

# Environment and Social Monitoring Report

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Semiannual Progress Report  
November 2005-April 2006

## LAO PDR: GMS Nam Theun 2 Hydroelectric Project

Prepared by the Environment and Social Division of Nam Theun 2 Power Company, Ltd.

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**NAM THEUN 2 POWER COMPANY LTD**

**Environment & Social  
Progress Report**

**Period Nov 2005 to Apr 2006**

This report is a revised version of the Semi-Annual Progress Report, Nov 2005 to April 2006, produced by the E&S Unit of Nam Theun2 Power Co. Ltd. The report has been edited for public release.



**Nam Theun 2 Power Company Ltd.**

## **Nam Theun 2 Hydroelectric Project**

# **Semi-Annual Progress Report**

**Period November 2005 to April 2006**

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## **DEFINITIONS AND ABBREVIATIONS**

## **MAP OF PROJECT SITE**

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## PREFACE

### **Purpose of this report**

The purpose of this document is to provide the wider audience with a comprehensive and transparent report on the Nam Theun 2 Project progress against its overall implementation planning.

### **Overview of the scope**

The scope of this report includes description of the Project implementation progresses in the field of construction, environmental management during construction, Public health programmes and social development throughout the various Project areas except the watershed, which is managed directly by the Government of the Lao PDR (GOL). It also describes the activities related to wildlife programmes, archaeological surveys and water quality monitoring of the various rivers affected by the Project.

### **Who prepares it?**

This report is prepared by NTPC. Prior to its disclosure to the wider audience, it is reviewed and commented by the GOL, lenders and International Financing Institutions involved in the Project.

### **Relationship to other NT2 related activities by the Government**

While NTPC is in charge of preparing the progress report on the above mentioned topics, GOL prepares a consolidated progress report including the description of the conservation and development activities that the Watershed Management Protection Authority (WMPA) is undertaking in the Nakai-Nam Theun National Protected Area (NPA), as well as elements of progress in the establishment of the revenue management scheme that the Ministry of Finance is coordinating with the rest of the national public administration.

## 1 EXECUTIVE SUMMARY

During the period, NTPC completed the organization of the company both in Vientiane and at the site. While doing so, it continued to:

- Direct the project constructions activities as subcontracted to the Head Contractor
- Monitor the measures for environmental protection ;
- Perform regular water quality monitoring;
- Carried out or launched various programs on wildlife (elephants, fish)
- Perform advanced UXO clearance and archaeological surveys and/or salvage for the resettlement activities on the plateau, as well as for all lands required by the constructors prior to their transfer
- Perform appropriate compensation to the villagers that are the most directly affected by the construction ("Project lands");
- Began, with the active participation of the local population, the implementation of the resettlement activities on the Nakai Plateau and social development measures in the downstream areas;
- Advanced the regional Public Health Programme throughout the Khammouane Province;

During the period, international stakeholders and the Public have largely participated and could witness this process. Numerous site visits and discussions have been conducted for that purposes.

### 1.1 CONSTRUCTION ACTIVITIES

Fine weather was experienced throughout much of the reporting period, enabling good progress with earthworks activities throughout the Project. At the end of the reporting period, work has commenced on most sites, apart from the majority of the saddle dams, the middle section of the Downstream Channel and the Regulating Pond.

Mobilization by the contractors was increased during the reporting period. At the end of March 2006, there were more than 6,200 personnel working on the project site.

UXO clearance of the remaining parts of the construction area nominated in the Contract continued throughout the reporting period, with cleared areas being marked and identified for access by the Contractor.

At the end of April 2006, the Project construction was about 20% completed. All 14 construction sites were opened. The period comprehends the 2005-2006 dry season during which substantial progresses were made that allowed to make up for the slight delays that has occurred because of the heavy rain endured during previous rainy season. Excavation and tunneling works have progressed substantively. In particular:

- **Dam Site:** Diversion of the Nam Theun was successfully completed on 4 March 2006, in the presence of the Lao PDR Deputy Prime Minister and Minister for Industry and Handicraft. This allowed the subsequent completion of the coffer dam. Excavation work at both upper abutments continued to progress satisfactorily and was complete at the end of the reporting period.
- **Headrace tunnel and power conduit:** Excavation of the Headrace Channel continued satisfactorily throughout the period and is progressing ahead of schedule with respect to the soft-ground excavation works. The Headrace Channel adjacent to the Power Conduit Water Intake continued, along with the excavation works for the Headrace Tunnel. Excavation of Pressure Tunnel and

Drainage Tunnel reached approximately 90 % of the total lengths of hydraulic tunnel.

- **Power Station:** Concreting works have progressed and is due to be completed by end 2006
- **Regulating Dam and Downstream Channel:** Excavation works for the 27 km Downstream Channel have started, including the tunnel section.

## 1.2 ENVIRONMENTAL AND SOCIAL DEVELOPMENT ACTIVITIES

Tasks associated with the environmental and social development activities of the Project were undertaken during the period in the field of:

- Resettlement and community development activities on the Nakai Plateau
- Health programmes at the local and provincial levels
- Project lands, of which physical cultural resources surveys and salvage and impacted villagers compensation
- Downstream program, including studies and pilot activities in selected villages
- Environmental management of the construction including water quality monitoring,
- Asian elephant programme and fish programme

### (a) Health programmes

Main activities for the period included workshops on road safety, GOL Ministry of Health staff training, refining activity plans with District and Provincial staff as well as monthly meetings with the GOL.

Over this period, infrastructures were developed (construction or rehabilitation of Health centers), medical and non-medical supplies were provided (including ambulances and other vehicles), additional health staff were recruited and formed, and the public health monitoring system is being put in place.

### (b) Physical Cultural Resources, Project lands, Camp Followers

Before handing over the construction areas required for the construction to the Head Contractor, and as part of the resettlement process, NTPC, jointly with the GOL, has been implementing:

- Physical Cultural Resources surveys and protective measures whenever required;
- Land surveys and payment of compensations to affected people.

In particular, the relocation and compensation of 54 families within the Oudomsouk village was completed before handing over the required land for the construction of a saddle dam. An international NGO has been contracted by NTPC to undertake a detailed assessment and design tailored made compensation to villagers affected by the Project construction. Before such restoration is fully implemented over time, affected people are receiving provisional compensation.

The PCR program, including surveys, protective measures and appeasement ceremonies is also implemented for the resettlement activities, particularly for moving items of religious or spiritual significance.

A careful monitoring of Camp Followers is continuing, including health and hygiene monitoring

**(c) Preparation activities for resettlement**

Building the capacity of both NTPC and Government resettlement team has been a priority during the period.

Population census was completed and meetings were conducted between NTPC and GOL to determine the families entitled and not entitled to resettlement policies under the Concession Agreement. The report has been finalized and submitted to Resettlement Committee (RC) to determine a proper policy concerning those Nakai Plateau villagers who are not entitled to resettlement package.

The topographic survey and mapping of all the resettlement areas are complete. In conjunction with the Government and its environmental and social Panel of Experts, it was decided to focus on the resettlement villages that could be affected by potential wet season flood, exacerbated since the closure of the coffer dam.

In the meantime, NTPC has been accelerating the livelihood implementation schedule so that it is in place when resettlers move to their new site. In particular, the wet season cropping system plan and other activities are being carefully considered in order to secure the food supply and household income of the resettlers.

**(d) Environmental management**

The main activities of NTPC during the period have included the following:

- Environment team continued its work with programmes and monitoring of construction activities. These activities led to the improvement and tuning of direct environmental management measures, such as waste management and at the various sites by construction contractors, but also in term of the organization of the monitoring of environmental issue during construction.
- The Water quality sampling has continued and noted some improvement in the sediment management, though some issues remain. The programme was extended to domestic water monitoring related to Camp Followers activities and new resettlement sites.
- The elephant programme, launched in March 2004 with WCS, has been extended, and the fish programme has started.

**1.3 MONITORING, VISITS, AND RESPONSES PROVIDED DURING THE PERIOD****(a) Independent monitoring Activities**

Lender Engineer, GOL Engineer, POE, DSRP, IAG, as well as International Financing Institutions (IFI) and commercial lenders involved in the Project have continued the monitoring of NTPC and GOL activities. Accordingly, the period was marked by the following monitoring events:

Month	Event
November	Quarterly visit of Lenders' Engineer
	Site visit by Thai lenders
January	POE visit, IAG visit
February	IFI technical review mission
	Site visit by ADB RSDD and MKRD
	Site visit by AFD Strategy Department
March	Quarterly visit of Lenders' Engineer
	Site visit by Dam Safety Review Panel and GOL engineer
April	Site visit by WB vice President for Asia
	Site visit by Project's insurers

**(b) Project partners monitoring activities**

In addition to the external monitoring by lenders and contractual entities and to the internal NTPC monitoring, the Government, EGAT, and NTPC's shareholders are conducting regular review missions on various topics. Activities during the period are summarized below:

Month	Event
November	Review mission by NTPC's Shareholders
December	Site visit by Environmental Advisor to NTPC's Board
January	Site visit and review mission by NTPC's Shareholders
	LHSE Board of Directors at site
February	Site visit by the Bank of Lao PDR
	EGCO Board of Directors at site
	Site visit by EDF Asia Branch
March	Site visit by EGAT
	Site visit by EDF President's Office
April	Site visit by Environmental Advisor to NTPC's Board

**(c) International Stakeholders Activities**

NTPC and GOL are encouraging civil society, academics, parliamentarians and members of the international media community to regularly visit the Project. The following table describes such activities during the period:

Month	Event
November	Construction cornerstone ceremony chaired by Prime Minister of Lao PDR, Prime Minister of Thailand, and Ambassador of France
January	Site visit by junior delegation from Mekong River Commission
February	Press Tour for Thai journalist on the occasion of an offering to Monk ceremony organized by EGCO on the Nakai Plateau
	Site visit by IHT reporter
March	Nam Theun Diversion Ceremony
	Site visit by World Bank Parliamentary Network
	Site visit by French Conseil Regional Rhone-Alpes
	Site visit by Lycee Francais International de Bangkok
April	Site visit by senior delegation from Mekong River Commission
	Site visit by New York Time reporter

A forum is also organized annually in Laos by the Government for all stakeholders to take stock of the Project progress and to discuss with concerned parties and project implementers. The next Public Stakeholders Forum will be conducted in May 06 in Thakhek.

## 2 PROJECT DESCRIPTION

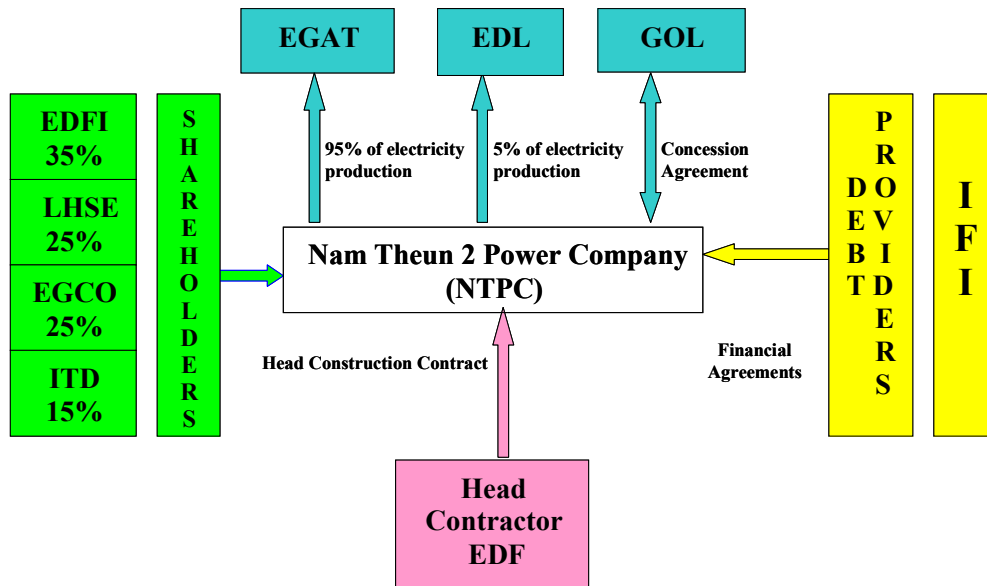
The potential for hydroelectric power projects on the Nam Theun River was first identified in the mid-1970s and was the subject of detailed studies during the following decades. It was not until the early 90s that the Nam Theun 2 hydroelectric project ("NT2" or the "Project") was specifically recognized by the Government of the Lao PDR (GOL) as a key project for the economic and social development of the Lao nation. With the introduction in 1994 of sponsors Electricité de France (EDF) and Italian-Thai Development Public Company Limited (ITD) of Thailand, and the invitation to the World Bank to participate in the project, NT2 moved from a concept to a development phase. Its design and preparation of a complete set of economic, environmental and social safeguards have taken more than ten years. A temporary delay caused by the Asian financial crisis of 1997 allowed the sponsors, which by 2000 also included Electricity Generating Public Company Limited (EGCO) of Thailand, to update some of aspects of the Project, and to develop an adjusted structure best suited to the requirement of commercial lenders. This finally led to the successful Project financing and subsequent beginning of full construction activities in June 2005.

### 2.1 CONTRACTUAL ARRANGEMENTS AND FINANCING

NT2 is the fourth hydropower project located in Laos that sells substantially all of its electricity availability to the Electricity Generating Authority of Thailand (EGAT) on the basis of a long term Power Purchase Agreement (PPA). The earlier developments were more modest in scale, with about 500 MW in combined capacity, but had established the viability of such a development model for Laos.

The Project is owned by the Nam Theun 2 Power Company (NTPC), a limited company incorporated under the law of the Lao PDR. NTPC will build, operate and then transfer the Project free of cost to the Government at the end of a 25-year operation period. NTPC's shareholders are:

- 35% EDF International (EDFI), a wholly owned subsidiary of Electricité de France
- 25% the Lao Holding State Enterprise (LHSE), owned by the Government of the Lao PDR
- 25% Electricity Generating Public Company Limited (EGCO) of Thailand
- 15% Italian-Thai Development Public Company Limited (ITD) of Thailand



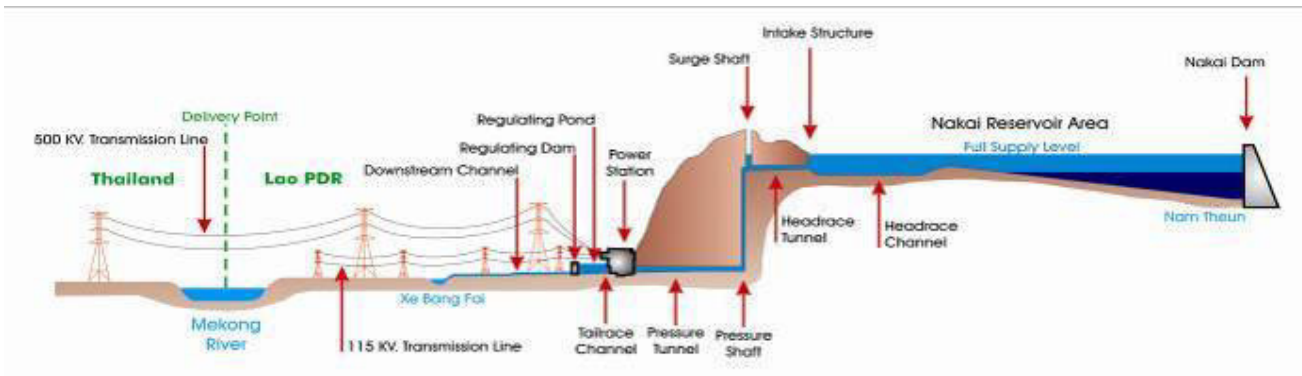
The Project is being implemented by NTPC in the framework of the Concession Agreement (CA) with the Government of the Lao PDR. International Financial Institutions (IFIs) and commercial lenders are contractually involved in the Project via a series of financing agreements among the Parties.

A total of more than USD 1,500 million in capital commitments for NTPC has been completed in May 2005 to finance the total base Project cost of US\$ 1,250 million, plus additional amounts for contingency and ancillary bonding facilities. In addition to senior loans facilities, shareholders complete the Project financing by contributing equity pro-rata their respective participation in NTPC. The equity contribution of LHSE is financed by means of loans, grants and other financing from institutions including the AFD, ADB, European Investment Bank and the World Bank.

While the CA established that NTPC and GOL have a joint responsibility for the proper implementation of E&S measures, NTPC has a full responsibility vis-à-vis its main customer EGAT for the construction on time of the power generation facilities. However, NTPC has passed most of its responsibilities for such timely completion of the scheme to EDF, through the Head Construction Contract which establishes that EDF shall construct the Project on a date certain, fixed price turnkey basis.

## 2.2 TECHNICAL DESCRIPTION

NT2 is a 1,075 MW trans-basin hydropower scheme diverting the upper flow of Nam Theun river from the Nakai plateau into the Xe Bangfai River in the Khammouane plain. By such the project is benefiting from a 348 m net head to drive generating units capable of producing an average 5,936 GWh per year.



The Project is being built on the Nam Theun River, a tributary of the Mekong. The key features of the Project include:

- a 39 m high, 436 m long, concrete gravity dam with integrated spillway;
- a 450 km<sup>2</sup> reservoir (at Full Supply Level) and active storage of 3,530 million m<sup>3</sup>;
- a catchment area of 4,039 km<sup>2</sup>;
- an average net head of water of 348 m;
- a powerhouse comprising 4 x 250 MW Francis turbines (for supply of power to EGAT) and 2 x 37.5 MW Pelton turbines (for supply of power to EDL);
- a double circuit 115 kV transmission line to Mahaxai in Laos;
- a 138 km long double circuit 500 kV transmission line to the Thai border; and
- a 160 km long double circuit 500 kV transmission line from the Thai border to Roi Et (to be built and funded by EGAT).

The Project's location is much favorable for a large-scale, world-class hydroelectric power facility. The natural geography of the Nakai Plateau and the surrounding area is unique in that it allows a hydroelectric project with a significant head of water without a corresponding requirement for a high dam.

### 2.3 BENEFITS TO LAOS

Nam Theun 2 is a major milestone in the economic development of Laos. The project will export 95% of its electricity to Thailand in the framework of the 25 year PPA between NTPC and EGAT, 5% of electricity will be delivered to Lao grid. Laos will receive almost US\$ 2 billion of cash revenue over the concession period (from royalties, taxes and dividends). This revenue will be used to reduce poverty and assist long term development in Laos through a carefully designed revenue management programme.

With the US\$ 1,250 million base financing for the Project, NT2 will be the largest economic asset and the largest foreign exchange earner in the country, as well as the largest single contributor to the Government's budget. Furthermore, the Project is providing numerous opportunities, both directly and indirectly, to appreciably enhance livelihoods in the various Project areas and in the wider region.

### 2.4 ENVIRONMENTAL AND SOCIAL SAFEGUARDS

A robust environmental and social impacts safeguards programme has been designed in conjunction with World Bank, Asian Development Bank and Agence Française de Développement. These measures are being fully funded as part of the Project's budget. It includes the entire Project area, and in particular:

- **The catchment area:** With respect to environmental protection and biodiversity conservation, the Nam Theun 2 reservoir will act as a natural barrier for the pristine forest of the Nakai-Nam Theun National Protected Area (NPA), which is in itself very valuable to the Project for being its watershed, ensuring continuous supply of water to the Project in the long run. This world-class primary forest area is recognized to be of outstanding significance in terms of its biodiversity. By receiving significant funding from NTPC (US\$ 1 million each year) to perform conservation activities in the NPA during the entire life of the Concession Agreement, the Government has committed to protect these 4,000 km<sup>2</sup> of forest and wildlife habitats in the long run.
- **The resettlement area on the Nakai Plateau:** The Nakai Plateau, through which the Nam Theun River flows, is composed of agricultural land, degraded forest, and both permanent and seasonal wetlands. The construction of the Project will require the resettlement of approximately 1,200 families or 6,200 people. The resettlement of these villagers onto the shore of the new reservoir will represent a considerable improvement in their livelihoods, and Nakai Plateau villagers have been hoping for relocation and better life to be created thanks to the Project since the beginning of its development. NTPC is legally committed with the Government through a very detailed Concession Agreement that was prepared in accordance with the Government policy on poverty reduction and ethnic minorities' development, and with World Bank and ADB Policies. Work on a pilot resettlement village, including the construction of 31 houses, an irrigation dam and distribution system, and electricity supply, began in early 2002. The families of the pilot village are now enjoying a new livelihood based on organized land ownership, permanent farms and community-based commercial activities. The model has proved to be a success and relatives from other villages on the Plateau are already joining to help for the work in the pilot village fields. By 2007, the entire 6,200 villagers will be re-established in similar locally designed villages provided with electricity, water supply, schools, clinics and other community infrastructures. Each village will have an irrigation system, and villagers will be fully supported in their choice of a range of livelihood options including both irrigated and rainfed agriculture, commercial forestry, reservoir fisheries, livestock husbandry, and off farm activities.
- **The downstream areas and Xe Bangfai plain:** The essential Project environmental and social safeguards also include the careful preparation of a mitigation plan and associated budget to address the effect of the Project on the downstream areas and in particular the Xe Bangfai River, which will receive turbined water after being regulated and released through a regulating pond and 27 km downstream channel. The Xe Bangfai will observe a progressive modification of its geomorphology and ecosystems due to increased flows of water transferred from the reservoir. In order to mitigate the effect of such river modification on livelihoods while enhancing the positive impact of bringing extra waters to this area, NTPC and the Government have agreed to jointly implement a US\$ 16 million programme funded by NTPC. This programme is aimed at properly compensating the villagers who live along the relevant sections of the Xe Bangfai, and whose livelihood depends partially on the Xe Bangfai River and tributaries. Loss of riverbank gardens and assets and impact on fisheries will be compensated through this programme. While allowing all year long navigation on the Xe Bangfai River, the extra water brought to the downstream areas below the power station will be used by impacted families for growing more rice and other crops during dry season. To that end, the Project includes the design of access points for irrigation facilities to be connected to the downstream channel so that communities are able to use the available water for irrigation. Finally, the wider rehabilitation of flooding gates and expansion of irrigation system in the Khammouane province is envisaged in cooperation with other donors.

## 2.5 IMPLEMENTATION AND MONITORING ARRANGEMENTS

In order to fulfil its duties and responsibilities vis-à-vis its host and partner the Government of the Lao PDR, its shareholders, lenders and ultimate customers, NTPC is organized as follows:

- **The Construction Division** works with the Owner's Engineer (an external engineering firm hired by NTPC) to supervise and monitor the construction activities of the Project, which are performed by the Head Construction Contractor.
- **The Environmental & Social (E&S) Division** covers activities related to environment and social programmes. The E&S Division works closely with the Government units in charge, jointly with NTPC, of environmental monitoring and resettlement / social development activities in the Project affected areas. The E&S Division is also in charge of monitoring and advising the Watershed Management Protection Authority.
- **The "project land study and coordination team"** has been set-up to ensure a timely coordination between construction and E&S divisions with regard to project land activities.
- **The Finance and Administration Division** is in charge of all administration, personnel and finance matters and plays an important support role for the operational divisions in relation to contracts and procedures, document management, financial aspects, IT, etc.
- **The Operation and Maintenance Division** will be staffed progressively three years before project commissioning and will be in charge to operate the Nam Theun 2 hydroelectric facility and perform the maintenance of all assets.

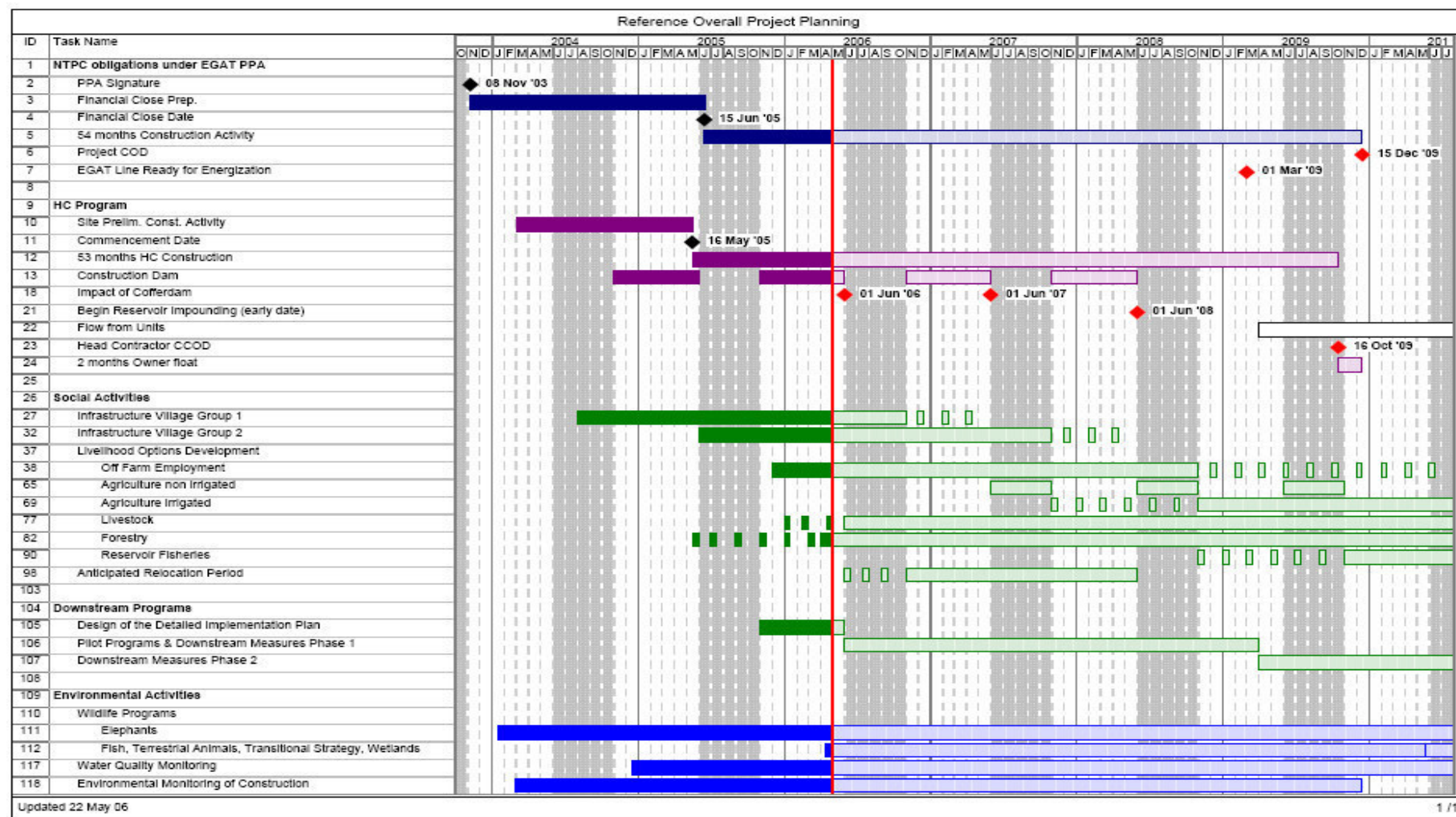
Being the owner company, NTPC is performing an internal monitoring of the Project construction, which is undertaken by a Head Contractor (namely EDF) and its civil work and electromechanical sub-contractors. That includes the monitoring of the environmental management during construction. For the implementation of the resettlement and social development measures however, NTPC and GOL are the direct implementers.

Also, in order to ensure that the Project is developed and operated in accordance with obligations as described in the Concession Agreement and Financial Documents, a comprehensive external monitoring structure has been defined. It is composed of internationally recognized and fully independent panels.

Panel	Acronym	Reporting to:	Monitoring frequency	Mission
<b>Lender's Engineer</b>	LE (team)	Lender's group (IFIs + Commercial Lenders + Export Credit Agencies, through the Inter-Creditor Agent)	Quarterly	Monitor quality, budget, implementation schedule and obligation compliance of : <ul style="list-style-type: none"> <li>- Construction of project</li> <li>- Environmental protection related to construction activities</li> <li>- Social programmes (resettlement, downstream programme, project lands compensations, health)</li> <li>- Environmental programmes</li> </ul> Depending on their findings, the LE issues warnings to NTPC in the form of Non-Compliance levels, which shall be properly and timely addressed to avoid financing drawstops.
<b>International Advisory Group</b>	IAG	World Bank	Occasionally	IAG is responsible for advising the World Bank in its handling of the social and environmental issues on the Project.
<b>GOL Engineer</b>	GOL-E (team)	Government of Lao PDR	3 to 4 visits per year	Advise GOL on NTPC compliance regarding all contractual obligations set in the CA (administrative, Lao preference, construction, Environment and Social)

Panel	Acronym	Reporting to:	Monitoring frequency	Mission
<b>Dam Safety Review Panel</b>	DSRP (3 experts)	Government of Lao PDR and World Bank	Once a year or more if required	Monitor the compliance with the World Bank's Dam Safety Policy
<b>Social and Environmental Panel of Experts</b>	POE (3 experts)	Government of Lao PDR	Once a year or more if required	<p>To facilitate guidance to GOL and NTPC on</p> <ul style="list-style-type: none"> <li>i) mitigation against and remedying of Project Impacts;</li> <li>ii) implementation of NTPC &amp; GOL obligations under the Environmental and Social Objectives;</li> <li>iii) improvement and remedying of Unanticipated Project Impacts; and</li> <li>iv) the appropriateness and relevance of the Environmental and Social Objectives.</li> </ul> <p>The POE will act as the "ultimate judge" in case of a disagreement between the parties.</p>
<b>Independent Monitoring Agencies</b>	IMA (team)	Government of Lao PDR	<p>Quarterly for social aspects</p> <p>Annually for environment</p>	To monitor implementation and effectiveness of environment and social programmes (including villagers' revenue post resettlement).

## 2.6 PROJECT OVERALL PLANNING



### **3 CONSTRUCTION PROGRESS**

#### **3.1 PROJECT WORKFORCE**

By the end of the period, more than 6,000 personnel were employed for the construction activities, of which 81% were Lao (with half coming from the Khammouane province). Approximately 3,500 workers were residing in the six Construction Camps, based in the vicinity of the main construction sites.

#### **3.2 UXO CLEARANCE**

Portion of the land used in the construction and resettlement aspects of the Project are contaminated to varying degrees with Unexploded Ordnances or UXO. For the safety of infrastructures, workers and resettlers, NTPC and Head Contractor undertook a vast UXO clearance programme since the beginning of preliminary construction activities in 2004. The programme covers not only the Project infrastructure areas, but also the resettlement areas and related agricultural zones, access roads (including the main road between Thakhek and Nakai), route of transmission lines, and various residential areas. In addition to the actual clearing work, NTPC has developed a safety policy, which fully integrates the risk associated with UXO in the Nam Theun 2 Project area. The NTPC UXO safety policy requires:

- the provision of basic advice regarding required work practices for employees and contractors in relation to the presence of UXO;
- the provision of procedures for UXO discoveries made by employees or contractors;
- the development of UXO awareness among the local population.

By the end of the period, more than 10,000 UXOs, ranging from small BLUs to 400 kg bombs had been collected and neutralized in the vicinity of construction areas, representing an area of approximately 2,000 ha cleared. In total, almost 3 million units had been detected, mainly bomb fragments or metal scraps, all of them requiring check by a de-mining technician.

#### **3.3 ROADS**

The Project is constructing a number of infrastructures, including 145 km of new and upgraded roads and bridges in the Khammouane province.

Maintenance of roads continued throughout the reporting period, with particular emphasis on:

- Preparing for the levelling and surfacing of the road between Thakhek and the Power Station.
- Levelling and side drainage of the road from Oudomsouk to Ban Nam Nian, including the construction of the Ban Thalang bridge foundation.
- Opening and constructing the definitive access road to the dam site. An amended alignment of the road, toward the Nakai Dam end, was proposed in an endeavor to optimize the cut and fill volumes and reduce the vegetation clearance requirements.
- Maintenance of portion of Public roads used for the Project, including watering for dust prevention.

**Road Works**

### **3.4 NAKAI DAM**

The diversion tunnel was complete and diversion of the river was successfully implemented in early March, allowing for the beginning of construction of the coffer dams. The upstream starter cofferdam was completed immediately following diversion of the river. The downstream starter cofferdam was also substantially completed during the reporting period. Construction of the upstream RCC cofferdam is being undertaken in 3 blocks (i.e. right abutment, left abutment and center block). Dewatering of the area between the two starter cofferdams has commenced.

Excavation for the spillway and stilling basin accelerated during the reporting period, following diversion of the river. At the end of the period, approximately 50% of this excavation work had been completed.



***Nakai Dam – Diversion Tunnel Completed (before diversion)***



***Nakai Dam – Construction of Upstream RCC Cofferdam (after diversion)***

### 3.5 POWER CONDUIT WATER INTAKE AND POWER CONDUIT

#### (a) Intake and Adjacent Headrace Channel

The suitability test report for the Headrace Channel slope protection is under review by NTPC and Owner Engineer. Work on the Intake structure is scheduled to commence in September 2006, so as to not interfere with the access needed for excavation and invert concreting of the upper portion of the Headrace Tunnel.

Excavation of the Headrace Tunnel, from the Intake portal, continued throughout the reporting period.

The Contractor commenced construction of a new access ramp to the Intake area to enable continuity of access to the Headrace Tunnel behind the flood protection cofferdam being constructed in preparation for the coming wet season.



***Power Conduit Intake – Intake and Headrace Tunnel Portal***



***Power Conduit Intake – Headrace Channel Excavation (Km 4.9)***

**(b) Headrace Tunnel and Surge Shaft**

Headrace Tunnel (total length of 1,526 m) excavation progress is approximately 90% completed. Full face (benching) excavation at the end of the period totals approximately 20 % of the total length.

Geological mapping was undertaken throughout the excavation process. Such mapping has been used to identify those areas requiring additional support.

Excavation of the Surge Shaft to final diameter has progressed substantially during the reporting period. Surge Shaft excavation progress to date has been slower than scheduled, but is not critical.



***Surge Shaft – Construction Platform***

**(c) Pressure Shaft and Pressure Tunnel**

Drilling of the pilot hole for the Pressure Shaft continued during the period. Drilling rates averaged 5.7 m per day. There were no identified unforeseen conditions, issues or concerns raised in relation to the target price works for the Pressure Shaft or Pressure Tunnel.

**(d) Access and Drainage Tunnel**

Drainage Tunnel excavation is completed. Further excavation is being undertaken to provide an alternative route for evacuation of material from the Pressure Shaft excavation. This is to ensure that preparations for installation of the Pressure Tunnel steel liner can proceed without interference from the Pressure Shaft excavation works.

There were no identified unforeseen conditions, issues or concerns raised in relation to the target price works for the Access and Drainage Tunnels.



***Drainage Tunnel – Support Installation***

### **3.6 POWER STATION, SUBSTATIONS AND TAILRACE**

#### **(a) Power Station and Tailrace Channel Excavation**

Mobilization of the workforce for the Power Station concreting works continued to be accelerated, including the continuation of a 12-hour day-shift and a night-shift. Electro-Mechanical supervisors are now on site to ensure correct preparation, installation and testing of the parts prior to embedment.

During the period, work continued on excavating the Nam Kathang end of the Tailrace Channel, i.e. downstream of the temporary cofferdam, and at the end of the reporting period was approximately 40 % complete. The remainder of the excavation work downstream of the temporary cofferdam is due to be completed prior to the beginning of the next wet season. Some portions of the Tailrace Channel will not be completed until the road bridges across the Nam Kathang and the Tailrace Channel have been constructed.

The temporary cofferdam and related flood protection works adjacent to the Nam Kathang will be retained and improved, as necessary, to ensure protection of the Power Station area from flooding during the next wet season.



***Power Station – Overview***



***Power Station – Sub-structure Concreting***

**(b) Nam Kathang Diversion**

The Nam Kathang diversion works, particularly riprap placement, will continue throughout the current dry season to ensure adequate flood protection for the Power Station and Switchyard areas for the 2006 wet season. To date, 50 % of the required riprap volume has already been placed.



***Nam Kathang Diversion – Slope Protection***

**(c) Switchyard**

Switchyard platform works continued throughout the reporting period, with the placement and compaction of backfill material and performance of related compaction tests.

At the end of March 2006, approximately 65 % (by volume) of the switchyard platform had been placed and compacted.



***Switchyard - Platform Fill and Compaction***

### **3.7 REGULATING DAM AND REGULATING POND**

#### Regulating Dam

Excavation for the Regulating Dam concrete section continued during the period. Such excavation and associated slope protection works will be completed prior to the commencement of the coming wet season.

#### Regulating Pond

No activity was scheduled during the reporting period.

### **3.8 DOWNSTREAM CHANNEL**

Soft ground excavation of the 27km Downstream Channel has commenced and approximately 12 km were excavated during the period. The Downstream Channel temporary access road, constructed mainly along the left bank construction boundary is used to divert heavy construction traffic away from Gnommalat village. Concreting for the Ban Itak Crossing bridge piers and culvert slab and walls is now about 80 % complete.

Substantial progress were made on the downstream tunnel excavation work. However, at the end of the reporting period, the Contractor has encountered a clay-filled karst cavern that has significantly slowed progress.



***Downstream Channel – Excavation***



***Downstream Channel Tunnel – Outlet Portal***

### **3.9 500 kV AND 115 kV TRANSMISSION LINES**

UXO shallow search continued for the 500 kV and 115 kV transmission line corridors.

90 % of the total line length for the 500 kV line has been shallow searched and cleared. 65 % of the total line length for the 115 kV line has been shallow searched and cleared. Deep search UXO clearance continued at the identified sites for 500 kV transmission line towers.

Concrete tests for tower foundations have commenced.

### **3.10 HEALTH AND ENVIRONMENTAL MEASURES LINKED TO CONSTRUCTION**

#### **(a) Site Health, Safety and Security**

The Contractor held weekly health and safety meetings throughout the period, along with regular 'safety patrols' through each of the main construction areas.

Staffing of the Contractor's health and safety are being reinforced with the addition of the following personnel:

- Safety Officer (Head Contractor)
- Medic at Nakai Dam (Head Contractor)
- Safety Engineer (construction contractor)
- 10 skilled emergency nurses (construction contractor)

The construction contractor's medical team continues to be progressively reorganized and partially integrated with the Head Contractor's medical team. The Head Contractor is also undertaking a malaria prevention awareness reinforcement program with respect to pest control and the use of impregnated bed-nets. Additional impregnated bed nets have been purchased and distributed.

In parallel, the project site safety committee (including representatives from NTPC, the Head Contractor and the construction contractors) meets at least monthly to discuss key site safety issues.

#### **(b) Environmental Protection**

Construction activities are requested to be carried out within the framework of a set of Environmental and Social measures. 18 topics are covered by the Environment Monitoring and Management Plans (EMMP), such as erosion protection, dust, noise, waste management, etc. (ref. EAMP)

These EMMPs are implemented by the HC Environment Team through Site Specific Environmental Plans (SSEP), which have to be reviewed and approved by NTPC prior to implementation.

During the period, NTPC has continued to implement a procedure to monitor the performance and compliance by the HCC and subcontractors related to EMMP and SSEP as follows:

- NTPC receives and reviews monthly reports by the HCC.
- In parallel, NTPC has recruited a team of two environmental inspectors based at site. Environmental inspectors prepare daily reports on the situation at the various construction sites (including dam, power station, water intake, etc.) and identify potential issues against the non-compliance scale that has been defined in the EMMPs.
- On the basis of these daily site reports, NTPC sends a weekly summary of issues to the HCC and, if necessary, asks that corrections be implemented.

Environmental protections in relation to construction activities are being implemented (including drainage channels, sediment ponds, waste disposal facilities, fuel storage facilities, etc.) Re-vegetation works are being carried out on sensitive slopes. Several training sessions have been performed and various

warning boards concerning wildlife protection have been provided in workers camps.



***Preparation for Waste Disposal***



***Sedimentation Pond***

# Environmental protection measures during construction – Poster 1:

## Environmental Protection Measures



Petrol and Waste Oil Storage Area (Platform 1)

### Hazardous Materials

#### Storage of HazMat

HazMat shall be stored in a storage area protected by bunding. The volume of the bund is in excess of 110% of the volume of the largest container.

HazMat Storage/Use areas shall have storm water treatment before discharge.

Acids, coagulants and flocculants will be stored in a separate container with a bund to contain spills.

Shotcrete accelerators, chemical resins and cement grouts will be protected from the weather. The storage location will be within a safe area, as such any spill would be contained and out of flooding occurrence.

Waste oil and other liquid HazMat waste will be collected by a liquid waste removal tanker and will be disposed of at a safe temporary disposal area for Hazardous Waste.

(EMPP – SP05.3)



Main Petrol Storage Area (Dam Site)



Bins for Different Types of Waste with Labels (Access Adit)


Bins for Different Types of Waste with Labels  
(Construction Camp, Platform 1)

### Waste Management

Bins for Different Wastes shall be provided at any Construction sites (EMPP – SP12)

#### A. Non-Hazardous Waste

##### GROUP A1: Combustible Solid Waste

Cardboard  
Plastics  
Clean paper  
Food waste

##### GROUP A2: Non-combustible, Non-Petroleum Waste

Metals  
Glass  
Machinery parts  
Rubber waste  
Tires

##### GROUP A3: Non-Combustible, Petroleum Waste

Concrete  
Other construction debris  
Waste  
Vegetation suitable to be burnt (e.g. 9 ft tall)  
Other biological waste from various tanks

Note: Where any waste is in this column (A2) it is to be labelled HAZARDOUS and its name, source and components

#### B. Hazardous Waste

Acids and alkalis  
Batteries  
Chemicals and waste  
Flammable and flammable containers  
Fuel drums, oil drums and steel oil  
Fuel oil and oil-based waste

Fibers  
Hydraulic fluid  
Insulation material  
Paint and paint waste  
Pesticides  
Solvents  
Spill clean-up waste  
Waste from grain traps  
Other waste when its composition is unknown

Note: Waste in this column (B) is to be labelled HAZARDOUS and its name, source and components

### Sediment Control

#### Design specifications for erosion and sediment control measures:

• All erosion and sediment controls will be designed to cater for a minimum of a 2 year ARI flood event.

• Runoff velocities will be reduced by minimising flow lengths.

• Retention of vegetation along watercourses reduce flow velocities.

• 'Clean' runoff from undisturbed areas will be diverted away from the construction site.

• Runoff from disturbed areas will be directed into sediment trapping or filtering devices.

• Silt fences or vegetative fences should be installed to intercept any sediment.

• Sediment trapping or filtering devices such as sediment fences, sediment basins or traps will be constructed to capture and treat sediment laden runoff from all disturbed areas.

• Sediment collection devices will be cleared when basin capacity is reduced by a maximum of 50%.

• Sediment collection devices will be used to treat runoff from the site as appropriate.

• Release of discharge will only occur after monitoring to meet the requirements of Water Quality Monitoring.

All discharge from sediment collection devices will pass through a vegetative or silt filter, prior to release to an established watercourse.

• Trash racks will be provided at the outlet of all main drainage points entering watercourses. Trash racks will be cleared daily and waste disposed off.

• All erosion and sediment controls will be inspected once a week during the dry season and every 24 hours during the wet season.

• Prior to the wet season, a review of the effectiveness of the erosion and sediment controls will be made.

• Wastewater generated during tunnelling will be collected in a sediment basin prior to discharge (EMPP – SP1.32).



Waste Water Sediment Basin (Concrete Batching Plant 1, Platform 1)



Sediment Basin (Concrete Batching Plant 1, Platform 1)



Water Tunneling Sediment Basin (Access Adit)



Waste concrete basin (Concrete Batching Plant 1, Platform 1)



Nam Theun 2 Power Co., Ltd  
Environmental Management Office (EMO)

# Environmental protection measures during construction – Poster 2:

## Environmental Protection Measures

### Drainage System



Drainage at Contour line of the Site (Intake and Headrace Channel)



Drainage at the Downslope of the Stockpile Embankment (Powerhouse)



Road Drainage Protection (Switchyard)



Drainage above the Slope (Concrete Batching Plant L, Platform 1)

### Embankment Protection

#### Measures to minimise erosion:

- ◆ The location of works in sensitive erosion areas will be minimised.
- ◆ Where possible, works in sensitive erosion areas will be restricted to the dry season.
- ◆ "Sensitive erosion areas", are defined as follows:
  - Areas with slopes > 20%
  - Areas within 50m of a bank of a natural watercourse
  - Cut and fill slopes in areas of slope instability or erodible geology
- ◆ Progressive revegetation of exposed areas will take place as soon as practical following completion of construction works in that area. Reference will be made to Sub-Plan No. 10 in relation to suitable species for revegetation works.
- ◆ If construction works are temporarily stopped in an exposed area (for longer than 14 days), temporary stabilisation of exposed surfaces will be undertaken.
- ◆ Rip-rap, or similar, will be installed at the inlet and outlet of all culverts to prevent scour erosion.



Culvert Head Protection (Road 8b)



Revegetation of Embankment (Residence Nam Theun)



River Bank Protection along Nam Kathang Noi (Powerhouse)



River Bank Protection along Nam Kathang Noi (Switchyard)



Nam Theun 2 Power Co., Ltd  
Environmental Management Office (EMO)

## 4 RESETTLEMENT AND SOCIAL DEVELOPMENT ACTIVITIES

### 4.1 STAFFING AND PARTNERSHIPS

#### (a) Fine tuning NTPC Capacity

As end of the reporting period, NTPC E&S Division was composed of 86 people (71 Laotians / 15 foreigners). It represents approximately 20% more workforce than the maximum required staff originally proposed (67 people). NTPC also uses consultants, including a social scientist focusing on Resettlement Action Plans for Project Lands, one forestry specialist, two for infrastructure programs and one for community development program.

NTPC teams are working in coordination with GOL teams: Resettlement Committee, Resettlement Management Unit and District Working Groups. Most of the E&S teams are located at site, in Nakai, Gnommalat and Thakhek.

#### (b) Bring partners on board

Experienced organizations are being encouraged to cooperate with NTPC for the implementation of the resettlement and social development programme related to the Project. Accordingly, NTPC has developed a number of relationship with development NGOs and Research Institutes as follows:

Implication in the project	NGO, Research Institute
Elephant Programme Since March 2004	Wildlife Conservation Society (WCS)
Public Health Action Plan: Analysis of Baseline Health Data September 2004 – March 2005	Institut Francophone pour la Médecine Tropicale (IFMT)
Morpho-pedological and agronomic appraisal in Nakai Under AFD Grant - June 2005	Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD)
Livelihood assessment and compensation – since January 2006	INGO

Discussions have also been ongoing with other NGOs, Institutes and International Agencies to have these organizations serve as advisors or consultants to the GOL and/or NTPC on issues such as Anti Human trafficking awareness, Road Safety, Agriculture / Livestock Programme, as well as the various wildlife programs.

### 4.2 PHYSICAL CULTURAL RESOURCES (PCR), PROJECT LANDS, CAMP FOLLOWERS

#### (a) Physical and Cultural Surveys & Salvage

##### **Background**

The baseline PCR survey undertaken in 2004 identified all items and sites of PCR significance that are located either within or adjacent to Land Parcel Areas. The survey also provided an impact assessment for each PCR site.

Based on the findings of the baseline survey and the impact assessment advice provided by the Head Contractor, the PCR items and sites were separated into four PCR plans for (i) movable PCR; (ii) PCR within construction areas; (iii) PCR within the Reservoir; and (iv) PCR along the Xe Bangfai.

To date, the Institute of Cultural Research (ICR) has implemented the PCR plan for (i) movable PCR and (ii) PCR within construction areas. Implementation consisted of a series of consultations with PCR custodians. Potential impacts were discussed with the custodians then mitigation and compensation measures, that would help prevent any adverse impact, were identified and implemented.

In addition to those PCR that were identified during the baseline survey there is a potential for additional sites or items of PCR to be identified during construction activities. These sites or items are termed "chance find PCR" and a procedure has been developed, in conjunction with Department of Museums and Archaeology, to deal with these PCR as and when they are discovered.

Mitigation and compensation measures supported by NTPC for PCR impact include:

- appeasement ceremonies for impacts to cemeteries and spirit sites;
- ceremonies and logistic support for relocating movable PCR within caves to the security of the temple;
- provision of security measures (fencing or huts) to protect PCR that the custodians requested to remain within cave or on open ground;
- improving security at temples to protect movable PCR from theft; and
- undertaking consultation to raise awareness of the potential impact of theft during the construction phase.



***Buddhist ceremony at a cemetery***



***Post ceremony baci***

### **Main activities during the period**

During the period, the ICR conducted consultation and compensation measures for the Ban Oudomsouk Temple, which will be impacted by construction activities for the Saddle Dam 12b drainage channel. Although the main temple buildings will not be directly impacted, the western boundary of the temple grounds will be impacted by land take. 23 stupas were located along the western boundary and these required relocating before construction activities could commence.

Consultation with PCR custodians on the Nakai Plateau is now complete and a compensation measure has been identified for each PCR. Compensation activities are initiated prior to the relocation of the villages.

The plan for PCR along the Xe Bangfai is scheduled to be implemented in 2006-2007 in coordination with the downstream program. One historic site located on the banks of the Xe Bangfai will require an archaeological salvage. A more detailed survey will be conducted on the twelve temples located on the banks of the Xe Bangfai between Mahaxai and the Road 13 bridge to prioritize monitoring effort and identify any requirement for bank protection.



***Relocation of stupa onto newly constructed concrete pliths***



***Post relocation ceremony***

#### **PCR ceremony for Ban Oudomsouk Temple**



***Offering to the monks***



***Individual personal ceremony***

#### **(b) Project Lands**

##### **Affected areas, Project Affected People (PAP) and compensation procedure**

In total 3,700 ha and approximately 1000 households are being impacted at various degrees by the construction works. About 450 households are impacted less than 10% of their assets, and are therefore eligible to simple cash compensation. NTPC has been working with the Head Construction Contractor to ascertain precisely which areas are required for construction and at what time, in order to implement compensation activities in accordance with the construction schedule, so as to avoid unnecessary or untimely disturbance to impacted communities.

During the period, the collection of Baseline Study data was effectively complete. That said, there has and will continue to be ad-hoc requests from the HC for access to additional parcels of land for specific purposes. Such requests will be assessed on a case-by-case basis and household data will continue to be collected sufficient for NTPC to meet its obligations under the CA.

An international Rural development NGO and NTPC entered into agreement in early 2006 for the design and implementation of livelihood programmes related to Project lands. The NGO's input is to focus on the design of tailored compensation schemes through consultations with identified PAP for livelihood restoration options, and later to support and monitor the implementation of the compensation programme using information derived from baseline studies.

While finalizing tailored made compensation packages for each villager having part or all of its house, or its livelihood impacted by construction activities, NTPC has been implementing interim compensation to the most immediately impacted villagers. Such compensation mostly took the form of cash compensation. Excluding villagers impacted to less than 10% of their current property and livelihood (such villagers receive an immediate and final cash payment), interim compensation is obviously not complete and villagers who received such advances will later be more comprehensively compensated for the loss they have incurred.

The overall livelihood restoration options based on consultations with villagers and communities include the following:

- Land development
- Irrigation development
- Rice production
- Horticulture development
- Livestock improvement
- Non-timber forest products
- Industrial crops/trees
- Non-agriculture based options (wood processing, construction activities, tailoring, restaurant, food processing...)



***PAP on a field trip to Xaibouli district in Savannakhet on vegetable production***

***PAP of Gnommalat visiting the mushroom production at the demonstration farm in Nakai***



### **Specific areas**

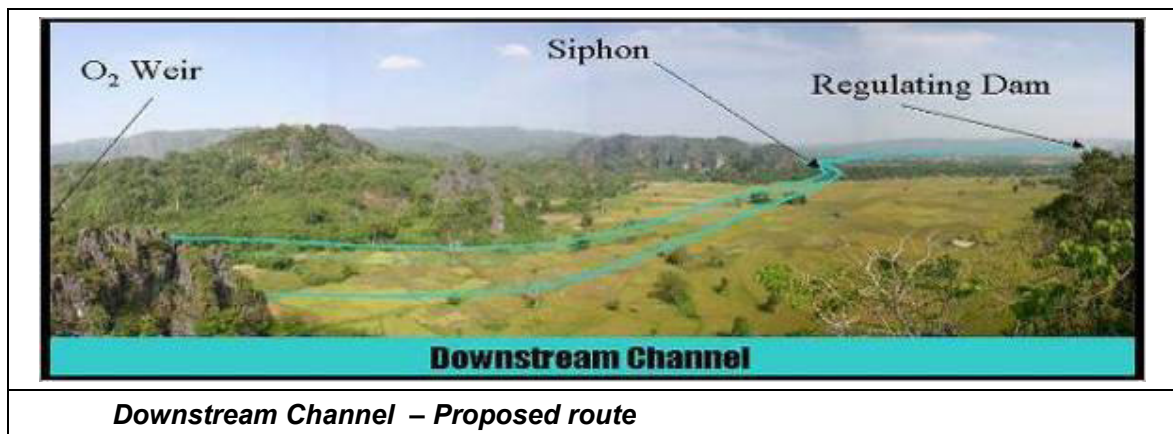
**Project Roads:** While road improvement works are not expected to impact significantly any villages, NTPC is working with District Working Groups (DWGs) to complete households and assets registration along the road alignment so that any impacts that may arise may be assessed and properly compensated. In recognition that reconstruction of Road 12 and Road 8b is likely to result in some form of disturbance to households located along the road alignment, NTPC has continued to distribute a “disturbance allowance” to all households prior to the commencement of construction works on any given section of road. The distribution of the disturbance allowance to all registered households was completed at the end of the period. Additional road safety awareness materials have been distributed within concerned districts and a road safety awareness campaign (at 35 schools in 26 villages) has commenced.

**Regulating Dam and Downstream Channel:** While timing construction activities so as not to impact the harvesting of the 2005 wet season crops, works on the regulating dam and downstream channel started at the beginning of the reporting period. Accordingly, NTPC and CARE continued local consultations on livelihood alternatives. Investigations are continuing within Gnommalat and Mahaxai districts to establish the suitability of lands for establishing replacement livelihood activities, including a rice improvement program.

Thus, 160 farmers of affected households from Gnommalat and Mahaxai Districts received training at a Rice Research Station during March and April 06. A land area of around 50 ha was identified near Gnommalat for redistribution to PAPs who have lost their entire productive land. Negotiations with the present landowners about the conditions of the handover are in progress.

The market development survey for vegetables and other annual crops was completed. This survey provides valuable information for the implementation of the horticulture development section in the livelihood restoration program.

To address site-specific safety issues related to the ongoing downstream channel construction activities through the Gnommalat plain, a safety awareness campaign was undertaken at various local schools, and a local villager has been engaged to ensure that villagers do not venture into the Downstream Channel construction area.



**Oudomsouk Urban planning:** Resettlement activities to move 54 households in Oudomsouk have been completed. The timber houses including toilet/bathrooms in the new urban area are complete. All families have moved in. The arrangement for the electrification of the urban area including the new primary school was completed.



**Replacement timber house in Oudomsouk**

### **(c) Camp Followers and capacity building for local agencies**

Due to an efficient GOL/NTPC collaboration, the situation of “camp followers” remains good and there was no occurrence of potential negative effects from the camp follower phenomena.

Estimates for new comers in the area are being made on continuous basis. In parallel to keeping updated information about the localization and activities of camp followers outlets, NTPC has been working on the improvement of food hygiene, as the hygiene in new eating places in the area is usually poor in nature leading to increase in food borne diseases. STI control is also a priority, as bars and other entertainment venues may encourage alcohol abuse, disorderliness and prostitution leading to increase in injuries and sexually transmitted infections. Health service provision to Camp Followers in the Project area is available from the district health services.

**Hygiene and Public Health**

The following measures have been implemented to keep a check on the minimum standards to be maintained in all the eating places. Following points detail the plans:

- All eating places are required to be registered with the local government, either with the district health office or the local government offices. Hence each eating place has to display a registration certificate in the restaurant.
- Regular visits are made by health officers to check the hygiene standards of the restaurants.
- Information is being collected to establish whether restaurants are run by the local people or people are coming from outside. Information will be regularly updated to monitor the increase in the local population.
- Water quality monitoring team of NTPC has continued to conduct faecal coliform analysis at five restaurants in Nakai District and ten restaurants in Gnommalat District on a seasonal basis to assess whether activities under the Camp Followers Health Program are contributing to improvements in the quality of domestic water supply. This has been indicated to the district authorities and it was then advised that restaurants that exceed the Lao standard should continue to avoid direct consumption of the water or to boil the water prior to washing vegetables and cooking pots. It was also recommended that these restaurants stop using this water for washing vegetables and other food items that can be consumed raw and for washing hands and dishes.

**STI and its control**

The impact of camp followers on the local population were studied and discussed in Nakai and Gnommalat district health offices. Measures implemented to monitor and control STIs are listed below:

- All bars are registered under local government rules.
- The number of service women working in these bars are also monitored by District Committee for Control of AIDS (DCCA)
- Regular health awareness and education programs are organized for the service women and general public, promoting protection against STIs by using condoms.
- Education programs for workers are also organized by the Head Contractor under Project Staff Health Plan.
- Opportunities like boat race festivals, World AIDS Day and other public events are being used to increase public awareness of the STIs and how it can be prevented.

**Traffic Safety and Regulations**

In addition to the road safety training program for schools and villages, every District has issued an additional Notice on traffic safety management, especially in the Project areas. NTPC initiated a joint working group to supervise the on-going works such as: road accidents data collection, the emergency response, the awareness for schools and villages, the police check posts, the proposal of the Provincial Governor in extending the training at district level, the obstacle removal along the road during the construction and the related compensation, etc. Accordingly, a road safety committee focused on the following immediate actions:

- strengthening the control check posts and check points with the capability to strictly enforce the regulations, establish the appropriate communication system between check points and more awareness training at all levels. Close collaboration with the Head Contractor for drivers' good conduct, the reduction of dust problem and more visible signs at the construction areas.
- close and regular supervision and site inspection

The district of Mahaxai has moved forward in disseminating the traffic regulation to nine villages and three schools. This action is being made in addition to raising awareness about drug abuse problems. Gnommalat/Nakai and Khamkeut sent also the weekly report informing the strict control. In total, the road safety training targets 35 schools and 26 villages along the roads serving.

As a temporary measure because of the heavy traffic and the work load along the Downstream Channel during this dry season, NTPC staff, equipped with security clothes and bicycle has been circulating along the channel in order to prevent the risk of accidents during day-time.

### **Social Security and capacity building for local agencies**

This effort includes support and technical assistance for district Police offices, support for department of roads, review and strengthening of regulations, the establishment of intersectoral task force on population management and security. Support is also provided to promote the organization of District Grievance Committee (DGC), the organization of Village Grievance Committee (VGC) and improvement of village regulation in seven villages nearest to the construction camps.

Among other actions, District Authorities initiated waste disposal management measures by issuing the notice on how to collect, dispose and manage the waste from the households and along the road. Education session relating to safe drinking is being conducted by the authorities for public and high risk groups under the road safety programme.

## **4.3 PUBLIC HEALTH REGIONAL AND RESETTLEMENT PROGRAMMES**

Routine monthly meetings have been conducted in the districts and the province. The meetings continued to provide an opportunity to discuss and explain the conceptual basis of the Public Health Action Plan, mutual exchange of experiences and difficulties in implementation of the programme, discussions on the forthcoming activities and reporting of the past activities.

### **(a) Construction and rehabilitation of health Infrastructure**

The Public Health programme includes:

- the construction and 4 new health centers and 1 District Hospital.
- the rehabilitation of 2 existing Health Centers, 3 District Hospitals and Emergency Department of Thakhek.

During the period, drawings and procurement activities have been ongoing for

- the roof renovation for Khamkeut district hospital in Laksao
- the Renovation works of district hospital in Nakai and Mahaxai and health centers of Nadou and Kaengdeng
- the new hospital of Gnommalat
- health centers which construction works are to start next dry season

**(b) Medical and non-medical equipment**

During the period, medical and laboratory equipment continued to be procured for health centers and hospitals of project area including:

- Computers and printers for districts and province
- Hospital beds and mattresses to Khamkeut District Hospital
- Two ambulances and 4 four wheel drive pickup trucks handed over to Bolikhamxay and Khammouane Provinces' Health Clinics and Hospitals to better serve the needs of their patients



***Computer and printers to DHO and PHO***



***Patient's beds and mattresses to Khamkeut District Hospital***

**(c) Health education, awareness programme**

Drugs under the Drug Revolving Fund (DRF) have been distributed to all centers and the provincial hospital. Village drug kits and practical training on the management of DRF have been provided to all target villages. The programme has been completed for the current year.

Anti TBC Drugs, family Planning consumables, Vitamin A, folic acid and ferrous sulphate for antenatal programmes were distributed with assistance from other agencies. TBA manual has been prepared and will be distributed shortly.

STIs (including HIV/AIDS Programme): The Provincial and District Committees for Control of AIDS are being supported by NTPC's HPMU to provide STIs services. HIV+ patients if/when identified in the resettlement programme will receive free treatment according to the CA. Voluntary testing and counseling is available to anyone in the province who may require the service, from the provincial hospital.

Several health education and awareness activities supported by HPMU were organized by district health and DCCA/PCCA during Public festivals and events.

**(d) Training, capacity building**

The Provincial Health Authorities in collaboration with NTPC have been organizing quarterly reviews and training programs to monitor all emergencies, including road traffic accidents, to ensure the quality of medical assistance provided is maintained to a high standard. NTPC has arranged and implemented intensive training programs for selected health workers from the Project Area. These programs were implemented in Vientiane at the Mahosot and Friendship Hospitals. These health

workers have now returned to their hometowns in Khammouane and Bolikhamxay Provinces and are currently working to improve the emergency services at the Provincial and District Hospitals.

In addition to the assistance NTPC provides to the hospitals and clinics, training programs are conducted for community and livelihood development, safe and clean water is provided to resettlers, and infrastructure needs (houses, roads, electricity, community buildings, irrigation facilities, etc) are being constructed and provided for local residents who will be resettled.

#### **(e) Public Health Monitoring and Surveillance**

***Routine data collection / HIS:*** Data collection is being reviewed continuously during field visits and through monthly reports to the district health offices. Priority is given to strengthen the quality and quantity of the exiting data collection. Where required and appropriate, new dataset are identified and collected. A specific Outbreak Response Preparedness Plan related to Avian Influenza was developed for the Khammouane and Bolikhamxay Provinces.

***Existing data Analysis 2004:*** Analysis of available health data and proposal of baseline health indicators was completed by Institut Francophone pour la Médecine Tropicale (IFMT). Findings provide additional information to the base line data. This is saved as repository for the future comparisons of new surveys.

***Health Checks in resettlement villages:*** Pilot village health checks and survey was carried out as planned during the period. Some cases have been followed up with further blood test and treatment provided as required.

Deworming program for children 2-5 years old is being organized by Health Centers. School children are covered under the MOH/WHO national deworming programme. In the meantime, mass treatment for worm infestation was provided during health checks and survey in Nongboua Village. The programme is extended to the whole communities in project area.

Public health and nutritional advice is being provided to most recent resettlers, together with the handover of impregnated bed nets.

### **4.4 NAKAI PLATEAU RESETTLEMENT**

During the reporting period, consultation with villagers, as well as discussions with the GoL and recommendations from the Panel of Experts have led to the development and implementation of a more progressive resettlement strategy than that initially considered.

This “transitional resettlement” enables:

- a smoother transition in time from old villages/lands to new sites;
- an earlier involvement of the resettlers on the preparation of their new houses and new lands;
- a better development of the sense of ownership of the new location by resettlers.

In this approach, the resettlers are still moving from their “old” village to their final location. The main infrastructures are in place at their date of first arrival (i.e. the lands have been cleared and UXO searched, water (tube wells) and sanitations are available, all-seasons roads are in place). However, some infrastructures are not yet available (like electricity), or are temporary, like the schools and houses. This transitional period is to last a couple of months, until all infrastructures are completed.

A first group of 10 villages has been resettling to transition housing on the final sites since March 2006. By end April, a total of 171 families had moved to their new sites, and a total of 631 families is expected to resettle by end of July.

**(a) Transitional resettlement**

During the period, adults who are part of the first batch of villages resettled under the transition resettlement programme have been participating in the clearing of their new housing and agricultural plots, collection of building materials for temporary houses, construction of temporary houses, toilets, wells, schools, etc. The enthusiasm of the villagers has been most encouraging, and the process is being closely monitored and supported by NTPC, District and RMU staff, to ensure that the process remains smooth and organized. Villagers are organized in units working as a team to establish the essential infrastructure required prior to moving in to their temporary houses. Rice and protein distribution programmes are in place (a mix of fresh and dried meat, eggs and vegetables was determined as appropriate by the NTPC Health team based on nutritional considerations), and basic household “kits” are distributed – these include water containers, washing gear and mosquito nets. District health officials are monitoring all transition families for any signs of ill health requiring treatment, and school uniforms are being provided as required. As of the end of the reporting period, there have been a total of approximately 171 families resettled to transition housing. This process will continue to move at a controlled rate with more than six hundred families expected to be living on their new plots of land and participating in the development of their new homes by July.



***Ban Sop On house  
dismantling***



***Temporary “transition”  
house and construction  
of new house.***

**(b) Transitional Livelihoods**

In parallel to the actual move of villagers (and their house) to their new village site, NTPC has been preparing for new fields for cultivation in 6 new village lands, during wet season 06. Present development programs in old villages were expanded such as:

- “pig and chicken raising” in existing villages
- vaccination of cattle
- training in home gardens and field crops

Cash revenue activities including work associated with UXO clearance and village construction (paid in cash in addition to food support) has also been ongoing.

There is a full time presence of NTPC and District community facilitators in each village.

***Household garden plot  
of transition resettlers  
from Keng Gnao.  
Permanent housing  
construction  
commenced (concrete  
piers in background)***



***The resettlers of Sop On and Keng Gnao received the agricultural tools***



After the completion of the temporary house construction, the resettlers have been proceeding immediately with the clearing of the agricultural land they now own.

Other villages which are not in the transitional resettlement programme, are encouraged to continue growing several vegetables for house consumption. Some villages could also sell their production.

***Presentation of detailed planning for Ban Bouama relocation***



### **(c) Livelihood programmes**

#### **Agricultural and Livestock Development Programme:**

With the closure of the coffer dam and associated risk of exacerbated flooding during the next rainy season (starting in May/June), the agricultural and livestock development team has been focusing on the resettlement villages with the lowest elevation. Accordingly, while resettlers are being encouraged to prepare their new land, a wet season cropping system plan is being developed. Vegetable garden and mushroom cultivation is being established for new villages. Vulnerable households have been considered in priority.

Livestock relocation is being implemented at the same time when resettlers move to a new site. The consultation on this issue has been done and every village is now building temporary buffalo sheds. Buffalo registration is continuing and expected to finish in mid-2006. Livestock vaccination (Hemorrhagic Septicemia) for buffaloes and cattle, Swine fever for pig and Newcastle M&F for poultry has been started.

**Plateau Forestry:**

The forestry component activities are focused on the establishment and strengthening of the Nakai Plateau Village Forestry Association (NPVFA) to effectively undertake sustainable forest management and operate a profitable forest industry business providing additional income to resettled families. It includes training and demonstration of alternative forest income generation activities through the optimum use of Non-Timber Forest Products (NTFP).

Accordingly, forestry inventories and reservoir/resettlement area border demarcations have been carried out during the period. Retyping and remapping of the better quality forest, degraded forest and protection forest zones have been completed and a permanent forest management area defined for long term sustainable forest management under a long term forest management contract and management plan.

Forest plantation, regeneration and fire patrol activities are being carried out by villagers under NPVFA supervision. This includes weeding and maintenance of 2004 and 2005 NTFP / timber plantations (42 hectares) and forest enrichment plantings (50 hectares) and the establishment of a nursery to service planting programmes. Over 55,000 seedlings have been produced in nursery for non-timber forest products and over 100,000 seedlings for plantation for 2006 operations.

All GOL licenses have now been approved to allow the VFA to mobilize and commence production to produce timber for the resettlement housing and village community buildings in the current dry season. The Government has approved tax exemption for wood harvested in resettlement area and part reservoir area if used for project resettlement related construction.

Production of furniture for project needs and new schools is being undertaken and production of door and window frames for resettlement housing has commenced. Over 200 window frames and 300 door frames have been produced. Small scale production of charcoal on a pilot demonstration scale has also been undertaken.

**Reservoir Fisheries:**

An appraisal of boat ownership and boat building capacity in the villages of Ban Thalang, Sop On, and Ban Done has been carried out and it was observed that in all three villages, there is enough boat building capacity and know how. Three experienced boat designers and builders live in Ban Thalang, while in Sop On and Ban Done respectively five and fifteen experienced boat designers and builders live. These existing boat designers and builders can form the nucleus of the household boat building program at each village.

A maximum of about 1,000 fishing boats will need to be built before COD. The number of boats that will need to be built before August/September 2006 to enable households to cope with the backwater effect from the cofferdam and the potential additional flooding is being estimated.



**Boat Builder at Ban Thalang**



**Five wooden boats (medium sized), one metal boat in Nam Theun at Ban Thalang**

#### 4.5 DOWNSTREAM AREAS DEVELOPMENT PLANS

The Downstream Program aims at designing and implementing a livelihood development and restoration program covering the downstream areas of the project. Out of a total of 16 MUS\$ 50% will be spent before COD and 50% after COD. The program will cover in total 200 villages, including XBF riverine villages, hinterland villages and villages downstream of the dam.

The implementation activity began early 06, on a pilot village: Beungxe, and was extended to an additional 19 villages since.

This pilot implementation provided valuable information for the design of the full-scale program, which is defined in participation with villagers, and will be reviewed by GOL and IFI in May 06.

The large scale implementation is to begin 2nd half 06 and continue till 2015.

During the reporting period, several options for the DS program were studied, discussed with villagers and DWG, and tested in the 20 pilot villages. Therefore, the final program will rely on :

##### 1°) Implement Infrastructure to remove bottlenecks:

- Flood protection
  - "Polders" will be created in lower Xe Bangfai, in order to control low level/ high occurrence floods. This will provide a major benefit for 60 000 people (approx. 2 MUS\$ saving on crops each year, with a limited "upfront investment" in range of 2 MUS\$)
- Safe Water supply, Sanitation and Hygiene Program

2°) Improve technology in agriculture, livestock and aquaculture through training and demonstration / pilot scheme (*present decline of agriculture*)

3°) Set up and fund, a revolving fund for Householder selected project

4°) Rehabilitate the flood gates and get involved in Co-management of fisheries so that fisheries do not continue to decline



*Rice paddies in the middle Xe Bangfai*

#### **4.6 GRIEVANCE MECHANISMS AND SUMMARY**

Two Grievance offices have been set up (one in Nakai, and the other in Gnommalat), allowing villagers impacted by the construction activities to express their concerns or requests.

Permanent mechanisms and channel of communications between the local population and Project authorities have been established. Regular flow of information has been circulating during the period.



***Grievance office at Nakai***

**Summary of claims during the period:**

- One household from Oudomsouk village complained that compensation for resettlement of his house was incomplete.
- Three farmers from Nong Boua Kham village claimed for the loss of rice field because of the building of an access road to new road 8b
- Nine farmers from Oudomsouk village claimed for the destruction of field huts and poultry houses.
- Seven farmers from Phonphanpek village claimed for the destruction of field huts.
- Eight households from Oudomsouk complained about water wells disturbance derived from the construction of the saddle dam. NTPC cooperated with Nakai Resettlement Office to properly solve and compensate for the issue.
- In the Gnommalat district, four households claimed for the loss of rice fields used for the construction as borrow pit. NTPC Project Land team cooperated with the District Working Group and farmers to properly address and compensate for the issue (re. Concession Agreement: borrow outside the concession area to be negotiated between owners and users)

In addition to the smooth solving, on time, of the above grievance, NTPC is investigating the specific nature of some complaints that have been received via the constructor.

**Grievance Procedure Poster in Lao language explaining the communications channels between villagers, NTPC and Government authorities**



## 5 ENVIRONMENTAL ACTIVITIES

### 5.1 WILDLIFE PROGRAMMES

The description of the various elements of the components of the wildlife programme is kept to remind the reader of the nature of the programme.

#### (a) Asian Elephant Programme

The Asian Elephant Programme, implemented by the Wildlife Conservation Society (WCS), started in March 04.

NTPC and WCS have agreed to extend the first phase of the programme until May 2006 and a contract for the extension of the programme was signed with WCS in February 06.

The design for line transect based dung count and faecal DNA capture-recapture survey, including a draft report on Human-Elephant Conflict (HEC), was submitted by WCS in March and commented by NTPC. The chronology of Human-Elephant Conflicts incidents indicated that during the months of March-May 2006 only one incident occurred on the Nakai Plateau. However, from October 2004 to March 2006, 129 Human-Elephants Conflicts were recorded in the area, out of which 25 occurred outside of the Nakai Plateau.

As the surveys are still on-going WCS, has not yet provided further information on the number of elephants on the Nakai Plateau, their distribution and movement. Given the delay of relocating the first group of villages, the test of crop protection

methods in agricultural areas has been postponed to the second phase of the elephant programme.

The second phase of the programme will relate to the protection of crops, management of populations of elephants in relation with the impoundment of the reservoir, as well as monitoring of HEC and crop damages.

**(b) Other wildlife programmes**

In addition to the Phase 2 Asian Elephant programme, other programmes include:

**Fish Impacts in upstream and downstream river species**

- Species and habitat inventory in Nam Theun (NT) and Xe Bangfai (XBF)
- Monitoring of fish productivity
- Fish migration studies in NT, NPA and XBF
- NT habitat and flow studies
- Modification of downstream NT habitat
- Implementation of flow adaptive management programme and related activities
- Incorporating river protection into the management of the NPA and Corridors

TORs for the survey component of the wildlife programme have been finalized. Fish species and habitat inventory in Nam Theun (NT) has commenced in April.

**Terrestrial animals in the inundation area**

- Pre-impoundment species and habitat inventory, distribution and movement
- Post-impoundment species and habitat inventory, distribution and movement (non-inundated part of the Nakai Plateau)
- Development and implementation of a post-impoundment species management programme

TOR for the survey component of the wildlife programme have been finalized

**Transitional Strategy for Reservoir Impoundment**

- Development of a strategy and measures targeting wildlife during salvage logging of the Nakai Reservoir.
- Implementation of measures during salvage logging.
- Development of a transitional strategy for reservoir impoundment.
- Training of local authorities in wildlife emergency response.
- Establishment and implementation of an emergency response team.
- Public awareness programme.
- Prevention and prohibition of wildlife trade.

During the period, NTPC and GOL continued to raise awareness on the illegal nature of wildlife trade of endangered species, including the systematic insertion of a clause in employment and consultancy contract to ensure that all NTPC employees and consultants working for NTPC are aware of the illegal nature of such trade and that they would be automatically dismissed if they are found involved in such activities.

**Impacts due to reservoir formation**

- Pre-impoundment species and habitat inventory, distribution and population.
- Development of a strategy for species and habitat management after impoundment.
- Implementation of habitat and species management programme.
- Implementation of biodiversity aspects of reservoir management plan.
- Patrolling of special conservation areas (WMPA).
- Post-impoundment monitoring of populations and distribution.
- Post-impoundment reservoir fish productivity and species monitoring.

**Adaptive Management Programmes**

Not yet applicable.

An Adaptive Management approach will be implemented for the following programmes:

- Wildlife Programme (all components)
- Riparian release downstream of the Nakai Dam
- Water release in the Nam Kathang
- Water release from the regulating pond to the downstream channel

**5.2 WATER QUALITY MONITORING AND ASSESSMENT PROGRAMME**

During the period, NTPC monitored water at eleven surface water sampling sites located upstream and downstream of construction areas on the Nam Theun, Nam Kathang, Nam Gnom, Nam Phit and Xe Bangfai, on a monthly basis. Quality parameters includes the consideration of water temperature, pH, dissolved oxygen, conductivity, turbidity, total suspended solids, alkalinity, ammonia-nitrogen, nitrate-nitrogen, nitrite-nitrogen, Kjeldahl nitrogen, potassium, sodium, manganese, total iron, lead, calcium, magnesium, silica, sulphate, chloride, total mercury, arsenic, biological oxygen demand, chemical oxygen demand, thermotolerant (faecal) coliform and total phosphorus.

*Samples collection  
beginning of  
September 2005.*

**Nam Theun**

Despite a drop in pH in the upstream sampling sites, water quality in the Nam Theun continues to be classified as good with few exceedences of the ANZECC guideline or river-specific guideline. Analytical results suggest that construction

activities at the Ban Thalung Bridge and Dam Site are having little or no significant negative impact on the water quality during sampling.

### **Nam Kathang**

It was observed that water quality in the Nam Kathang was impacted by construction activities and in particular the discharge from the Access Adit. The source of this elevation between the sedimentation basins and the Nam Kathang appeared to be excavation works within the Power House drainage channel. Accordingly, additional sedimentation basins have been constructed within the drainage channel, which led to substantial improvement in the second half of the reporting period.

### **Nam Gnom**

The water quality in the Nam Gnom continued to be good with few significant exceedences of the ANZECC guideline, river specific guideline or acceptable control range. However, both ammonia and nitrate levels are elevated. The source of these elevations is likely to be inputs from the surrounding communities (agriculture, livestock, sanitation) rather than Project-related. There is also a slight downstream increase in turbidity and TSS, but still well within the ANZECC guideline, and an associated slight elevation in iron and chloride. Construction activities on the road along the Downstream Channel alignment are likely contributing to this elevation.

### **Nam Phit**

Water quality in the Nam Phit can still be classified as good despite the sluggish flow and relatively low, but still above the ANZECC minimum for dissolved oxygen. Ammonia and iron still remain above the ANZECC guideline. Given that there are currently no construction-related activities located in the vicinity of the Nam Phit, the dry season deterioration in the Nam Phit is not deemed to be Project related but a function of the low dry season flow.

### **Xe Bangfai**

Water quality in the Xe Bangfai continued to remain good with few exceedence of the ANZECC guideline or river-specific guideline. Water quality has improved slightly over the dry season months with less observed exceedences of both the ANZECC guidelines and the acceptable control range when compared to the wet season condition. This improvement in water quality reflects the end of the wet season and less sediment and nutrient laden run-off from the surrounding agricultural and urban areas. Analytical results indicate that construction activities on the Nam Kathang are not subsequently impacting the water quality of the Xe Bangfai

In addition to the monthly surface water monitoring, the domestic water supply of fifteen restaurants in Nakai (5) and Gnommalat (10) Districts were analyzed for faecal coliform contamination. This monitoring is under the Camp Followers Health Program and the results of the analysis are discussed in Section 4.2 (Camp Followers).

**Nam Theun 2 Power Company**  
**Water Quality Monitoring and Assessment Program**  
**SW Sample Sites - Jan'06**

Ref.: NTPC/WQMAP/HAP/01067 Author: S. Srikon  
 Prepared: 17th June 06  
 Datum: Indian (Thailand) Reference; Spheroid: Everest (India: 1956)

**Legend:**  
 ★ = Surface Water Sample Site  
 ■ = Main Project Infrastructure

0 4,000 8,000  
 meters

N

Dam S4 SW3 SW2 SW1 SW4 SW5 SW11 SW9 SW12 SW14 SW13 SW6 SW8 SW7

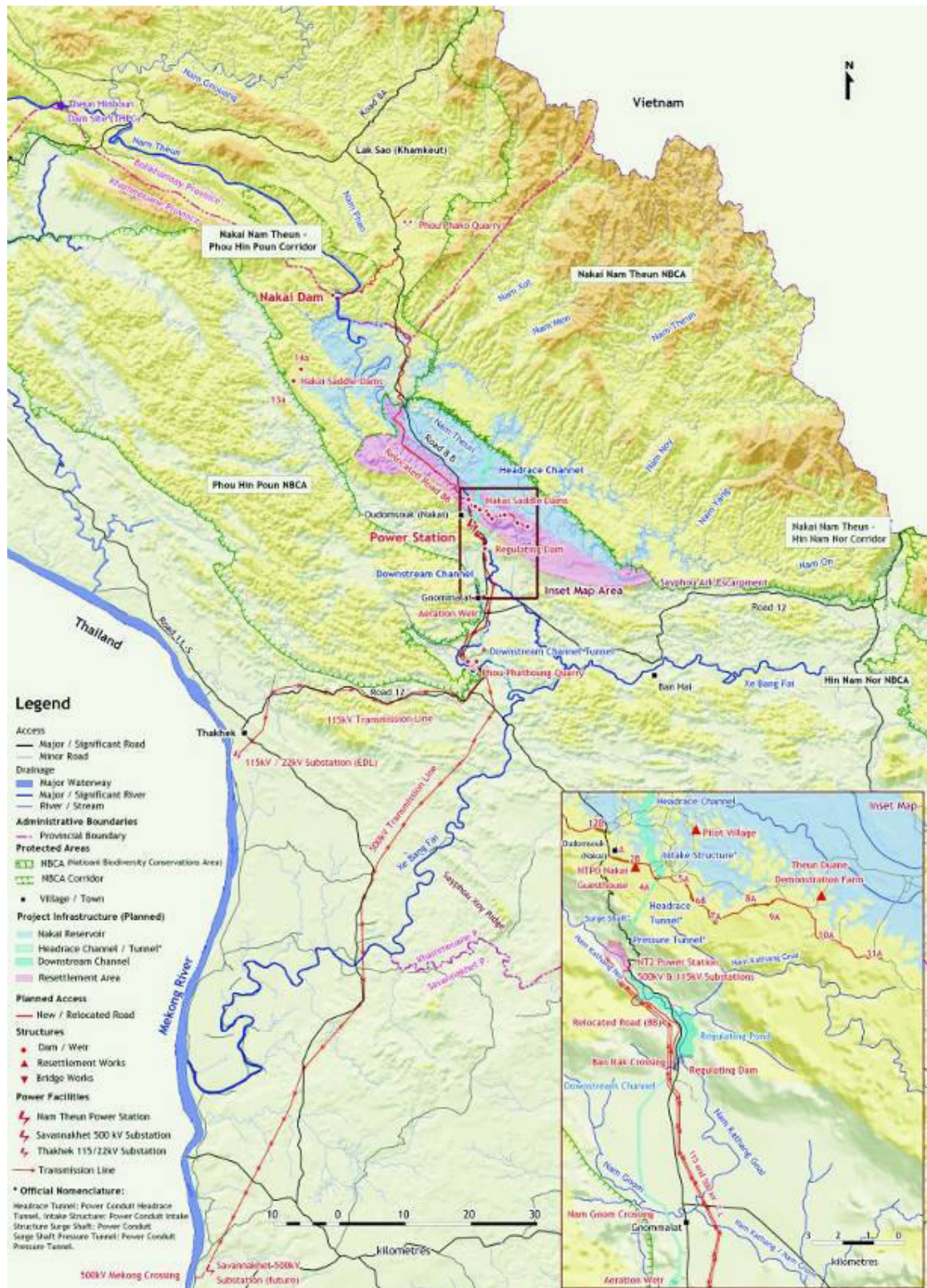
Nam Theun Headrace Channel Power Station Downstream Pipeline Nam Phit Xe Bang Fa

**LIST OF ABBREVIATIONS**

<b>CA</b>	Concession Agreement between the GOL and NTPC
<b>CD</b>	Community Development
<b>CW</b>	Civil Works contracts, being CW1, CW2 and CW3
<b>DCCA</b>	District Committee for Control of AIDS
<b>DCD</b>	District Community Development
<b>DOI</b>	Department of Irrigation
<b>DRF</b>	Drug Revolving Fund
<b>DSRP</b>	Dam Safety Review Panel
<b>EAMP</b>	Environmental Assessment Management Plan
<b>EDF</b>	Electricité de France
<b>EDF-CIH</b>	Electricité de France's Centre d'Ingenierie Hydraulique division
<b>EDFI</b>	EDF International
<b>EDL</b>	Electricité du Laos, the offtaker under the EDL PPA
<b>EDL PPA</b>	Power Purchase Agreement to be entered into between EDL and NTPC
<b>EGAT</b>	EGAT Public Company Limited (EGAT Plc.), the offtaker under the EGAT PPA
<b>EGAT PPA</b>	Power Purchase Agreement to be entered into between EGAT and NTPC
<b>EGCO</b>	Electricity Generating Public Company Ltd
<b>EM</b>	Electromechanical Works contracts, being EM1 and EM2
<b>EMO</b>	Environmental Management Organization of NTPC
<b>EMU</b>	Environmental Management Unit of GOL
<b>FSL</b>	Full Supply Level, the maximum water level in the reservoir for which operation of the Project can be safely undertaken
<b>GOL</b>	Government of the Lao PDR
<b>GW</b>	Gigawatt
<b>GWh</b>	Gigawatt Hour
<b>HC</b>	Head Contractor
<b>HCC</b>	Head Construction Contract
<b>IAG</b>	International Advisory Group
<b>ICR</b>	Institute of Cultural Research
<b>IMA</b>	Independent Monitoring Agency
<b>ICHC</b>	Integrated Community Health Center
<b>ITD</b>	Italian-Thai Development Public Company Limited
<b>IUCN</b>	International Union for Conservation of Nature
<b>Kip</b>	The lawful currency of the Lao PDR
<b>kV</b>	Kilovolt
<b>kW</b>	Kilowatt

<b>kWh</b>	Kilowatt Hour
<b>LE</b>	Lender's Engineer
<b>LNFPFC</b>	Lao National Front Committee
<b>LPA</b>	Land Parcel Area
<b>Lao PDR</b>	Lao People's Democratic Republic
<b>LWU</b>	Lao Women's Union
<b>masl</b>	Meters above sea level
<b>MOH</b>	Ministry of Health
<b>MOL</b>	Minimum Operating Level, the minimum water level in the reservoir for which operation of the Project can be safely undertaken
<b>MoU</b>	Memorandum of Understanding
<b>MW</b>	Megawatt
<b>MWh</b>	Megawatt Hour
<b>NT2</b>	Nam Theun 2 or the Project
<b>NPA</b>	National Protected Area
<b>NTPC</b>	Nam Theun 2 Power Company Limited
<b>PAP</b>	Project Affected People
<b>PCCA</b>	Provincial Committee for Control of AIDS
<b>PCR</b>	Physical Cultural Resources
<b>PMF</b>	Probable Maximum Flood
<b>POE</b>	Panel of Experts
<b>Project</b>	Nam Theun 2 hydroelectric power project
<b>RAP</b>	Resettlement Action Plan
<b>SDP</b>	Social Development Plan
<b>SEMFOF</b>	Social and Environmental Management Framework and Operational Plan
<b>SESIA</b>	Summary Environmental and Social Impact Assessment
<b>Shareholders</b>	EDFI, LHSE, EGCO and ITD
<b>Sponsors</b>	EDF, EGCO and ITD
<b>THB</b>	Thai Baht, the lawful currency of the Kingdom of Thailand
<b>USD or US\$</b>	US Dollar, the lawful currency of the United States of America
<b>VCD</b>	Village Community Development
<b>WCS</b>	Wildlife Conservation Society
<b>WMPA</b>	Watershed Management and Protection Agency
<b>VRC</b>	Village Resettlement Committee

## MAP OF PROJECT SITE



## PROPOSED NAKAI PLATEAU VILLAGES BOUNDARIES DEMARCATION

