Environmental and Social Monitoring Report

Project Number: 41924-014
16 July 2015

Nam Ngiep 1 Hydropower Project
(Lao People's Democratic Republic)

Quarterly Monitoring Report 2015 – Q1 Environmental

Prepared by Nam Ngiep 1 Power Company Limited for the Asian Development Bank

NAM NGIEP 1
POWER COMPANY

Nam Ngiep 1 Hydropower Project

Quarterly Monitoring Report
ENVIRONMENT
January to March 2015

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ABBREVIATIONS / ACRONYMS

AD	Administration Division
ADB	Asian Development Bank
ARCAP	Audit Report and Corrective Action Plan
BODM	Board of Directors Meeting
BOQ	Bill of Quantity
CA	Concession Agreement between the NNP1PC and GOL,
CAP	Corrective Action Plan
COD	Commercial Operation Date
	Chemical Oxygen Demand (in environmental terms)
CV	Curriculum Vitae
CVC	Conventional Vibrated Concrete
CWC	Civil Works Contract
CTA	Common Terms Agreement
DAS	Document Approval Sheet
DEB	Department of Energy Business, MEM
DEPP	Department of Energy Policy and Planning, MEM
DESIA	Department of Environmental and Social Impact Assessment, MONRE
DFRM	Department of Forest Resources Management, MONRE
DGC	District Grievance Committee
DL	Distribution Line
DO	Dissolved Oxygen
DSRP	Dam Safety Review Panel
EC	Electrolytic Conductivity
ECOCD	EGAT Construction Obligation Commencement Date
ECZ	Elephant Conservation Zone
EDL	Electricite du Laos
EDL PPA	Power Purchase Agreement between NNP1PC and EDL
EGAT	Electricity Generating Authority of Thailand
EGATi	EGAT International Company Limited
EIA	Environmental Impact Assessment
EL	Elevation (in surveying terms, vertical position as height above a datum)
EMO	Environmental Management Office
EMU	Environmental Monitoring Unit
EMWC	Electrical-Mechanical Works Contract
EPF	Environmental Protection Fund
ESMMP	Environmental and Social Monitoring and Management Plan
FAD	Finance and Accounting Division
FC	Financial Close
FCD	Financial Close Date (as defined in the EGAT PPA)

FI	Fire Incident
FY	Fiscal Year
GOL	Government of Lao PDR.
HMWC	Hydraulic Metal Works Contract
HR	Human Resources
IEE	Initial Environmental Examination
IFC	International Finance Corporation
IMA	Independent Monitoring Agency
ISP	Integrated Spatial Planning
JBIC	Japan Bank for International Cooperation
JICA	Japan International Cooperation Agency
KANSAI	Kansai Electric Power Company Incorporated
km	kilometre
KPN	KPIC Netherlands B.V.
kV	kilo-Volt
LACP	Land Acquisition and Compensation Plan
LHSE	Lao Holding State Enterprise
LMP	Labor Management Plan
LNTP	Limited Notice to Proceed (under each construction Contract)
LTA	Lender's Technical Advisor
LTI	Lost Time Incident
M	million
m	meter
MEM	Ministry of Energy and Mines, Lao PDR
MOF	Ministry of Finance, Lao PDR
MOFA	Ministry of Foreign Affairs, Lao PDR
MOM	Minutes of Meeting
MONRE	Ministry of Natural Resource and Environment, Lao PDR
MOU	Memorandum of Understanding
MVI	Motor Vehicle Incident
NBCA	National Biodiversity Conservation Area
NCI	Non-Compliance Issue
NCR	Non-Compliance Report
NN2	Nam Ngum 2 Power Company Limited
NNP1PC	Nam Ngiep 1 Power Company Limited
NPA	Non-Profit Association
NPF	National Protection Forest
NT2	Nam Theun 2 Hydropower Project
NTP	Notice to Proceed (under each construction contract)
OC	Obayashi Corporation
ORP	Oxidation Reduction Potential
PAP	Project Affected People

PD	Property Damage
PHAP	Public Health Action Plan
PPA	Power Purchase Agreement (between NNP1PC and EGAT)
PONRE	Provincial Department of Natural Resource and Environment, MONRE
PRLRC	Provincial Resettlement and Livelihood Restoration Committee
PvPA	Provincial Protection Area
RCC	Roller Compacted Concrete
REDP	Resettlement and Ethnic Development Plan
RI	Recordable Injury
RMU	Resettlement Management Unit
ROW	Right of Way
SBLC	Stand-by Letter of Credit
SCOD	Scheduled Commercial Operation Date (as defined in EGAT PPA)
SFCD	Scheduled Financial Close Date (as defined in EGAT PPA)
SHM	Shareholders Meeting
SMO	Social Management Office
SSESMMP	Site Specific Environmental and Social Monitoring and Management Plan
STA	Station (in surveying terms, plan or horizontal position measured from a datum)
STD	Sexually Transmitted Disease
TD	Technical Division
TEXIM	Export-Import Bank of Thailand
THB	Thai Baht
TLWC	Transmission Line Works Contract
TOR	Terms of Reference
TSS	Total Suspended Solids
USD	US Dollar
UXO	Unexploded Ordinance
VO	Variation Order
WMC	Watershed Management Committee

EXECUTIVE SUMMARY

Construction Progress: By the close of the 1st quarter of 2015 (1st April) overall construction progress was 20.14% complete. Access roads to the site were finished with sealed surfaces and speed reduction humps installed at pass-through villages.

With access roads and camps established, construction continued on excavations and foundation works at the two dam sites, as well as establishing construction civil works facilities such as quarries, the conventional concrete (CVC) plant, roller compacted concrete (RCC) Plant, Aggregate Crushing Plant, related conveyor systems and assembly yards. A focus of the Environmental Management Office was to work with the civil works contractor to ensure adequate hazardous material management, and site drainage was installed in readiness for the wet season.

There are 205 NNP1 staff. Eight subcontractor camps were operating with a work force of 1790 for civil works and 230kV transmission line construction. These are managed by 145 Obayashi Corporation staff.

230kV Transmission Line: The 230 kV transmission line will extend approximately 125 km from the NNP1 Dam site in Bolikhamxay Province to Nabong substation outside Vientiane Capital. Physical construction had not commenced in the reporting period as alignment changes were still being considered to avoid areas of possible high biodiversity value, as well as plantation concession areas. These proposed new alignments are now the subject of environment and social impact assessments. Construction progress is being made, as the other sections of the 230kV line ROW are currently being surveyed and pegged in preparation for vegetation clearing and earth works at tower locations.

Contractor Compliance Management: In the 1st quarter of 2015, NNP1 introduced a new system to manage minor issues of environmental noncompliance by the contractor with the intention of reducing unnecessary administration and reporting, but still be an effective means to monitor corrective actions. The new noncompliance reporting system is two-tiered, composing of Tier 1 *Observation of Noncompliance (ONC),* and Tier 2 *Non Compliance Reporting (NCR)*.

Over the reporting period 51 ONCs and 3 NCRs were issued, and the related matters are summarized in Table 1.

Table 1 Summary of contractor non compliance

NCR Issue	Observation of noncompliance	NCR Level 1	NCR Level 2	NCR Level 3
Camp sewage waste water treatment		1	nil	nil
Camp grey water treatment	24	1		
Hazardous waste management	7			
Soil erosion and sedimentation	4			
Waste Management	12	1		
Site Closure	4			
TOTAL	**51**	**3**		

The inability of camp waste water treatment systems (WWTS), particularly grey water systems, to effectively process effluent remains an ongoing concern. Physical site constraints (available area and topography), lack of planning prior to camp establishment, and inadequate system maintenance are all contributing factors to ineffective processing. All camp WWTS are now the subject of external independent expert assessment. Upgrades to the systems is scheduled for the 2nd quarter of 2015 at the completion of the review.

Hazardous material and camp waste management were also issues of concern, but these are largely resolved quickly with improvements to site facilities and staff training provided by the contractor and sub contractors.

Environmental Monitoring: January to March are months of low rainfall and surface runoff which typically relates to low levels of surface water pollutants. Since January 2015, both fecal coliform and Total coliform were included in routine surface water monitoring. Most sites, including upstream of the project, within the project and downstream recorded high counts of coliforms for January. A pollution spike was observed in the lower Nam Xao and in the Nam Ngiep mainstream at B. Somseun – both sites downstream of NNP1. The source and cause of the spikes are not known, but relatively high coliform results at seven of the 12 monitoring sites suggest surface runoff from early rain events in the catchment transported pollutants to the river.

NNP1 Waste Management: The operation of the NNP1 landfill site commenced in the first quarter of 2015, and construction waste transfer offsite to the Paksan Landfill was suspended in March. All waste is now processed and managed on site, with hazardous waste being transferred to processing companies that have met NNP1 environmental and social due diligence assessments.

Health and Safety: A total 29 incidents were recorded to 31 March 2015. Two serious injuries, one of them fatal, were sustained in the period. Each accident has been subject to investigation with causes identified and corrective action implemented, including targeted worker personal safety training, and site safety improvements.

Watershed Management: In collaboration with MONRE DFRM and PONRE of Xaysomboun and Bolikhamxay, NNP1 have consulted on watershed planning activity requirements for the pre COD period (2015-2019). The key aspects being discussed include the principal objectives of NNP1 Watershed Management Plan (WMP), WMP components, role and responsibilities of relevant stakeholders; and operational costs. The outcomes of these consultations will be contained within a WMP Activity Plan. NNP1 is also in the process of securing the services of a watershed management expert consultant. NNP1 is also conducting its own field studies to identify land and water uses, and developments that have the potential to negatively impact on the projects operation.

Biodiversity Management: The Biodiversity Advisory Committee (BAC) is the key technical review committee for the NNP1 biodiversity offset program. NNP1 has sought expressions of interest from an independent specialists to sit on the BAC.

Technical workshops and consultations were conducted to continue the revision of the Biodiversity Offset Framework (BOF). The revision has been communicated closely with GOL

and was endorsed by them on the 12 March 2015 prior to final submission to ADB on 13 March 2015. The updated BOF is can be found on the NNP1 and ADB websites.

1 BACKGROUND

This document is a quarterly environmental safeguard report of the Nam Ngiep 1 Hydropower Project Lao PDR, prepared by the company's Environmental Management Office (EMO). It provides a summary of the results for environmental management, mitigations and monitoring during the three months January to March 2015. This is the second quartely report following the signing of the Asian Development Bank (ADB) Facility Agreement in August 2014.

The Project is a signatory of and committed to the requirements of the ADB Safeguard Policy Statement (version June, 2009). Key safeguards relevant to environmental management of the project include but not limited to the following:

1. The NNP1 will identify measures to *avoid, minimize, or mitigate* potentially adverse impacts and risks.
2. During the design, construction, and operation of the project the NNP1 will apply pollution prevention and control technologies and practices consistent with international good practice, as reflected in internationally recognized standards.
3. The NNP1 will monitor and measure the progress of implementation of the EMP/EMMP-CP, commensurate with the project's risks and impacts.
4. The NNP1 will carry out meaningful consultation with affected people and other concerned stakeholders.

According to the Projects Facility Agreement with the ADB, the project is obligated to report quarterly on progress of the project and the application of its safeguards (social and environmental), and that the subsequent reports are publically disclosed (on the ADB website) in line with the banks Public Communications Policy.

This report has been prepared by the Environmental Management Office of the NNP1. The contents have been sourced from various internal departments including the companies Technical Division, Social Management Office, and with some information provided by the Civil Works Contractor - Obayashi Corporation. Comments on draft versions have been received from *environmental safeguard specialists* of the project lenders technical advisors (LTA) and the Asian Development Bank. LTA and ADB comments have been incorporated into this version of the report. This report is to be disclosed on both ADB and NNP1 Websites. The projects Independent Advisory Panel provides comment on the disclosed QMR, and response to the IAP are provided as part of the following QMR report.

2 PROJECT OVERVIEW

The Nam Ngiep river originates in the mountains of Xieng Khouang Province, flowing through Khoun District into Thathom District of Xaysomboun Province, through Hom District and into Bolikhan District of Bolikhamxay Province. The Nam Ngiep (*nam* is the Lao word for river) meets the Mekong River just upstream from Paksan city in Bolikhamxay Province.

The project will consist of two dams on the Nam Ngiep. The main dam, 9.0 km upstream of Hat Gnuin Village in Bolikhan District, will create a 70-km-long, narrow reservoir that extends up the Ngiep Valley as far as Thathom District. At almost 150 m high, the main dam will be the second largest in Laos. The Power Station at this dam will generate up to 272 MW of electricity for export to Thailand.

Approximately 6.0 km below the main dam is a 20 m high re-regulation dam that will control water flows to avoid impacts from sudden large releases of water to the river downstream. A second power station at this re-regulation dam will be able to produce around 18 MW of power for sale to the national utility, Electricité du Laos (EDL).

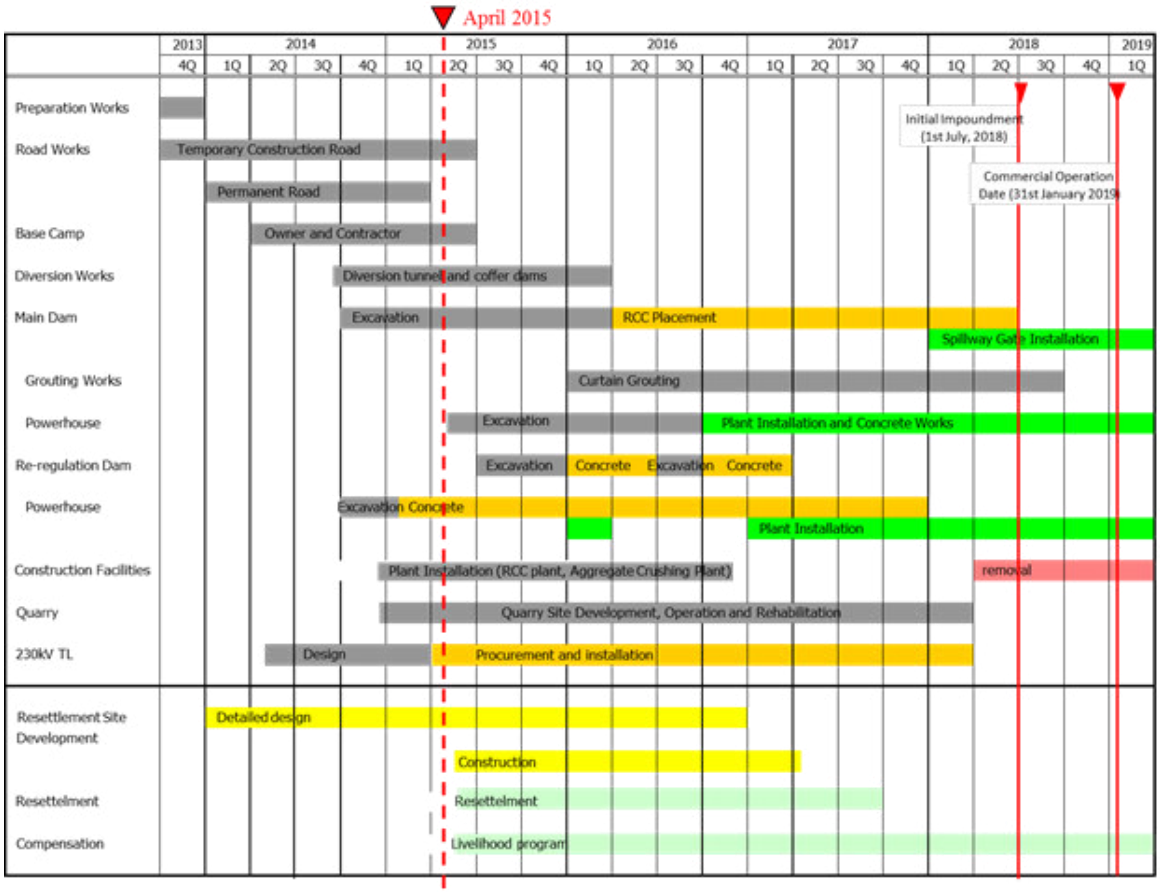
With a combined capacity of 290 MW, Nam Ngiep 1 will generate around 1,620 GWh of electricity annually. Two transmission lines will be required to transport the electricity generated by the project. From the main power station a 230-kV line will run for 125 km to the Nabong outside Vientiane Capital. A 115-kV transmission line will be constructed by EDL from the Re-regulation Power Station to Paksan over a distance of 40 km.

2.1 CONSTRUCTION PROGRESS DURING THE REPORTING PERIOD

By the end of March 2015 the overall construction progress was 20.14% complete. Main construction activities and respective progress during the period January to March 2015 includes the following:

i. Access Roads
ii. Quarries
    - STA9+400
    - Main Quarry
iii. Spoil Disposal Areas (Permanent)
iv. Main Dam
v. River Diversion Tunnel - Inlet and Outlet
vi. Regulation Dam
vii. Worker Camps
viii. Owner and Main Contractor Camps
ix. 230Kv Transmission Line
x. Other construction related facilities

Figure 1 Overall construction progress to April 2015



The following section is a summary of progress for main hydropower related facilities. For an overview of all construction related activities for the 1st quarter of 2015 refer to Table 13 in the Appendix Section.

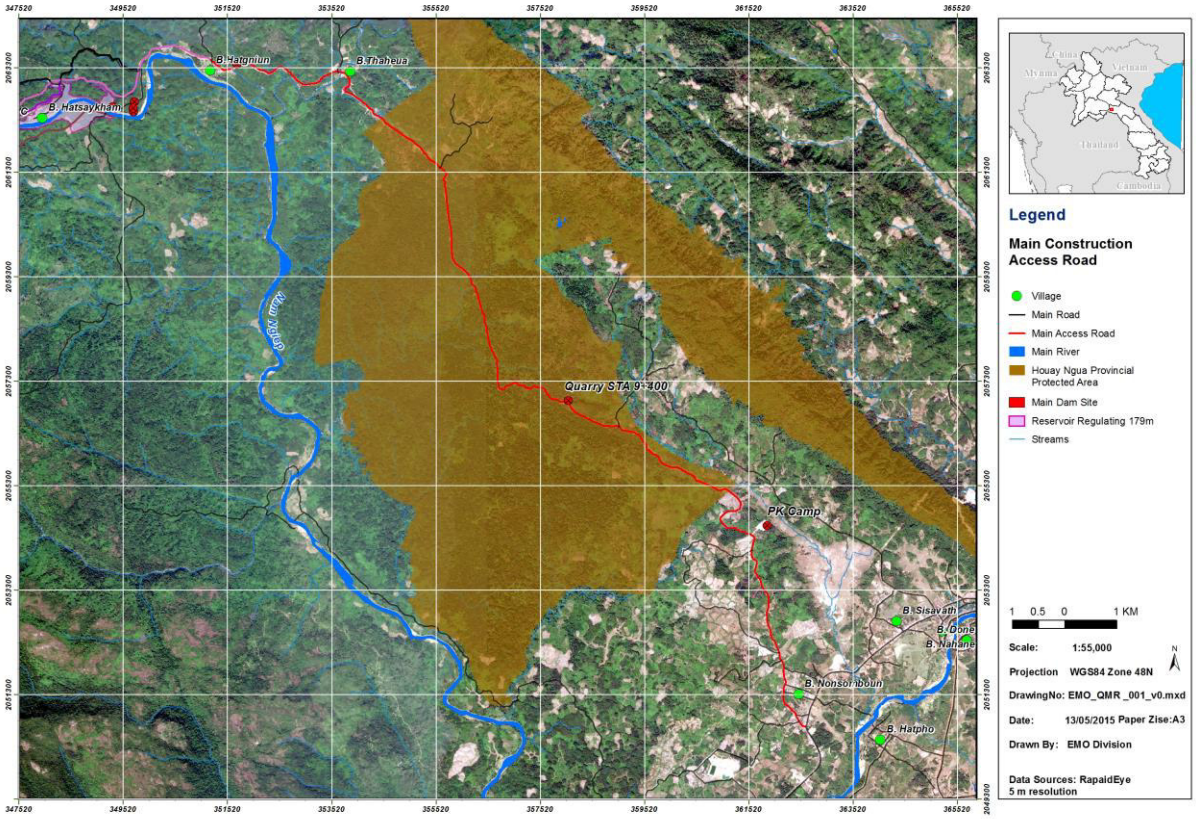
2.1.1 Access Roads

The main project access road links Ban Nonsomboun, Bolikhamxay Province to the dam site, and a distance of 52km. The upgrade was required to improve drainage and hauling capacity. Upgrade of the main access road commenced in December 2013, and by end of March 2015 the first 21km was 100% completed. The final section connecting the dam site was 86% completed.

This main access road forms part of an existing road that dissects a section of the Houay Ngua Provincial Protected Area (PPA), in Bolikhan District for a distance of approximately 9km. The road also passes through the three village settlements of Nonsomboun, HatGnuin and Thaheua, and passes nearby to Ban Hatsaykham before reaching the dam site.

At the dam site there are 13 internal temporary roads that link construction facilities, with each at various stages of completion: currently eight roads are completed, and the remaining five are over 90% completed.

Figure 2 Main Project Access Road - Ban Nonsomboun to Dam site (with Houay Ngua PPA area)



2.1.2 Quarry (STA9+400)

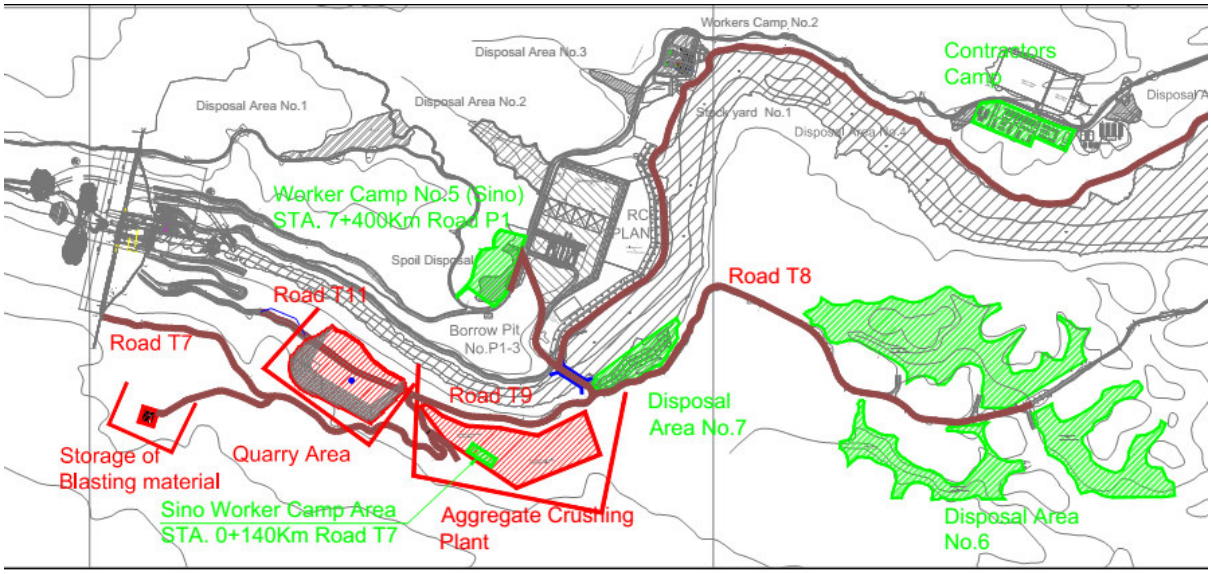
A quarry was established at 9.4km along the main access road in the vicinity of the Houay Ngua Provincial Protected Area. Clearing involved around 2ha, and the quarry has an expected aggregate and rock extraction capacity of 51,000m^3. The quarry serviced the construction of the main access road and as this was completed within the 1st quarter of 2015, the quarry was placed on 'standby' for possible later use. Access restriction and site drainage were installed. A Site Closure Plan is being prepared by the contactor. Rehabilitation works will commence once confirmation notice is received that it is to be decommissioned. The quarry is adjacent to the Houay Ngua PPA boundary so when finally decommissioned the quarry rehabilitation will attempt to minimize impacts on the amenity of the PPA.

Photo 1 Main Access Road Quarry at STA9+400 – on standby

2.1.3 Main Quarry

Groundbreaking on the main quarry began in March 2015. The quarry is located set back on the right bank downstream of Main Dam (see Figure 2). It is serviced by temporary roads T9 and T11, and is 4.8 km away from the nearest village of Hatsaykham. The quarry will have an area of 7 hectares and a capacity of 1,784,553m^3. Trucks will haul material to the nearby Aggregate Crushing Plant for processing.

Figure 3 Main Quarry location



2.1.4 Spoil Disposal Areas (Permanent)

Along the main access road to the dam (left bank) from STA 24+700 to STA29+600 there are seven permanent spoil disposal areas, with between 53,510m^3 to 372,918m^3 capacity. On the right bank two spoil areas (6 and 7) are located within easy access to main dam construction. Spoil area preparation includes vegetation clearing, earth works, slope protection and drainage installation. All spoil areas were operating within the 1st quarter of 2015.

Figure 4 Left bank Spoil Disposal Area

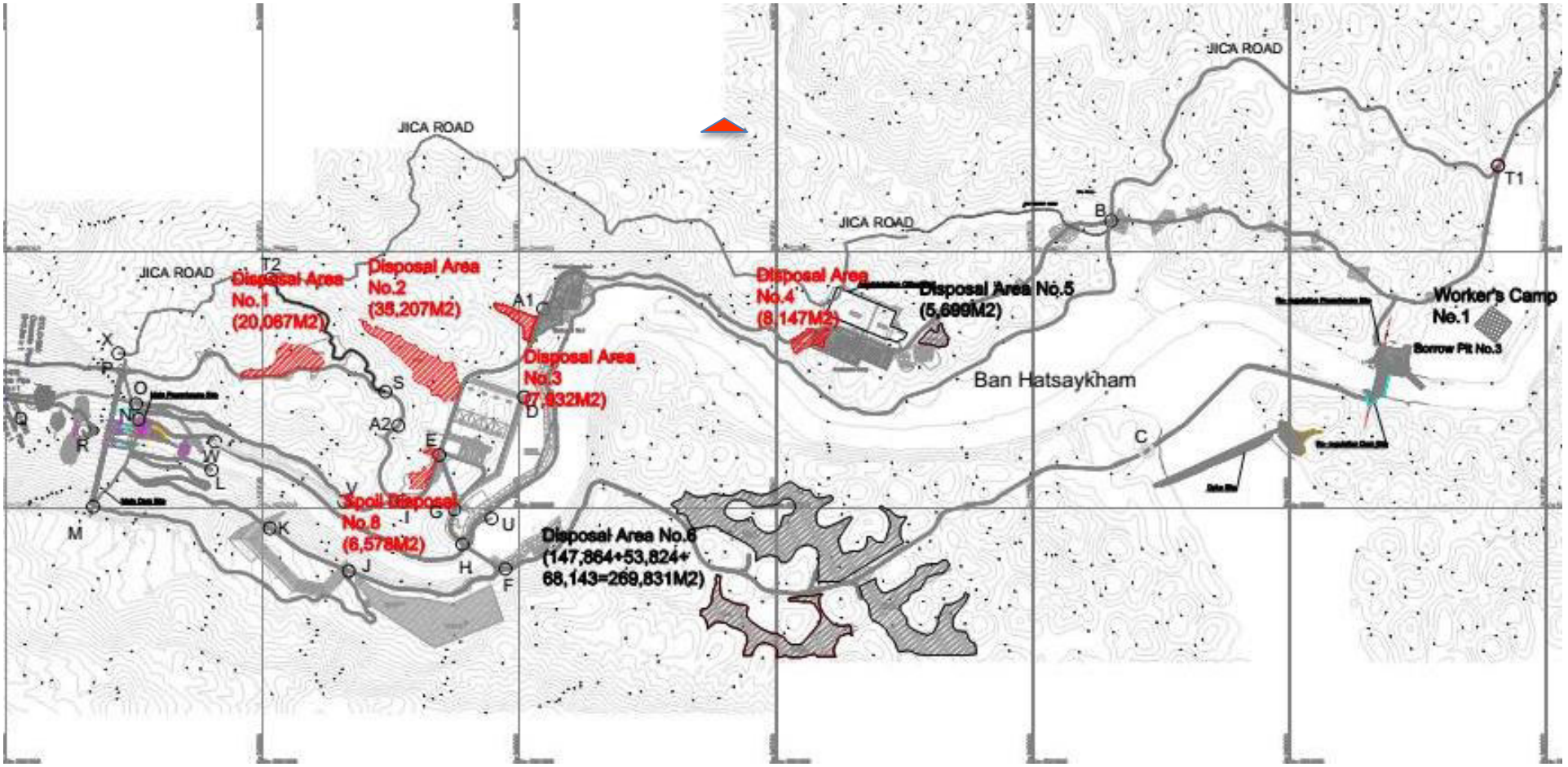
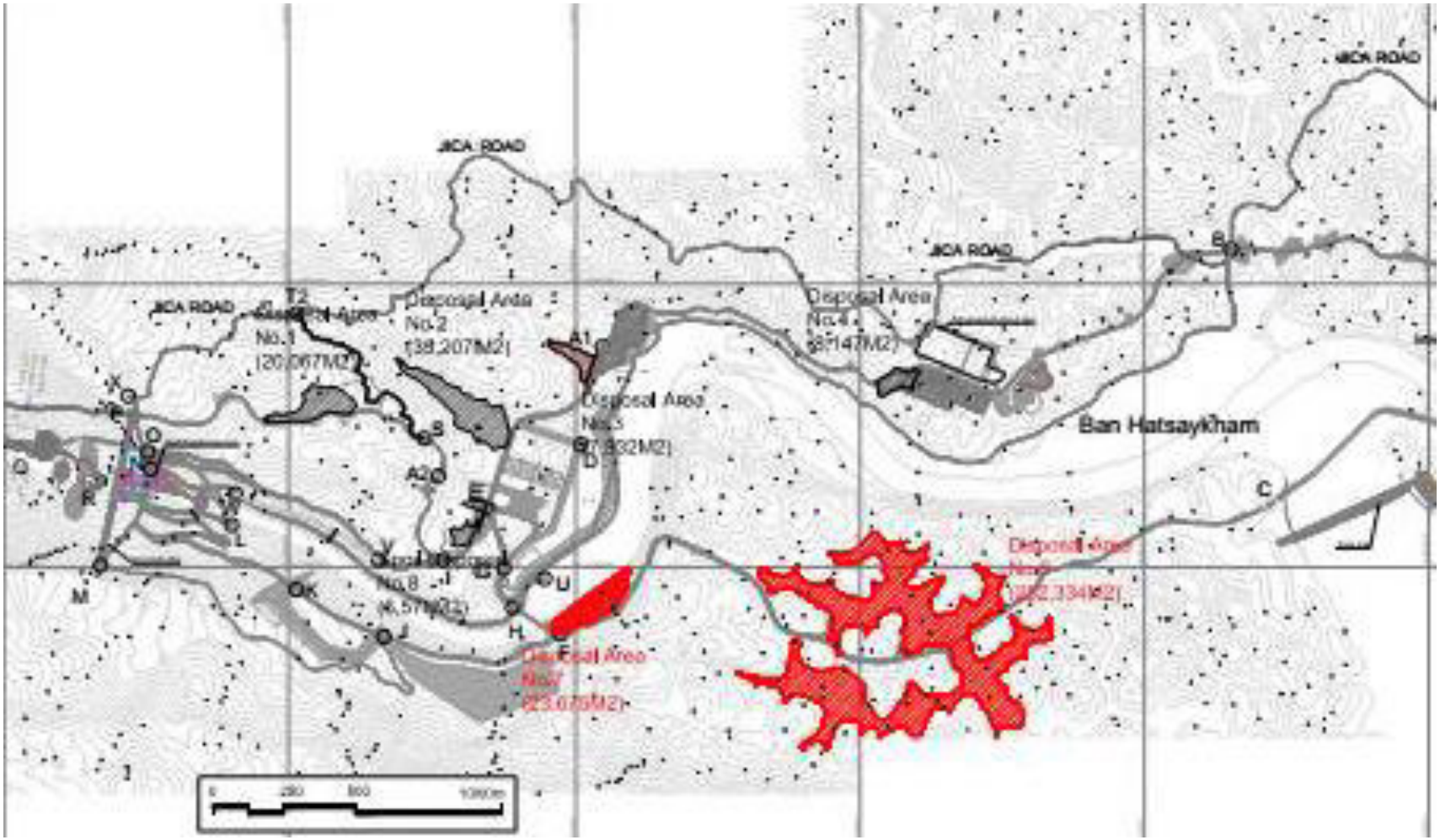


Figure 5 Right bank Spoil Disposal Areas



2.1.5 Main Dam Excavations

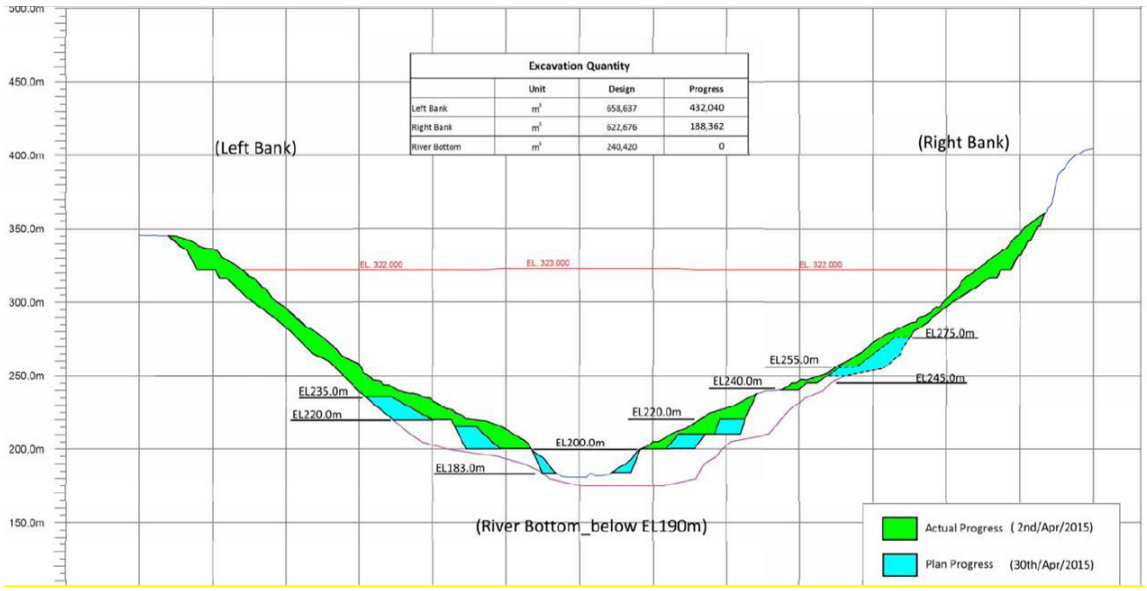
The main dam is located 6km upstream from the re-regulation dam. At the conclusion of the reporting period (March 2015) 43% of the main dam foundation excavations were completed.

Photo 2 Main dam excavations, April 2015

A: Left bank at Main Dam site

B: Towards right bank with Nam Ngiep

Figure 6 Progress of dam excavation as of April 2015.



2.1.6 River Diversion Tunnel

The river diversion tunnel when completed will be 620m long. Tunneling excavation is being undertaken from the downstream outlet end, and was 34.5% completed by the close of March 2015. Head works were also advanced at the upstream inlet.

Photo 3 Diversion Tunnel Inlet head works (left photo looking downstream) and Outlet excavations (looking downstream), April 2015

Note: in Photo 3 the Nam Ngiep River is to the right of shot. The photos were taken at about the same time. Importantly, the Inlet head works is the most upstream extent of NNP1 excavations and work areas. River water was naturally turbid before reaching the project site.

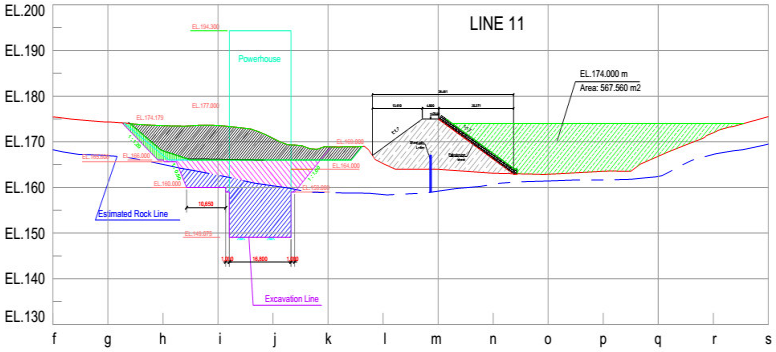
2.1.7 Re-regulation Dam

Work on the re-regulation dam commenced on the left bank with the construction of the river diversion (flood protection) levee, and then excavation into the river bed behind the levee for the construction of the regulation dam power station. Vegetation clearing and preliminary earth works (basic site preparation) commenced in February 2014, but was then suspended for the wet season. Work recommenced in October 2014 and by March 2015 79% earth works were completed, which included 100% of the left bank flood protection levee. Approximately 3% of main body works were also completed.

Photo 4 Regulation dam powerhouse excavation (left bank) with flood levee. Vegetated hills in the background are on the right bank (April 2015).

Photo 5 Regulation dam powerhouse excavation (left bank) with flood levee.

Figure 7 Excavation profile into the Nam Ngiep river bed for regulation dam power house, and river diversion levee



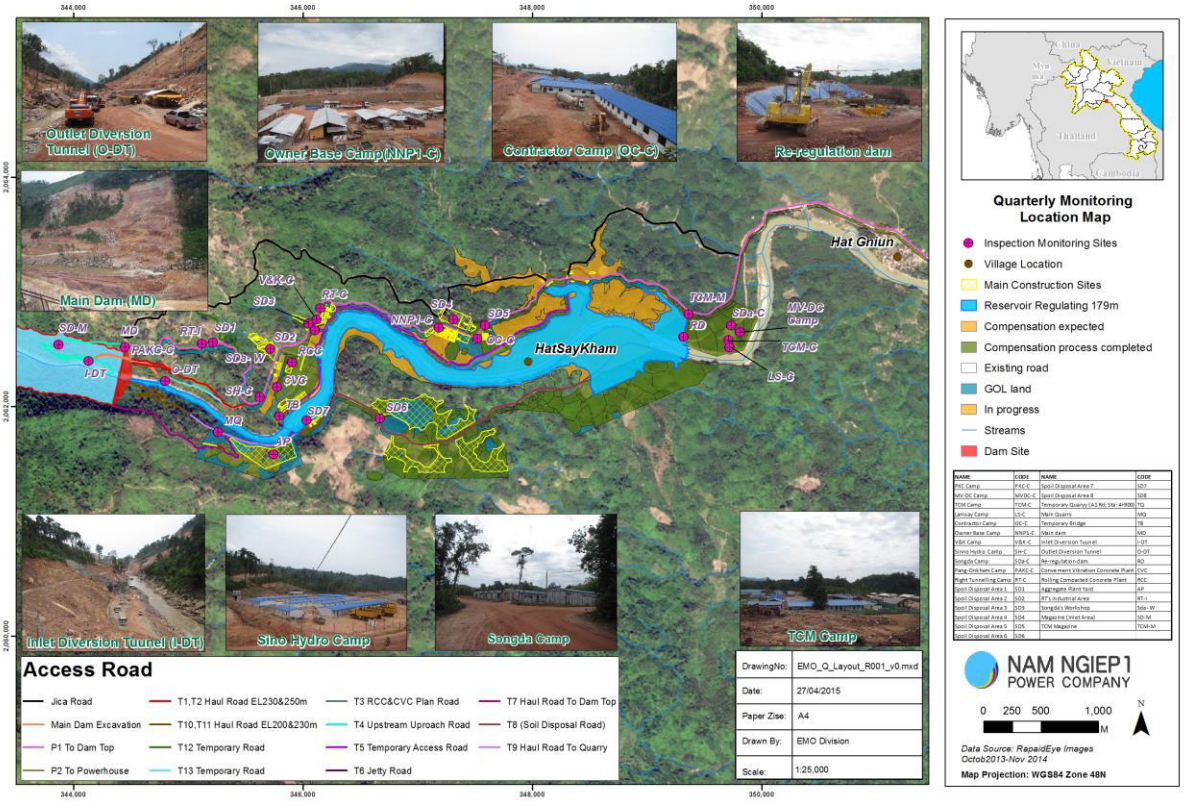
2.1.8 Worker Camps

By the conclusion of the reporting period March 2015 eight worker camps were operating or under construction. The following table is a list of company camps and respective worker numbers. In addition, construction of the Main Contractor Camp was 70% complete, and the Owners Camp was 19% complete.

Table 2 Sub-contractor camps on site as of the end of March 2015

Company		Number of workers
1	Phoukhong Construction Sole Company (PKC)	220
2	TCM Engineering Camp (TCM)	140
3	Vilayvannh & Keota Concrete Sole Company (V&K)	47
4 and 5	Songda 5 Joint Stock Company Camp (Sonda)	525
6	Right Tunnel Camp (RT)	320
7	Sinohydro Camp (SH)	154
8	Pang-Onkham (PO)	193

Figure 8 Worker Camp locations



2.1.9 230kV Transmission Line

The 230 kV transmission line will extend approximately 125 km from the NNP1 Dam site in Bolikhamxay Province to Nabong substation outside Vientiane Capital, and will have a right of way (ROW) of 35 meters. Actual construction had not commenced in the reporting period as alignment changes were still being considered to avoid areas of possible high biodiversity values, as well as plantation concession areas. These proposed new alignments are now the subject of environment assessments. Progress is being made, as the other sections of the 230kV line ROW are currently being surveyed and pegged in preparation for vegetation clearing and earth works at tower locations.

2.1.10 Other construction related facilities

Currently there are eight engineering workshops on site, one for each subcontractor. The layout and scale of each workshop relates to the types of works required. Generally a workshop will consist of two vehicle service bays, an engineering workshop, holding (stock) yard, a hazardous materials storage facility and an administration office.

Photo 6 Typical subcontractor workshop (TCM Workshop)

Under construction or operating are also the Conventional Vibration Concrete (CVC) Plant, Rolling Compacted Concrete (RCC) Plant, and Aggregate Yard. The RCC plant will receive sorted and proceeded aggregate to produce concrete to be used for the actual dam construction. The CVC plant is operational and produces conventional concrete mainly for shotcrete of the diversion tunnel excavation and re-regulation powerhouse.

Photo 7 Construction related facilities

A: **Conventional Vibrated Concrete Plant** (operating)

B: **Aggregate Crusher Plant** (with conveyor system under assembly)

C: **Roller Compacted Concrete plant** (to right of photo, under construction).

2.1.11 Related to vegetation biomass clearing

NNP1 has committed to the implementation of a biomass removal program through the NN1 EIA 2014 and Concession Agreement 2013. This includes coordination with the GOL regarding government led salvage logging activities; and NNP1 led removal of residual biomass. Commercial timber within the Project area is owned by the GOL and government authorities such as the MAF and MONRE (and their provincial counterparts PAFO and PONRE) are responsible for harvesting activities

Prior to vegetation clearing all work areas are pegged to mark site area boundaries. Trees of commercial value are stockpiled for later GOL removal. Scrub and ground cover layers are stockpiled (windrowed) and burnt away from sensitive areas. In the case of access roads, trees of conservation significance were identified via a (valuable tree) survey and, where possible, new alignments were selected to avoid such areas. Trees of conservation value were then labeled (in Lao Language) to inform locals of their significance.

All main construction areas and access roads have completed biomass removal. The 230kV transmission line clearing will start in the 2nd quarter of 2015 at tower site locations. Construction schedule for the 115Kv transmission line has not been confirmed. The 115kV TL is a GOL owned and built facility, but its impacts, including those on biodiversity values, will need to apply NNP1 project social and environmental safeguard standards.

2.1.12 Related to temporary soil stock piles

Temporary soil disposal areas are required for most construction sites. The material is later transferred to a permanent spoil area, or used as filling or top soil at the point of excavation. All temporary soil stock piles are marked as such. As required, temporary soil stock piles, those only required for up to two weeks (less duration during wet season), are located at least 20m from waterways, and large natural drainage lines to avoid sedimentation of aquatic environments.

2.2 CONTRACTOR COMPLIANCE MONITORING

2.2.1 Contractor Site Specific Environmental and Social Management and Monitoring Plans

Since issuance of the Notice to Proceed in October 2014 to the Main Contractors, Obayashi Corporations environment and social management safeguards has been monitored and managed by one in-house Environmental Specialist and one Environment and Safety Officer.. These officers work in consultation with Obayashi site engineers and sub-contractor managers. NNP1 provides support to gaps in the current main contractor structure of the Environment and Social Department.

Environmental monitoring of construction activities is critical to identify potential or actual non-compliance issues that require corrective actions. Under the Owners EMP, NNP1 is required to review the contractor Site Specific Environmental Management and Monitoring Plans (SS ESMMP) to determine if sufficient preparation and planning has gone into managing anticipated environmental and social impacts of each construction site. Generally, two SS ESMMPs are required for each site: 1) Vegetation Clearing and Earth Works, and 2) Main Body Construction. Generally, once NNP1 is satisfied with the content of the SS ESMMP and it is approved, works can proceed.

Once construction commences the NNP1 assess the compliance to mitigations outlined in the SS ESMMPs against 18 thematic areas, or sub plans (Table 3). SS ESMMPs provide the necessary detail on what the contractor will do to avoid, minimize or mitigate against the social and environmental impacts of each thematic area at a particular site.

Table 3 Thematic Areas (sub-plans) of SS ESMMP

SP01: Erosion and Sediment Control
SP02: Water Availability and Pollution Control
SP03: Emission and Dust Control
SP04: Noise and Vibration
SP05: Waste Management
SP06: Hazardous Material Management
SP07: Vegetation Clearing
SP08: Landscaping and Re-vegetation
SP09: Biodiversity Management
SP10: Spoil Disposal
SP11: Quarry and Construction Layout
SP12: Unexploded Ordnance (UXO) Survey and Disposal
SP13: Construction of Work Camps
SP14: Traffic and Access
SP15: Training and Awareness
SP16: Project Personnel Health Program
SP17: Emergency Preparedness
SP18: Cultural Resources

2.3 CONTRACTOR SS ESMMP APPROVALS

Sixteen (16) SS ESMMPs were submitted to NNP1 between 1st January and March 31st 2015, which included the SSESMMP-CP from Loxley Company for vegetation clearing at tower sites along the 230kV transmission line. (Refer to Table 4).

Table 4 SS ESMMPs submitted by the contractor

No.	List of EMMP and SS ESMMPs	Date approved by NNP1/EMO	Pending NNP1 Approval
1	Site-Specific ESMMP-CP for A Road		X
2	Site-Specific ESMMP-CP for P1 Road		X
3	Site-Specific ESMMP-CP for P2 Road		X
4	Site-Specific ESMMP-CP for T1 Road		X
5	Site-Specific ESMMP-CP for T2 Road		X
6	Site-Specific ESMMP-CP for T3 Road	12-Jan-15	
7	Site-Specific ESMMP-CP for T4 Road		X
8	Site-Specific ESMMP-CP for T9 Road		X
9	Site Specific ESMMP for T13 Road		X
10	Site-Specific ESMMP-CP for Contractor's Camp		X
11	Site-Specific ESMMP-CP for Foundation and Installation works of RCC	21-Jan-15	
12	Site-Specific ESMMP-CP for earthwork of waste disposal	12-Feb-15	
13	Site-Specific ESMMP-CP for Contractor Camp		X
14	SS ESMMP-CP for the 230 kV Transmission Line construction (Loxley Con,)	16-Mar-15	
15	Site-Specific ESMMP-CP for Stock yard and site office	20-Mar-15	
16	Site-Specific ESMMP-CP for Clearing the ROW		X
Total		**05**	**11**

As reported in QMR1, during the 1st half of 2014 NNP1 observed that SS ESMMPs being submitted by the Head Contractor did not provide adequate detail for proper monitoring. Plans were found to be generic and rely heavily on direct extracts from the Owners ESMMP-CP, and not related to site specific conditions. Importantly, detailed information on pre-construction site conditions, detail of intended works and mitigations was less than what was needed for proper evaluation and monitoring.

Construction of the access road was advanced and needed to continue to avoid delays in overall construction. Eleven plans are now in progress for retrospective finalization. As the construction works for the access roads are all but complete, the process of SSESMMP finalization is largely an administrative one, however should any of the sites require maintenance and upgrades then the approved SS ESSMP sets out the necessary works quality standards and monitoring requirements.

2.4 MANAGING NONCOMPLIANCE MATTERS

During the process of construction numerous minor and temporary environmental issues of a variety of causes are created. These can be in the form of minor oil spills in workshops, improper drainage connections, improper waste separation and or disposal etc. The standard operating procedure (SOP) for these minor noncompliance issues was for the NNP1 to issue the contractor or sub-contractors a Non Compliance Report (refer to 2.4.2). Given the high volume of minor breaches (29 in the last quarter of 2014) an administrative burden was being created for both the Owner and contractors, which meant time that could be used resolving the issues and improving site conditions was taken up by administration.

In the 1st quarter of 2015 NNP1 introduced a new system to manage minor issues of contractor noncompliance in an effort to reduce reporting, but still be effective at monitoring corrective actions. It's effectively a two-tier system composing of: Tier 1 *Observation of Noncompliance (ONC),* and Tier 2 *Non Compliance Reporting (NCR)*. The 2-Tier System was introduced as a means to provide the contractor an opportunity to correct an issue in an agreed manner and time frame, in place of an NCR report.

2.4.1 Observation of Noncompliance Reporting (Tier 1)

During routine inspections the NNP1 Compliance and Monitoring team visit sites and meet with the contractor site engineer and or manager to assess environmental compliance. Where a minor breach is identified an agreement is made on the corrective action and the implementation time-frame. This agreement is then recorded as an *Observation of Noncompliance*. At the conclusion of each week all *Observation of Noncompliance* matters are reported to the main contractor for their follow-up. Later NNP1 inspections determine if the issues has been corrected. Generally, failure to undertake an agreed correction under ONC triggers an NCR.

No issues that are or have the potential for significant environmental and social harm are managed via the *Observation of Noncompliance* procedure. In these situations, corrective requirements are managed via NCRs.

2.4.2 Non Compliance Reporting (Tier 2)

A non-compliance reporting system was initiated by NNP1 in April, 2014. NCR is now a standard operating procedure. The primary purpose of generating a non-compliance report (NCR) is to raise awareness of environmental issues and track and facilitate appropriate corrective actions by the contractor.

An NCR is generated when the contractor or sub-contractor fails to meet the required mitigations outlined in the SS ESMMP. For example, elevated levels of coliform present in discharge water, exceeding specified criteria.

Currently three levels of non-compliance levels are used (Levels 1, 2, and 3). Refer to Table 5 All non-compliance issues identified are recorded in a database. Routine inspection and assessment is undertaken by NNP1 Compliance Officers to determine if the NCR issue has been resolved, or if it requires escalation.

Table 5 Non Compliance Report levels

Level	Significance
1	Non-compliance issue but not an immediate threat to people or environment.
2	Moderate impacts or anticipation of more significant impacts if unattended.
3	Significant impacts to people or environment or reasonable expectations of significant impacts.

Non-compliance issues can be assigned Level 1, 2 or 3 depending on their significance without stepping through each level. Level 1 NCRs should not be regarded as negative toward the contractor but simply an administrative procedure to identify current issues and track the

remedy progress. If a NCR 2 and NCR 3 are issued, this can indicate that the contractor has not satisfactorily met their agreed obligations to remedy an issue. All non-compliance issues identified are recorded in a database.

For both ONC and NCR, the NNP1 and contractor agree on the types of remedy to be implemented and the timeframe for completion. When the timeframe has been exceeded or when substandard work has been performed the NNP1 can choose to elevate the ONC to an NCR, or elevate the NCR to a higher level depending on significance of the issue.

Site closure is the last option but can be enforced for major breaches of safeguard standards. This would normally occur after NCR Level 3 has not been complied too.

2.4.3 Contractor Non Compliance Record

Weekly NNP1 construction monitoring is conducted at all sites. The inspection results are shared with the contractor at a Coodination Meeting every week. In addition to the NNP1 inspections, joint inspections are undertaken fortnighly between NNP1 and the contractor at priorty sites. All sub contractor compliance is managed through the main contractor, although inspections usually involve the project managers of sub contractors.

Between January and March 2015 54 (54) non compliance reports were issued to the contractor/sub contractor. Table 6 is a summary of Level 1 NCR issued.

Table 6 ONCs and NCRs issued to March 2015

NCR Issue	Observation of noncompliance	NCR Level 1	NCR Level 2	NCR Level 3
Camp sewage waste water treatment		1	nil	nil
Camp grey water treatment	24	1		
Hazardous waste management	7			
Soil erosion and sedimentation	4			
Waste Management	12	1		
Site Closure	4			
TOTAL	**51**	**3**		

Table 7 Detail of contractor environmental non conformance

No	Site name	Observation/NCR	Resolution date
1	Meuang Vang Development Company (MVDC) Camp	ONC: NNP1 requested a camp site decommissioning plan follow camp closure. (An official closure plan format was provided to the sub-contractor for completion.)	17/02/2015
2		ONC: First submission of the camp decommissioning plan submitted to NNP1 was not satisfactory due to insufficient information and a revision was requested.	17/02/2015
3		ONC: The contractor was requested to separate waste before disposal (burning).	03/03/2015

4		**NCR 1**: The contractor was requested to provide evidence of the location and manner of how septic waste water was disposed after the closure of the camp.	On-going
5	MVDC Parking Area	ONC: NNP1 requested a camp parking area site decommissioning plan follow camp closure. (An official closure plan format was provided to the sub-contractor for completion.)	03/02/2015
6	Lamsay Construction Company Camp	ONC: NNP1 requested a camp site decommissioning plan follow camp closure. (An official closure plan format was provided to the sub-contractor for completion.)	03/02/2015
7	Phoukhong Construction Sole Company (PKC) Camp	ONC: Improve camp solid waste management, as well as grey water treatment system.	17/02/2015
8		ONC: Contractor to provide a storage area for general waste (for later collection.)	03/03/2015
9		ONC: Contractor requested to provide worker training on the appropriate methods for storage and management of hazardous waste materials.	31/03/2015
10		ONC: Contractor requested to improve camp grey water treatment system.	31/03/2015
11		ONC: NNP1 requested the contractor to improve the conditions of the shower and toilet areas.	31/03/2015
12	TCM Engineering Corporation Limited (TCM) Camp	ONC: Contractor requested to improve camp grey and black water treatment system.	17/03/2015
13	Road A1	ONC: Contractor requested to remove scattered fallen/felled timber along the access road.	17/03/2015
14	Re-regulation dam	ONC: Requested the contractor to provide bins for proper separation of wastes (hazardous and non-hazardous)	17/02/2015
15		ONC: Requested the contractor to improve effluent discharge water quality from the site by increasing the area/volume of sediment ponds.	31/03/2015
16	Right Tunneling Company Limited Camp	ONC: Requested the contractor to improve drainage management of the material storage shed and yard, as well as improvements to the camp waste water treatment plant.	03/02/2015
17		ONC: Requested the contractor to provide bins for proper separation and processing of recyclable materials.	17/02/2015
18		ONC: Contractor requested to improve camp grey and black water treatment system, including operational plan.	On-going
19		ONC: Contractor requested to advise NNP1 of its intent to discharge construction waste effluent.	31/03/2015
20		ONC: Contractor requested to improve camp grey water treatment system.	31/03/2015
21		ONC: Contractor requested to improve hazardous waste storage and management.	31/03/2015
22		ONC: Contractor to provide a storage area for general waste (for later collection.)	17/02/2015

23	Song da 5 Joint Stock Company	ONC: Contractor requested to improve camp grey water treatment system, and submit design, operational/maintenance plan prior to construction.	03/02/2015
24		ONC: Contractor requested to improve camp site surface water drainage.	17/02/2015
25		ONC: Contractor requested to submit WWTS design, operational/maintenance plan prior to construction.	On-going
26		ONC: Contractor requested to increase the size of the camp grey water treatment pond.	17/02/2015
27		ONC: Contractor requested to improve the design of the camp grey water treatment system that was submitted to NNP1.	17/03/2015
28		ONC: Requested the contractor to provide bins for proper separation and processing of recyclable materials, also to stop burning of unsegregated waste.	17/03/2015
29		ONC: Requested the contractor to improve surface and waste water drainage system at the CVC Plant Yard	On-going
30		ONC: Contractor requested to improve hazardous waste storage and management.	Pending
31		ONC: Requested the contractor to provide bins for proper separation of camp wastes, improve waste separation, as well as increase the cleaning frequency of the kitchen grease-oil traps.	On-going
32		ONC: Contractor requested to provide worker training on the appropriate methods for storage and management of hazardous waste materials.	17/03/2015
33		ONC: Contractor to improve storage area for general waste (for later collection.)	31/03/2015
34		ONC: Contractor was requested to stop washing any machinery in the river.	17/03/2015
35		ONC: Contractor was requested to follow the design of the engineering workshop with no maintenance to be carried out in areas without a concrete platform, concrete bund or oil traps.	On-going
36		**NCR1:** Contractor requested to improve camp wastewater treatment system, and site drainage. The design is to be improved before construction.	Pending
37	Vilayvanh & Keota Concrete Sole Company (V&K)	ONC: Contractor requested to provide worker training on the appropriate methods for storage and management of hazardous waste materials. Hazardous material storage facility management requires improvement.	On-going
38		ONC: Contractor requested to improve camp grey water treatment system, and submit design, operational/maintenance plan prior to construction.	Pending
39	River diversion tunnel	ONC: 1st request to the contractor to stop untreated construction effluent being discharged to the natural environment.	17/02/2015
40		ONC: 2nd request to the contractor to stop untreated construction effluent being discharged to the natural environment.	03/02/2015

41		ONC requested that waste bins be provided at site, and the hazardous materials be separated.	03/02/2015
42		ONC: Contractor requested to provide worker training on the appropriate methods for storage and management of hazardous waste materials. Hazardous material storage facility management requires improvement.	03/03/2015
43	Sino Hydro Camp	ONC requested that waste bins be provided at site, and the hazardous materials be separated.	17/02/2015
44		ONC: Contractor requested to improve the grey water treatment system, oil and grease trapping from the kitchen/cooking areas and to stop discharge of untreated effluent to the environment.	03/03/2015
45		ONC: NNP1 1st request to the Contractor to provide the detail design of grey and black wastewater treatment facility system.	17/02/2015
46		ONC: NNP1 2nd request to the Contractor to provide the detail design of grey and black wastewater treatment facility system	17/03/2015
47	Spoil Disposal N#6	ONC: During the construction of the Spoil Area, remove vegetation from outside sites (do not fell and bury) to reduce the risk of sub surface water becoming anaerobic.	17/03/2015
48	Spoil Disposal N#7	ONC: NNP1 provided the contractor with the necessary mitigation measures to minimize sediment run-off into the Nam Ngiep river. Implementation was expected by Contractor by May 2015.	Pending
49	Pang-Keoonkham Company PAKC	ONC: Contractor requested to improve site drainage by increasing sediment pond volume.	17/03/2015
50		ONC: Contractor to improve storage area for general waste (for later collection.)	17/03/2015
51		ONC: Contractor requested to improve camp grey water treatment system by increasing the volume of the temporary retaining pond, add hyacinth plants, clean up the oil traps and install the fence for preventing the villager's animals.	17/03/2015
52		ONC: Contractor requested to improve camp grey water treatment system by having the (i) stone (ii) charcoal and (iii) sand at outlet of retaining pond to have the grey water double treated prior discharge	31/03/2015
53		I ONC: Contractor requested to improve site waste management. Collect the scattered wastes, improving the site drainage ditch and proceed an awareness training program for all workers.	Pending
54		**NCR1**: Contractor requested for **all currently operating worker** camps to provide training on the appropriate methods for storage and management of domestic waste materials, improve waste segregation procedures, and prohibit the burning of hazardous materials on site.	On-going
Total		Issues Closed = 41	
		Issus Pending = 05	

	Issues On-going = 08
Definitions	'Closed': all issues resolved
	'Pending': corrective action not done according to the Owners request so further actions required.
	'On-going': partially implemented and working to Owner requirements

2.5 WASTE MANAGEMENT

2.5.1 Common Construction and Domestic Waste

By mid-2014 no landfill site for common construction waste had been constructed. The construction focus was on the access road, and the main waste being generated was domestic waste from worker camps. Inspections of the camp waste management facilities found them to be poorly managed (open pits with poor draining). These were a risk to worker health, and a potential source of environmental pollution. Camps were requested to shut down these facilities. At that time only the Civil Works Contractor with three sub-contractors were operating on site. On closure of the camp waste pits, the contractor made an agreement with the Urban Planning Development Organization (UPDO), Paksan District to have wasted collected and then transferred to the Paksan Landfill.

Two temporary pits were installed at the NNP1 Landfill facility and were being used as of March 2015. At the time when the landfill is completely operational, which is expected in the 2nd quarter of 2015, waste from these two pits are to be exhumed and transferred to 'completed' operational pits. Construction waste transfer offsite to the Paksan Landfill was suspended in March 2015. Except for hazardous waste, all other types of waste generated by NNP1 is processed on site.

Photo 8 NNP1 landfill embankment works and one of the temporary pits (January 2015)

Final landfill design and its operational aspects is now subject to independent expert assessment, who will advise on NNP1 on necessary changes. Conclusion of the review is expected in the 2nd quarter of 2015.

2.5.2 Hazardous Waste Management

2.5.2.1 Hazardous Materials Inventory

In the months January to March 2015, the NNP1, OC and sub-contractors conducted a hazardous materials inventory of all the main construction sites, engineering workshops and sub-contractor camps. Hazardous materials were recorded at PKC camp, MVDC workshop, TCM 1&2 camps, Songda camp, Songda workshop, the Right Tunnel camp (RT workshop), CVC Plant, V&K camp and Sinohydro camp.

The inventory process identified that old batteries were missing from the PKC workshop (seven units) and one from TCM workshop. NNP1 were advised by the sub-contractors that the batteries had actually been returned to the original place of purchase as part of an exchange for new ones.

2.5.2.2 Hazardous Waste Management Audit

On 26 March 2015 NNP1 conducted a joint hazardous waste management audit (HazMat) with the contractor and sub-contractors. The HazMat audit was conducted at PKC Camp, Songda Camp, RT Camp, Songda workshop, CVC plant, TCM Camp, Sinohydro Camp, Sinohydro fuel storage area and Sinohydro explosive storage area.

The audit procedure was an inspection of storage and disposal areas, checking adequacy and currency of Hazardous Material documentation, and also and evaluation of the general management procedures and training (including emergency response, HazMat handling, safety, and refueling area). Findings of the HazMat Management Audit is presented Table 12.

Findings: Most sites visited lack general procedures (i.e. safety, spill response, refueling), HazMat Registration, SOPs, and safety procedure were not sighted. Adequate information labels displayed on containers, materials safety data sheets were not sighted, and most sites are yet to conduct formal training for HazMat handling/spill response.

The NNP1 requested via ONC that the contractor provide a training for staff regarding these issues.

2.5.3 Medical Procedure Wastes Management

Medical waste in the reporting period was very minimal, mainly used swabs, cotton balls and bandages. Medical wastes are being temporarily stored inside sealed disinfected drums. Medical sharp equipment is also stored in drums, but separated from tissue material. Sharp objects will be transferred to Vientiane landfill for incineration.

Note: NNP1 conducted a social and environmental safeguards due diligence assessment of the Vientiane Landfill incinerator facility in November 2014 and found no issue of concern.

2.6 WATER QUALITY MONITORING

The following section presents the results of water quality monitoring undertaken between January and March 2015. The monitoring results are compared against Lao Government

Water Quality Standards. These standards are consistent with the projects Concession Agreement requirements. Monitoring was undertaken for the following categories:

1. Surface Water
2. Groundwater (village wells)
3. Effluent discharge
4. Construction Area Discharge

For each category only parameters that are outside the standards are presented as tables in the following sections. The appendix section contains graphs that show trends of all key parameters since the beginning of monitoring in September 2014.

2.6.1 Surface water (river) quality monitoring

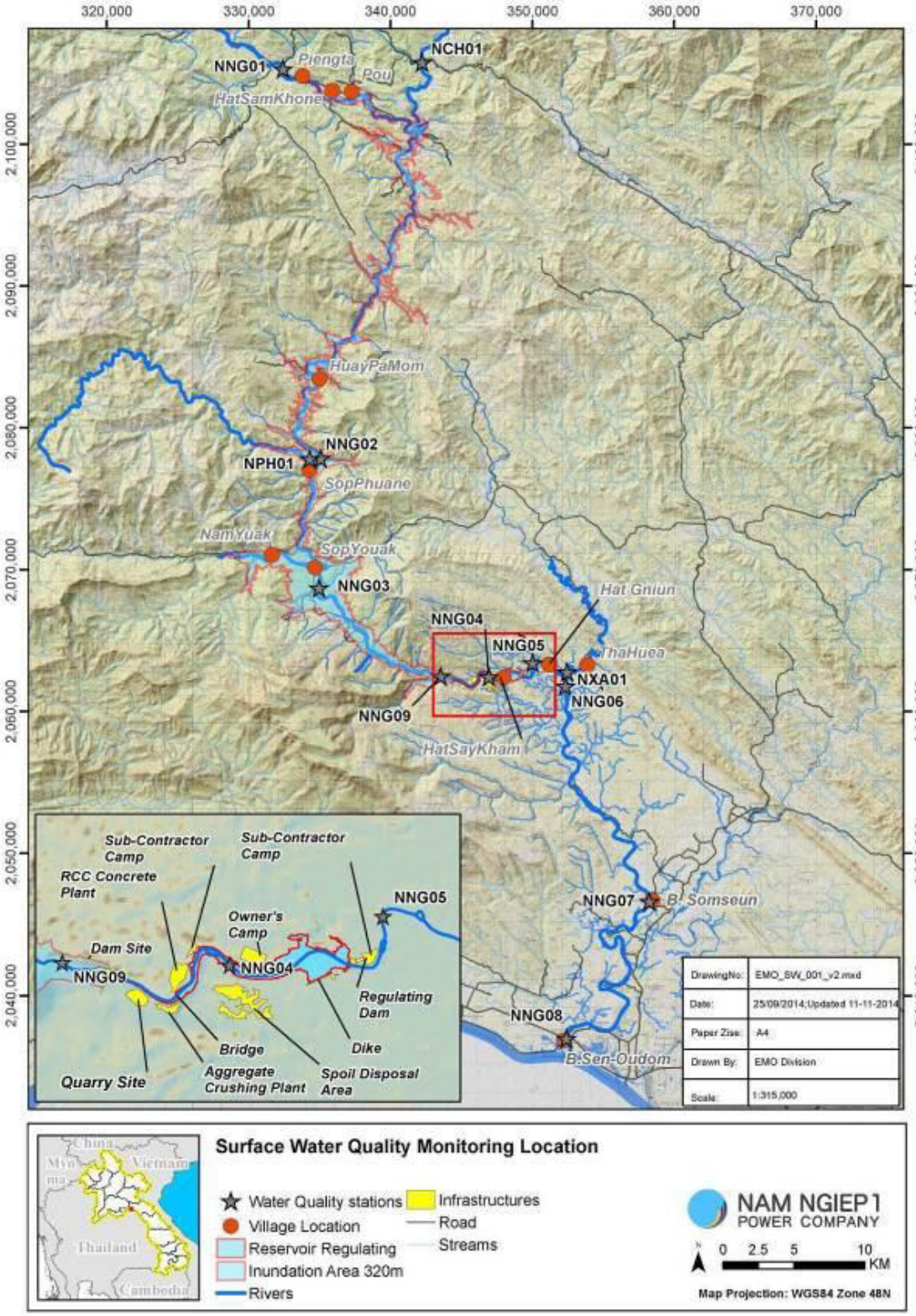
To assist the company's understanding of the condition of surface waters in the catchment and its construction activity impacts downstream, water quality monitoring is conducted at 12 locations in the watershed. Six (6) sites are located in the upper Nam Ngiep above NNP1 Project, and include the Nam Ngiep main channel, and the lower reaches of the Nam Chiane and Nam Phouan systems. Four (4) sites are located in the Nam Ngiep below the project, and one site on the lower Nam Xao.

In addition, there is one Nam Ngiep monitoring site within the construction area (NNG04), and one immediately downstream (NNG05). Refer to Figure 9. These two are reference sites for NNP1 project impacts. Site NNG09 is located immediately above the project construction area, and is the control site for pre-NNP1 water quality condition.

Table 8 Surface water quality monitoring locations

Site Code	Location station
NNG01	Nam Ngiep Upstream of Ban Phiengta
NNG02	Nam Ngiep Upstream of Nam Phouan Confluence
NNG03	Nam Ngiep Downstream of Ban Sop-Yuak
NNG09	Nam Ngiep Upstream Main Dam
NNG04	Nam Ngiep Downstream RT Camp
NNG05	Nam Ngiep Upstream of Ban Hat Gniun
NNG06	Nam Ngiep Downstream of Nam Xao Confluence
NNG07	Nam Ngiep at Ban Somsuen
NNG08	Nam Ngiep at the Bridge of Road 13
NCH01	Nam Chiane at the Bridge of Road 1D
NPH01	Nam Phouan Upstream of Nam Ngiep Confluence
NXA01	Nam Xao Upstream of Nam Ngiep Confluence

Figure 9 Nam Ngiep watershed surface water quality monitoring locations



For surface water monitoring, twenty five (25) parameters are tested which include the following:

1) pH
2) DO (%)
3) DO (mg/L)
4) Conductivity (µs/cm)
5) TDS (mg/L)
6) Temperature (°C)
7) Turbidity (NTU)
8) Arsenic (mg/L)
9) Calcium (mg/L)
10) Iron (mg/L)
11) Lead (mg/L)
12) Magnesium (mg/L)
13) Manganese (mg/L)
14) Mercury (mg/L)
15) Potassium (mg/L)
16) Sodium (mg/L)
17) Total coliform (MPN/100mL)
18) Ammonia-Nitrogen (mg/L)
19) BOD (mg/L)
20) COD (mg/L)
21) Chloride (mg/L)
22) Nitrate-Nitrogen (mg/L)
23) Sulfate (mg/L)
24) Total Alkalinity (mg/L)
25) TSS (mg/L)

For January to March 2015 surface water parameters that exceeded Lao PDR guidelines include COD, BOD, Total and fecal Coliforms. The results are provided in the following sections for these parameters.

2.6.1.1 Results: Chemical Oxygen Demand

Chemical Oxygen Demand (COD) is an expression of the amount of water-dissolved oxygen used to break down compounds in the water which cannot be broken biologically. The higher the COD reading, the greater concentration of pollutants.

COD was recorded slightly high across a number of sites for January and February. COD was recorded highest in January upstream of the project area, but was not detected at sites below Ban Hat Gniun (NNG05). A COD spike was observed in the Nam Chiane.

	River Name	**Nam Ngiep**									**Nam Chiane**	**Nam Phouan**	**Nam Xao**
	Station	NNG01	NNG02	NNG03	NNG09	NNG04	NNG05	NNG06	NNG07	NNG08	NCH01	NPH01	NXA01
Month-Year	Guideline (mg/L)												
Jan-15	<5.0	5.6	5.4	5.2	ND	5.6	ND	ND	ND	5.4	11.3	ND	ND
Feb-15	<5.0	ND	ND	ND	ND	ND	ND	ND	5.0	ND	5.4	ND	7.0
Mar-15	<5.0	ND	ND	5.0	ND	ND	ND	ND	ND	ND	ND	ND	ND

2.6.1.2 Results: Biochemical Oxygen Demand

Biochemical Oxygen Demand (BOD) measures the amount of oxygen consumed by microorganisms in decomposing organic matter in the river. Biochemical Oxygen Demand directly affects the amount of dissolved oxygen available in rivers. The greater the BOD, the more rapidly oxygen is depleted in a water body, resulting in less oxygen being available to aquatic biota. Only the lower Nam Xao (downstream of the Project) recorded slightly high BOD in January 2015.

	River Name	Nam Ngiep									Nam Chiane	Nam Phouan	Nam Xao
	Station	NNG01	NNG02	NNG03	NNG09	NNG04	NNG05	NNG06	NNG07	NNG08	NCH01	NPH01	NXA01
Month-Year	Guideline (mg/L)												
Jan-15	1.5	ND	1.1	1.2	1.2	1.1	1.1	1.4	1.2	1.2	1.2	ND	1.8
Feb-15	1.5	ND	ND	ND	1.0	ND	ND	1.0	ND	ND	ND	ND	1.0
Mar-15	1.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

2.6.1.3 Results: Fecal and Total Coliform

Since January 2015 both fecal coliform and Total coliform were included in routine surface water monitoring. Most sites, including upstream of the project, within the project area and downstream recorded high counts of both fecal coliform and Total coliform for January. A pollution spike was observed in the lower Nam Xao and in the Nam Ngiep main stream at B. Somseun.

The source of the spikes is not known, but high coliform readings at many sites may have been a result of early rains and surface runoff carrying pollutants into the river system. February and March values of fecal coliform and Total coliform were found to be within the accepted range for Lao PDR.

	River Name	Nam Ngiep									Nam Chiane	Nam Phouan	Nam Xao
	Station	NNG01	NNG02	NNG03	NNG09	NNG04	NNG05	NNG06	NNG07	NNG08	NCH01	NPH01	NXA01
Month-Year	Guideline (MPN/100mL)												
Jan-15	1,000*	1,300	130	700	1,500	700	1,100	3,500	92,000	460	4,900	330	92,000
Feb-15	1,000*	490	110	170	110	130	130	110	79	170	3,300	230	17
Mar-15	1,000*	790	540	240	130	240	33	23	13	540	700	280	130
Jan-15	5,000**	1,300	350	13,000	4,900	2,200	2,200	13,000	92,000	7,900	4,900	790	160,000
Feb-15	5,000**	1,300	490	1,700	490	350	330	170	490	170	3,300	230	330
Mar-15	5,000**	790	2,300	330	1,600	540	2,300	2,300	70	540	700	2,300	130

*Total Coliforms. Standard is <5000 MPN/100ml

**Fecal Coliform. Standard is <1000 MPN/100ml

2.6.2 Effluent Discharge Quality Monitoring

NNP1 is required to monitor water quality of all effluent discharge to the environment from work sites and worker camps. At times when no discharge is observed, such as the case where effluent is being held in tanks, no monitoring is conducted. During the monitoring period two camps were discharging effluent: Right Tunnel and Sinohydro.

Sixteen (16) parameters were monitored, as below, and the results of those that exceeded accepted standards are presented below

1. pH
2. Sat. DO (%)
3. DO (mg/L)
4. Conductivity (µs/cm)
5. TDS (mg/L)
6. Temperature
7. Turbidity (NTU)
8. TSS (mg/L)
9. Iron (mg/L)
10. Manganese (mg/L)
11. Ammonia (mg/L)
12. BOD (mg/L)
13. COD (mg/L)
14. Oil & Grease (mg/L)
15. Total coliform (MPN/100ml)
16. Fecal coliform (MPN/100ml)

		Site Name	TCM Camp	MVDC Camp	RT Camp	Sino Hydro camp
		Station	EF03	EF04	EF05	EF06
Month Year	Parameter	Guideline				
Jan-15	BOD (mg/L)	<30			70	
Feb-15	BOD (mg/L)	<30			29.1	59.2
Mar-15	BOD (mg/L)	<30			25.4	78.2
Jan-15	COD (mg/L)	<125			127	
Feb-15	COD (mg/L)	<125			89.6	127
Mar-15	COD (mg/L)	<125			88	150
Jan-15	TSS (mg/L)	<50			272	
Feb-15	TSS (mg/L)	<50			244	18.2
Mar-15	TSS (mg/L)	<50			41.4	8.1
Jan-15	Ammonia-nitrogen (mg/L)	<10			4	
Feb-15	Ammonia-nitrogen (mg/L)	<10			6	16
Mar-15	Ammonia-nitrogen (mg/L)	<10			12	17
Jan-15	Oil & Grease (mg/L)	<10			6	
Feb-15	Oil & Grease (mg/L)	<10			4	9
Mar-15	Oil & Grease (mg/L)	<10			1	8
Jan-15	Fecal coliform (MPN/100mL)	-			160,000	
Feb-15	Fecal coliform (MPN/100mL)	-			160,000	160,000
Mar-15	Fecal coliform (MPN/100mL)	-			160,000	
Jan-15	Total Coliform (MPN/100mL)	<400			160,000	
Feb-15	Total Coliform (MPN/100mL)	<400			160,000	160,000
Mar-15	Total Coliform (MPN/100mL)	<400			160,000	

Note: No discharge from MVDC and TCM camps recorded.

Right Tunnel Camp: BOD, COD, TSS, Fecal and Total coliform exceeded the guidelines for January 2015. During February and March an aeration system and water-hyacinth were installed as part of a system upgrade, however results for February and March suggest little improvement to water quality. Seepage from the system continues to be a problem and

additional improvements to the system have been requested of the sub-contractor. NNP1 has requested the waste water treatment system design for review.

Photo 9 Right Tunnel grey water treatment pond

Photo 10 Right Tunnel Camp effluent discharge location

Sino Hydro Camp: BOD, COD, Ammonia-nitrogen, fecal coliform and Total coliform exceeded guidelines for the quarter. Discharge from this site WWTS enters a road side earth drain.

Photo 11 Sinohydro grey water treatment system discharge location

TCM Camp: The TCM grey water treatment system has had a history of being unable to adequately process grey water before discharge to the environment. Elevated counts for both Total and fecal coliforms were recorded in November and December 2014. In the period January to Match 2015 no discharge was released from the camp. Completion of the WWTS

upgrade was in March 2015 and included an increase in grey water pond storage capacity, and the introduction of aquatic plants to help reduce nutrient levels.

Photo 12 TCM Camp WWTS upgrade

2.6.2.1 Systems design review and upgrade

Waste water discharge from the camps continues to be a problem caused by ineffective systems (grey and black). NNP1 has requested that all camps provide detailed designs of the systems which will be subject to review of an independent specialist. From the review it is expected that camp systems will be overhauled. Sub-contractors will be required to monitor for effectiveness. The review is expected to be completed in the 2nd quarter of 2015.

2.6.3 Groundwater Quality Monitoring

There are three borehole wells in Hatsaykham village used for domestic purposes. During January to March 2015 water quality from these boreholes was tested against twenty two (22) parameters. These include the following:

1. pH
2. Sat. DO (%)
3. DO (mg/L)
4. Conductivity (µs/cm)
5. TDS (mg/L)
6. Temperature
7. Turbidity (NTU)
8. Arsenic (mg/L)
9. Cadmium (mg/L)
10. Calcium (mg/L)
11. Iron (mg/L)
12. Magnesium (mg/L)
13. Manganese (mg/L)
14. Potassium (mg/L)
15. Sodium (mg/L)
16. Fluoride (mg/L)
17. Nitrate (mg/L)
18. Nitrite (mg/L)
19. Total Hardness (mg/L)
20. Total coliform (MPN/100ml)
21. Fecal coliform (MPN/100ml)
22. E. coli (MPN/100mL)

Groundwater in the three wells was found to be acceptable quality for the reporting period. pH result results were slightly lower than the guidelines but not to the extent that it would impact on health.

Very low level fecal coliform and E coli bacteria counts were found in one well (GHSK02) in January. It's possible the unhygienic conditions of the surrounding environment may have been a cause for the contamination. Through routine consultation, NNP1 conveyed a message to villagers of the presence of the bacteria and there is ongoing extension services informing them about the need to improve domestic hygiene and to boil water before drinking.

Month Year	Parameter	Site Name	Ban Hatsaykham		
		Station	GHSK01	GHSK02	GHSK03
		Guideline			
Jan-15	pH	6.5 -9.2	5.83	5.85	6.3
Feb-15	pH	6.5 -9.2	7.82	6.6	6.61
Mar-15	pH	6.5 -9.2	5.96	6.4	6.7
Jan-15	Fecal coliform (MPN/100mL)	0	0	2	0
Feb-15	Fecal coliform (MPN/100mL)	0	0	0	0
Mar-15	Fecal coliform (MPN/100mL)	0	0	0	0
Jan-15	E.coli (MPN/100mL)	0	0	2	0
Feb-15	E.coli (MPN/100mL)	0	0	0	0
Mar-15	E.coli (MPN/100mL)	0	0	0	0

2.6.4 Construction Area Discharge Water Monitoring

Over the reporting period two construction sites were discharging effluent to the natural environment: the Regulation Dam and Diversion Tunnel Outlet. These sites can produce potentially large volumes of effluent – underground water or trapped surface water. Both sites operate for 2x 10hour shifts per day and for six days a week, but the requirement to rid the site of water build up is 24hrs a day seven days a week. An effluent filtration system that controls pH and removes suspended solids is operating at the tunnel excavation outlet, and one is planned for the re-regulation dam site. At the regulation dam a series of sediment ponds treats effluent before discharge.

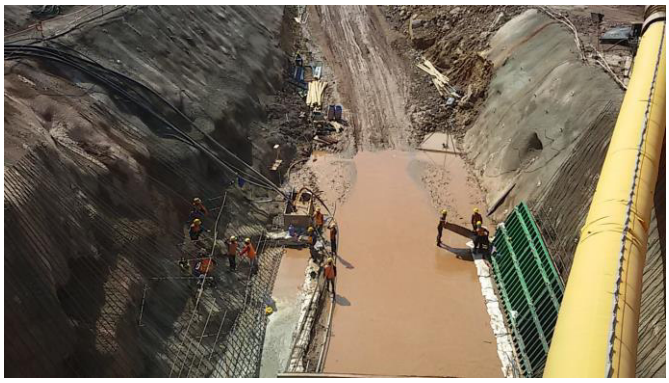


Photo 13 Pooled effluent water at the tunnel outlet excavation site (April, 2015). The filtration system in the adjacent photo is situated on the upper left bank of the tunnel excavations. The trapped effluent water is tanked and then pumped to sediment ponds before passing through the filtration system. Sediment 'cake' is disposed of at Spoil Area 6. Processed effluent water is discharged to the Nam Ngiep.

Photo 14 The effluent filtration system used at the tunnel outlet excavation site.

Nine discharge parameters were tested at these sites:

1. pH
2. Sat. DO (%)
3. DO (mg/L)
4. Conductivity (µs/cm)
5. TDS (mg/L)
6. Temperature
7. Turbidity (NTU)
8. TSS (mg/L)
9. Oil & Grease (mg/L)

Month Year	Parameter	River Name	Diversion Tunnel Outlet	Regulating Dam
		Station	DS01	DS08
		Guideline		
Jan-15	pH	6.0 -9.0	8.66	8.57
Feb-15	pH	6.0 -9.0		8.6
Feb-15	pH	6.0 -9.0		9.5
Feb-15	pH	6.0 -9.0		8.89
Mar-15	pH	6.0 -9.0		9.48
Mar-15	pH	6.0 -9.0		10.51
Jan-15	TSS (mg/L)	50		74.5
Jan-15	TSS (mg/L)	50	132	119
Feb-15	TSS (mg/L)	50		82.7
Mar-15	TSS (mg/L)	50		233
Mar-15	TSS (mg/L)	50		206

During January to March the regulation dam and the tunnel excavation sites recorded elevated TSS in effluent discharge. Elevated pH was observed in effluent from the regulation dam site. At the regulation dam effluent water was treated by series of sediment ponds. A large portion of the effluents suspended fraction was very fine and could not settle out prior to discharge, which explains the consistently high TSS values. After treatment both sites discharged directly to the Nam Ngiep.

The volume of water passed through the effluent filtration system at the tunnel outlet excavation site between the 9th February (effluent treatment plant commissioning date) to the 31st March was 17,900m^3. NNP1 estimated that only 1/3 of the effluent was actually treated, with the rest being discharged to a road side drain that flows directly into the Nam Ngiep. With 2/3 not being processed the total amount of untreated effluent being discharged is approximately 35,800m^3 since February 2015. This issue is currently subject to an NCR Level 2. The contractor is expected to increase the processing capacity of the filtration system by increasing sediment pond storage volume. The contractor has been requested to redesign the facility, and submit the plan to NNP1 for approval. This new system plan is expected in May 2015, with upgrade works commending after its approval.

The Regulation dam treats water via a rudimentary settling pond system prior to direct discharge into the Nam Ngiep. NNP1 has requested system improvements at both sites, including the installation of filtration system at the regulation dam site, and increased sediment capacity at the diversion tunnel outlet site. A new filtration system at the regulation dam is expected to be operating in the 2nd Quarter of 2015.

2.7 Air Quality Monitoring

Air quality monitoring is planned for twice per year at Ban Hatsaykham, Ban Thaheua and Ban HatGnuin. Due to equipment failure air quality monitoring was not conducted during the quarter, however routine visual observations continued. (The equipment was returned to

supplier in the United States for correction and is expected to be returned in the 2nd quarter of 2015.)

Road construction and vehicle passage are considered the most prevalent generator of dust at sensitive receptors (e.g. villages), but the following improvements were made to reduce levels:

- All the road sections within three villages (Ban Hat Gnuin, Ban Nonsomboun, Ban Nonsomboun) were sealed in the first quarter of 2015.
- Speed bumps were also be installed to reduce vehicles speed through villages and improve safety.
- Access road nearby other sensitive receptors along the roads, such as ad hoc camps and construction area have increased the frequency of watering.

Photo 15 sealed road surface and speed bumps at Ban Hat Gnuin (April 2015).

2.8 NOISE MONITORING

Due to equipment failure, noise monitoring was not implemented during the quarter. The equipment was returned to supplier for correction. Road construction and vehicle passage are considered the most prevalent generator of noise at sensitive receptors (e.g. villages), but the following improvements were made to reduce noise levels:

- All the road sections within three villages (Ban Hat Gnuin, Ban Nonsomboun, Ban Nonsomboun) were sealed in the first quarter of 2015.
- Speed bumps were also be installed to reduce vehicles speed through villages and improve safety.

- Access road nearby other sensitive receptors along the roads, such as ad hoc camps and construction areas have increased the frequency of watering.

2.9 VIBRATION

Lao PDR does not have a recommended guideline for vibration. Structural damage from road construction activity (e.g. vibratory rollers) and ancillary activity (e.g. blasting at the quarries) is unlikely given the distance from public infrastructure to the construction areas.

2.10 CONSTRUCTION RELATED MATTERS

2.10.1 Community Grievance Management

Village consultations were held by NNP1 (EMO) team at least once per month at Ban Hat Gnuin, Ban Thaheua and Ban Hat Saykham during to 2014. This activity was suspended from January 2015 at the completion of the sealing of the access road through village settlments, and the construction of speed - reducing humps.

2.10.2 Physical Cultural Resources

No disturbance to Physical Cultural Resources was recorded in the reporting period.

2.10.3 Reservoir Biomass Management

Conditions of the Project Lenders *Common Terms of Agreement* require NNP1 to provide an executed *Biomass Clearance Agreement*. For this milestone to be met, NNP1 will have to have in place agreed contracts with biomass clearance firms. The Project Concession Agreement requires the NNP1 to undertake biomass clearance according to the *Step-by-step Environmental Guidelines for Biomass Removal from Hydropower Reservoirs in Lao PDR, December 2012*. There are two components to biomass removal planning: 1) The formulation and GOL approval of a Biomass Management Plan - BMP, and 2) Block Clearance Plans, or BCPs. BCPs will form the base documents for tendering contractors.

Tender proposals for the development of the Biomass Management Plan were advertised in the 1st quarter of 2015. Plan development is expected start in the 2nd quarter of 2015.

2.10.4 UXO Clearance

UXO clearance is conducted by NNP1 according to the recommendations in the Owners ESMMP Sub-Plan 13: Unexploded Ordnance (UXO) Survey and Disposal, and also related in Sub-Plan 06: Hazardous Material Management and Sub-Plan 16: Training and Awareness.

UXO clearance of all construction work sites, reservoirs, resettlement area and access roads is conducted under contract by licensed clearance teams to NNP1. Certificates of clearance are provided to NNP1, and no work is permitted until such authorization is provided by the owner to contractors.

3 PROGRESS OF CURRENT ENVIRONMENTAL ASSESSMENTS AND MANAGEMENT PLANNING

3.1 HOUAY SOUP RESETTLEMENT AREA IEE

An IEE for Houay Soup was prepared in July 2014. ADB comments were subsequently received 20 August 2014 and these were rolled into a redraft that was presented to ADB on the 19 November 2014.

The focus for the IEE was to assess the impacts on stream-systems from resettlement. After review the ADB and IAP have requested greater attention be given to how the resources in the Protected Forest Area land, particularly forests, were going to be managed. The IEE for Houay Soup Resettlement Area is now subject to revision, and will be disclosed six months prior to the commencement of resettlement, which is planned for the 1st Quarter of 2016.

3.2 230KV TRANSMISSION LINE IEE UPDATE

The ROW alignment has been adjusted several times since 2002 design concept to avoid boundaries of the Phou Khao Kouay National Protect Area (PKK), the Ban Na Elephant Conservation Zone (ECZ), Houay Ngua PPA, and the Leng Nam Ngiep + Nam Mang National Protection Forest Area (PFA). This has been confirmed by additional field studies conducted by the project.

The Initial Environmental Examination (IEE) of the NN1 Hydropower Project's 230 kV Transmission Line was conducted by ERIC in 2012 and updated by ERM (May 2014). This work provided an initial assessment of potential impacts on biodiversity utilizing *normal difference vegetation index* (NDVI) data. Lenders have requested to confirm and refine the findings of the earlier ERM report, regarding biodiversity values along the proposed alignment. An evaluation is currently underway. The alignment has also been changed to avoid concession plantations, and for construction suitability in the landscape. The May 2014 IEE, if required, will be updated based on the results of the assessment.

3.3 115KV TRANSMISSION LINE IEE

NNP1 has requested from the GOL the 115kV transmission line design and construction schedule. Preparation of an Initial Environmental Examination for this facility has not commenced. NNP1 will support GOL to completed necessary studies and compensation arrangements. The 115kV TL will be used to distribute 18MW from the regulation dam. It will be owned and operated by the GOL.

3.4 HOUAY NGUA PROVINCIAL PROTECTED AREA CONSERVATION MANAGEMENT

NNP1PC have provided $48,000 to Bolikhamxay PONRE for forest management training for staff and local villages; establishment of checkpoints at either end of the access road through the Houay Ngua Provincial Protected Area (PPA); and forest patrolling by PONRE and Provincial Forestry College students. These activities were conducted between August and December 2014. PONRE has requested ongoing support for the program, and this request is now subject to NNP1 review.

3.5 ENVIRONMENTAL PROTECTION FUND

According to the CA, NNP1 has an obligation to provide $990K throughout the concession period to the GOL Environmental Protection Fund (EPF), in which $180K has to provide before the COD.

NNP1 held discussion with EPF Director in August 2014 in regards to the process of transferring, and the use of EPF. EPF Director initially agreed that the fund will be allocated to two EPF Operational Windows: Community and Biodiversity Investment (CBI), and Water Resources Management (WRM).

Discussion are ongoing for the EPF to be used to test mechanism for delivering biodiversity offset outcomes for the NNP1 project.

3.6 INTEGRATED SPATIAL PLAN FOR XAYSOMBOUN PROVINCE

Integrated spatial planning (ISP) program for Xaysomboun was recommended by the ADB and IAP mission, for use in the NNP1 watershed and biodiversity management planning. The NNP1 has set aside company budget to assist Xaysomboun Province develop an ISP for the province. In the reporting period, NNP1 is continuing to collaborate with GOL on this aspect.

3.7 FLOOD EVENT MONITORING

No events to report.

4 WATERSHED AND BIODIVERSITY MANAGEMENT

NNP1PC accepts that integrated watershed management is a priority issue. As the lower end user of the Nam Ngiep watershed it is in NNP1PC's direct interests to commit and support government, community and private sector interests in sustainable watershed development. To not do so would be to leave our operations, productivity and sustainability to considerable risk.

4.1 WATERSHED MANAGEMENT

The company is entering the planning phase for development of Watershed Management Plan for areas of the Nam Ngiep catchment (NNP1 WMP)

NNP1, in collaboration with MONRE DFRM and PONRE of Xaysomboun and Bolikhamxay, have discussed the foreseeable planning activity requirements for the period pre COD (2015-2019). The key aspects being discussed include: the principal objectives of NNP1 WMP, essential watershed management components, role and responsibilities of relevant stakeholders and operational cost under Watershed Management Fund (WMF). It is understood that this *activity plan* will be to gather and collate information for NNP1 WMP, which is expected to be ready in March 2016.

In parallel to this *activity plan*, NNP1 is on progress of procuring a watershed management expert consultant to support the development of the NNP1 WMP. Technical and financial proposals have been received from firms and individuals consultants. Technical appraisals were conducted in early April 2015, and it is expected that the Watershed Consultant will commence the work in May or June 2015.

NNP1 is also conducting its own field observation within watershed to identify land and water uses that have the potential to impact on the company's operations, primarily around other developments that affect:

- land use patterns and development trends,
- vegetation cover,
- forests and biodiversity,
- water resources (quality and quantity),
- landslide, erosion and sedimentation hotspots.

4.2 COMMITTEE FOR BIODIVERSITY OFFSET PROGRAM

Biodiversity Advisory Committee (BAC) is the key technical review committee for the NNP1 biodiversity offset program. NNP1 has sought expressions of interest from independent specialist to sit on the committee with expertise in biology and biodiversity. The NNP1 is now reviewing applicants in consultation with ADB and GOL. It is expected that the BAC will be established before 30 April 2015.

4.3 BASELINE BIODIVERSITY SURVEY

Over the reporting period NNP1 has sought expressions of interest from candidates to complete baseline biodiversity surveys in the NNP1 watershed for the purposes of identifying

plan communities or fauna species requiring offsetting. Its expected the process of recruitment will conclude in the 2nd quarter of 2015, and followed by immediate mobilization. The TOR and consultant outputs are currently being reviewed by NNP1 stakeholders (lenders and IAP).

4.4 UPDATED BIODIVERSITY OFFSET FRAMEWORK (BOF)

A series of technical workshop and teleconferences have been conducted to follow up with the revision of Biodiversity Offset Framework (BOF). The revision principally addressed the key update requirements on: (i) the basic approach for biodiversity offset planning including the *offset needs assessment* process; (ii) information on the approach for watershed management and the mitigation of biodiversity impacts in the NNP1 Watershed; (iii) criteria for the selection of biodiversity offset sites; (iv) the roles and responsibilities of the Company and the GOL, with a time-bound action plan, and (v) the financial arrangements.

Throughout the revision, the realistic time-bound action plan was formulated that set new milestone for compliance with ADB FA. The financial arrangement have also incorporated the foreseeable expenditure that will be directly incurred by NNP1 Company.

The revision have been communicated closely with GOL and the workshop at central level on 4 March 2015 was made to finalize the inputs from MONRE DFRM and PONRE of Project Provinces (Xaysomboun and Bolikhamxay). The document was endorsed by GOL on 12 March 2015 prior to final submission to ADB on 13 March 2015.

The updated BOF is can be found on the NNP1 and ADB websites.

5 OCCUPATIONAL HEALTH & SAFETY OF CONSTRUCTION WORKERS

5.1 SAFETY ORGANISATION

Since issuance of the Notice to Proceed in October 2014 to the Civil Contractor, safety has been monitored and managed by one safety officer employed by NNP1, another by the Contractor and one for each subcontractor. They report to senior management within their organisations and in the case of the Contractor and subcontractors to their respective Project Managers. The philosophy of the Project is that every site engineer and site manager is a safety officer. However both Owner and Contractor are intent on strengthening their professional safety staff with more international construction safety experience in the near future. Advertising for internal and external candidates have been placed and interviews arranged. Budget is allocated for the Owner to employ a senior professional experienced in construction safety management and a second safety officer if necessary.

5.2 SAFETY PATROLS, COMMITTEES AND MEETINGS

In October 2014, a Joint Monthly Safety Patrol was established. Every month the Patrol meets together on site for a whole morning when three or more different sections of the construction works are visited and inspected for safety hazards. The Patrol comprises all the safety officers and their senior managers representing the Owner, the Contractor and each subcontractor. All participants visit every location together. The Patrol culminates in a 30

minute wrap-up meeting that runs through the safety hazards identified and the corrective action to be taken, if still outstanding. A report is circulated to all participants within 24 hours of the meeting with documentation of the actions necessary.

One week later the same participants spend at least one hour at a Safety Committee Meeting when the safety hazards from the Patrol are reviewed for actions taken and outstanding, all reportable safety incidents are discussed with respect to risk avoidance in the future, and a special safety topic is chosen for presentation by a selected individual nominated beforehand. Discussion by participants is encouraged. The meeting is minuted.

From February 2015, in the weeks when the Joint Monthly Safety Patrol does not take place, the safety officers from the Owner, Contractor and all Subcontractors participate together in their own inspection of the construction site, visiting all active areas of work, reporting back to their respective management.

Periodic inspections of the various construction activities are therefore made on a regular basis and in respect of specific incidents that occur on site.

5.3 SAFETY TRAINING

All the training that the Safety Officers of the Owner and Contractor carried out in the period January to March 2015 is provided in the Contractor's Monthly Progress Reports but is summarised below. This includes all training by external and internal trainers and toolbox talks given by Owner, Contractor or Subcontractor personnel.

Table 9: Safety Training for the Reporting Period

Month & Year	Number of Training Courses	Cumulative Total Number of Trained Workers in Each Month	Training Course Topics
January, 2015	46	1,601	Accident on 02-Jan / Site Regulations / Use of Safety Belt / Use of Wheel Chocks
February, 2015	32	1,125	Working at height / Evacuation during flood event / Use of PPE
March, 2015	52	2,083	Chemical waste / Site regulations / Electrical Safety

5.4 SAFETY CLASSIFICATION AND STATISTICS

Incidents are classified by the Project into six categories in accordance with international convention. These categories are:

		Cum. Total	Q1 Total
LTI	Lost Time Incident	(3)	[2]
RI	Recoverable Injury	(3)	[0]
NM	Near Miss (Reported)	(4)	[2]
PD	Property Damage	(1)	[0]
FI	Fire Incident	(1)	[0]
MVI	Motor Vehicle Incident	(17)	[4]
	Total	(29)	[8]

Starting in February 2014, and during the 13-month period to 31 March 2015, there have been 29 reported incidents. The distribution in number by type is shown in parenthesis above with the cumulative totals in rounded brackets and the Q1 amount in square brackets. In Q1 of 2015 there have been 8 incidents, comprising 4 Motor Vehicle Incidents, 2 Near Misses and 2 Lost Time Injuries including one fatality.

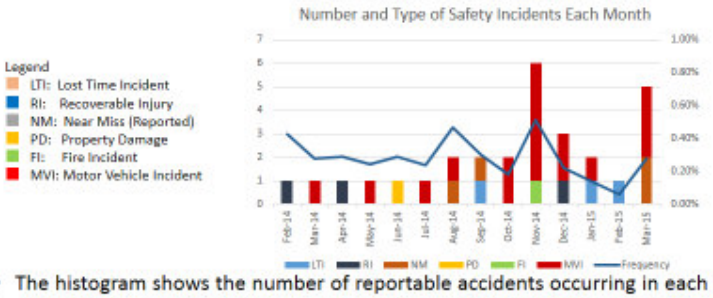
By far the largest number of incidents (4 out of 8 in Q1 and 17 out of 29 cumulatively) have been those associated with Motor Vehicles. Sadly, the single fatality to a truck driver occurred in January 2015 (see details later) while there have been no injuries sustained in the other 16 MVI incidents. All have been due to vehicle malfunction, loss of concentration or lack of good sense by drivers. This has obviously been a focus of attention for safety inspection and training since October 2014 when the incidence of MVI rose from one per month to two and more after reaching a maximum of 5 incidents in November 2014. With the steep increase in the number of vehicles using the near completed access roads in areas of the construction site, with steep escarpment, for purposes of disposal of excavated material for dam, powerhouse and tunnel excavations, there has been a huge emphasis on vehicle maintenance and driver ability to keep workers safe in these circumstances.

The distribution of incidents by type and over time can be seen in the histogram and graph in the illustration below. The different categories of incident and number each month are represented by different coloured blocks. The graph shows the frequency of incidents and is the number of incidents divided by the number of workers on site expressed as a percentage, plotted against time. The highest recorded number of incidents in any one month was 6 in November 2014 when the number of workers was 1,177 and this also produced the greatest frequency to-date of 0.5% or 1 incident per month per 200 workers. This compares with an average over the Project to 31 March 2015 of 0.24% or about 1 incident per month per 425

workers and a peak in Q1 in March 2015 of 0.28% or about 1 incident per month per 360 workers.

Safety Incidents

Type of Incident	LTI	RI	NM	PD	FI	MVI	Total
Total 01- Jan-15 to 31-Mar-15	2	0	2	0	0	4	8
Cumulative Total at 31-Mar-15	3	3	4	1	1	17	29



- The histogram shows the number of reportable accidents occurring in each month with the colour indicating the type of accident, incident or near miss.
- The graph shows the frequency of accidents, incidents or near misses with the number occurring each month expressed as a percentage of the number of Civil Works Contract workers employed in each month.

5.5 REPORTING TO THE LENDERS, LTA AND OTHERS ON SAFETY INCIDENTS AND ACCIDENTS

Under the Facility Agreement signed with ADB, NNP1PC submit a detailed report of any serious and reportable accident in accordance with a timeline required by ADB. As a general rule an accident is considered serious and reportable if any injured person is detained in hospital for more than 24 hours. Under this regimen full particulars of the accident are submitted to ADB together with a corrective action plan which requires the consent of ADB to re-start the works once the corrective actions have been carried out satisfactorily.

The total 29 incidents recorded to 31 March 2015 are tabulated below. Two serious injuries, one of them fatal, were sustained in the period and that was Incident No.22 on 02 January 2015 and Incident No. 24 on 06 February 2015.

Incident No.22 occurred when a truck driver working for an external sand supplier to a subcontractor had an apparent brake failure on a steep down-ramp leading to the cross-river ferry. Rather than run into the river at speed the driver made an abrupt right turn, overturned his vehicle and was unfortunate enough to smash his cab on another parked truck in doing so.

Incident No.24 occurred when a worker, waiting for his own activity to start, was struck on his safety helmet by a piece of dry shotcrete that fell from the crown of the diversion tunnel. He suffered compression of the spinal column and spent some time in hospital recuperating.

A full report was submitted to ADB in respect of both of the above incidents complete with corrective actions and these were fulfilled prior to work restarting. The Company is working to ensure that the driver's widow and two children receive appropriate social security benefit

and not less than the amount of benefit that would be due in the event that the driver's employer did not make contributions to the national scheme.

NNP1PC includes data and statistics on safety incidents in their Monthly Progress Report to its shareholders, Lenders and their Technical Advisors.

Table 10: List of Safety Incidents to 31 March 2015 (Sheet 1 of 2)

List of Safety Incidents Prior to 01-Apr-15

S. No.	Date	Type	Description	M-M
1	24-Feb-14	RI	MVDC excavator fell over on T5 road.	233
2	24-Mar-14	MVI	Collision of MVDC truck with Owner car.	358
3	07-Apr-14	RI	Collision of bike rider with MVDC truck.	348
4	05-May-14	MVI	Collision of MVDC truck with TCM car.	409
5	06-Jun-14	PD	Fly rock from blast fell on local houses.	345
6	27-Jul-14	MVI	SECC crane fell over as passing excavator.	418
7	02-Aug-14	NM	Ferry tug lost from mooring in flood.	426
8	11-Aug-14	MVI	MVDC truck overturned.	
9	20-Sep-14	LTI	ASA linesman fell from pole after shock.	671
10	26-Sep-14	NM	Large rock fell down slope on equipment	
11	15-Oct-14	MVI	Water tanker overturned on Road P2	1096
12	23-Oct-14	MVI	RT truck fell from Road T13 after failure.	
13	01-Nov-14	MVI	RT truck engine/brake failure on slope.	1177
14	08-Nov-14	MVI	External concrete truck overturned.	
15	19-Nov-14	FI	Unoccupied/rented village house fire.	
16	23-Nov-14	MVI	SECC crane engine fire.	
17	25-Nov-14	MVI	RT pick-up fell over on Road A	
18	26-Nov-14	MVI	RT dump truck brake failure on Road P1	

Table 11: List of Safety Incidents to 31 March 2015 (Sheet 2 of 2)

List of Safety Incidents Prior to 01-Apr-15

S. No.	Date	Type	Description	M-M
19	15-Dec-14	MVI	SD5 excavator fell over at disposal area	1372
20	17-Dec-14	MVI	RT articulated truck engine failure	
21	18-Dec-14	RI	PKC scaffolding collapse at box culvert	
22	02-Jan-15	LTI	Fatality – sand supplier truck overturned	1452
23	08-Jan-15	MVI	Unattended ASA small truck ran away	
24	06-Feb-15	LTI	Shotcrete fell onto RT worker's helmet	1751
25	12-Mar-15	NM	Boulder falling down slope at outlet	1790
26	19-Mar-15	MVI	Dump truck slid into roadside ditch	
27	23-Mar 15	MVI	Concrete truckmixer reverses into tanker	
28	24-Mar-15	MVI	22 kV TL pulled down by dump truck	
29	27-Mar-15	PD	Boulder falling down slope at tunnel outlet portal	
30				
31				
32				
33				
34				
35				
36				

In accordance with its Company Procedures, the Civil Contractor, Obayashi Corporation, provides a summary report of safety incidents that occurred during the month and statistical

analysis of safety performance such as lost time in each Monthly Progress Report and this is circulated to NNP1PC, its Lenders and their Technical Advisors. The summary provided by the Civil Contractor in their March 2015 Report is extracted and provided below.

- Total working hours until this end of last month: 2,258,098 hours… (1)
- Total working hours in this month: 356,324 hours… (2)
- Total working hours until the end of this month: 2,614,422 hours… (3)
- Total working hours without accident: 584,831 hours… (4)
- Number of Accident 2 … (5)
- Number of Lost Days: 202 days… (6)
- Performance parameters:
  Accident Frequency (5)/(1) = 0.76 <1.00 (Target)
  Accident Severity Rate (6)/(1) = 77.26 < 350 (Target)

(Note)

1.Total Working hours, number of works X working hours (8 hours) – break time (1 hours) * not include any overtime

2. Number of Accident, Count only the accident by which workers could not work equal to or more than 2 consecutive days.

3. Number of Loss Day, days of no-working day by accident X 300/365

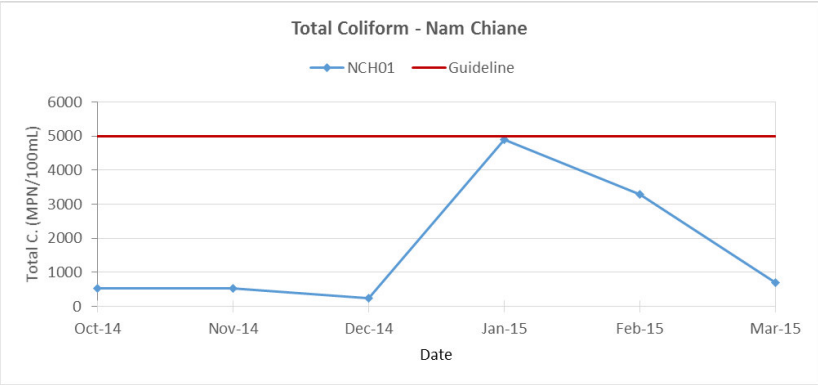
4. Accident frequency rate; =(the number of injured/death person)/ (total working hours) X 1,000,000.

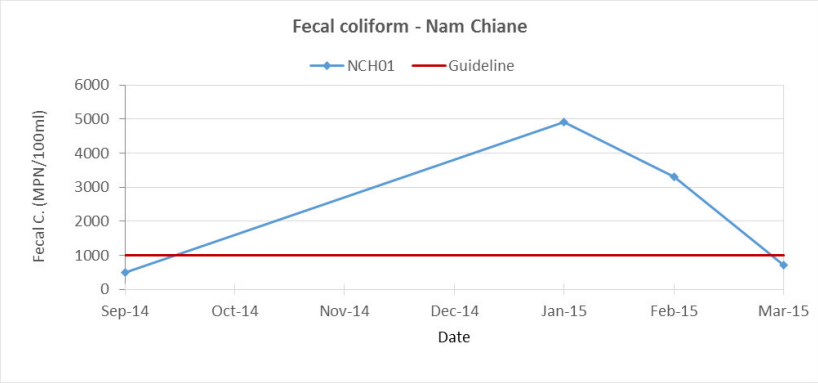
5. Accident Severity Rate= (Number of Loss day)/ (total working hours) X1,000,000.

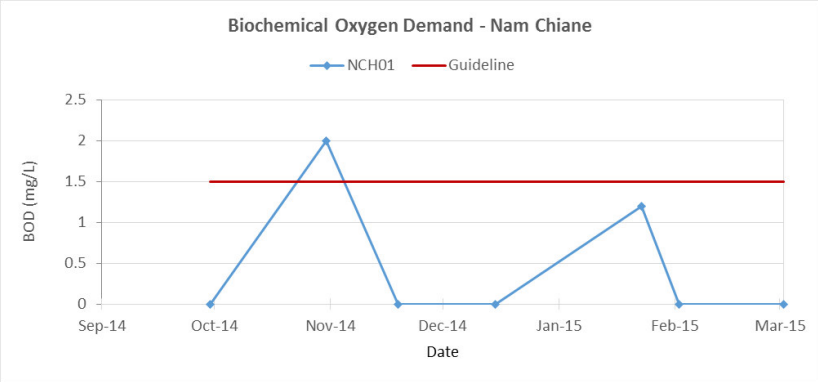
APPENDIX: ENVIRONMENTAL MONITORING RESULTS

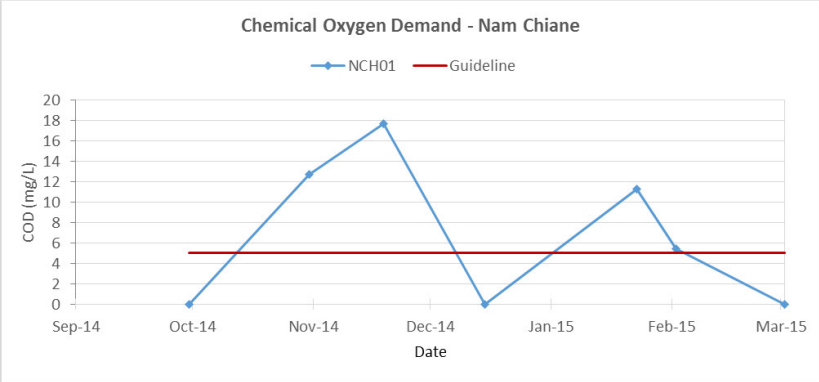
KEY WATER QUALITY MONITORING TRENDS FROM AUGUST 2014 TO END OF MARCH 2015 (ONLY PARAMETERS THAT EXCEEDED GUIDELINE STANDARDS)

Nam Chaine Surface Water (upstream of NNP1)

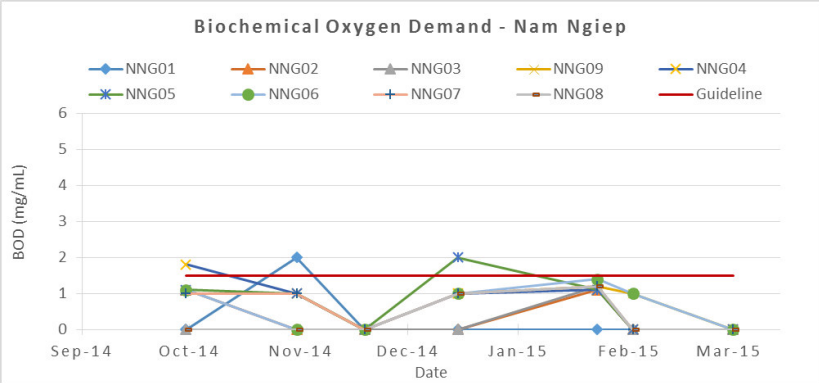


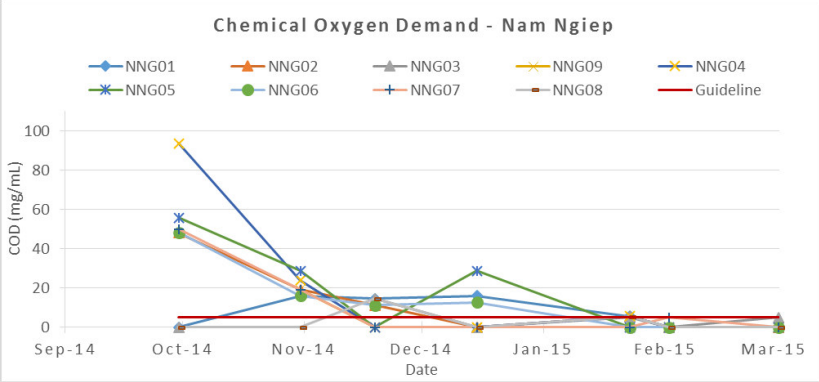


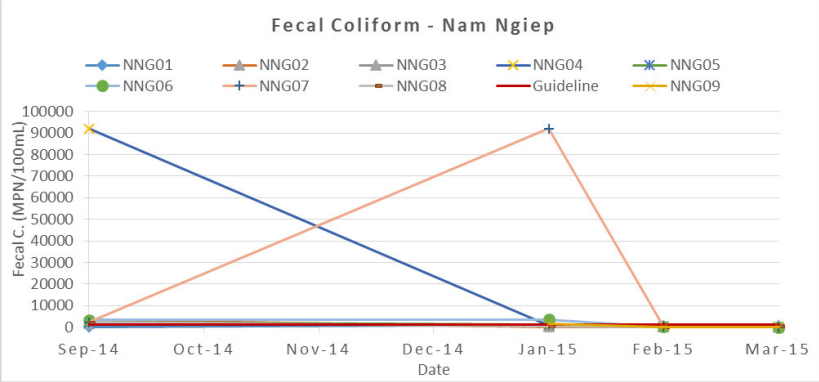


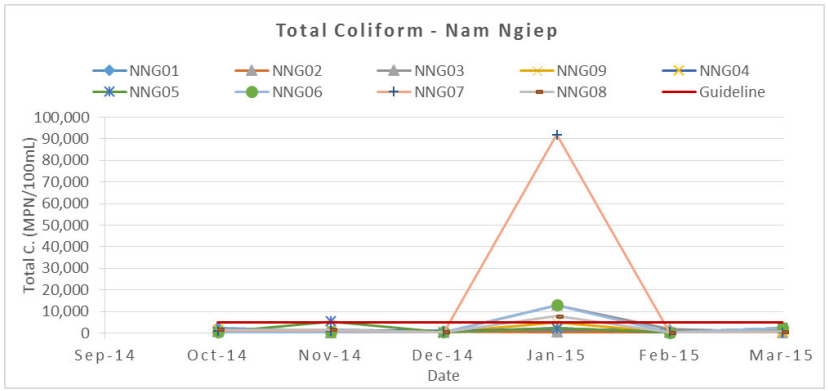


Nam Ngiep Surface Water main channel

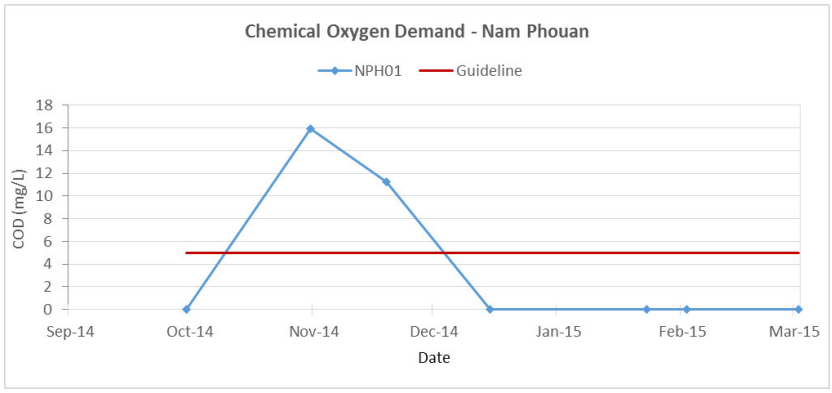


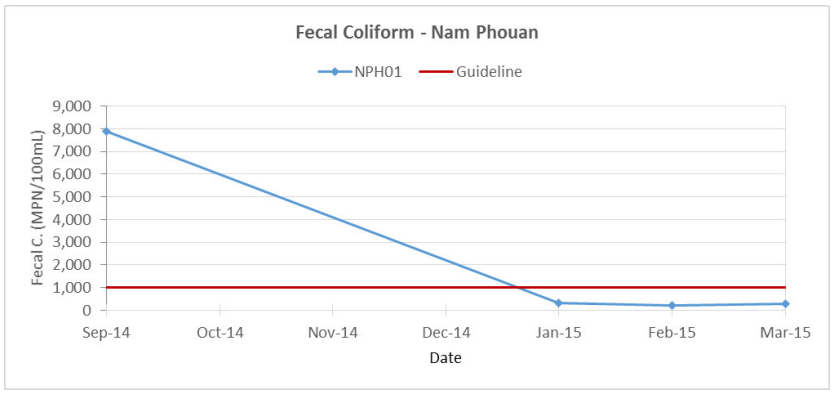




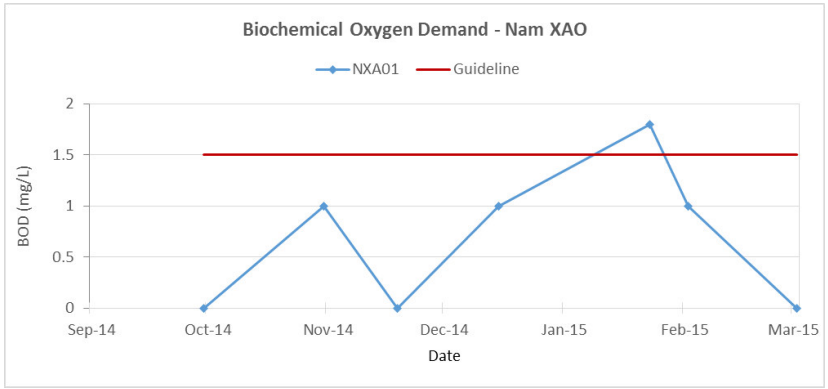


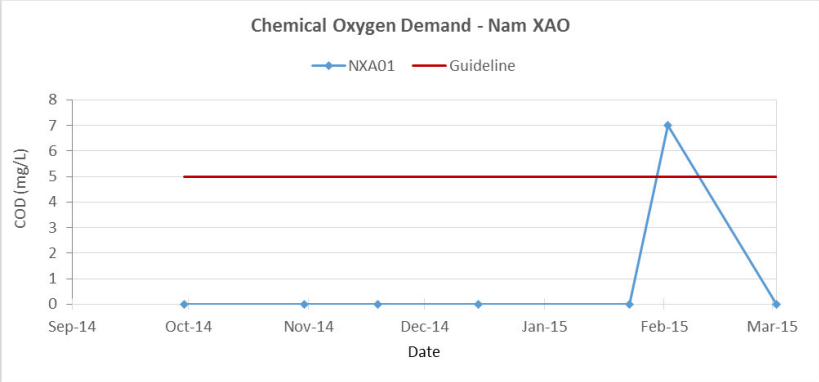
Nam Phouan Surface Water (upstream of NNP1)

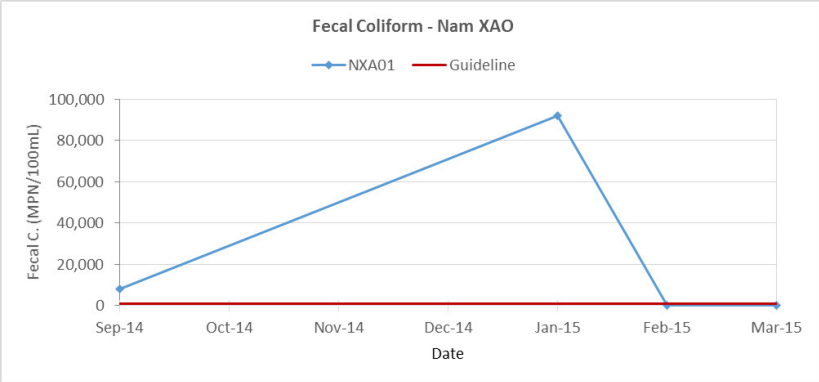


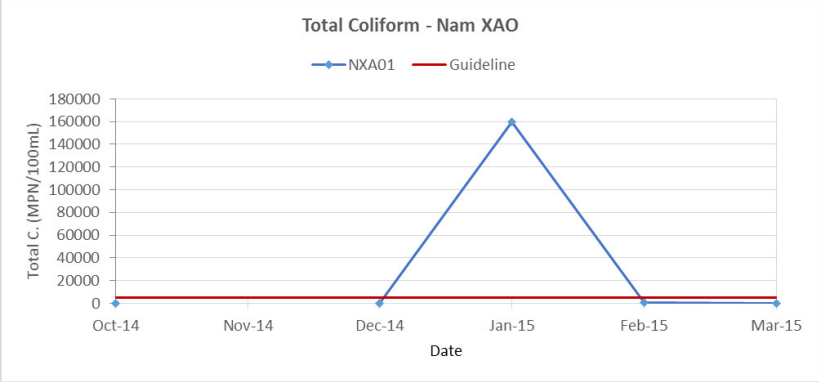


Nam Xao Surface Water (downstream of NNP1)

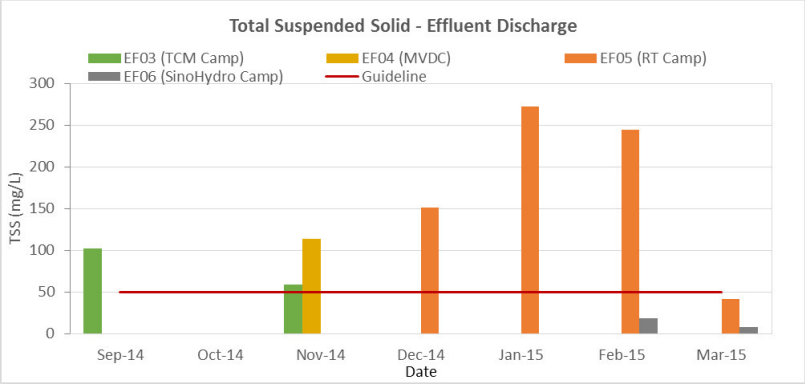


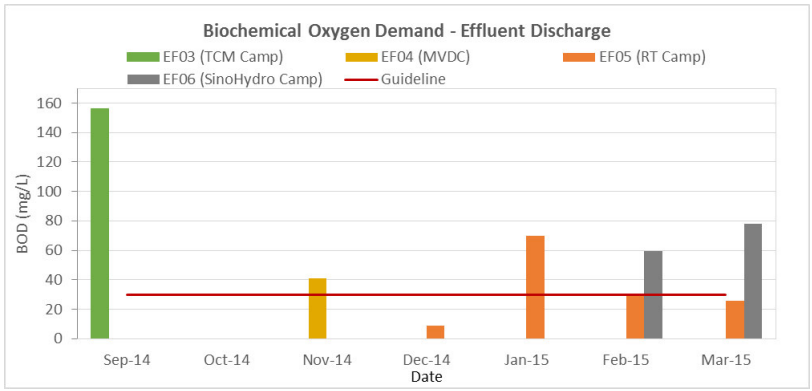


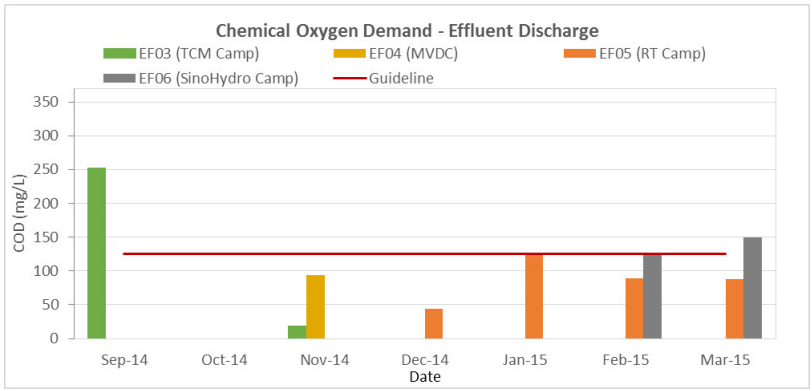


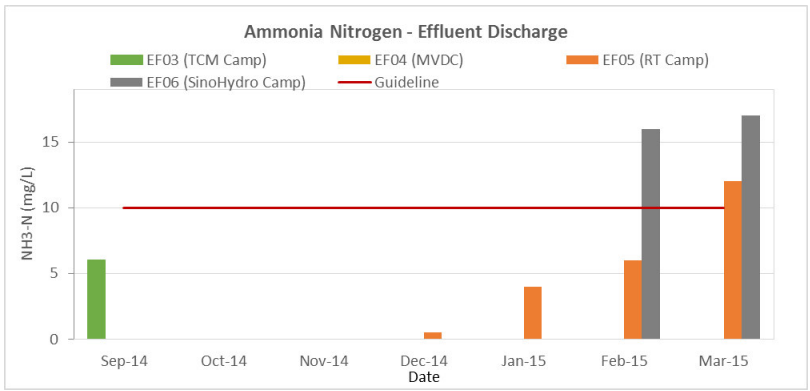


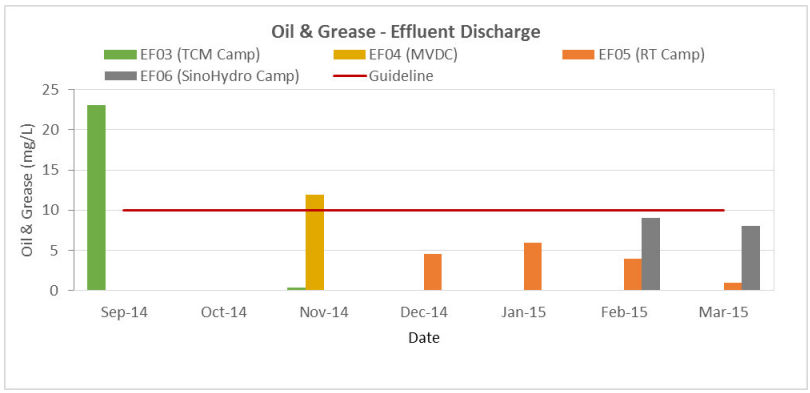
EFFLUENT DISCHARGE WATER QUALITY

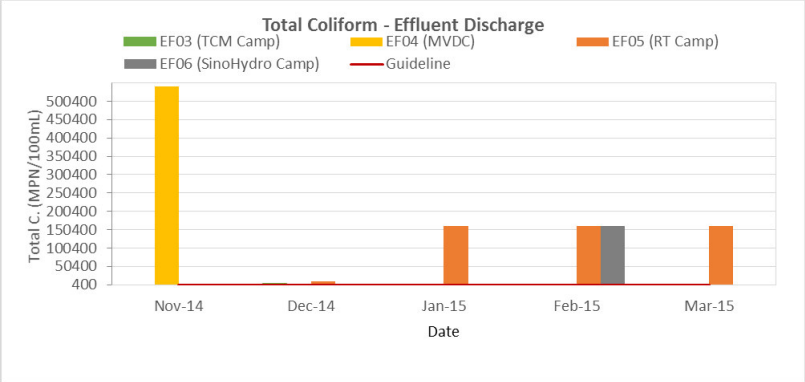



Biochemical Oxygen Demand - Effluent Discharge
EF03 (TCM Camp)
EF04 (MVDC)
EF05 (RT Camp)
EF06 (SinoHydro Camp)
Guideline
BOD (mg/L)
160
140
120
100
80
60
40
20
0
Sep-14
Oct-14
Nov-14
Dec-14
Jan-15
Feb-15
Mar-15
Date

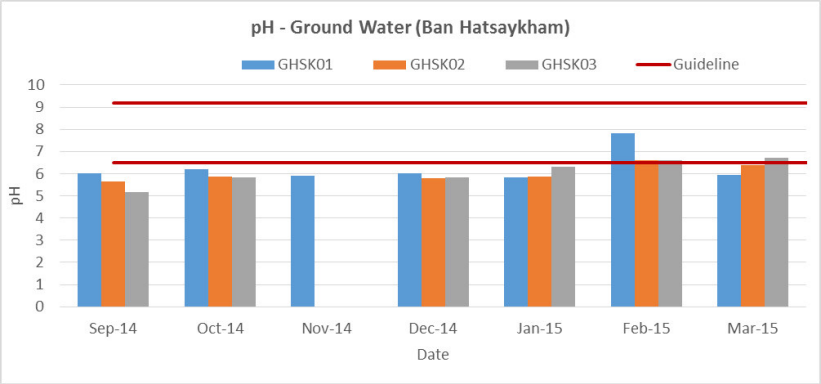

Chemical Oxygen Demand - Effluent Discharge
EF03 (TCM Camp)
EF04 (MVDC)
EF05 (RT Camp)
EF06 (SinoHydro Camp)
Guideline
COD (mg/L)
350
300
250
200
150
100
50
0
Sep-14
Oct-14
Nov-14
Dec-14
Jan-15
Feb-15
Mar-15
Date

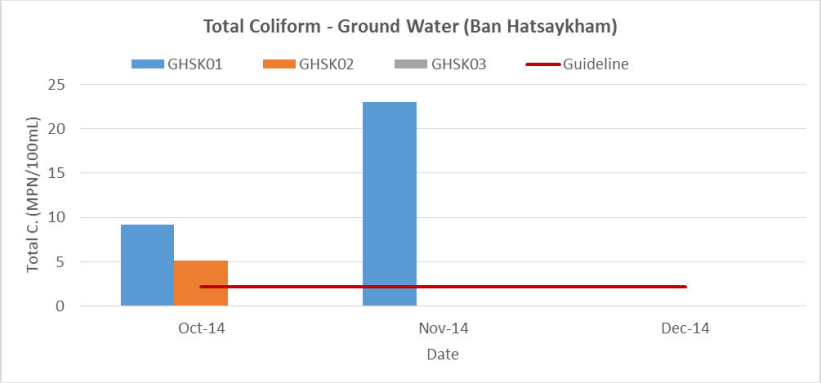

Ammonia Nitrogen - Effluent Discharge
EF03 (TCM Camp)
EF04 (MVDC)
EF05 (RT Camp)
EF06 (SinoHydro Camp)
Guideline
NH3-N (mg/L)
15
10
5
0
Sep-14
Oct-14
Nov-14
Dec-14
Jan-15
Feb-15
Mar-15
Date

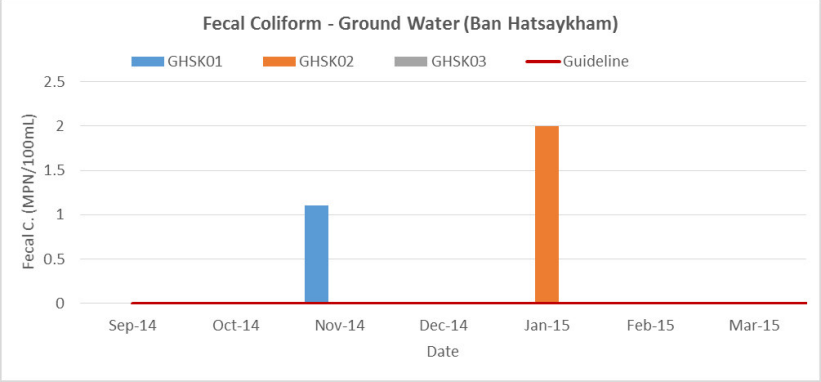

Oil & Grease - Effluent Discharge
EF03 (TCM Camp)
EF04 (MVDC)
EF05 (RT Camp)
EF06 (SinoHydro Camp)
Guideline
Oil & Grease (mg/L)
25
20
15
10
5
0
Sep-14
Oct-14
Nov-14
Dec-14
Jan-15
Feb-15
Mar-15
Date

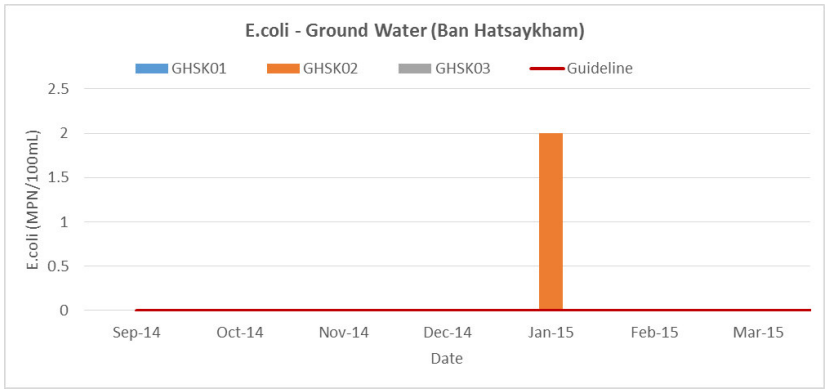


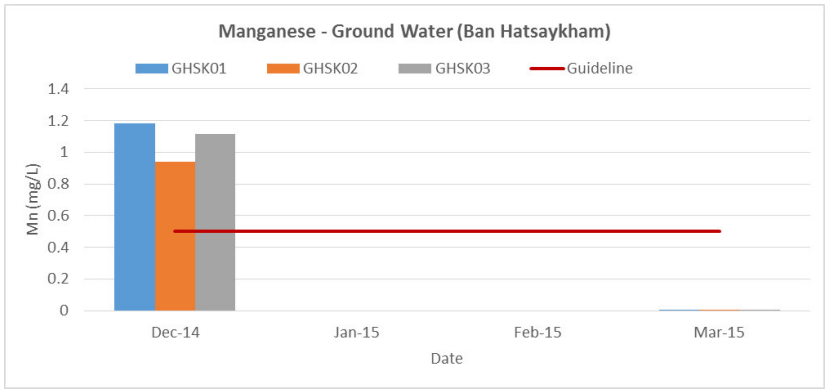
GROUND WATER QUALITY TRENDS AT THE BAN HATSAYKHAM WELLS



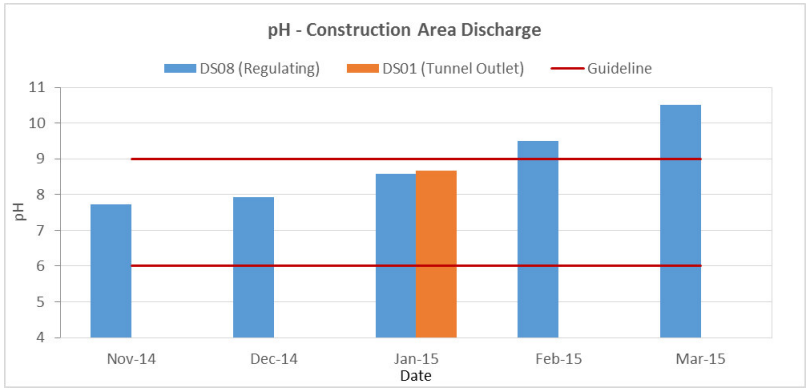


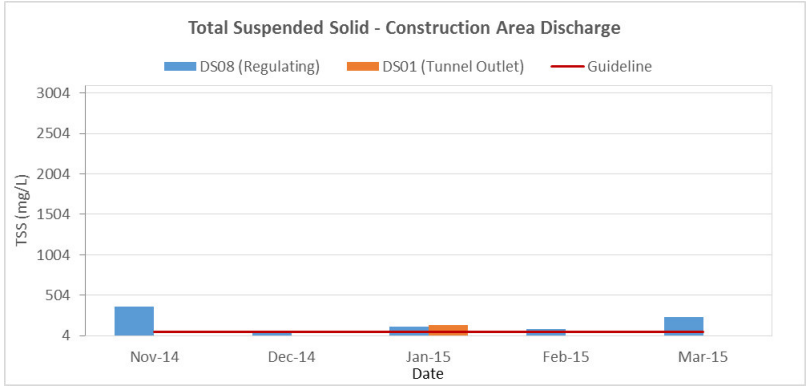






CONSTRUCTION SITE EFFLUENT DISCHARGE RESULTS





HAZMAT AUDIT RESULTS FOR MARCH 2015

Table 12 HazMat Management Audit for March 2015.

	Site	PKC Fuel station and storage area	Songda Fuel station and storage area	TCM fuel station and storage area	RT workshop	Songda workshop	CVC Plant	Sinohydro camp and storage area	Sinohydro fuel station	Sinohydro Explosive Storage area
1	Floor of storage area is impervious	√	√	√	√	X	X	√	√	√
2	Fully bunded with capacity >120% of combined	√	√	√	√	X	X	NR	√	NA
3	Bunds in adequate condition	√	√	√	X	X	X	NR	√	√
4	Closed storage protected from rainfall and flood	√	√	√	√	√	X	√	√	√
5	Storage area is well ventilated	√	√	√	√	√	NA	X	√	√
6	Oil trap linked to the storage area	√	√	X	X	X	X	NR	X	NA
7	Located not close to camp, office and	√	√	√	√	√	√	√	√	√
8	Storage has the fence and lock	X	√	√	√	√	X	√	√	√
9	Incompatible hazardous materials and chemicals	√	√	√	√	X	X	X	√	√
10	Explosives stored in underground facilities or in	NA	NA	NA	NA	NA	NA	NA	NA	√

	Site	PKC Fuel station and storage area	Songda Fuel station and storage area	TCM fuel station and storage area	RT workshop	Songda workshop	CVC Plant	Sinohydro camp and storage area	Sinohydro fuel station	Sinohydro Explosive Storage area
11	Explosive storage facilities are locked and access	NA	NA	NA	NA	NA	NA	NA	NA	√
12	Containers leak-proof and in good condition	√	√	√	√	√	√	√	√	-
13	Metallic (Iron) containers without corrosion	√	√	√	√	√	√	√	√	-
14	Container chemically compatible with material	√	√	√	√	√	√	√	√	-
15	Container closed unless material added or used	√	√	√	√	X	√	√	√	-
16	Refuelling equipment without leakages	√	√	√	√	√	√	√	√	-
17	Restricted access signs outside facility	X	X	X	X	X	X	X	√	√
18	Display of labels with words “Hazardous	√	X	X	√	X	X	X	X	-
19	Label describes content	X	X	X	√	X	X	X	X	-
20	Label describes hazards for users	X	X	X	X	X	X	X	X	-
21	PPE request sign posted within premises	X	X	X	X	X	√	√	√	√
22	Procedures for HazMat handling posted within	X	X	X	X	X	X	X	X	X

	Site	PKC Fuel station and storage area	Songda Fuel station and storage area	TCM fuel station and storage area	RT workshop	Songda workshop	CVC Plant	Sinohydro camp and storage area	Sinohydro fuel station	Sinohydro Explosive Storage area
23	Procedures for emergency response posted	X	X	X	X	X	X	X	X	X
	Safety									
24	Fire fighting equipment available and controlled	√	√	√	√	X	√	X	√	√
25	Fire fighting equipment is sited appropriately for	√	√	√	√	X	√	X	√	√
26	Staff wear PPE on site	X	√	√	√	X	√	√	√	√
27	Staff trained for HazMat handling and spill	X	X	X	X	X	X	X	X	X
	Spill response									
28	Spill response kits readily available with	X	X	X	X	X	X	NR	X	NR
29	Safe storage is provided for contaminated	√	X	√	√	X	X	X	X	NR
30	Plan is in place for removal and final disposal of	X	√	√	√	X	X	X	X	X
	Documentation									
31	HazMat Register in place	√	√	√	√	X	√	X	X	X
32	HazMat Register up-to-date	X	X	X	√	X	X	X	X	X
33	MSDS sheets readily accessible	X	X	X	X	X	X	X	X	-

CONSTRUCTION ACTIVITIES FOR THE 1ST QUARTER OF 2015

Table 13 Construction Activities 1st Quarter 2015

Category	Site ID	Site Name	Construction Status
1. Access Road			
1	*JR*	*JICA Road*	Closed.
2	A1	Road A	Stabilization and drainage improvements.
3	P1	Road P1	Stabilization and drainage improvements.
4	P2	Road P2	Stabilization and drainage improvements.
5	T1	Road T1	Operating
6	T2	Road T2	Operating
7	T3	Road T3	Not commenced
8	T4	Road T4	Initial survey and site clearing.
9	T5	Road T5	Operating
10	T6	Road T6	Not commenced.
11	T7	Road T7	Operating
12	T8	Road T8	Excavation and embankment work ongoing.
13	T9	Road T9	Excavation and embankment work ongoing.
14	T10	Road T10	Excavation and embankment work ongoing.
15	T11	Road T11	Excavation and embankment work ongoing.
16	T12	Road T12	Closed
17	T13	Road T13	Operating
***2.* Worker Camp**			
18	PKC_C	PKC Camp	Operating
19	MVDC_C	MV-DC Camp	Operating, preparing schedule for demobilization
20	TCM_C	TCM Camp	Operating
21	SECC_C	SECC Camp	Closed(end of contract)
22	LS_C	Lamsay Camp	Closed(end of contract)
23	OC_C	Contractor Camp	Under construction
24	NNP1_C	Owners Base Camp	Under construction
25	V&K_C	V&K Camp	Operating
26	SH_C	Sinno Hydro Camp	Operating
27	PAKC-C	Pang-Onkham Camp	Operating
3. Spoil Disposal Area			
28	SD1	Spoil Disposal Area 1	Developed for RT and Songda
29	SD2	Spoil Disposal Area 2	Operating
30	SD3	Spoil Disposal Area 3	Operating
31	SD4	Spoil Disposal Area 4	On-hold
32	SD5	Spoil Disposal Area 5	On-hold
33	SD6	Spoil Disposal Area 6	Operating
34	SD7	Spoil Disposal Area 7	Operating
35	SD7	Spoil Disposal Area 8	Developed for Sino-Hydro camp
4. Borrow Pit			
36	B1	Borrow Pit 1	Completed

37	B2	Borrow Pit 2	Completed
38	B3	Borrow Pit 3	Completed
5. Quarry Site			
39	TQ	Temporary Quarry (A1 Rd; st: 4+900)	Closed (no more use)
40	MQ	Main Quarry	Vegetation clearing and earth works.
6. Construction Site			
41	*TB*	Temporary Bridge	Completed
42	*MD*	Main dam	Earthworks ongoing
43	DT	Diversion Tunnel	Construction on-going
44	*RD*	Re-regulation dam	Construction on-going
7. Industrial Area			
45	CVC	Conventional Vibration Concrete Plant	Operating
46	RCC	Rolling Compacted Concrete Plant	Clearing and Earth work completed
47	AP	Aggregate Plant Yard	Structure installation
48	RT's IA	RT's Industrial Area	Operating
49	Songda	Songda's Workshop	Operating
8. Transmission Line			
50	PS_22kV	Power supply 22kV Line	Construction on-going
51	TL_230 kV	Transmission Line 230kV Line	Alignment survey
52	TL_150kV	Transmission Line 150kV Line	No activity