Environmental Monitoring Report

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

Quarterly Monitoring Report 2016 – Q2 Environmental

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

NAM NGIEP 1
POWER COMPANY

Nam Ngiep 1 Hydropower Project

Environment Monitoring Report

Second Quarter of 2016

April to June 2016

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ABBREVIATIONS / ACRONYMS

ADB	Asian Development Bank
BAC	Biodiversity Advisory Committee
BMSP	Biodiversity Management Sub-Plan
BOD	Biochemical Oxygen Demand
BRP	Biomass Removal Plan
CA	Concession Agreement between the NNP1PC and GOL
CBI	Community and Biodiversity Investment
COD	Chemical Oxygen Demand
DEQP	Department of Environmental Quality Promotion
DESIA	Department of Environmental and Social Impact Assessment, MONRE
DFRM	Department of Forest Resources Management, MONRE
DO	Dissolved Oxygen
ECZ	Elephant Conservation Zone
EGAT	Electricity Generating Authority of Thailand
EIA	Environmental Impact Assessment
EMO	Environmental Management Office
EMU	Environmental Monitoring Unit
EPF	Environmental Protection Fund
GOL	Government of Lao PDR
IEE	Initial Environmental Examination
IFMP	Integrated Fishery Management Plan
IMA	Independent Monitoring Agency
ISP	Integrated Spatial Planning
LTA	Lender's Technical Advisor
LTI	Lost Time Incident
MONRE	Ministry of Natural Resource and Environment, Lao PDR
MVI	Motor Vehicle Incident
NCI	Non-Compliance Issue
NCR	Non-Compliance Report
NNP1PC	Nam Ngiep 1 Power Company Limited
NPA	Non-Profit Association
NPF	National Protection Forest
NTP	Notice to proceed (under each construction contract)
OC	Obayashi Corporation
ONC	Observation of Non-Compliance
PAFO	Provincial Agriculture and Forestry Office
PAP	Project Affected People
PCDP	Public Consultation Disclosure Plan
PONRE	Provincial Department of Natural Resource and Environment, MONRE
PPA	Provincial Protected Area
QMR	Quarterly Monitoring Report
RI	Recordable Injury
ROW	Right of Way

SMO	Social Management Office
SS-ESMMP	Site Specific Environmental and Social Monitoring and Management Plan
TD	Technical Division
TOR	Terms of Reference
TSS	Total Suspended Solids
UXO	Unexploded Ordinance
WMC	Watershed Management Committee
WMO	Watershed Management Office
WMP	Watershed Management Plan
WWTS	Waste water treatment systems

EXECUTIVE SUMMARY

The overall cumulative progress of the construction works until the end of the Second Quarter, 2016 was 42.2% compared to planned progress of 46.1%.

During the Second Quarter of 2016, the EMO carried out 15 revisions of 11 SS-ESMMPs received. Out of these, 8 SS-ESMMPs were approved and 3 are under review. A total of 45 Observations of Non-Compliances (ONCs) were recorded during the reporting period, out of which, 12 ONCs were carried over from the previous Quarter and 33 ONCs were issued during this Quarter. In addition, one NCR (Level 1) was issued in May 2016 as a result of high turbid water discharge from the construction areas at the main dam and powerhouse to the Nam Ngiep River without prior treatment.

In April 2016, EMO received and approved the Detailed Works Programme (DWP) and Site Specific Environmental and Social Management and Monitoring Plan (SS-ESMMP) for NNP1 Project landfill construction. In May 2016, the construction of NNP1 Project landfill was commenced. Key construction progresses by June 2016 included excavation and lining of waste pits and leachate treatment ponds, installation of four groundwater monitoring wells, and construction of a field office and a guard house. The NNP1 Project landfill construction is planned to be completed in July 2016.

A small laboratory to carry out basic water quality analyses (including measurements of bacteria, biochemical oxygen demand, and total suspended solids) is intended to be constructed at the Owner's Site Office and Village area. The technical design of the laboratory has been prepared and approved and the construction works are out to tender. The procurement of the laboratory equipment and instruments is also under way. It is expected that the construction will be started and completed in the fourth Quarter of 2016. Meanwhile, the bids for the construction of Houay Soup landfill were evaluated and a Contractor was selected for the construction of Houay Soup landfill. The first version of the DWP and the SS-ESMMP for the construction of Houay Soup landfill was submitted on 17 June 2016 and is under review.

Regarding environmental monitoring, all of the effluent water quality at the camps did not meet the applicable standards. A second joint inspection of the waste water treatment systems (WWTS) between a Thai external specialist, the Owner (TD and EMO) and Contractors (OC, HM and IHI) was undertaken during 29-30 June 2016 at all the camps. A final report is being prepared by the Consultant. Proposed corrective actions by the Consultant (such as chlorination) will be discussed with NNP1PC-TD and the Contractors in August 2016.

The development of the draft Nam Ngiep 1 Watershed Management Plan (WMP) has continued in the Second Quarter of 2016 through collaboration among the members of the watershed planning team comprising the Watershed and Reservoir Protection Committee (WRPC), the Watershed and Reservoir Protection Office (WRPO), NNP1PC, Xaysomboun District ISP team, NNP1PC Biodiversity Consultant and NNP1PC Fishery Consultant. In June 2016, a technical workshop was held to further improve the working draft of the Nam Ngiep 1 WMP and this improved draft was shared with ADB, IAP, LTA and BAC monitoring mission in May 2016. During this Quarter, a draft Integrated Spatial Plan of Xaysomboun Province has been prepared and shared with the monitoring mission.

In terms of biodiversity offsets, on 29 June 2016 the consultant issued the final draft ground truth survey report. This report includes data of both the 1st and the 2nd rounds of camera-trap data. The report has been submitted to ADB on 30 June for review and approval.

On 06 June 2016, NNP1PC issued an official confirmation to Bolikhamxay Province accepting Nam Chouane-Nam Sang Watershed as the primary designated biodiversity offset site of the Project and requested permission to commence further surveys by ADB Consultant. The survey is intended to provide wet season baseline information and also to assess the potential of the adjoining wet evergreen forest which will form the basis of the preparation of Biodiversity Offset Management Plan

(BOMP). The discussion with Bolikhamxay Provincial Governor in the late of June 2016 concluded that Biodiversity Offset Management Committee (BOMC) needs to be established first prior to commencing any further activities related to NNP1 offset program including the survey by ADB consultant. The BOMC is expected to be officially established in the first week of July 2016.

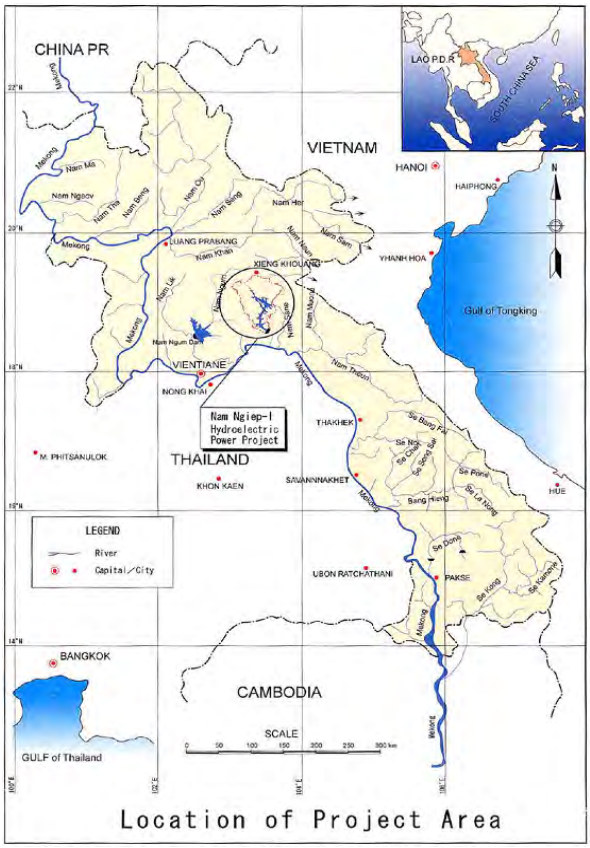
The Biomass Clearance has continued in the second quarter 2016. The Contractor has contracted 152 villagers as day labour and 169 households on a lump sum payment basis. By the end of June 2016, the Contractor completed 12% of the UXO work targeted for this period (131 ha out of 1,073 ha), and 96% of the biomass cutting and burning targeted for the period (237 ha out of 247).

1. INTRODUCTION

The Nam Ngiep 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 meets the Mekong River just upstream from Pakxan in Bolikhamxay Province.

The project is constructing two dams. The main dam, which is located 9 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 Lao PDR. The power station at this dam will generate up to 272 MW of electricity for export to Thailand. 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 substation outside Vientiane Capital. A 115 kV transmission line will be constructed by EDL from the Re-Regulating Power Station to Pakxan substation over a distance of 40 km.

Figure 1-1: Project Location



This Quarterly Monitoring Report (QMR) provides a summary of environmental management and monitoring activities from 01 April to 30 June, 2016. The QMR was prepared by the Project's Environmental Management Office (EMO). It has been internally reviewed and cleared by EMO senior technical staff and management prior to submitting the report to the Lenders' Technical Adviser (LTA) and ADB.

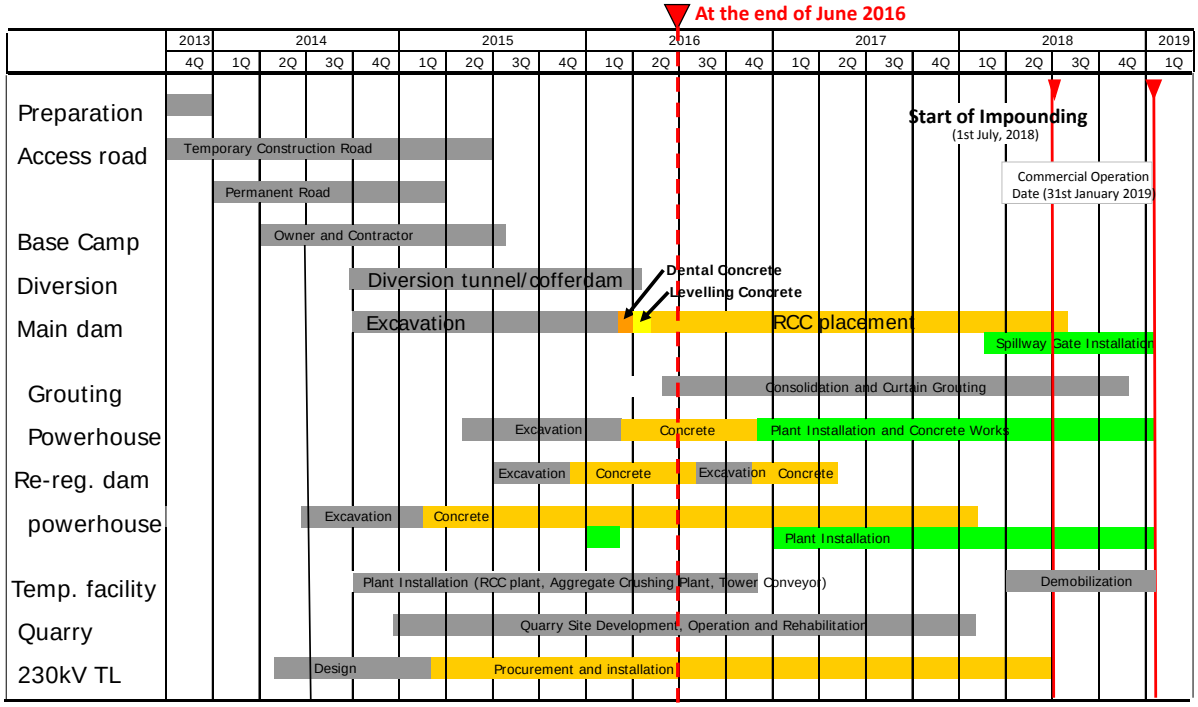
The QMRs and other related reports, including the Site Specific Environmental and Social Monitoring and Management Plans (SS-ESMMPs), are publically disclosed on NNP1PC's website http://namngiep1.com/. Hard copies of these reports are also available upon written request to the Project's main office in Vientiane Capital and at the field office in Pakxan, Bolikhamxay Province.

2. CONSTRUCTION PROGRESS

Construction Works for the Project are being carried out through four separate main construction contracts. These are the Civil Works, the Electrical and Mechanical Works, the Hydro-Mechanical Works and the 230 kV Transmission Line Works. The overall cumulative work progress up until the

end of the Second Quarter of 2016 was 42.2%[1] compared to the planned progress of 46.1%. The main construction activities and respective progress made from the Fourth Quarter 2013 to June 2016 is shown in Figure 2-1.

Figure 2-1: Overall Construction Progress up to the end of June 2016



Excavation works of the main dam, the diversion tunnel and the re-regulation dam were commenced in October 2014 and completed in February 2016. Accordingly, the concreting work has commenced. The cumulative work progress of the Civil Works until the end of June 2016 was 47.9% (compared to planned progress of 45.8%).

The Civil Works overall are considered to be on schedule despite increased quantities of dam excavation and slope stabilisation and the complex bedding of hard over soft layers of rock and the folding nature of these layers in the foundation rock of the main dam below the old river bed which had created difficulty to finalise the foundation design to the satisfaction of the Dam Safety Review Panel in all respects. Accordingly, further review of the dam foundation design was carried out to create sufficient safety factor for stability against sliding of the dam on the weak zones. This resulted in further excavation and concreting of a shear key structure in the old river bed, taking of the dam height to 167 m, measured from the deepest excavation level to the crest level, some 19 m higher than anticipated. However, the original schedule is maintained as a result of the efforts of the Civil

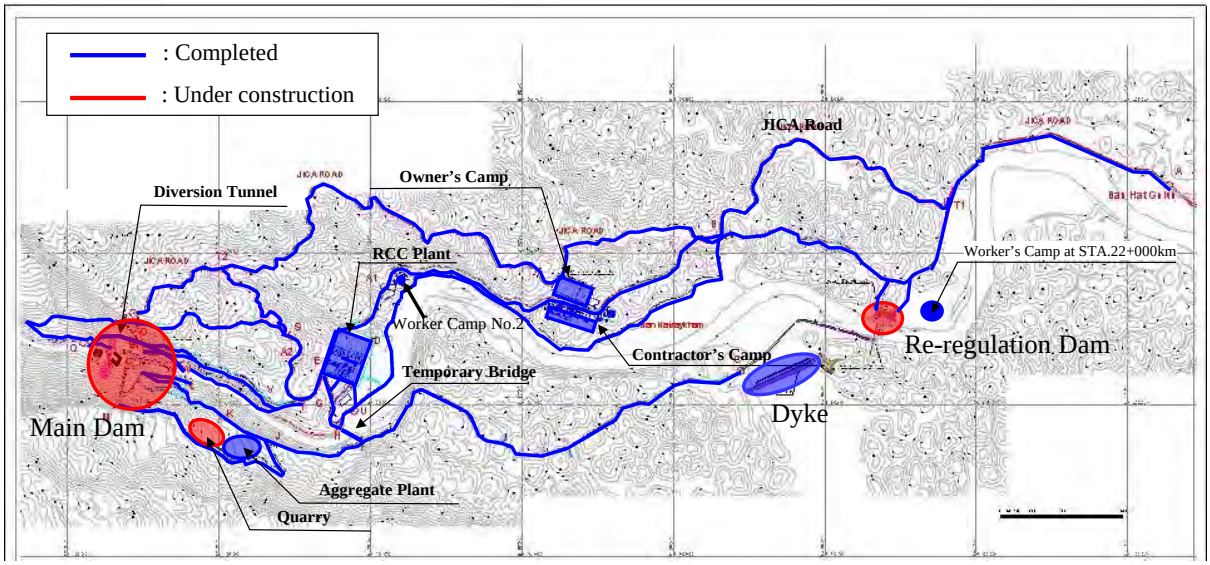
[1] The progress to-date is calculated as (Cumulative Amount of Achieved Interim Milestone Payments) / (Total Agreed Price of Construction Contracts) and expressed as a percentage.

Works Contractor. The additional excavation works were completed as of the end of February 2016 and RCC consolidation grouting and RCC placement for the main dam were commenced on 10 and 21 May 2016 respectively.

2.1 Access Roads

All main access road construction works are completed following an early December 2013 start, and only maintenance of these remains ahead of the 2016 wet season. Temporary access roads are mostly formed to reach various construction activities and others will be developed or modified as is necessary as activities change to reach current or new areas of dam concreting and consolidation grouting, the upstream and downstream cofferdams and the main powerhouse and belt conveyor support tower foundations. The layout of the access road system is as shown in Figure 2-2 below:

Figure 2-2: Access Road Progress



2.2 Main Quarry

After removal of overburden the excavation of raw materials for aggregate crushing were started in July 2015. The nature and type of the rock being exploited is acceptable though unsuitable soil layers are removed to spoil disposal areas, and good quarry management continues.

2.3 Main Dam and Power House

The dental concreting works were commenced in March 2016, and conventional RCC levelling concrete placement for the main dam in the 'shear key' structure up to El. 170.5 m was completed at the beginning of May. Consolidation grouting at the main dam area was commenced on 10 May 2016 and RCC concrete placement for the main dam body was commenced on 21 May 2016. Consolidation grouting covers the whole footprint of the main dam and RCC concrete placement and consolidation grouting are implemented in parallel, section by section.

Powerhouse excavation works was completed in January 2016 and levelling concreting works was started in coordination with installation of the grounding system. Progress of the concreting works is proceeding well and is shown in Table 2-1 below.

Table 2-1: Progress of the Main Powerhouse Structural Concrete Works to 30 June 2016

Total Anticipated Volume (m^3)	Completed (m^3)	Progress (%)
32,600	8,672	26.6

2.4 Secondary Upstream Cofferdam and RCC Trial Embankment

The concrete placement works in both conventional and roller compacted concrete (CVC and RCC respectively) for the secondary upstream cofferdam were started in November 2015 and completed ahead of construction schedule in the middle of February 2016. The grout curtain works for this cofferdam were completed on 02 April 2016.

The RCC trial embankment was anticipated to be carried out during and as part of the dyke construction, originally intended to be an RCC structure. However this was not possible as it was found to be more economical to construct the dyke as an earth fill embankment. The trial embankment was then necessarily constructed in isolation laboratory and close to the RCC plant in October and November 2015. Once finished the construction of the left bank structure of the re-regulating dam started soon after in November 2015 and was substantially complete in March 2016. In November 2015 the secondary upstream cofferdam was also constructed in RCC and it was completed, in February 2016. Both structures allowed valuable practical construction experience to be had in this means of concrete placement, ahead of main dam concreting.

2.5 Re-Regulation Dam

The re-regulation powerhouse excavation and cofferdam works for river diversion were commenced in early October 2014. The excavation works for the powerhouse on the left bank were fully completed down to El. 146.7 m at the end of February 2015.

Structural concrete works were commenced in March 2015, in coordination with installation of the grounding system. The progress of structural concrete works is shown in Table 2-2 below.

Table 2-2: Progress of Re-regulation Dam Structural Concrete Works to 30 June 2016

	Concrete Volume (m^3) Placed by the End of June 2016						
Structure	Intake	Powerhouse	Tailrace	Retaining Wall	Spillway	Left Bank RCC Structure	Overall Total
Anticipated Quantity	26,549			508	23,500	13,200	63,757
Completed Quantity	11,536	10,465	1,681	312	3,758	13,228	40,980
Progress	**89%**			**61%**	**16%**	**100%**	**64%**

The concrete volume placed already for both powerhouse and dam is 40,980m^3 being 64% of the revised total estimate of 63,757 m^3 for all structures. The powerhouse concreting has advanced well and secondary concrete embedment for the draft tube liner was completed at the end of April 2016. The left bank structure was re-designed as roller compacted concrete (RCC) and was completed on 18 March 2016. Following installation of guide frames for re-regulation waterway gate and stop log and re-regulation intake gate in April 2016, secondary concrete embedment of the guide frames was completed in May 2016 and structural concrete works for the retaining wall to support the substation yard was commenced in June 2016.

The shaping of the excavation of the re-regulating dam at the right bank was carried out starting in May 2015, being completed ahead of the 2015 wet season. The excavation works at the left bank for

the labyrinth weir portion of the dam and the left bank embankment structure in RCC were started and finished in October 2015.

The dyke, constructed as an earth fill saddle dam embankment on the right bank near the Houay Soup Resettlement Area was also started in November 2015 and completed on 30 April 2016.

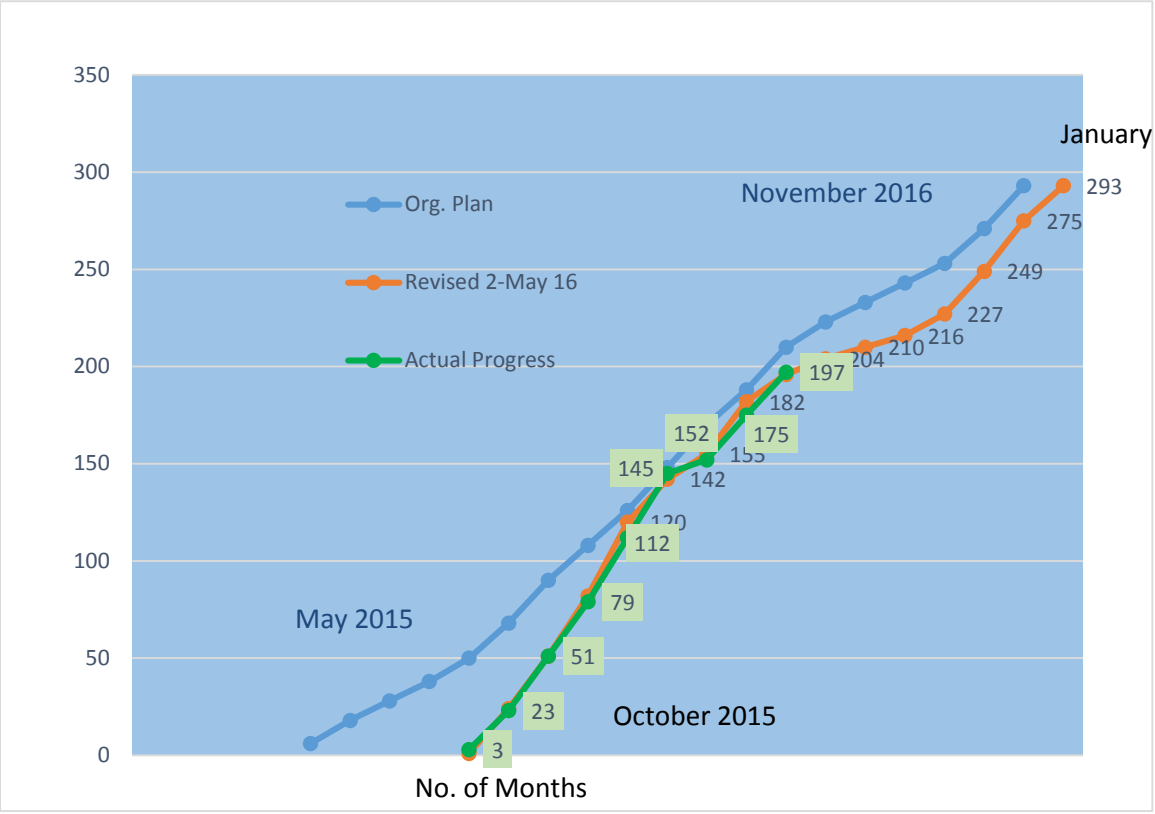
2.6 Camps

The Hydro-mechanical Contractor, IHI, continues to receive further material for main dam penstock fabrication and welding work continues at its workshop and labour camp facility between to the RCC Batching Plant and the Nam Ngiep River. Meanwhile the Electrical & Mechanical Contractor continues to work on its own laydown area at Disposal Area No.9.

2.7 230 kV Transmission Line

The Transmission Line Works Contract was executed between Loxley-Sri Consortium and NNP1PC on 11 July 2014 and on 03 October 2014, NNP1PC issued the NTP to the Contractor. The cumulative work progress of the Transmission Line Works until the end of June 2016 was 62.67% (compared to planned progress of 64.0%). The difference is chiefly a result of a delay in commencement of construction works by approximately 7 months while awaiting compensation matters to be resolved by NNP1PC. The Contractor has agreed to accelerate its Works and is on target to get back onto the original schedule for tower foundation excavation by May 2016, within 8 months from starting.

Figure 2-3: Cumulative Work Progress (Plan and Actual)



2.8 Electrical and Mechanical Work

The EMWC was executed between Hitachi-Mitsubishi Hydro Corporation and NNP1PC on 13 June 2014 and the NTP was issued on 03 October 2014 The cumulative work progress of the Electrical and Mechanical Works until the end of June 2016 was 31.8% (compared to planned progress of 53.0%).

The installation work of embedded piping for the main powerhouse commenced on 17 February 2016 and it is under way in coordination with concrete casting work. The status of embedded pipe installation is shown in Figure 2-4.

The grounding works for the main powerhouse and re-regulation power house are under way in coordination with concrete casting work.

Figure 2-4: Embedded piping installation (Main powerhouse)

2.9 Hydro-Mechanical Work

The cumulative work progress of the Hydraulic Metal Works until the end of June 2016 was 21.3% (compared to planned progress of 21.9%). The main activities carried out during this month are described below:

a) Main Dam

- Witnessed inspection result confirming painting quality of penstock pipe P36, Line 2 was approved by Owner's Engineer on 4-June-2016.
- Witnessed inspection result confirming painting quality of penstock pipe P36, Line 1 and P35, Line 2 was approved by Owner's Engineer on 11 June 2016.
- Witnessed inspection result confirming painting quality of penstock pipe P39, P40, P41, Line 1 and 2, including P35 Line 1 was approved by Owner's Engineer on 13 June 2016.
- Site Inspection and Setting out of Bench marks for Installation of Steel penstock pipe lower part, Line 1 & 2 was conducted and completed on 29 June 2016.
- Latest progress of penstock pipes fabrication at IHI field shop as of the end of June 2016 is shown Table 2-3 below:

Table 2-3*:* Progress of the penstock pipe fabrication at the IHI field shop as at the end of June 2016

Item No.	Work Activity	Fabrication Progress (%)	Remarks
1.1	Assembly & Welding	16.3%	
1.1	Painting	11.68 %	
1.1	Delivery to Main Dam Laydown Area	0.0 %	IHI planned schedule is to start delivery of lower penstock pipes to main dam on 06 July 2016
1.1	Site Erection at Main Dam	0.0 %	IHI planned schedule is to start penstock pipe erection work in second week of July 2016

b) Re-regulation dam

- Witnessed dimensional and visual inspection results for Intake Gate Leaf (before welding) was approved by the Owner's Engineer on 15 June 2016.
- Witnessed dimensional and visual inspection results for Re-regulation Gate Leaf (before welding) was approved by the Owner's Engineer on 23 June 2016.
- Witnessed dimensional and visual inspection results for Intake Trash Rack (Left Bank) was approved by the Owner's Engineer on 29 June 2016.
- Witnessed dimensional and visual inspection results for Intake Gate Leaf (before painting) was approved by the Owner's Engineer on 30 June 2016.
- Latest progress of steel gate installation for each work item at the end of June 2016 is shown Table 2-4 below :

Table 2-4*:* Progress of steel gate installation for each work item at the end of June 2016

Item No.	Work Item Description	Site Installation Progress (%)	Remarks
2.1	Re-regulation Waterway Gate	50 %	Gate leaf installation is ongoing
2.2	Re-regulation Waterway Stop Log	20 %	IHI plan to carry-out dry test in the first week of July 2016.
2.3.1	Re-regulation Intake Gate	50 %	Gate leaf installation is ongoing.
2.3.2	Re-regulation Intake Trash Rack	70 %	Installation of Trash Rack is ongoing
2.4	Re-regulation Draft Gate	20 %	Upper removable guide frame will be installed in the last week of July 2016. Setting and dry test will be carried out in October 2016.

3. ENVIRONMENTAL MANAGEMENT AND MONITORING

3.1 Contractor SS-ESMMPs

During the Second Quarter of 2016, the EMO carried out 15 reviews of 11 SS-ESMMPs received during the period as listed in Table 3-1.

Table 3-1: Summary of reviewed SS-ESMMP documents during the Second Quarter of 2016

SS-ESMMP	Revision 1	Rev. 2	Rev. 3	Approved
SS-ESMMP for Biomass Clearance in the Reservoir			√	√
SS-ESMMP for the Improvement of the Internal Road in 2UR (Upper Reservoir)	√	√		√
SS-ESMMP for 22kV electrical installation at the Houay Soup Resettlement Area (HSRA)	√			√
SS-ESMMP for the construction of NNP1 Project solid waste landfill	√	√		√
SS-ESMMP for the construction of houses, pre-school and accommodation buildings Lot3 at the HSRA		√		√
SS-ESMMP for the Construction of the Main Road at HSRA	√	√		√
SS-ESMMP for the Construction of Irrigation Canal at the HSRA	√			√
SS-ESMMP for Dam Monitoring System at the Main Dam	√	Under review		
SS-ESMMP for the Construction of HM Sub-contractor's Labour Camp No.2 (LILAMA10)		√		√
SS-ESMMP for the Construction of Houay Soup Waste Landfill	Under review			
SS-ESMMP for Construction of the Main Dam Body	Under review			

As a result, eight (08) SS-ESMMPs were approved and three (03) SS-ESMMPs are still under review. More details on the approved SS-ESMMPs can be found in Appendix 1: Status of SS-ESMMPs Approval during April to June, 2016.

3.2 Results of Non-Compliance Inspections

During April to June 2016, the EMO conducted bi-weekly and weekly follow-up inspections of 24 construction sites and camps including temporary camps at Houay Soup Resettlement Areas (HSRA), 230 kV Transmission Line and biomass removal areas as listed in Figure 3-1 and Figure 3-2 below.

Figure 3-1: Site Inspection Location

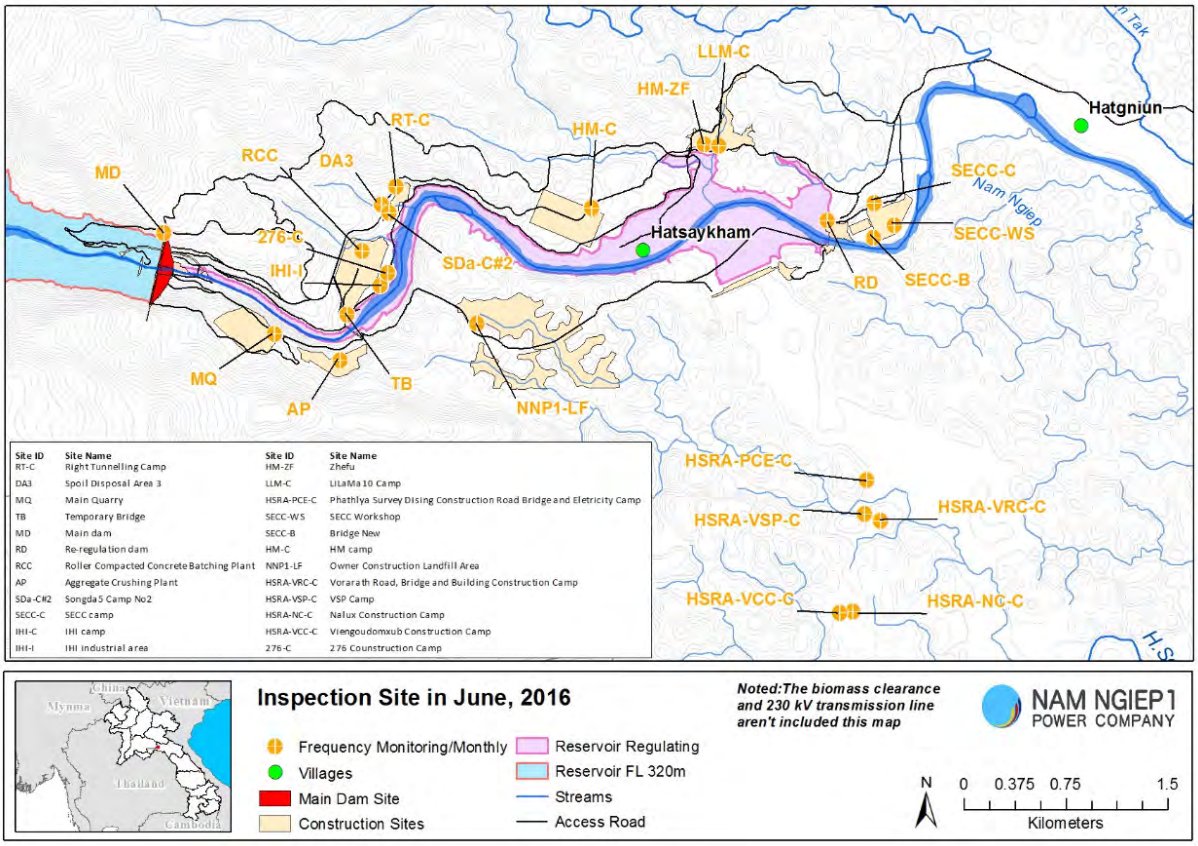


Figure 3-2: 230 kV Transmission Line construction monitoring

A total of 45 Observations of Non-Compliances (ONCs) were recorded in the Second Quarter of 2016. Out of these, 12 ONCs were carried over from the previous Quarter and 33 ONCs were issued during this Quarter (see Table 4-2 and Figure 4-3 below). In addition, one NCR (Level 1) was issued in May 2016 as a result of high turbid water discharge from the construction areas at the main dam and

powerhouse to the Nam Ngiep River without prior treatment. EMO followed-up the implementation of corrective actions in June 2016 and closed. A total of 12 ONCs could not be resolved in this quarter and will be carried forward into the Third Quarter. More details on the issued ONCs and NCR as well as the corrective actions can be found in Table 3-2 and Table 3-3 and in Appendix 2: Environmental Monitoring Corrective Actions From April to June 2016.

Table 3-2: Summary of Environmental Non-Compliance Status during the Second Quarter of 2016

Environmental Non-Compliance Status	ONC	NCR-Level 1	NCR-Level 2
Carried over ONC/NCR	12	0	0
New ONC/NCR	33	1	0
Total ONC/NCR	45	0	0
Resolved ONC/NCR	33	1	0
Unresolved ONC/NCR carried forward to the next quarter	12	0	0

Figure 3-3: Summary of ONCs and NCRs during the Second Quarter of 2016

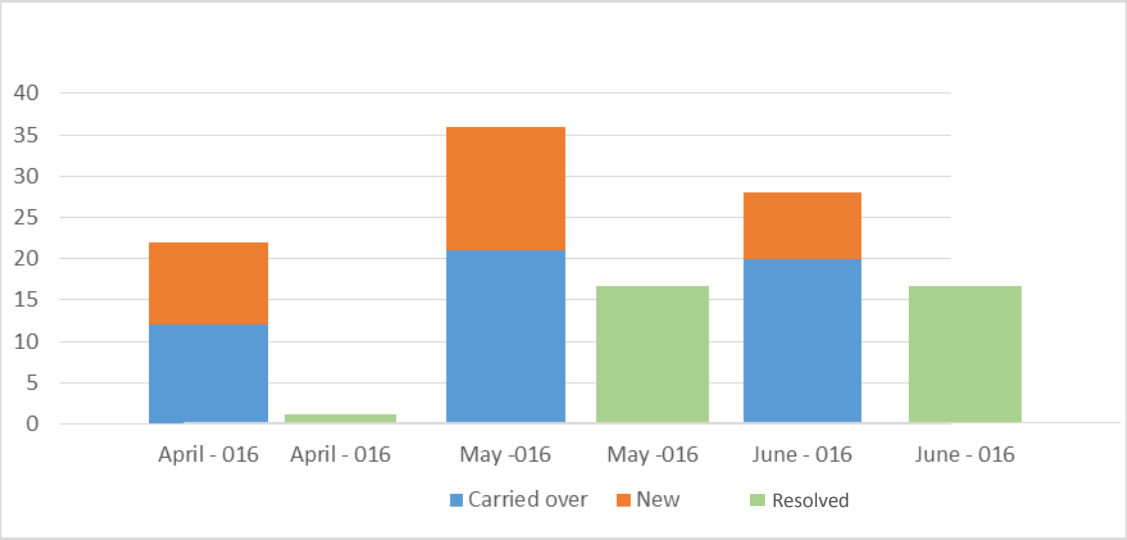


Table 3-3: Types of ONCs and NCRs during Q2, 2016

Non-compliance Issue	ONC	NCR-Level1	Resolved ONCs	Carried Over ONCs
Hazardous material management	13	1	11	1
Effluent discharge	8	0	5	3
Waste management	7	0	5	2
Erosion and sediment control	11	1	7	4
Project personal health program	1	0	1	0
Construction of workers' camp	3	0	2	2
Landscape and re-vegetation	2	0	2	0
Total	**45**	**1**	**33**	**12**

Photograph 1: A Joint LTA/IAP/ADB mission No.7 undertaken on 17 May 2016	Photograph 2: An investigation of a NCR level 1 on turbid water discharge from the Main Dam and Powerhouse areas
	
Photograph 3: Monitoring of erosion and Sediment Control from the main construction sites (Joint bi-weekly Inspection)	Photograph 4: Site inspection at the Transmission Line construction
	

3.3 Waste Management at the Construction Sites

3.3.1 General Waste Management

In April 2016, EMO received and approved the Detailed Works Programme (DWP) and Site Specific Environmental and Social Management and Monitoring Plan (SS-ESMMP) for NNP1 Project landfill construction. In May 2016, the construction of NNP1 Project landfill was commenced. Key construction progresses by June 2016 included excavation and lining of waste pits and leachate treatment ponds, installation of four groundwater monitoring wells, and construction of a field office and a guard house (see photos below). The NNP1 Project landfill construction is planned to be completed in July 2016.

Photograph 5: Completed HDPE lining of sanitary solid waste pit

Photograph 6: Completed HDPE lining of treatment ponds

A total of six temporary waste pits have been excavated at the landfill site. Four out of the six pits have already been closed and covered with soil. Two pits are still in use. Once the NNP1 Project landfill construction is completed, the waste in the temporary pits will be removed and placed in the newly constructed permanent pit.

Several types of waste generated from construction activities were sold to Khunmixay Processing Factory for further processing as shown in Table 3-4 below.

Table 3-4: Waste types and quantities sold from April to June 2016

No.	Date	Types of Waste	Unit	Site Name			Total
				SECC Camp	Songda 5 Camp #2	IHI	
1	04 June 16	Scrap metals	Kg	3,514	-	100	**3,614**
2		Cement bags	Bag	1,680	1,000	-	**2,680**
3		Used cooking oil	Litre	-	-	70	**70**
4		Plastic bottles	Kg	54	-	-	**54**
5		Aluminium tin/cans	Kg	5	-	-	**5**

Photograph 7: Scrap metals were sold at the SECC Camp

Photograph 8: Cement bags were sold at the Songda5 Camp #2

3.3.2 Hazardous Materials and Waste Management

From April to June 2016, a number of joint inventories have been conducted by the EMO, the Civil Works Contractor and its sub-contractors for hazardous materials and hazardous waste at the main construction sites, workshops and sub-contractors' camps; including, Loxley office, Stock yard and Loxley RCR (sub-contractor camp along the 230 kV transmission line); TCM; Song Da 5 camp#.1 and 2, Song Da 5 workshop; Right Tunnelling workshop; V&K Camp; CVC Plant; Sino-Hydro Camp; HM Hydro's ZHEFU camp; LILAMA 10 camp; IHI's 276 camp and explosive storage areas. It was observed that some inspected sites had poor hazardous materials and waste storage management, including the Loxley's RCR sub-contractor, RT Workshop, the Songda 5 workshop at Disposal Area No. 2, V&K workshop, and the CVC Plant. The EMO issued Observations of Non-Compliances (ONCs) to these sub-contractors requiring each workshop to improve their standards. The hazardous waste recorded during the joint inventories are presented in the Table 3-5 below.

Table 3-5: Hazardous materials recorded during the Second Quarter of 2016

No.	Hazardous Waste Type	Unit	Addition	Disposed	Remaining Volume
1	Used Oil (Hydraulic and Engine)	Litre	2,750	0	2,750
2	Used oil mixed with water	Litre	600	0	600
3	Empty used oil drum/container	Drum (20 L)	41	6	35
4	Empty used oil drum/container	Drum (200 L)	21	5	16
5	Empty contaminated bitumen drum/container	Drum (200 L)	82	0	82
6	Used oil filters	Piece	88	0	88
7	Contaminated soil, sawdust and concrete	bag	30	0	30
8	Contaminated textile and material	bag	7	0	7
9	Used tyre	Piece	86	4	82
10	Empty used chemical drum/container	Drum (200 L)	45	0	45
11	Battery	unit	7	0	7
12	Empty paint and spray cans	can	42	1	41
13	Acid and caustic cleaners	Bottle	285	0	285
14	Clinical Waste	Kg	4	0	4
15	Ink cartridge	unit	11	0	11
16	Halogen/fluorescent bulbs	unit	8	0	8
17	Empty used chemical drum/container	drum(20L)	544	0	544
18	cement bag	bag	1,500	0	1,500

3.3.3 Medical Waste Management

Only small amounts of medical waste were generated at the site clinics (Owners' Site Office and Village, Song Da Camp No. 2, OC Camp and RT Camp). During the Second Quarter of 2016, a total of 5.3 kg of such waste was collected from the clinics and sent to the Vientiane landfill for incineration.

Photograph 9: An incinerator at the Vientiane landfill

Photograph 10: Clinical waste was sent to the incinerator at the Vientiane landfill

3.4 Community Waste Management Support

3.4.1 Community Recycling Programme

During April to June 2016, a total of 302.9 kg of recyclable waste were bought by the Community Recycle Bank at Hat Gnuin village as shown in the **Table 3-6** below. By the end of June 2016, a total of 184 people (130 adults and 54 students) or 120 households held accounts at the Recycle Bank. The percentages of participation in the programme for each village are: Hat Gniun- 80%, Hatsaykham- 64% and Thahuea- 64%. One new member signed-up for the programme in the Second Quarter of 2016.

Table 3-6: Purchased recyclables by the Community Recycle Bank

Types of Waste	Unit	Purchased Amount during the Second Quarter of 2016	Accumulated Amount (July 2015 – June 2016)
Recyclables			
Scrap metal	Kg	204	2,225.70
Glass	Kg	16	2,022
Paper/cardboards	Kg	33	1,116
Plastic bottles	Kg	22	1,113.50
Aluminum/tin cans	Kg	27.9	509.3
Sub-Total	Kg	302.9	6,986.50
Hazardous waste			
Hydraulic/oil containers	Kg	0	11.5
Used batteries	Am	0	9

Photograph 11 and 12: Recyclables were sold to Khunmixay Processing Factory

A trial test of the recyclable compactor was carried out for the first time in April 2016. This trial operation was done in collaboration with the NNP1PC-Technical Division's Safety Team and included an environmental assessment (noise monitoring). The results of the noise monitoring at different distances from the crushing machines are summarised below:

- **The noise level inside the Recycle Bank (about 6 m from the compactor):** During the operation of the compactor from 10:05-10:36 (31 minutes), the maximum noise level was 99.8 dB(A) and the mean noise level range was between 57.97 – 87.04 dB (A) which were higher than the National Guidelines for noise level in the community;
- **The noise level at the Ban Hat Gniun Primary School (about 48 m from the compactor)**: During the operation of the compactor from 10:46-11:30 (44 minutes), the maximum noise level was measured at 73.1 dB (A) and the average noise level was between 55.8 – 61.77 dB (A) which were slightly higher than the noise standard in the guideline for the community;
- **The noise level at the nearest community house (about 50 m from the compactor):** The maximum noise level was measured at 67.9 dB (A) and the average noise level was between 54.49 – 59.85 dB (A) during the period of compactor operation from 11:40 – 12:00 (20 minutes).

According to these results, the compactor will be operated under the following conditions:

- All operators are required to have appropriate ear protection and each worker may not operate the machine for more than 8 hours per day.
- The recyclable compactor should only be operated during the weekend and the duration should be minimized in order to avoid a noise disturbance to the students in the nearby school.
- The operator should conduct a regular maintenance to reduce the operational noise level.

Photograph 13: The extended storage area for the pressing machine

Photograph 14: Installation of the pressing machine

3.4.2 Animal Fodder (Pig Feed) Collection Programme

During the Second Quarter of 2016, a total of 7,227 kg of food waste from Owner's Village and Contractors' camps were collected by the villagers from Hat Say Kham for use as feed.

Table 3-7: Amount of food waste collected by local villagers for use as pig feed

No.	Site Name	Unit	Amount
1	Songda 5 camp #2	Kg	3,070
2	Songda 5 camp #1	Kg	2,334
3	OC camp	Kg	1,230
4	Owner's Village and Site Office	Kg	501
5	TCM camp	Kg	90
6	276 Sub-contractor	Kg	2
Total		Kg	7,227

The EMO continued to monitor the food waste separation at the canteens to ensure that other waste is not mixed with food waste as well as the safety procedures used by villagers to access the Site for food waste collection. A draft Operating Procedure for Food Waste Separation and Collection was reviewed and being finalized.

3.4.3 Waste Management Training

Waste Management Training for the owners (camp followers) of the shops along the main Road at Ban Hat Gniun was held on 18 April 2016 (see below photos). This training was focussed on waste reduction with 3R principles (Reduce, Re-use and Recycle), waste separation and disposal, information on the Community Recycle Bank and types of waste that the Community Recycle Bank purchases. A total of 34 persons received this training. Six of the shops are owned by local villagers and the rest are owned by Vietnamese. Table 3-8 summarizes the number of participants presented in the trainings.

Table 3-8: Summarised number of participants who attended the waste management training

Date	Description	No. of Participants
18 April 2016	Local villagers (Hat Gniun Village)	6
	Lao people immigrated to Hat Gniun Village	10
	Foreigners (Vietnamese) immigrated to Hat Gniun Village	18
	Total	**34**

Photograph 15: Waste management training for camp followers at Ban Hat Gnuin

Photograph 16: Waste management training for camp followers at Ban Hat Gnuin

3.4.4 Houay Soup Waste Management

During the Second Quarter of 2016, the bids for the construction of Houay Soup landfill was evaluated and the contractor was selected. The draft DWP and the SS-ESMMP were prepared and submitted on 17 June 2016 for EMO review. The mentioned documents are under reviewing process.

3.5 Environmental Monitoring

The environmental quality monitoring undertaken from April to June 2016 has followed the environmental quality monitoring programme presented in the ESMMP-CP Volume III. The monitoring programme consists of the following components:

a) Effluent discharge from camps and construction sites
b) Ambient surface water quality monitoring
c) Ambient air quality monitoring (particulate matter of less than 10 microns)
d) Ambient noise and noise emission monitoring.

All the monitoring results have been assessed against the 2009 National Environmental Standards and the Effluent Standards specified in the Concession Agreement Annex C[2], as applicable. For the purposes of simplifying the report, this Section focuses on the key results that did not meet the mentioned Standards.

A small laboratory to carry out basic water quality analyses (including bacteria, Biochemical Oxygen Demand, and Total Suspended Solid) will be constructed at the Owner's Site and Village area. The technical design of the laboratory has been prepared and approved. Procurement of a Contractor is in process during the reporting period. Quotations of the laboratory equipment are being obtained from suppliers in Lao PDR. It is expected that the construction will be completed by the end of the Fourth Quarter of 2016.

3.5.1 Surface Water (River) Quality

Water quality monitoring is conducted at 13 stations in the Nam Ngiep 1 watershed area at:

i. six stations located in the upstream of the NNP1 Main Dam, included four stations along the upper Nam Ngiep River, a station at lower Nam Phouan and a station at lower Nam Chian;

ii. seven stations located downstream of the NNP1 Main Dam including five stations along Nam Ngiep, a station at lower Nam Xao and a station at lower Nam Houay Soup.

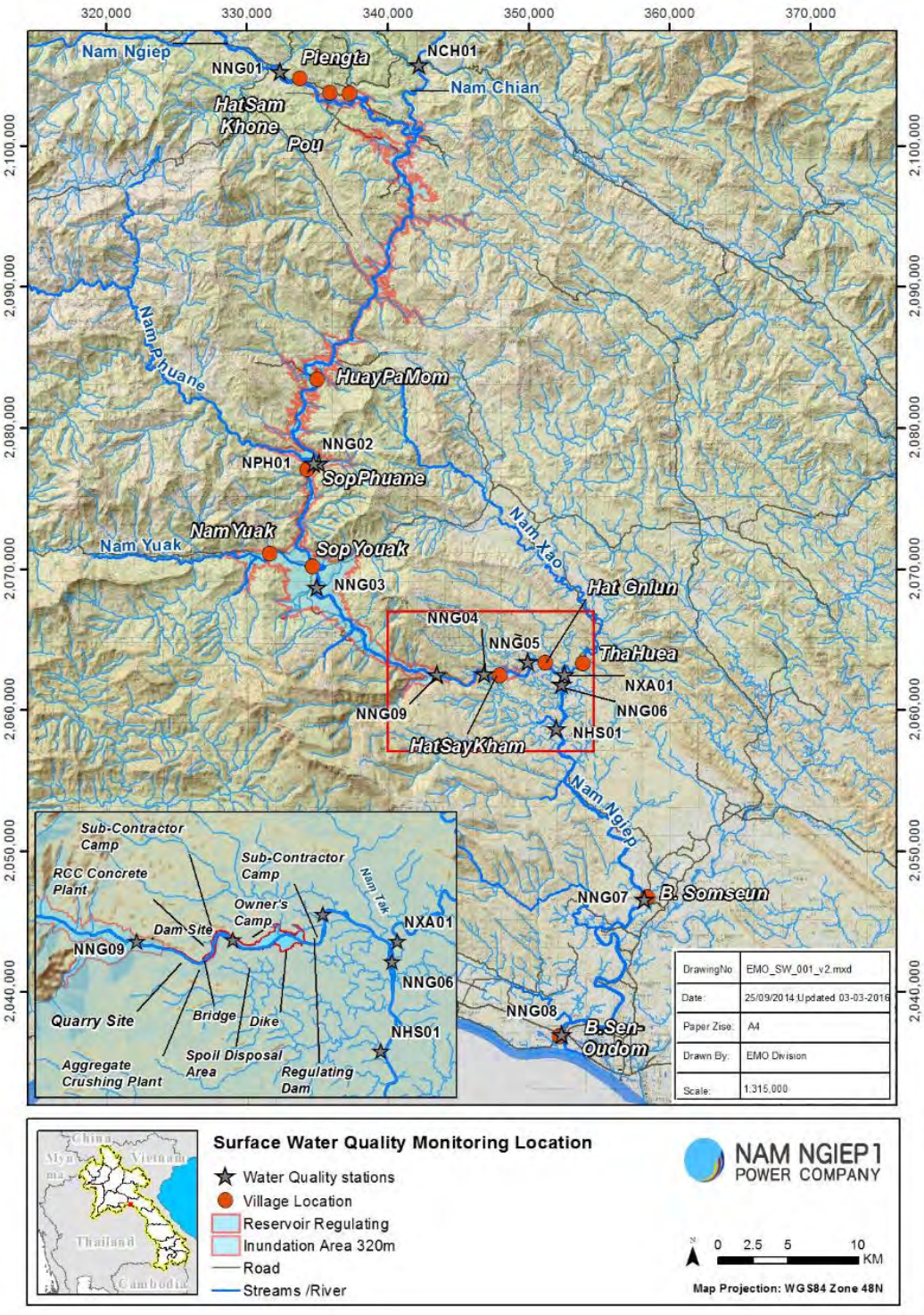
The frequency of monitoring for group of parameters are presented in Table 3-9 and the locations of the monitoring stations are shown in Figure 3-4.

Table 3-9: Monitoring Frequency for Surface Water Quality Parameters

Frequency of Monitoring	Parameters (Unit)
Fortnightly	Physical parameters: pH, DO (%), DO (mg/l), Conductivity (µs/cm), TDS (mg/l), Temperature (°C), Turbidity (NTU)]
Monthly	Biological parameters: TSS (mg/l), BOD5 (mg/l), COD (mg/l), NH3-N (mg/l), NO3-N (mg/l), Total Iron (mg/l), Manganese (mg/l), total coliform (MPN/100 ml), faecal coliform (MPN/100 ml)
Quarterly	Chemical parameters: Total Kjeldahl Nitrogen (mg/l), Chloride (mg/l), Sulphate (mg/l), Alkalinity (mg/l), Lead (mg/l), Arsenic (mg/l), Mercury (mg/l), Calcium (mg/l), Magnesium (mg/l), Potassium (mg/l), Sodium (mg/l)

[2] The Effluent Standards in Annex C are **the stricter of** the indicative guideline values applicable to sanitary wastewater in IFC Environmental Health and Safety Guideline, General Guidelines: Wastewater and Ambient Water Quality – and the applicable values in the Lao National Environmental Standards. Note also that the indicative guideline values in the IFC EHS Guideline are meant to apply in the absence of national values

Figure 3-4: Surface water quality monitoring locations



Descriptions of each monitoring station and surface water quality monitoring parameters can be found in Appendix 3 Codes and Locations of the Surface Water Quality Monitoring Stations.

During the Second Quarter of 2016, the results of the monitoring programme indicated values exceeding the Lao National Environmental Standard (Surface Water Quality Guideline) with respect to Dissolved Oxygen (DO), Chemical Oxygen Demand (COD), Biochemical Oxygen Demand (BOD_5), faecal coliforms and total coliform as described in details below.

3.5.1.1 Dissolved Oxygen

The DO levels measured in Nam Ngiep River since the start of the monitoring programme in 2014 indicate substantial spatial and temporal variations.

During late April and early May 2016, the DO results were marginally lower than the Standard at lower Nam Xao and Nam Houay Soup (tributaries downstream of the Project construction area). The very low water level and slow flow of these tributaries may have affected the DO level in the surface water.

Table 3-10: Surface water DO results from April to June 2016

	River Name	Nam Ngiep									Nam Chiane	Nam Phouan	Nam Xao	Nam Houaysoup
	Station	NNG01	NNG02	NNG03	NNG09	NNG04	NNG05	NNG06	NNG07	NNG08	NCH01	NPH01	NXA01	NHS01
	Zone	Upstream of Project Construction Area				Within Construction Area	Downstream of Project Construction Area				Tributaries Upstream of Project Construction Area		Tributaries Downstream of Project Construction Area	
Month Year	Guideline													
Apr-16	>6.0 mg/l	8.36	8.08	8.2	8.4	8.47	8.88	8.78	7.9	7.88	8.79	8.53	6.49	7.84
Apr-16	>6.0 mg/l	8.01	7.83	8.14	7.56	7.76	8.28	8.38	8.12	7.7	8.31	7.89	5.52	5.90
May-16	>6.0 mg/l	7.4	6.95	7.63	7.35	7.56	7.47	7.38	7.56	7.61	8.03	8.00	5.96	7.5
May-16	>6.0 mg/l	7.15	7.23	7.55	7.75	7.94	7.55	7.41	7.67	6.78	7.69	7.68	6.8	6.92
Jun-16	>6.0 mg/l	7.3	7.26	7.57	8.13	8.38	8.22	7.98	7.55	7.8	8.04	7.95	6.88	7.03
Jun-16	>6.0 mg/l	7.44	7.02	7.54	7.45	7.67	7.57	7.11	6.86	6.81	8.14	8.09	6.16	6.93

3.5.1.2 Chemical Oxygen Demand (COD)

The COD levels measured in Nam Ngiep River since the start of the monitoring programme in 2014 indicate substantial spatial and temporal variation from 'not detected' to double-digit mg/l. A proper statistical analysis of the COD values will be included in the 2017 Annual Report.

It is highly unlikely that the previous and currently ongoing construction works of NNP1 would cause any measurable increase in the COD levels in the Nam Ngiep River downstream of the Site. The purpose of the monitoring is therefore mainly to establish a baseline prior to the formation of the reservoir after which it will be important to monitor and assess changes in the downstream water quality of the Nam Ngiep River.

Table 3-11: Surface water COD results from April to June 2016 (*ND^{16} means less than the detection limit 5.0 mg/l)*

	River Name	Nam Ngiep									Nam Chiane	Nam Phouan	Nam Xao	Nam Houaysoup
	Station	NNG01	NNG02	NNG03	NNG09	NNG04	NNG05	NNG06	NNG07	NNG08	NCH01	NPH01	NXA01	NHS01
	Zone	Upstream of Project Construction Area				Within Construction Area	Downstream of Project Construction Area				Tributaries Upstream of Project Construction Area		Tributaries Downstream of Project Construction Area	
Month Year	Guideline													
Apr-16	<5.0 mg/l	ND^{16}	ND^{16}	ND^{16}	ND^{16}	ND^{16}	ND^{16}	ND^{16}	ND^{16}	ND^{16}	6.5	ND^{16}	11.7	11.1
May-16	<5.0 mg/l	9.1	11.4	9.3	17.9	5.7	8.9	6.3	8.1	7.1	9.1	14	14.2	20.7
Jun-16	<5.0 mg/l	13.1	13.3	9.2	28.2	30.6	31	37.9	13.5	16.9	16	8.8	10.6	15.3

3.5.1.3 Biochemical Oxygen Demand (BOD_5)

During the Second Quarter of 2016, a Biochemical Oxygen Demand (BOD5) result at Nam Ngiep upstream (NNG01) was slightly higher than the Standard set at less than 1.5 mg/l.

Similar to the COD analyses, the purpose of the BOD5 measurements is mainly to establish a baseline prior to inundation.

Table 3-12: Results of surface water BOD from April to June 2016

	River Name	Nam Ngiep									Nam Chiane	Nam Phouan	Nam Xao	Nam Houaysoup
	Station	NNG01	NNG02	NNG03	NNG09	NNG04	NNG05	NNG06	NNG07	NNG08	NCH01	NPH01	NXA01	NHS01
	Zone	Upstream of Project Construction Area				Within Construction Area	Downstream of Project Construction Area				Tributaries Upstream of Project Construction Area		Tributaries Downstream of Project Construction Area	
Month Year	Guideline													
Apr-16	<1.5 mg/l	1.1	ND[13]	ND[13]	ND[13]	ND[13]	1.2	ND[13]	ND[13]	ND[13]	ND[13]	ND[13]	1.0	1.2
May-16	<1.5 mg/l	1.4	ND[13]	ND[13]	ND[13]	ND[13]	ND[13]	ND[13]	ND[13]	1.1	ND[13]	ND[13]	1.2	1.0
Jun-16	<1.5 mg/l	2	ND[13]	ND[13]	1.2	1.4	1.3	1.2	ND[13]	ND[13]	1.3	ND[13]	1	ND[13]

Note: N/A means no data available because of the mission was cancelled. ND[13] means less than the detection limit (<1.0 mg/l)

3.5.1.4 Total Coliforms

The amount of total coliforms exceeded the National Surface Water Quality Standard in June 2016 with values ranging from 22,000 to 160,000 MPN/100 ml at Nam Ngiep Upstream of the Project Construction Area (NNG09), Nam Ngiep within the Construction Area (NNG04), Nam Ngiep Downstream of the Project Construction Area (NNG05 & NNG06), lower Nam Xao (NXA01) and Nam Houay Soup (NHS01). The total coliform peaks occurred in June 2016 (onset of the rainy season) at Nam Ngiep upstream of the Project Construction Area (NNG09) and Nam Ngiep within the Construction Area (NNG04).

Table 3-13: Results of the surface water total coliforms from April to June 2016

	River Name	Nam Ngiep									Nam Chiane	Nam Phouan	Nam Xao	Nam Houaysoup
	Station	NNG01	NNG02	NNG03	NNG09	NNG04	NNG05	NNG06	NNG07	NNG08	NCH01	NPH01	NXA01	NHS01
	Zone	Upstream of Project Construction Area				Within Construction Area	Downstream of Project Construction Area				Tributaries Upstream of Project Construction Area		Tributaries Downstream of Project Construction Area	
Month Year	Guideline													
Apr-16	<5,000 MPN/100ml	1,300	490	230	1,300	280	170	790	2,400	330	490	490	490	790
May-16	<5,000 MPN/100ml	1,300	170	490	490	330	170	240	490	280	1,300	330	490	2,400
Jun-16	<5,000 MPN/100ml	1,600	2,200	2,400	160,000	160,000	28,000	92,000	240	240	400	3,300	22,000	22,000

3.5.1.5 Faecal Coliforms

The amount of faecal coliforms exceeded the National Surface Water Quality Standard during the Second Quarter of 2016 with values ranging from 1,100 to 17,000 MPN/100 ml at Nam Ngiep River (NNG01, NNG03, NNG09, NNG04, NNG06 & NNG07), lower Nam Chian (NCH01), Nam Xao (NXA01) and Nam Houay Soup (NHS01). The faecal coliform peak occurred at lower Nam Houay Soup (NHS01) in June 2016.

Table 3-14: Results of the surface water faecal coliforms from April to June 2016

	River Name	Nam Ngiep									Nam Chiane	Nam Phouan	Nam Xao	Nam Houaysoup
	Station	NNG01	NNG02	NNG03	NNG09	NNG04	NNG05	NNG06	NNG07	NNG08	NCH01	NPH01	NXA01	NHS01
	Zone	Upstream of Project Construction Area				Within Construction Area	Downstream of Project Construction Area				Tributaries Upstream of Project Construction Area		Tributaries Downstream of Project Construction Area	
Month Year	Guideline													
Apr-16	<1,000 MPN/100ml	1,300	490	230	490	170	170	490	1,300	130	490	490	330	490
May-16	<1,000 MPN/100ml	490	33	79	330	79	70	79	220	49	1,300	79	79	790
Jun-16	<1,000 MPN/100ml	1.8	490	2,400	7,900	13,000	46	2,300	240	240	9	240	1,100	17,000

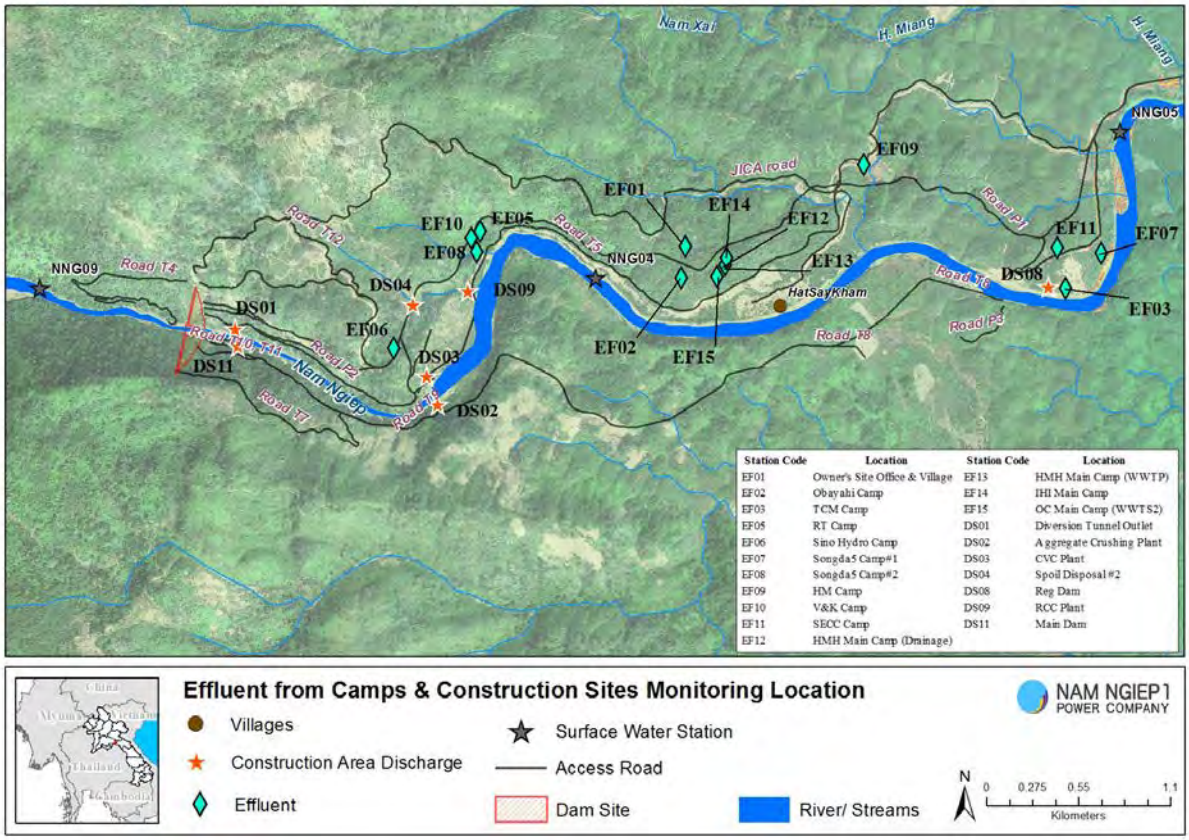
3.5.2 Effluent Discharge Quality Monitoring

All the camps' effluent water was sampled and analysed irrespective of whether or not effluents were discharged at the time of sampling. In case of no discharge, the samples were collected from the downstream end of the final treatment pond.

During the Second Quarter of 2016, effluents were monitored in twelve camps (fourteen sampling sites) including the Owner's Site Office and Village (EF01), the Obayashi Corporation Camp (EF02 and

EF15), TCM Camp (EF03), the Right Tunnelling Camp (EF05), the Sino Hydro Camp (EF06), the Song Da 5 Camp No.1 (EF07), the Song Da 5 Camp No.2 (EF08), the HMH Worker Camp No.1 (EF09), the V&K Camp (EF10), the SECC Camp (EF11), HMH Main Camp (EF12 and EF13) and the IHI Camp (EF14) (see Figure 4-5). Since April 2016, the effluent monitoring has been conducted for TCM Camp, Sino Hydro Camp, Song Da 5 Camp No.1, Song Da 5 Camp No.2, Obayashi Camp, HMH Main Camp, IHI Camp and SECC Camp as non-discharge condition.

Figure 3-5: Map of effluent monitoring locations during the Second Quarter of 2016



Results of the effluent water quality monitoring of selected camps during the Second Quarter of 2016 are described and shown in Table 3-15.

Table 3-15: Results of the effluent water quality monitoring of the camps from April to June 2016

Month-Year	Parameter (Unit)	Site Name	Owner's Site Office and Village	OC Camp - WWTS01	OC Camp - WWTS02	TCM Camp	RT Camp	Sino Hydro Camp	SongDa5 Camp No.1
		Station	**EF01**	**EF02**	**EF15**	**EF03**	**EF05**	**EF06**	**EF07**
		Guideline in the CA							
Apr-16	pH	6.0-9.0	6.99	8.23	N/A	7.64	6.88	7.65	7.24
May-16	pH	6.0-9.0	7.03	7.57	N/A	7.2	7.63	8.29	6.35
Jun-16	pH	6.0-9.0	8.05	7.74	7.94	6.92	7.46	6.98	6.53
Apr-16	TSS (mg/l)	<50	ND[16]	31.4	N/A	23.6	6.3	35.9	16.7
May-16	TSS (mg/l)	<50	ND[16]	26.2	N/A	10.4	16.2	39.3	68.3
Jun-16	TSS (mg/l)	<50	ND[16]	34.8	10.7	100	84.1	62.3	14.9
Apr-16	BOD (mg/l)	<30	1.9	88.5	N/A	4.5	3.1	19	55.2
May-16	BOD (mg/l)	<30	3.2	69	N/A	5.6	12.5	32.1	34
Jun-16	BOD (mg/l)	<30	3.1	73.5	19	7.8	10	28.2	54.6
Apr-16	COD (mg/l)	<125	14.3	169	N/A	27.5	19.6	49.8	119
May-16	COD (mg/l)	<125	9.6	178	N/A	51	49	92	116
Jun-16	COD (mg/l)	<125	20.7	146	72.3	38.6	22.8	80.3	114
Apr-16	Ammonia-nitrogen (mg/l)	<10	12	32	N/A	ND[12]	ND[12]	8	13
May-16	Ammonia-nitrogen (mg/l)	<10	6	35	N/A	ND[12]	6	11	13
Jun-16	Ammonia-nitrogen (mg/l)	<10	7	34	3	ND[12]	ND[12]	7	11
Apr-16	Fecal coliform (MPN/100ml)		490	160,000	N/A	2,300	1,300	7,900	92,000
May-16	Fecal coliform (MPN/100ml)		79	160,000	N/A	1,300	24,000	54,000	92,000
Jun-16	Fecal coliform (MPN/100ml)		24,000	160,000	54,000	3,300	160,000	92,000	160,000
Apr-16	Total coliform (MPN/100ml)	<400	490	160,000	N/A	13,000	4,900	13,000	160,000
May-16	Total coliform (MPN/100ml)	<400	130	160,000	N/A	13,000	160,000	160,000	160,000
Jun-16	Total coliform (MPN/100ml)	<400	160,000	160,000	92,000	92,000	160,000	160,000	160,000

Month-Year	Parameter (Unit)	Site Name	SongDa5 Camp No.2	HMH Worker Camp No.1	V & K Camp	SECC Camp	HMH Main Camp - Drainage	HMH Main Camp - WWTS01	IHI Camp
		Station	**EF08**	**EF09**	**EF10**	**EF11**	**EF12**	**EF13**	**EF14**
		Guideline in the CA							
Apr-16	pH	6.0-9.0	7.54	N/A	7.74	8.64	N/A	N/A	N/A
May-16	pH	6.0-9.0	7.81	7.28	7.69	6.61	9.49	N/A	N/A
Jun-16	pH	6.0-9.0	7.35	8.25	6.96	6.47	8.17	7.63	7.44
Apr-16	TSS (mg/l)	<50	10.4	N/A	164	83.3	N/A	N/A	N/A
May-16	TSS (mg/l)	<50	32.2	24.3	7	35	6.8	N/A	N/A
Jun-16	TSS (mg/l)	<50	31.8	38.4	32.7	55.3	11.1	48.4	41.4
Apr-16	BOD (mg/l)	<30	53.8	N/A	10.4	29.8	N/A	N/A	N/A
May-16	BOD (mg/l)	<30	107	20.8	4.5	16.9	5.6	N/A	N/A
Jun-16	BOD (mg/l)	<30	51.3	9.8	3.7	19.3	3.6	23.7	75.6
Apr-16	COD (mg/l)	<125	113	N/A	31.8	206	N/A	N/A	N/A
May-16	COD (mg/l)	<125	114	44.5	30.5	62	41.1	N/A	N/A
Jun-16	COD (mg/l)	<125	94.4	33.3	17.7	56.2	8.4	129	223
Apr-16	Ammonia-nitrogen (mg/l)	<10	36	N/A	6	10	N/A	N/A	N/A
May-16	Ammonia-nitrogen (mg/l)	<10	32	4	5	3	3	N/A	N/A
Jun-16	Ammonia-nitrogen (mg/l)	<10	23	ND[12]	3	4	ND[12]	8	21
Apr-16	Fecal coliform (MPN/100ml)		160,000	N/A	22,000	160,000	N/A	N/A	N/A
May-16	Fecal coliform (MPN/100ml)		160,000	92,000	240	17,000	330	N/A	N/A
Jun-16	Fecal coliform (MPN/100ml)		160,000	92,000	790	4,900	54,000	160,000	28,000
Apr-16	Total coliform (MPN/100ml)	<400	160,000	N/A	92,000	160,000	N/A	N/A	N/A
May-16	Total coliform (MPN/100ml)	<400	160,000	160,000	240	160,000	160,000	N/A	N/A
Jun-16	Total coliform (MPN/100ml)	<400	160,000	92,000	4,900	54,000	160,000	160,000	160,000

ND[1] (<0.0005 mg/L) ND[2] (<0.0003 mg/L) ND[3] (<0.0002 mg/L) ND[4] (<0.005 mg/L) ND[5] (<0.003 mg/L)
ND[6] (<0.09 mg/L) ND[7] (<0.07 mg/L) ND[8] (<0.04 mg/L) ND[9] (<0.02 mg/L) ND[10] (<0.01 mg/L)
ND[11] (<0.3 mg/L) ND[12] (<0.2 mg/L) ND[13] (<1.0 mg/L) ND[14] (<1.5 mg/L) ND[15] (<4.0 mg/L)
ND[16] (<5.0 mg/L) ND[17] (<2.7 mg/L)

A joint inspection of the waste water treatment systems between a Thai external specialist, the Owner (TD and EMO) and the Contractors (OC, HM and IHI) was undertaken during 29-30 June 2016 at all the

camps. Table 3-16 indicates for each site the treatment system, the status of compliance with the Effluent Standards and the preliminary corrective actions.

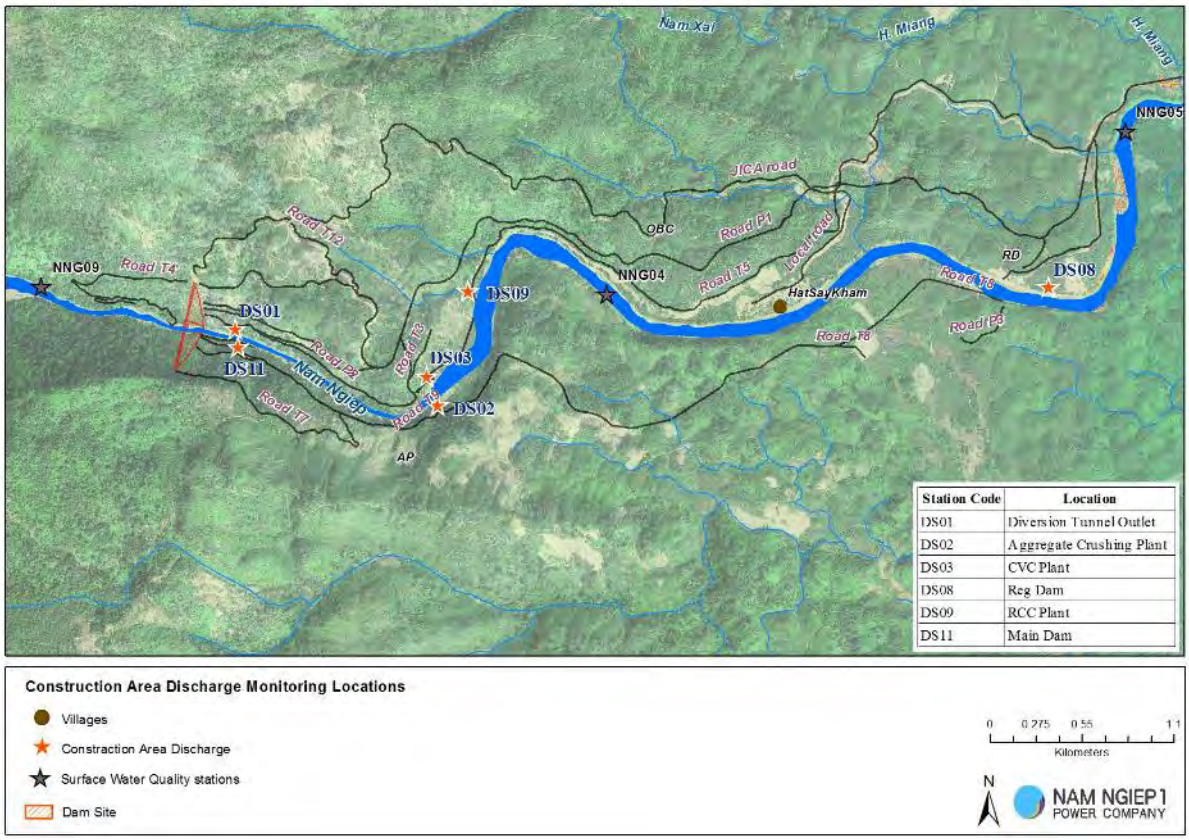
Table 3-16: Compliance assessment of the effluent discharge from the camps and construction sites during the Second Quarter of 2016

Site	ID	Treatment System	Compliance	Corrective Actions
Owner's Site Office and Village (NNP1PC)	EF01	Septic tanks (kitchen and black water) and wetland (grey water), discharged 70 m3/day	Ammonia nitrogen (April 16) and faecal and total coliforms (April & June) were higher than the Standards	A system check was carried out by the NNP1 site engineer, all leakage points have been repaired on 16 June 2016. The EMO will continue to monitor the effluent quality at all sites after the completion of repair works.
OC Camp – WWTS01	EF02	Septic tanks (kitchen and black water) and wetland (grey water)	Non-compliance of BOD_5, COD, Ammonia Nitrogen and total coliforms in April, May and June 2016	A joint inspection for the waste water treatment system (WWTS) between a Thai external specialist, the Owner (TD and EMO), and Contractor (OC) was undertaken during June 29-30 at all the camps. It was agreed that chlorination in a one cubic metre Chlorine contact tank using sodium hypochlorite (NaOCl) was needed. Additional details on specifications and drawings of the WWTS for this camp were requested by the Consultant before delivering his final report for implementation by August 2016. The corrective actions proposed by the Consultant will be discussed and agreed upon including timing of implementation between NNP1PC and the Contractors
OC Camp – WWTS02	EF15	Septic tanks (kitchen and black water) and wetland (grey water)	Non-compliance of the total coliforms in June 2016	As above
TCM Camp	EF03	Septic tank (kitchen and black water), sediment ponds (grey water)	TSS (June 16) and total coliforms for April, May and June 2016 were higher than the standard	A final report is being prepared by the Consultant. Proposed corrective actions by the Consultant will be discussed with NNP1PC-TD and Contractor's new management in August 2016.
Sino Hydro Camp	EF06	Septic tank (kitchen and black water), sediment ponds (grey water)	BOD, ammonia nitrogen (May 16), TSS (June 16) and total coliform results exceeded the standard	As above
HMH Worker Camp No.1	EF09	Septic tank (kitchen and black water), sediment ponds (grey water)	Total coliforms were not complied with the standard.	As above
V&K Camp	EF10	Septic tank (kitchen and black	TSS (April 16), faecal and total	As above

Site	ID	Treatment System	Compliance	Corrective Actions
		water), sediment ponds (grey water)	coliforms (April & June 16) were higher than the standards	
SECC Camp	EF11	Septic tank (kitchen and black water), sediment ponds (grey water)	TSS (April & June 16), Ammonia nitrogen (April 16) and total coliforms were higher than the Standard.	As above
HMH Main Camp - Drainage	EF12	Septic tank (kitchen and black water), sediment ponds (grey water), drainage (all runoff in the camp)	The level of pH (May 2016) and total coliforms (May-June 2016) were not compliant with the Standard.	As above
HMH Main Camp – WWTS01	EF13	Septic tank (kitchen and black water), sediment ponds (grey water)	TSS and total coliforms (June 16) were not compliant with the Standard.	As above
IHI Camp	EF14	Septic tank (kitchen and black water), sediment ponds (grey water)	BOD, COD, faecal coliforms and total coliforms (June 16) were not compliant with the standard.	As above
Song Da 5 Camp No. 1	EF07	Septic tank (kitchen and black water), sediment ponds (grey water)	TSS (May 16), BOD, NH_3, faecal coliforms and total coliforms were much higher than standards during the Quarter.	In addition to the above, separation the grey water from the surface water around the camp (through grey water pipes) was completed.
Song Da 5 Camp No. 2	EF08	Septic tank (kitchen and black water), sediment ponds (grey water)	Non-compliant of the BOD, COD, NH_3 and total coliforms	In addition to the above, separation of the grey water from the surface water around the camp (through grey water pipes) was completed.
Right Tunnelling Camp	EF05	Septic tank (kitchen and black water), sediment ponds (grey water)	TSS (June16), faecal and total coliforms were higher than the standards	This camp is being decommissioned in June 2016. A draft site decommissioning plan was being reviewed by NNP1PC's EMO.
CVC Plant	DS03	Sediment ponds	Non-compliance with the Standard for pH (measured 9.71 for May 16) and the TSS	The Contractor washed their trucks around the sediment pond, which was directly discharge to outside environment. The Contractor was asked to use existing car/truck washing facilities. This issue will be followed up

Site	ID	Treatment System	Compliance	Corrective Actions
			(measured 16,426 mg/l for June 16).	again in the next bi-weekly site inspection scheduled in early July 2016.
Re-regulating Dam	DS08	pH adjustment and chemical flocculation	In early June 2016, the TSS value exceeded the National Effluent Discharge Standard with a value recorded at 302 mg/l. This was in compliant in late June 2016.	The Contractor was advised to monitor the treatment of effluents using the Turbid Water Treatment Plant in early June. The result in late June showed the level of compliance.
RCC Plant	DS09	Sediment ponds	Non-compliance with TSS Standard in May and June 2016 (higher than the Standards) with values recorded range 165 - 27,850 mg/l.	A few ONCs were issued to the Contractor in May and June 2016. Latest, another ONC was issued on 25 June 2016. The Contractor was required to: - Frequency adjust the sediment clean-up when observed that the ponds are 60% full; - Regularly remove dried sediment from the drying yards; - Prepare/update the SS-ESMMP for the operation stage of the RCC plant and submit to NNP1PC for review and approval. Note: the mentioned SS-ESMP needs to fully address the areas of Sedimentation Control and Water Availability & Pollution control. If these issues are still not fixed by the agreed timeline, a NCR level 1 will be issued.
Main Dam Construction Area	DS11	pH adjustment and chemical flocculation 6000 m^3/day	Non-compliance with TSS Standard in early April and early June 2016 with values recorded as 177 and 80.4 mg/l respectively.	One NCR (Level 1) was issued in May 2016 after issuing several ONCs as a result of high turbid water discharge from the construction areas at the main dam and powerhouse to the Nam Ngiep River. NNP1PC-EMO notified the Contractor to treat the effluents from the construction area using the turbid water treatment plant and improve the construction site waste water management. This brought the TSS level down to about 10.7 mg/l in late June 2016.

Figure 3-6: Map of the effluent monitoring locations for construction areas



Key results of the construction area discharge monitoring are described below. Parameters that are above the prescribed Standards are highlighted in yellow and presented in the Table 3-17 below:

Table 3-17: Results of the construction area discharge monitoring from April to June 2016

Month-Year	Parameter (Unit)	Site Name	CVC Plant Site	Spoil Disposal No.2	Regulation Dam	RCC Plant Site	Main Dam
		Station	**DS03**	**DS04**	**DS08**	**DS09**	**DS11**
		Lao National Standard					
Apr-16	pH	6.0-9.0	N/A*	6.15	7.53	N/A*	7.73
Apr-16	pH	6.0-9.0	N/A*	N/A*	7.23	8.12	8.69
May-16	pH	6.0-9.0	N/A*	5.92	7.49	6.98	8.94
May-16	pH	6.0-9.0	9.71	5.62	7.43	7.44	8.68
Jun-16	pH	6.0-9.0	8.98	6.35	7.87	8.63	8.09
Jun-16	pH	6.0-9.0	N/A*	6.59	7.26	8.17	7.06
Apr-16	TSS (mg/l)	<50	N/A*	13,240	ND[16]	N/A*	177
Apr-16	TSS (mg/l)	<50	N/A*	N/A*	13.00	28	48.8
May-16	TSS (mg/l)	<50	N/A*	17.8	ND[16]	45.5	38.1
May-16	TSS (mg/l)	<50	No Sampling	76.7	46.90	1,001	12.8
Jun-16	TSS (mg/l)	<50	16,426	225.0	302.00	27,850	80.4
Jun-16	TSS (mg/l)	<50	N/A*	9.1	11.2	165.0	10.7

Note: N/A means data 'not available' due to no discharge into the environment*

ND[1] (<0.0005 mg/L)	ND[2] (<0.0003 mg/L)	ND[3] (<0.0002 mg/L)	ND[4] (<0.005 mg/L)	ND[5] (<0.003 mg/L)
ND[6] (<0.09 mg/L)	ND[7] (<0.07 mg/L)	ND[8] (<0.04 mg/L)	ND[9] (<0.02 mg/L)	ND[10] (<0.01 mg/L)
ND[11] (<0.3 mg/L)	ND[12] (<0.2 mg/L)	ND[13] (<1.0 mg/L)	ND[14] (<1.5 mg/L)	ND[15] (<4.0 mg/L)
ND[16] (<5.0 mg/L)	ND[17] (<2.7 mg/L)			

3.5.3 Groundwater Quality Monitoring

The groundwater quality was monitored in three boreholes of Ban Hatsaykham installed by NNP1PC and a private well in Ban Hat Gniun. The boreholes of Ban Hatsaykham are used for drinking, washing, cooking and bathing purposes for 42 households, whereas the private well in Ban Hat Gniun is used by 6 households for washing and bathing purpose only. In addition, in June 2016, a groundwater sample was collected from one out of six wells installed at the Houay Soup Resettlement Area (HSRA) as a baseline data.

All the groundwater samples were tested for twenty one (21) parameters including:

a. *Monthly:* Physical parameters [pH, DO (%), DO (mg/l), Conductivity (µs/cm), TDS (mg/l), Temperature (^{o}C), Turbidity (NTU), Faecal Coliform (MPN/100 ml) and E. coli (MPN/100 ml)];

b. *Quarterly:* Chemical parameters [Arsenic (mg/l), Cadmium (mg/l), Calcium (mg/l), Iron (mg/l), Magnesium (mg/l), Manganese (mg/l), Potassium (mg/l), Sodium (mg/l), Fluoride (mg/l), Nitrate (mg/l), Nitrite (mg/l) and Total Hardness (mg/l)].

Figure 3-7: Map of groundwater sampling sites at Hatsaykham and Hat Gniun villages

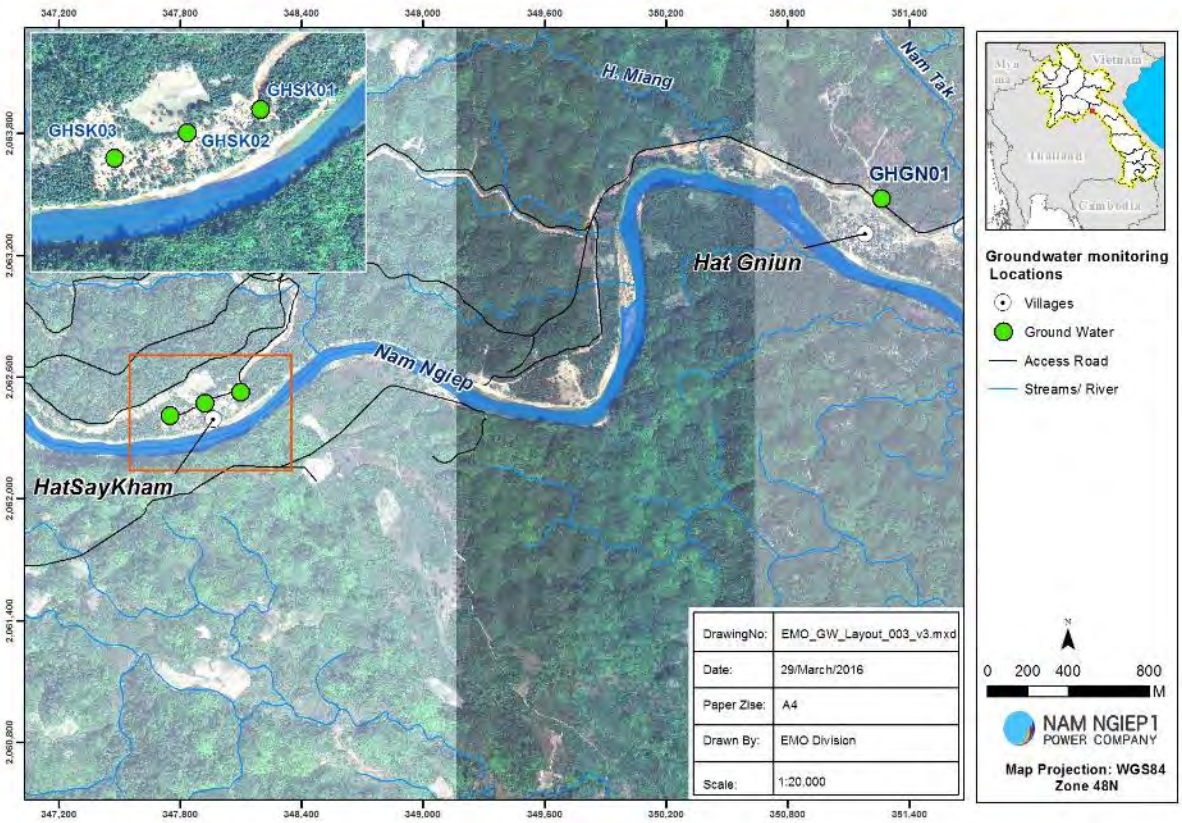


Table 3-18: Results of the groundwater quality monitoring from April to June 2016

Month Year	Parameter (Unit)	Site Name	Ban Hatsaykham			Ban Hat Gniun	Houay Soup Resettlement
		Station Code	GHSK01	GHSK02	GHSK03	GHGN01	GHSPO4
		Guideline					
Apr-16	pH	6.5-9.2	5.81	5.69	5.84	5.15	N/A
May-16	pH	6.5-9.2	5.44	5.69	5.71	5.05	N/A
Jun-16	pH	6.5-9.2	8.01	N/A	6.75	6.34	6.08
Apr-16	Turbidity (NTU)	<20	0.02	0.03	0.02	1.27	N/A
May-16	Turbidity (NTU)	<20	1.06	0.53	0.26	3.72	N/A
Jun-16	Turbidity (NTU)	<20	0.06	N/A	0.19	35.9	0.13
Apr-16	Fecal coliform (MPN/100ml)	0	0	0	0	49	N/A
May-16	Fecal coliform (MPN/100ml)	0	0	0	0	110	N/A
Jun-16	Fecal coliform (MPN/100ml)	0	0	N/A	0	1,300	0
Apr-16	E.coli Bacteria (MPN/100ml)	0	0	0	0	49	N/A
May-16	E.coli Bacteria (MPN/100ml)	0	0	0	0	110	N/A
Jun-16	E.coli Bacteria (MPN/100ml)	0	0	N/A	0	1,300	0

Key findings of groundwater quality monitoring are summarized as the following:

Ban Hatsaykham: All parameters monitored complied with the relevant Standards, except with respect to pH (for April and May 2016) which for all three boreholes (GHSK01, GHSK02 & GHSK03) was slightly lower than the Standard minimum level. However such low pH levels do not pose any risk to human health.

Ban Hat Gniun: During the Second Quarter of 2016, the pH levels were lower than the National Standard range of between 6.50 and 9.20. The low level of pH does not pose any risk to human health. The faecal coliform and E.coli bacteria contamination levels exceed the National Standard. The measured concentrations of E.coli indicate recent faecal contamination and the possible presence of disease-causing pathogens. This means that the water is not safe to drink. NNP1PC regularly communicate the water quality results to the local authorities, and the Company follows up with awareness raising in the village.

Houay Soup Resettlement Area: All parameters monitored complied with the Standard except pH which was slightly lower than the Standard minimum level. However, such low pH does not pose any risk to human health.

3.5.4 Gravity Fed Water Supply (GFWS) Monitoring

The GFWS monitoring was carried out by the EMO during the Second Quarter of 2016 to monitor and assess the quality of the water that is being used for bathing and washing by the villagers of Ban Hat Gniun and Ban Thahuea. Water samples were taken from the tap for analysis. The results are shown in Table 4-19 and described below.

Table 3-19: Water quality results of the GFWS monitoring from April to June 2016

Month Year	Parameter (Unit)	Site Name	Ban Thaheua	Ban HatGnuin
		Station	WTHH02	WHGN02
		Guideline		
Apr-16	Faecal Coliform (MPN/100ml)	0	0	6.9
May-16	Faecal Coliform (MPN/100ml)	0	23	23
Jun-16	Faecal Coliform (MPN/100ml)	0	23	23
Apr-16	E.coli Bacteria (MPN/100ml)	0	0	6.9
May-16	E.coli Bacteria (MPN/100ml)	0	23	23
Jun-16	E.coli Bacteria (MPN/100ml)	0	23	23

Ban Thahuea (WTHH02): All parameters complied with the National Drinking Water Standard, except the faecal coliform and E.Coli bacteria parameters which were measured 23 MPN/100 ml in May and June 2016 which was above the National Standard (0 MPN/100 ml).

Ban Hat Gniun (WHGN02): All parameters complied with the National Drinking Water Standard, except faecal coliforms and E.Coli bacteria which were measured 6.9 MPN/100ml (April 2016) and 23 MPN/100ml (May and June 2016) above the National Standard (0 MPN/100 ml).

The level of bacterial contamination detected in the Gravity Feed Water Supply in Ban Thahuea and Ban Hat Gniun means that the water is not safe to drink, but it is not likely to cause significant concerns for bathing and washing purposes (for persons who can avoid swallowing the water). The villagers have been advised through the SMO to boil the water before drinking.

3.5.5 Air Quality (Dust) Monitoring

3.5.5.1 Ambient Air Quality in the Host Villages

The ambient air quality monitoring for dust was carried out for 72 consecutive hours in the villages closest to the project construction sites (Ban Hatsaykham, Ban Thahuea and Ban Hat Gniun). The monitoring was also carried out on the weekend to obtain a record of at least 20 hours of background conditions. The main purpose of the dust monitoring in Ban Hatsaykham, Ban Hat Gniun and Ban Thahuea is to assess if the project construction works and the project related traffic passing through the villages caused elevated levels of dust in the ambient air. The dust emission monitoring for Ban Thahuea was stopped since February 2016 since this site is located approximately 6 Km away from the construction sites and the road passing through these villages was paved with asphalt concrete.

The records in all village were within the Lao National Environmental Standard for Air Quality of 0.12 mg/m^3. The average results of dust emission monitoring in 24 hours during the Second Quarter 2016 are shown in Figure 4-8 and summarized in Table 3-20.

Figure 3-8: Noise and dust monitoring locations for Project nearby villages and construction sites

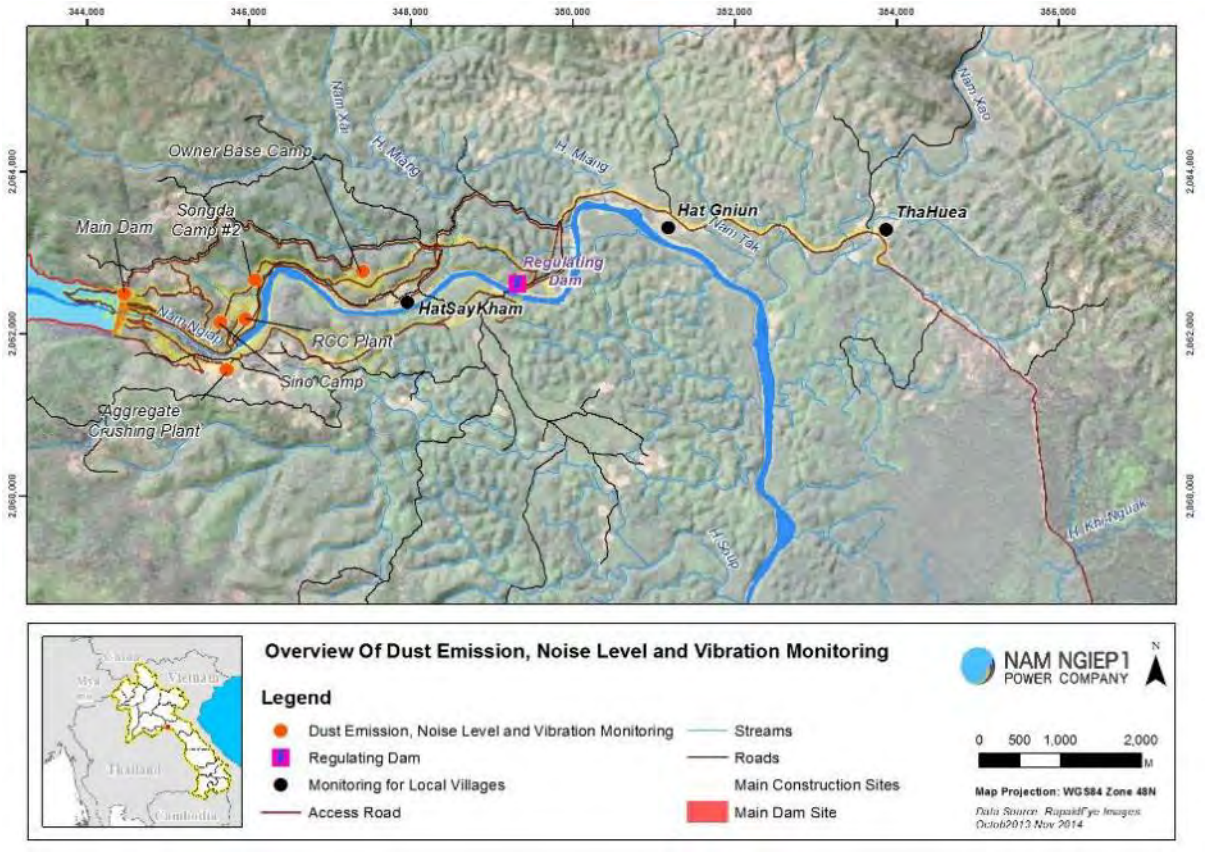


Table 3-20: Air quality (dust) monitoring results for villages near to the Project from April to June 2016

Hatsaykham Village - Average Dust Level in 24 h – April 2016			
Period	00-24 Hours	24-48 Hours	48-72 Hours
Start Time	21/04/2016 13:23	22/04/2016 13:23	23/04/2016 13:23
End Time	22/04/2016 13:23	23/04/2016 13:23	24/04/2016 13:22
Average Value Recorded in 24 h	0.06	0.06	0.11
Guideline Average in 24 h	***0.12***	***0.12***	***0.12***
Hatsaykham Village - Average Dust Level in 24 h – May 2016			
Period	00-24 Hours	24-48 Hours	48-72 Hours
Start Time	08/05/2016 15:19	09/05/2016 15:19	10/05/2016 15:19
End Time	09/05/2016 15:19	10/05/2016 15:19	11/05/2016 15:19
Average Value Recorded in 24 h	0.04	0.07	0.05
Guideline Average in 24 h	***0.12***	***0.12***	***0.12***
Hatsaykham Village- Average Dust Level in 24 h – June 2016			
Period	00-24 Hours	24-48 Hours	48-72 Hours
Start Time	05/06/2016 12:56	06/06/2016 12:56	07/06/2016 12:56
End Time	06/06/2016 12:56	07/06/2016 12:56	08/06/2016 12:56
Average Value Recorded in 24 h	0.03	0.02	0.02
Guideline Average in 24 h	***0.12***	***0.12***	***0.12***
Hat Gniun Village – Average Dust Level in 24 h – April 2016			
Period	00-24 Hours	24-48 Hours	48-72 Hours
Start Time	24/04/2016 15:52	25/04/2016 15:52	26/04/2016 15:52
End Time	25/04/2016 15:52	26/04/2016 15:52	27/04/2016 14:51
Average Value Recorded in 24 h	0.07	0.04	0.08
Guideline Average in 24 h	***0.12***	***0.12***	***0.12***
Hat Gniun Village– Average Dust Level in 24 h – May 2016			
Period	00-24 Hours	24-48 Hours	48-72 Hours
Start Time	05/05/2016 14:18	06/05/2016 14:18	07/05/2016 14:18
End Time	06/05/2016 14:18	07/05/2016 14:18	08/05/2016 14:18
Average Value Recorded in 24 h	0.09	0.06	0.07
Guideline Average in 24 h	***0.12***	***0.12***	***0.12***
Hat Gniun Village– Average Dust Level in 24 h – June 2016			
Period	00-24 Hours	24-48 Hours	48-72 Hours
Start Time	16/06/2016 12:31	17/06/2016 12:31	18/06/2016 12:31
End Time	17/06/2016 12:31	18/06/2016 12:31	19/06/2016 12:31
Average Value Recorded in 24 h	0.03	0.03	0.02
Guideline Average in 24 h	***0.12***	***0.12***	***0.12***

3.5.5.2 Project Construction Sites

During the Second Quarter of 2016, the dust monitoring was carried out at priority project construction sites for 24 hours consecutively on a monthly basis at six construction sites including the Aggregate Crushing Plant, RCC Plant, Main Dam, Sino Hydro Camp, Songda5 Camp#2 (to assess possible impact on worker's health) and Owner's Site Office and Village (to monitor the ambient dust levels). The results of dust monitoring in these construction sites are summarized in Table 3-21. All results were recorded within the Lao National Environmental Standard for Air Quality of 0.12 mg/m^3 (24 hour mean).

Table 3-21: Dust Monitoring Results from April to June 2016 – Project Construction Sites

Aggregate Crushing Plant - Average Dust Level in 24 h – Second Quarter 2016			
Month	April 2016	May 2016	June 2016
Start Time	18/04/2016 10:39	04/05/2016 13:03	24/06/2016 10:37
End Time	19/04/2016 10:39	05/05/2016 13:03	25/06/2016 10:37
Average Value Recorded in 24 h	0.074	0.066	0.045
Guideline Average in 24 h	***0.12***	***0.12***	***0.12***
RCC Plant – Average Dust Level in 24 h – Second Quarter 2016			
Month	April 2016	May 2016	June 2016
Start Time	27/04/2016 15:56	03/05/2016 10:07	20/06/2016 11:21
End Time	28/04/2016 15:56	04/05/2016 10:07	21/06/2016 11:21
Average Value Recorded in 24 h	0.066	0.070	0.024
Guideline Average in 24 h	***0.12***	***0.12***	***0.12***
Songda5 Camp No.2 – Average Dust Level in 24 h – Second Quarter 2016			
Month	April 2016	May 2016	June 2016
Start Time	05/04/2016 10:48	20/05/2016 10:19	13/06/2016 10:57
End Time	06/04/2016 10:48	21/05/2016 10:19	14/06/2016 10:57
Average Value Recorded in 24 h	0.06	0.03	0.02
Guideline Average in 24 h	***0.12***	***0.12***	***0.12***
Sino Hydro Camp - Average Dust Level in 24 h – Second Quarter 2016			
Month	April 2016	May 2016	June 2016
Start Time	19/04/2016 11:30	23/05/2016 10:20	15/06/2016 11:38
End Time	20/04/2016 09:59	24/05/2016 10:20	16/06/2016 11:38
Average Value Recorded in 24 h	0.070	0.024	0.021
Guideline Average in 24 h	***0.12***	***0.12***	***0.12***
Main Dam - Average Dust Level in 24 h – Second Quarter 2016			
Month	April 2016	May 2016	June 2016
Start Time	20/04/2016 10:39	24/05/2016 12:02	01/06/2016 10:03
End Time	21/04/2016 10:39	25/05/2016 10:33	02/06/2016 10:03
Average Value Recorded in 24 h	0.096	0.033	0.047
Guideline Average in 24 h	***0.12***	***0.12***	***0.12***
Owner's Site Office and Village - Average Ambient Dust Level in 24 h – Second Quarter 2016			
Month	April 2016	May 2016	June 2016
Start Time	04/04/2016 09:48	13/05/2016 09:29	10/06/2016 09:32
End Time	05/04/2016 09:48	14/05/2016 09:29	11/06/2016 09:32
Average Value Recorded in 24 h	0.041	0.048	0.014
Guideline Average in 24 h	***0.12***	***0.12***	***0.12***

3.5.6 Noise Monitoring

3.5.6.1 Host Villages

The noise monitoring was carried out in Hatsaykham, Hat Gniun and Thahuea villages from 10:50 in the morning for 72 consecutive hours. The monitoring was carried out on a non-working day (Sunday), to obtain a record of at least 20 hours of background conditions. The recorded values were measured against the Standards (maximum mean noise levels for daytime 06:00-18:00, evening 18:00-22:00 and night time 22:00-06:00; and the maximum peak noise level.

The noise monitoring for Ban Thahuea was stopped since February 2016 as it is located approximately 6 km away from the Project construction sites. Therefore, this village is not significant for conducting a noise monitoring.

The results revealed that all recorded results from the monitored villages were within the allowable maximum peak value of 115 dB(A). The mean noise level occasionally exceeded the standard is described below:

- The recorded average noise level during the night time from 22:01 -06:00 on 06 to 07 February 2016 in Ban Hatsaykham was slightly higher than the allowable value of 45 dB(A), the results are demonstrated in **Table 3-22** below. The main source of the elevated noise level was the rain event which occurred during the monitoring period.
- In January 2016, the average noise level in Ban Hat Gniun from 18:01-22:00 and 22:01-06:00 were higher than the Standard with recorded values range of 49.3 dB(A) to 66.52 dB(A). The local entertainment activities and windy condition were the key factors causing this high noise level.

Table 3-22: Noise monitoring results from April to June 2016 for host villages

Ban Hatsaykham-Noise Monitoring 72 consecutive hours-April 2016										
Noise Level (dB)	**21-22/04/2016**			**22-23/04/2016**			**23-24/04/2016**			**24/04/2016**
	13:40-18:00	18:01 – 22:00	22:01 – 06:00	06:01 – 18:00	18:01 – 22:00	22:01 – 06:00	06:01 – 18:00	18:01 – 22:00	22:01 – 06:00	06:01 - 13:40
Maximum Value Recorded	67.00	74.90	102.90	80.90	81.20	87.40	65.90	60.10	61.60	66.20
Guideline Max	115	115	115	115	115	115	115	115	115	115
Average Data Recorded	44.66	46.19	47.33	46.48	48.71	49.78	45.22	46.84	47.74	46.91
Guideline Averaged	55	55	45	55	55	45	55	55	45	55
Ban Hatsaykham-Noise Monitoring 72 consecutive hours-May 2016										
Noise Level (dB)	**08-09/05/2016**			**09-10/05/2016**			**10-11/05/2016**			**11/05/2016**
	15:31-18:00	18:01 – 22:00	22:01 – 06:00	06:01 – 18:00	18:01 – 22:00	22:01 – 06:00	06:01 – 18:00	18:01 – 22:00	22:01 – 06:00	06:01 - 15:31
Maximum Value Recorded	69.40	62.60	61.60	71.60	64.70	65.70	72.20	60.90	67.50	64.60
Guideline Max	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***
Average Data Recorded	45.89	46.03	46.94	48.06	46.30	47.39	48.63	45.36	46.20	49.66
Guideline Averaged	***55***	***55***	***45***	***55***	***55***	***45***	***55***	***55***	***45***	***55***
Ban Hatsaykham-Noise Monitoring 71 consecutive hours-June 2016										
Noise Level (dB)	**05-06/06/2016**			**06-07/06/2016**			**07-08/06/2016**			**08/06/2016**
	13:04-18:00	18:01 – 22:00	22:01 – 06:00	06:01 – 18:00	18:01 – 22:00	22:01 – 06:00	06:01 – 18:00	18:01 – 22:00	22:01 – 06:00	06:01 - 12:14
Maximum Value Recorded	71.80	74.60	82.90	82.60	86.40	66.40	77.20	78.20	80.00	84.00
Guideline Max	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***
Average Data Recorded	53.80	51.16	52.83	52.70	53.82	50.63	52.04	51.63	52.46	64.42
Guideline Averaged	***55***	***55***	***45***	***55***	***55***	***45***	***55***	***55***	***45***	***55***

Ban Hat Gnuin -Noise Monitoring 72 consecutive hours-April 2016										
Noise Level (dB)	24-25/04/2016			25-26/04/2016			26-27/04/2016			27/04/2016
	13:40-18:00	18:01 – 22:00	22:01 – 06:00	06:01 – 18:00	18:01 – 22:00	22:01 – 06:00	06:01 – 18:00	18:01 – 22:00	22:01 – 06:00	06:01 - 13:40
Maximum Value Recorded	73.00	73.40	94.40	73.70	70.90	73.70	76.50	69.60	74.10	72.60
Guideline Max	**115**	**115**	**115**	**115**	**115**	**115**	**115**	**115**	**115**	**115**
Average Data Recorded	49.99	54.11	55.97	48.65	55.47	51.71	49.86	51.00	50.63	51.21
Guideline Averaged	**55**	**55**	**45**	**55**	**55**	**45**	**55**	**55**	**45**	**55**
Ban Hat Gnuin -Noise Monitoring 72 consecutive hours-May 2016										
Noise Level (dB)	05-06/05/2016			06-07/05/2016			07-08/05/2016			08/05/2016
	14:26-18:00	18:01 – 22:00	22:01 – 06:00	06:01 – 18:00	18:01 – 22:00	22:01 – 06:00	06:01 – 18:00	18:01 – 22:00	22:01 – 06:00	06:01 - 14:26
Maximum Value Recorded	65.20	67.50	71.40	97.60	72.40	69.80	73.60	69.80	80.60	79.20
Guideline Max	**115**	**115**	**115**	**115**	**115**	**115**	**115**	**115**	**115**	**115**
Average Data Recorded	48.66	54.06	55.81	52.78	52.61	49.96	47.99	52.99	51.56	50.14
Guideline Averaged	**55**	**55**	**45**	**55**	**55**	**45**	**55**	**55**	**45**	**55**
Ban Hat Gnuin -Noise Monitoring 72 consecutive hours-June 2016										
Noise Level (dB)	16-17/06/2016			17-18/06/2016			18-19/06/2016			19/06/2016
	12:54-18:00	18:01 – 22:00	22:01 – 06:00	06:01 – 18:00	18:01 – 22:00	22:01 – 06:00	06:01 – 18:00	18:01 – 22:00	22:01 – 06:00	06:01 - 12:54
Maximum Value Recorded	66.30	75.90	86.80	78.40	68.10	73.70	77.60	66.80	65.90	80.20
Guideline Max	**115**	**115**	**115**	**115**	**115**	**115**	**115**	**115**	**115**	**115**
Average Data Recorded	47.71	50.62	50.32	54.25	51.08	47.79	50.40	49.73	46.34	47.18
Guideline Averaged	**55**	**55**	**45**	**55**	**55**	**45**	**55**	**55**	**45**	**55**

3.5.6.2 Project Camps and Construction Sites

During the Second Quarter of 2016, noise monitoring was also conducted at the Aggregate Crushing Plant, RCC Plant, Sino Hydro Camp and Song Da 5 Camp No.2, Main Dam and Owner's Site Office and Village mainly in order to assess possible impacts on workers' health as well as to estimate any potential impact on the ambient noise levels in the surrounding areas.

The assessment found that all maximum peak noise levels were within the National Standard. The monitoring suggested that the mean noise level during 22:00-06:00 at Song Da 5 Camp No.2 was slightly higher than the National standard (<50 dB(A)). The exceedance noise level at Song Da Camp No.2 was likely caused by the windy weather conditions during the night.

The ESMMP-CP states that all workers must wear appropriate ear protection equipment if they are exposed to the noise levels that is greater than 80 dB(A).

Table 3-23: Noise monitoring results for Project construction sites from April to June 2016

Site Name	Aggregate Crushing Plant - Noise Monitoring 24 Hours Consecutively - Second Quarter 2016								
Month	Apr-16			May-16			Jun-16		
Noise Level (dB)	18-19/04/2016		19/04/2016	04-05/05/2016		05/05/2016	24-25/06/2016		25/06/2016
	10:50 – 22:00	22:01 – 06:00	06:01-10:50	13:15 – 22:00	22:01 – 06:00	06:01-13:15	13:15 – 22:00	22:01 – 06:00	06:01-13:15
Maximum Value Recorded	84.3	66.1	82.5	84.30	62.00	74.40	85.50	82.70	66.50
Guideline Max	***115***	***115***	***115***	**115**	**115**	**115**	**115**	**115**	**115**
Average Data Recorded	48.32	46.26	51.38	63.84	51.79	52.17	67.16	66.25	48.70
Guideline Averaged	***70***	***50***	***70***	**70**	**50**	**70**	**70**	**50**	**70**

Site Name	RCC Plant - Noise Monitoring 24 Hours Consecutively - Second Quarter 2016								
Month	Apr-16			May-16			Jun-16		
Noise Level (dB)	27-28/04/2016		28/04/2016	03-04/05/2016		04/05/2016	20-21/06/2016		21/06/2016
	16:04 – 22:00	22:01 – 06:00	06:01-16:04	10:11 – 22:00	22:01 – 06:00	06:01-10:11	11:14 – 22:00	22:01 – 06:00	06:01-11:14
Maximum Value Recorded	73.4	60.5	76.8	89.8	82.5	80.4	67.3	72.1	70.6
Guideline Max	**115**	**115**	**115**	**115**	**115**	**115**	**115**	**115**	**115**
Average Data Recorded	64.52	54.23	64.01	56.82	55.76	61.26	54.77	53.58	54.51
Guideline Averaged	***70***	***50***	***70***	***70***	***50***	***70***	***70***	***50***	***70***

Site Name	Sino Hydro Camp - Noise Monitoring 24 Hours Consecutively - Second Quarter 2016								
Month	Apr-16			May-16			Jun-16		
Noise Level (dB)	19-20/04/2016		20/04/2016	23-24/05/2016		24/05/2016	15-16/06/2016		16/06/2016
	11:42 – 22:00	22:01 – 06:00	06:01-10:16	10:38 – 22:00	22:01 – 06:00	06:01-10:38	11:59 – 22:00	22:01 – 06:00	06:01-11:59
Maximum Value Recorded	66.9	86.3	83.7	77.2	88.5	83.5	75.7	83.5	73.9
Guideline Max	***115***	***115***	***115***	**115**	**115**	**115**	**115**	**115**	**115**
Average Data Recorded	53.47	54.46	58.81	60.56	66.48	60.86	60.07	58.93	61.62
Guideline Averaged	***70***	***50***	***70***	**70**	**50**	**70**	**70**	**50**	**70**

Site Name	Song Da5 Camp No.2 - Noise Monitoring 24 Hours Consecutively - Second Quarter 2016								
Month	Apr-16			May-16			Jun-16		
Noise Level (dB)	05-06/04/2016		06/04/2016	20-21/05/2016		21/05/2016	13-14/06/2016		14/06/2016
	10:55 – 22:00	22:01 – 06:00	06:01-10:55	10:34 – 22:00	22:01 – 06:00	06:01-10:34	11:01 – 22:00	22:01 – 06:00	06:01-11:01
Maximum Value Recorded	73.7	70.2	75.2	84.9	63.1	65.5	75.5	77	67
Guideline Max	**115**	**115**	**115**	**115**	**115**	**115**	**115**	**115**	**115**
Average Data Recorded	49.31	54.07	52.56	55.80	51.74	52.79	55.65	54.88	56.27
Guideline Averaged	***70***	***50***	***70***	***70***	***50***	***70***	***70***	***50***	***70***

Site Name	Main Dam - Noise Monitoring 24 Hours Consecutively - Second Quarter 2016								
Month	Apr-16			May-16			Jun-16		
Noise Level (dB)	20-21/04/2016		21/04/2016	27-28/05/2016		28/05/2016	01-02/06/2016		02/06/2016
	10:55 – 22:00	22:01 – 06:00	06:01-10:55	10:33 – 22:00	22:01 – 06:00	06:01-10:33	10:13 – 22:00	22:01 – 06:00	06:01-10:13
Maximum Value Recorded	67.1	68.7	65.7	60.5	89.4	76.5	73.7	79.2	58.4
Guideline Max	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***
Average Data Recorded	48.73	51.67	50.43	53.30	59.52	57.00	53.12	53.77	52.32
Guideline Averaged	***70***	***50***	***70***	***70***	***50***	***70***	***70***	***50***	***70***

Site Name	Owner's Site Office and Village - Noise Monitoring 24 Hours Consecutively - Second Quarter 2016								
Month	Apr-16			May-16			Jun-16		
Noise Level (dB)	04-05/04/2016		05/04/2016	13-14/05/2016		14/05/2016	10-11/06/2016		11/06/2016
	10:02 – 22:00	22:01 – 06:00	06:01-10:02	09:45 – 22:00	22:01 – 06:00	06:01-09:45	09:53 – 22:00	22:01 – 06:00	06:01-09:53
Maximum Value Recorded	64.4	57.4	54.1	71.2	66.3	55.4	63.2	85.8	53.9
Guideline Max	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***
Average Data Recorded	43.54	52.09	42.15	41.14	56.12	43.34	46.51	56.62	46.78
Guideline Averaged	***70***	***50***	***70***	***70***	***50***	***70***	***70***	***50***	***70***

3.5.7 Vibration

Lao PDR does not have guidelines for vibration. Structural damage from road construction activity (e.g. vibratory rollers) and ancillary activity (e.g. blasting at the quarries) are unlikely to impact on human ad surrounded environment given that the distance from public infrastructure to the construction areas are far from each other.

4. WATERSHED AND BIODIVERSITY MANAGEMENT

4.1 Watershed Management

Obligations	Status by end of the Second Quarter of 2016
Prepare a draft Watershed Management Plan by 31 July 2016	Development of the Nam Ngiep 1 Watershed Management Plan is in progress: • Further analysis and discussion on identification of issues and thematic areas of activity, • Integrated analysis with the planning team involving both Biodiversity and Fishery Consultants
Prepare draft Watershed Management Regulations by 31 July 2016	Initial discussions during the technical workshop in late June 2016 on the content of the provincial watershed regulations based on the experiences in Xaysomboun and Bolikhamxay Province

Obligations	Status by end of the Second Quarter of 2016
Final Watershed Management Plan by 31 October 2016	Not relevant for this quarter
Final Watershed Management Regulations by 31 January 2017	Not relevant for this quarter

- Further analysis and discussion on identification of issues and thematic areas of activity,
- Integrated analysis with the planning team involving both Biodiversity and Fishery Consultants

Activities in the Second Quarter of 2016	Results
Technical workshop in the fourth week of June 2016	**Workshop participants** The Watershed and Reservoir Protection Committee (WRPC), the Watershed and Reservoir Protection Office (WRPO), NNP1PC, Xaysomboun District ISP team, NNP1PC Biodiversity Consultant and NNP1PC Fishery Consultant **Workshop results** • Reviewed and revised the vision of the NNP1 WMP. • Cross validated the issue analysis that further link with the formulation of activity packages (goals, objectives, indicators and activities) for the thematic areas of Land use, Biodiversity, Water resource, Fishery, Soil erosion & sedimentation and Livelihood • Discussed the initial content of the draft provincial regulation for WMP that referred to the existing national Laws including Land law, Forest law, wildlife Law, water and water resource Law, Environment Law, related decrees and regulations. • Discussed the inclusion of Nam Xao sub-watershed of approximately 31,145 ha at the eastern part of reservoir sub-watershed due to its confluence to Nam Ngiep River that any activities within the area might impact the reservoir sub-watershed and the downstream watershed.
Xaysomboun Integrated Spatial Planning (ISP)	• The draft of district ISP report has been submitted to Xaysomboun ISP Technical Committee in the middle of June 2016 for further compilation and finalization. • The Committee shared the draft during WMP technical workshop for some data verification/update and to provide reference for further WMP analysis and formulation of activity package under different WMP thematic area. The outcomes of discussion will be elaborated to further improve the draft.
Consultant procurement o **GOL Consultant** o **NNP1 Watershed Consultant Team Leader**	• The candidate for GOL consultant has discussed and agreed with MONRE DFRM on the contract. The contract will be effective from 11 July 2016 to 10 January 2017. • NNP1PC has shortlisted potential candidates for international consultant and completed the technical evaluation. The

Activities in the Second Quarter of 2016	Results
	strongest candidates will be invited for interview and contract negotiation process in the second week of July 2016. The contract is expected to be effective afterward for a period of 4.5 months until submission of final NNP1 WMP with possible extension based on the agreed term.
Implementation of Priority Activity - Watershed boundary survey	• Bolikhamxay and Xaysomboun WRPO completed the field activity of watershed boundary survey in April 2016. In Xaysomboun Province a total of 23 villages including 8 villages close to the watershed boundary were consulted while a total of 5 villages were consulted in Bolikhamxay Province. The WRPO has prepared a survey report that includes the documentation of GPS marking and agreement with concerned villages within and nearby identified NNP1 watershed boundary. • Bolikhamxay WRPO further discussed and conducted general survey in the Nam Xao sub-watershed area at the eastern part of reservoir sub-watershed in May 2016. It was noted that there are 13 villages within and surrounding Nam Xao sub-watershed area in which some villages might need to be consulted for future management activities after inclusion of Nam Xao sub-watershed into NNP1 watershed.
Implementation of Priority Activity - Land use planning activity	• Both Xaysomboun and Bolikhamxay WRPO completed the land use planning at the priority villages as planned, 4 villages in Xaysomboun Province and 7 villages in Bolikhamxay Province. • The report that contains land zoning and minutes of discussion about issues/concerns for future land use management was prepared. The outcomes will serve as a model for future planning exercise in other villages under WMP activity
Implementation of Priority Activity - WRPO Office Construction in Xaysomboun and Borikhamxay	• The construction of the WRPO Offices in both Xaysomboun and Bolikhamxay WRPO were completed in June 2016 and the official opening and announcement is planned to take place in July 2016

Plan for the next quarter	
Xaysomboun Integrated Spatial Planning (ISP)	• Produce final report of Xaysomboun ISP and further process for approval by Xaysomboun Provincial Governor
Consultant procurement	• NNP1 consultant team leader will be on board in the early of 3rd quarter and to further collaborate with the watershed planning team to continue with the development of draft WMP
WMP preparation	• Settle the discussion with ADB on the milestone date and commitment related to WMP

Plan for the next quarter	
	• Produce draft of WMP
Implementation of priority activity	• Continue with the implementation of activities • Maintain regular reporting and further improve its quality

4.2 Biodiversity Management

Obligations	Status by end of the Second Quarter of 2016
Final Biodiversity Offset Survey Report by 30 June 2016	• The consultant completed the final draft survey report on 29 June 2016 and the draft was further submitted to ADB on 30 June 2016.
Draft Offset Options Paper for the Biodiversity Offset Sites by 31 July 2016	• The draft Offset Option Paper will be developed by ADB consultant and the deadline will be shifted.
Consensus building and workshops among stakeholders for the offset site selection by 15 September 2016	• The deadline will be shifted
Final Offset Options Paper for the Biodiversity Offset Sites by 31 October 2016	The deadline will be shifted

Activities in the Second Quarter of 2016	Results
Rapid ground truth survey in Nam Chouane-Nam Sang Watershed (GOL official name for Nam Mouane Watershed), Bolikhamxay Province	• The 1st camera-trap data retrieval by Consultant team was completed on 10 April and the 2nd camera-trap data retrieval by NNP1 team was completed on 30 May 2016. • On 15 June 2016 the Consultant presented the key findings of the ground truth survey to Bolikhamxay Province. Identified gaps in the survey may be filled through the additional survey by ADB Consultant later in 2016. • The consultant completed the final draft ground truth survey report on 29 June 2016 elaborating the results from the 2nd camera trap record and the report was further submitted to ADB on 30 June. • Additional comments are expected from ADB, IAP, BAC and LTA to further finalize the report not later than by August 2016.
Boundary Confirmation Baseline Survey by ADB Consultant	• The TOR was prepared in May 2016. The survey was intended to provide wet season baseline info and assess potential of the adjoining wet evergreen forest which will form the basis of the preparation of Biodiversity Offset Management Plan (BOMP)

Activities in the Second Quarter of 2016	Results
	• NNP1 further progressed with the preparation to provide technical support for the survey including the procurement of National Consultant and discussion with Bolikhamxay Province. • NNP1 has issued an official confirmation to Bolikhamxay Province on 6 June 2016 accepting Nam Chouane-Nam Sang Watershed as the primary designated biodiversity offset site of the Project and requested permission to commence the survey. • Bolikhamxay Province officially responded on 14 June 2016 for the positive acceptance of Nam Chouane-Nam Sang Watershed and advised the following steps to be undertaken prior to commence any further activities related to NNP1 offset program: • Establish NNP1 Biodiversity Offset Management Committee (BOMC) at provincial level; • Establish a Coordination Unit to deal with coordination and implementation of the future activities; • Organize a consultation in the province for the awareness and approval of the offset's project related activities; • Plan the detail baseline survey and long term management plan; • Establish Biodiversity Management Regulations. • Implement the activities as per agreed management plan. • NNP1 has further discussed with Bolikhamxay Provincial Governor on 29 June 2016 and noted that BOMC establishment could be concluded as soon as in the first week of July 2016 then the survey could be commenced afterward. The discussion also noted that the survey in Nam Pan watershed cannot be proceeded because the area was not recognized before by the Province as candidate offset site. The survey in other areas or outside of the Project provinces could be considered in the future only if the evaluation in Nam Chouane-Nam Sang area justifies that more actions are required to meet the ADB Safeguard Policy requirement. Additional discussion is also needed before a decision is made to survey outside the core area of Nam Chouane-Nam Sang area.
3rd and 4th BAC mission	• BAC conducted the 3rd mission from 29 March - 10 April 2016 with the objective to make a field visitation to the Nam Chouane-Nam Sang Watershed and to make an independent initial assessment of the site's potentiality as a suitable biodiversity offset site for the NNP1 Project.

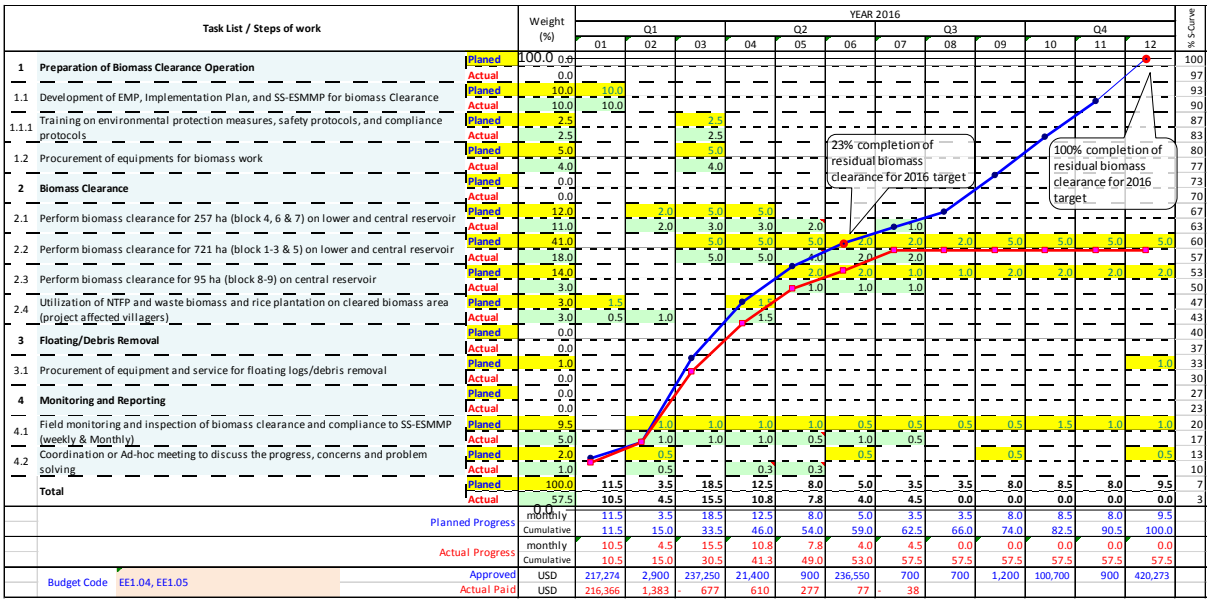
Activities in the Second Quarter of 2016	Results
	• BAC conducted the 4th mission from 12-22 May 2016 with the primary objective to overlap with the missions of IAP, LTA, and ADB including a site visitation to the Nam Chouane-Nam Sang Watershed Biodiversity Offset Site together with IAP, NNP1 EMO, BAC, and PoNRE. A secondary objective of the 4th mission was to carry out a short visitation to Khoun Xe Nong Ma Provincial Protected Area (KXNM PPA) in Khammouane Province to make a first-person rapid assessment of the area. • All BAC mission reports are accessible on NNP1PC website

Plan for the next quarter	
1st BOMC Workshop	• BOMC will commence the 1st BOMC Workshop after its officially established
Boundary confirmation baseline survey by ADB Consultant	• Commence the survey by ADB consultant with technical support from NNP1
NNP1 Biodiversity Baseline Survey	• To procure the consultant and starts conducting biodiversity baseline survey in Nam Chouane-Nam Sang area.

4.3 Biomass Clearance

The overall progress of Biomass Clearance Programme is demonstrated in **Figure 4-1** below.

Figure 4-1 : Gantt Chart of Biomass Clearance Programme as of June 2016



The blue graph highlight represent the planned activity, the red graph highlight represent the actual progress.

Activities in the Second Quarter of 2016	Results
Labour recruitment	• By the end of June 2016, the Contractor-LAUNC employed around 152 villagers with daily labour contract from Ban Namyouak, Ban Nong (Sop Youak), and Ban Sop Phouan for assisting UXO and biomass clearance work. The labour conducting the work in weekly rotational schedule. • In addition, the Contractor also employed around 169 households with lump sum contract for biomass clearing, comprise of 5 households from Ban Nam Youak, 141 households from Ban Nong (Sop Youak) and 23 from Ban Sop Phouan.
Induction/orientation on NNP1 Safety Procedure	A follow up induction/orientation on NNP1 Safety Procedures, Biomass Clearance Safety and NCR/ONC Protocols is scheduled in September 2016
Ground survey and demarcation of priority biomass clearance area	• The Contractor has completed the ground survey and demarcation in Block 1-6. Further survey was also commenced in the registered area for compensation. • The map of priority biomass clearance area was further updated in May 2016 (Figure 4-2).
Vegetation clearance	• The biomass cutting and burning have been completed for around 30 ha in Block 1, 10 ha in Block 2, 132.29 ha in Block 4, 50.70 ha in Block 5, 10 ha in Block 6, and 4 ha in Block 8 totaling of around 96% (237.38 ha) of the target clearance in June 2016. Detailed progress of biomass clearance could be seen in **Table 4-1** and **Figure 4-4**, **Figure 4-5**, Not a valid result for table. and **Figure 4-7**.
Utilization of NTFP, waste biomass and lesser value tree	The join inspection by NNP1 EMO, DAFO and DONRE of Hom District in Block 1, 4-5, and 8-9 estimated that there is around 1,500 m^3 of the cut lesser value tree with the diameter of more than 20 cm that required for further action before the burning schedule in September 2016 at Block 1 and December 2016 at Block 4-5, and 8-9.
Opportunity in the cleared biomass area	There are 142 households from 3 villages (Nam Youak, Sopyouak and Sop Phouan) registered for doing the crop plantation in the cleared biomass area and more than 120 household has started integrated crop plantation (rice, maize, ginger, chili, cucumber, melon, etc.) at Block 4-6.

Plan for the next quarter	
Ground survey and demarcation of priority biomass clearance area	• Complete the ground survey and demarcation of forest areas in Block 7- 9. • Start the ground survey and demarcation in Block 10-18 (middle and upper reservoir)

Vegetation cutting and clearance	• Complete biomass clearance work in Block 1, 4-6 and 8 • Start biomass clearance work in Block 2-3, 7 & 9.
Utilization of NTFP, waste biomass and lesser value tree	• Follow up the GOL action to remove the cut tree with diameter more than 20cm in Block 1, 4-5, and 8-9.
Opportunity in the cleared biomass area	• Monitor the crop plantation by villagers in the cleared biomass area

Figure 4-2: Map of priority biomass clearance areas (updated in May 2016)

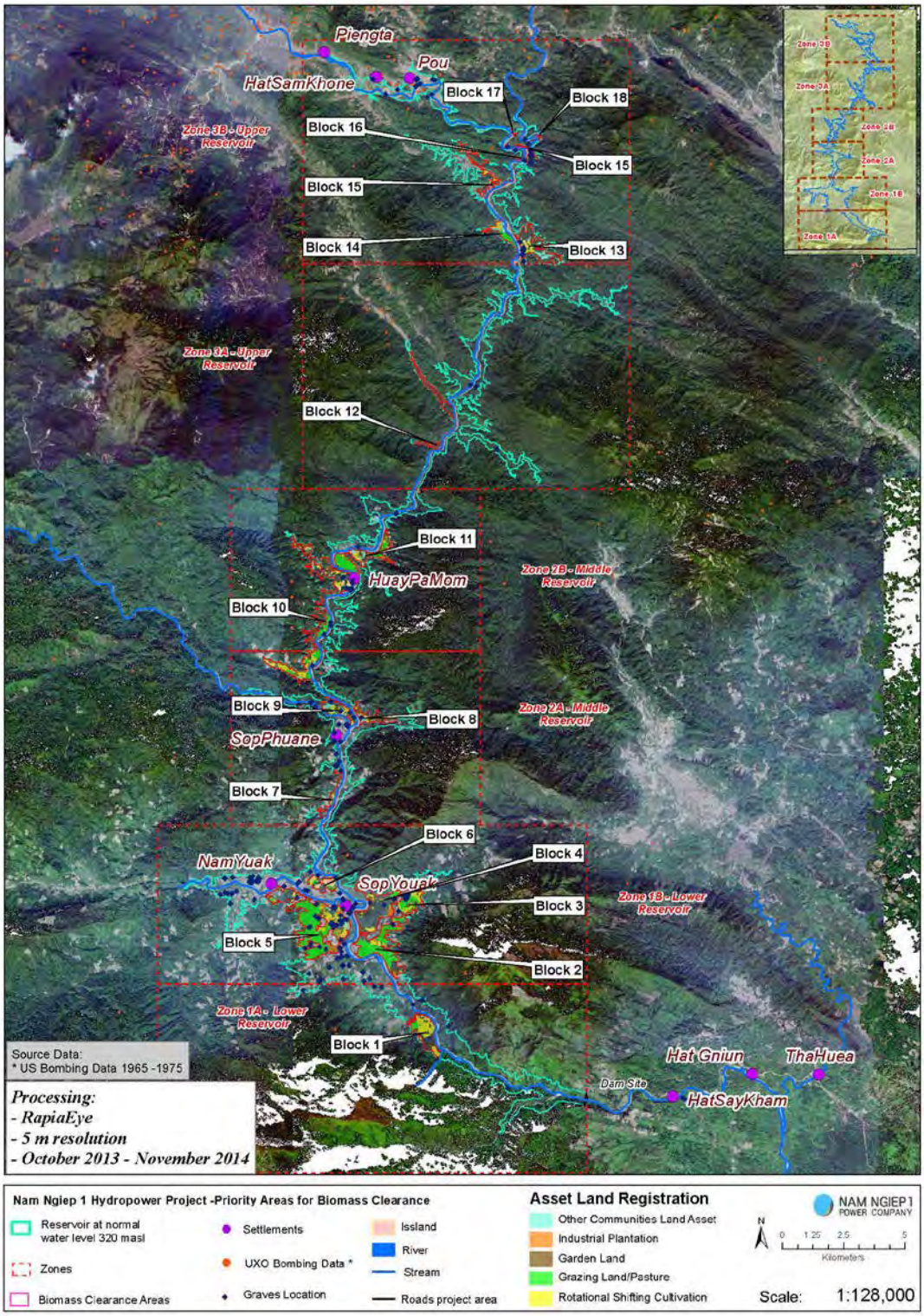
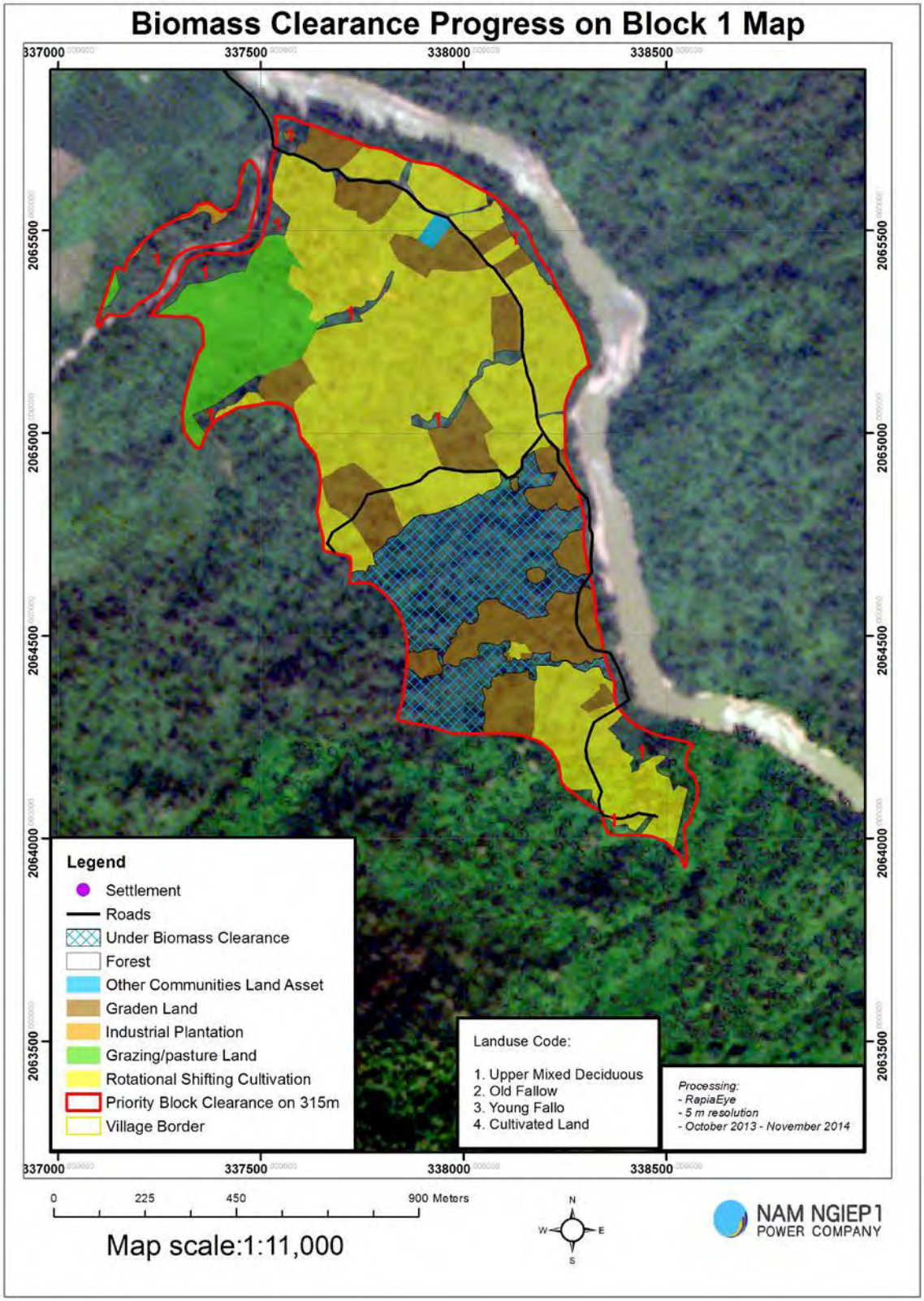


Table 4-1: Progress to date on the biomass clearance

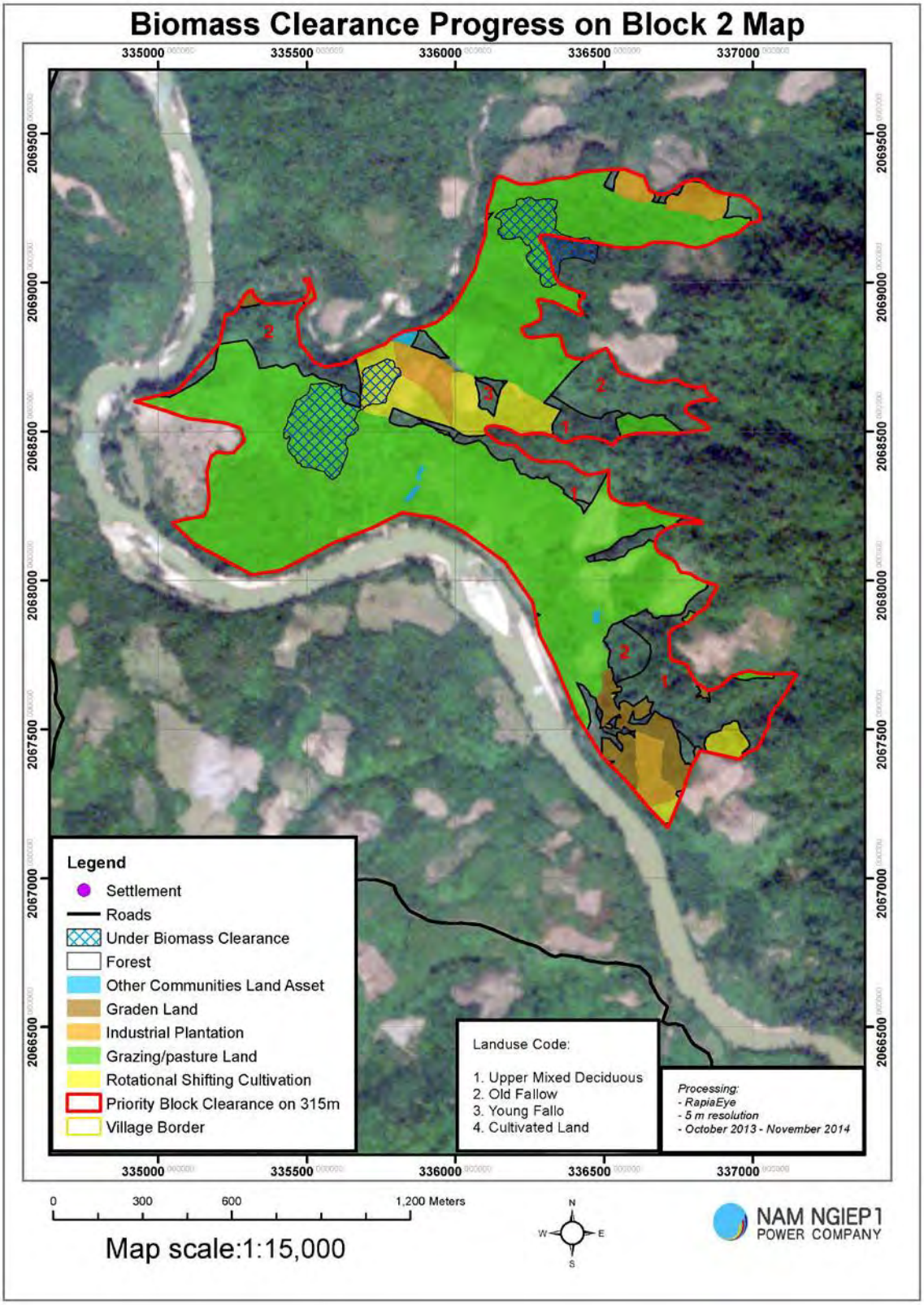
Priority area	Zone	Land Use Classification in Priority Biomass Clearance Area						Target Area for clearance in 2016 (ha)	Status as of June 2016	
		Rotational Shifting Cultivation	Garden Land	Industrial Plantation	Other Communities Land Asset	Maintained Vegetation (315-320 masl)	Forests		Clearance Progress (ha)	Remark
Block 01	1	49.63	20.59	0.05	9.61	6.15	29.35	**115.38**	30.00	On-going biomass cutting and burning
Block 02	1	8.81	5.67	6.30	99.11	7.30	38.72	**165.92**	10.40	Further biomass cutting and final burning after crop harvesting Nov-Dec 2016
Block 03	1	23.78	8.27	2.59	31.28	8.51	14.43	**88.86**	-	Will start in 3rd quarter 2016
Block 04	1	14.68	13.46	2.85	9.78	3.94	122.97	**167.68**	132.28	Final biomass burning after crop harvesting Nov-Dec 2016
Block 05	1	40.32	12.05	30.28	191.07	10.72	66.27	**350.72**	50.70	On-going biomass cutting and burning
Block 06	1	0.22	1.69	1.03	11.19	16.38	16.21	**46.71**	10.00	Further biomass cutting and final burning after crop harvesting Nov-Dec 2016
Block 07	2	6.41	13.73	0.39	0.64	3.39	18.48	**43.03**	-	Will start in 3rd quarter 2016
Block 08	2	12.10	3.04		7.83	3.40	14.64	**41.00**	4.00	On-going vegetation cutting
Block 09	2	18.43	13.38	0.02	9.25	1.38	11.67	**54.13**	-	Will start in 3rd quarter 2016
Total		**174.37**	**91.89**	**43.52**	**369.76**	**61.15**	**332.74**	**1,073.44**	237.38	

Figure 4-3: Map showing the progress of biomass clearance in priority block 1



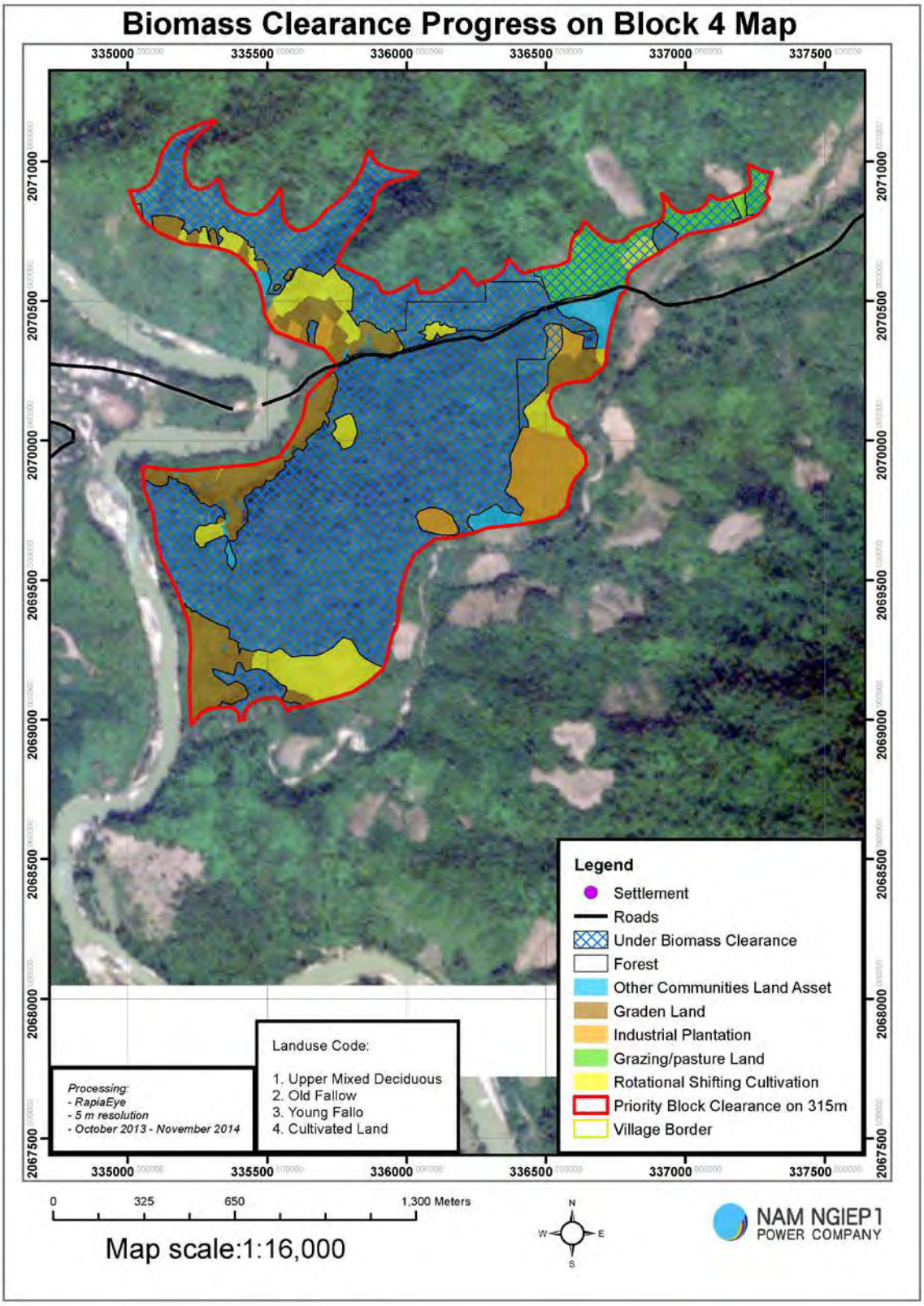
As of end of 2nd quarter 2016, the cleared area in this block is around 30 ha out of target clearing of 115.38 ha.

Figure 4-4: Map showing the progress of biomass clearance in priority block 2



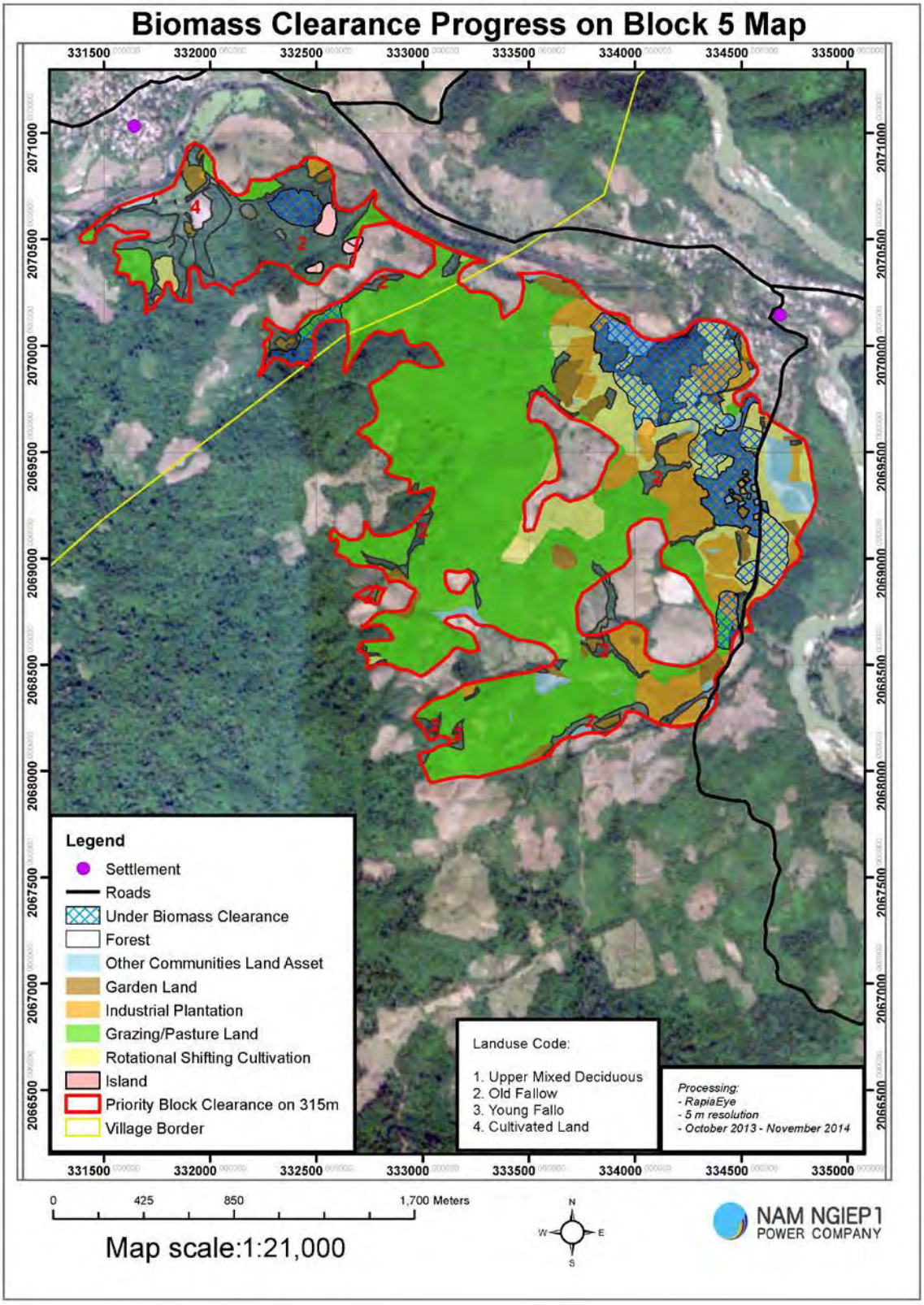
As of end of 2nd quarter 2016, the cleared area in this block is around 10.04 ha out of target clearing of 165.92 ha.

Figure 4-5: Map showing the progress of biomass clearance in priority block 4



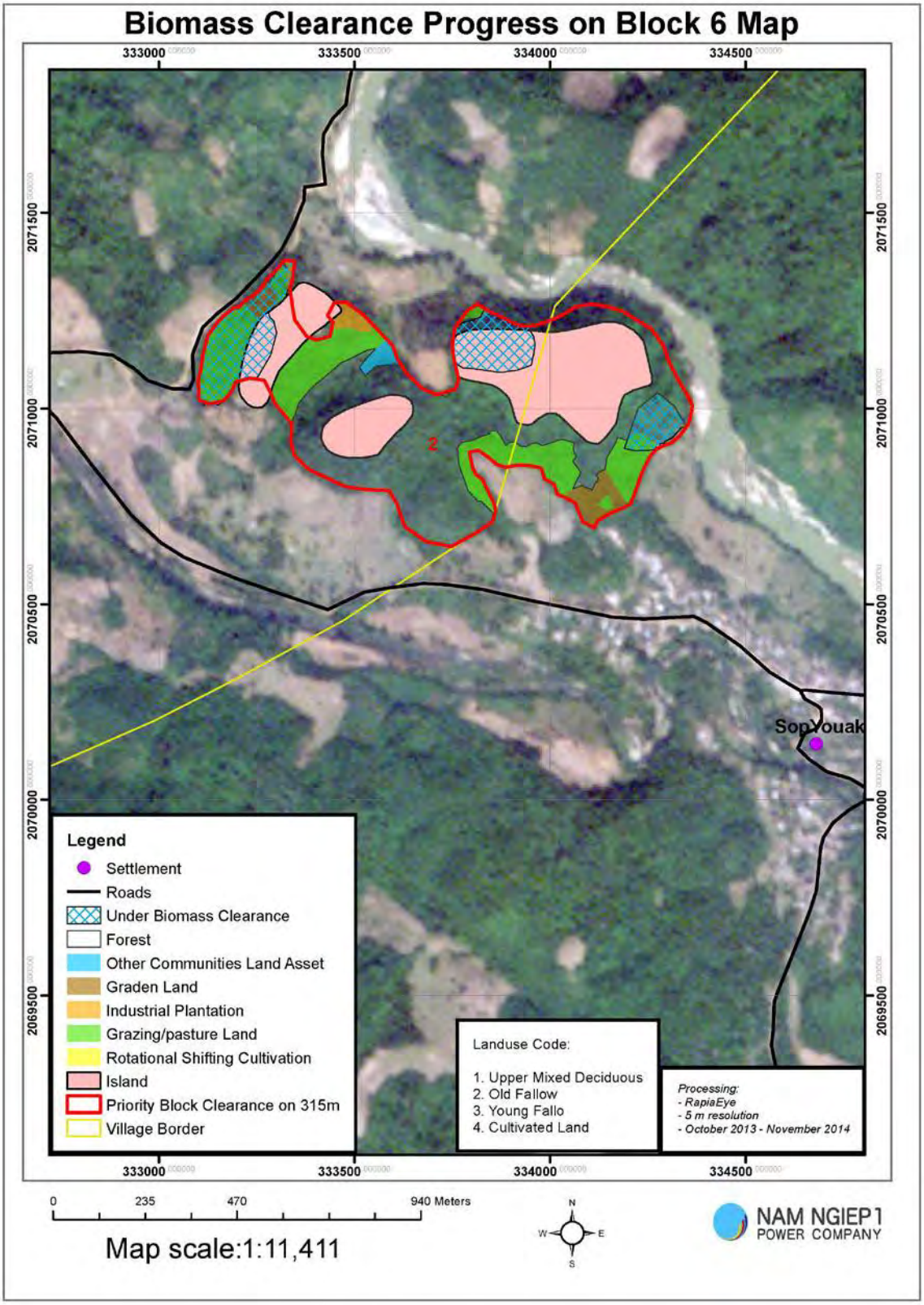
As of end of 2nd quarter 2016, the cleared area in this block is around 132.28 ha out of target clearing of 168 ha.

Figure 4-6: Map showing the progress of biomass clearance in priority block 5



As of end of 2nd quarter 2016, the cleared area in this block is around 50.70 ha out of target clearing of 351 ha.

Figure 4-7: Map showing the progress of biomass clearance in priority block 6



By the end of the Second Quarter of 2016, the cleared area in this block is around 10 ha out of target clearing of 47 ha.

5. OTHER SUPPORT PROGRAMMES

5.1 Nabong Substation Upgrade - Due Diligence Assessment (DDA)

A Due Diligence Assessment (DDA) Report was finalized and submitted to the ADB at the end of May 2016 and no comment has been received to date.

5.2 115 kV Transmission Line IEE Due Diligence Assessment

In April 2016, NNP1PC received the IEE document for the 115 kV Transmission Line. However, an alignment section of the proposed 115 kV Transmission Line would pass through the Houay Ngua Provincial Protected Area (PPA). Therefore, on 22 June 2016, the Bolikhamxay PONRE sent a letter to the Contractor to revoke the first issued Environmental Compliance Certificate dated 11 March 2016. The letter also instructed the Contractor to revise the IEE and realign the Transmission Line to avoid the PPA. A new ECC will be issued if the revised IEE is satisfactory to Bolikhamxay PoNRE

5.3 Missions of the Environmental Management Units (EMU)

No EMU missions were conducted during the Second Quarter of 2016.

5.4 Independent Monitoring Agency (IMA) Procurement

An introductory meeting with the Independent Monitoring Agency (IMA) was carried out in April 2016 followed by the first mission to NNP1 Project during 16-17 June 2016. A debriefing meeting with NNP1PC management will be conducted on 05 August 2016.

5.5 Environmental Protection Fund (EPF)

The sub-project proposal for the protection of Houy Ngoua Provincial Protected Area in Bolikhamxay province utilizing NNP1 fund has been approved by EPF technical committee and Board of Director. The grant agreement was signed in June 2016. The sub-project's proposal for Xaysomboun and Xiengkhuang provinces are being developed in June and will be submitted earlier August for NNP1 review.

6 OCCUPATIONAL HEALTH AND SAFETY

6.1 Safety Organisation

Since issuance of the Notice to Proceed in October 2014 to the Civil Contractor, safety was monitored and managed initially by one Safety Officer employed by NNP1PC, another by the Contractor and one for each sub-contractor. They report to senior management within their organisations and in the case of the Contractor and Sub-contractors, they report to their respective Project Managers. The Contractor has further strengthened its safety team in the period by the appointment of a third experienced safety specialist, another Philippine national, who has previous experience on other Obayashi international projects. The philosophy of the Project is that every site engineer and site manager is a safety officer.

The Owner has strengthened its safety team in June 2016 by adding an experienced OHS construction professional Vietnamese Deputy Manager (Safety) to lead the OHS team, starting in July 2016. A second Safety Officer is being sought to work under the Deputy Manager.

Further progress has been made with cooperation between the Owner and Contractors by actively working together. Over the last three months the Project has continued to demonstrate a strong safety performance in all disciplines and with positive engagement especially with management of Electrical and Mechanical and Hydro-Mechanical Works Contractor's as these two Contractors increase their work activities and fulfil their roles and responsibilities in the management of occupational health and safety across Project organization.

In terms of assigned H&S supervisor, the Electrical and Mechanical and Hydro-Mechanical Works Contractors, currently provide general technical assistance cum safety supervisor for close implementation of safety management at their work places and assisting line management in its day-to-day responsibility for ensuring health and safety of people at work. They appear to be capacitated on how to carry out safety works and definitely follow up all health and safety issues at their work places. Neither Contractor has reported any safety incidents to-date.

Beyond its contractor's safety personnel are being put in place, we also confirm its responsibility to nominate 10 safety officers (7 people of Song Da 5, 2 people of Sinohydro, 1 safety officer of ISS) of Sub-contractors who are supposed to remain focused on ensuring that we continue to undertake on going safety management at sites.

Excluding Subcontractors, the total dedicated safety personnel for the quarter are 13 persons from Owner and the four principal Contractors for Civil, Electrical and Mechanical, Hydro-Mechanical and 230 kV Transmission Line Works. While the OH&S team work within the Technical Division of NNP1PC, they continues to assist the Environmental and Social Division with health and safety matters for their construction activities in the Houay Soup Resettlement Area, Region 2UR and the Biomass Clearance in the area of the future reservoir.

6.2 Safety Training

Detail of all the training that the Safety staff of the Owner and Contractor have carried out in the period April to June 2016 is provided in the various Contractors' Monthly Progress Reports. This includes all training by external and internal training given by Owner, Contractor or Subcontractor professionals.

The HSE training function continues to make progress since, as can be seen from the Table 6-1 below, specific HSE training compliance is maintained. A total of 9.716 employees were trained in Q2, 2016 compared 9,980 employees in the previous quarter.

Table 6-1: Safety Training for the Reporting Period from April to June 2016

Month & Year	Total Number of Training Courses Held in Each Month	Total Number of Workers Receiving Training in Each Month According to Their Needs	Subject Matter of Training Courses Variously Attended According to the Needs of Workers
April 2016	33	1,896	Induction, evacuation movement, road accident and cause, welding safety and safety committee
May 2016	52	2,001	Induction, safety committee, speed limits on site, PPE use, duty of crane operator and signal man, welding safety, snake bites and first aid, evacuation drill, and safety of Installation of embedded pipes and parts
June 2016	39	1,536	Lighting safety, Induction and first aid drill and Install the embedded piping and parts

Table 6-2: Environmental Training for the Reporting Period from April to June 2016

Month & Year	Total Number of Training Courses Held in Each Month	Total Number of Workers Receiving Training in Each Month According to Their Needs	Subject Matter of Training Courses Variously Attended According to the Needs of Workers
April 2016	10	1,530	Hazardous material management
May 2016	11	1,427	Waste bin labelling and proper disposal of waste
June 2016	11	1,326	Wildlife preservation

6.3 Safety Classification and Statistics

Incidents are classified into six categories in accordance with international convention. The number of incidents by category are presented in Table 6-2.

Table 6-2: Safety Incidents by Category

ID	Incident Category	No. of Incidents from 01 February 2014 to 31 June 2016	No. of Incidents from 01 April 2016 to 31 June 2016
LTI	Lost Time Incident	9	0
RI	Recoverable Injury	6	1
NM	Near Miss (Reported)	11	0
PD	Property Damage	3	0
FI	Fire Incident	3	0
MVI	Motor Vehicle Incident	33	3
	Total	65	4

The Table indicates both the total number of incidents since February 2014, and the number of incidents in the Second Quarter of 2016.

The Project continues to focus on identifying risk by regular inspection, training and warning to avoid risk and in this has good cooperation between the Owner, the Civil Contractor and its Subcontractors.

6.4 Reporting to the Lenders, LTA and Others on Safety Incidents and Accidents

The total of 65 incidents recorded to 31 June 2016 are as tabulated above. No serious injuries were sustained in the Q2 2016 period. NNP1PC includes data, statistics and related information on safety incidents in their Monthly Progress Report to its Shareholders, Lenders and their Technical Advisors.

APPENDIXES

ENVIRONMENTAL MONITORING RESULTS

APPENDIX 1: STATUS OF SS-ESMMPS APPROVAL DURING APRIL TO JUNE, 2016

No	Site name	List of ESMMP and SS-ESMMP	Subcontractor	Approval Status by EMO/NNP1 (date)	Detailed Site Information	Monthly Construction & Operation Status
Electrical and Mechanical works (Hitachi-Mitsubishi Hydro)						
1	Main dam and re-regulating dam	SS-ESMMP for HM's Sub-Contractor Labor Camp #2	Lilama 10 joint stock Company (LILAMA)	Approved with comments on 22 June 2016 (2nd Revision)	Installing the camp for workers	On-going installing the camp platform
Civil Works Contractor (Obayashi Corporation)						
2	Main dam	SS-ESMMP for Dam Monitoring System at Main Dam	Obayashi Corporation	Approved with comments on 10 June (1st revision), the second revision was under review	Installing Dam Monitoring System	On-going
3	Main dam	SS-ESMMP for Construction of Main dam body	Song Da 5	Under review (2nd revision)	Constructing of main dam body	On-going
Houay Soup Resettlement Area (NNP1PC-ESD Contractors)						
4	Houay Soup Resettlement Area	SS-ESMMP for the Construction of Houay Soup Waste Landfill	PhouKham Chanvong Construction Co.,Ltd (PKC)	Under review during the reporting period	No construction activity	-
5	Road improvement	SS-ESMMP for the Improvement of the Internal Road in 2UR (Upper Reservoir)	Infrastructure team	Approved with comments on 6 April 2016 (1st revision) and 10 May 2016 (2nd revision).	Improvement of the Internal Roads for Ban Pou, Ban Hatsamkhone and Ban Phiengta at Zone 2, Upper Reservoir	Work completed
6	Irrigation canal Construction at HSRA.	SS-ESMMP for the Construction of	VSP Construction company	Approved with comments on 11 May 2016	Construction of Irrigation canal (0.975 km) for HSRA paddy field	Completed main construction activities.

		irrigation canal at the HSRA				Ongoing maintenance work
7	Construction of house buildings, pre-school, and accommodation buildings Lot3	SS-ESMMP for construction of house, pre-school, and accommodation buildings Lot3 on HSRA	Viengouxap	Approved with comments on 21 April 2016 (2nd revision)	Returned for the 1st draft and approved with comments for the 2nd version	On-going
8	Main road construction on HSRA	SS-ESMMP for construction of main road on HSRA	VRC	Approved with comments on 21 April 2016 (1st revision) and 24 June 2016 (2nd revision)	Construction of 3.35km main road to HSRA	Road surface levelling, culvert and drainage control installation
9	Installation of transmission line, HSRA	SS-ESMMP for 22kV electrical installation at the Houay Soup Resettlement Area (HSRA)	SES electrical installation company Co., Ltd,	Approved with no comment on 21 April 2016	Installation of 22 kV transmission lines and 0.4 KV distribution for Hatsaykham resettlement village at HSRA	On going
10	Biomass clearing of the reservoir	SS-ESMMP for Biomass clearing	Lao UNEOD Cooper	Approved with no comment on 6 April 2016		On-going
NNP1PC-TD Contractor						
11	NNP1 Landfill	SS-ESMMP for the construction of NNP1 Project solid waste landfill	PhouKham Chanvong Construction CO. ,Ltd (PKC)	Approved with comments on 20 April 2016 (1st revision) and 15 June 2016 (2nd revision)	1st stage construction of NNP1 Landfill	HDPE lining and site fencing

APPENDIX 2: ENVIRONMENTAL MONITORING CORRECTIVE ACTIONS FROM APRIL TO JUNE 2016

List of Environmental Issues Recorded and Corrective Action Progressed							
Issue ID	**Inspection Date**	**Site Name**	**Issue/ Description**	**Action Required / Recommendation**	**Deadline**	**Latest Follow up dated**	**Final Status**
01	17 Feb 2015	RT camp	The temporary current sediment pond / retaining ponds which incorporated the camp site's grey water and storm run-off, currently accumulates and increase the wastewater quantity in the pond has been leaking to the environment / natural water. The result of the water discharge testing in December 2014 and January 2015 indicated continuously contaminated with high bacteria and has trended of bacteria increasing. 01/12/2014, detected 9200 MPN/100ml, total Coliform. And 01/01/2015, detected >160,000 MPN/100ml, total Coliform and 160,000 MPN/100ml fecal-coliform.	The Contractor is required to propose and submit detailed wastewater treatment plan including a sufficient operational information before any action implementation. The contractor should consider to: (i) Review through the waste water treatment / seepage system including operational and maintenance activities what is the missing, wrong and /or necessary to be added / improved. (ii) Calculate the flow rate and evaluate pollutant load which it shall support to have an appropriate wastewater treatment system re-design. (iii) Design an appropriate treatment system for long term operation and effective in order to compliance with the environmental standard of effluent discharge.	03 Mar 2015	07 Jun 2016	This camp is being decommissioning thus the pending issue will be closed in July 2016
02	02 Jun 2015	Song Da5 Camp No.2	The wastewater treatment system does not follow the proposed design.	i. Contractors needs to follow the proposed plan, submitted on 31 Mar 2015; ii. Contractor should fix the drainage system with the sediment pond. It needs to separate the drain of surface water run-off and wastewater from bathroom and kitchen.	16 Jun 2015 Revised to October 2016	07 Jun 2016	Pending

List of Environmental Issues Recorded and Corrective Action Progressed							
Issue ID	**Inspection Date**	**Site Name**	**Issue/ Description**	**Action Required / Recommendation**	**Deadline**	**Latest Follow up dated**	**Final Status**
03	02 Jun 2015	V&K camp	Referring to the previous site inspection report (ref: NNP1-ESD-EMO-SIR-OC-0005 on SI-0036 dated 03 Mar 2015, the issue has been repeated. No improvement on the design of wastewater treatment system. The camp has insufficient facilities for the long-term operation. There is an evidence of grey water has been released from the septic tank to the open ditch. This is observed to be non-compliance to the project's environmental guideline.	i. Contractor needs to improve the submitted plan on 31 Mar 2015 which EMO has been commended and advised. ii. Contractor shall install the wastewater treatment system following the improved system under the EMO's recommendation.	16 Jun 2015 Revised to October 2016	07 Jun 2016	pending
04	23 Feb 2016	CVC plant yard	Referring to water analysis results, the waste water generated and discharged from CVC plant yard detected high pH, which exceeded the environment standard (effluent discharge standard). Currently, this wastewater has been used to spray the roads and expose areas for dust control. However, EMO were concerned that without appropriate mitigation measures during the wet season this non-compliant wastewater will continue to be discharged off-site. In fact, this issue was raised to the Contractor for a couple of months ago and the Contractor confirmed that this was connected to the wastewater treatment facilities of RCC Plant Yard. So far, no action has been undertaken.	The Contractor is required to find a way /alternative mitigation measures to deal with this wastewater which is not allowed to flow out of site to the open ditch or/and natural drains. **Note:** The Contractor needs to ensure that the capacity of waste water treatment system of the RCC plant is sufficient for additional treatment of the wastewater from the CVC plant yard.	07 March 2016	26 April 2016	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed							
Issue ID	**Inspection Date**	**Site Name**	**Issue/ Description**	**Action Required / Recommendation**	**Deadline**	**Latest Follow up dated**	**Final Status**
05	15 March 2016	SECC camp	The septic tank was full and over-flowed into the environment. This caused bad odor and has a high risk of disease/bacteria contamination in watercourses that will impact the worker health.	The Contractor shall empty and dispose of the septic waste at an authorized area (through discussion and approval from the EMO). It also needs to regularly check the septic tank to ensure that no wastewater is discharged into the environment.	18 March 2016	05 May 2016	Resolved
06	22 March 2016	Earth dyke	There was inadequate waste segregation being practiced on site. Scrap metal, used tyres, dust and oil filters are mixed while being stockpiled on site. This has a potential risk of creating ground contamination and impact on the environment.	The Contractor needs to segregate the waste according to waste types and ensure that the management follows NNP1 Project's waste management hierarchy introduced.	05 April 2016	05 May 2016	Resolved
07	22 March 2016	Earth dyke	The sub-contractor lacked proper hazardous material management. (i). Contaminated soil and oily rags were left behind the work place without cleaning-up / collection and store properly. (ii). No proper spillage protection facilities provided for maintenance activities. These resulted in engine oil and diesel spilt onto the ground every time the site inspection was conducted and followed up. EMO previously informed (verbally and officially) the contractor to take an appropriate action and improve their contractor's hazardous material management process on site (ref: SIR-0026, 0027 and 0033). So far, it seemed to be that no attention is being paid by the sub-contractor.	The Contractor needs to take an appropriate action to solve the issues. The proposed and approved SS-ESMMP will be followed strictly (ref: SS-ESMMP for Earth Dike, SP06: Hazardous material management).	05 April 2016	05 May 2016	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed							
Issue ID	**Inspection Date**	**Site Name**	**Issue/ Description**	**Action Required / Recommendation**	**Deadline**	**Latest Follow up dated**	**Final Status**
08	22 March 2016	Spoil disposal area #3	A spoil area is situated on the seasonal stream/ channel which receives a large volume of water from the catchment area upstream. Referring to the EMO's official issued report (SIR0018, dated 11/08/2015) which the issue was later closed on 17/11/2015 with a condition that it would be addressed before the wet season. Thus, the EMO requested that the Contractor provides an appropriate mitigation measures for the spoil area to minimize the erosion and sediment being transported off-site. Currently, the contractor is constructing an open channel by rock compaction. The EMO is concerned that without check dike being installed along the open channel, it is highly possible that the sediment will to be washed down into the waterways during the incoming wet season.	The Contractor shall install earth/stone dike (at least 30-40 cm high) along the side of the open channel (between material stockpile yard and open channel) in order to to stop and minimize the sediment being washed away from this spoil area in the coming wet season.	11 April 2016	24 May 2016	Resolved
09	24 March 2016	TL 230 kV	During the site inspection, it was found that about 0.5 m3 of concrete waste was dumped on the ground adjacent to the Tower No. 157. The concrete waste water was also found to be pumped and dispose of in the surrounding area. This has a potential risk to impact the environment.	The Contractor needs to remove the concrete waste and dispose it at the designated disposal area according to the approved SS-ESMMP for the TL. The concrete wastewater shall be pumped into a specific sediment pond after completing the work and backfilled.	07 April 2016	05 May 2016	Resolved
10	29 March 2016	SECC batching plant yard	A new generator for supplying electricity during the night time was not kept inside the storage area at the Batching Plant. About 200 litres of diesel is used every day to generate electricity from both generators. They will be used for the next	The Contractor shall extend the existing roof as well as the concrete floor and bunding (10 cm high) to cover a new generator. The soil covering the outlet shall be dug out to allow water discharge from the oil trap thus reducing the overflow. The extended	12 April 2016	05 May 2016	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed							
Issue ID	**Inspection Date**	**Site Name**	**Issue/ Description**	**Action Required / Recommendation**	**Deadline**	**Latest Follow up dated**	**Final Status**
			2-3 months. Some oil spill on the ground was observed around the generators. This has a potential risk to impact water courses especially the nearby Nam Ngiep should the oil spill is washed away in during coming wet season. Also, the existing oil trap system is not working. First, the outlet pipe was covered by soil and the inner outlet was broken. Second, no drainage channel around this area is observed.	bunding area can also safely contain the potential oil spills and contaminated water if any.			
11	29 March 2016	SECC batching plant yard	The left embankment of the Nam Ngiep River at the batching plant does not have a sediment pond and sufficient erosion and sediment control. During the upcoming rainy season, this sediment has a high potential to be washed into to Nam Ngiep river.	The Contractor shall take appropriate action to control and protect the left embankment from erosion. Proposed mitigation measures will need to be discussed and consulted with EMO prior to the implementation.	12 April 2016	31 May 2016	Resolved
12	29 March 2016	SECC batching plant yard	The sediment and concrete waste in the sediment pond located at the Batching plant is nearly full. It has a high potential to overflow and release into the Nam Ngiep River impacting the surface water quality and aquatic animals.	The Contractor shall immediately remove the concrete waste when it is nearly 80% full and disposed of at the designated disposal area.	12 April 2016	05 May 2016	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed							
Issue ID	**Inspection Date**	**Site Name**	**Issue/ Description**	**Action Required / Recommendation**	**Deadline**	**Latest Follow up dated**	**Final Status**
13	05 April 2016	Earth dyke	There was no significant environmental issue identified during the inspection. However, EMO was informed (un-officially) that the earth dike works would be completed and the camp site facilities will be decommissioned soon (by April 2016). EMO suggested that there are 3 (three) main tasks below are necessary to be addressed before the machines demobilized: i. Temporary camp and supporting facilities structures decommissioning. ii. Hazardous materials (used oil and contaminated soil removal/ elimination). III. Borrow pits site landscaping and / or site closure / site environmental restoration.	The Contractor needs to coordinate with the sub-contractor to prepare a site decommissioning plan and submit to EMO for review and approval before decommissioning starts. This will be used for EMO reference/guide to further monitor/ follow up on the camp facilities demobilization/decommission activities.	18 Apr 2016	28 Jun 2016	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed							
Issue ID	**Inspection Date**	**Site Name**	**Issue/ Description**	**Action Required / Recommendation**	**Deadline**	**Latest Follow up dated**	**Final Status**
14	05 April 2016	Quarry	According to the site conditions and operation status (i) a massive clay and rocky-soil is stockpiled on site (ii) NamNgiep river is directly received at toe of slope. Without appropriated mitigation measures / methods and sufficient erosion and sedimentation control devices. It has a potential risk of erosion and massive sediment transported to the Nam Ngiep river which may impacts on water quality and aquatics life. Currently, cut-of drain and a small sediment pond have provided/ installed. However, EMO concerned that only the provided control devices mentioned is still not sufficient.	The Contractor is required to find an appropriate alternative solution and provide a proper control device to ensure that the sediment is being trapped as much and possible on site in order to prevent impacts on the environment. **Note:** ***The corrective action plan is required to be submitted to EMO for review and agreement prior to starting any action. Any support idea needed please consult EMO and then find the appropriate solution together.***	27 April 2016	24 May 2016	Resolved
15	19 April 2016	Vorarath camp	It was observed during this inspection that a 20,000 liters fuel tank was installed and operated in appropriately within the VRC work camp boundary. • The fuel tank was placed within the earth bund with an absence of hardstand, oil trap and roofing facilities. • The storage was not equipped with spill response kits This non-engineering design storage will not withstand rainy season and any oil leakage events.	The Contractor needs to monitor and take appropriate mitigation measures on the hazardous material management as proposed in the approved SS-ESMMP which include the following: • Design and construct a 120% containment storage according to the SP-06 of the ESMMP-CP; • Install oil traps with a control valve; • Install roofing facility to prevent stagnant rain water. • Equip spill response materials such as dry sand within the storage area for oil spill absorption.	03 May 2016	14 Jun 2016	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed							
Issue ID	**Inspection Date**	**Site Name**	**Issue/ Description**	**Action Required / Recommendation**	**Deadline**	**Latest Follow up dated**	**Final Status**
16	19 April 2016	Vorarath camp	An electricity generator was stored outside the VRC work camp boundary. There was no provision of steel tray and roofing. As a result, oil spillage was observed at the refueling point of this power generator.	• Move this power generator to a designated area inside VRC work camp boundary and; • Provide a steel tray and roofing.	03 May 2016	14 Jun 2016	Resolved
17	19 April 2016	HSRA land leveling	During this weekly inspection, a 12000 liters fuel tank was observed storing on bare ground at Huay Soup resettlement development site. This fuel container was also not equipped with any spill responded kits. This potential causes oil spillage during fuel handling and soil contamination as a result of an absence of the spill responded material	The contractor needs to monitor and take appropriate actions in accordant to approved SSESMMP on hazardous material management including the following: • Providing a steel tray to protect oil spillage during operation of the fuel tank and during fuel handling. • Install roofing to prevent stagnant rain water within the fuel storage; • Store dry sand drum within the storage area for absorbing spilled oil	03 May 2016	05 May 2016	Resolved
18	26 April 2016	Songda5 camp #1	It was observed during the site inspection that the sub-contractor operated a general waste incinerator on site without consulting with EMO as the followings: - Plastics were burned; - Dust from the burning was disposed outside the camp boundary. - The location of the incinerator is close to water courses (i.e. upstream of the Nam Ngiep river)	It is suggested that the general waste incinerator is operated with proper operation management as the following: - Provide waste management induction/ training for related workers on general waste management and burning procedures (simple steps shall be developed by the Contractor); - Only non-plastic and non-hazardous waste is allowed to be burned (infectious waste is strictly prohibited unless approved by the EMO); - The ash from burning shall be managed properly (i.e. clean up and dispose of at the designated location within spoil disposal area. - The	10 May 2016	10 May 2016	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed							
Issue ID	**Inspection Date**	**Site Name**	**Issue/ Description**	**Action Required / Recommendation**	**Deadline**	**Latest Follow up dated**	**Final Status**
				burning location shall be provided at least 30 m far away from water course and / or natural channel.			
19	26 April 2016	Main dam	It was observed that a pipe for the cement waste water from the conveyor belt and washing activities was connected to an existing sediment pond. This potentially reduces the treatment capacity of the onsite waste water treatment systems or leads to higher consumption of chemicals (such as the Polyaluminium chloride or PAC) for waste water treatment (PAC). It was concerned that, during this incoming wet season the waste water generated on-site may exceed the capacity of the existing wastewater treatment systems and may consequently lead to (i) non-compliant water discharges (ii) the waste water treatment system operation cost increase.	The Contractor was required to install additional sedimentation ponds and/or erosion control devices for separating the cement waste water from the clean water (underground and surface run-off) prior to being treated by the waste water treatment facility.	10 May 2016	10 May 2016	Resolved
20	26 April 2016	Songda5 Batching Plant	During the inspection, it was observed that construction waste was left behind at the temporary batching plant (under CVC plant).	The construction waste shall be managed properly as per SP05.8: Waste Management by the Contractor. Specifically, this construction waste shall be removed and disposed of at the designated area.	10 May 2016	28 June 2016	Resolved
21	27 April 2016	IHI workers' camp	During the joint bi-weekly inspection, it was observed that an electricity generator with a 100-litres of oil refueling capacity was stored on the bare ground at a welding area of IHI worker camp.	The Contractor needs to take appropriate actions in accordance to an approved SS-ESMMP for this site, specifically on the SP06- Hazardous Material Management as the following: 1. Provide a drip tray or sufficient bunded area with a concrete floor to prevent oil	12 May 2016	22 June 2016	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed							
Issue ID	**Inspection Date**	**Site Name**	**Issue/ Description**	**Action Required / Recommendation**	**Deadline**	**Latest Follow up dated**	**Final Status**
			It was noted that this location is located within 50 m proximity to the Nam Ngiep. This may cause potential environmental impacts including soil contamination, water pollution in case of oil spills during the upcoming rainy season.	spills during the operation of the electricity generator and fuel handling; 2. Install appropriate roofing materials to prevent therain water in the generator's storage area; 3. Store dry sand (a spill response kit) within the storage area for absorbing spills. 4. Provide a bin for disposing of contaminated rags or contaminated sand after use.			
22	27 Apr 2016	HM worker camp #2	During the joint bi-weekly site inspection at the camp site, it was found that no temporary/mobile toilet facilities were provided at the temporary worker camp (new worker's camp #2 construction site) for more than 28 labor working at this site. This has a potential risk of impacting natural ways and is not hygiene for workers.	The Contractor needs to take appropriate actions in accordance to an approved SS-ESMMP for the site, specifically on the Water availability and Pollution control, including the following: 1. Whilst temporary toilet is being constructed, all workers and staff shall temporary use the nearby HM Hydro Contractor's camp toilet; 2. Contractor shall provide temporary/mobile toilet facilities on site and at isolated areas, pit latrines will be installed for the workforce; 3. Toilet facilities will be maintained by the Contractor to prevent water borne diseases.	12 May 2016	11 May 2016	Resolved
23	05 May 2016	Nalux Construction camp	During the inspection it was observed that: 1. No waste disposal pit was provided on site. Garbage was observed to be disposed of on the ground outside the camp's boundary;	1. Provide a temporary waste disposal pit inside the camp boundary for non-recyclable waste disposal; collect and dispose waste in the designated waste pit; provide at least 03 (three) waste bins at the camp's site. 2. Adequate waste water retention pond for	19 May 2016	14 Jun 2016	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed							
Issue ID	**Inspection Date**	**Site Name**	**Issue/ Description**	**Action Required / Recommendation**	**Deadline**	**Latest Follow up dated**	**Final Status**
			2. NNP1PC-EMO was concerned that a single 0.75 m^3 grey water retention tank installed on the camp site may be insufficient for an eight months camp operation (April to August 2016) with a maximum of 30 people.	30 people over the eight months period needs to be constructed to ensure a proper collection of grey water.			
24	05 May 2016	Viengoudomxup worker camp	It was observed during the site inspection that the temporary worker camp's facilities were not appropriately constructed as per the approved SS-ESMMP as the following: 1. One of the toilet septic tanks was installed with a hole. This potentially allows the black water from the septic tank to overflow and mix with the rain water causing waste water contamination. 2. No waste water retention pond(s) was provided for the grey water from bathing and cooking areas as originally proposed in the SS-ESMMP. 3. No waste disposal pit was provided. Food waste was disposed on the bare ground behind the cooking hut, garbage was scattered around the camp. This attracts flies and disease. 4. Insufficient provision of water supply for hand washing at site. This shows a non-hygienic environment for workers and can potentially pose health risks, for example, toilets are not being used or being cleaned properly.	The Contractor needs to ensure that the waste water treatment systems for grey and black water are built in accordance to the designs proposed in the approved SS-ESMMP. Specifically, the mentioned issues should be addressed properly as the following: 1. Permanently close the septic tank's hole, provide a gaze pipe and backfill the septic tanks properly to avoid stagnant water and rain water from entering into the septic tanks. 2. Install/provide 2 waste water retention ponds (at least 2x2x1.5 m / each) below the washing and bathing areas. 3. Provide proper temporary waste disposal pit on site for non-recyclable waste disposal. At least 3 waste bins are necessary to be provided at the camp site. The scattered garbage surrounding of the camp shall be collected, separated and disposed of properly. 4. Please ensure that the water supply is provided sufficiently at camp site for workers. Three (3) water containers / drums are necessary to be provided in the existing three (3) toilet rooms.	19 May 2016	28 Jun 2016	Pending

List of Environmental Issues Recorded and Corrective Action Progressed							
Issue ID	**Inspection Date**	**Site Name**	**Issue/ Description**	**Action Required / Recommendation**	**Deadline**	**Latest Follow up dated**	**Final Status**
25	05 May 2016	Vorarath camp	During the site inspection, it was informed that most of the waste generated on site was transported and disposed of in Paksan municipality (no information of the exact location). However, it was observed that food waste and garbage were disposed into the existing wastewater retention pond. This resulted in unpleasant odour as well as attracted flies and worms which were likely to cause potential health risks and unpleasant environment for the workers should the waste were disposed of at undesignated places.	The Contractor has to provide a temporary waste disposal pit for non-recyclable waste disposal. For recyclables, appropriate separation of plastic bottles, glasses and cardboards shall be practiced. NNP1PC-EMO recommended that the Contractor provides more details on how the garbage is removed and disposed off-site for NNP1 record during the next site inspection.	19 May 2016	14 Jun 2016	Resolved
26	05 May 2016	Chaluensavan h camp	EMO was informed by the sub-contractor during the site inspection that the CRCC camp would be demobilized soon. However, There was no official information from the contractor on this camp decommissioning plan. EMO was concerned about the decommissioning of septic tanks and wastewater retention ponds.	The Contractor needs to closely coordinate with the ESD prior to the commencement of the CRCC temporary camp decommissioning to ensure that all concerned camp's facilities are demobilized properly.	19 May 2016	31 May 2016	Resolved
27	05 May 2016	SECC camp	There was inadequate housekeeping at the SECC camp. Wood off-cut, plastic sheets, scrap metal and garbage were scattered around the bathing area and recycling center.	The Contractor needs to collect, segregate and dispose of the scattered waste / scraps properly as per the Project's waste management hierarchy using 4 Rs (Reduce, Reuse, Recycle and Right disposal).	18 May 2016	28 Jun 2016	Pending
28	05 May 2016	SECC Workshop and Industrial Area	A 30 kg contaminated soil/sand bag and four (04) full drums (see photo) were stored on the concrete platform with a shallow bund. However, there were no roofing and oil trap for this storage.	If there will be no improvement of this concrete platform with roofing material , oil trap and extended bund, please move the contaminated soil/sand bags and fuel drums to a designated hazardous storage area that have proper roofing and bunding.	18 May 2016	14 Jun 2016	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed							
Issue ID	**Inspection Date**	**Site Name**	**Issue/ Description**	**Action Required / Recommendation**	**Deadline**	**Latest Follow up dated**	**Final Status**
				Please add the duration of the site, how long it will be lasted before giving an option to not build a proper bunding area			
29	10 May 2016	Songda5 workshop (at spoil #2)	A hazardous storage facility was operated on site without a proper bund, oil traps and spill response kits. This has a potential risk of oil spills to adjacent drainage line.	Please provide a concrete bund around the existing storage area that can retain at least 120% storage capacity as well as installing oil traps. Otherwise, it is recommended that all hazardous materials and waste shall be moved to a proper designated hazardous storage area that has adequate bunding area and oil traps.	24 May 2016	07 Jun 2016	Resolved
30	11 May 2016	IHI worker camp	During the inspection it was observed that There is an evidence of septic waste water and grey water being released directly to the drain without processing. This has a potential risk of bacterial release to the Nam Ngiep.	The Contractor needs to fix the septic function and empty the septic tank according to the agreed Owner's procedures for Emergency Disposal.	18 May 2016	25 May 2016	Resolved
31	17 May 2016	PC Bridge	During the joint IAP, LTA and ADB mission which was undertaken on 17 May 2016. The EMO observed that the SECC conducted slope stabilization work on the Nam Ngiep's riverbank without applying appropriate mitigation measures as proposed in the related SS-ESMMP document to protect minimize the sediment loads being transported to downstream (See attached photo). This resulted in laden sediment water flowing downstream which contributed to the high turbidity of the Nam Ngiep water quality and potentially affects aquatic lives the downstream users of the Namg Ngiep river as well as the aquatic life.	The contractor need to follow the requirement of the Sup Sub-Plan 01.17 on Erosion and Sediment Control for the excavation in the waterways in order to minimize the amount of sediment loads being washed into the river as the following: "suitable soil erosion control measures (e.g., provision of coffer dam and related structures to redirect flows around construction areas, use of silt curtains, silt fences, fiber rolls, etc.) shall be implemented prior to excavation of the bridge pier foundation and construction activities at waterways to minimize the influx of sediment into surface water".	20 May 2016	31 May 2016	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed							
Issue ID	**Inspection Date**	**Site Name**	**Issue/ Description**	**Action Required / Recommendation**	**Deadline**	**Latest Follow up dated**	**Final Status**
32	17 May 2016	Main dam	During a joint IAP, LTA and ADB mission on Tuesday 17 May 2016 at around 12.40 pm, It was found that the turbid water was discharged at the Powerhouse excavation areas as the following: • The turbid water from an existing sediment pond was pumped into the lower slope of the powerhouse excavation areas and 10 meters from the Nam Ngiep which was claimed to be "a sediment pond" without being treated by the turbid waste water treatment plant. • This turbid water discharge is equivalent to a direct discharge because the claimed "sediment pond' does not have adequate characteristics to be the sedimentation control pond. For examples, the crushed sandstone and river stones were piled up to create an embankment; the pond was not excavated to retain and treat the turbid water before discharging. This resulted in a direct flow of turbid water into the Nam Ngiep without settling the sediment. Note: During a joint site inspection dated 10 May 2016 (SIR Ref.: NNP1-ESD-EMO-SIR-OC-0038). EMO agreed to close the issue on the turbid cement water discharge from the conveyor belt to this claimed sediment pond with a condition proposed by the OC that there would be NO emergency discharge into Nam Ngiep directly from the claimed' sediment pond.	Stop pumping turbid water from the existing pond to the last pond located downstream of Nam Ngiep without treatment by the Turbid Water Treatment Plant. The turbid water generated at the dam and Powerhouse excavation areas need to be treated, such as by the Turbid Water Treatment Plant prior to releasing into Nam Ngiep.	18 May 2016	07 Jun 2016	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed							
Issue ID	**Inspection Date**	**Site Name**	**Issue/ Description**	**Action Required / Recommendation**	**Deadline**	**Latest Follow up dated**	**Final Status**
			This finding indicated that the Contractor did not follow the recommendation on the erosion and sediment control.				
33	25 May 2016	HM worker camp #2 (LILAMA 10)	EMO previously commented in writing on 18 February 2016 to the submitted SS-ESMMP for the Construction of HM Labour Camp #2 (1st version dated 29 January 2016) that the clean surface water, black and grey water shall be separated and detailed designs of the waste water treatment systems were needed. Owner (EMO) followed up with the Contractor during the Weekly Coordination Meeting held in April 2016 where the Contractor agreed to submit a revised SS-ESMMP and detailed drawings of the waste water treatment system by mid-May 2016. During the site inspection, it was found that the Contractor has commenced the construction of the waste water treatment system (WWTS) without submitting revised detailed designs and updating the SS-ESMMP responding to the Owner's comments. For example, the retention ponds were not built in accordance to the proposed designs in the SS-ESMMP (i.e. using readily made concrete blocks with less than 100 mm thick compared to the proposed bricks to make 220 mm tank walls, see photos). The Contractor's representatives informed the Owner that they were not sure if the construction	The Owner recommends that the Contractor temporarily hold the construction of the waste water treatment system until a discussion with the Owner is made to agree on the final designs. If significant adjustments are to be made, revised designs with detailed information on the adjustments shall be submitted to the NNP1PC for prior review and approval.	08 Jun 2016	22 Jun 2016	Pending

List of Environmental Issues Recorded and Corrective Action Progressed							
Issue ID	**Inspection Date**	**Site Name**	**Issue/ Description**	**Action Required / Recommendation**	**Deadline**	**Latest Follow up dated**	**Final Status**
			would follow the specifications highlighted in the first approved SS-ESMMP. A revised diagram was later submitted showing the separation of the black water from the grey water but still was not adequate in responding to the Owner's comments. Also, these concrete blocks cannot handle the long term operation of the system and are likely to collapse.				
34	25 May 2016	IHI main camp & office	During a joint inspection between the Owner (EMO and TD) and the Contractor, it was observed that algal blooms had occurred in the waste water treatment ponds as a result of excess nutrients (phosphates and nitrogen from detergents and organic matter). The Contractor installed an automatic pump to discharge the waste water from the last pond into the environment without checking if it met the effluent standards causing unpleasant odor. Additionally, a dead fish was observed in the first pond indicating a very low dissolved oxygen level in the pond. From June 2016, the Owner (EMO) will start collecting water samples from these waste water ponds for water quality analysis and verifications on a monthly basis.	It is recommended that the Contractor stops discharging the waste water from any of the three retention ponds into the environment without checking if it meets the effluent standards specified in the ESMMP-CP Appendix 3. Discussions on the temporary solutions shall be organized with the Owner once the effluent quality results from this camp is available.	08 Jun 2016	22 Jun 2016	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed							
Issue ID	**Inspection Date**	**Site Name**	**Issue/ Description**	**Action Required / Recommendation**	**Deadline**	**Latest Follow up dated**	**Final Status**
35	31 May 2016	SECC camp	It was observed that the storage of an electricity generator was not equipped with rain-screen sheets. As a result, rain water was stagnant inside this storage area. In addition, there was no oil trap to collect oil contaminated water.	The EMO recommends that: - Use oil absorbent sheets to absorb oil film from the rain water ; - Clean up the storage facility including contaminated soil and sand; - Store contaminated soil and sand properly within the designated hazardous storage area for proper disposal/ elimination; - Provide complete rain-screen sheets to protect the storage area from having stagnant rain water; - Provide an oil trap to separate water from the oil film in case of spills.	14 Jun 2016	14 Jun 2016	Resolved
36	31 May 2016	SECC workshop	Oil contaminated water was observed inside the hazardous waste storage area without cleaning up. This has a high potential risk of contaminated water overflowing into the environment.	Use oil absorbent sheets to absorb the oil film completely, and drain off stagnant water to keep the storage dry; - Fix the roof to protect the rain water from entering storage area.	14 Jun 2016	14 Jun 2016	Resolved
37	31 May 2016	Borrow pit for HSRA Irrigation canal	Based on the Owner (EMO)'s follow up inspection in May 2016 and this joint bi-weekly inspection, it was observed that the a borrow pit was operated about 10 m close approximately to Houy Soup Noi stream. The borrow pit was used for irrigation construction without environmental protection measures as per approved SS-ESMMP with comments dated 11 May 2016. This has a potential risk of erosion and sediment transport to the Houysoup Noi stream in the event of heavy rain.	Provide erosion and sediment control system for the borrow pit including adequate cut-off drain and sediment pond to prevent direct sediment runoff. The Owner requests the Contractor to revise and re-submit a revised version of the SS-ESMMP as per the EMO's comments for the proposed SSE-SMMP for construction of irrigation canal dated 11 May 2016.P292	14 Jun 2016	28 Jun 2016	Pending
38	09 Jun 2016	HM worker camp	There was improper waste management at the new temporary camp. Two waste	The Contractor is required to monitor and take appropriate corrective actions on this	22 Jun 2016	22 Jun 2016	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed							
Issue ID	**Inspection Date**	**Site Name**	**Issue/ Description**	**Action Required / Recommendation**	**Deadline**	**Latest Follow up dated**	**Final Status**
			bins were left on the ground without closing the lids. This has potential risk that the waste are washed into adjacent drainage lines during a rain event. In addition, these bins are not labelled for waste separation.	issue including: §Store waste bins at appropriate location within the camp that is far from the drainage lines. Provide at least three (03) waste bins for (i) recycle waste, (ii) general waste and (iii) hazardous waste.			
49	14 Jun 2016	SECC workshop	It was observed that oily machines and equipment as well as used hydraulic oil containers were left at an open workplace without proper spill protection devices. This resulted in minor oil spills on the ground.	Please provide an oil collection tray for the equipment maintenance activities. Used oil/ hydraulic oil generated from the maintenance need to be removed daily to a designated hazardous storage area. Oily machinery and equipment need to be covered by plastic sheets to prevent the rain water and cause oil spills.	28 Jun 2016	30 Jun 2016	Resolved
40	14 Jun 2016	SECC batching plant yard	During the joint site inspection, there was an evidence of Nam Ngiep river bank erosion which was previously disturbed by the Contractor, but there was no erosion protection being implemented so far. This has a high potential risk of massive erosion and sediment transport to downstream of Nam Ngiep river.	While on site, the EMO and the Contractor discussed and agreed on following actions: - Place more rocks/river stones to stabilize the eroded area; - Provide a proper drainage / ditch by rock compaction and / or rip-rap to prevent soil erosion.	28 Jun 2016	30 Jun 2016	Resolved
41	16 Jun 2016	TL 230 kV	During this joint inspection, it was observed that the contractor constructed an access road to the tower foundation number 241 and 269. This assess road was built by using the topsoil from a small borrow area located on the river bank and backfilled a part of a natural/seasonal creek which block the river flow and sediment being transported to downstream of the creeks.	The Contractor is advised to install a culvert and/or rock placement on the road surface to allow the water flow and ensure possibility of this access road. The borrow area along the river bank needs to be rehabilitated to minimize river bank erosion and allow natural re-vegetation.	24 Jun 2016	28 Jun 2016	Pending

List of Environmental Issues Recorded and Corrective Action Progressed							
Issue ID	**Inspection Date**	**Site Name**	**Issue/ Description**	**Action Required / Recommendation**	**Deadline**	**Latest Follow up dated**	**Final Status**
42	22 Jun 2016	HM stock yard (at worker camp #1; ZheFu camp)	During jointed bi-weekly site inspection, two oil drums were stored in the steel tray but without roofing in open air. There was also an evidence of oil spills into the ground approximately 5 liters.	Clean up of oil spills/contaminated soil and remove fuel drums to an appropriate location/designated hazardous storage area that have proper roofing and bund.	22 Jun 2016	28 Jun 2016	Pending
43	28 Jun 2016	Songda5 workshop (at spoil #2)	No designated location for the heavy truck and machinery maintenance. The maintenance has been conducted at the open parking area without provision of sufficient spill response kits (steel trays were provided). Oily clothes from maintenance activities were disposed on the bare ground. This has a potential risk of hydrocarbon and oil contaminated waste being washed by the rain water.	The Contractor is required to: 1. Conduct the heavy trucks and machinery maintenance activities in the designated area which is built with proper hard stand, bund, oil trap and oil spill response kits; and 2. Clean-up oily rags and store in the hazardous waste storage area for further disposal by authorized vendor.	08 Jul 2016	N/A	Pending
44	28 Jun 2016	RCC plant yard	1). Referring to previous site inspection reports on turbid water at the RCC plant which have been issued: - SIR-0018, 18 /07/2015 - SIR- 0023, 06/10/2015 - SIR-0028, 15/12/2015 - SIR-0032, 09/02/2016 and - SIR-0040, 25/05/2016 2). Referring to the approved SS-ESMMP for the RCC Plant Foundation and Installation (note that this document does not cover the operation stage of the RCC Plant), the Contractor has implemented simple corrective actions to improve the turbid water quality generated from the RCC material washing area including cleaning-up of the sediment from the first and second sediment ponds when they	The Contractor is required to: - Follow the agreed actions specified in earlier issued SIRs above. These include the frequency adjustment of the sediment clean-up from the sedimentation ponds when observed that they are 60% full; - Regularly remove dried sediment from the drying yards to keep space for incoming sediment cleaning-up from the ponds; - Prepare/update the Site Specific Environmental and Social Management Plan (SS-ESMMP) for the operation stage of the RCC plant and submit to NNP1 for review and approval. Note: the mentioned SS-ESMP needs to fully address the areas of Sedimentation Control and Water Availability & Pollution control. - If these issues are still not fixed by this	20 Jul 2016	N/A	Pending

List of Environmental Issues Recorded and Corrective Action Progressed							
Issue ID	**Inspection Date**	**Site Name**	**Issue/ Description**	**Action Required / Recommendation**	**Deadline**	**Latest Follow up dated**	**Final Status**
			were full. However, it was found that no proper sedimentation control facilities were installed to improve the turbid water discharge and cleaning-up and removal of sediment inadequate. Specifically, no cleaning-up of these sediment ponds was carried out whilst the RCC plant was temporary shut-down and no removal of sediment from the drying yards. EMO conducted water discharge sampling and testing at the last sediment pond prior to discharging into the drainage canals and found the results as follows: - Monthly testing dated 08/06/2016 detected 64,000 NTU of turbidity and 27,850 mg/L of TSS. - Field testing dated 25/06/ 2016, detected 2186 NTU of turbidity. By comparing/ converting the Turbidity of the latest field tested (2186 NTU on 25/06/2016) to/from the monthly sampling and laboratory testing (64,000 NTU on 08/06/2016), the TSS value of 951 mg/l was obtained. These show that the concentration of the TSS in the turbid water being discharged continues to exceed the effluent standard specified in the Concession Agreement Annex C.	agreed timeline, a NCR level 1 will be issued.			

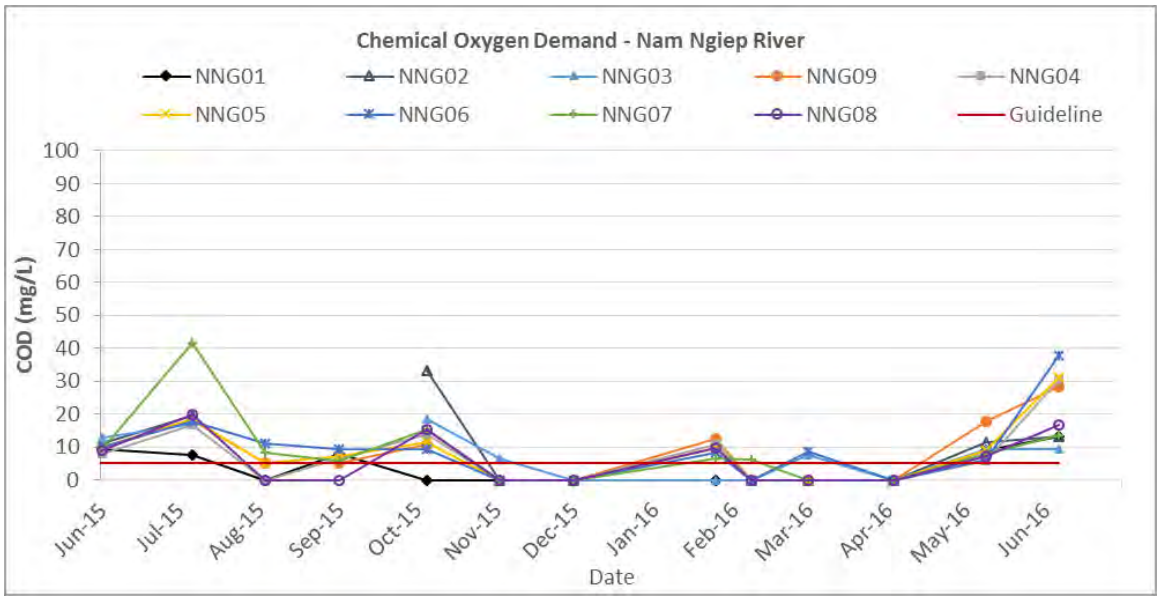
List of Environmental Issues Recorded and Corrective Action Progressed							
Issue ID	**Inspection Date**	**Site Name**	**Issue/ Description**	**Action Required / Recommendation**	**Deadline**	**Latest Follow up dated**	**Final Status**
45	28 Jun 2016	Main dam	There was an evident of removed sediment from the turbid water treatment plant being disposed near the Nam Ngiep River's bank. The contractor has been warned for proper management of sediment cake.	The Contractor is required to stop dumping of removed sediment from the treatment plant in this area (Nam Ngiep river's bank). The sediment cake needs to be disposed of at the only approved area at spoil disposal area #6.	28 Jun 2016	N/A	Pending

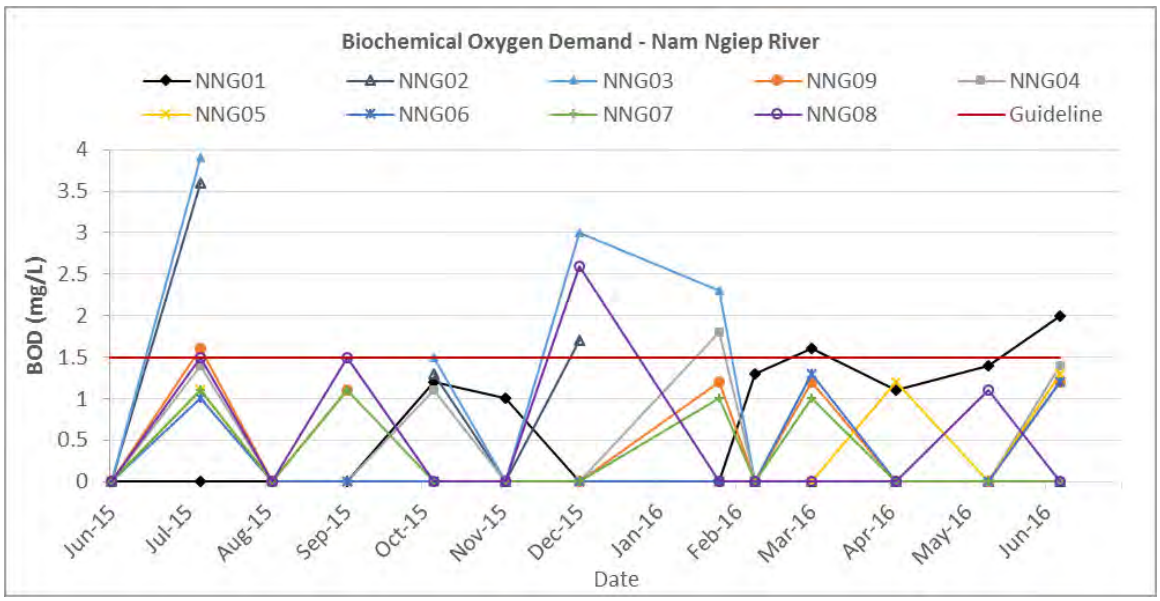
APPENDIX 3 CODES AND LOCATIONS OF THE SURFACE WATER QUALITY MONITORING STATIONS

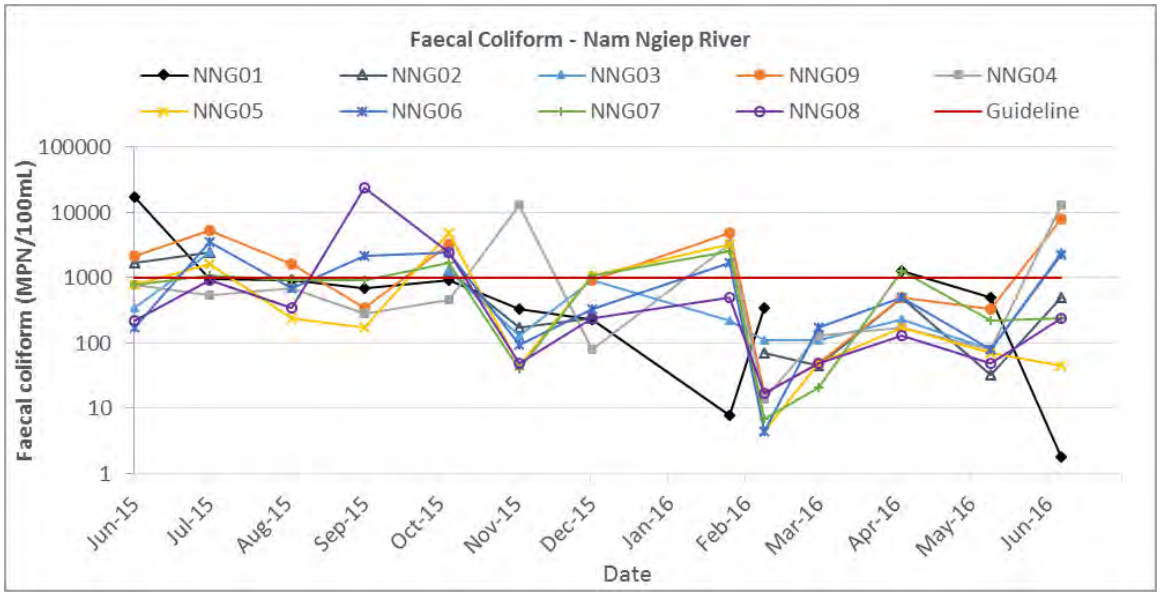
Site Code	Location station	Zone
NNG01	Nam Ngiep Upstream of Ban Phiengta	Upstream Project Construction Site
NNG02	Nam Ngiep Upstream of Nam Phouan Confluence	
NNG03	Nam Ngiep Downstream of Ban Sop-Yuak	
NNG09	Nam Ngiep Upstream Main Dam	
NNG04	Nam Ngiep Downstream RT Camp	Within Project Construction Site
NNG05	Nam Ngiep Upstream of Ban Hat Gniun	Downstream Project Construction Site
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	Tributaries Upstream of Project Construction Site
NPH01	Nam Phouan Upstream of Nam Ngiep Confluence	
NXA01	Nam Xao Upstream of Nam Ngiep Confluence	Tributaries Downstream of Project Construction Site
NSH01	Nam Houay Soup Upstream Nam Ngiep Confluence	

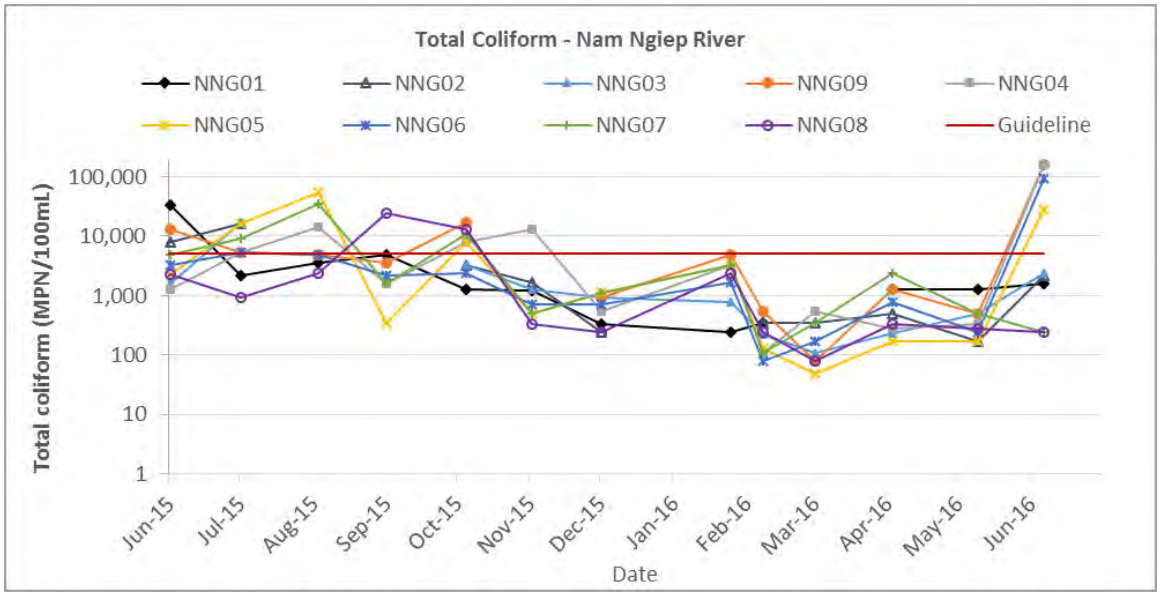
APPENDIX 4: KEY TRENDS OF WATER QUALITY MONITORING FROM JUNE 2015 TO END OF JUNE 2016 (ONLY PARAMETERS THAT EXCEEDED GUIDELINE STANDARDS)

Nam Ngiep Surface Water main channel

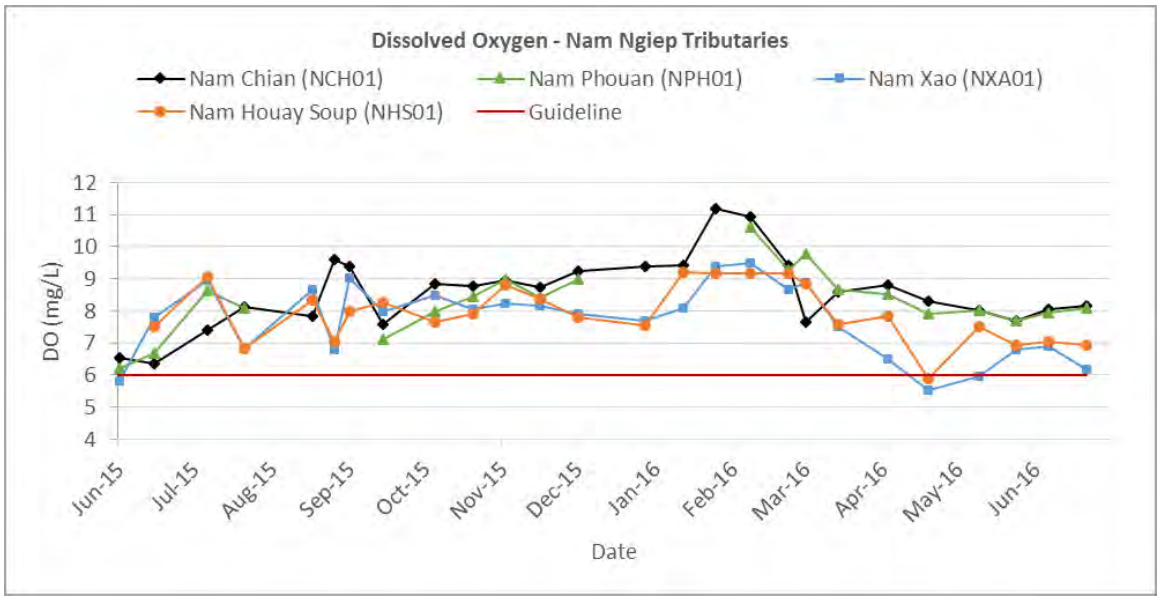


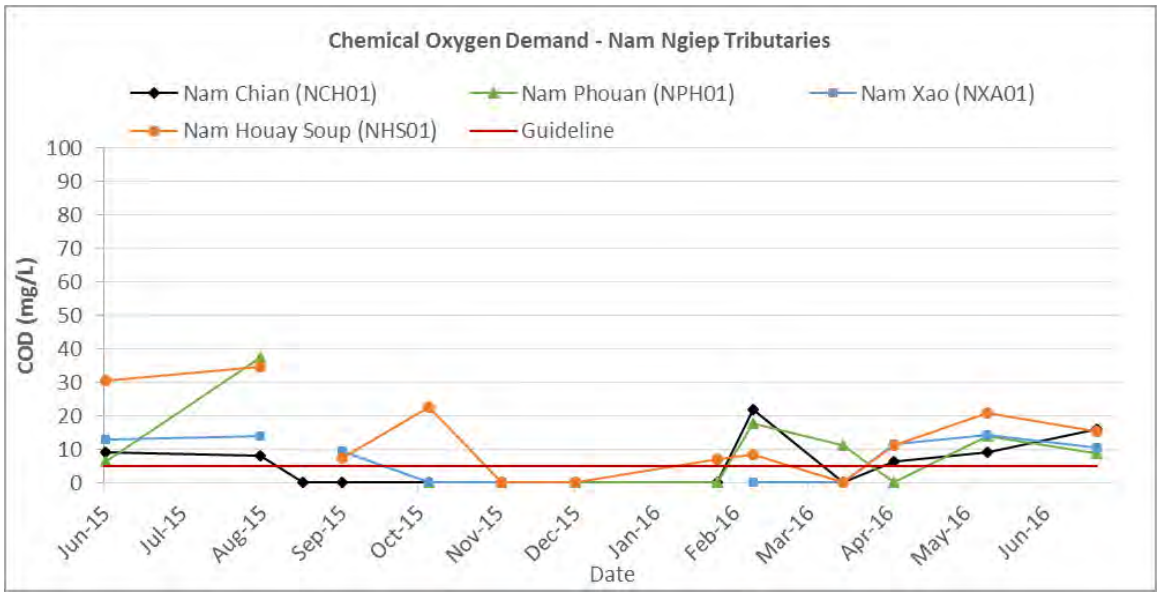


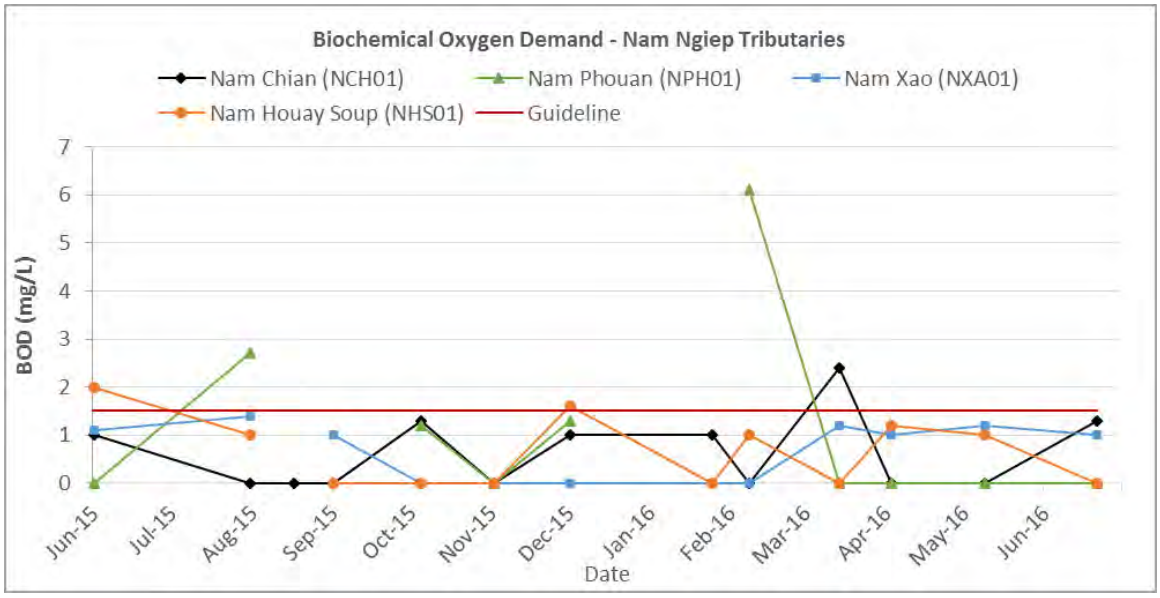

Faecal Coliform - Nam Ngiep River
NNG01
NNG02
NNG03
NNG09
NNG04
NNG05
NNG06
NNG07
NNG08
Guideline
Faecal coliform (MPN/100mL)
100000
10000
1000
100
10
1
Jun-15
Jul-15
Aug-15
Sep-15
Oct-15
Nov-15
Dec-15
Jan-16
Feb-16
Mar-16
Apr-16
May-16
Jun-16
Date

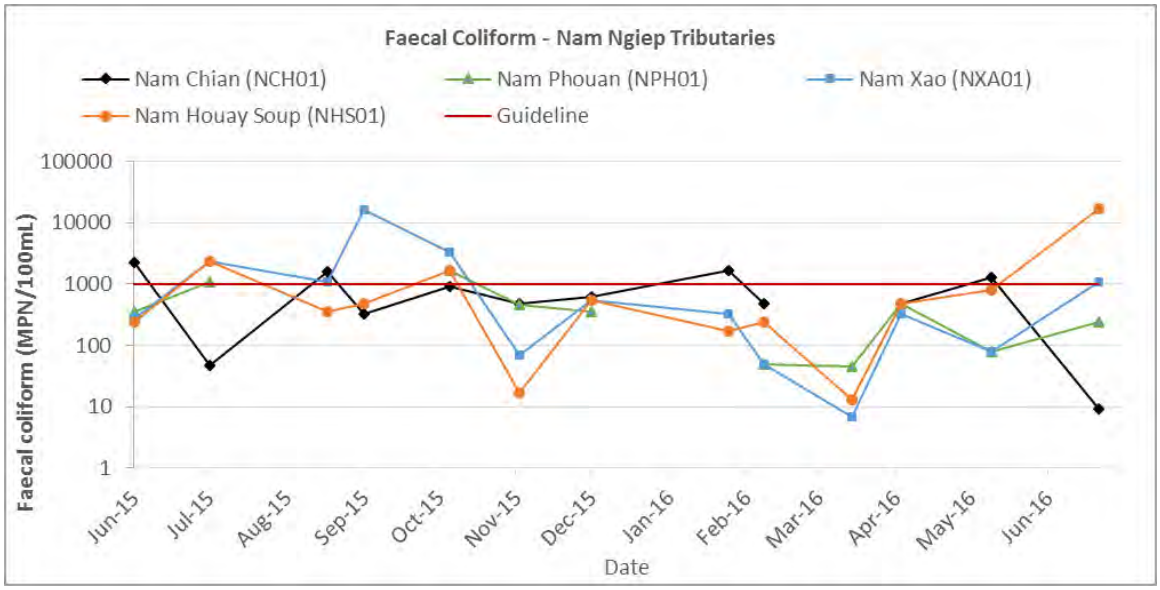

Total Coliform - Nam Ngiep River
NNG01
NNG02
NNG03
NNG09
NNG04
NNG05
NNG06
NNG07
NNG08
Guideline
Total coliform (MPN/100mL)
100,000
10,000
1,000
100
10
1
Jun-15
Jul-15
Aug-15
Sep-15
Oct-15
Nov-15
Dec-15
Jan-16
Feb-16
Mar-16
Apr-16
May-16
Jun-16
Date

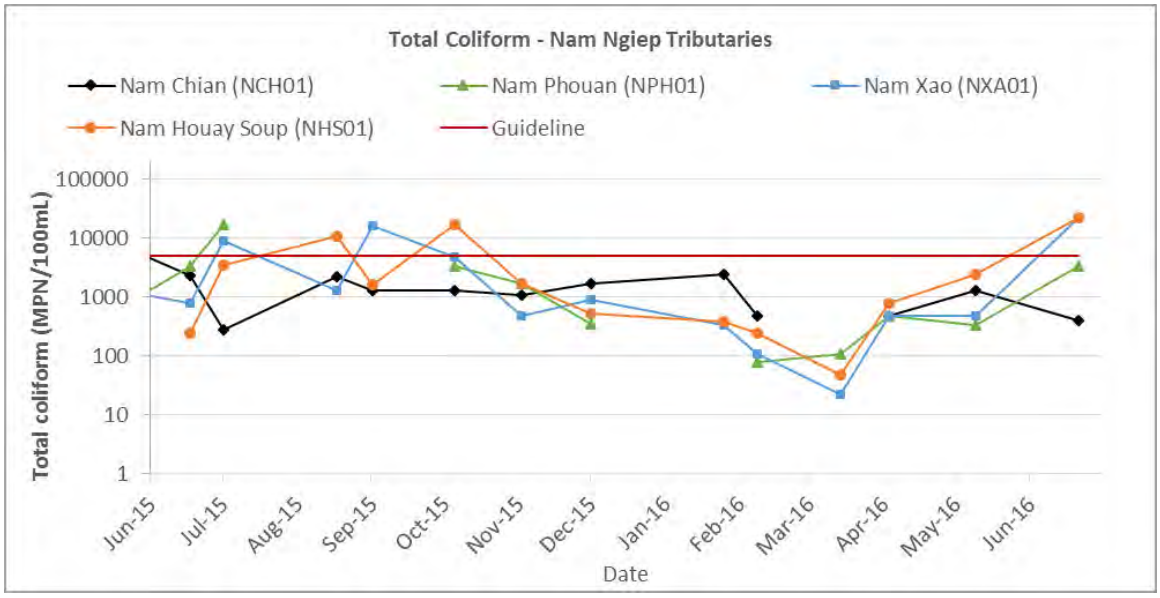
Key Water Quality Parameters for the Nam Ngiep Tributaries: Nam Chian, Nam Phouan, Nam Xao, Nam Houay Soup



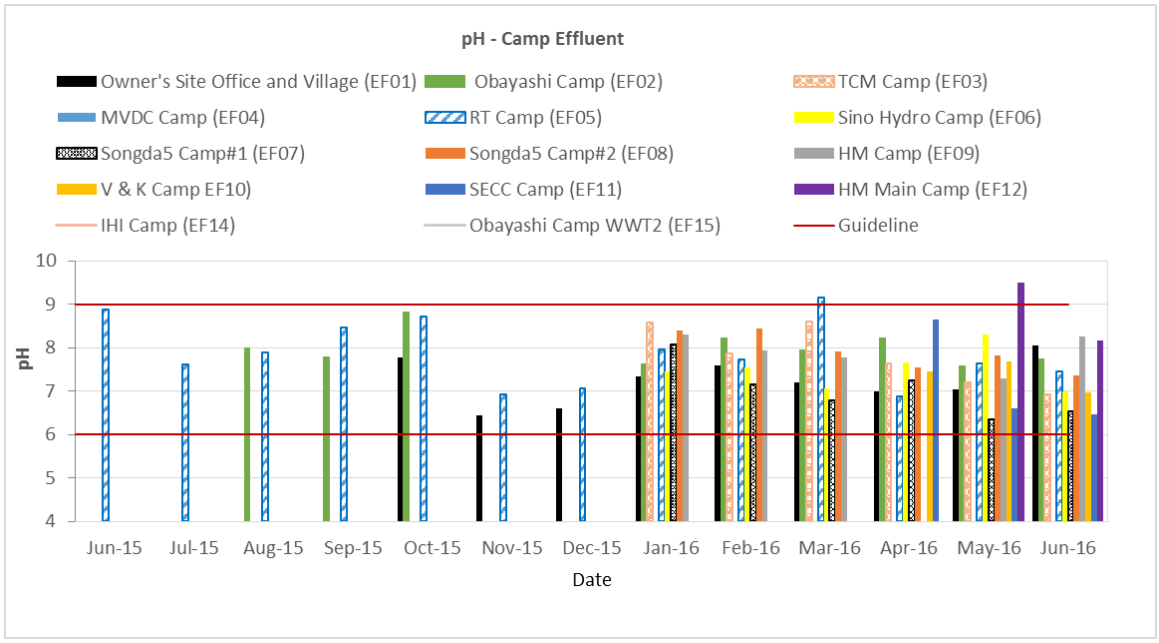


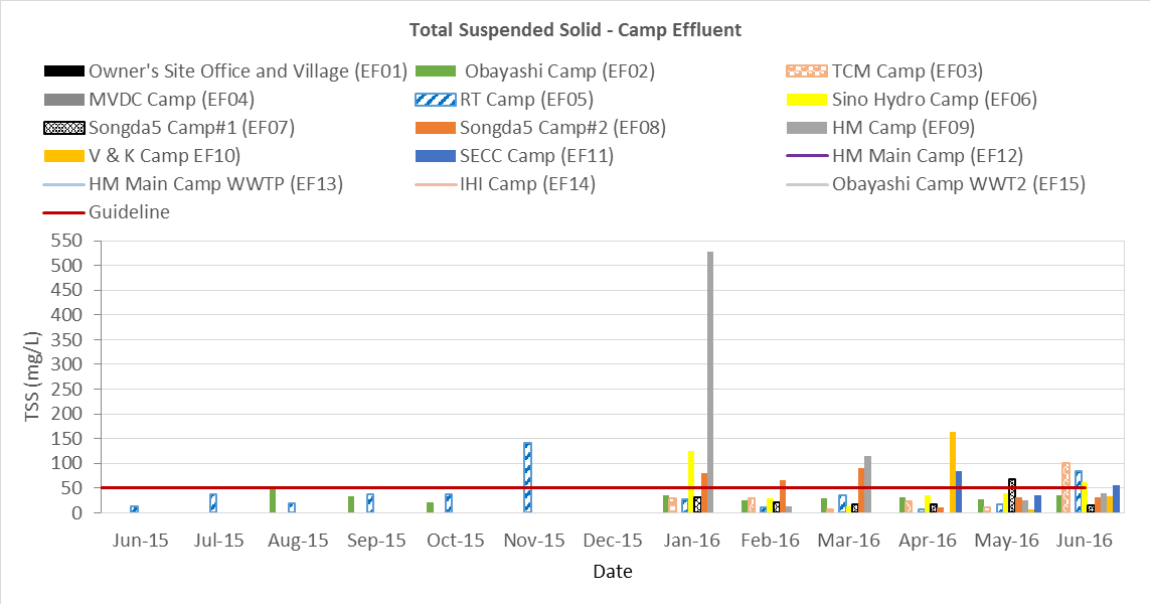

Biochemical Oxygen Demand - Nam Ngiep Tributaries
Nam Chian (NCH01)
Nam Phouan (NPH01)
Nam Xao (NXA01)
Nam Houay Soup (NHS01)
Guideline
BOD (mg/L)
0
1
2
3
4
5
6
7
Jun-15
Jul-15
Aug-15
Sep-15
Oct-15
Nov-15
Dec-15
Jan-16
Feb-16
Mar-16
Apr-16
May-16
Jun-16
Date

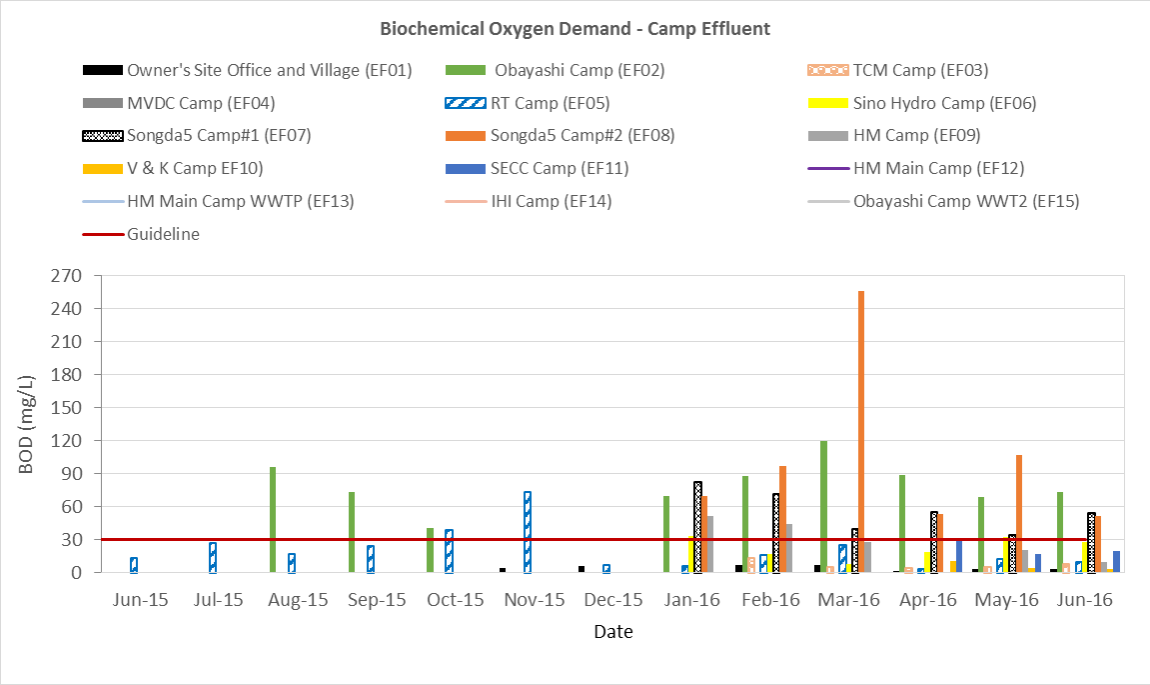

Faecal Coliform - Nam Ngiep Tributaries
Nam Chian (NCH01)
Nam Phouan (NPH01)
Nam Xao (NXA01)
Nam Houay Soup (NHS01)
Guideline
Faecal coliform (MPN/100mL)
1
10
100
1000
10000
100000
Jun-15
Jul-15
Aug-15
Sep-15
Oct-15
Nov-15
Dec-15
Jan-16
Feb-16
Mar-16
Apr-16
May-16
Jun-16
Date

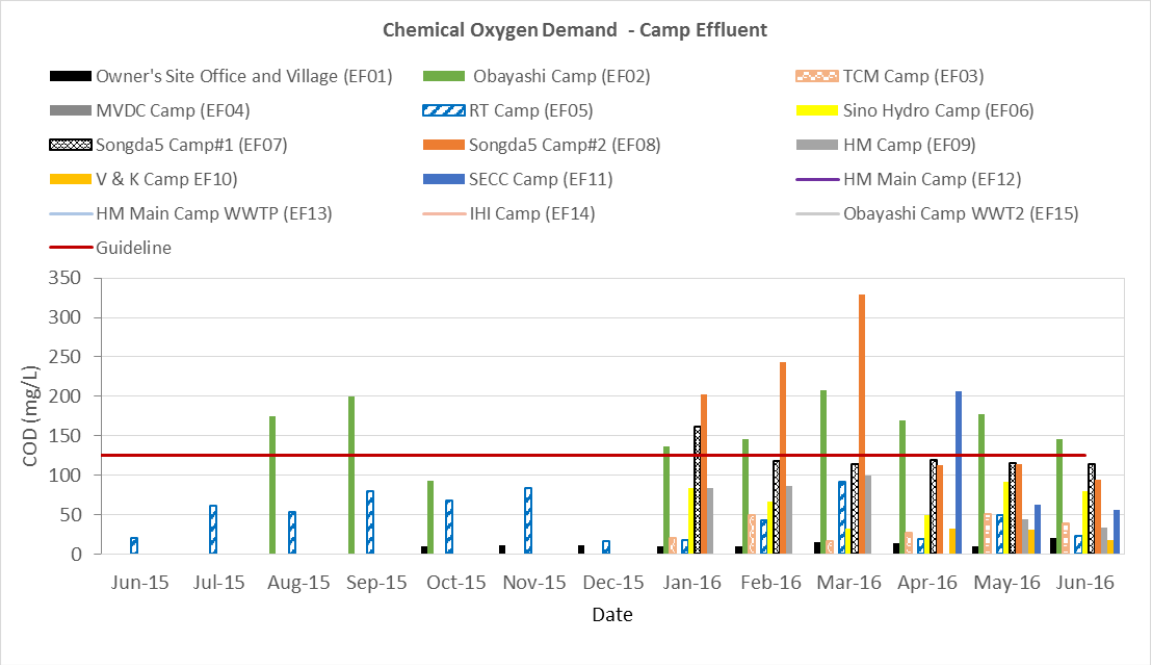


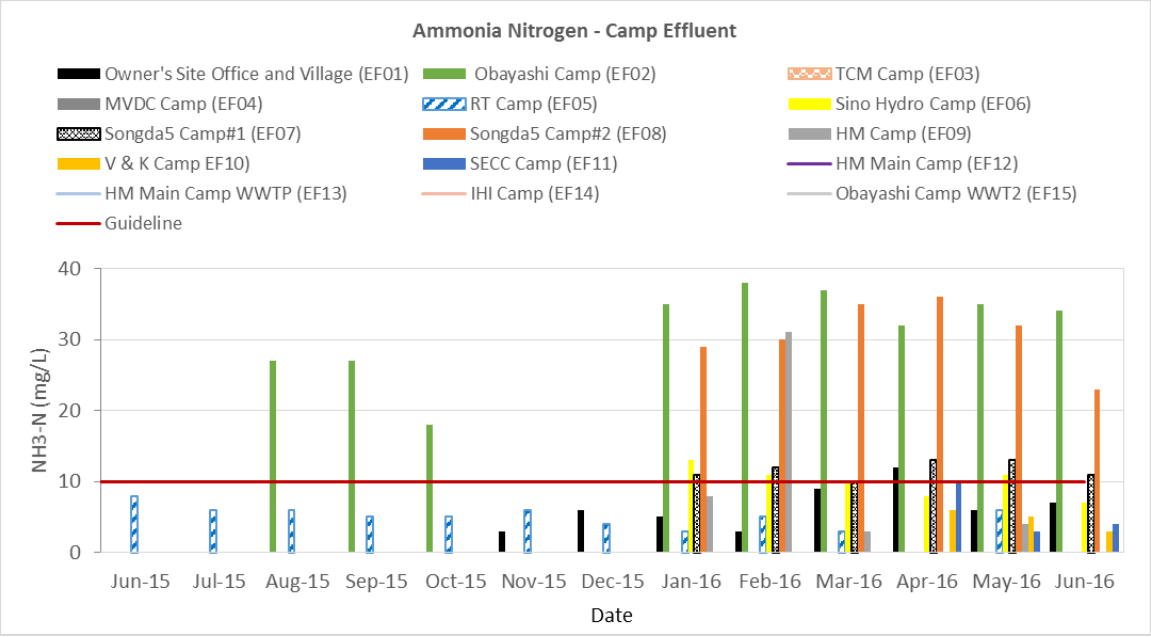
Camps' Effluent Water Quality Trends

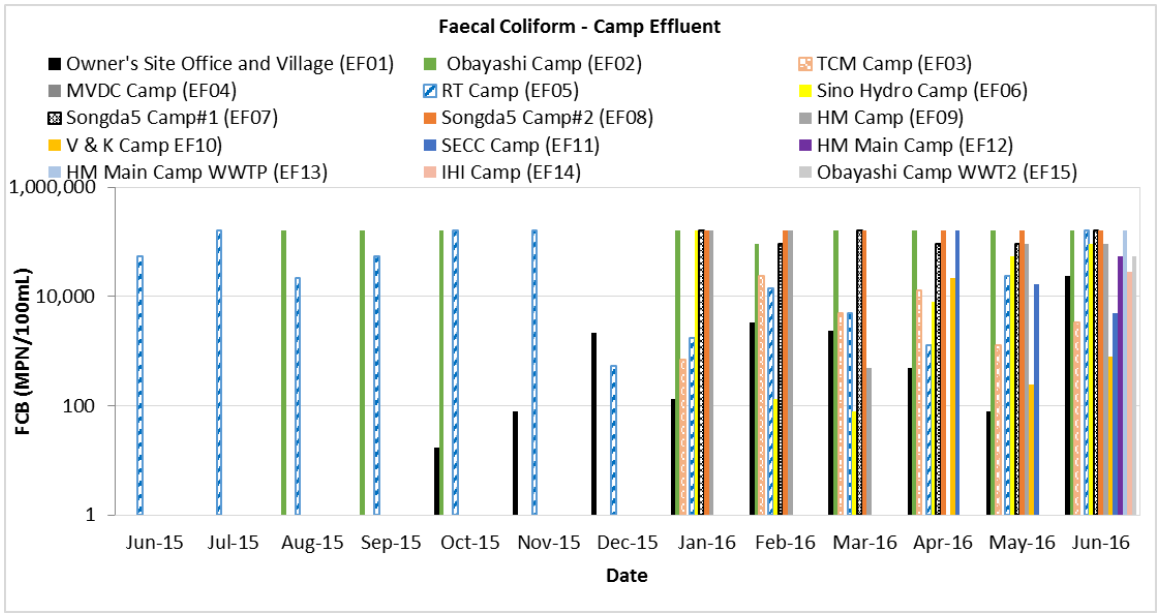


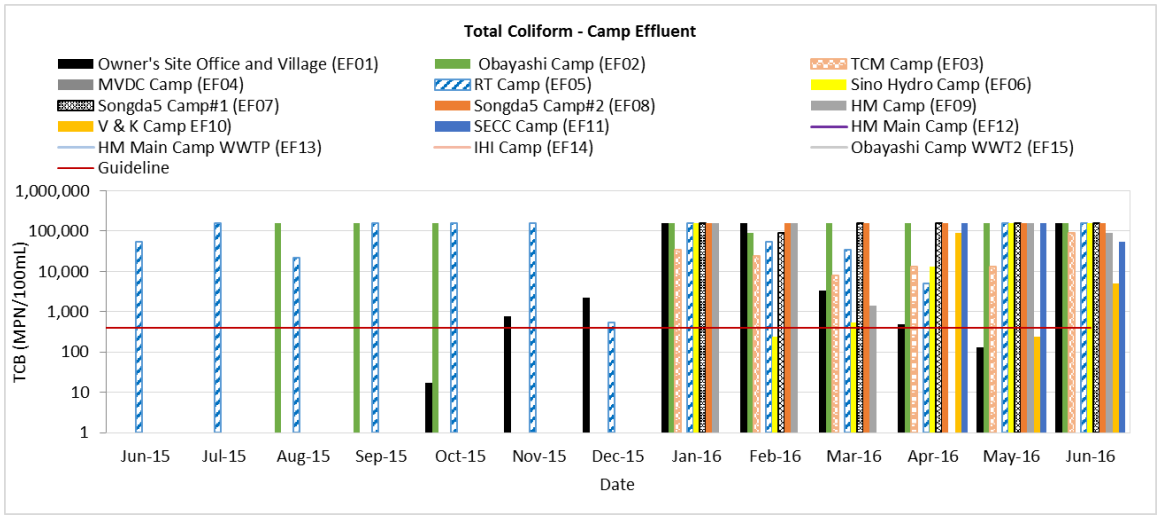

Total Suspended Solid - Camp Effluent
Owner's Site Office and Village (EF01)
Obayashi Camp (EF02)
TCM Camp (EF03)
MVDC Camp (EF04)
RT Camp (EF05)
Sino Hydro Camp (EF06)
Songda5 Camp#1 (EF07)
Songda5 Camp#2 (EF08)
HM Camp (EF09)
V & K Camp EF10)
SECC Camp (EF11)
HM Main Camp (EF12)
HM Main Camp WWTP (EF13)
IHI Camp (EF14)
Obayashi Camp WWT2 (EF15)
Guideline
TSS (mg/L)
550
500
450
400
350
300
250
200
150
100
50
0
Jun-15
Jul-15
Aug-15
Sep-15
Oct-15
Nov-15
Dec-15
Jan-16
Feb-16
Mar-16
Apr-16
May-16
Jun-16
Date


Biochemical Oxygen Demand - Camp Effluent
Owner's Site Office and Village (EF01)
Obayashi Camp (EF02)
TCM Camp (EF03)
MVDC Camp (EF04)
RT Camp (EF05)
Sino Hydro Camp (EF06)
Songda5 Camp#1 (EF07)
Songda5 Camp#2 (EF08)
HM Camp (EF09)
V & K Camp EF10)
SECC Camp (EF11)
HM Main Camp (EF12)
HM Main Camp WWTP (EF13)
IHI Camp (EF14)
Obayashi Camp WWT2 (EF15)
Guideline
BOD (mg/L)
270
240
210
180
150
120
90
60
30
0
Jun-15
Jul-15
Aug-15
Sep-15
Oct-15
Nov-15
Dec-15
Jan-16
Feb-16
Mar-16
Apr-16
May-16
Jun-16
Date


Chemical Oxygen Demand - Camp Effluent
Owner's Site Office and Village (EF01)
Obayashi Camp (EF02)
TCM Camp (EF03)
MVDC Camp (EF04)
RT Camp (EF05)
Sino Hydro Camp (EF06)
Songda5 Camp#1 (EF07)
Songda5 Camp#2 (EF08)
HM Camp (EF09)
V & K Camp EF10)
SECC Camp (EF11)
HM Main Camp (EF12)
HM Main Camp WWTP (EF13)
IHI Camp (EF14)
Obayashi Camp WWT2 (EF15)
Guideline
COD (mg/L)
350
300
250
200
150
100
50
0
Jun-15
Jul-15
Aug-15
Sep-15
Oct-15
Nov-15
Dec-15
Jan-16
Feb-16
Mar-16
Apr-16
May-16
Jun-16
Date


Ammonia Nitrogen - Camp Effluent
Owner's Site Office and Village (EF01)
Obayashi Camp (EF02)
TCM Camp (EF03)
MVDC Camp (EF04)
RT Camp (EF05)
Sino Hydro Camp (EF06)
Songda5 Camp#1 (EF07)
Songda5 Camp#2 (EF08)
HM Camp (EF09)
V & K Camp EF10)
SECC Camp (EF11)
HM Main Camp (EF12)
HM Main Camp WWTP (EF13)
IHI Camp (EF14)
Obayashi Camp WWT2 (EF15)
Guideline
NH3-N (mg/L)
40
30
20
10
0
Jun-15
Jul-15
Aug-15
Sep-15
Oct-15
Nov-15
Dec-15
Jan-16
Feb-16
Mar-16
Apr-16
May-16
Jun-16
Date


Faecal Coliform - Camp Effluent
Owner's Site Office and Village (EF01)
Obayashi Camp (EF02)
TCM Camp (EF03)
MVDC Camp (EF04)
RT Camp (EF05)
Sino Hydro Camp (EF06)
Songda5 Camp#1 (EF07)
Songda5 Camp#2 (EF08)
HM Camp (EF09)
V & K Camp EF10)
SECC Camp (EF11)
HM Main Camp (EF12)
HM Main Camp WWTP (EF13)
IHI Camp (EF14)
Obayashi Camp WWT2 (EF15)
1,000,000
10,000
100
1
FCB (MPN/100mL)
Jun-15
Jul-15
Aug-15
Sep-15
Oct-15
Nov-15
Dec-15
Jan-16
Feb-16
Mar-16
Apr-16
May-16
Jun-16
Date


Total Coliform - Camp Effluent
Owner's Site Office and Village (EF01)
Obayashi Camp (EF02)
TCM Camp (EF03)
MVDC Camp (EF04)
RT Camp (EF05)
Sino Hydro Camp (EF06)
Songda5 Camp#1 (EF07)
Songda5 Camp#2 (EF08)
HM Camp (EF09)
V & K Camp EF10)
SECC Camp (EF11)
HM Main Camp (EF12)
HM Main Camp WWTP (EF13)
IHI Camp (EF14)
Obayashi Camp WWT2 (EF15)
Guideline
1,000,000
100,000
10,000
1,000
100
10
1
TCB (MPN/100mL)
Jun-15
Jul-15
Aug-15
Sep-15
Oct-15
Nov-15
Dec-15
Jan-16
Feb-16
Mar-16
Apr-16
May-16
Jun-16
Date

Construction Area Discharge Water Quality