which the licensee may proceed to the National Court.

Alternatively, there is provision under sections 151–152 to request the DPE to dispatch an Inspector if the obstruction also constitutes a health and safety hazard. In certain circumstances, the DPE Inspector may impose a fine of K5000.

Landowners will not be allowed to build or otherwise use any land within the proscribed ROW for the duration of the Project and term of rental. Some instances are excepted when the Project has first formally advised landowners that small crop planting and gardening are permitted and the pipeline is buried.

The Project will inform affected landowners of relevant ROW use restrictions. Mechanisms may include roadshow presentations and distribution of information leaflets.

3.5 Land Requirements

3.5.1 Land Needs

The area of land-take along the ROW is summarized in Table 3-4.

Table 3-4: ROW Land Need

Section	KP	Width (M)	Total Area + 10% (Ha)	
			Corridor	Works (90%)
Life of Project (20 to 30 years) Pipeline ROW*	80 – 85	40	24	21
	85 – 120	30 to 50	177	160
	120 – 153	30	109	98

Temporary Use During Construction (~ 1.5 yrs.) KP148 Tamadigi camp/laydown	148		26	16
Total Ha			336	295

Note: * An average of 15 m will be required during operations with the remaining construction ROW corridor (+/- 15 m) being available for gardening or reversion to forest as per EMP.

IPCA compensation rates are paid as per the O&GA, Section 118 (2) a-e (Table 3-5). In the event of a dispute, the matter will be referred to an appointed DPE officer, or Warden, in accordance with Sections 118-119.

Table 3-5: Compensation Rates

Type of Compensation	Kina	Area	Term
Land Rental/Deprivation	400	Ha	Year
Land Surface	2,575.00	Ha	Once only
Natural vegetation, bush etc	1,287.50	Ha	Once only
Gardens, plants, trees	Full Replacement Valuation	Agreed counts	Once only
Water contamination etc	TBA	As agreed	Per month
Gravel Royalty	0.70	Cubic meter	-

Although a number of garden sites were counted in the survey area, most are abandoned or used sporadically where they have some economic trees and crops. The loss of ten active and seven fallow/abandoned gardens, some with remaining tree crops, is not assessed as causing a serious subsistence hardship to their owners, all of whom rely on other gardens for similar resources.

The ten active gardens identified are planted with various crops used as subsistence food resources. These gardens will be fully compensated based on FRV, as will the economic trees remaining in the fallow/abandoned gardens.

The Company's Land & Community Affairs personnel will assess areas and crop losses for individually owned gardens identified. Individual agreements will be made and compensation paid as per the agreement.

In addition to gardens, 79 food/economic trees and 20 sago patches were identified. These are understood to be communally owned and be compensated as part of clan compensation for land loss.

The social features/assets requiring management during construction of Tamadigi camp are Ana Ano Creek, Kekeno Wasaki Creek and Mubi River Road. Water is unlikely to be consistently sourced from Ana Ano Creek, as it is ephemeral. The Mubi River Road is a vital link between Moro, Gobe and Kikori and maintenance of continued access is essential.

Along the KP 80-153 ROW, several watercourses including ephemeral streams and creeks were identified that represent sources of drinking water, food source and fish and reptile habitat. The following streams provide secondary sources of water.

- Baiawara'aro Marisa stream: Sura Wabo and Tamadigi hunters;
- Ketegeta stream: Amaranawano Clan and other Tamadigi hunters accessing the area;
- Fakapiri stream: Hegeso clansmen and neighboring Hedinia and Tamadigi villagers access the stream in this part of the jungle for hunting and gardening purposes; and

- Hirisia stream: local hunters accessing this part of the jungle and downstream it supplies water to Hedinia villagers.

Section 1.4.1.4, construction near watercourses, provides details regarding community engagement and construction methodologies to be used to reduce community disruption when construction crosses these watercourses.

All construction, logistics and labor resource activities will be undertaken in accordance with the following Social Management Plans:

- Camp Management Plan - PGGP-EH-SPENV-000018-024;
- Community Health & Safety Management Plan PGGP-EH-SPENV-000018-021;
- Community Impacts Management Plan PGGP-EH-SPENV-000018-022;
- Community Infrastructure Management Plan PGGP-EH-SPENV-000018-027;
- Community Engagement Management Plan PGGP-EH-SPENV-000018-026; and
- Labour and Worker Conditions Management Plan PGGP-EH-SPENV-000018-023.

Pursuant to Mitigation Measure M006 of the Company's Ecological Management Plan, the areas to be disturbed will be restricted while undertaking the works. The construction footprint shall be demarcated and works shall not be permitted to exceed the designated areas.

Decommissioning responsibilities are detailed in the Project's Environmental Management Plan. All infrastructure will be removed and re-vegetation and land rehabilitation programs implemented.

Negotiations will be conducted with landowners with respect to return of cleared and decommissioned campsites and laydown areas. Landowner preferences may be to reinstate the land for agriculture and/or utilize the site to accommodate some type of business venture.

3.5.2 Minimizing Resettlement

The ROW has been realigned to avoid all physical resettlement and reduce impacts on gardens or sago clusters.

There is no residential settlement nearby the proposed 16 ha Tamadigi campsite; no physical resettlement is needed since it is not used. To evaluate potential impacts of the site's temporary loss during construction, the Project commissioned an independent expert⁸ to assess: (a) landowner perspectives on loss of campsite land; and (b) availability of other land owned by the affected clan.

Weiner conducted interviews with Amaruru clan members – previously identified as campsite landowners - who unanimously indicated the campsite land was '*busnating*' (pidgin – 'just bush scrub'). The area was not a significant sago or garden planting site. Amarurusago places were identified as several km from the site.

The clan attributed no great significance to the land in terms of subsistence value and the proposed use does not constitute for them a significant 'loss.' Weiner advised that there would be no impact on local subsistence activity and no resultant shortage of land in that area for project affected landowners.

⁸ Weiner conducted the PNG LNG SMLI studies for Kutubu (2005), Kantobo-Kaiam (2005), and Kaiam-Omati (2006) and is thus uniquely equipped to provide an expert assessment of these issues.

3.6 Cultural Heritage Sites

Knowledge of cultural heritage in the Kutubu-Kantobo ROW is based on:

- Research undertaken in 2005 and reproduced in the 2009 EIS SIA (Appendix 26).
- The 2009-2010 ROW pre-construction fieldwork.

No firm dates are available for first settlement of the area, but should date to at least 26,000 BP1, when the Central Highlands were first occupied (Gillieson and Mountain 1983, White with O'Connell 1982). Understanding of the long human history of the region rests for the moment on the linguistic reconstruction of movements and of relationships between groups.

Prior to the inception of the Chevron project at Kutubu in the late 1980s, no archaeological sites had been reported from the Middle Kikori region and only a handful were known from the immediate vicinity of Lake Kutubu.

A total of 291 sites were identified and documented in the course of the initial site surveys, either in the literature, or through interview, or through field identification. These sites extended along the ROW from Gobe to Baguale and were listed in the EIS SIA (2009) appendices (Table 3-6).

Table 3-6: Initial Cultural Heritage sites Kutubu-Gobe ROW

Site Survey Areas	Prefix Code	No. Sites
Lake Kutubu	LK	63
Foi-Fasu	FF	207
Gobe	GB	21
TOTAL		291

The principal site types nominated by communities in the Foi-Fasu area are:

- Caves and rock-shelters which are referred to as kaniako in Foi and as kunika in Fasu, and are often used as temporary camps, ossuaries or for hunting flying foxes;
- Spirit sites which commonly take the form of water features such as rivers, lakes or pools, but also appear as hills, caves, boulders and trees, and can have either malevolent or healing powers;
- Burials, which are usually located in caves or niches but are also occasionally found in open ground;
- Settlement sites, which are the known locations of former settlements, usually on well-drained ridges adjacent to fresh water sources and sago groves; and
- Stone tools and weapons, such as mortars, pestles, club heads, and stone bowls, are found in the topsoil in the Mubi Valley. The Foe tended to see these artifacts and remnants, which they called tibu, as material incarnations of spirit beings, and they considered that they could be used for magical purposes, primarily to kill or injure other persons. After missionization, the Foe tended to fear these objects and some were destroyed by the Missionaries.

There are particular concentrations of sites along the pipeline route at points where the pipeline traverses clay ridges interspersed with sago groves, or enters relatively level and open areas within the limestone karst country. These are also areas in which archaeological evidence for past settlement is concentrated and in the form of surface scatters of flaked stone and artifact finds. Areas along the pipeline ROW in which cultural heritage sites appear concentrated include the:

- Moro area, where many of the sites have already been partially or wholly destroyed or impacted;
- Kaipu River valley, around Kaipu Village, which contains a particularly rich series of sago swamps; and
- Tamadigi village area, where there appears to be a cluster of burial and settlement sites.

Table 3-7 presents the findings of the pre-construction archaeological surveys along the impacted ROW and which took place in the last quarter of 2010.

Table 3-7: Cultural Heritage Sites

Area	# Sites	Cultural Heritage/ Spiritual Sites
KP 80- KP 120	19	<p>Two significant sites are in the construction footprint – burial sites LK045 and TA009. These sites belong to Lai Sirigi clan and have been avoided through realignment of the ROW. Site TJ005 (a and b) is on contested land and permission has been granted by the Oro'odobo Clan. Permission will be sought from the contesting clan prior to commencement of construction.</p> <p>The cultural heritage sites identified/verified during the survey included:</p> <ul style="list-style-type: none"> • Two burials (LK045 and TA009) (see Plate 11) which are outside the ROW construction footprint. Sites will be avoided and access prohibited. • Six oral tradition sites (TJ006, TC004, TC003, TC002, TJ005, TC001 and CPF-002). According to Mitigation Measure M237 of Company's Cultural Heritage Management Plan, consultation will be undertaken through Company's L&CA team with relevant landowners to determine appropriate mitigation measure, which may include compensation for destruction. • Six caves (FF112, TJ004, LK048, TA015, F111 and CPF-001) are located outside the pipeline ROW and will be avoided and access thereto prohibited. • One artifact scatter (TJ003) which as per the Mitigation Measure M232, has been assessed by a PNG qualified archeologist and approval granted for disturbance (see Plate 12). • Three ossuaries (LK046, TA016 and TA017). LK046 is approx 100m away from the construction footprint, the site will be avoided and access prohibited. Site TA016 and TA017 will be mitigated according to M237 of Company's Cultural Heritage Management Plan.
KP 148 - Tamadigi	0	<p>One cave (TA011) and one sing-sing ground (TA012) are outside ROW and the sites will be avoided with access prohibited.</p>
KP 120.2- KP 153	5	<p>Two other previously identified sites (TA006 and TA004) could not be verified by the Kikisuru Clan representative present during the survey.</p> <p>The cultural heritage sites identified/verified during the survey included:</p> <ul style="list-style-type: none"> • Two oral tradition sites (TA007, TJ011). • Two (TA003, TA002). • One archeological site (TJ008).

The Project's cultural heritage programs and protocols have been developed to deal with both archaeological evidence and secondary burials, and to ensure that, where appropriate, relocation of ritual items occurs in accordance with local custom. The Project's preferred management approach for known cultural heritage sites is avoidance. For sites that cannot be avoided however, appropriate management measures may include sample salvage-excavation and/or salvage through surface collections.

4.0 CONSULTATION AND DISCLOSURE

4.1 Stakeholder Engagement

Stakeholder engagement sessions (Table 4-1) were conducted to provide communities with clearly understood overviews of the Project including:

- Specific details associated with the scope of work to be undertaken within a particular area;
- Information associated with construction methodologies;
- Details regarding the environmental processes and safeguards used by the Project teams; and
- Information related to ensuring the safety of the community and the Project members.

Table 4-1: Summary of Stakeholder Engagement Consultations along ROW

Village	Dates	Activities	Issues	Attendees
Tubage-Moro	23/11/2010	Pipeline construction and road safety awareness	Safety of children, environmental impact, UBSA	55
Mano	6/5/2011	Operations & Maintenance Training Program, pipeline construction and road safety awareness	Marginalization of local people by high educational entry standards, employment and training opportunities, safety	60
Waro	1/11/2010	Pipeline construction and road safety awareness	Employment and training opportunities, safety	47
	12/6/2011	Operations & Maintenance Training Program	Marginalization of local people by high educational entry standards, provision of other educational opportunities	50
Tamadigi	4/11/2010	Pipeline construction and road safety awareness	Employment, Environmental impact, Compensation, social services	40
	12/12/2010	Pipeline construction and road safety awareness	Failed government promises, business development opportunities, concerns about Lancos	23
	8/3/2011	Clan leaders meeting on road safety	Road upgrade, construction of culverts to avoid flooding	42
	6/5/2011	Operations & Maintenance Training Program	Marginalization of local people by high educational entry standards, request for other training opportunities	80
Ai'o	5/11/2010	Pipeline construction and road safety awareness	Employment, environmental impact, road construction, Lancos	78
Kantobo	7/2/2011	General project information, pipeline construction and road safety awareness	OSL PDL2 royalties, clan land boundary conflicts, recognition of own Lanco	141
	15/6/2011	Operations & Maintenance Training Program	Marginalization of local people by high educational entry standards, concern that university students apply and miss longer-term opportunities, provision of other training	50

4.2 Resettlement Engagement

A specialist resettlement team from the Company conducted initial resettlement public consultations along the Kutubu-Kantobo ROW in Ai'o, Mano, Tamadigi, Tubage and Waro between 14–17 December 2010. The Environmental Law Center (ELC) played an active monitoring and review role as an impartial observer (Table 4-2).

Table 4-2: Summary of Kutubu-Kantobo Consultation Interactions for Affected Communities

Resettlement Awareness						
Village	Date	Awareness Team*	Number of Attendees			
			Male	Female	Children	Total
Tubage-Moro	14/12/2010	RIT, L&CA	20	8	12	40
Mano	15/12/2010	RIT, L&CA	33	12	13	58
Waru	15/12/2010	RIT, L&CA	42	11	11	64
Tamadigi	16/12/2010	RIT, L&CA	12	10	13	35
Ai'io	17/12/2010	RIT, L&CA	35	24	20	79
Kantobo	26/11/2010	RIT, SE & L&CA	33	15	13	61

* RIT – Resettlement Implementation, SE – Stakeholder Engagement, L&CA – Land & Community Affairs.

4.3 Summary of Issues by Communities

Concerns raised during resettlement consultation and disclosure sessions (Table 4-3) were generally related to the possibility of environmental damage, past broken promises, loss of sago palms, and dissatisfaction with the Valuer General rates. A selection of the concerns and questions raised is summarized in Table 4-3.

Table 4-3: Summary of Issues by Communities

Main Issue	Question	Answer	Action Required
Tubage Village-Kutubu, 14/12/2010, 10:15-14:35			
Grievance Process	How will the community bring its grievances to the Project and ELC?	Can be taken to L&CA anytime. ELC will also have a presence at Moro and Homa.	Ascertain dates when ELC at Homa & Moro and advise community.
Environment	Will the ground be affected after the gas is extracted?	No. The top soil is about only 1 m and the gas and oil deposits are 2 - 3 km below the surface.	None.
Social	We have had promises before and they were broken. How do we know it won't be the same here?	We are from the Resettlement Implementation Team doing this RAP Disclosure to inform you prior to the construction or laying of the pipe. You will receive your economic displacement payment for your flora and fauna as well as rental or lease payment. LBBSA/UBSA is under the control of the government and MRDC to provide the tangible development that you have been promised.	To keep communities fully informed about progress in delivering commitments. Informing them about how to find L&CA for obtaining information or lodging grievances.
Mano Village, 15/12/2010, 10:35-12:45			
Environment/ Social	Sago is their staple food. If the pipeline alignment goes through the sago patch, their sago palms will be destroyed. The community is concerned they will lose access to their sago patch. Will the Company look into this issue?	Construction will be for a short period. They will only be restricted during construction and laying the pipes. They will still have access to their sago patch after construction.	None.
Benefits/ Government	Previous awareness conducted by DPE said that everybody along the pipeline route will receive the same benefits. Why will there be different types of	This issue is best addressed by DPE.	Advise DPE of need for more awareness along ROW.

Main Issue	Question	Answer	Action Required
	benefits (Physical & Economical)?		
Environment	SpieCapag surveyors and engineers surveyed the area where the pipeline will be laid. The area through which they intend to put the gas pipelines is the only water source for the community.	The Project will work to ensure access to watercourses continues and minimal impact occurs.	Advise contractor of need for more awareness on environment impacts and mitigations. Request L&CA continue advising communities about water supply plans.
Waro, 15/11/2010, 13:40-15:05			
Social	Fasu people are not worried about the compensation payments. What has been in the LBBSA/UBSA needs to be fulfilled. There haven't been any changes in their community after Chevron and OSL. They are afraid history might repeat itself.	Acknowledged comment.	None.
Social	Pipeline will be laid on our land. Get the actual landowners to participate in the Project, through employment opportunities, etc. Why are they employing people from outside of the Project area?	Skilled and unskilled workforces are recruited by the Contractor or the Contractor's subcontractors.	Advise Contractor to undertake further employment communication in this area.
Tamadigi, 16/11/20, 10:35-14:30			
Environment/ Social	Chevron brought lots of damage. Our environment is damaged. Trees, birds disappeared. Our people don't want to stay here anymore. The road needs upgrading because so many cars and trucks drive over it each day. We must work together to bring prosperity and improve the living standard.	Acknowledged comment.	Advise Company's stakeholder engagement team to review possible additional communication sessions for this area.
Benefits/ Government	Our leaders cheated us. Bring our money directly to us. We don't trust our leaders. Just look at our community. The houses are deteriorating and falling apart. Bring the money directly to us; don't put it in MRDC where selfish leaders can have access to our royalties. We have established a limited company and an Association for OSL and LNG royalties - Kaipu Hau Ltd and Awahau Pipeline Principal Landowner Assn. We have 5 clans:(1) Amululu Rauano (2) Suku haku Siriki (3) Hegeso (4) Kawirakatiki Siriki (5) Enapo Kikili (6) Hetatake.	Acknowledged comment and explained that Company is not responsible for these decisions but would assist in relaying the message to DPE.	To advise DPE.
Business/ Social	I have lived through all the experiences and promises from the 1992 petroleum project. We were advised to plant all the cash crops, vanilla, coffee, cocoa, and they all fell through because of lack of market. We are now planting rice - too much rice and still no market. We	Acknowledged comment. The Project will be upgrading many of the support roads used for construction. The Project will not be building roads, which are government's responsibilities. The UBSA/LBSA was also the	None.

Main Issue	Question	Answer	Action Required
	hope that with LNG there will be a better deal for us to market our produce and better roads so I can take my produce to distant markets (e.g., Kikori or Tari).	forum for requesting this kind of infrastructure improvement.	
Ai'io, 17/12/2010, 9:20-11:35			
Environment	I am the Aid Post Orderly. When OSL laid the pipes, it disturbed the flow of the waterway (Kamoana River) causing waterlog upstream and dry downstream. As a result, fish died and trees/plants (Saksak) died within that area. OSL never compensated them for this, nor attempted to alleviate the problem. Will LNG do the same to their water source and the environment?	The Project will work to ensure access to watercourses continues and minimal impact occurs. Any damage inadvertently done will be compensated.	None.

5.0 PROJECT IMPACTS

As described above, most of the villages in the Kutubu-Kantobo environs have been stable over a number of decades. The majority of Samberigi people live away from the pipeline ROW to the north and in the hills. The ROW is situated for the most part in unoccupied rural land of marginal subsistence or residential potential for local populations. Table 5-1 summarizes principal impacts likely to be experienced by landowners.

Table 5-1: Principal Impacts Likely to be Experienced by Kutubu- Kantobo Landowners

Impact	Scale	Mitigation – Project Responses
Residential, business or other structures affected	None.	None. (If structures be encountered protocols detailed in the Heavy Haul Road RAP will be implemented.)
Loss of trees and crops	Ten active gardens. Seven fallow/abandoned gardens. 79 food/ economic trees. 20 sago/mixed sago forest assets.	As per O&GA Section 118 and Eligibility Matrix landowners are entitled to one-off damage compensation payments, should losses arise. Active garden owners will be compensated for loss of crops and trees at FRV. Fallow/abandoned gardens will be verified as not active. Any economic/cultivated trees compensated at FRV.
Loss of forest/other natural resources	Access to 336 ha of communal forest resources, 13 fishing areas, and 3 hunting grounds were identified as potentially impacted. Pandanus swamp forest/sago swamp occur sporadically within ROW.	As per O&GA Section 118 and Eligibility Matrix these affected landowners are entitled to temporary loss (K1,287/ha), damage (K2,575/ha) as well as deprivation compensation (K400/ha p.a. rental). All currently negotiated rates will be verified against full replacement values (market rates). These payments are made to the respective landowning groups (i.e., clans or clan segments) and have to be shared out amongst the respective members in accordance with custom. In the event of disputes, the money is held in escrow until the dispute has been resolved either formally through the court system or informally. Impacts on fishing areas and hunting grounds will be temporary. Compensation is included in the damage and deprivation payments for communal resources. There is an abundance of pandanus and sago swamp outside of the ROW that the clans will have access to and which will not be impacted by project construction. Removal of some for construction will not significantly affect subsistence livelihoods of the local people.
Disruption in social networks	No physical relocation. Some impact from contractors' workers operating in the area.	Minimal. Contractor's workers will be housed within a closed camp environment to minimize the effect associated with the introduction of large numbers of people into the community.
Water	29 Drinking water sources and 5 water sources used for other domestic supply were identified in the survey as potentially impacted.	The Company's Water Management Plan mitigation measures and consultation processes are in place. Pipeline construction methodologies will be utilized to minimize construction impact. Where water supplies are impacted mitigation measures will include provision of trucked water and possible provision of water shelters.
Impacts on Business/	No existing business will be impacted. 2 OSL structures were	No loss of employment anticipated and there are no businesses, which require relocation or compensation.

Impact	Scale	Mitigation – Project Responses
Employment	identified as potentially impacted. They were avoided.	Village residents feel the development activity will be beneficial for start-up businesses in the area.
Access	27 access tracks were identified as potentially impacted during construction.	Where access tracks are temporarily impacted, access points will be maintained and appropriate traffic controls implemented. Project Drivers will be trained and advised in access point safety. Mubi River road will be kept open for landowner use and travel.
Cultural Sites	Approximately 24 identified.	Mitigation measures as per the Company's Environmental and Social Management Plan – Cultural Heritage.
Influx of Migrants	While not directly attributable to the Project, there is an ongoing trend of Huli settling further south in Kutubu and beyond.	Will not be large in scale but will be inexorable in nature. More intermarriage and movement of population could occur.

The location of various social sites along the ROW, including active and fallow gardens, water sources, access routes and hunting grounds, are illustrated in the following three figures: Figure 5-1: KP 80 – 102,

Figure 5-2: KP 102 – 128 and Figure 5-3: KP 128 – 153. A more detailed set of maps is attached as Appendix 1.

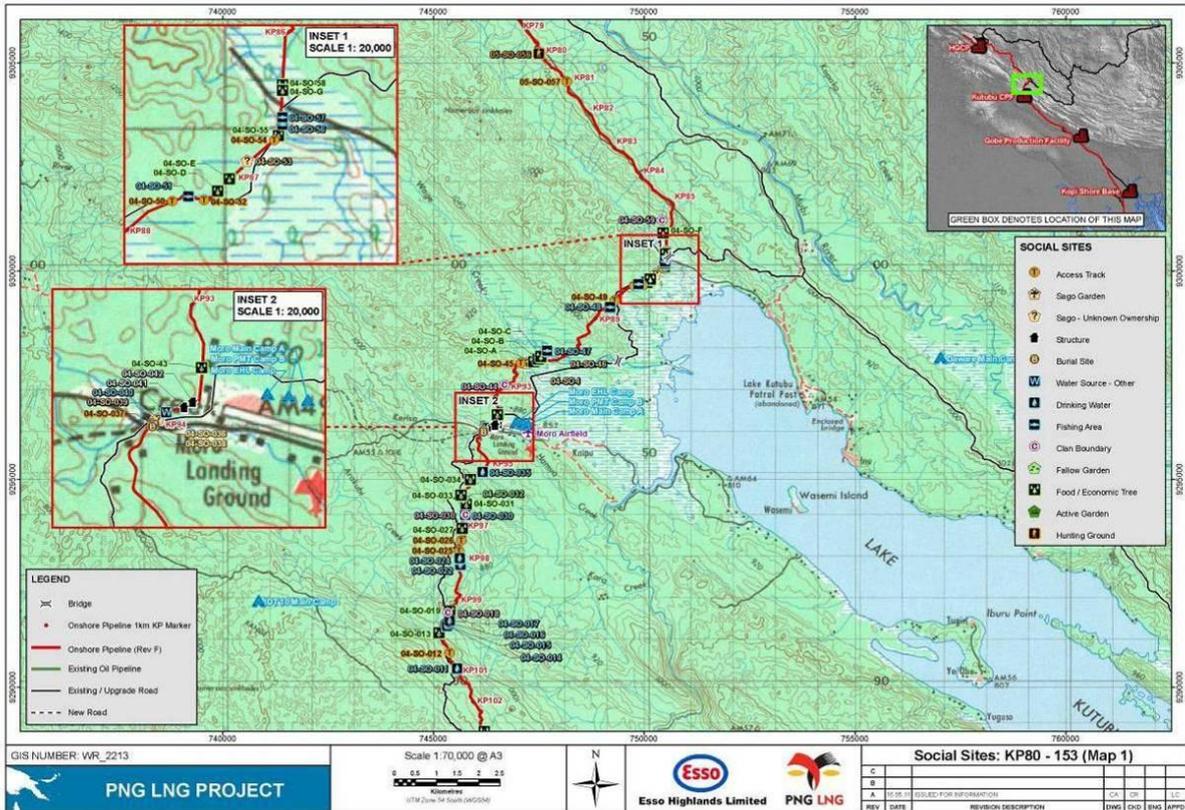


Figure 5-1: Social Sites KP 80 - 102

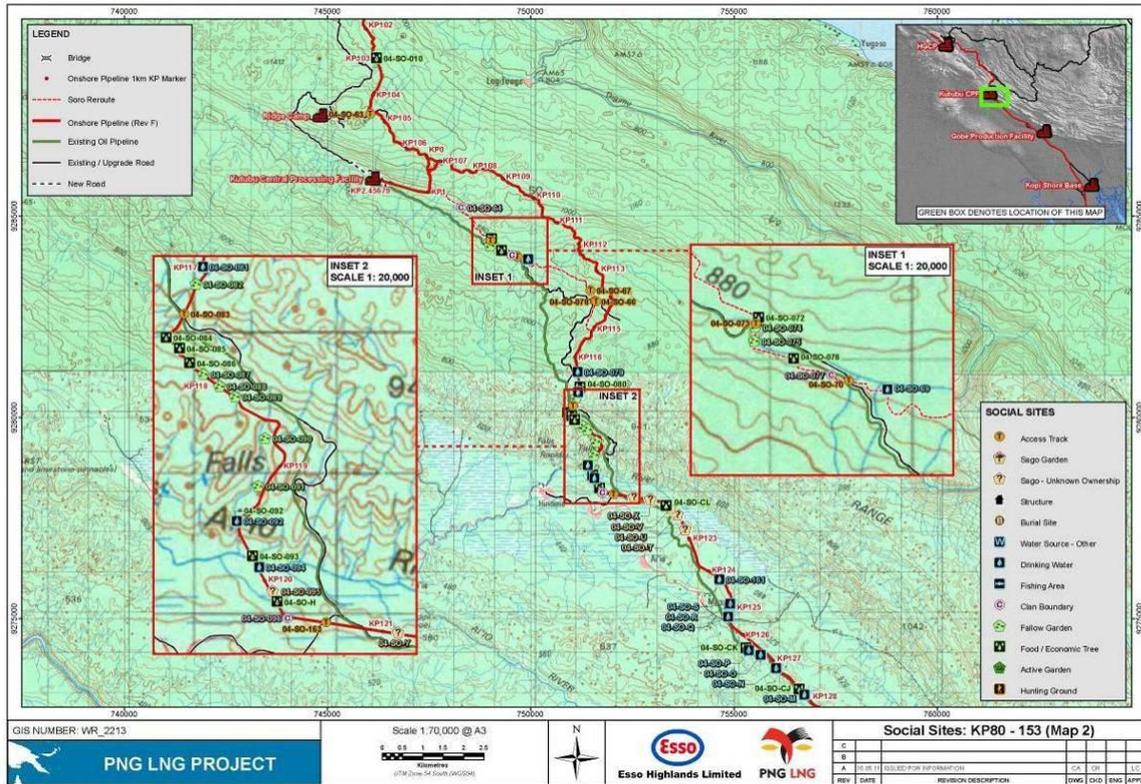


Figure 5-2: Social Sites KP 102 – 128

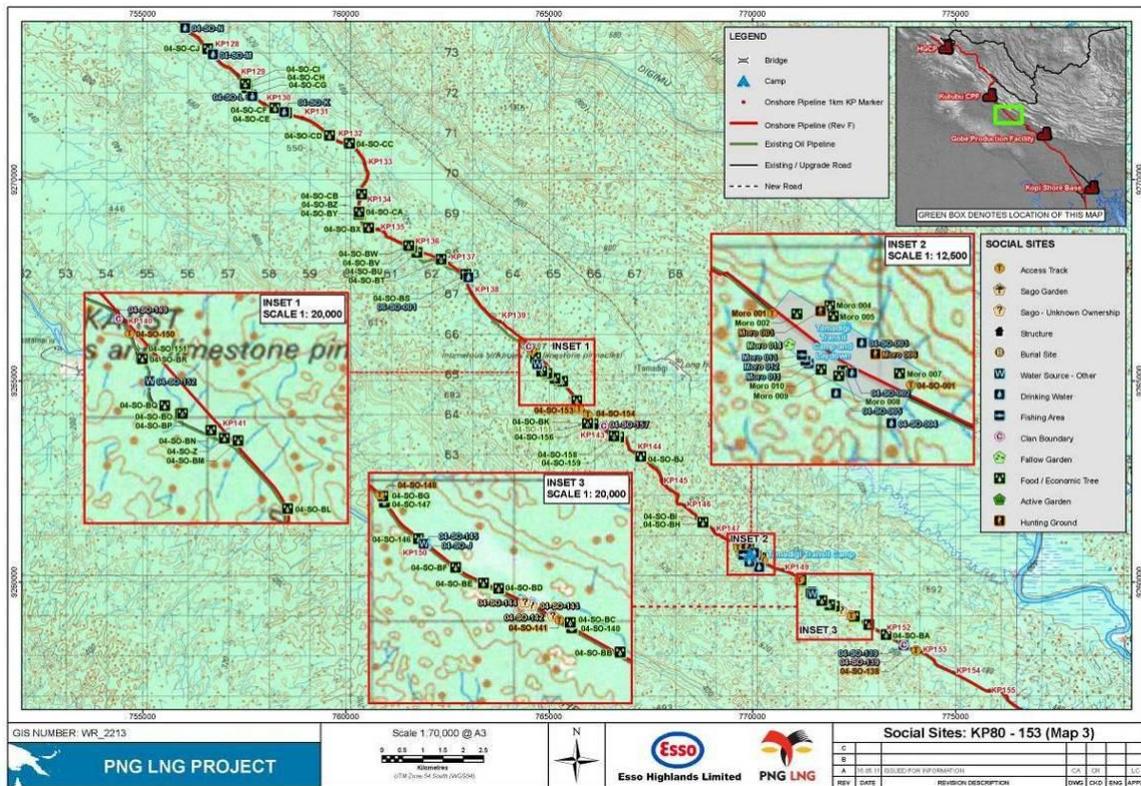


Figure 5-3: Social Sites KP 128 – 153 (including Tamadigi)

6.0 ELIGIBILITY AND ENTITLEMENTS

The RPF provides a full schedule of eligibility criteria for compensation and entitlements that will be adopted for the Project. Table 6-1 summarizes eligibility and entitlements relevant to Kutubu-Kantobo communities for statutory damage and deprivation compensation.⁹ Damage and deprivation payments will have regard for the customary classification of landowners, landholders and land users with respect to their tenure status and portfolio of land rights and responsibilities.

No physical resettlement is expected along this ROW but should this arise then the same principles and procedures that have been adopted for other Project areas, such as the Heavy Haul Road RAP, will apply.

Table 6-1: Eligibility and Entitlements for Kutubu-Kantobo Landowners

Eligibility	Affected Category	Assistance / Compensation	Considerations for Implementation
1. Land Deprivation			
Recognized landowners	Clans or other groups (incl. individual landowners) with rightful recognized claim to communal land.	Payment will be made to clans within the final ROW as set out in the IPCAs (Table 3-5) and summarized below:	Clearly inform affected group authorities about site development and land allocation schedules and regulations. Compensation paid at agreed intervals directly and publicly to landowner.
		1. Compensation for the use and enjoyment of the surface of the land (336 ha).	The Company will pay Landowners at a rate per year at equivalent market rates currently negotiated at K400, to be verified against market rates) for each hectare of land occupied (but not otherwise damaged) by the Company for depriving Landowner(s) of the use of the surface of the land, for cutting Landowner(s) off from other parts of their land, and for any loss or restriction of rights of way, in compliance with Section 118(2).
		2. Compensation for land surface damage (295 ha).	If the surface of any land of the Landowner(s) is damaged by the Company, the Company will make a one-off compensation payment at equivalent market (currently negotiated at K2,575, to be verified against market rates) rates to the Landowner(s) for each ha of land surface, damaged by the Company.
	3. Compensation for initial damage to naturally occurring bush, vegetation, birds, animals or fish (336 ha).	The Company will make a single payment to the Landowner(s) for any damage on their land to the natural bush, birds, and fish at equivalent market rates (currently negotiated at K1,287.50, to be verified against market rates) for each hectare of land on which the Company damages the natural bush. Payments will be in accordance with ownership determinations.	
	Individual/household landowners for garden land	Payment for land deprivation as per above (if land privately owned).	Clearly inform about site development. Compensation paid at agreed intervals directly and publicly to landowner.
2. Damage to Trees and Crops			
Recognized	Clans or other	Cash compensation based FRV	Clearly inform community about site

⁹ This excludes royalties paid by the government to communities along the pipeline.

Eligibility	Affected Category	Assistance / Compensation	Considerations for Implementation
land and resource users and owners	groups (e.g., ILOs) with rightful recognized claim to communal land.	for trees naturally seeded in affected area as identified in the IPA, as included above for Land Deprivation.	development. One-off compensation to community (landowners group) directly and publicly to landowner.
	Individual/household landowners for garden land.	Cash or in-kind compensation FRV for affected area for crops and trees planted by individuals (excluding mature crops that can be harvested prior to occupation by the Project). Compensation for garden infrastructure improvements (including garden fences and trenches). Assistance to restore livelihoods through economic restoration programs.	Clearly inform community about site development. Cash compensation at FRV. Once-off compensation or at agreed intervals to individual/household owners directly and publicly.
3. Reduced access to Land and Resources			
Persons recognized as landowners of land to which access is reduced	Individual/household landowners and land users with reduced access to land due to Project activities.	Cash or in-kind compensation at agreed intervals until reduction in access ceases.	Clearly inform about site development. Cash compensation at FRV "Lost production" compensation will be considered for compensation. This means that if there is interrupted access to land during construction for a short time then affected people will be eligible for compensation for lost production – i.e., what they could have grown or done with the land had they had access One-off payment or compensation at agreed intervals to individual/household owner directly. This will be done publicly.

7.0 LIVELIHOOD RESTORATION PROGRAM

Garden owners will be compensated for crop losses at full replacement value. However, as all impacted gardens in this area are temporary/one-rotation gardens, and all households have alternative gardens and will be moving onto other areas as is their custom, the livelihoods restoration program is not applicable. The Project will ensure it restores, impacted livelihoods, in accordance with IFC PS 5 and the RPF.

8.0 GRIEVANCE MANAGEMENT FRAMEWORK

The resettlement process for the Kutubu-Kantobo landowners will consider grievances through the Grievance Procedure, which will apply across all Project activities. The Grievance Procedure is available to people affected by displacement, other local populations residing in the Project impact area, and other stakeholders directly affected by the Project.

The Grievance Procedure to be adopted for the Kutubu-Kantobo area is defined in the RFP. The Project will disclose information about the Grievance Mechanism to the affected Kutubu-Kantobo communities, adjoining landowners and interested persons and organizations. The transparency and fairness of the process will be explained through both verbal (via regular stakeholder meetings) and written updates (such as newsletters and posters).

9.0 ORGANIZATIONAL ROLES AND RESPONSIBILITIES

The Company is responsible for overall resettlement planning, implementation, and monitoring as per the RPF. It is implemented by the Company's Land & Community Affairs Team. Organizational details are described in the Komo and HGCP RAPs, Sections 9 and 10 respectively.

10.0 MONITORING AND EVALUATION

The Monitoring and Evaluation system (M&E) provides Project management, and directly affected persons, households and communities, with timely, concise, indicative information on whether compensation, resettlement and related development investments are on track and achieving Project goals. The Resettlement Team Coordinator, supported by the Field Implementation Coordinators, will coordinate M&E internal and external implementation.

Further details of the monitoring process to be implemented can be obtained from the Komo (Section 10) and HGCP (Section 11) RAPs.

11.0 IMPLEMENTATION SCHEDULE

Table 11-1 lists tasks to implement the CRP.

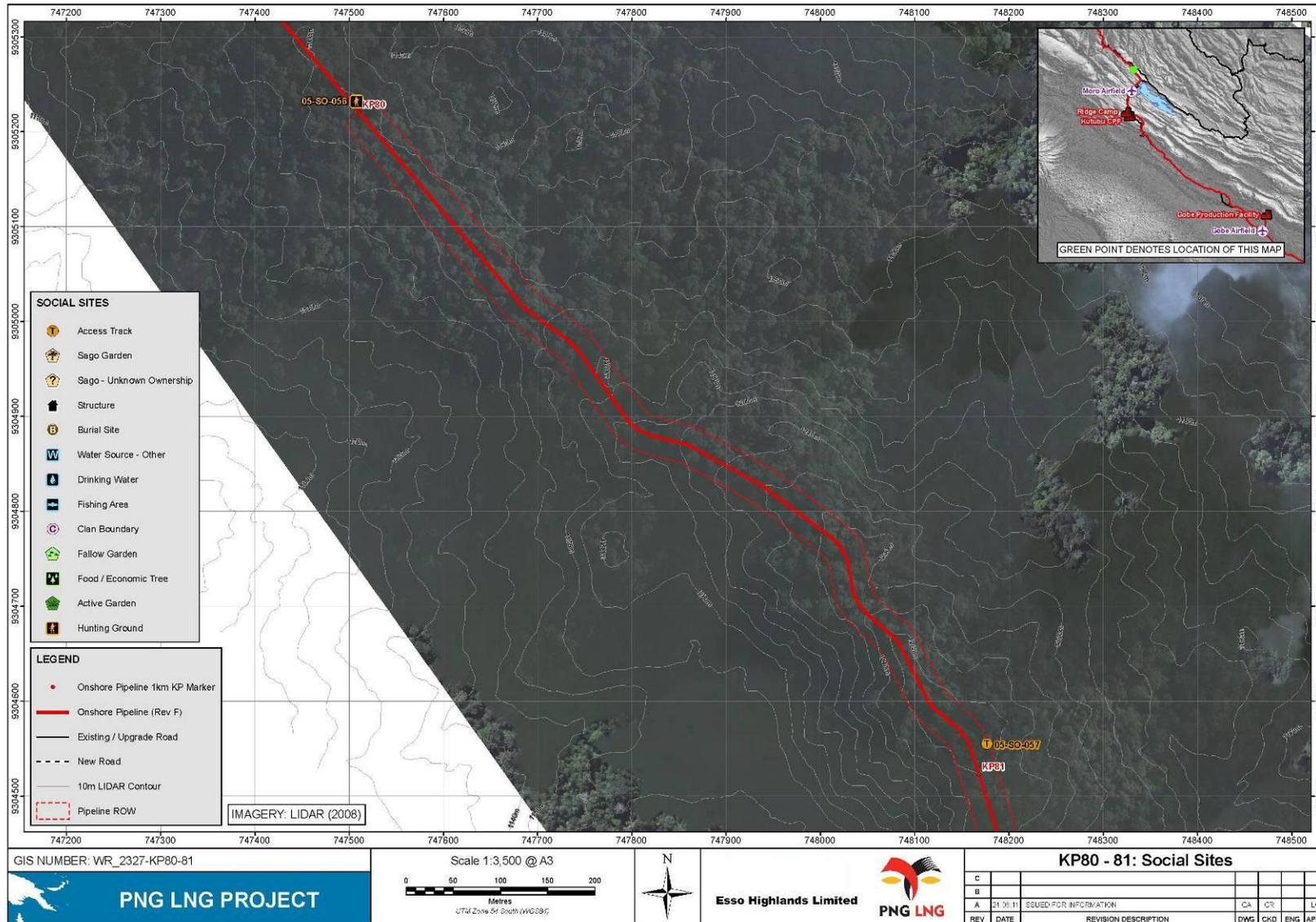
Table 11-1: CRP Implementation Schedule

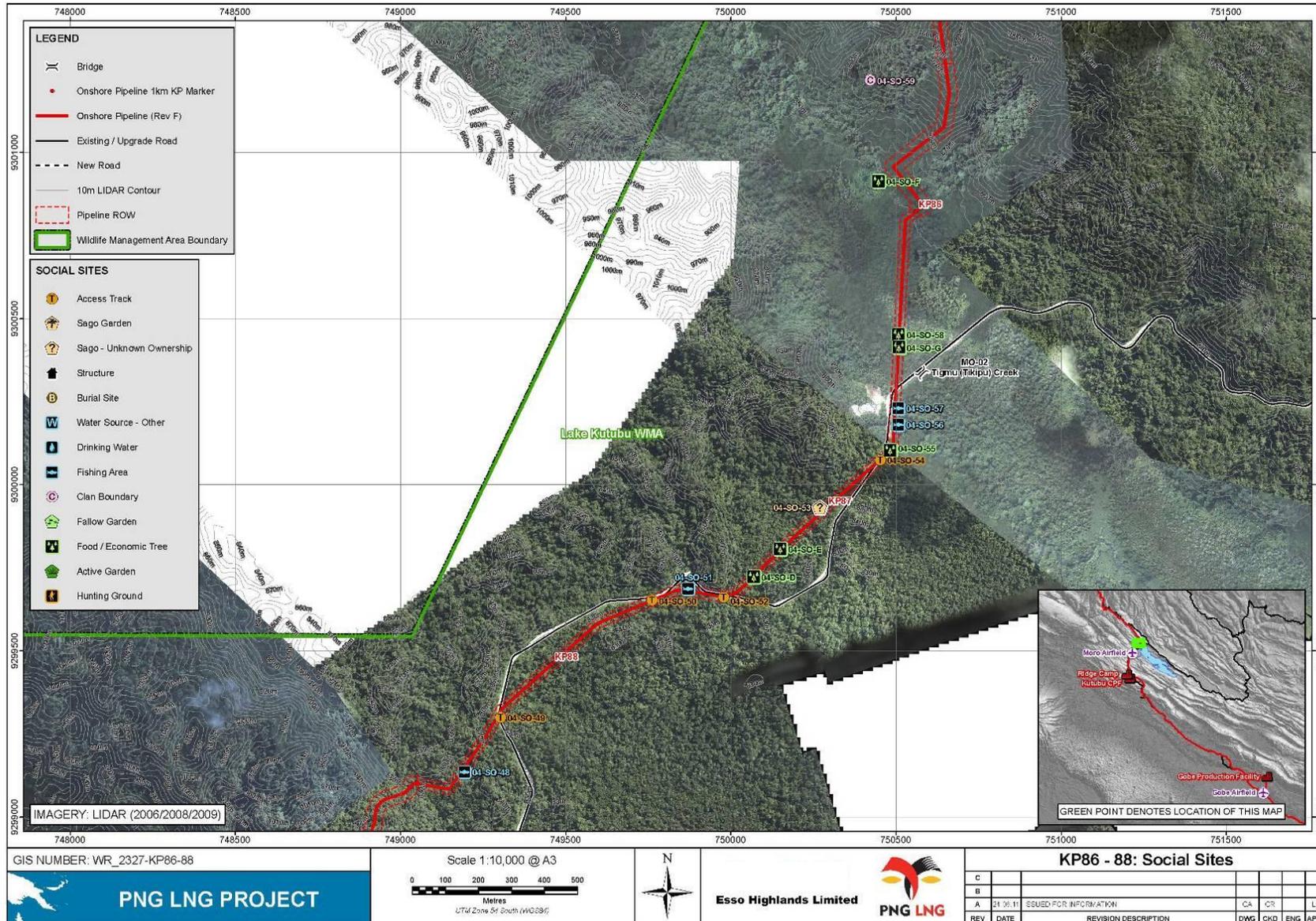
Activity or Task	Actions	2011					
		A	M	J	J	A	S+
Planning	Completion of CRP						
Approvals	Internal EHL approval of the CRP						
	CRP Submission to Lenders						
	CRP Summary to community						
Land Issues	Confirm resettlement sites and any impacted water sources (provision)						
Confirm and finalize compensation agreements	Verify inventories of affected land and assets (incl. special valuations)						
	Finalize any entitlement contracts						
Compensation payments	IPCA payments and cash payments to individuals (provision – none expected)						
Graves, spiritual and other cultural sites	Relocate / recover (provision)						
Verification and monitoring	Design and implementation of monitoring and evaluation system (ending May 2013)						
	Local advocacy and compensation advisors						
	Internal monitoring						
	External evaluation (including completion audit)						

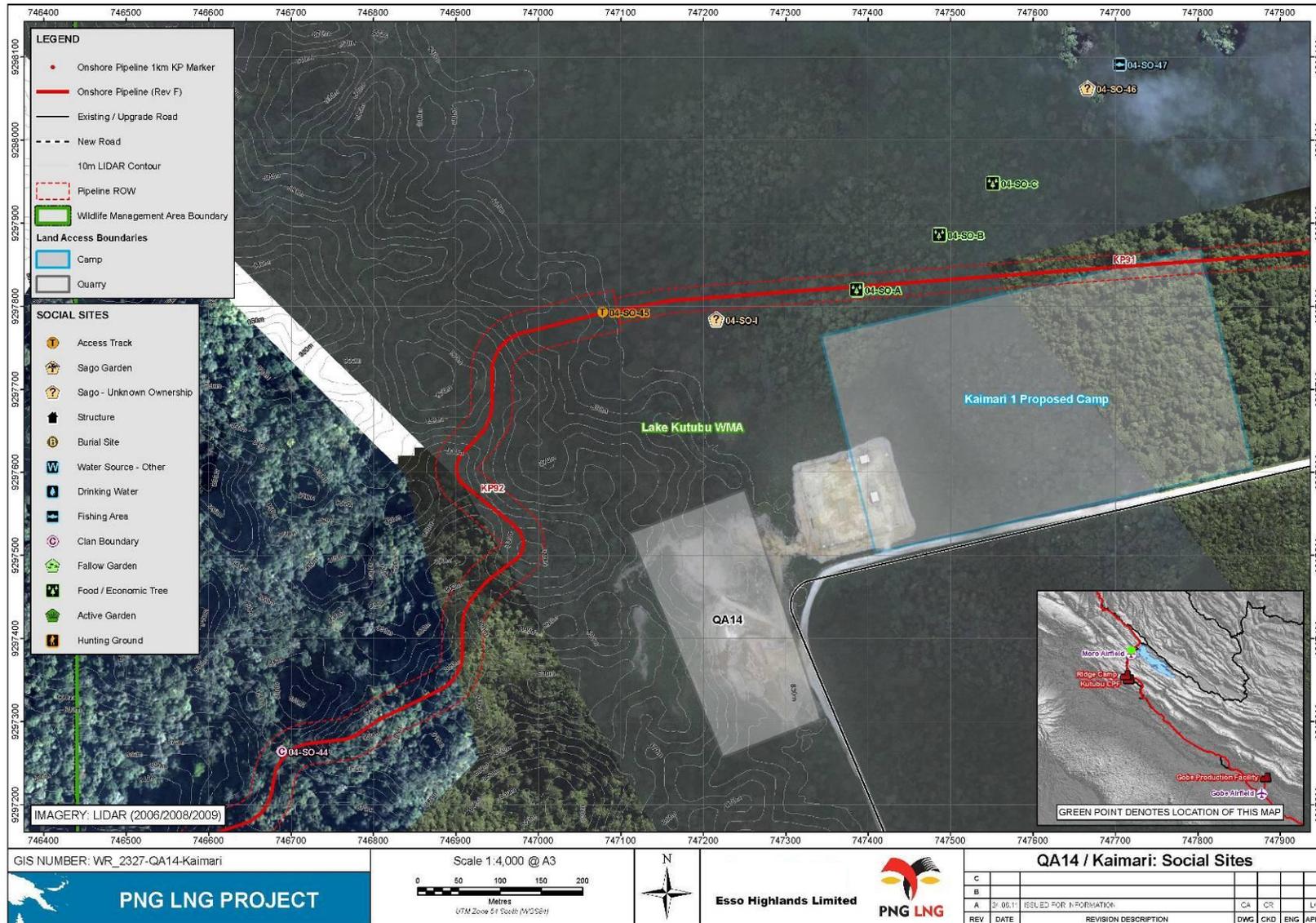
12.0 COST AND BUDGET ESTIMATE

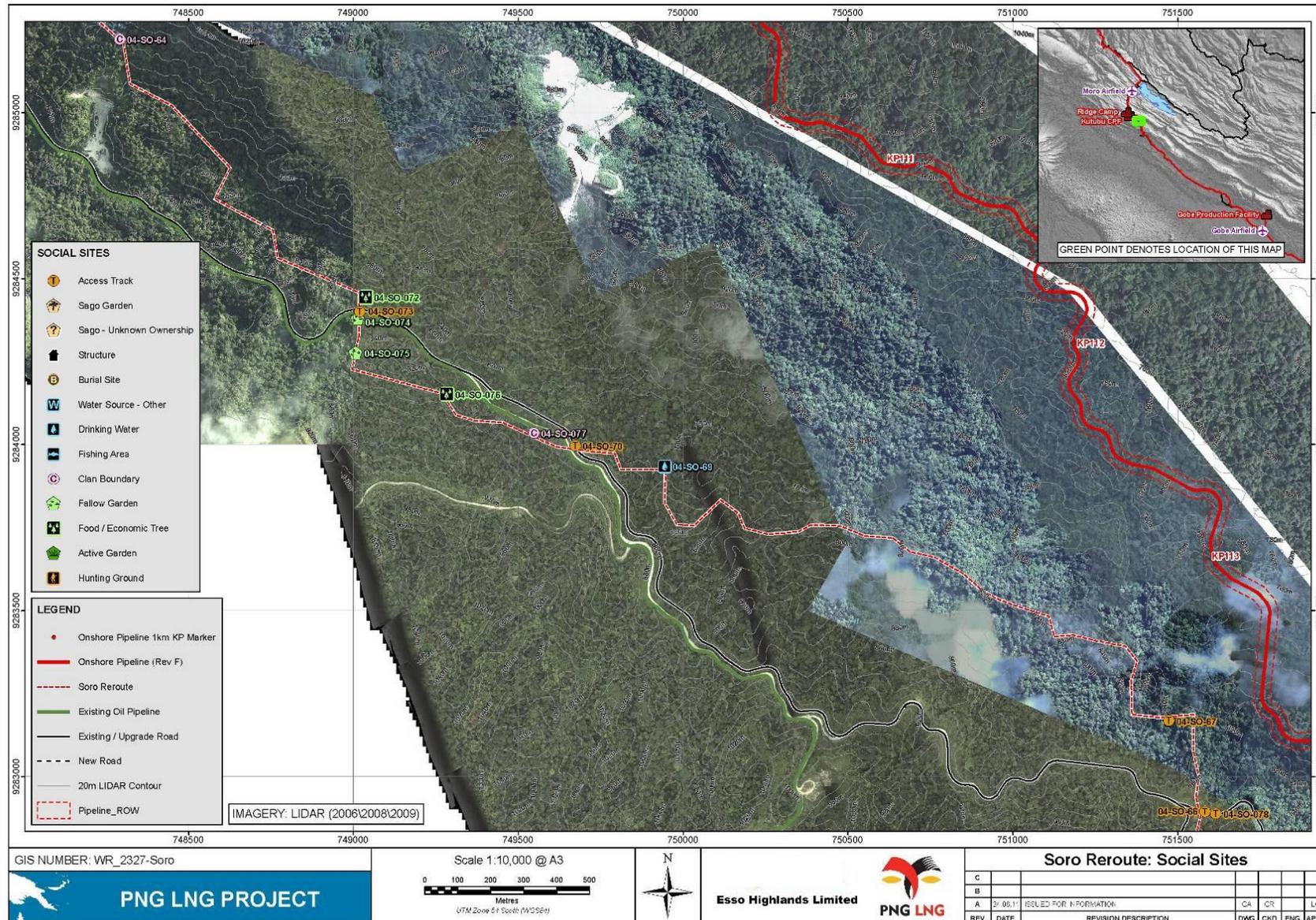
Budget provision of US\$1.4 million is included for forest damage and deprivation costs to clans, as well as losses associated with individual gardens and trees and other social infrastructure, should these arise. Landowning clans will also receive an annual rental payment of K400/ha for the duration of the Project (20-30 years).¹⁰

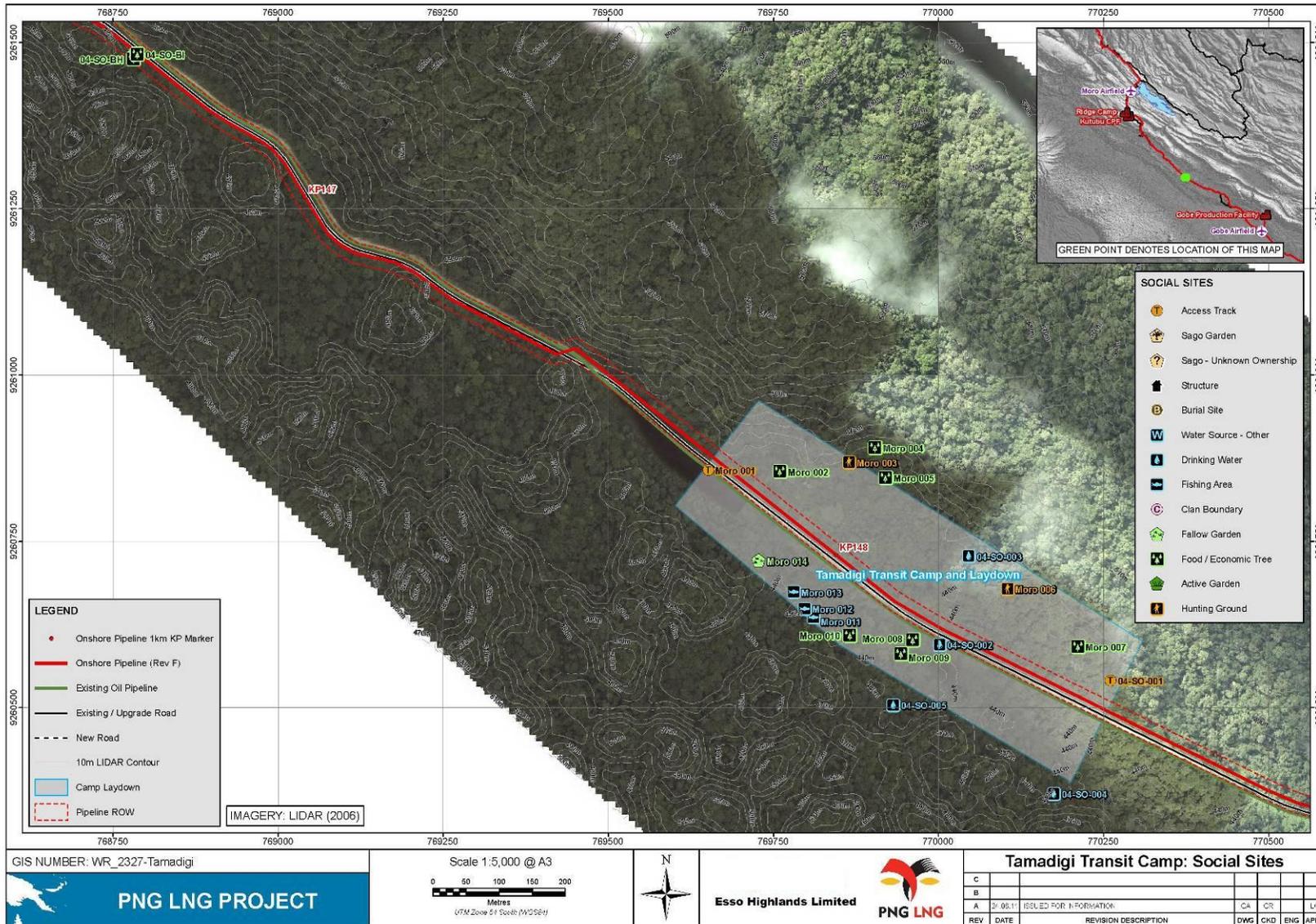
¹⁰ All IPCA payments will be reviewed to confirm equivalence to Full Replacement Value.

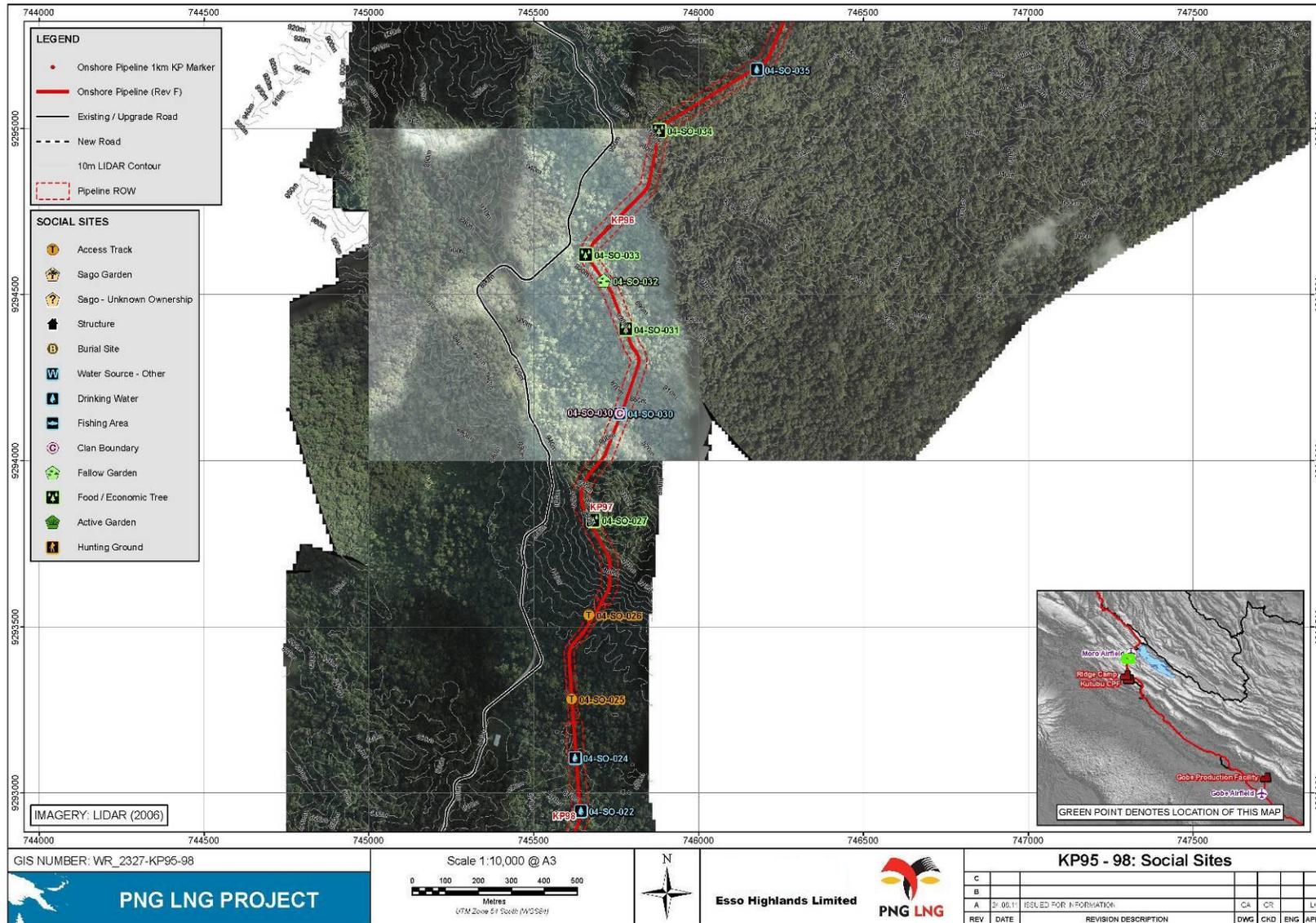


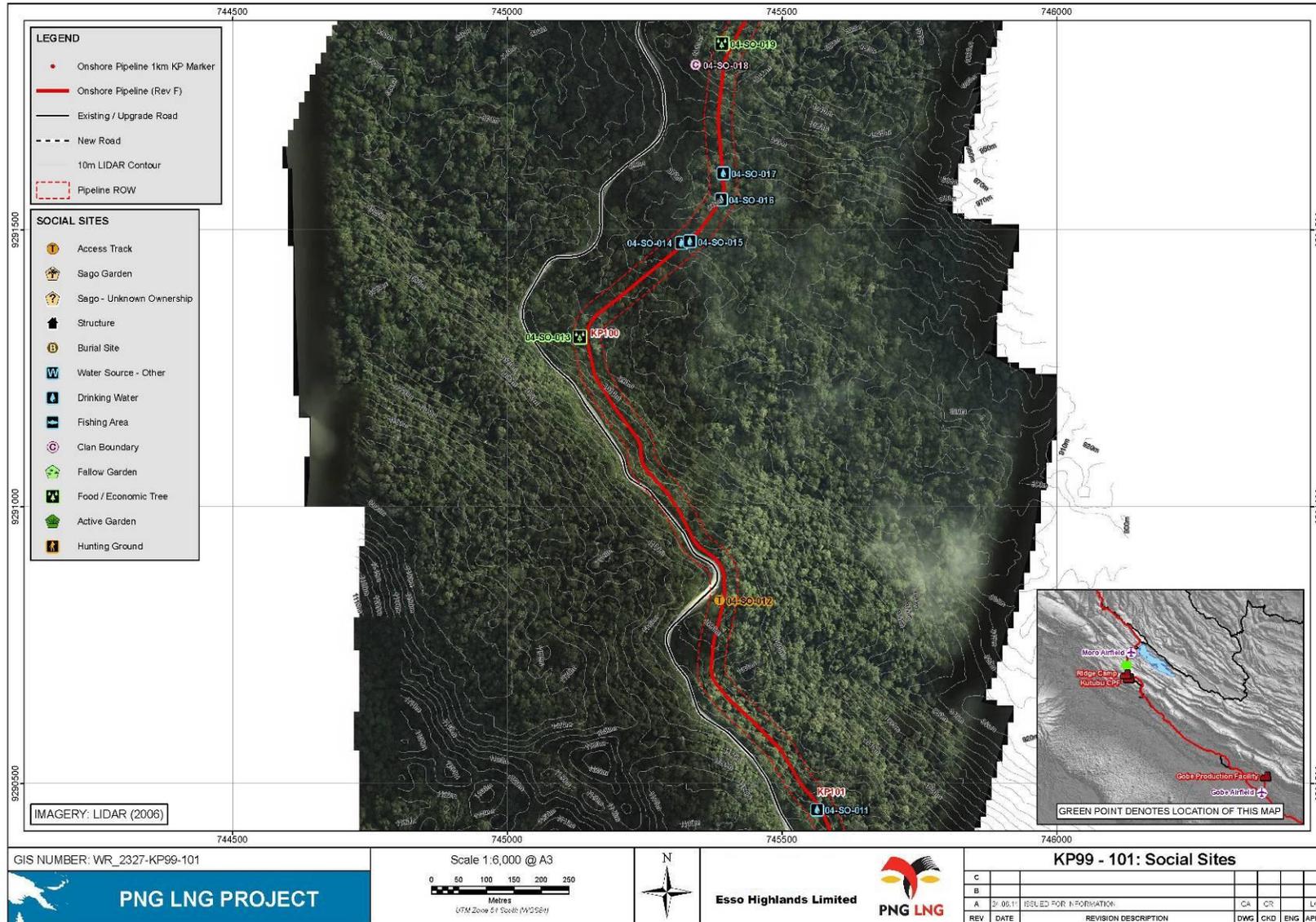


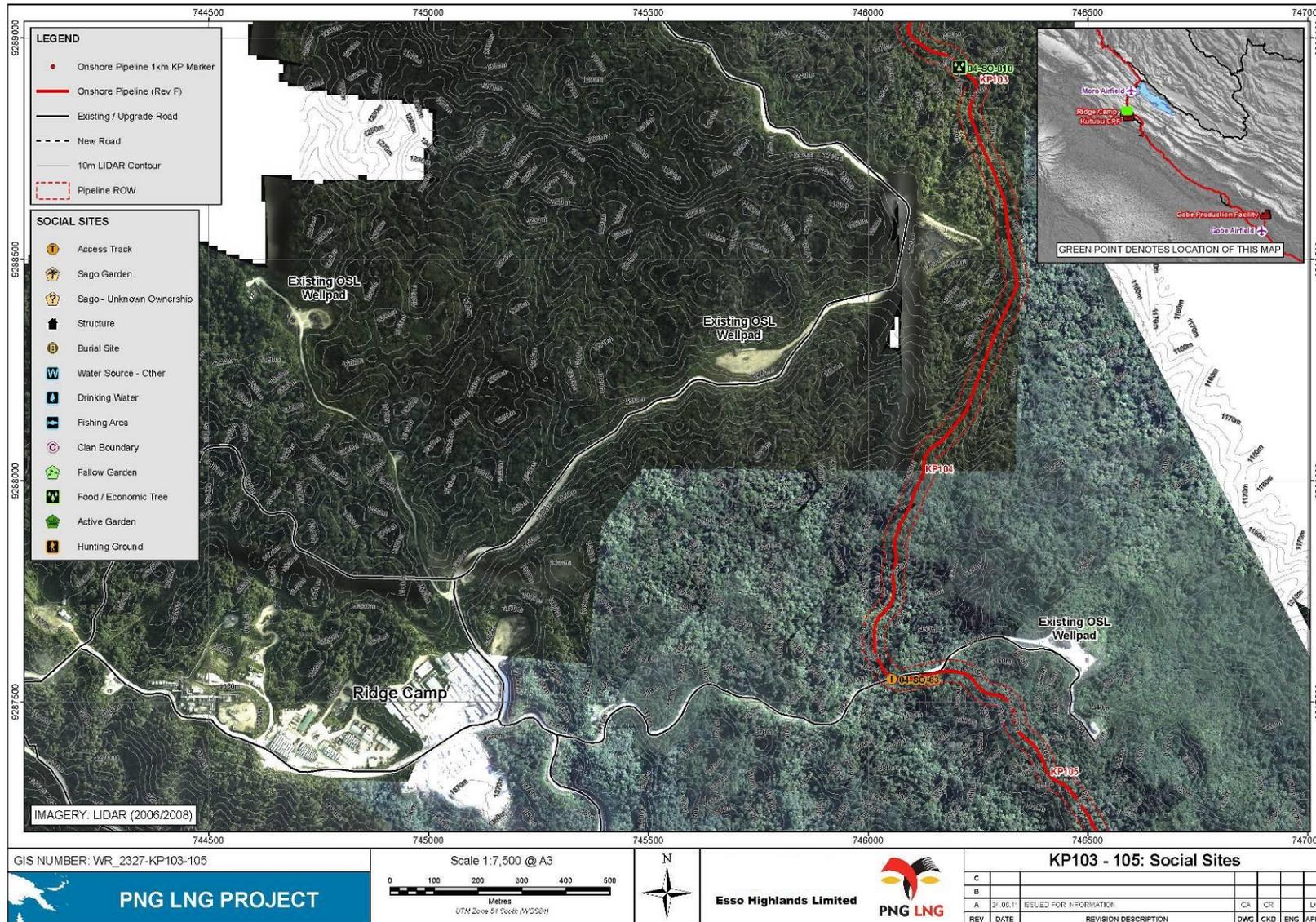


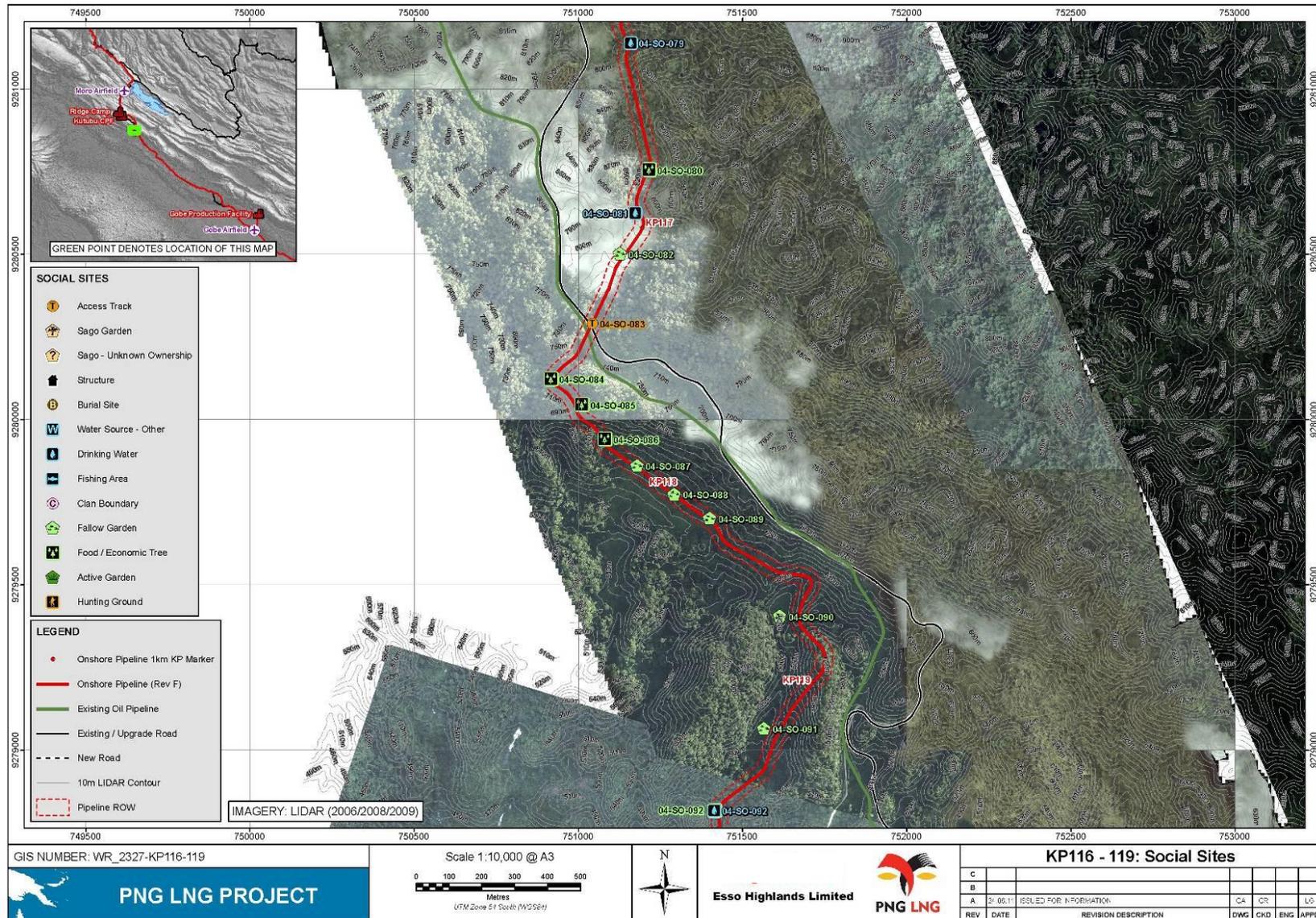


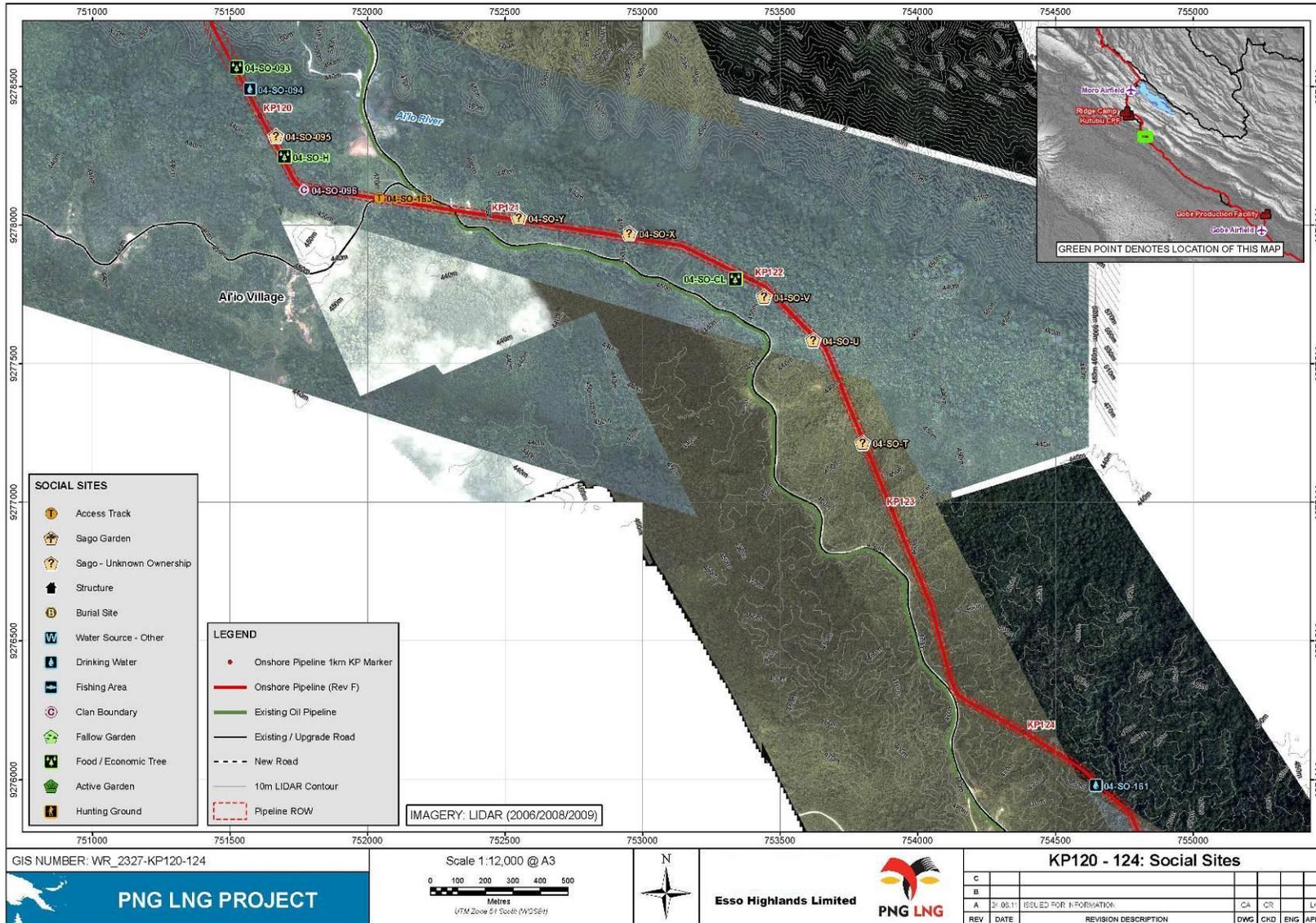


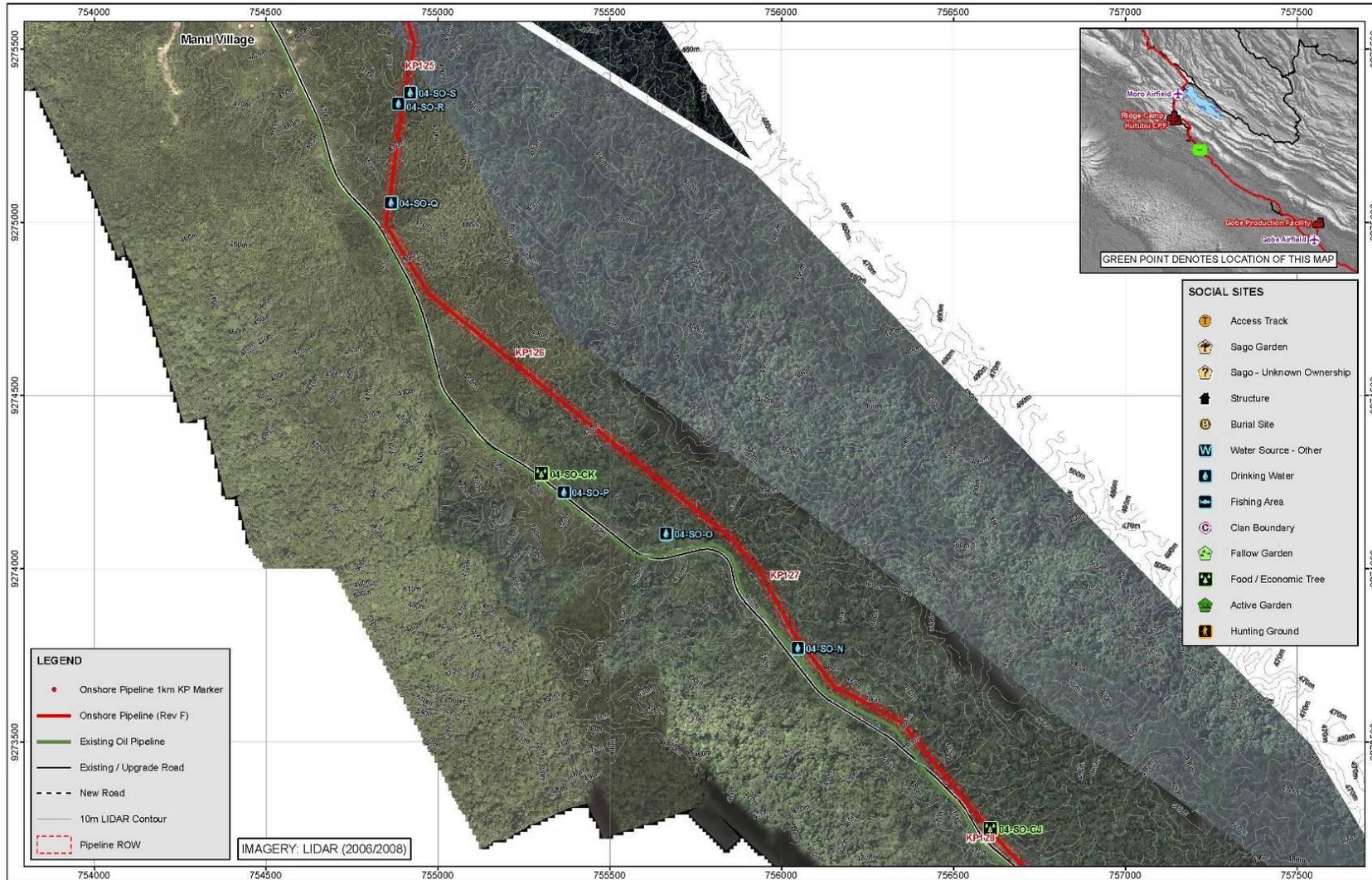












GIS NUMBER: WR_2327-KP125-128

Scale 1:10,000 @ A3

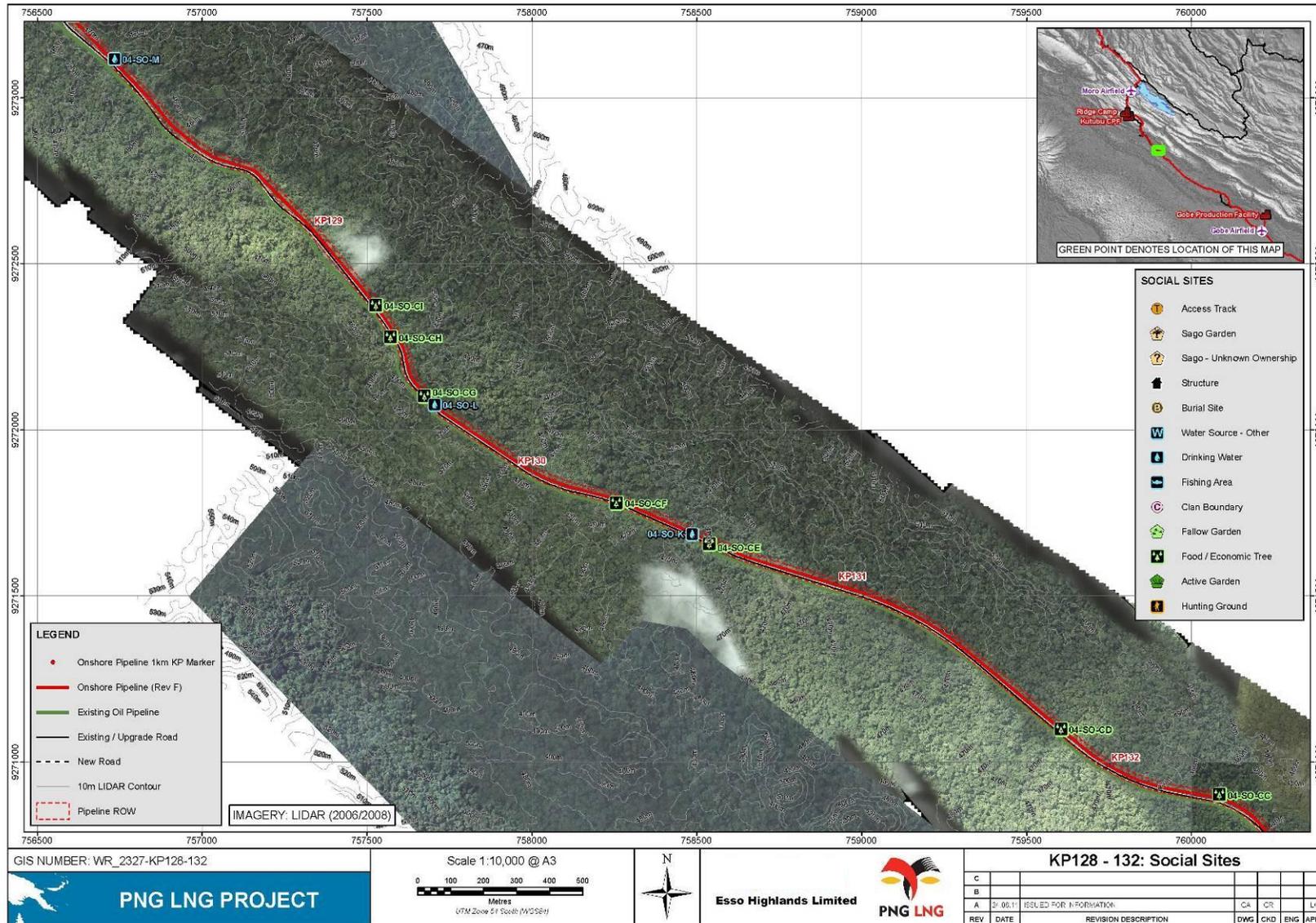
UTM Zone 51 South (WGS84)

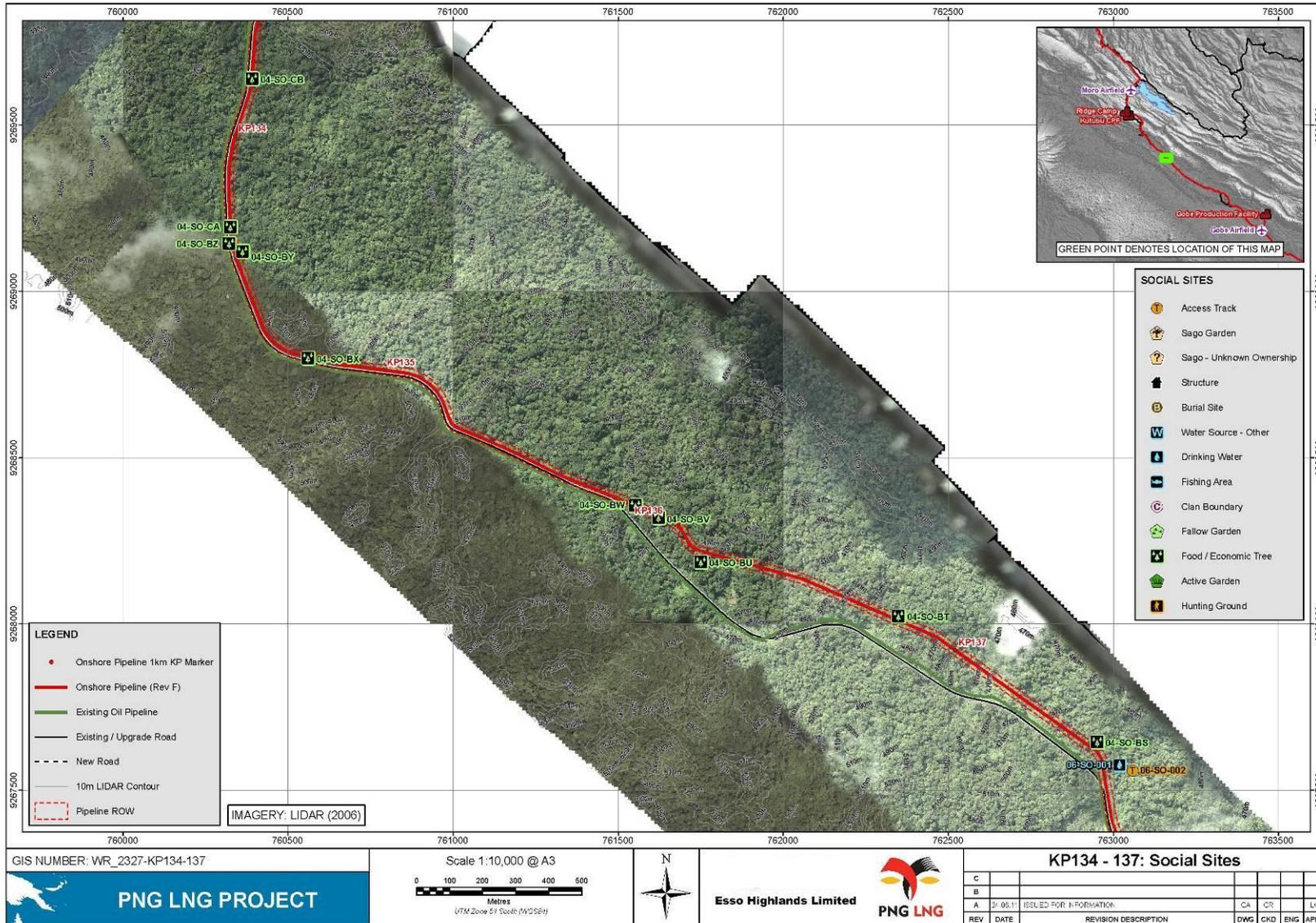


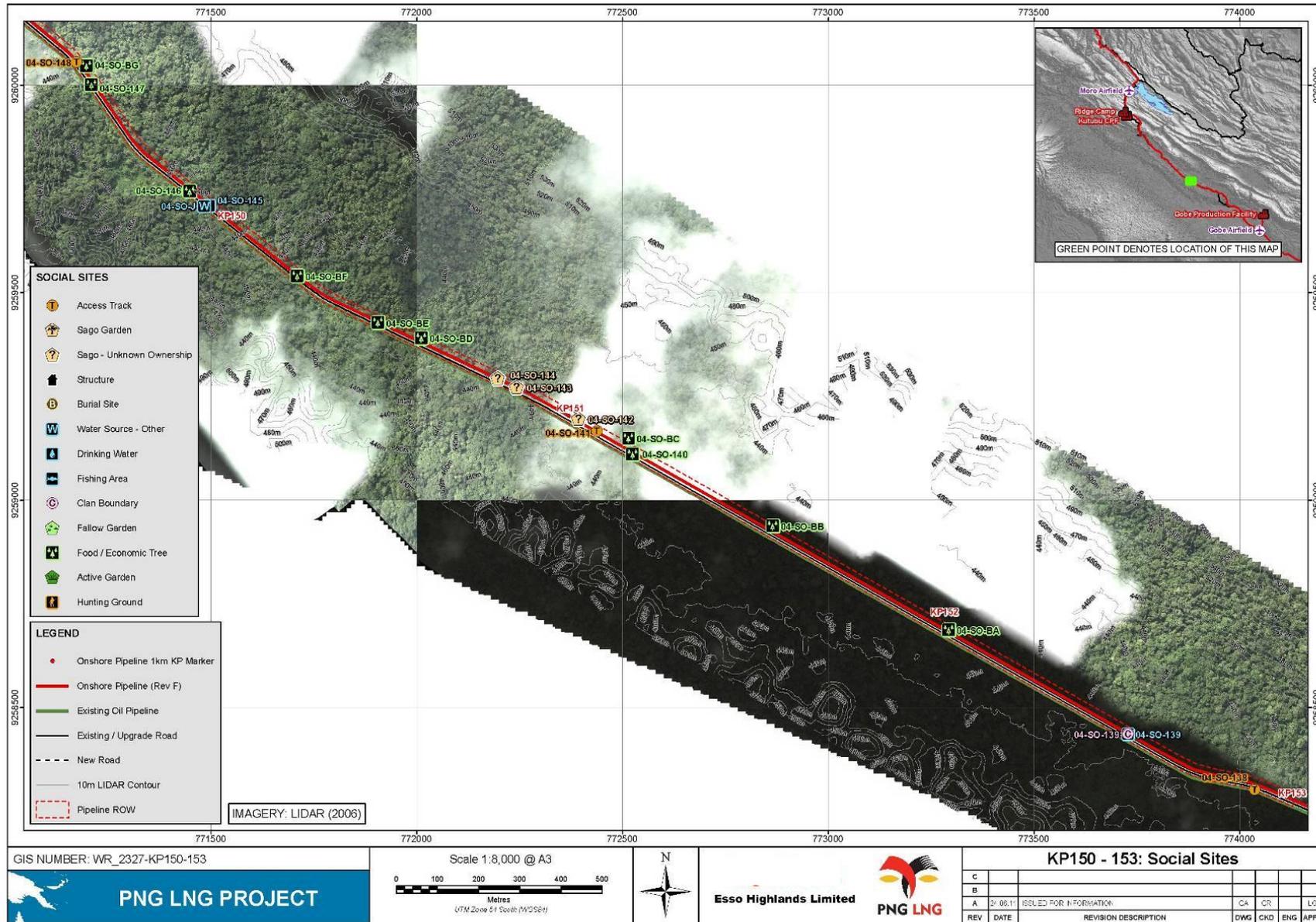
Esso Highlands Limited

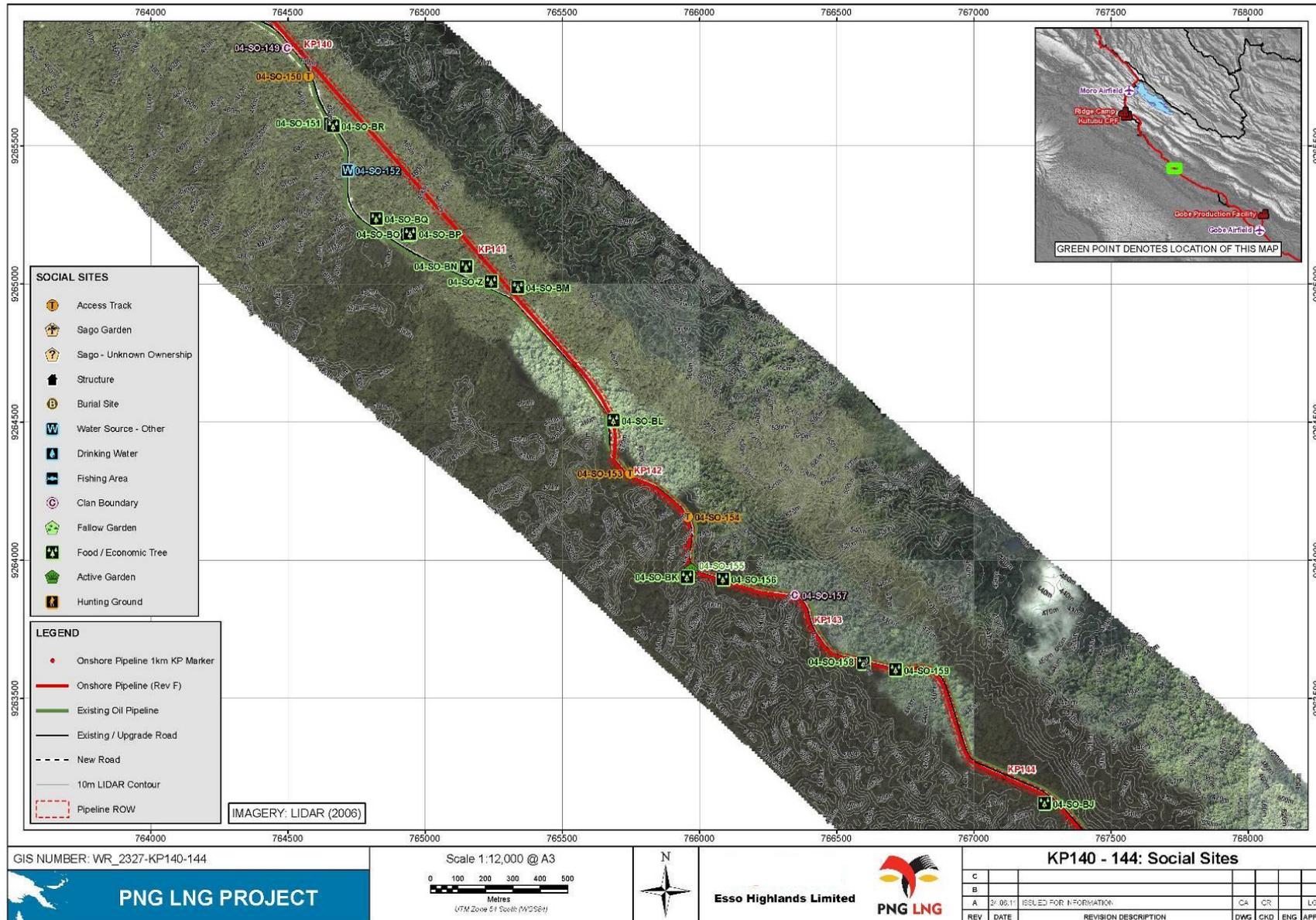
KP125 - 128: Social Sites

C					
B					
A	21.08.11	ISSUED FOR INFORMATION	CA	CR	LG
REV	DATE	REVISION DESCRIPTION	DWG	CHK	ENG APPD









APPENDIX 2: LIST OF SOCIAL FINDINGS

KP Point	Section and Social Sites
KP 148	<u>Tamadigi Campsite and Laydown Area</u>
04-SO-001	Mubi River Road Main Access Road
04-SO-0002	Ana Ano Creek - ephemeral creek
04-SO-0003	Stream flowing into Ana Ano Creek
04-SO-004	Kekeno Wasaki Creek
04-SO-005	Watercourse - likely to be Kekeno Wasako Creek (see 04-SO-002)
TA012	Sleeping Cave outside of corridor
	<u>ROW KP 120.2 to KP 153</u>
04-SO-138	Access Road Moro / Iagifu to Kantobo
04-SO-139	Baiwara'ara Marisa Stream - provides water source for project personnel and Sura Wabo and Tamadigig hunters. Land boundary
04-SO-140	Wild pandanas - used for building resource - community owned
04-SO-141	Bush walking track to hunting and garden areas and original Kaipu hamlet
04-SO-142	Clumps of wild sago trees - Clan owned
04-SO-143	Clumps of wild sago trees - Clan owned
04-SO-144	Clumps of wild sago trees - Clan owned
04-SO-145	Ketegeta Stream - water source for hunters accessing area
04-SO-146	Breadfruit trees and wild Pandanas trees - community owned
04-SO-147	Clumps of sago, breadfruit and wild pandanas trees - community owned
04-SO-148	Access bush track to . From original Kaipu hamlet and gardening
04-SO-159	Wild pandanas - community owned
04-SO-158	Cooking bamboo, edible pandanas, sago, breadfruit, black palms and terminalia trees - community owned
04-SO-157	Land boundary between Hegeso and Hetake clans
04-SO-156	Wild pandanas - community owned
04-SO-155	Garden of Aibika cabbage - individually owned - economic displacement
04-SO-154	Walking track for Hegeso clan to access hunting, garden and sago making areas
04-SO-153	Access Road Moro to Kantobo
04-SO-152	Fakapiri Stream - water resource access to jungle for hunting and gardening purposed
04-SO-151	Clumps of wild pandanas - building resources - community owned
04-SO-150	Walking bush track Hegeso clan uses to access original Tamadigi village site for gardening, hunting and pig farming purposes
04-SO-149	Land boundary between Hegeso and Sikuriakusirigi clans
04-SO-161	Hirisia Stream - water resource for hunters accessing jungle, supplies water to Hedinia village
04-SO-163	Main access road from Aiiio to Hedinia Village
04-SO-J	Stream - occasional water resource to local hunters
04-SO-K	Unknown stream - occasional water resource for local hunters
04-SO-L	Unknown stream - occasional water resource for local hunters
04-SO-M	Unknown stream - occasional water resource for local hunters
04-SO-N	Kusumi Creek - occasional water resource for local hunters
04-SO-O	Unknown stream - occasional water resource for local hunters
04-SO-P	Unknown stream - occasional water resource for local hunters
04-SO-Q	Unknown stream - occasional water resource for local hunters. Also used as a fishing location for fish and crayfish
04-SO-R	Unknown stream - occasional water resource for local hunters
04-SO-S	Unknown stream - occasional water resource for local hunters
04-SO-T	Sago swamp extending approx 90m - clan owned
04-SO-U	Sago swamp extending approx 50m - clan owned
04-SO-V	Sago swamp extending approx 30m - clan owned
04-SO-X	Sago swamp extending approx 30m - clan owned
04-SO-Y	Sago swamp extending approx 30m - clan owned
04-SO-Z	Walnut tree - community asset
04-SO-BA	Wild Fig Tree community owned
04-SO-BB	Wild Fig Tree community owned
04-SO-BC	Wild Fig Tree community owned
04-SO-BD	Wild Fig Tree community owned
04-SO-BE	Wild Fig Tree community owned

KP Point	Section and Social Sites
04-SO-BF	Wild Fig Tree community owned
04-SO-BG	Wild Fig Tree community owned
04-SO-BH	Wild Fig Tree community owned
04-SO-BI	Wild Fig Tree community owned
04-SO-BJ	Wild Fig Tree community owned
04-SO-BK	Wild Fig Tree community owned
04-SO-BL	Wild Fig Tree community owned
04-SO-BM	Wild Fig Tree community owned
04-SO-BN	Wild Fig Tree community owned
04-SO-BO	Wild Fig Tree community owned
04-SO-BN	Wild Fig Tree community owned
04-SO-BQ	Wild Fig Tree community owned
04-SO-BQ	Wild Fig Tree community owned
04-SO-BR	Wild Fig Tree community owned
04-SO-BS	Wild Fig Tree community owned
04-SO-BT	Wild Fig Tree community owned
04-SO-BU	Wild Fig Tree community owned
04-SO-BV	Wild Fig Tree community owned
04-SO-BW	Wild Fig Tree community owned
04-SO-BX	Wild Fig Tree community owned
04-SO-BY	Wild Fig Tree community owned
04-SO-BZ	Wild Fig Tree community owned
04-SO-CA	Wild Fig Tree community owned
04-SO-CB	Wild Fig Tree community owned
04-SO-CC	Wild Fig Tree community owned
04-SO-CD	Wild Fig Tree community owned
04-SO-CE	Wild Fig Tree community owned
04-SO-CF	Wild Fig Tree community owned
04-SO-CG	Wild Fig Tree community owned
04-SO-CH	Wild Fig Tree community owned
04-SO-CI	Wild Fig Tree community owned
04-SO-CJ	Wild Fig Tree community owned
04-SO-CK	Wild Fig Tree community owned
04-SO-CL	Pendants swamp - building material - community owned
04-SO-001	Main access road Moro to Kantobo - adjacent to ROW
04-SO-002	Ano Ano Creek - occasional water source for drinking and bathing for Hedinia village
06-SO-001	Keno Creek
06-SO-002	walking track 1m wide crosses the centre line
06-SO-003	walking track 1m wide crosses the centre line
06-SO-004	Fallow/active garden with food crops, banana, breadfruit, pandanas, and young sago palms
06-SO-005	Firewood shelter - physical displacement
06-SO-006	Keno Creek
06-SO-007	Active Garden, sago palms, breadfruit, bamboo, owned by Kifa Umukiti of Sugurhagu Sinigi Clan - economic displacement
06-SO-008	Sago Patch - community owned
06-SO-009	Fallow garden with pitpit, banana, breadfruit, and bamboo - reverted to clan
06-SO-010	Wild Sago Patch owned by Moke Tofa of Hegeso clan
06-SO-011	Wild Sago Patch owned by Stanley Baki of Sinigi Clan
06-SO-012	Fallow garden (pineapple, bamboo, pandanas owned by Yawari Kosaria of Amununu Clan
06-SO-013	Fallow garden (pineapple, bamboo, pandanas owned by Albert Kote of Hetake Clan. Economic displacement to be reviewed
06-SO-014	Track

KP Point	Section and Social Sites
06-SO-015	Fallow garden (pineapple, sugarcane and pawpaw owned by Felix Subai of Hetake Clan
06-SO-016	Active Garden, taro, albica, pipit, banana, sugarcane, etc
06-SO-017	Wild Sago patch owned by Karapa Karchia of Amuranu clan
06-SO-018	Wild Sago stems owned by Simiti Umuguti of Sugarhagu Sinigi clan
06-SO-019	Wild Sago stems owned by Tao Kebo of Sinigi clan
06-SO-020	Sago patch 220 planted in 2001. 20m east and 30m west of center line - owned by John Smith of Sugurhagi Singi clan
06-SO-021	Kareoabo Creek
06-SO-023	Fallow garden breadfruit, pineapple, bamboo pandanas owned Susan Henry of Hegeso Clan
06-SO-024	Abandoned garden bamboo, pandanas, breadfruit owned by Ofeng Faku
06-SO-025	Abandoned garden bamboo and palms
06-SO-026	Abandoned garden breadfruit owned by John Smith
06-SO-027	Fallow garden breadfruit, pandanas, bamboo, pineapple owned by Karapa Karoshia
06-SO-028	<u>ROW KP 85.4 to KP 120.2</u>
04-SO-010	Pandanas Trees - occasionally accessed by Hedinia Village
04-SO-011	Stream occasionally used as source of water by people in area
04-SO-012	Main access road between lagifu Ridge Camp and Moro op site
04-SO-013	Terminalia fruit trees used by Kaipu village
04-SO-014	Stream provide drinking, fishing and domestic waster for Kaipu village - non vital water source
04-SO-015	Stream provide drinking, fishing and domestic waster for Kaipu village - non vital water source
04-SO-016	Stream provide drinking, fishing and domestic waster for Kaipu village - non vital water source
04-SO-017	Stream provide drinking, fishing and domestic waster for Kaipu village - non vital water source
04-SO-018	Clan boundary for land ownership between Ufama and Yafaraka clans
04-SO-019	Cluster of 12 Hoop Pine trees - source of building materials - community owned
04-SO-022	Arurusia Stream provide drinking water - tributary of Lake Kutubu
04-SO-023	Puni Creek provide drinking water - tributary of Lake Kutubu
04-SO-024	Arurusia Stream provide drinking water - tributary of Lake Kutubu
04-SO-025	Access track between Kara hamlet and Main vehicle road
04-SO-026	Access track between Kara hamlet and Main vehicle road
04-SO-027	Hoop Pine trees - source of building materials - community owned
04-SO-030	Karasa Stream (Clan Land Boundary for Yafaraka and Laisirigi clans)
04-SO-031	Hoop Pine trees - source of building materials - community owned
04-SO-032	Fallow Garden - to community
04-SO-033	Pandanas Trees - community owned
04-SO-034	Tulip trees - edible leaves and building materials - Moro Village owned
04-SO-035	Small watercourse provides water fro hunters
04-SO-036	Burial ground outside of ROW - for information outside of ROW
04-SO-037	Main access road for lagifu Ridge Camp to Moro
04-SO-038	Burial ground for late Kigo Haibau - for information - outside of ROW
04-SO-039	Sago Trees -community owned
04-SO-040	Muddy Creek - drainage for water water swampy areas behind Moro Camp
04-SO-041	Housing for PNG DEP attached to Oilsearch Moro operation - outside of ROW
04-SO-042	Housing for PNG Police attached to Oilsearch Moro operation - outside of ROW
04-SO-043	Pandanas tree - community owned
04-SO-044	Customary land boundary for laisirigi and Orasanamahia clans
04-SO-045	Bush track used to access Tubagi Village and hunting and garden areas located further inland
04-SO-046	Sago Trees food source - community owned
04-SO-047	Kaimari River - fishing source for Kaimari village. Road runs along the river providing access to hunting and garden areas
04-SO-048	Konagi Creek - fishing source and access route to garden and hunting areas
04-SO-049	Access road between Moro and Pimaga regions

KP Point	Section and Social Sites
04-SO-050	Access road between Moro and Pimaga regions
04-SO-051	Taga Creek - fishing source access route to gardening and hunting areas
04-SO-052	Access road between Moro and Pimaga regions
04-SO-053	Sago Trees -community owned
04-SO-054	Access road between Moro and Pimaga regions
04-SO-055	Bamboo trees and Pandanas trees - community owned
04-SO-056	Tugibu River access to gardening and hunting areas - source of fish
04-SO-057	Bibi River access to gardening and hunting areas - fishing source
04-SO-058	Pandanas trees -community owned
04-SO-059	disputed clan boundary
04-SO-063	Access road for travel between Hedinia Villagers
04-SO-064	Clan boundary between Ufama and Kawai Sana Mahia Clans
04-SO-066	Access road for travel between Hedinia Villagers
04-SO-067	Bush Track - alternative route between Hedinia and Moro villages
04-SO-069	Tamanide Stream - secondary drinking water
04-SO-070	Access road for travel between Hedinia Villagers
04-SO-072	Bamboo Trees - community owned
04-SO-073	Access Track between lagifu and Kaintobo villages
04-SO-074	Abandoned garden - bamboo trees, terinalia tree and pandanas trees
04-SO-075	Abandoned Garden - bamboo trees, terinalia tree and pandanas trees
04-SO-076	Active garden - Bamboo trees, small banana and sugarcane
04-SO-077	Disputed land boundary between Kawai Sana Mahia and Murubayu
04-SO-078	Access Track used by lagifu and Kaintobo villages
04-SO-079	Ephemeral waterhole - occasionally accessed for drinking water when hunting. Similar waterholes exist in the area
04-SO-080	Bamboo trees - used during cooking - community owned
04-SO-081	Hirisia Stream - water source to hunters, downstream supplies water to hedinia village
04-SO-082	Abandoned Garden - Bamboo trees - no longer used by Hedinia village
04-SO-083	Access Road between lagifu and Hedinia villages - general public access
04-SO-084	Bamboo trees - used in cooking - community owned
04-SO-085	Bamboo trees - used in cooking - community owned
04-SO-086	Pandanas Palms - food source - community owned
04-SO-087	Active garden - containing banana trees, bamboo trees and sugarcane - economic displacement
04-SO-088	Active garden - containing banana trees, sugar cane, taro and local cabbages - economic displacement
04-SO-089	Active garden - containing banana trees, bamboo trees and sugarcane - economic displacement
04-SO-090	Active garden - containing banana trees, tapioka, pumpkin and sugarcane - economic displacement
04-SO-091	Active garden - containing bamboo, pandanas and sago cabbages - economic displacement
04-SO-092	Sawaki Stream and pandanas and sago trees
04-SO-093	Pandanas Trees - community owned
04-SO-094	Ai'io River
04-SO-095	Sago trees - community owned
04-SO-096	Clan Boundary
04-SO-A	Pandanas swamp - community owned
04-SO-B	Pandanas swamp - community owned
04-SO-C	Pandanas swamp - community owned
04-SO-D	Pandanas swamp - community owned
04-SO-E	Pandanas swamp - community owned
04-SO-F	Pandanas swamp - community owned
04-SO-G	Pandanas swamp - community owned
04-SO-H	Pandanas swamp - community owned
04-SO-I	sago swamp - community owned
04-SO-AA	ancestral garden - archaeological site
	<u>ROW KP 85.4 to KP 69.4</u>
05-SO-057	walking track used for hunting for Bangore and Hiwalevi areas
05-SO-056	Hunting ground - loss of small area - fauna will move to other areas covered under the IPCA

APPENDIX 3: TYPICAL CAMP LAYOUT

