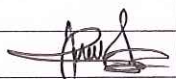
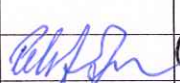
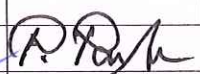
NAM NGIEP 1
POWER COMPANY

Nam Ngiep 1 Hydropower Project

Environmental Management Monthly Monitoring Report

March 2017

					
A	05 May 2017	Viengkeo Phetnavongxay	Peter.G.Jensen	Prapard PanARam	
REV	DATE	AUTHOR	CHECKED	APPROVED	MODIFICATION DETAILS

Accessibility		Document No.
☑	Public	NNP1-C-J0904-RP-027-A
☐	Internal	
☐	Confidential	

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BBREVIATIONS / ACRONYMS

AIP	Annual Implementation Plan
ADB	Asian Development Bank
BBS	Biodiversity Baseline Survey
BAC	Biodiversity Advisory Committee
BOF	Biodiversity Offset Framework
BOMC	Biodiversity Offset Management Committee
BOMP	Biodiversity Offset Management Plan
CA	Concession Agreement between the NNP1PC and GOL,
CAP	Corrective Action Plan
COD	Commercial Operation Date
CVC	Conventional Vibrated Concrete
CWC	Civil Works Contract
CTA	Common Terms Agreement
DEB	Department of Energy Business, MEM
DEPP	Department of Energy Policy and Planning, MEM
DEQP	Department of Environment and Quality Promotion, MONRE
DESIA	Department of Environmental and Social Impact Assessment, MONRE
DFRM	Department of Forest Resources Management, MONRE
DLA	Department of Land Administration, MONRE
DSRP	Dam Safety Review Panel
EC	Electrolytic Conductivity
ECOCD	EGAT Construction Obligation Commencement Date
EDL	Electricite du Laos
EDL PPA	Power Purchase Agreement between NNP1PC and EDL
EGAT	Electricity Generating Authority of Thailand
EGATi	EGAT International Company Limited
EIA	Environmental Impact Assessment
EMMR	Environmental Management and Monitoring Reports
EMO	Environmental Management Office of ESD within NNP1PC
EMU	Environmental Monitoring Unit
EMWC	Electrical-Mechanical Works Contract
EPF	Environmental Protection Fund
ERIC	Environmental Research Institute Chulalongkhorn University
ERM	Environmental Resource Management
ESD	Environmental and Social Division of NNP1PC

ESMMP	Environmental and Social Monitoring and Management Plan
FY	Fiscal Year
GOL	Government of Lao PDR
GIS	Geographic Information Systems
HH	Household
HMWC	Hydraulic Metal Works Contract
HR	Human Resources
IEE	Initial Environmental Examination
IMA	Independent Monitoring Agency
INRMP	Integrated Natural Resources Management Plan
ISP	Intergraded Spatial Planning
km	kilometre
kV	kilo-Volt
LEPTS	Lao Electric Power Technical Standard
LHSE	Lao Holding State Enterprise
LTA	Lender's Technical Advisor
M	million
m	metre
MAF	Ministry of Agriculture and Forestry
MEM	Ministry of Energy and Mines, Lao PDR
MOF	Ministry of Finance, Lao PDR
MOM	Minutes of Meeting
MONRE	Ministry of Natural Resource and Environment, Lao PDR
MOU	Memorandum of Understanding
NBCA	National Biodiversity Conservation Area
NCI	Non-Compliance Issue
NCR	Non-Compliance Report
NN2	Nam Ngum 2 Power Company Limited
NNP1PC	Nam Ngiep 1 Power Company Limited
NPF	National Protection Forest
NTFP	Non-Timber Forest Products
NT2	Nam Theun 2 Hydropower Project
OC	Obayashi Corporation
ONC	Observation of Non-Compliance
PAFO	Provincial Department of Agriculture and Forestry
PAP	Project Affected People
PD	Property Damage

PONRE	Provincial Department of Natural Resource and Environment, MONRE
PvPA	Provincial Protection Area
RCC	Roller Compacted Concrete
SIR	Site Inspection Report
SLBMP	Salvage Logging Biomass Management Plan
SOP	Standard Operating Procedure
SMO	Social Management Office of ESD within NNP1PC
SS-ESMMP	Site Specific Environmental and Social Monitoring and Management Plan
TD	Technical Division of NNP1PC
TOR	Terms of Reference
TSS	Total Suspended Solids
UAE	United Analysis and Engineering Consultant Company Ltd.
UXO	Unexploded Ordinance
WMF	Watershed Management Fund
WMP	Watershed Management Plan
WRPC	Watershed and Reservoir Protection Committee
WRPO	Watershed and Reservoir Protection Office
WWTS	Waste Water Treatment System

EXECUTIVE SUMMARY

During March 2017, the Environmental Management Office (EMO) of NNP1PC received a total of 13 SS-ESMMPs and one additional supporting document to a previously approved SS-ESMMP for review and clearance. With seven SS-ESMMPs carried over from previous months, there were 20 SS-ESMMPs and one supporting document for EMO review during the reported month. Out of these, eight SS-ESMMPs and one supporting document were cleared with conditions; three SS-ESMMPs were cleared without conditions; four SS-ESMMPs were closed and the remaining five SS-ESMMPs are carried over to April 2017.

A total of 16 including five new Observations of Non-Compliances (ONCs), two - including one new - Non-Compliance Report level 1 (NCR1) and five - including one new - Non-Compliance Report level 2 (NCR2) were active in March 2017. Out of these, five ONCs and four NCR2 were resolved. A total of 11 ONCs, two NCR1 and one NCR2 will be carried over into April 2017. During 16 to 17 March 2017, Provincial and District EMUs conducted a joint environmental monitoring mission together with NNP1PC covering the main construction sites and camps, Houay Soup landfill and Houay Soup Resettlement Area (HSRA). The EMUs submitted their mission report to NNP1PC on 21 March 2017. An official response describing progress of corrective actions will be submitted by NNP1PC in April 2017.

The construction of NNP1PC Environmental Laboratory at the Owner's Site Office and Village (OSOV) was fully completed on 15 March 2017. The laboratory equipment was relocated from the warehouse, installed and operated at the new laboratory. The NNP1 Project laboratory, in collaboration with United Analysis and Engineering Consultant Company Limited (UAE) has started to conduct performance verification of its analyses for Total Suspended Solids in March 2017 and expect to continue in April 2017 to obtain more information prior to making any conclusion.

In addition, a part time local consultant is being recruited to assist with the laboratory operation including performance verification in collaboration with the UAE laboratory, data analysis and Quality Assurance/Quality Control (QA/QC).

The effluent monitoring results for March 2017 indicate that all of the camps contain total coliforms above the effluent standards of 400 MPN/100 ml. There was a slight increase for total coliforms found at the Owner's Village and Site Office and Zhefu Camp above the effluent standards in one of the missions during March 2017. Regardless, some progresses have been achieved where the Waste Water Treatment System (WWTS) improvements at both Song Da5 Camp No. 1 and No.2, Kenber Camp and IHI Main Camp were completed. Dosing with calcium hypochlorite and sodium hypochlorite have commenced at Song Da 5 Camp No. 2 and IHI Main Camp only. The amount of application to achieve satisfactory results are being experimented in the NNP1PC Environmental Laboratory for adjustment to the field situation accordingly. The WWTS improvements at Lilama 10 Camp is ongoing and has commenced at HM Hydro Main Camp. A proposal for the WWTS improvement at Sino Hydro Camp was submitted for NNP1PC review on 23 February 2017 but actual work has not started. Deadlines for the improvements of the WWTS at the TCM/GFE, V&K and Obayashi Corporation Camps were yet concrete.

On 28 March 2017, an updated Detailed Works Programme (DWP) and Site Specific Environmental and Social Management and Monitoring Plan (SS-ESMMP) for NNP1 Project Landfill construction was submitted to NNP1PC for review and clearance.

The development of the Nam Ngiep 1 Watershed Management Plan (WMP) continued to progress. The consultant revised the plan based on the comments and recommendations from NNP1 EMO and ADB Consultant. The latest version of the plan was submitted to NNP1 on 27 March 2017. The plan will be discussed with GOL line agencies after ADB review and approval.

The TOR for preparation of a Biodiversity Offset Management Plan (BOMP) was revised based on recommendations from BAC and IAP. The revised TOR was circulated to the applicants in the middle

of March 2017 and two of the three shortlisted applicants submitted a full proposal on 30 March 2017. The full proposal will be reviewed by NNP1, ADB, IAP, BAC and GOL in April 2017.

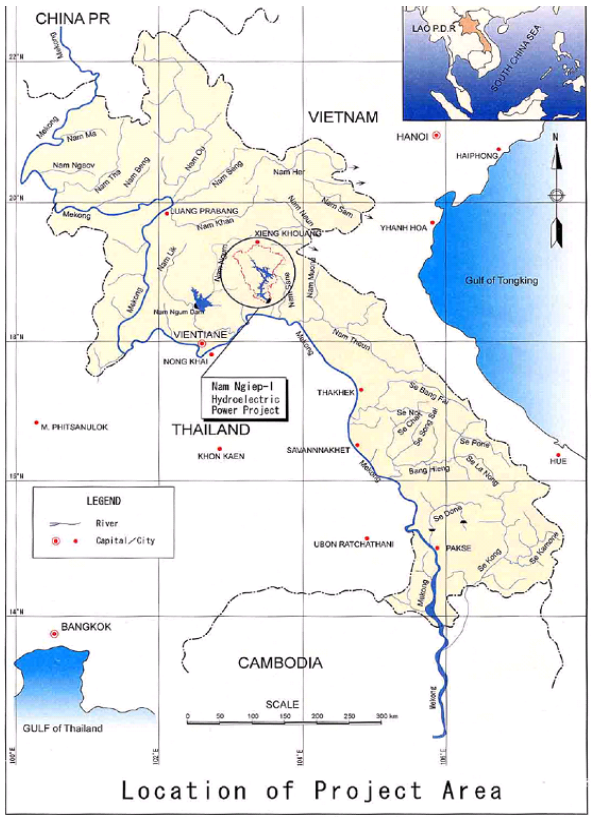
Biomass clearance was completed for around 50 ha in March 2017 or around 50% of the total target for March 2017. The total biomass clearance covers around 899 ha, representing about 55% of the total target of 1,640 ha. The clearance for the remaining area planned for around 200 ha before wet season 2017 and another 500 ha from October to December 2017.

The fisheries monitoring programme is progressing, and a database has been developed to support the future fish management programme as part of the Nam Ngiep 1 Watershed Management Plan. Three types of surveys were conducted during March 2017 including daily fish catch logbook monitoring, daily catch logbook verification survey and fish migration and spawning survey. The gathered information is being put into the database. The data from the daily fish catch logbook monitoring indicates that the mean daily fish catch in the Nam Ngiep River was 2.3 kg/fishing household/day in February 2017. The estimated total fish catch in Nam Ngiep basin for February 2017 is 53,000 kg. Around 28% of the catch was sold, 65% was consumed fresh by the fishing households, 4% processed and approximately 3% was used for other purposes.

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 (Figure 1-1).

Figure 1-1: Location Map



The project will consist of two dams. The main dam which is located 9.0 km upstream of Hat Gnuin Village in Bolikhan District, will create a 70-km-long, narrow reservoir that extends up the Ngiep Valley as far as Thathom District. At almost 150 m high, the main dam will be the second largest in 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 outside Vientiane Capital. A 115-kV transmission line will be constructed by EDL from the Re-regulation Power Station to Pakxan substation over a distance of 40 km.

This Environmental Monthly Monitoring Report (EMMR) provides a summary of environmental monitoring activities and mitigation actions in March 2017. The EMMR 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 Government of Lao PDR (GoL) related agencies.

The EMMR and other related reports including related construction Site Specific Environmental and Social Monitoring and Management Plans (SS-ESMMPs) are publically disclosed on the Project website in line with the ADB and GoL Public Disclosure Policies. Hard copies of the final reports will also be available upon requests at the Project's main office in Vientiane Capital and field office in Pakxan, Bolikhamxay Province.

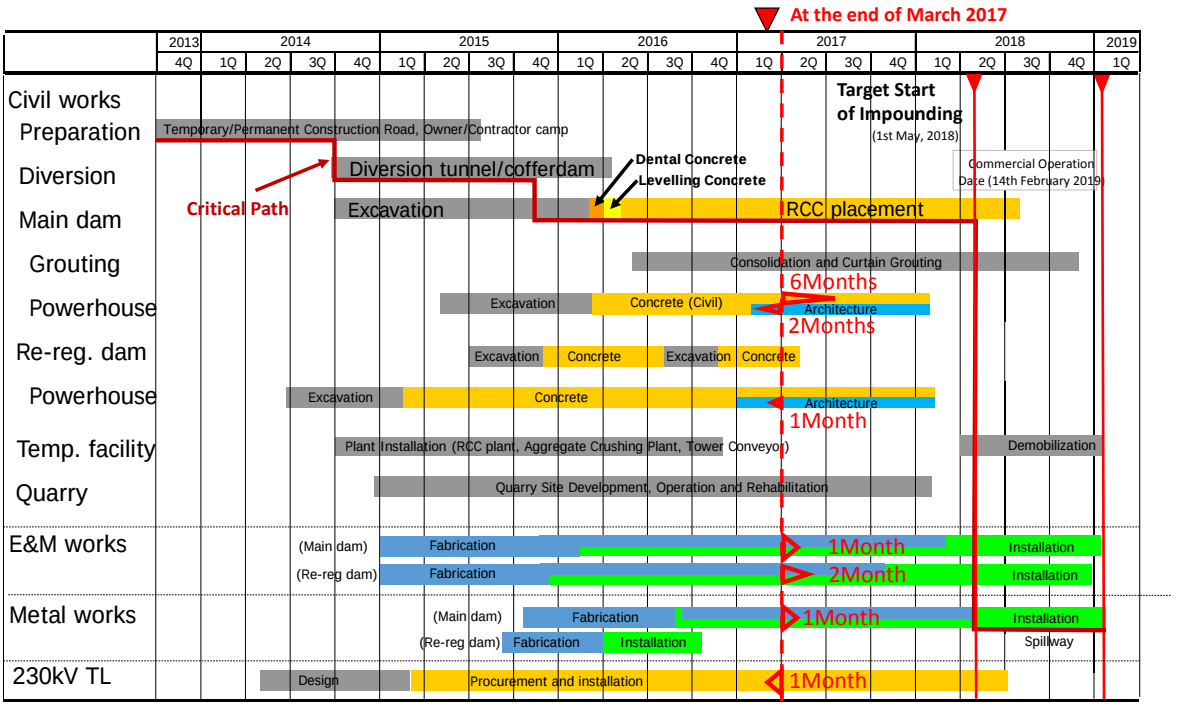
2. WORK PROGRESS OF PRINCIPAL CONTRACTORS

Construction Works for the Project are being carried out through four separate main construction contracts under the supervision of the Technical Division of NNP1PC. The four contracts are the Civil Works, the Electrical and Mechanical Works, the Hydraulic Metal or Hydro-mechanical Works and the 230 kV Transmission Line Works. Actual overall cumulative work progress until the end of

March 2017 was 66.3%[1] (compared to planned progress of 69.3%),based on achieved Interim Milestone Payments for all Contracts excluding the value of Advance Payments, varied works and other adjustments allowed under each Contract. In terms of the value of actual work done the percentage is slightly understated since work completed, but not paid, is not included.

The overall construction schedule and progress curve (by achieved Milestone Payments) are shown in Figure 2-1.

Figure 2-1: Overall Construction Schedule



2.1 Civil Work

The Civil Works Contract was executed between Obayashi Corporation and the Nam Ngiep 1 Power Company on 30 September 2013 and the NTP was issued on 03 October 2014. Excavation works of the main dam, the diversion tunnel and the re-regulation dam were commenced in October 2014 and completed in February 2016, following which the concreting works were commenced.

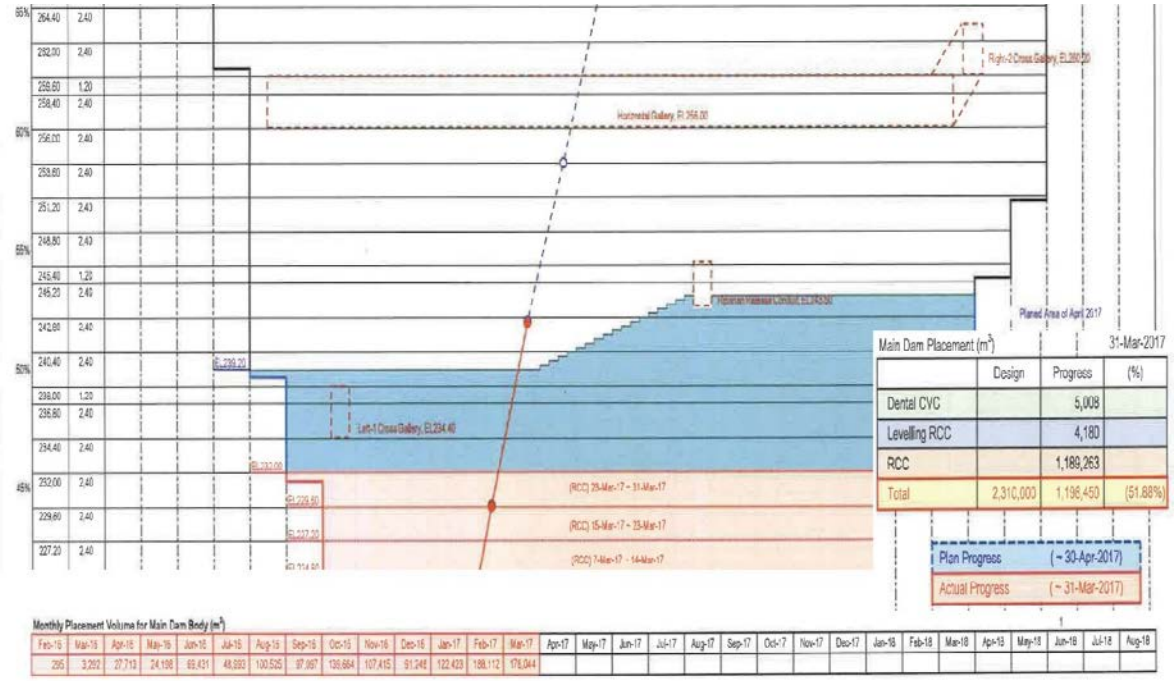
The cumulative actual work progress of the Civil Works until the end of March 2017 was 70.4% (compared to planned progress of 69.9 %) calculated in the same manner as described above for the value of achieved Interim Milestone Payments excluding advance payment.

[1] The progress to-date is calculated as (Cumulative Amount of Achieved Interim Milestone Payments) / (Total Agreed Original Price of Construction Contracts) and expressed as a percentage. These totals exclude varied works and other adjustments allowed under each Contract.

2.1.1 Main dam and power house

After starting the main dam excavation works in October 2014 on the left bank, the works were about one month advanced when diversion of the Nam Ngiep River was achieved at the end of October 2015. However, excavated volumes were 20% greater than expected and part of this additional work is necessary to construct a 'shear key' structure due to the weak layers of rock encountered in the dam foundation. Following the efforts on Site, the additional excavation work was completed at the end of February 2016.

Figure 2-2: Progress of Main Dam RCC Works as of 31 March 2017



The consolidation drilling and grouting for the main dam started in May 2016 and is ongoing. The progress is 77 % by achievement of total drilled length at the end of March 2017 as a proportion of the total expected drilling

Table 2-1: Progress of consolidation and curtain drilling for grouting as of 31 March 2017

Item	Total Anticipated Drilling (m)	Completed (m)	Progress (%)
Consolidation Grouting	16,845	13,058	77
Curtain Grouting	27,945	3,201	11

* The linear metres 'completed' are drilling only and exclude grouting

Main powerhouse sub-structure excavation works were completed in January 2016 and levelling concrete works were started in coordination with installation of the grounding system. Overhead travelling crane runway beam was installed in December 2016. Progress of the powerhouse concreting works is still proceeding well and is shown in Table 2-2 below.

Table 2-2: Progress of Main Powerhouse Sub-Structure Concrete Works to 31 March 2017.

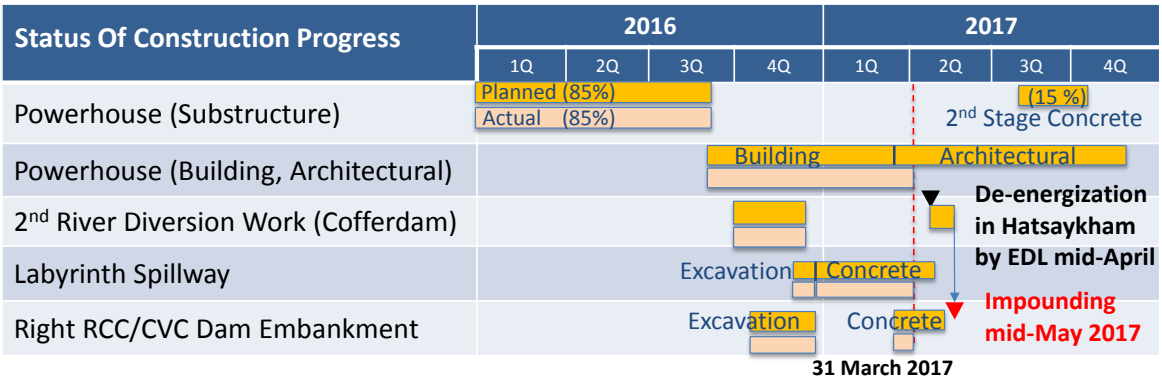
Location	Total Anticipated Volume (m^3)	Completed (m^3)	Progress (%)
Main Powerhouse	32,600	24,645	75
Penstock Embedment	10,117	7,150	70

2.1.2 Re-regulation dam and powerhouse

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 ***Figure** 2-3* below

Figure 2-3: Progress of Re-regulation Dam Powerhouse Works to 31 March 2017



Structure	Civil Structure	Spillway		Building			Right Bank RCC Structure	Left Bank Backfill
	Intake + PH + Tailrace	Right Bank Side Concrete	Concrete Apron	Roof Frame	Roof Sheet	Block Wall over El.177 m	RCC + CVC	Powerhouse and Switch Yard
	(m3)	(m3)	(m3)	(ton)	(m2)	(m2)	(m3)	(m3)
Design	26,549	17,515	471	65	1,532	1,576	11,576	45,000
Completed	24,748	16,493	377	65	1,342	1,520	7,074	42,800
Progress %	**93**	**94**	**80**	**100**	**88**	**96**	**61**	**95**


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. Installation of the re-regulation waterway gate and stop log and re-regulation intake gate and structural concrete works for the retaining wall to support the substation yard were completed in October 2016. Building superstructure work continued for the powerhouse with the commencement of construction of concrete columns.

2.1.3 Temporary work facility

2.1.3.1 DIVERSION TUNNEL INLET AND OUTLET

The diversion tunnel works which is over 600 m in length and 10 m in diameter were commenced in October 2014 by drill and blast techniques and completed in late September 2015. The river diversion took place on 31 October 2015 together with construction of earth-fill cofferdams upstream and downstream.

2.1.3.2 SECONDARY UPSTREAM COFFERDAM

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 were completed on 02 April 2016.

2.1.3.3 PLANT YARDS

These comprise the Aggregate Crushing Plant, the CVC Batching Plant and the RCC Batching Plant. Foundation work and installation of equipment were completed at all the plant yards and the belt conveyor system from the RCC plant to the main dam was completed in early April 2016.

2.1.3.4 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.

2.1.3.5 DISPOSAL AREAS

The disposal area on the right bank has been available for operation since January 2015, as was the adjacent waste disposal area. The Disposal Area No.9 along Road P1 near the entrance of Road T5 started operation in April 2015. Unsuitable material from the quarry continues to be hauled to Disposal area No.6 and Disposal Area No.9 is being developed by the E&M Contractor as stated above.

2.2 Electrical and Mechanical Works

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 by value until the end of March 2017 was 60.8 % (compared to planned progress of 73.3%).

Figure 2-4: Preparation for installation of stay ring for unit 1 at the main powerhouse on 24 March 2017

Figure 2-5: Installation of 80 tonne OHTC at the re-regulation powerhouse

2.3 Hydro-Mechanical Works

The HMWC was executed between IHI Infrastructure Systems (IIS) and NNP1PC on 18 April 2014 and the NTP was issued to the Contractor on 03 October 2014. The cumulative work progress of the Hydraulic Metal Works until the end of March 2017 was 31.7 % (compared to planned progress of 35.4 %).

The latest progress of penstock pipes fabrication at IHI field shop as of the end of February 2017 is shown ***in Table 2-3*** below

Table 2-3: Progress of the penstock pipe fabrication at the IHI field shop as at the end of March *2017*

Item No.	Work Description	Work Progress (%)	Remarks
1.1	Assembly and Welding	74 %	Straight Pipes
1.1	Painting	68 %	Straight Pipes
1.1	Delivery to Main Dam Laydown Area	31 %	Straight Pipes
1.1	Site Erection at Main Dam	31 %	Inclined Part

2.4 230kV Transmission Line Works

The TLW Contract was executed between Loxley-Sri Consortium and NNP1PC on 11 July 2014 and the NTP was issued to the 230 kV TL Contractor on 03 October 2014. The cumulative work progress of the Transmission Line Works until the end of March 2017 was 84.1% (compared to planned progress of 84.8%).

In respect of the delay to commencement of most works the Contractor is studying its programme to ensure that sufficient resources are committed as the works progress to ensure that completion

is achieved in good time. Onset of daily rains has made access to all areas difficult but the Contractor follows its revised acceleration schedule, after the progress for the construction of tower foundations slowed after April, 2016 (See Figure 2-6 below)

Figure 2-6: Cumulative Work Progress of Tower Foundation (Original Planned and Actual)

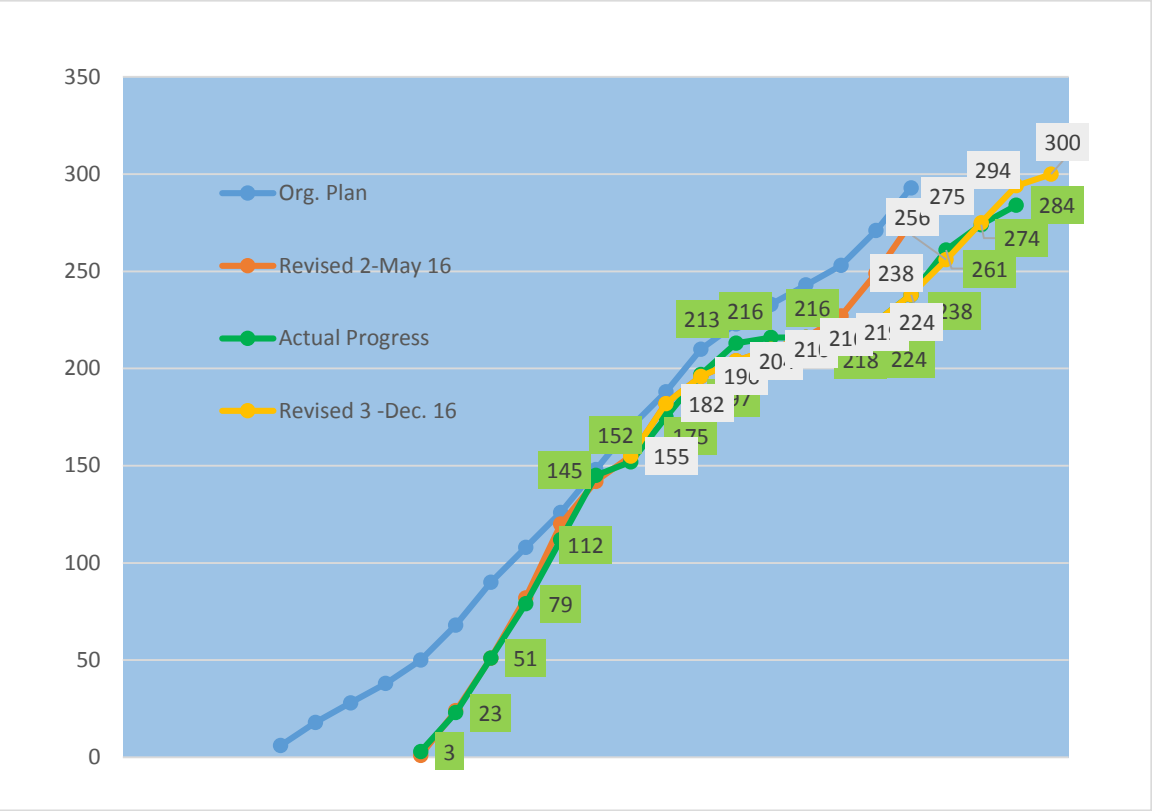


Figure 2-7: Cumulative Works Progress of tower foundation (Revised Planned & Actual)

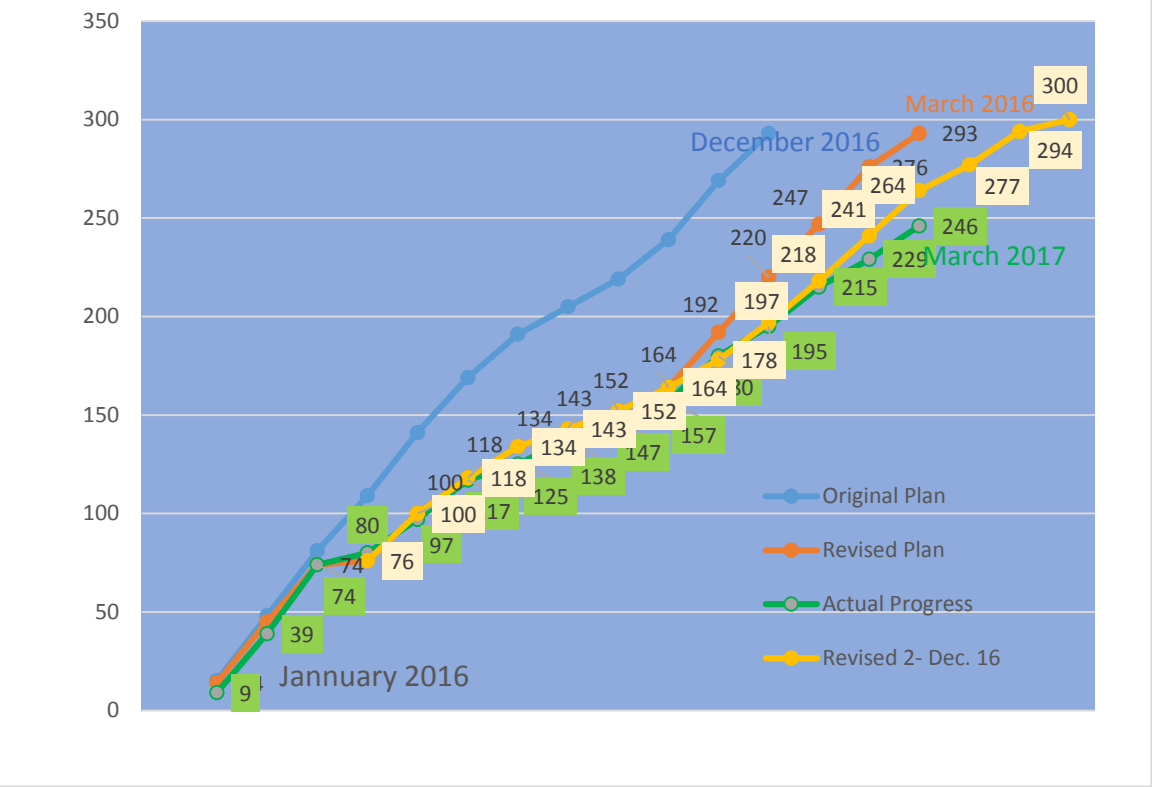


Figure 2-8: Revised Cumulative Works Progress of Tower Erection (Planned & Actual)

3. ENVIRONMENTAL MANAGEMENT MONITORING

3.1 Compliance Management

3.1.1 ESMMP-CP Update 2017

The finalisation of the Environmental and Social Management and Monitoring Plan for the Construction Phase (ESMMP-CP) is in progress. Due to technical data availability, the final review to address some of the provided comments have faced delay. Therefore, the translation into the Lao language cannot be made until a final revision is completed. It is expected that the submission to the Ministry of Natural Resources and Environment (MONRE) can be made by the end of April 2017.

3.1.2 Site Specific Environmental and Social Management and Monitoring Plans

During March 2017, the Environmental Management Office (EMO) of NNP1PC received a total of 13 SS-ESMMPs and one additional supporting document to a previously approved SS-ESMMP for review and clearance. With seven SS-ESMMPs carried over from previous months, there were 20 SS-ESMMPs and one supporting document for EMO review during the reported month. Out of these, eight SS-ESMMPs and one supporting document were cleared with conditions; three SS-ESMMPs were cleared without conditions; four SS-ESMMPs were closed and remaining five SS-ESMMPs are carried over to April 2017.

Table 3-1: SS-ESMMP review status in March 2017

Title	Date Received	Response Status	Comments
SS-ESMMP for Construction of Irrigation Dam, 1	27 January 2017 (2nd submission)	Responded with 'No Objection with Conditions' on 24 March 2017	- Provide appropriate mitigation measures for erosion and sediment

Title	Date Received	Response Status	Comments
Spillway & Outlet Pipe Culvert			control, hazardous material and waste management; - Submit a landscaping and site decommissioning plan at least two weeks before work completion.
SS-ESMMP for RRPS, Closing of Borrow Pit Area at Corner of P1 & P1A beside RRD	15 February 2017 (2nd submission)	Responded with 'No Objection with Conditions' on 14 March 2017	- Provide conceptual designs for open drainage and sediment ponds which show their approximate sizes and shapes; - Indicate timeframe for implementing erosion and sediment control measures (must be in place before the upcoming wet season).
SS-EMMP for Land Levelling (Cutting and Filling) for 90 House Plots at 2LR-Lower Reservoir Village and Health Centre at Resettlement Site	19 February 2017 (3rd submission)	Responded with 'No further Comments and Closing of the DWP & SS-ESMMP' on 24 March 2017	
SS-ESMMP for Extension of Main Road Construction 1.375 Km, phase 2 for Houay Soup Resettlement Site	19 February 2017 (2nd submission)	Responded with 'No Further Comments and Closing of the DWP & SS-ESMMP' on 24 March 2017	
SS-ESMMP for Installation Work of 360 Ton Electrical Overhead Traveling Crane for Main Power Station	20 February 2017 (2nd submission)	Responded with 'No Further comments' on 07 March 2017	
SS-ESMMP for Building Construction at Main Powerhouse	22 February 2017 (4th submission)	Under review	
SS-ESMMP for NNP1 Solid Waste Landfill Construction (Stage 2)	24 February 2017 (1st submission)	Responded with 'No Objection with Conditions' on 13 March 2017	- Provide more details *(not only width and height, but also lining material and elevation)* of the proposed 300 m open ditch specified in Section 5.3; - Provide mitigation measures in section 3 in case of any anticipated impacts from the

Title	Date Received	Response Status	Comments
			earth work and extended area. - Enclose a clear drawing of the leachate pipes with flow direction through the existing waste water treatment ponds; - Provide names of native tree species that will be planted.
SS-ESMMP for the NNP1 Solid Waste Landfill Construction (Stage 2)	28 March 2017 (2nd submission)	Under review	
SS-ESMMP for the Supply and Installation Material for Natural Grass Soccer Field Phase II, Nam Ngiep 1 Hydro Power Project	02 March 2017 (1st submission)	Responded with 'No further comments' on 30 March 2017	
SS-ESMMP for Adit Closure at Right Bank of Main Dam	04 March 2017 (2nd submission)	Responded with 'No further comments' on 16 March 2017	
SS-ESMMP for Curtain Grouting Works at Main Dam	04 March 2017 (7th submission)	Under review	
SS-ESMMP for RCC Operation and Maintenance Work	08 March 2017 (4th submission)	Under review	
SS-ESMMP for EMO Water Quality Laboratory Building Construction at NNP1 Owner's Site Office and Village	10 March 2017 (3rd submission)	Responded with 'No Further Comments and Closing of the DWP & SS-ESMMP' on 16 March 2017	
SS-EMMP for 1.2 km Road Construction to Landfill at Houay Soup Resettlement Site of the Nam Ngiep 1 Hydropower Project	16 March 2017(2nd submission)	Responded with 'No further Comments and Closing of the DWP & SS-ESMMP' on 24 March 2017	
Annex of the DWP for construction of Re-regulation Power Station, Closing of Dyke Borrow Pit No. 7	17 March 2017 (1st submission)	Responded with 'No Objection with Conditions' on 05 April 2017	- Provide a drainage system for southern side of the spoil and drain away to avoid the damage to this access road in the longer term;

Title	Date Received	Response Status	Comments
			- Check if the topsoil and cleared vegetation will also be stockpiled at the Dyke Borrow Pit No. 7. If so, additional measures for topsoil management shall be incorporated in this SP01.
SS-ESMMP for Installation Work of Stay Cone, for Channel Liner and Hatch Cover for Re-regulation Power Station	22 March 2017 (1st submission)	Responded with 'No Objection with Conditions' on 05 April 2017	- Improve the Waste Water Treatment System of Zhefu Camp as per "SP05.23 where sewer toilet facilities are provided, sewage shall be treated to the level defined in Appendix 3 of the ESMMP-CP.
SS-ESMMP for Irrigation Dam Reservoir Land Clearance at Houay Soup Resettlement Site on Nam Ngiep1 Hydro Power project	27 March 2017 (1st submission)	Under review	
SS-ESMMP for Land Levelling (Clearing/Grabbing/Cutting/ Filling) for 28 House Plots (Zone A) and extended areas	28 March 2017 (1st submission)	Responded with 'No Objection with Conditions' on 31 March 2017	- Add detailed mitigation measures for Vegetation Clearance Activities including cutting, grubbing, disposal and elimination of waste vegetation as per SP07; - Add detailed information of the "sodding" work in Section 1.3 Construction Procedures; - Enclose a draft Site Decommissioning Plan for the worker camp and all related facility with the next document submission.
SS-ESMMP for House Construction of Lot No. 4 at Resettlement Site	29 March 2017 (1st submission)	Responded with 'No Objection with Conditions' on 05 April 2017	- Provide detailed design of the sediment pond and drainage control of the sub-camp.
SS-ESMMP for House Construction of Lot No. 5 at Resettlement Site	29 March 2017 (1st submission)	Responded with 'No Objection with Conditions' on 05 April 2017	See above comments to the SS-ESMMP for House Construction of Lot No. 4 at the Resettlement Site.

Title	Date Received	Response Status	Comments
SS-ESMMP for Construction of Resource Centre and Pilot Plan Improvement at Houay Soup Resettlement Area of Nam Ngiep 1 Hydro Project	29 March 2017 (1st submission)	Responded with 'No Objection with Conditions' on 05 April 2017	Provide detailed design of septic tank and drainage control of the sub-camp.

3.1.3 Compliance Report

During March 2017, NNP1PC-EMO issued five new Observations of Non-Compliances (ONCs), one Non-Compliance Report level 1 (NCR1) and one Non-Compliance Report level 2 (NCR2); and resolved five ONCs and four NCR2. A total of 11 ONCs, two NCR1 and one NCR2 will be carried over into April 2017. NNP1PC-EMO will follow up with Contractors to resolve the remaining issues in April 2017.

The carried-over ONC and NCR from March 2017 into April 2017 are summarized in Table 3-2 below.

Table 3-2: Carried-Over ONCs and NCRs from March 2017 into April 2017

Site ID	Issues	Reporting	Actions
Song Da 5 Camp No.2	Waste water collection tanks from the kitchen was nearly full (about 10 cm left) due to low check bunds of the waste water collection tanks (ONC_OC-0252). 1st inspection date: 21 March 2017	ONC (New)	The Contractor was instructed to increase the bunds in the waste water collection tank up to at least 20 cm above the surrounding surface level.
V&K Camp	Insufficient capacity of waste water treatment ponds to handle the operation of the V&K camp (ON_OC-0087). 1st inspection date: 02 June 2015	ONC (Closure Pending)	The wetland ponds have to be improved. A follow up discussion with the Contractor will be made in April 2017.
	No maintenance of the WWTS. Weeds blocked the open ditches and took up spaces inside the wetlands, and dead reeds were not replaced. As a result, the grey water is being discharged into the open ditch and flowed directly into Nam Ngiep (ONC_OC-0251). 1st inspection date: 21 March 2017	ONC (New)	The existing WWTS has to be maintained regularly to ensure that it works properly. The following works have to be completed by 04 April 2017: - Remove the weeds around and inside the wetland pond to keep areas clear and tidy; - Collect and segregate the dead reeds in the wetland ponds and replace with new healthy reeds.
HM Hydro Subcontractor 's Worker	The LILAMA10 Camp is accommodating 11 workers so far, but the construction of the Waste	NCR-1 (Closure Pending)	There was a significant progress of the WWTS construction (completed about 80 %). The remaining construction

Site ID	Issues	Reporting	Actions
Camp (LALIMA10 Camp)	Water Treatment System (WWTS) remained incomplete. The Camp is expected to accommodate about 200 workers by May 2018 (NCR_HM-0001). 1st inspection date: 28 September 2016 Latest follow up: 07 March 2017		work shall be completed by the end of April 2017. In addition, the Contractor should provide: (a) a drawing which indicates positions of inflow and outflow pipes at each pond, (b) supporting structure to the walls of the WWTS by the Contractor to avoid wall collapsing and stagnant water.
RCC Plant	Not having proper sedimentation facilities to improve the quality of turbid water generated from the prant (ONC_OC-0217) 1st inspection date: 28 June 2016 Latest follow up: 28 March 2017	ONC (Closure Pending)	The improvement of the sediment pond system was completed in middle of February 2017, a response to EMO comment and a revised DWP & SS-ESMMP (4th submission) for the RCC Plant Operation were sent and discussed with NNP1PC on 28 February 2017. The Contractor confirmed to clean up all sediment ponds at least once a day. However, high turbid water discharge into Nam Ngiep is still being observed (see Water Quality Monitoring Results for March 2017 in next section). Thus, installing an additional sediment pond and carrying out more cleaning up of the sediment pond system per day is suggested.
Re-Regulation Dam (Borrow Pit Area)	The Contractor started operating a borrow pit with inadequate environmental management practices as indicated below: - Topsoil was stockpiled at sensitive erosion area; - The cut slope area had no berm and cut-off drains; - Spoil was disposed and stockpiled on the access road to the SECC waste disposal pit. No information and management measures on the excavation of this borrow pit was included in the two approved SS-ESMMPs for the Re-Regulation Dam (i.e. the Re-Regulation Dam Left Bank Excavation and Re-Regulation Dam Power Station (ON_OC-0232). 1st inspection date: 30 August 2016 Latest follow up: 21 March 2017	ONC (Closure Pending)	- No further progress on the site closure was observed during the reported month. - OC informed during the monthly inspection that there will be no closure activity as the borrow pit is being used by another Contractor. - NNP1PC will discuss with the Contractor during April Monthly Meeting between NNP1PC and OC.

Site ID	Issues	Reporting	Actions
Re-regulation dam (spoil disposal area)	There was a land levelling activity for permanent spoil disposal from the excavation of left bank coffer-dam behind the SECC camp (ON_OC-0236). 1st inspection date: 11 October 2016 Latest follow up: 21 March 2017	ONC (Closure Pending)	A spoil disposal closure plan was submitted which EMO provided "No Objection with Conditions" on 14 March 2017 as below: - Provide conceptual designs for open drainage and sediment ponds to show their approximate sizes and shapes; - Indicate a timeframe for implementing the proposed erosion and sediment control measures before upcoming wet season.
Aggregate Crushing Plant	- Inadequate maintenance and implementation of agreed corrective actions on controlling the sediment pond at the Aggregate Plant below the Spoil Disposal Area No.7; - Improper monitoring and maintenance of the said sediment pond resulted in leakage of turbid water from the sediment pond into Nam Ngiep River. This is a serious non-compliance with CA annex C and ESMMP-CP 2014 (NCR_OC-0013) 1st inspection date: 08 November 2016 Latest follow up: 07 March 2017	NCR-2 (Closure Pending)	There are ongoing activities to improve the leaking points as agreed in the corrective actions including: - Install sandbags below the pond's embankment along Nam Ngiep banks to contain leaked turbid water ***(completed);*** - Install an automatic pump to pump the waste water trapped by the sandbags below the pond's embankment along Nam Ngiep banks back to the first sediment pond (not done).
	Insufficient number of waste bins were provided; improper collection and disposal of waste which attracted flies (ONC_OC-0253). 1st inspection date: 21 March 2017	ONC (New)	By 04 April 2017, following action shall be taken: - Provide 2-3 more waste bins with lids/covers; - Provide regular schedule for waste collection, transportation and disposal at the NNP1 landfill.
Sino Hydro Workshop	Poor workshop housekeeping and improper hazardous waste management. Some oil spills were still observed, used oil and oily rags were stored in open areas (NCR_OC-0017). 1st inspection date: 21 March 2017	NCR-1 (New)	Following actions shall be completed by 04 April 2017: - Maintenance of machinery and equipment should be performed in a designated area that has permeable floor and rain protection or oil drip trays and spillage protection facilities must be provided; - Move the used oil drums to an appropriate designated hazardous material storage area;

Site ID	Issues	Reporting	Actions
			- Clean up contaminated ground with hydrocarbon by using absorbent pads/dry sand and store contaminated materials in designated hazardous storage area for proper elimination.
Kenber Camp	The Waste Water Treatment System (WWTS) has been malfunctioned. The piping system is clogged and consequently causes the waste water to overflow from the first wetland pond to outside and the planted reeds are dead due to a lack of maintenance (ON_OC-0248). 1st inspection date: 07 February 2017 Latest follow up: 21 March 2017	ONC (Closure pending)	The renovation work was completed and the WWTS is in full operation in March 2017. A joint inspection of work completion will be conducted in April 2017 to conclude the pending issue.
Biomass Clearance Zone	A 1,200 litres oil tank and oil containers were installed at a temporary workers' camp without a proper storage facility. This resulted in some oil spills and contaminated soil at the handling point (ON_UCC-0001). 1st inspection date: 23 February 2017	ONC (Closure Pending)	- Provide an impermeable oil collective tray to prevent oil dripping into the ground during fuel handling; - Clean up oil contaminated soil and store in the oil storage for proper elimination (such as incineration) by authorized NNP1PC vendor.
Sand stockpile at former RT camp	Another stockpile of sand from the RCC plant sediment pond (the first two sediment ponds) has been established at the former RT Camp without introducing or installing erosion and sediment control devices/facilities. In absence of sound environmental practices in accordance to the ESMMP-CP SP01: Erosion and Sediment Control, rainwater runoff is likely to wash sediments from this stockpile into the adjacent Nam Ngiep River, which is located about 50 m downstream (see photos); (ONC_OC-0250) 1st inspection date: 07 March 2017	ONC (New)	The Contractor shall immediately remove the sediment from this stockpile and stop using this area until appropriate erosion and sediment controls are applied and a confirmation from NNP1PC is received in writing as appropriate. In addition, all proposed temporary stockpiles with estimated volume of materials to be stockpiled, cleaning-up frequencies and mitigation measures for erosion and sediment controls shall be submitted to NNP1PC as these are not provided in the 4th submission of the DWP & SS-ESMMP for the RCC Plant Operation on 09 March 2017.

Site ID	Issues	Reporting	Actions
RCR Temporary Camp (Thapabat District)	Improper establishment and operation of workshop facility: - A mixture of hazardous wastes (used oil filters, hydraulic hoses, oily rags), scrap metal and other general waste were disposed on the ground beside the workshop area; - Vehicle maintenance was not conducted properly inside the workshop area. This led to some oil spill on the ground; - Both sides of the workshop were extended with plastic roof (point 1 & 2) with no permeable floor (ONC_LS-0020). 1st inspection date: 16 March 2017	ONC (New)	1. Collect and segregate hazardous waste from general waste for proper elimination; 2. Clean up oil contaminated soil around the workshop area for proper incineration by an authorized vendor; 3. Carry out vehicle fixing and maintenance only within the workshop area; 4. Improve the extended parts of the workshop by providing proper roofing material, impermeable floor and bund. It was agreed that the requirement no. 1, 2 and 3 will be implemented immediately. The requirement no. 4 shall be proposed by the Contractor during next bi-weekly joint site inspection (EMO instructed the contractor to complete the workshop improvement before rainy season).

Photograph 1 and 2: *Improvement of the Grey Water Ponds at HM Hydro Main Camp*

Photograph 3: Improvement of the Waste Water Treatment System at Kenber Camp (Left Photo);
Photograph 4: EMU Mission wrap-up Meeting on 17 March 2017 (right photo)

Figure 3-1: Site Inspection Locations

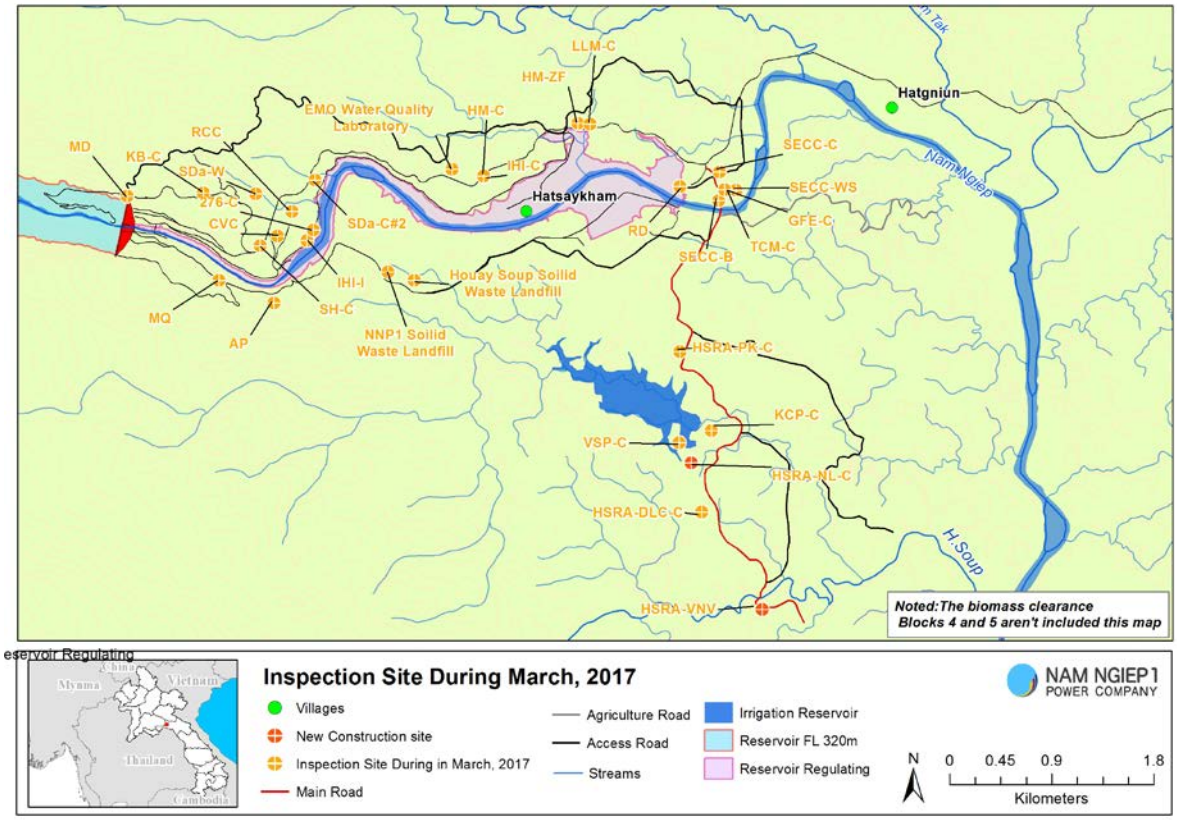


Figure 3-2: 230 kV Transmission Line Construction Monitoring

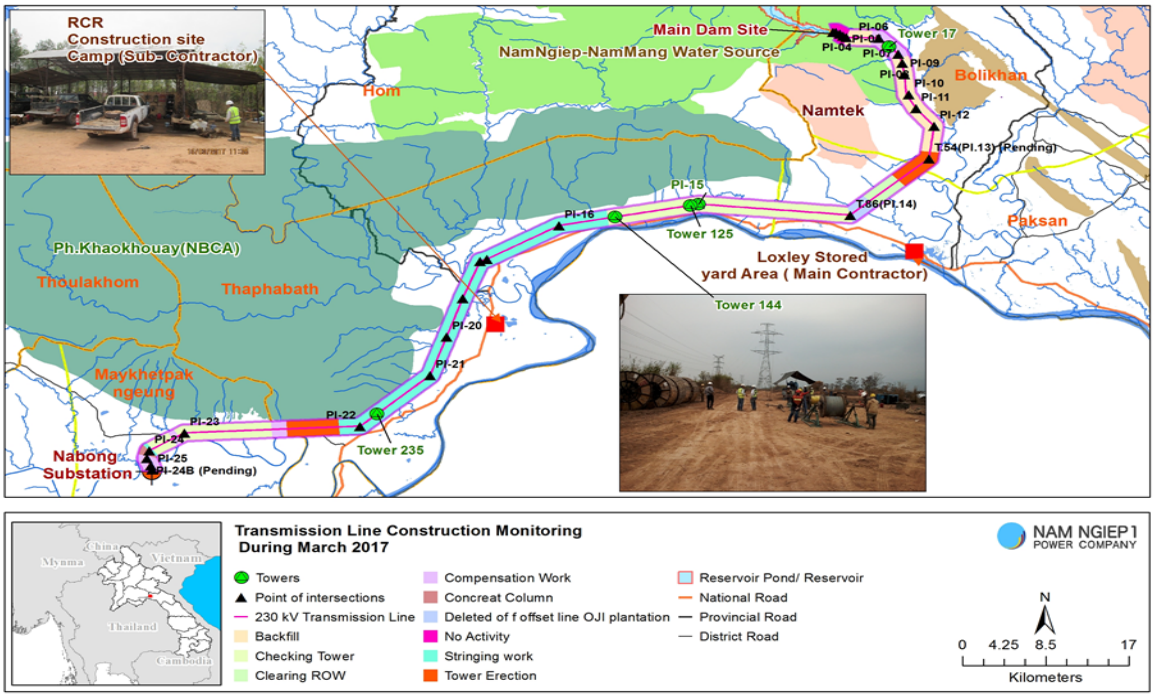
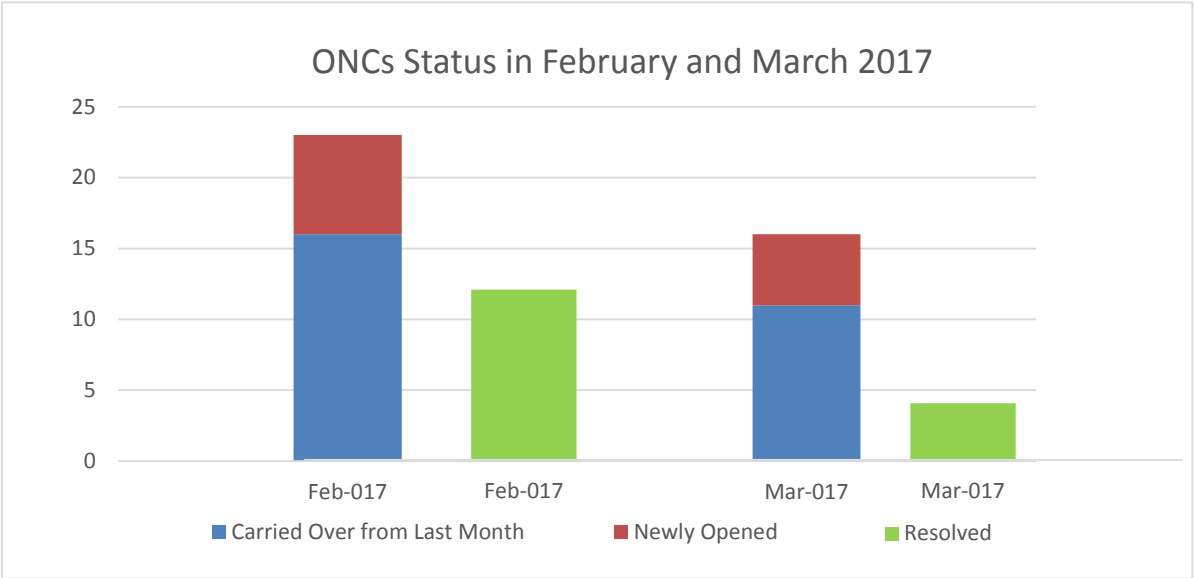


Table 3-3: Summary of ONCs and NCRs

Reporting Period (01-31 March 2017)	ONC	NCR-1	NCR-2	NCR-3
Carried over from February 2017	11	1	4	0
New issues this month	5	1	1	0
Resolved this month	5	0	4	0
Carried forward into April 2017	11	2	1	0
Unresolved exceeding deadline	5	1	1	0

Figure 3-3: Observations of non-compliance (ONCs) in February 2017 Compared with March 2017



3.1.4 Inspection by Environmental Monitoring Units

During 16 to 17 March 2017, Provincial and District EMUs conducted a joint environmental monitoring mission together with NNP1PC covering the main construction sites and camps, Houay Soup landfill and Houay Soup Resettlement Area (HSRA). After the wrap-up meeting, the EMUs submitted their mission report to NNP1PC on 21 March 2017. The EMUs identified the following main environmental issues:

a) Construction waste and plastic waste accumulated at LILAMA10 Camp without proper management;
b) Oil spills from a cement truck of V&K subcontractor;
c) A mixture of construction waste and hazardous waste was disposed at the RCC Plant. In addition, it was noted that RCC sediment ponds were improved by installing control valves to reduce velocity and separate clear water through an upper PVC pipe. However, it was understood that turbid water discharge found during this mission was due to the recently completed sediment clean up activity;
d) High turbid water discharge from the Aggregate Plant's second sediment pond. According to water quality monitoring results dated 09 March 2017 by NNP1-EMO, turbidity was detected at 11,630 NTU and the Total Suspended Solids (TSS) was detected at 3,927 mg/l; and
e) High pH value (11.14 pH) of treated water from the Main Dam's Waste Water Treatment Plant was released into Nam Ngiep River.

An official response with progresses on the corrective action implementation will be submitted to the EMUs in April 2017.

3.2 Environmental Quality Monitoring

The construction of NNP1PC Environmental Laboratory at the Owner's Site Office and Village (OSOV) was fully completed on 15 March 2017. The laboratory equipment was relocated from the warehouse, installed and operated at the new laboratory. The NNP1 Project laboratory, in collaboration with United Analysis and Engineering Consultant Company Limited (UAE) has started to conduct performance verification of its analyses for Total Suspended Solids starting in March 2017 and expect to continue in April 2017 to obtain more information prior to making any conclusion.

In addition, a part time local consultant is being recruited to assist with the laboratory operation including performance verification in collaboration with the UAE laboratory, data analysis and Quality Assurance/Quality Control (QA/QC).

The environmental quality monitoring has followed the environmental quality monitoring programme presented in the ESMMP-CP Volume III. The programme consists of the following components:

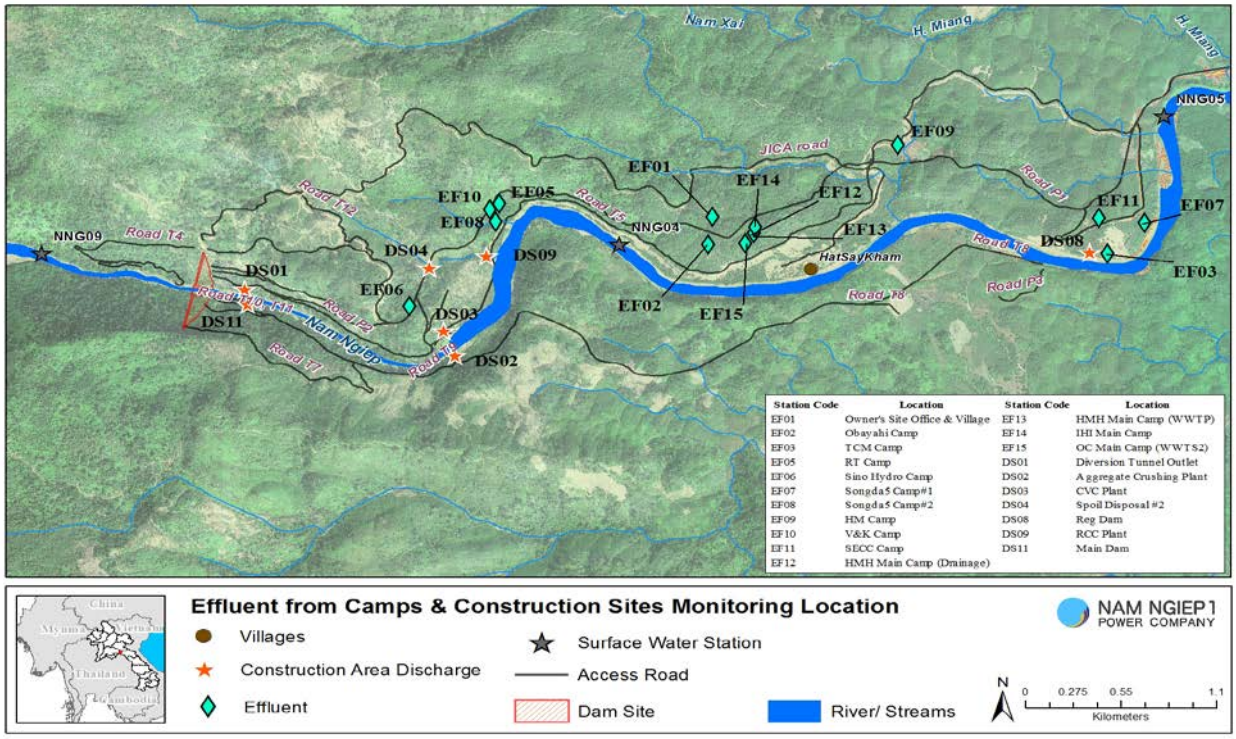
a) Effluent discharge from camps and construction sites;
b) Ambient surface water quality monitoring;
c) Groundwater and community water supply;
d) Landfill leachate;
a) Ambient noise and noise emission monitoring.

All Environmental Quality Monitoring data are routinely reported to the Ministry of Natural Resources and Environment (MONRE) in the Monthly Environmental Management and Monitoring Reports (EMMR) and to ADB in the Quarterly Environment Monitoring Reports.

3.2.1 Effluent Discharge from Camps and Construction Sites

Since July 2016, the frequency of effluent monitoring has increased from monthly to fortnightly at all the camps, and from fortnightly to weekly at the construction sites. During March 2017, effluent discharge from the new Kenber Camp WWTS was added. Results of effluent monitoring from the camps and construction sites are presented in Table 3-4, and the monitoring locations are displayed on the map in **Figure 3-4**.

Figure 3-4: Map of Effluent Discharge Monitoring Locations



Detailed monitoring results are provided in Annex A of this Report. The effluent monitoring results for March 2017 indicate that none of the camps complied with the effluent standards. There was a slight increase of total coliforms found at the Owner's Village and Site Office and Zhefu Camp above the effluent standards in one of the missions during March 2017. Regardless, some progresses have been achieved where the Waste Water Treatment System (WWTS) improvements at both Song Da5 Camp No. 1 and No.2, Kenber Camp and IHI Main Camp were completed and are being treated with chlorine (calcium hypochlorite and sodium hypochlorite). The chlorine dosage necessary to achieve satisfactory results are being tested in the NNP1PC Environmental Laboratory for Song Da 5 Camp No. 2 and IHI Camp and adjusted to field conditions. The WWTS improvements at Lilama 10 Camp is ongoing and has commenced at HM Hydro Main Camp. A proposal for the WWTS improvement at Sino Hydro Camp was submitted for NNP1PC review on 23 February 2017 but actual work has not started. Deadlines on improvements at the TCM/GFE, V&K and Obayashi Corporation Camps are yet concrete.

Progress on implementation of the corrective actions for the non-compliant camps and key construction areas is summarized below.

Table 3-4: Assessment of the Effluent Discharge from the Camps and Construction Sites against the Effluent Discharge Standards

Site	Sampling ID	Non-Compliance with applicable effluent standards	Corrective Actions
Owner's Site Office and Village	EF01	Minor non-compliances: Total coliform and total nitrogen exceeded the standard.	The minor increase in total coliform was likely caused by cow manure. Installation of a fence around the wetland to prevent villagers' cows from accessing the site will be discussed.
OC Camp (WWTP1)	EF02	Significant non-compliances: Biochemical Oxygen Demand (BOD_5), COD, ammonia nitrogen (NH_3-N), total nitrogen and total coliforms	The Contractor needs to improve its WWTS in accordance with the Owner's instruction letter issued in November 2016.
Sino Hydro Camp	EF06	Significant non-compliance: Biochemical Oxygen Demand (BOD_5), NH_3-N, total nitrogen and total coliforms	
Song Da5 Camp No. 1	EF07	Minor non-compliances: total iron, NH_3-N, total nitrogen and total coliform	Dosing with calcium hypochlorite will be monitored on daily basis by EMO to ensure that the Contractor applied on daily basis until the suitable amount can be identified. .
Song Da5 Camp No. 2	EF08	Significant non-compliance: TSS, BOD, NH_3-N, COD, total nitrogen, and total coliform	As above.
Zhefu Camp (Hitachi-Mitsubishi Hydro Worker Camp No.1)	EF09	Minor non-compliance: total coliforms	The Contractor needs to install an additional of 1 cubic metre (m^3) of Chlorine Contact Tank and 1 m^3 of Chlorine Monitoring Tank according to Owner's instruction letter issued in November 2016.
V&K Camp	EF10	Significant non-compliances: total coliforms, TSS, total nitrogen and total iron	As above.
SECC Camp	EF11	Minor non-compliance: total coliforms	The Contractor started to demobilise the remaining camp facilities.
H-MH Main Camp (WWTS)	EF13	Significant non-compliance: TSS, NH3-N, BOD_5, COD, total nitrogen and total coliforms	During late March 2017, the Contractor commenced its WWTS improvement in accordance to the Owner's instruction letter issued in November 2016. The improvement is

Site	Sampling ID	Non-Compliance with applicable effluent standards	Corrective Actions
			expected to be completed by April 2017.
IHI Main Camp	EF14	Significant non-compliance: NH3-N, BOD_5, COD, total nitrogen and total coliforms	Chlorination with sodium hypochlorite has been used. However, the breakpoint for chlorination has not been found in the lab and still being conducted by EMO.
OC Camp (WWTS2)	EF15	Significant non-compliance: BOD_5, COD, total coliforms and total nitrogen	The Contractor needs to improve its WWTS in accordance with the Owner's instruction letter issued in November 2016.
Kenber Camp	EF16	Significant non-compliance: BOD_5, COD, total nitrogen and total coliforms	Repairing of the completed WWTS was carried out by the Contractor and completed in March 2017. Chlorination has not started due to a low inflow into the last wetland pond.
Main Dam Construction Area (Lower Treatment Plant)	DS11	Minor non-compliance: pH and TSS	The Contractor informed NNP1PC that the high pH was due to a temporary shortage of Sulfuric Acid available on site. This was finally delivered to the site and the pH related issue will be re-addressed in April.
Re-Regulation Dam	DS08	Minor non-compliance: TSS	The Contractor was advised to consider the capacity of the existing sediment ponds if they are sufficient for the turbid water containment and sedimentation settlement during the rain events.
Spoil Disposal Area No.2 (SongDa5 Workshop)	DS04	Minor non-compliance: TSS	This will be continually monitored for April 2017.
RCC Plant	DS09	Significant non-compliance: TSS.	Refer to***Table 3-2*** for corrective action.
Aggregate Crushing Plant	DS02	Significant non-compliance: TSS	See ***Table 3-2*** for corrective actions.

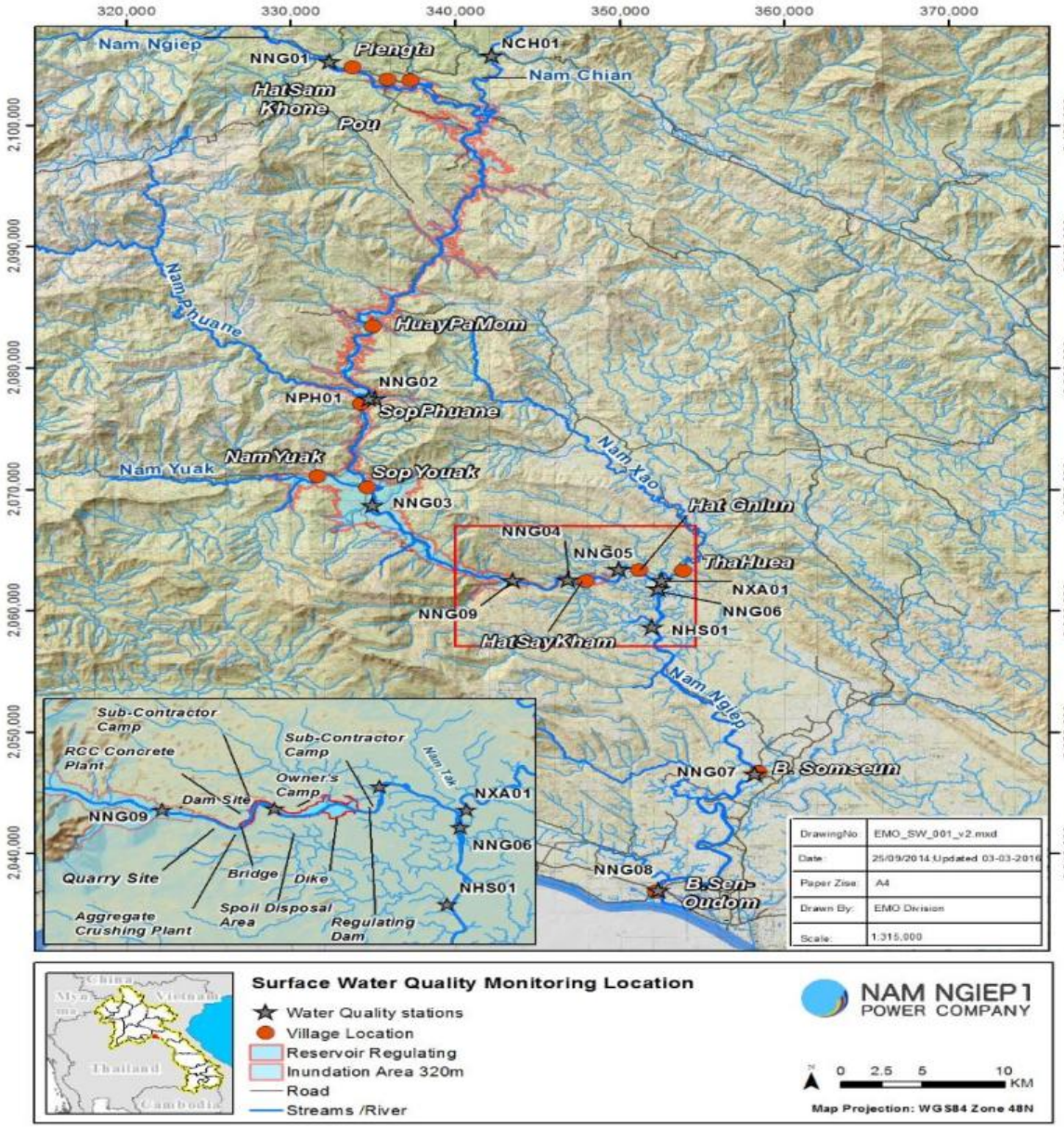
3.2.2 Ambient Surface Water Quality Monitoring

Surface water samples are collected and analysed twice a month[2] from nine stations in Nam Ngiep and four stations in the main tributaries including the lower Nam Chian, Nam Phouane, Nam Xao and Houay Soup (total thirteen stations). From August 2016, weekly surface water quality monitoring (physical parameters only) has been undertaken with respect to Station NNG09 located

[2] Monthly for chemical parameters and fortnightly for physical parameters

immediately upstream of the Main Dam, NNG04 located in the reach within the Construction Area and NNG05 immediately downstream of Re-regulation Dam.

Figure 3-5: Surface Water Quality Monitoring Stations



Key findings for surface water quality monitoring in February 2017 are shown below.

Nam Ngiep

Most of the monitored parameters complied with the national surface water quality standards, except Chemical Oxygen Demand (COD) which continued to exceed the Standard for all stations at Nam Ngiep River. The COD peak value was 15.9 mg/l at Nam Ngiep Downstream of RT Camp (NNG04 – Nam Ngiep within Construction Site).

Since Nam Ngiep surface water quality monitoring programme commenced in September 2014, EMO has frequently found elevated levels of COD with concentrations exceeding the surface water quality standards.

Table 3-5: Results of the Physical and Chemical Parameters of Nam Ngiep Surface Water Quality Monitoring

	River Name	Nam Ngiep								
	Zone	Upstream of Construction Sites				Within Construction Site	Downstream of Construction Sites			
	Station Code	NNG01	NNG02	NNG03	NNG09	NNG04	NNG05	NNG06	NNG07	NNG08
	Date	01-Mar-17	02-Mar-17	02-Mar-17	03-Mar-17	03-Mar-17	03-Mar-17	03-Mar-/17	03-Mar-17	03-Mar-17
Parameters (Unit)	**Guideline**									
pH	5.0 – 9.0	7.39	7.62	7.15	7.3	7.25	7.85	8.05	7.44	7.9
DO (%)		85.4	85.8	96.6	86.9	88.9	104.9	87.9	89.8	88.2
DO (mg/l)	>6.0	7.38	7.18	8.33	7.31	7.12	8.69	6.92	7.19	6.95
Conductivity (µs/cm)		110	106	102	105	105	104.5	104.9	109	106
TDS (mg/l)		55	53	51	52	53	52	53	54	53
Temperature (°C)		20.7	22.62	21.7	23.44	25	23.7	24.1	25.76	25.15
Turbidity (NTU)		12.5	6.36	4.55	6.19	6.43	3.7	6.08	5.13	6.62
TSS (mg/l)		22	13.4	11	11.1	10.7	9.8	8.9	10.4	10.6
BOD_5 (mg/l)	<1.5	ND[13]	ND[13]	ND[13]	ND[13]	ND[13]	ND[13]	ND[13]	ND[13]	ND[13]
COD (mg/l)	<5.0	8.9	7.3	10	5.9	15.9	5.1	5.9	5.5	5.9
NH3-N (mg/l)	<0.2	ND[12]	ND[12]	ND[12]	ND[12]	ND[12]	ND[12]	ND[12]	ND[12]	ND[12]
NO3-N (mg/l)	<5.0	0.06	0.05	0.05	0.06	0.04	0.05	0.05	0.06	0.09
Manganese (mg/l)	<1	0.1	0.055	0.042	0.035	0.034	0.033	0.029	ND	ND
Total Iron (mg/l)		1.24	0.879	0.628	0.426	0.558	0.443	0.376	0.372	0.366
Total coliform (MPN/100ml)	<5,000	490	130	240	280	170	110	79	1,300	110
Faecal coliform (MPN/100ml)	<1,000	130	130	240	94	130	33	23	79	13

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)			

Table 3-6: Results of Physical Parameters of Nam Ngiep Surface Water Quality Monitoring – Weekly and Fortnightly

	River Name	Nam Ngiep		
	Zone	Upstream of Construction Sites	Within Construction Site	Downstream of Construction Sites
	Station Code	NNG09	NNG04	NNG05
	Date	09-Mar-17	09-Mar-17	09-Mar-17
Parameters (Unit)	**Guideline**			
pH	5.0 – 9.0	7.63	7.29	7.95
DO (%)		90	88.9	99.2
DO (mg/l)	>6.0	7.22	7.18	8.15
Conductivity (µs/cm)		106	102	102
TDS (mg/l)		53	51	51

	River Name	Nam Ngiep		
	Zone	Upstream of Construction Sites	Within Construction Site	Downstream of Construction Sites
	Station Code	NNG09	NNG04	NNG05
	Date	09-Mar-17	09-Mar-17	09-Mar-17
Parameters (Unit)	**Guideline**			
Temperature (°C)		25.29	24.79	24.27
Turbidity (NTU)		7.57	9.79	8.25

	River Name	Nam Ngiep								
	Zone	Upstream of Construction Sites				Within Construction Site	Downstream of Construction Sites			
	Station Code	NNG01	NNG02	NNG03	NNG09	NNG04	NNG05	NNG06	NNG07	NNG08
	Date	15-Mar-17	16-Mar-17	16-Mar-17	17-Mar-17	17-Mar-17	17-Mar-17	17-Mar-17	17-Mar-17	17-Mar-17
Parameters (Unit)	**Guideline**									
pH	5.0 – 9.0	7.41	7.43	7.52	8.21	7.56	7.91	7.83	7.67	7.68
DO (%)		88.7	88.3	93	88.4	90	91.3	95.2	85.5	92.6
DO (mg/l)	>6.0	7.46	7.18	7.52	7.37	7.36	6.77	7.13	6.71	7.15
Conductivity (µs/cm)		112	112	104	105	103	110	109	107	106
TDS (mg/l)		56	56	52	53	51	55	55	53	53
Temperature (°C)		21.37	24.14	24.63	24.61	24.91	23.9	24.05	26.41	27.48
Turbidity (NTU)		7	5.14	5.56	10.27	8.75	13.2	15.1	10.27	8.62

	River Name	Nam Ngiep		
	Zone	Upstream of Construction Sites	Within Construction Site	Downstream of Construction Sites
	Station Code	NNG09	NNG04	NNG05
	Date	22-Mar-17	22-Mar-17	22-Mar-17
Parameters (Unit)	**Guideline**			
pH	5.0 – 9.0	7.54	7.94	7.94
DO (%)		86.5	83.5	100
DO (mg/l)	>6.0	6.98	6.94	7.73
Conductivity (µs/cm)		99	102	100
TDS (mg/l)		50	51	50
Temperature (°C)		25.65	27.88	26.94
Turbidity (NTU)		16.9	16.28	20.58

	River Name	Nam Ngiep		
	Zone	Upstream of Construction Sites	Within Construction Site	Downstream of Construction Sites
	Station Code	NNG09	NNG04	NNG05
	Date	30-Mar-17	30-Mar-17	30-Mar-17
Parameters (Unit)	**Guideline**			
pH	5.0 – 9.0	7.67	7.82	8.35
DO (%)		90.1	99.7	100.6
DO (mg/l)	>6.0	7.13	7.81	7.63
Conductivity (µs/cm)		109	108	107
TDS (mg/l)		55	54	53
Temperature (°C)		26.16	27.62	28.3
Turbidity (NTU)		8.3	13.29	38.5

Tributaries upstream the main dam: Nam Chiane (NCH01), Nam Phouan (NPH01)

Nam Chiane (NCH01) is located about 66 km upstream of the Main Dam. The COD exceeded the National Surface Water Quality Standard with recorded values of 10.4 mg/l.

Nam Phouan is located about 24 km upstream of NNP1 Project construction site. The COD exceeded the National Surface Water Quality Standard with recorded values of 17.5 mg/l.

Tributaries downstream of the main dam: Nam Xao (NXA01), Nam Houay Soup (NHS01)

Nam Xao has a confluence with the Nam Ngiep downstream of the NNP1 Project construction site. The COD exceeded the National Surface Water Quality Standard with recorded values of 11.2 mg/l.

Houay Soup Nyai has a confluence with the Nam Ngiep River downstream of NNP1 Project construction site. The COD exceeded the National Surface Water Quality Standard with a recorded value of 6.3 mg/l.

Table 3-7: Results of Physical and Chemical Parameters of Nam Chian, Nam Phouan, Nam Xao and Nam Houay Soup

	Site Name	Nam Chain	Nam Phouan	Nam Xao	Nam Houaysoup
	Zone	Tributaries Upstream		Tributaries Downstream	
	Station Code	NCH01	NPH01	NXA01	NHS01
	Date	01-Mar-17	02-Mar-17	03-Mar-17	03-Mar-17
Parameters (Unit)	**Guideline**				
pH	5.0 - 9.0	6.97	7.63	7.65	7.86
DO (%)		77.4	98.8	82.5	102.2
DO (mg/l)	>6.0	7.04	8.62	6.61	8.34
Conductivity (µs/cm)		56	82	70.3	41.5
TDS (mg/l)		28	41	35	20
Temperature (°C)		18.11	20.68	25.4	24.5
Turbidity (NTU)		10	2.27	2.56	9.12
TSS (mg/l)		29.3	5.6	ND[16]	13.8
BOD5 (mg/l)	<1.5	ND[13]	ND[13]	ND[13]	ND[13]
COD (mg/l)	<5.0	10.4	17.5	11.2	6.3
NH3-N (mg/l)	<0.2	ND[12]	ND[12]	ND[12]	ND[12]
NO3-N (mg/l)	<5.0	0.05	0.02	0.04	0.05
Manganese (mg/l)	<1	0.038	0.028	0.072	0.026
Total Iron (mg/l)		0.975	0.223	0.22	0.397

	Site Name	Nam Chain	Nam Phouan	Nam Xao	Nam Houaysoup
	Zone	Tributaries Upstream		Tributaries Downstream	
	Station Code	NCH01	NPH01	NXA01	NHS01
	Date	01-Mar-17	02-Mar-17	03-Mar-17	03-Mar-17
Parameters (Unit)	**Guideline**				
Total coliform (MPN/100ml)	<5,000	490	79	170	330
Faecal coliform (MPN/100ml)	<1,000	490	79	33	27

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)				

Table 3-8: Physical Parameters Results of Surface Water Quality – Nam Chian, Nam Phouan, Nam Xao and Nam Houay Soup (measured Every Fortnight)

	Site Name	Nam Chain	Nam Phouan	Nam Xao	Nam Houaysoup
	Zone	Tributaries Upstream		Tributaries Downstream	
	Station Code	NCH01	NPH01	NXA01	NHS01
	Date	15-Mar-17	16-Mar-17	17-Mar-17	17-Mar-17
Parameters (Unit)	**Guideline**				
pH	5.0 - 9.0	6.92	7.08	7.62	7.51
DO (%)		78.7	86.6	89	84.9
DO (mg/l)	>6.0	6.96	7.23	6.57	6.07
Conductivity (µs/cm)		55	84	173	98
TDS (mg/l)		28	42	87	49
Temperature (°C)		20.5	23.1	23.58	23.09
Turbidity (NTU)		11	2.69	9.6	4.1

3.2.3 Groundwater Quality Monitoring

During March 2017, NNP1PC sampled and analysed the groundwater quality in twelve boreholes. Out of these, two boreholes are community owned boreholes at Hatsaykham Village, six boreholes were built by the Project for re-settlers at Houay Soup Resettlement Area and four boreholes at NNP1 Solid Waste Landfill.

All groundwater quality data are routinely reported to the Social Management Office of NNP1PC which then communicates the results to the village authorities and the local health centres as part of the Project's public health programme. The results are shown below.

Hatsaykham Village

The monitored parameters complied with the standards, except pH which was lower than the Standard with recorded values of 5.91 and 5.82 for the borehole number GHSK01 and GHSK02 respectively. Other parameters complied with the standard.

Houay Soup Resettlement Area (HSRA)

The pH for the borehole number GHSP04 with the values recorded of 5.80 (same boreholes with similar pH level as the previous month). Other parameters complied with the standard.

NNP1 Solid Waste Landfill

Lead was detected in all four boreholes at NNP1 Project Landfill (at MW1 – 4), higher than the standard with values recorded between 0.014 – 0.097 mg/l. These results are similar to the levels found in the previous monitoring mission. It is unlikely that the levels of lead found in those boreholes are caused by seepage of leachate pond from the landfills - not least because lead has not been detected in the leachate.

Figure 3-6: Groundwater Quality Monitoring Locations

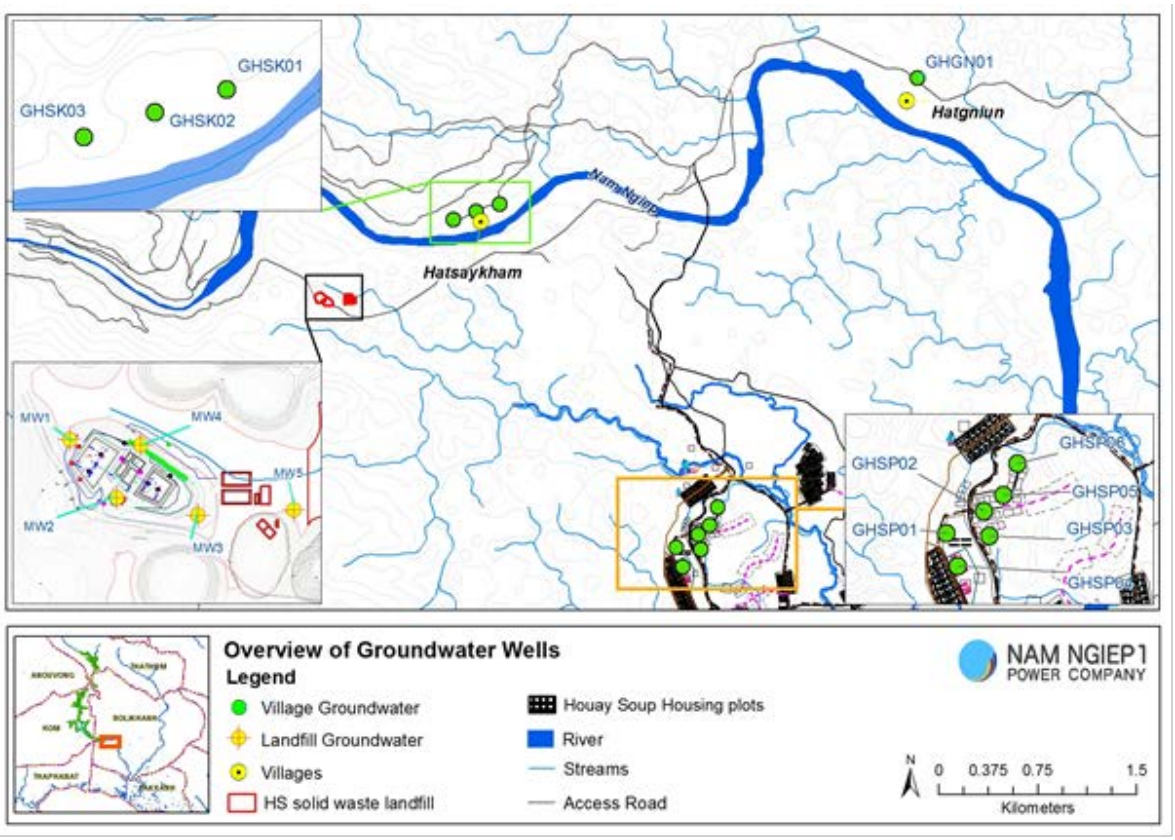


Table *3-9: Groundwater Quality Monitoring Results Hatsaykham and Hat Gniun Villages in March 2017*

	Site Name	Hatsaykham Village		
	Station Code	GHSK01	GHSK02	GHSK03
	Date	**10**-Mar-**2017**	**10**-Mar-**2017**	**10**-Mar-**2017**
Parameter (Unit)	**Guideline**			
pH	6.5-9.2	5.91	5.82	
DO (%)		43.4	35.1	
DO (mg/l)		3.37	2.77	
Conductivity (µs/cm)		94	85	
TDS (mg/l)	<1,200	47	43	
Temperature (°C)		25.97	26.45	
Turbidity (NTU)	<20	0.18	0.28	
Nitrate (mg/l)	<45	0.22	0.037	
Total Hardness (mg/l)	<500	81.6	50.9	
Nitrite (mg/l)		ND[7]	ND[7]	Broken Pump
Fluoride (mg/l)	<1	ND[9]	ND[9]	

	Site Name	Hatsaykham Village		
	Station Code	GHSK01	GHSK02	GHSK03
	Date	10-Mar-2017	10-Mar-2017	10-Mar-2017
Parameter (Unit)	**Guideline**			
Arsenic (mg/l)	<0.05	ND[2]	ND[2]	
Manganese (mg/l)	<0.5	ND[4]	ND[4]	
Magnesium (mg/l)		1.15	0.979	
Cadmium (mg/l)	<0.01	ND[5]	ND[5]	
Iron (mg/l)	<1	ND[10]	0.051	
Faecal coliform (MPN/100 ml)	0	0	0	
E. Coli Bacteria (MPN/100 ml)	0	0	0	

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)

Table 3-10: Groundwater Quality Monitoring Results for Houay Soup Resettlement Area in March 2017

	Site Name	Houay Soup Resettlement Area					
	Station Code	GHSP01	GHSP02	GHSP03	GHSP04	GHSP05	GHSP06
	Date	10-Mar-17	10-Mar-17	10-Mar-17	10-Mar-17	10-Mar-17	10-Mar-17
Parameter (Unit)	**Guideline**						
pH	6.5-9.2	7.03	6.78	7.18	5.8	6.5	7.21
DO (%)		51	64.5	55.2	31.7	59.1	73
DO (mg/l)		4.04	5.01	4.31	2.5	4.61	5.76
Conductivity (µs/cm)		412	217	468	97	173	215
TDS (mg/l)	<1,200	206	109	234	49	87	108
Temperature (°C)		25.44	25.79	26.13	25.76	25.98	26.01
Turbidity (NTU)	<20	0.2	0.37	0.22	0.22	0.24	0.23
Nitrate (mg/l)	<45	0.27	0.27	0.27	0.32	0.25	0.17
Total Hardness (mg/l)	<500	255	141	297	73.5	127	133
Nitrite (mg/l)		ND[7]	ND[7]	ND[7]	ND[7]	ND[7]	ND[7]
Fluoride (mg/l)		ND[9]	0.04	ND[9]	ND[9]	0.05	0.09
Arsenic (mg/l)	<0.05	ND[2]	ND[2]	ND[2]	ND[2]	ND[2]	ND[2]
Manganese (mg/l)	<0.5	ND[4]	ND[4]	ND[4]	ND[4]	ND[4]	ND[4]
Magnesium (mg/l)		3.96	2.02	3.99	1.48	2.45	2.62
Cadmium (mg/l)	<0.01	ND[5]	ND[5]	ND[5]	ND[5]	ND[5]	ND[5]
Iron (mg/l)	<1	ND[10]	ND[10]	ND[10]	ND[10]	ND[10]	0.059
Faecal coliform (MPN/100 ml)	0	0	0	0	0	0	0
E. Coli Bacteria (MPN/100 ml)	0	0	0	0	0	0	0

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)

Site Name	NNP1 Landfill				Houay Soup Landfill
Station Code	MW1	MW2	MW3	MW4	MW5

	Date	28-Mar-17	28-Mar-17	28-Mar-17	28-Mar-17	28-Mar-17
Parameters (Unit)	**Guideline**					
pH		6.14	5.36	6.34	5.36	The access to the sampling borehole is too steep. A safe access pathway is being constructed
Sat. DO (%)		14.4	14.9	7.9	31.3	
DO (mg/l)		1.12	1.14	0.64	2.42	
Conductivity (µs/cm)		171	68	161	65	
TDS (mg/l)		86	34	84	33	
Temperature (°C)		26.19	25.9	27.98	26.96	
Turbidity (NTU)		0.68	1.87	4.86	5.87	
Biochemical Oxygen Demand (mg/l)		ND[13]	1.1	ND[13]	ND[13]	
Amonia-Nitrogen (mg/l)		ND[12]	ND[12]	ND[12]	ND[12]	
Total Nitrogen (mg/l)		0.52	0.58	0.57	0.71	
Copper (mg/l)		ND[5]	ND[5]	ND[5]	ND[5]	
Lead (mg/l)	<0.01	0.097	0.014	0.039	0.023	
Total Phosphorus (mg/l)		0.06	0.04	0.16	0.04	
Total Coliform (MPN/100 ml)		<1.8	<1.8	110	79	
Faecal Coliform (MPN/100 ml)		<1.8	<1.8	110	79	
Total Petroleum Hydrocarbons (mg/l)		ND[13]	ND[13]	ND[13]	ND[13]	

3.2.4 Gravity Fed Water Supply (GFWS) Quality Monitoring

Water quality monitoring for GFWS system is conducted on a monthly basis with the aim to alert the users in case of health risks when using the water for bathing or washing. During March 2017, water samples were taken from the taps at Thaheua and Hat Gniun Villages.

Results of the assessment for GFWS of both Thaheua and Hat Gniun Villages are shown and summarised as below:

Thahuea Village (WTHH02): All parameters complied with the National Drinking Water Standards except for faecal coliforms and E. Coli which were found to be 33 MPN/100 ml for both parameters.

Ban Hat Gnuin (WHGN2): All parameters complied with the National Drinking Water Standards except for faecal coliforms and E. Coli, which were found to be 79 MPN/100 ml for both parameters.

The presence of the E.Coli in the GFWS system is normal for the rainy season where the water sourced from the mountain is likely to be contaminated from agricultural activities in the watershed area. The local villagers will be informed about the results and encouraged to boil their water for drinking purposes.

Table 3-11: Results of the Gravity Fed Water Supply Quality Monitoring

	Site Name	Ban Thaheua	Ban Hat Gnuin
	Station Code	**WTHH02**	**WHGN02**
	Date	**10-Mar-2017**	**10-Mar-2017**
Parameter (Unit)	**Guideline**		
pH	6.5-9.2	6.79	6.75
DO (%)		74	99.4
DO (mg/l)		5.83	7.57
Conductivity (µs/cm)		79	108
TDS (mg/l)	<1,200	39	54
Temperature (°C)		25.93	27.4
Turbidity (NTU)	<20	0.58	0.79
Nitrate (mg/l)	<45	0.06	0.09

	Site Name	Ban Thaheua	Ban Hat Gnuin
	Station Code	WTHH02	WHGN02
	Date	10-Mar-2017	10-Mar-2017
Parameter (Unit)	Guideline		
Total Hardness (mg/l)	<500	51.7	70.7
Nitrite (mg/l)		ND[7]	ND[7]
Fluoride (mg/l)	<1	0.04	ND[9]
Arsenic (mg/l)	<0.05	ND[2]	ND[2]
Lead (mg/l)	<0.05	ND[10]	ND[10]
Faecal coliform (MPN/100 ml)	0	33	79
E. Coli Bacteria (MPN/100 ml)	0	33	79

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)			

3.2.5 Landfill Leachate Monitoring

During March 2017, water samples were taken from the last landfill leachate ponds of the NNP1 Project Landfill (LL4). The location of landfill leachate monitoring is displayed in Figure 3-7. The results indicate compliance with the relevant standards in the final pond (LL4), except COD.

Figure *3-7: Landfill Leachate Monitoring Location*

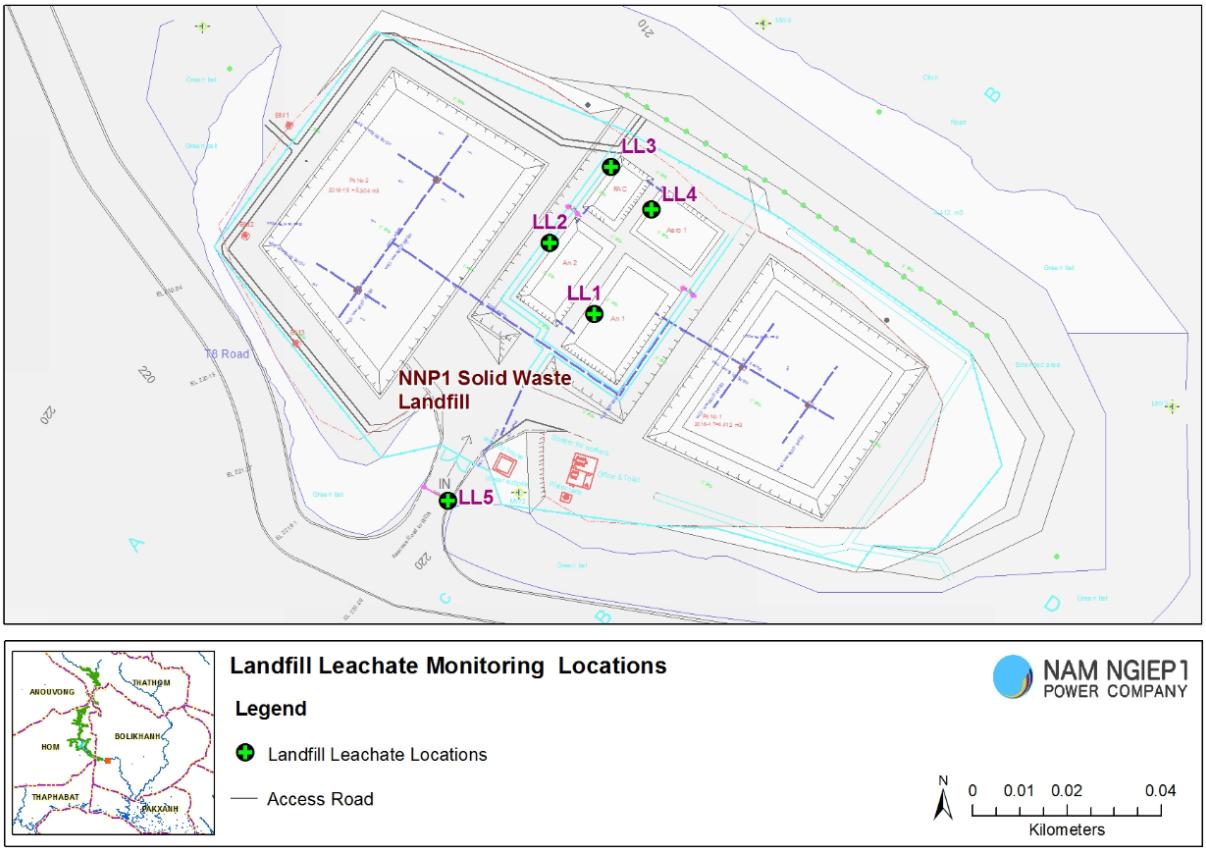


Table 3-12: Landfill Leachate Monitoring Results

	Site Name	NNP1 Landfill (Leachate Ponds)
	Station Code	LL4
	Date	14-Mar-2017
Parameters (Unit)	**Guideline**	
pH	6.0 - 9.0	7.87
Sat. DO (%)		41.3
DO (mg/l)		3.33
Conductivity (µs/cm)		661
TDS (mg/l)		330
Temperature (°C)		24.36
Turbidity (NTU)		4.99
BOD (mg/l)	<30	6.2
COD (mg/l)	<125	248
Total nitrogen (mg/l)	<10.0	4.24
Lead (mg/l)	<0.2	ND[10]
Arsenic (mg/l)	<0.1	ND[2]
Manganese (mg/l)		0.082
Mercury (mg/l)	<0.002	ND[3]
Iron (mg/l)	<2	0.328
Total coliform (MPN/100 ml)	<400	280
Total petroleum hydrocarbons (mg/l)		ND[13]

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)			

3.2.6 Dust Monitoring

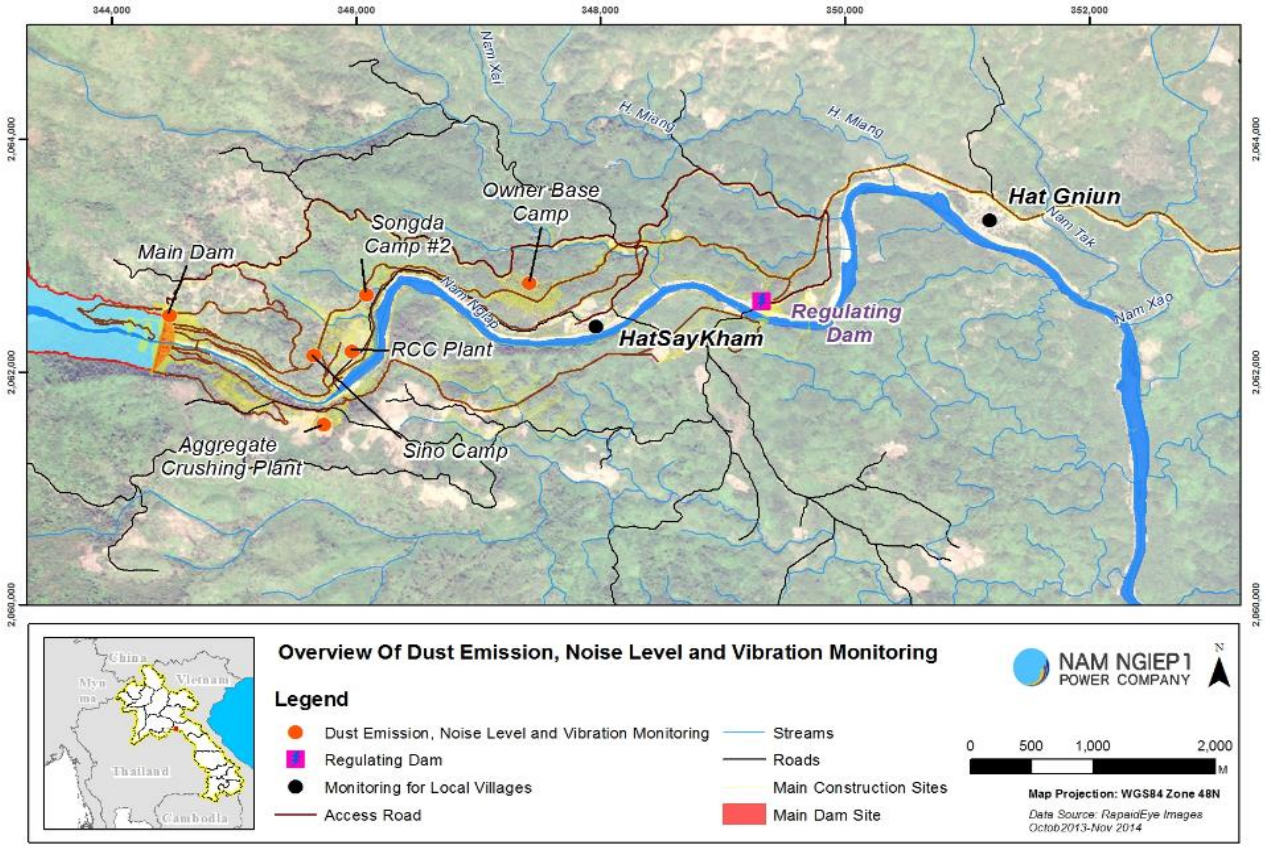
The monitoring points are indicated on the map in ***Figure 3-8***. Almost average dust results during the monitored period complied with the National Standard, except at the Aggregate Crushing Plant, Sino Hydro Temporary Worker Camp and RCC Plant. The results are presented in ***Annex B***.

3.2.7 Noise Monitoring

During March 2017, noise monitoring was conducted in Ban Hat Gnuin and Houay Soup Resettlement Village for at least 72 consecutive hours. Noise monitoring was also conducted at the Aggregate Crushing Plant, RCC Plant, Sino Hydro Camp, Song Da 5 Camp No. 2, Sino Hydro Temporary Worker Camp and Lilama 10 Camp (new) to assess possible impact on workers' health and Owner's Site Office and Village (to monitor the ambient noise levels) for 24 consecutive hours.

The noise monitoring location are described in the Figure 3-8 below

Figure 3-8: Noise and Dust Emission Monitoring Locations



The noise levels recorded at the monitoring stations indicated full compliance with the National Standard for the period of 06:01-22:00, except at the Aggregate Crushing Plant, Sino Hydro Camp and Sino Hydro Temporary Worker Camp. The noise levels during the period of 22:01-06:00 were higher than the Standard at the Aggregate Crushing Plant, RCC Plant, Sino Hydro Camp, Sino Hydro Temporary Worker Camp and the Main Dam [between 52.65 – 67.04 dB(A) compared to the Standard of 50 dB(A)].

3.3 PROJECT WASTE MANAGEMENT

3.3.1 Solid Waste Management

In March 2017, approximately 164.7 m^3 of solid waste was disposed at the NNP1 Project Landfill during March 2017, an increase of 28.4 m^3 compared to February 2017.

The construction of a second stage of NNP1 Project Landfill will start on 15 April 2017. On 28 March 2017, an updated Detailed Works Programme (DWP) and Site Specific Environmental and Social Management and Monitoring Plan (SS-ESMMP) for NNP1 Project Landfill construction was submitted to NNP1PC for review and clearance.

Photograph 5: Waste compaction and soil cover at the NNP1 Project Landfill	*Photograph 6: Waste disposal spot checking by NNP1PC staff at the NNP1 Project Landfill*
	

3.3.2 Hazardous Materials and Waste Management

Hazardous materials generated at construction sites and camps are stored on site for collection and disposal by authorised vendors. During March 2017, joint hazardous materials and waste inventories were carried out at the main construction sites and subcontractors' camps as indicated in Table ***3-13***

Table *3-13: Results of hazardous material inventory*

No.	Hazardous Waste Type	Unit	Total in March 2017 (A)	Disposal by Selling/Reuse (B)	Remainder (A - B)
1	Used hydraulic and engine oil	litre (l)	9,530	0	9,530
2	Empty used chemical drum/container	drum (20 l)	2,500	0	2,500
3	Used oil filters	No.	779	0	779
4	Used tyre	No.	380	18	362
5	Ink cartridge	No.	271	0	271
6	Empty paint and spray cans	can	239	0	239
7	Cement bag	bag	180	0	180
8	Empty used oil drum/container	drum (20 l)	108	17	91
9	Empty contaminated bitumen drum/container	drum (200 l)	82	0	82
10	Empty used chemical drum/container	drum (200 l)	42	0	42
11	Empty used oil drum/container	drum (200 l)	38	5	33
12	Halogen/fluorescent bulbs	No.	26	0	26

No.	Hazardous Waste Type	Unit	Total in March 2017 (A)	Disposal by Selling/Reuse (B)	Remainder (A - B)
13	Contaminated soil, sawdust and concrete	bag	24	0	24
14	Contaminated textile and material	Bag	24	0	24
15	Acid and caustic cleaners	bottle	12	0	12
16	Car battery	No.	11	0	11
17	Clinical waste	kg	13	11	2
18	Used oil mixed with water	liter (l)	0	0	0

In March 2017, a total of 16,882kg of recyclable waste was sold at Song Da 5 Camp No. 1, TCM Camp, GFE Camp, Re-regulation Dam, V&K Camp, Song Da5 Camp No.2, Song Da 5 Workshop at Disposal Area No.2, RCC Plant, Sino Hydro Worker's Camp, Sino Hydro Camp, Kenber Camp, SECC Camp and each Contractor's Camp at Houay Soup Resettlement Area (HSRA). The amount of sold recyclable waste is shown in Table 3-14:

Table 3-14: Amounts of Recyclable Waste Sold

No.	Type of Recycled Waste	Unit	Sold	Cumulative Total by March 2017
1	Scrap metal	kg	0	15,886
2	Glass	kg	92	417
3	Plastic bottles	kg	17	253.5
4	Aluminium	kg	6	114.5
5	Paper/Cardboard	kg	50	211

In addition, a total of 445 kg of recyclable waste (glass bottles) from Hat Giun Recyclable Waste Bank was sold to Keo Lao Company; eleven kg of clinical waste from the NNP1PC clinic was transported and incinerated at the incinerator located within the Vientiane landfill; 3 m^3 of sludge was disposed of at the designated Spoil Disposal Area No. 6 following NNP1PC-EMOs Standard Operating Procedure (SOP) for Sewage/Black Water Disposal (See Photograph 7 and Photograph 8 below).

Photograph 7: HM Hydro's Sewage Sludge was Disposed of At the Designated Spoil Disposal Area No. 6

Photograph 8: NNP1 Project Clinical Waste was Incinerated at Vientiane Landfill

The food waste generated from the Owner's Site Office and Village (OSOV), selected camps of Contractors and subcontractors continues to be collected by Hatsaykham villagers for use as animal feed (pig and poultry). A total of 7,721 kg was collected in March 2017 as shown in Table 3-15.

Table 3-15: Amount of Food Waste Collected by Villagers

NO.	SITE NAME	UNIT	TOTAL
1	Song Da5 Camp No. 2	kg	2,976
2	Song Da5 Camp No. 1	kg	2,648
3	Obayashi Corporation Camp	kg	1,375
4	Owner's Village and Site Office (OSOV)	kg	471
5	LILAMA 10 Camp	kg	252
6	HSRA-DLC-C	kg	0
Total		**kg**	**7,721**

3.4 Community Waste Management

3.4.1 Community Recycling Programme

During March 2017, a total of 955 kg of recyclable waste was recorded, an increase of 362 kg compared to February 2017. A total of 121 households hold accounts at the Community Recycle Bank (no increase in membership since October 2016). The percentages of participation in the programme for each village remain as 87% for Hat Gniun Village, 64% for Hatsaykham Village and 64% for Thahuea Village. Discussions with a few villagers in Thahuea Village found that the price of recyclables were low and the Recycle Waste Bank is far from their Village thus transporting recyclables to sale at Hat Gniun Village is not a good option. Other alternative solutions for recovering more recyclables from villagers will be explored during the operation of the Houay Soup Landfill.

The types and amounts of waste recycled in February 2017 are presented in Table 3-16

Table 3-16: Types and amounts of waste traded

Types of Waste	Unit	Remaining In February 2017	Additions In March 2017	Sold	Remaining In March 2017
Scrap metal	kg	208	336	0	544
Glass	kg	165	395	0	560
Paper/cardboard	kg	107	120	0	227
Aluminium cans	kg	62	30	0	92
Plastic bottle	kg	51	74	0	125
Total	**kg**	**593**	**955**	**0**	**1,548**

NNP1PC-EMO continued to support Recyclable Waste Bank Programme at the Hat Gniun Village. It is an opportunity to raise their awareness on the waste management which includes waste segregation, reduction and disposal in a temporary waste pit at each household, and how to manage recyclable waste before selling to the Community Recyclable Waste Bank at Hat Gniun Village (see Photograph 09 and Photograph 10 below):

Photograph 9: Students members Sold Recyclable Waste to Hat Gniun Recyclable Waste bank

Photograph 10: NNP1PC Bought Recyclable Waste from New Residents at HSRA

In addition, a joint induction was carried out during 21 and 29 March 2017 by NNP1PC staff and Hat Gniun Village Authorities for 22 camp followers/shops at Hat Gniun Village. The purpose of this induction was to raise their awareness on the sound waste management practices which include waste segregation, waste generation reduction based on the 3 Rs principle (Reduce, Reuse and Recycle), waste disposal and types of waste accepted at the Community Recycle Bank (see Photograph 11 and Photograph 12 below):

Photograph: 11: Waste Management Induction for Local Camp Followers/Shops	*Photograph 12: Waste Management Induction for Vietnamese Camp Followers/Shops*
	

3.4.2 Houay Soup Resettlement Area Waste Management

In March 2017, a total of 0.22 m^3 of solid waste from HSRA's Contractors was disposed of at Houay Soup Landfill (see Photograph 13 and Photograph 14 below). The Contractors were not permitted to dispose of their waste permanently in their camps. The Houay Soup Landfill is opened every Tuesday and Thursday from 09:30 am to 10:30 am through individual arrangement with NNP1PC-EMO staff. It was agreed by NNP1PC that additional works for erosion control and slope stabilisation are required for the landfill, an estimated Bill of Quantity (BOQ) for this work was completed on 29 March 2017. Work is expected to start and complete in June 2017.

Photograph 13 & 14: HSRA's Contractors Disposed Solid Waste at Houay Soup Landfill	
	

3.5 Watershed and Biodiversity Management

3.5.1 Preparation of the Nam Ngiep 1 Watershed Management Plan

Obligation[3]	Status by March 2017
Prepare draft Watershed Management Regulations by 15 November 2016	There is no further progress on Watershed Management regulation this month after the draft was submitted to ADB on 13 January 2017. The discussion will be resumed after ADB approve the latest version of watershed management plan.
Final Watershed Management Plan by 23 December 2016	As agreed between ADB and NNP1PC, this target date is moved to the First Quarter of 2017. The latest version of the plan was submitted by Consultant to NNP1 on 27 March 2017. The plan will be discussed with GOL line agencies after ADB review and approval.
1) A draft provincial regulation submitted to Provincial Justice Department by 23 December 2016 2) Start of public hearing process by 10 January 2017	As agreed between ADB and NNP1PC, this target date is moved to the First Quarter of 2017. These processes will be continued after acceptance of draft provincial regulation by ADB.

[3] All previous deadlines on preparation of the Nam Ngiep 1 Watershed Management Plan and watershed management regulations were revised and agreed with ADB in August 2016. The Table only shows the current required submissions and their respective target dates.

Activities in March 2017	Results
Preparation for NNP1 WMP	The consultant completed the overall sections of the plan based on the comments and recommendations from NNP1 EMO and ADB Consultant. The latest version of the plan was submitted to NNP1 on 27 March 2017. The WMP is under NNP1PC internal review and will thereafter be submitted to ADB. The plan will be discussed with GOL line agencies after ADB review and approval.
Prepare draft Watershed Management Regulations	The discussion will be resumed after the latest version of watershed management plan has been approved by ADB.
WRPO Activities	Due to the move of forest management (protected areas and protection forest) from MONRE to MAF, the WRPO will be reorganized. The new organization structure and assignment for Xaysomboun WRPO are being reviewed by MAF and MONRE.
Xaysomboun ISP	A workshop with MONRE's Department of Environmental Quality Promotion (DEQP) and Xaysomboun ISP team on improvement of draft Xaysomboun ISP was held on 27-30 March 2017 at MONRE DEQP office. A debriefing meeting was held on 31 March 2017 with participations from MONRE DEQP, Xaysomboun ISP team, and NNP1PC representatives with the following notes: o Xaysomboun ISP team will continue to improve the plan by incorporating the comments provided by NNP1-EMO especially related to environmental monitoring and compliance for the development projects within the province, land-use zoning, water resources and biodiversity protection within the NNP1 watershed as well as village land-use planning of the villages surrounding NNP1 watershed area; o The final draft of ISP will be shared with NNP1-EMO on 27 April 2017 for final review and further process for obtaining approval from Provincial leadership and GOL line agencies at provincial and district levels; o Fund disbursement for ISP team can be transferred directly to Xaysomboun ISP Committee Bank Account upon approval of budget plan by MONRE DEQP.

3.5.2 Biodiversity Offset Management

Obligation[4]	Status by March 2017
Consultant acceptable to ADB is engaged as technical consultant for preparation of biodiversity offset management plan by 30 November 2016.	NNP1 received two full proposals from shortlisted consultants on 30 March 2017
ADB approval on the NNP1PC's draft legal agreement with the government by 31 January 2017 and execute the legal agreement by 15 February 2017	• The first draft was prepared on 14 October 2016 and the revised version elaborating BAC comments was submitted to ADB on 28 November 2016. • ADB confirmed that NNP1PC could proceed and negotiate the draft legal agreement with GOL on 16 February 2017 • The draft legal agreement is being reviewed by Bolikhamxay Provincial Authorities.
Baseline survey for summer (observations during March and April 2017) starts by 28 February.	On 21 February 2017, ADB confirmed that the summer baseline survey should be rescheduled and form part of BOMP implementation.

[4] All previous deadlines on preparation of the Nam Ngiep 1 Watershed Management Plan and watershed management regulations were revised and agreed with ADB in August 2016. The Table only shows the current required submissions and their respective target dates

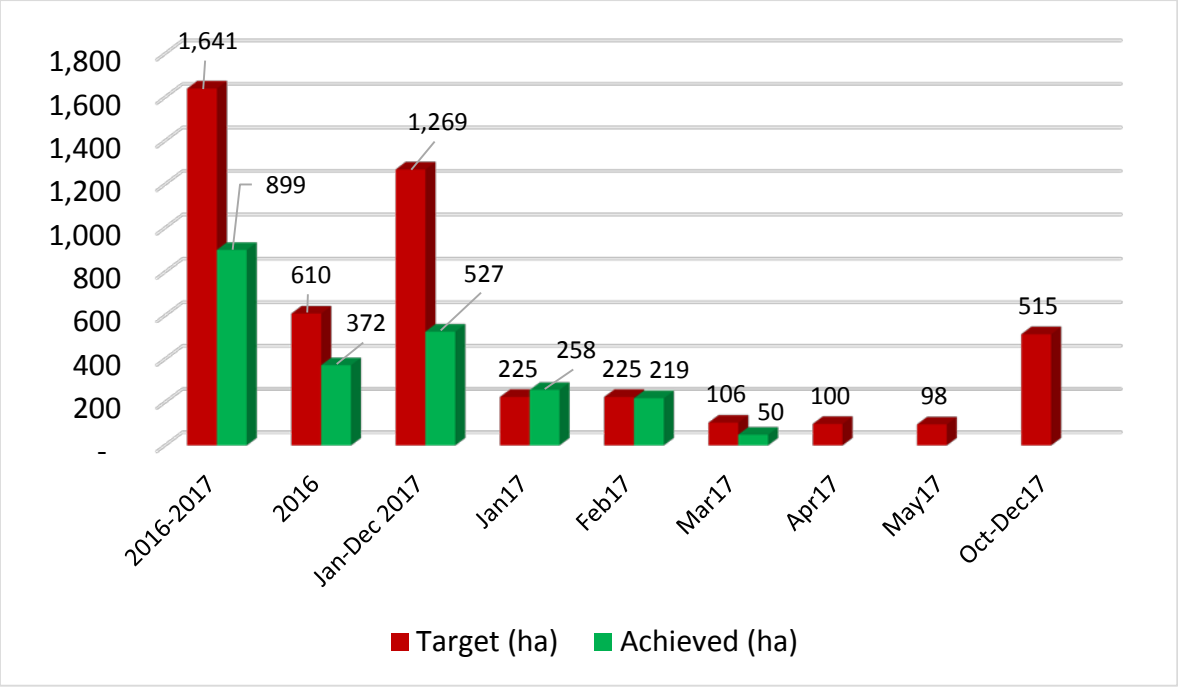
Activities in March 2017	Results
Consultant acceptable to ADB is engaged as technical consultant for preparation of biodiversity offset management plan by 30 November 2016.	• NNP1 advertised for expression of interests in the second week of January 2017. Four applicants expressed their interest by the end of January 2017. • The TOR was further revised elaborating the comments from BAC and IAP. The latest TOR was circulated to the applicants in the middle of March 2017 for full proposal submission. • NNP1 only received the full proposal from 2 applicants on 30 March 2017. The proposal will be reviewed by NNP1, ADB, IAP, BAC, and GOL in April 2017.
Activities pre-BOMP period of 1 October 2016 – 31 September 2017	• BOMC started the advertisement process for pre-BOMP consultant in the second week of March 2017. • BOMC together with NNP1 EMO team prepared the detail proposal of some activities in the first week of March 2017. This included: a) coordination meeting with Vietnam Government; b) local coordination unit establishment; c) community relationship building; and d) community mapping exercise. • The proposal for coordination meeting and local coordination unit establishment was approved by BOMC Chair in the second week of March 2017 after series of internal BOMC workshops. • The coordination meeting with Vietnam Government was held on 14-17 March 2017. The MOU for cooperation of protection and management of NCNX (BLX Province - Laos) and Pu Mat National Park (Nge Anh Province-Vietnam) was signed by both parties at the end of the event. • The workshop for local coordination unit establishment was held on 27-29 March 2017 at Xaychomphone and Viengthong District, Bolikhamxay Province. The wrap up meeting will be held in the first week of April 2017 to agree on the MOU with the 2 districts for the coordination mechanism, detail TOR, and appointed key position at district and village level. • BOMC together with NNP1 EMO also prepared the detail operational and financial procedure for office operation activity.

3.5.3 Biomass Clearance

Activities in March 2017	Results
Labour recruitment	• 31 workers from Ban Houaypamom continued with vegetation cutting progress in Block 10 and 11. • By the end of March 2017, 11 workers from Longsan was mobilized from Block 2 to support the vegetation cutting progress in Block 10. • 25 workers from Longsan resumed vegetation cutting progress in Block 12 on 18 March 2017. • 10 workers from Ban Hatsamkhone were recruited with daily contract to complete the firebreak preparation in Block 13 and 14. • 30 workers from Ban Nahong are preparing waste biomass burning in Block 15.
Perform UXO work on priority biomass clearance areas.	• The UXO search and clearance until end of the March 2017 have been completed for around 1,487 ha out of the total target of 1,500 ha. • There was no UXO found during the reporting period. QA/QC was undertaken and documented by Field Supervisor and Field Manager. The contractor is preparing field inspection and QA/QC to be conducted by NRA. • The UXO work progress to date is showed in ***Table 3-17***
Perform biomass clearance.	• There was less progress on biomass clearance during the reporting period mainly because: 1) The contractor could not settle the payment to local workers in time, and 2) some local workers from Longsan and Ban Houaypamom did not resume the work until third week of March 2017. • The total progress of vegetation cutting is around 50 ha from the total target in March 2017 of around 106 ha. • Preparation of waste biomass burning in Block 10, Block 11, and Block 13 to Block 18 was completed. The biomass burning will start in April 2017. • The status of cutting and stockpiling of logs with diameter >20 cm within the priority biomass clearance blocks in 2LR: o NNP1-EMO, Contractor, DONRE and DAFO of Hom District completed joined inspection and monitoring of cutting and stockpiling tree with diameter greater than 20 cm in

	Block 1, Block 2, and Block 4 for local GOL utilization. o There are around 231 logs recorded in Block 1 that will be chopped and burned at site because the difficulty for further stockpiling and transporting. There are only 6 trees that could be cut and easily stockpiled for further utilization by GOL. o There are around 323 trees recorded in Block 2 that will be cut and stockpiled. o There are around 226 trees recorded in Block 4 that will be cut and stockpiled. • The status of cutting and stockpiling of logs with diameter >20 cm within the priority biomass clearance blocks in 2UR: o NNP1-EMO, Contractor, DONRE and DAFO of Thathom District completed joined inspection and monitoring of cutting and stockpiling tree with diameter greater than 20 cm in the priority biomass clearance blocks in 2UR. o There were 865 cut down and stockpiled within the biomass clearance blocks. o There are around 825 trees within the blocks that will be cut and stockpiled for the next round. o Thathom District has issued an official agreement with GOL Contractor (Xayakhue Company) to transport 117 logs from biomass clearance blocks to GOL log-yard No#2 in Ban Hatsamkhone. NNP1 EMO will follow up on this issue. • To date, the overall biomass clearance (cutting and burning) has been completed for around 899 ha. The biomass clearance progress to date can be seen in***Figure 3-9***, ***Figure 3-10*** and ***Table 3-17***.

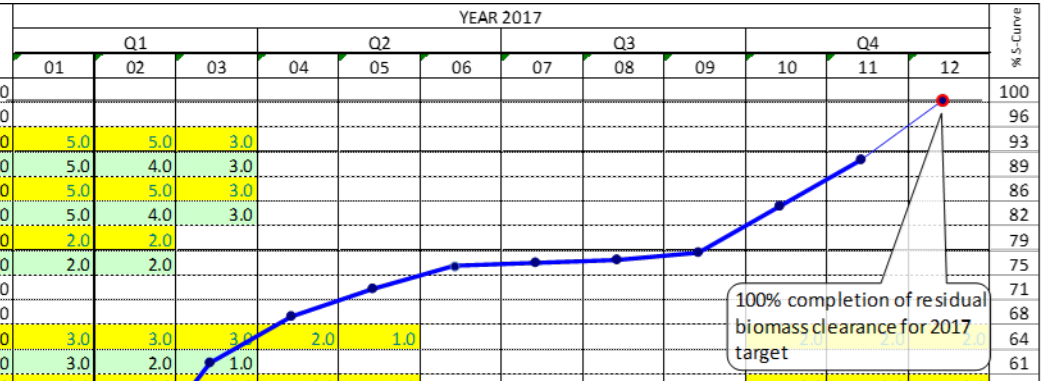
Figure 3-9: Biomass Clearance work Progress in figure as of 31 March 2017



The overall progress of biomass clearance programme is demonstrated in Figure 3-10 below.

Figure 3-10: Gantt Chart of Biomass Clearance Programme in 31 March 2017

	Task List / Steps of work		Weight (%)	YEAR 2017 Q1 01	Q1 02	Q1 03	Q2 04	Q2 05	Q2 06	Q3 07	Q3 08	Q3 09	Q4 10	Q4 11	Q4 12	% S-Curve
1	**UXO Search and Clearance**	Planed	100.0	0.0												100
		Actual		0.0												96
1.1	Perform UXO work for 549.20 ha (6 blocks) of priority biomass clearance on lower and central reservoir	Planed	13.0	5.0	5.0	3.0										93
		Actual	12.0	5.0	4.0	3.0										89
1.2	Perform UXO work for 334.03 ha (5 blocks) of priority biomass clearance on lower and central reservoir	Planed	13.0	5.0	5.0	3.0										86
		Actual	12.0	5.0	4.0	3.0										82
1.3	Perform UXO work for 84.58 ha (2 blocks) of priority biomass clearance on upper reservoir	Planed	4.0	2.0	2.0											79
		Actual	4.0	2.0	2.0											75
2	**Biomass Clearance**	Planed	0.0													71
		Actual	0.0													68
2.1	Perform biomass clearance for 593.61 ha (6 blocks) on lower and central reservoir	Planed	18.0	3.0	3.0	3.0	2.0	1.0								64
		Actual	6.0	3.0	2.0	1.0										61
2.2	Perform biomass clearance for 462.09 ha (5 blocks) on lower and central reservoir	Planed	18.0	3.0	3.0	3.0	2.0	1.0					2.0	2.0	2.0	57
		Actual	7.0	3.0	2.0	2.0										54
2.3	Perform biomass clearance for 212.66 ha (7 blocks) on central and upper reservoir	Planed	17.0	3.0	3.0	3.0	2.0	1.0					2.0	2.0	1.0	50
		Actual	8.0	3.0	2.0	3.0										46
3	**Preparation of Floating/Debris Removal**	Planed	0.0													43
		Actual	0.0													39
3.1	Procurement of service for floating logs/debris removal	Planed	5.0						2.5						2.5	36
		Actual	0.0													32
4	**Monitoring and Reporting**	Planed	0.0													29
		Actual	0.0													25
4.1	Field monitoring and inspection of biomass clearance and compliance to SS-ESMMP (weekly & Monthly)	Planed	10.0	1.0	1.0	1.0	1.0	1.0	0.5	0.5	0.5	0.5	1.0	1.0	1.0	21
		Actual	3.0	1.0	1.0	1.0										18
4.2	Coordination or Ad-hoc meeting to discuss the progress, concerns and problem solving	Planed	2.0		0.5				0.5			0.5			0.5	14
		Actual	0.5		0.5											11
	Total	Planed	100.0	**22.0**	**22.5**	**16.0**	**7.0**	**4.0**	**3.5**	**0.5**	**0.5**	**1.0**	**7.0**	**7.0**	**9.0**	7
		Actual	62.5	**22.0**	**17.5**	**13.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	4
	Planned Progress	monthly		22.0	22.5	16.0	7.0	4.0	3.5	0.5	0.5	1.0	7.0	7.0	9.0	
		Cumulative		22.0	44.5	60.5	67.5	71.5	75.0	75.5	76.0	77.0	84.0	91.0	100.0	
	Actual Progress	monthly		22.0	17.5	13.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
		Cumulative		22.0	39.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	52.5	



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

Table 3-17: Biomass and UXO clearance progress in each priority area as of 31 March 2017

Priority Area	Zone	Total Area (ha)	Island & Buffer Zone (315-320 m ASL)	Priority Biomass Clearance Area			Completed UXO Clearance as of 28 Feb 2017	Status of Biomass Clearance as of 31 Mar 2017 (ha)	
				Forests	Fallow-shifting Cultivation and Garden-Plantation Lands	Total			
Block 01	1	115.38	6.15	29.35	79.88	109.24	106.95	58.30	- Completed vegetation cutting and burning of 19 ha of forest area and 39.30 ha of communities' lands - Completed inventory of trees to be cut and stockpiled - Waste biomass including 231 logs to be piled and burned at site - 6 trees will be cut and stockpiled for GOL further utilization.
Block 02	1	165.92	7.30	38.72	119.89	158.62	150.41	107.00	- Completed vegetation cutting of 69 ha of communities' lands and 38 ha of forest area - Fire break of cut biomass area is under completion - Completed inventory of trees to be cut and stockpiled - Around 323 trees will be cut and stockpiled
Block 03	1	88.86	8.51	14.43	65.92	80.35	74.84	46.50	- Completed vegetation cutting of 32.50 ha of communities' lands and 14 ha of forest - Fire break of cut biomass area is under completion

Priority Area	Zone	Total Area (ha)	Island & Buffer Zone (315-320 m ASL)	Priority Biomass Clearance Area			Completed UXO Clearance as of 28 Feb 2017	Status of Biomass Clearance as of 31 Mar 2017 (ha)	
				Forests	Fallow-shifting Cultivation and Garden-Plantation Lands	Total			
									- Inventory of trees to be cut and stockpiled is under completion
Block 04	1	167.68	3.94	122.97	40.77	163.74	156.49	132.28	- Completed vegetation cutting and burning of 35.38 ha of community land and 96.90 ha of forest - Waste woods is being piled and re-burned - Stockpiling of 226 logs is under completion.
Block 05	1	350.72	10.61	66.53	273.58	340.11	285.52	123.37	- Completed vegetation cutting and burning of around 83.37 ha of community land and around 40 ha of forest - Continue biomass clearance of compensated area around 16 ha - Fire break of cut biomass area is under preparation
Block 06	1	46.71	14.87	20.31	11.54	31.84	10.87	10.00	- Completed vegetation cutting and burning (bush and small trees) of 10 ha of community land in 2016 - Further clearing will be resumed in the fourth quarter of 2017
Block 07	2	43.03	3.39	18.48	21.17	39.65	33.54		Not yet started

Priority Area	Zone	Total Area (ha)	Island & Buffer Zone (315-320 m ASL)	Priority Biomass Clearance Area			Completed UXO Clearance as of 28 Feb 2017	Status of Biomass Clearance as of 31 Mar 2017 (ha)	
				Forests	Fallow-shifting Cultivation and Garden-Plantation Lands	Total			
Block 08	2	41.00	3.40	14.64	22.97	37.61	35.21	4.00	- Completed vegetation cutting and burning (bush and small trees) of 4 ha of community land in 2016 - Further biomass clearing will be resumed in April 2017
Block 09	2	54.13	1.38	11.67	41.08	52.75	44.76		- biomass clearing will start in April 2017
Block 10	2	317.39	48.28	128.97	140.14	269.10	259.58	96.62	- Completed vegetation cutting of around 76.62 ha of community land and around 20 ha of forest area - Fire break of cut biomass area is under completion
Block 11	2	98.05	8.07	24.06	65.92	89.98	87.73	89.98	- Completed vegetation cutting of around 65.98 ha of community land and around 24.06 ha of forest area - Fire break of cut biomass area is under completion
Block 12	3	84.23	20.13	64.11		64.11	63.95	27.42	- Completed vegetation cutting around 27.42 ha. - Fire break of cut biomass area is under completion
Block 13	3	131.35	30.10	76.44	24.81	101.24	87.61	101.24	- Completed vegetation cutting of 101.24 ha

Priority Area	Zone	Total Area (ha)	Island & Buffer Zone (315-320 m ASL)	Priority Biomass Clearance Area			Completed UXO Clearance as of 28 Feb 2017	Status of Biomass Clearance as of 31 Mar 2017 (ha)	
				Forests	Fallow-shifting Cultivation and Garden-Plantation Lands	Total			
									- Completed inventory of trees to be cut and stockpiled - 96 trees were cut and stockpiled - Fire break of cut biomass area is completed
Block 14	3	53.00	9.66	7.79	35.54	43.33	35.74	43.33	- Completed vegetation cutting of 43.33 ha - Fire break of cut biomass area is completed - Completed inventory of trees to be cut and stockpiled - 454 trees were cut down and being stockpiled - 44 trees will cut and stockpiled
Block 15	3	93.27	49.54	13.52	30.21	43.73	39.43	43.73	- Completed vegetation cutting of 43.73 ha - Fire break of cut biomass area is completed - Completed inventory of trees to be cut and stockpiled - 17 trees were cut down and stockpiled - 39 trees will cut and stockpiled
Block 16	3	9.86	6.53	1.30	2.02	3.32	3.32	3.32	- Completed vegetation cutting of 15.23 ha of Block 16, 17 and 18
Block 17	3	44.25	36.29	1.33	6.63	7.96	7.78	7.96	
Block 18	3	7.18	3.23	3.95		3.95	3.95	3.95	

Priority Area	Zone	Total Area (ha)	Island & Buffer Zone (315-320 m ASL)	Priority Biomass Clearance Area			Completed UXO Clearance as of 28 Feb 2017	Status of Biomass Clearance as of 31 Mar 2017 (ha)	
				Forests	Fallow-shifting Cultivation and Garden-Plantation Lands	Total			
									- Fire break of cut biomass area is completed - Completed inventory of trees to be cut and stockpiled - 39 trees in Block 16 will cut and stockpiled - 46 trees were cut down and stockpiled in Block 17. 14 trees in Block 17 will cut and stockpiled in the block - 26 trees were cut down and stockpiled in Block 18. 76 trees in Block 18 will cut and stockpiled in the block.
Total		**1,912.01**	**271.38**	**658.55**	**982.08**	**1,640.63**	**1,487.68**	**899**	

3.5.4 Fishery Monitoring

The fisheries monitoring programme is progressing, and a database has been developed to support the future fish management programme as part of the Nam Ngiep 1 Watershed Management Plan. Three types of the survey were conducted during March 2017 including daily fish catch logbook monitoring, daily catch logbook verification survey with household exit interview and fish migration and spawning survey. The gathered information is being put into the database.

The data from the daily fish catch logbook monitoring indicates that the mean daily fish catch in Nam Ngiep River was 2.3 kg/fishing household/day in February 2017. The estimated total fish catch in Nam Ngiep basin for February 2017 is 53,000 kg. Around 28% of the catch was sold, 65% was consumed fresh by the fishing households 4% processed and approximately 3% was used for other purposes.

The overall progress of fish monitoring programme is illustrated in Figure ***3-11*** below.

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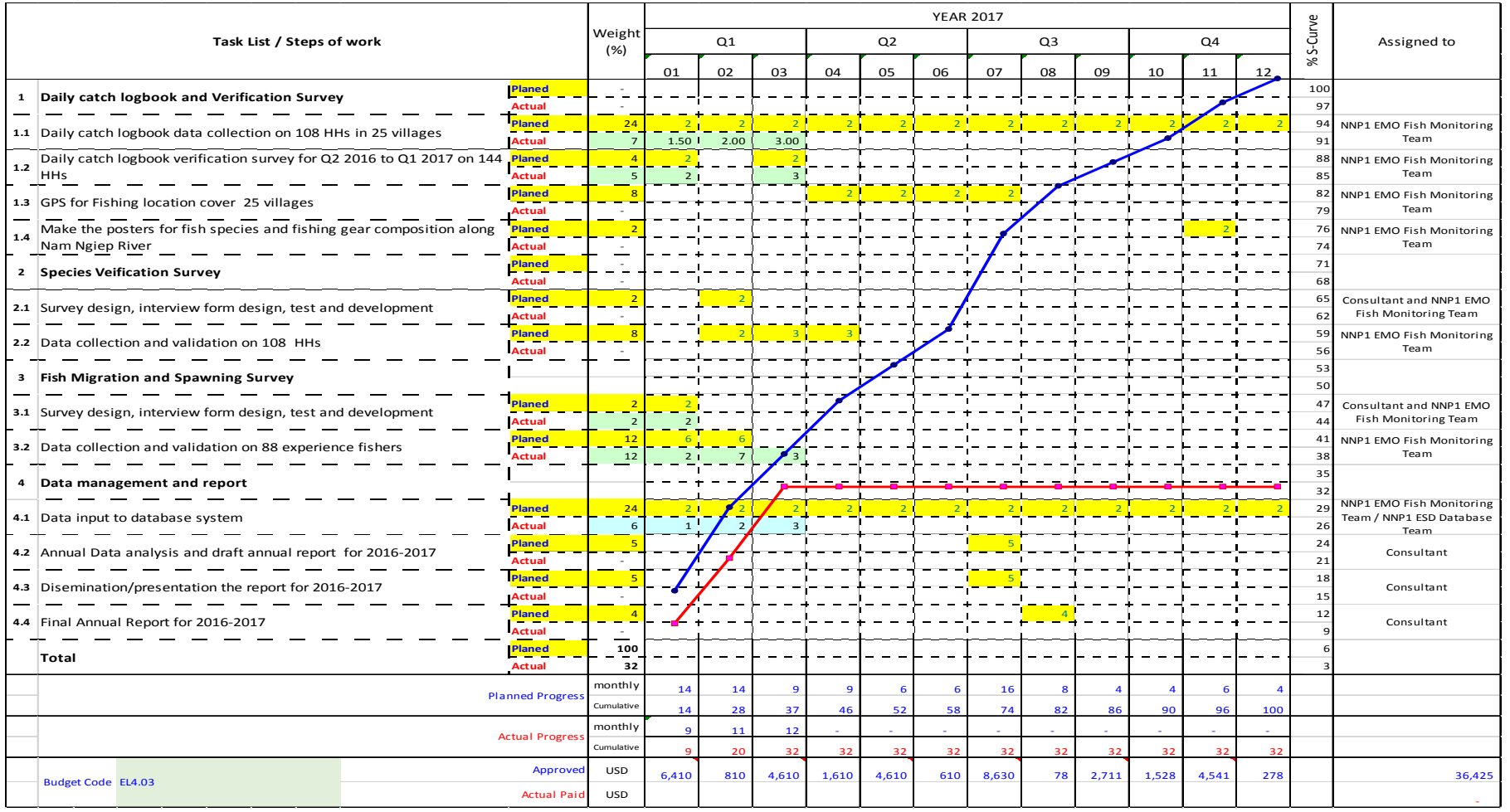
The overall progress of fish monitoring programme is illustrated in ***Figure 3-11*** below.

Figure *3-11: Gantt Chart of Fish Monitoring Programme as of 31 March 2017*



	Task List / Steps of work		Weight (%)	YEAR 2017 Q1 01	02	03	Q2 04	05	06	Q3 07	08	09	Q4 10	11	12	% S-Curve	Assigned to
1	**Daily catch logbook and Verification Survey**	Planed	-													100	
		Actual	-													97	
1.1	Daily catch logbook data collection on 108 HHs in 25 villages	Planed	24	2	2	2	2	2	2	2	2	2	2	2	2	94	NNP1 EMO Fish Monitoring Team
		Actual	7	1.50	2.00	3.00										91	
1.2	Daily catch logbook verification survey for Q2 2016 to Q1 2017 on 144 HHs	Planed	4	2		2										88	NNP1 EMO Fish Monitoring Team
		Actual	5	2		3										85	
1.3	GPS for Fishing location cover 25 villages	Planed	8				2	2	2	2						82	NNP1 EMO Fish Monitoring Team
		Actual	-													79	
1.4	Make the posters for fish species and fishing gear composition along Nam Ngiep River	Planed	2											2		76	NNP1 EMO Fish Monitoring Team
		Actual	-													74	
2	**Species Veification Survey**	Planed	-													71	
		Actual	-													68	
2.1	Survey design, interview form design, test and development	Planed	2		2											65	Consultant and NNP1 EMO Fish Monitoring Team
		Actual	-													62	
2.2	Data collection and validation on 108 HHs	Planed	8		2	3	3									59	NNP1 EMO Fish Monitoring Team
		Actual	-													56	
3	**Fish Migration and Spawning Survey**															53	
																50	
3.1	Survey design, interview form design, test and development	Planed	2	2												47	Consultant and NNP1 EMO Fish Monitoring Team
		Actual	2	2												44	
3.2	Data collection and validation on 88 experience fishers	Planed	12	6	6											41	NNP1 EMO Fish Monitoring Team
		Actual	12	2	7	3										38	
4	**Data management and report**															35	
																32	
4.1	Data input to database system	Planed	24	2	2	2	2	2	2	2	2	2	2	2	2	29	NNP1 EMO Fish Monitoring Team / NNP1 ESD Database Team
		Actual	6	1	2	3										26	
4.2	Annual Data analysis and draft annual report for 2016-2017	Planed	5							5						24	Consultant
		Actual	-													21	
4.3	Disemination/presentation the report for 2016-2017	Planed	5							5						18	Consultant
		Actual	-													15	
4.4	Final Annual Report for 2016-2017	Planed	4								4					12	Consultant
		Actual	-													9	
	Total	Planed	100													6	
		Actual	32													3	
		Planned Progress	monthly	14	14	9	9	6	6	16	8	4	4	6	4		
			Cumulative	14	28	37	46	52	58	74	82	86	90	96	100		
		Actual Progress	monthly	9	11	12	-	-	-	-	-	-	-	-	-		
			Cumulative	9	20	32	32	32	32	32	32	32	32	32	32		
	Budget Code EL4.03	Approved	USD	6,410	810	4,610	1,610	4,610	610	8,630	78	2,711	1,528	4,541	278		36,425
		Actual Paid	USD														-

The blue line and yellow highlights represent the planned activity, and the red line and green highlight represent the actual progress

Activities in March 2017	Results
Daily Catch Logbook and Verification Survey	• Completed the daily catch logbook survey in 108 households out of the total target of 108 households. 4,175 forms were used in the survey. • Conducted daily catch logbook survey for round 7 with household exit interview on 144 households. • A fishery database has been developed. • The daily household catch on average for Nam Ngiep in February 2017 is 2.3 kg/household/day. The median catch for all fishing zone is presented in ***Figure 3-12***. • The estimated total catch for Nam Ngiep in February 2017 is approximately 53,000 kg as shown in***Figure 3-13***.
Household Catch Assessment Survey	• On progress for data analysis and reporting by fishery consultant.
Village Community Interview	• On progress for data analysis and reporting by fishery consultant.
Fish Migration and Spawning survey	• Completed the second round of interview on 7 villages with 28 fishermen. • Completed data entry and submitted to Fishery Consultant for analysis
Gillnet Sampling Survey	• In preparation for the survey including procurement of equipment and service for fishery taxonomist. • The survey is postponed due to delays in purchasing the equipment and it will be started in late of April 2017.

Figure 3-12: Median daily household catch by fishing zone and Nam Ngiep mean value for all fishing zones combined (Kg/HH/day)

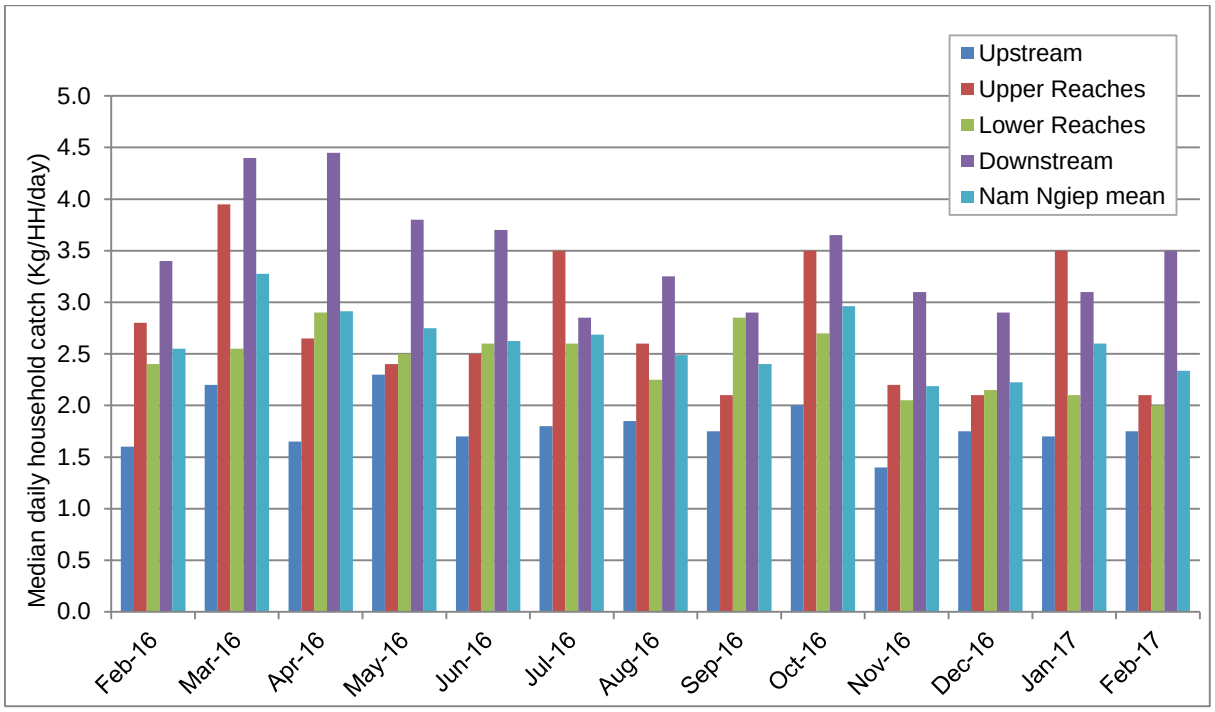
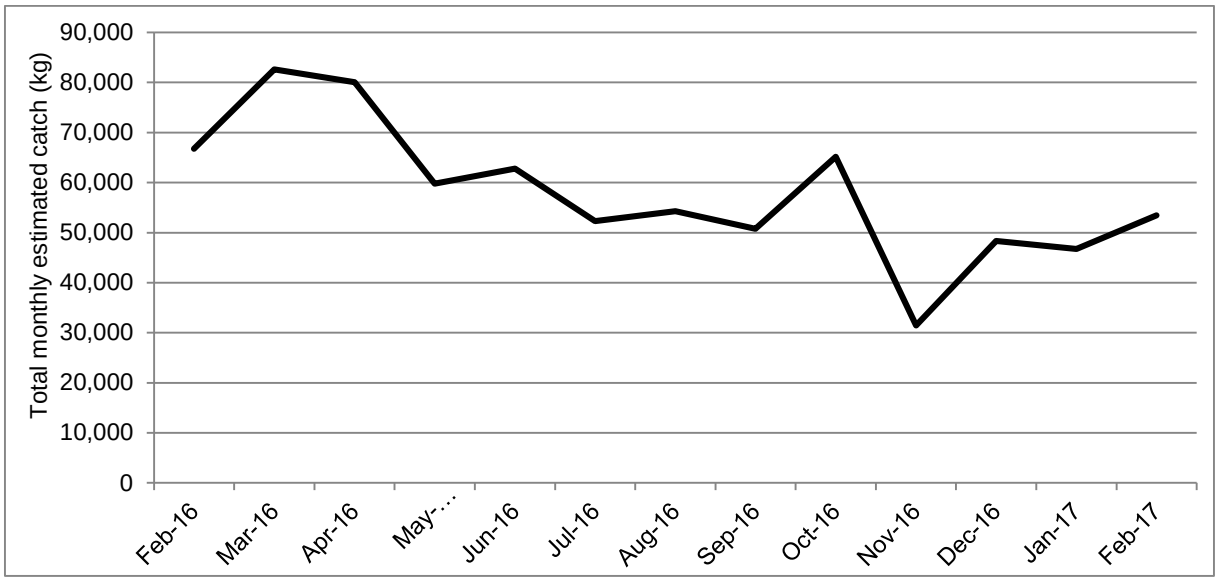


Figure 3-13: Total estimated fish catch for Nam Ngiep by month (Kg)



3.6 Other Obligations and Support Programmes

3.6.1 Environmental Protection Fund (EPF)

EMO team completed another round of review on the revised EPF sub-project proposal of Xaysomboun and Xiengkouang on 23 March 2017 for further improvement.

Bolikhamxay Team (sub-project implementation team) submitted the February progress report of sub-project implementation work to EPF. NNP1 EMO team also inquired Bolikhamaxay Team to share the document and for next progress reporting.

3.6.2 115 kV Transmission Line IEE Due Diligence Assessment

There was no update on the revision of IEE for 115kV TL during the reported period. The due diligence assessment (DDA) will be resumed once the IEE is revised (based on the new alignment) and environmental and social mitigation measures are implemented.

3.7 External Monitoring

There was no external monitoring during the reported period.

3.7.1 Biodiversity Advisory Committee

BAC submitted the 5th BAC mission report in the first week of February 2016.

NNP1 EMO provided the comments to 5th BAC mission report in the second week of March 2017. The report was further revised with some response from BAC Team Leader in the last week of March. It is currently under final reviewed by NNP1 EMO and expected to conclude the report in April for further sharing with BOMC.

ANNEXES

ANNEX A: RESULTS OF EFFLUENT ANALYSES

Table A- 1: Results of Camp Effluents in March 2017 (first mission)

	Site Name	Owner Site Office and Village	Obayashi Camp WWT1	Obayashi Camp WWT2	TCM Camp	Sino Hydro Camp	V & K Camp
	Station Code	EF01	EF02	EF15	EF03	EF06	EF10
	Date	09/03/17	09/03/17	09/03/17	09/03/17	09/03/17	09/03/17
Parameters (Unit)	Guideline						
pH	6.0 - 9.0	6.93	7.68	8.11	No water discharge	7.33	7.28
Sat. DO (%)		14.3	0	46.1		0	0.5
DO (mg/l)		1.41	0	3.7		0	0.04
Conductivity (µs/cm)		496	807	789		579	392
TDS (mg/l)		247	404	394		289	196
Temperature (°C)		26.81	26.28	25.3		25.78	25.07
Turbidity (NTU)		1.13	23	60.6		16.6	47
TSS (mg/l)	<50	ND[16]	35.2	21.2		25.7	55.2
BOD (mg/l)	<30	ND[13]	73.6	75.2		45.4	20.4
COD (mg/l)	<125	ND[16]	160	218		104	57.9
NH3-N (mg/l)	<10.0	10	25	ND[12]		31	3
Total Nitrogen (mg/l)	<10.0	17.8	28.9	6.2		35.2	5.27
Manganese (mg/l)		0.146	0.054	0.058		0.088	0.137
Total Iron (mg/l)	<2	ND[10]	0.188	0.202		0.686	2.25
Total Phosphorus (mg/l)		1.13	1.32	0.48		1.74	0.34
Oil & Grease (mg/l)	<10.0	ND[13]	3	1		1	1
Total coliform (MPN/100ml)	<400	240	160,000	160,000		160,000	160,000
Faecal Coliform (MPN/100ml)		240	160,000	160,000		160,000	160,000
Discharge Volume (m3/day)		***17.3***	***0***	***0***		***0***	***0***

	Site Name	Songda5 Camp#1	Songda5 Camp#2	Zhefu Camp (HMH Worker Camp)	SECC Camp	HMH Main Camp WWTP	IHI Camp	KENBER Camp
	Station Code	EF07	EF08	EF09	EF11	EF13	EF14	EF16
	Date	09/03/17	09/03/17	09/03/17	09/03/17	09/03/17	09/03/17	09/03/17
Parameters (Unit)	Guideline							
pH	6.0 - 9.0	7.94	7.6	7.43	7.39	7.4	7.39	
Sat. DO (%)		10.6	11.3	71.5	56.7	24	0	
DO (mg/l)		0.55	0.87	5.09	4.44	1.88	0	
Conductivity (µs/cm)		767	756	177	369	517	729	
TDS (mg/l)		383	378	88	185	258	364	
Temperature (°C)		26.11	25.82	30.76	26.49	26.49	26.16	
Turbidity (NTU)		8.05	53.4	3.69	4.8	36.4	12.6	

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	Site Name	Songda5 Camp#1	Songda5 Camp#2	Zhefu Camp (HMH Worker Camp)	SECC Camp	HMH Main Camp WWTP	IHI Camp	KENBER Camp
	Station Code	EF07	EF08	EF09	EF11	EF13	EF14	EF16
	Date	09/03/17	09/03/17	09/03/17	09/03/17	09/03/17	09/03/17	09/03/17
Parameters (Unit)	**Guideline**							
TSS (mg/l)	<50	15.9	77.1	5.3	9.8	68.2	31.5	No water in the last pond
BOD (mg/l)	<30	13.8	4.1	ND[13]	4.5	84.2	89.8	
COD (mg/l)	<125	44.6	104	ND[16]	36	198	172	
NH3-N (mg/l)	<10.0	20	41	2	ND[12]	18	22	
Total Nitrogen (mg/l)	<10.0	23	41.3	2.88	3.23	23.9	23.7	
Manganese (mg/l)		0.902	0.205	ND[4]	ND[4]	0.144	0.364	
Total Iron (mg/l)	<2	1.44	1.22	0.131	0.808	0.666	0.385	
Total Phosphorus (mg/l)		0.86	1.39	0.48	0.12	0.86	0.98	
Oil & Grease (mg/l)	<10.0	ND[13]	ND[13]	ND[13]	ND[13]	3	5	
Total coliform (MPN/100ml)	<400	4,900	35,000	1,700	1,100	160,000	160,000	
Faecal Coliform (MPN/100ml)		4,900	7,000	1,100	490	160,000	160,000	
Discharge Volume (m3/day)		***0***	***17.3***	***0***	***0***	***0***	***0***	

Table A- 2: Results of Camp Effluents in March 2017 (second mission)

	Site Name	Owner Site Office and Village	Obayashi Camp WWT1	Obayashi Camp WWT2	TCM Camp	Sino Hydro Camp	V & K Camp
	Station Code	EF01	EF02	EF15	EF03	EF06	EF10
	Date	21/03/17	21/03/17	21/03/17		20/03/17	21/03/17
Parameters (Unit)	**Guideline**						
pH	6.0 - 9.0	6.85	7.48	8.18		7.47	7.49
Sat. DO (%)		2.8	0	54		6	0
DO (mg/l)		0.21	0	4.15		0.46	0
Conductivity (µs/cm)		268	716	673		744	382
TDS (mg/l)		134	358	337		372	191
Temperature (°C)		27.58	26.82	26.81	No water	28.08	24.82
Turbidity (NTU)		0.7	17.9	7.19	in the	21.17	88.55
TSS (mg/l)	<50	ND[16]	22.1	41.2	last pond	26.5	139

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	Site Name	Owner Site Office and Village	Obayashi Camp WWT1	Obayashi Camp WWT2	TCM Camp	Sino Hydro Camp	V & K Camp
	Station Code	EF01	EF02	EF15	EF03	EF06	EF10
	Date	21/03/17	21/03/17	21/03/17		20/03/17	21/03/17
Parameters (Unit)	**Guideline**						
BOD (mg/l)	<30	8.5	39.9	44.7		32.1	9
COD (mg/l)	<125	ND[16]	103	126		108	43.7
NH3-N (mg/l)	<10.0	7	23	10		39	12
Total Nitrogen (mg/l)	<10	19.6	30	14.4		42.7	16
Total Iron (mg/l)	<2	ND[10]	0.187	0.35		0.791	2.62
Manganese (mg/l)		0.12	0.06	0.036		0.112	0.096
Total Phosphorus (mg/l)	<2	1.59	1.67	0.89		1.23	0.66
Total coliform (MPN/100ml)	<400	4,900	160,000	160,000		160,000	160,000
Faecal Coliform (MPN/100ml)		4,900	160,000	160,000		160,000	160,000
Discharge Volume (m3/day)		***8.6***	***0***	***0***		***0***	***0***

	Site Name	Songda5 Camp#1	Songda5 Camp#2	Zhefu Camp (HMH Worker Camp)	SECC Camp	HMH Main Camp WWTP	IHI Camp	KENBER Camp
	Station Code	EF07	EF08	EF09	EF11	EF13	EF14	EF16
	Date	21/03/17	20/03/17	21/03/17	20/03/17	21/03/17	21/03/17	20/03/17
Parameters (Unit)	**Guideline**							
pH	6.0 - 9.0	7.7	7.76	7.67	7.51	7.35	7.66	7.55
Sat. DO (%)		5.4	0	46.6	54.7	1.7	0	0.9
DO (mg/l)		0.4	0	3.3	4	0.15	0	0.08
Conductivity (µs/cm)		843	720	203	339	397	329	437
TDS (mg/l)		421	360	102	169	199	164	219
Temperature (°C)		27.96	27.7	30.67	26.55	26.88	26.47	27.01
Turbidity (NTU)		11.7	25.81	15.38	6.01	5.61	35.75	13.02
TSS (mg/l)	<50	21.2	42.2	18.9	12.6	57.1	26.1	43
BOD (mg/l)	<30	12.5	71.7	5.3	3.8	68.2	44.2	74
COD (mg/l)	<125	57.1	170	ND[16]	38.4	165	123	190
NH3-N (mg/l)	<10.0	18	36	ND[12]	ND[12]	14	17	10
Total Nitrogen (mg/l)	<10	21.5	40.5	7.4	3.7	19.1	19.9	13.6
Total Iron (mg/l)	<2	2.06	0.456	ND[10]	1.37	0.644	0.405	0.756
Manganese (mg/l)		0.985	0.13	0.039	0.015	0.156	0.288	0.724

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	Site Name	Songda5 Camp#1	Songda5 Camp#2	Zhefu Camp (HMH Worker Camp)	SECC Camp	HMH Main Camp WWTP	IHI Camp	KENBER Camp
	Station Code	EF07	EF08	EF09	EF11	EF13	EF14	EF16
	Date	21/03/17	20/03/17	21/03/17	20/03/17	21/03/17	21/03/17	20/03/17
Parameters (Unit)	**Guideline**							
Total Phosphorus (mg/l)	<2	1.3	1.48	1.2	0.05	1.44	1.33	0.24
Total coliform (MPN/100ml)	<400	160,000	160,000	160,000	1,700	160,000	160,000	160,000
Faecal Coliform (MPN/100ml)		92,000	160,000	160,000	79	160,000	160,000	160,000
Discharge Volume (m3/day)		***8.6***	***0***	***0***	***0***	***0***	***0***	***0***

Table A- 3: Results of the Construction Area Discharge in March 2017

	Site Name	Aggregate Crushing Plant				Spoil Disposal #2			
	Station Code	DS02				DS04			
	Date	03/03/17	09/03/17	17/03/17	22/03/17	03/03/17	09/03/17	17/03/17	22/03/17
Parameter (Unit)	**Guideline**								
pH	6.0 - 9.0	7.96	6.77	7.98	7.47	8.21	7.95	6.35	6.65
Sat. DO (%)		59.8	30.2	46	64.5	70.2	71.4	50.8	63.9
DO (mg/l)		5.01	2.27	4.06	4.42	6.89	5.61	4.6	4.77
Conductivity (µs/cm)		123	136	120	145	70	115	300	88
TDS (mg/l)		61	68	60	73	35	57	150	44
Temperature (°C)		22.38	27.35	23.96	30.18	28	26.88	25.94	27.88
Turbidity (NTU)		966	1,630	11,190	2,736	5.65	10.36	49	72
TSS (mg/l)	<50	445	746	3,927	1,383	1	26	67	153
Oil & Grease (mg/l)	<10	ND[13]	N/A	N/A	N/A	ND[13]	N/A	N/A	N/A
Discharge Volume (m^3/day)		***5.80***	***8.60***	***172.80***	***86.40***	***17.30***	***14.40***	***86.40***	***172.80***

	Site Name	RCC Plant				Regulating Dam			
	Station Code	DS09				DS08			
	Date	03/03/17	09/03/17	17/03/17	22/03/17	03/03/17	09/03/17	17/03/17	22/03/17
Parameter (Unit)	**Guideline**								
pH	6.0 - 9.0	7.71	6.92	7.60	7.46	7.37	6.93	6.29	7.2
Sat. DO (%)		98.9	83	63.8	66.5	85.1	64.5	68	63.3
DO (mg/l)		7.46	6.73	4.94	4.61	6.87	5.16	5.59	4.74
Conductivity (µs/cm)		184	261	258	277	226	262	137	246
TDS (mg/l)		92	130	129	139	113	131	68	123
Temperature (°C)		28.96	26.96	25.49	28.77	25.83	26.98	24.24	29.12
Turbidity (NTU)		6,660	6,880	920	83	18.5	19.55	1,772	24

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	Site Name	**RCC Plant**				**Regulating Dam**			
	Station Code	**DS09**				**DS08**			
	Date	**03/03/17**	**09/03/17**	**17/03/17**	**22/03/17**	**03/03/17**	**09/03/17**	**17/03/17**	**22/03/17**
Parameter (Unit)	**Guideline**								
TSS (mg/l)	<50	4,420	3,362	906	170	17	15	1,736	34
Oil & Grease (mg/l)	<10	ND[13]	N/A	N/A	N/A	ND[13]	N/A	N/A	N/A
Discharge Volume (m^3/day)		***172.80***	***86.40***	***86.40***	***86.40***	***86.40***	***17.30***	***86.40***	***86.40***

	Site Name	**Main Dam (Lower Treatment Plant)**				**Main Dam (Upper Treatment Plant)**			
	Station Code	**DS11**				**DS12**			
	Date	**03/03/17**	**09/03/17**	**17/03/17**	**22/03/17**	**03/03/17**	**09/03/17**	**17/03/17**	**22/03/17**
Parameter (Unit)	**Guideline**								
pH	6.0 - 9.0	11.39	6.8	12.21	11.88	No water discharge	No water discharge	No water discharge	No water discharge
Sat. DO (%)		68.2	87.4	56.8	54.6				
DO (mg/l)		5.73	6.92	4.55	4.28				
Conductivity (µs/cm)		1,344	1,416	3,023	1,997				
TDS (mg/l)		672	708	1513	998				
Temperature (°C)		22.61	26.56	24.97	25.59				
Turbidity (NTU)		7.14	29.5	11	8.23				
TSS (mg/l)	<50	4,215	60	60	77				
Oil & Grease (mg/l)	<10	ND[13]	N/A	N/A	N/A				
Discharge Volume (m^3/day)		***6,000***	***6,000***	***6,000***	***6,000***				

ANNEX B: AMBIENT DUST QUALITY

Table B- 1: 24-hour Average Dust Concentrations Measured in Ban Hat Gniun

Hat Gnuin Village - 24 Hours Average Particulate Matter (PM10) Concentration			
Period	00 to 24 Hours	24 to 48 Hours	48 to 72 Hours
Start Time	23-03-17 15:55	24-03-17 17:05	25-03-17 17:05
End Time	24-03-17 02:26	25-03-17 17:05	26-03-17 13:09
Average Data Record in 24h (mg/m3)	0.11	0.08	0.03
Guideline Average in 24h (mg/m3)	0.12	0.12	0.12

Figure B- 1: Dust Monitoring Results at Ban Hat Gnuin in March 2017

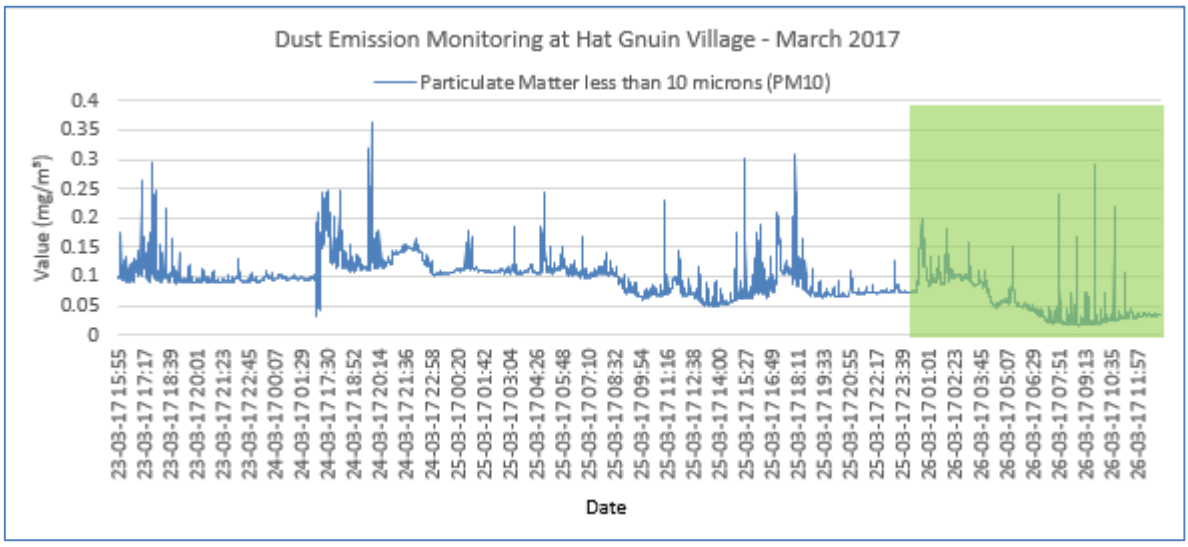


Table B- 2: 24-hour Average Dust Concentrations Measured in Houay Soup Resettlement Area

Houay Soup Resettlement Area - 24 Hours Average Particulate Matter (PM10) Concentration			
Period	00 to 24 Hours	24 to 48 Hours	48 to 72 Hours
Start Time	26-03-17 14:30	27-03-17 14:30	28-03-17 14:30
End Time	27-03-17 14:30	28-03-17 14:30	29-03-17 14:18
Average Data Record in 24h (mg/m3)	0.03	0.04	0.08
Guideline Average in 24h (mg/m3)	0.12	0.12	0.12

Figure B- 2: Dust Monitoring Results at Houay Soup Resettlement Village in March 2017

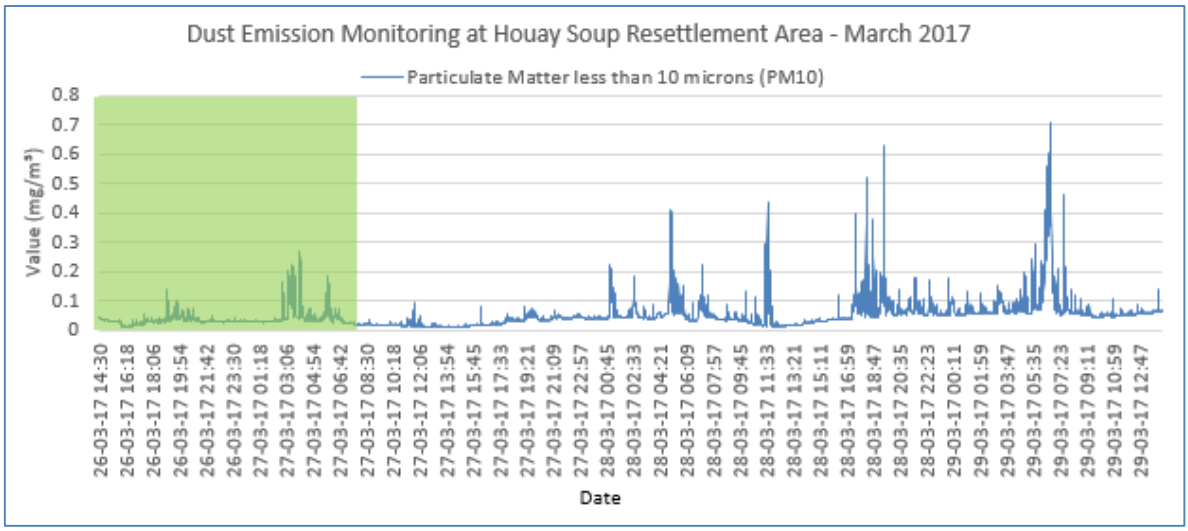


Figure B- 3: Dust Monitoring Results at the Aggregate Crushing Plant in March 2017

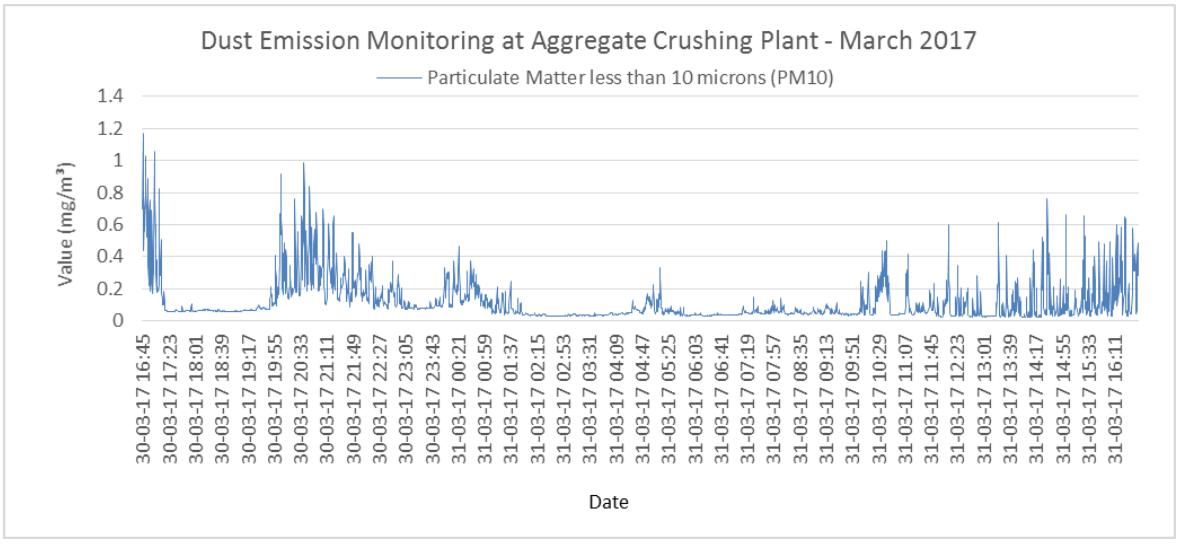


Figure B- 4: Dust Monitoring Results at the RCC Plant in March 2017

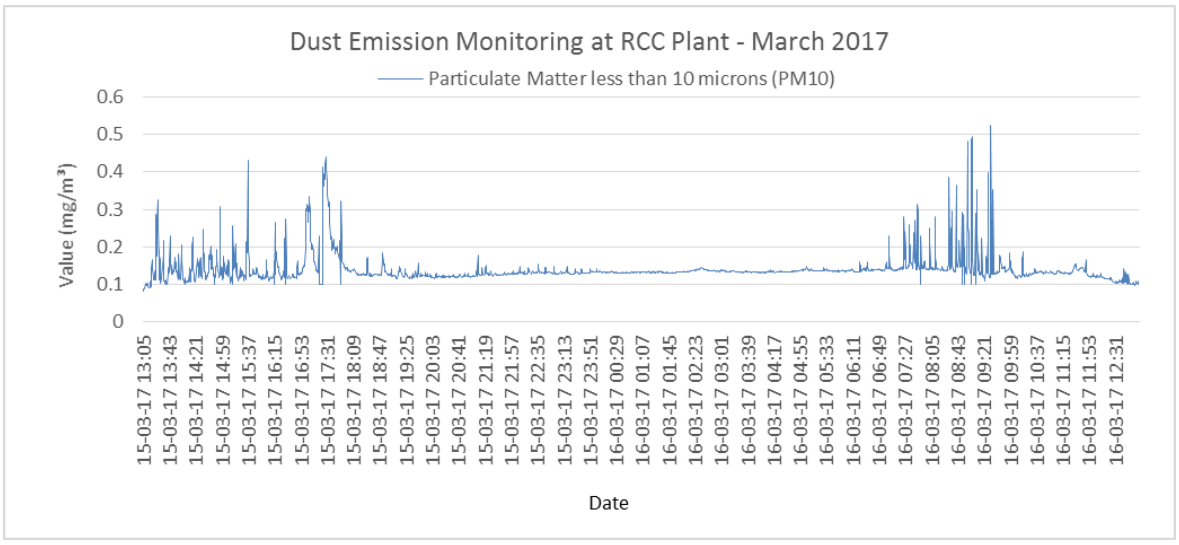


Figure B- 5: Dust Monitoring Results at the Sino Hydro Camp in March 2017

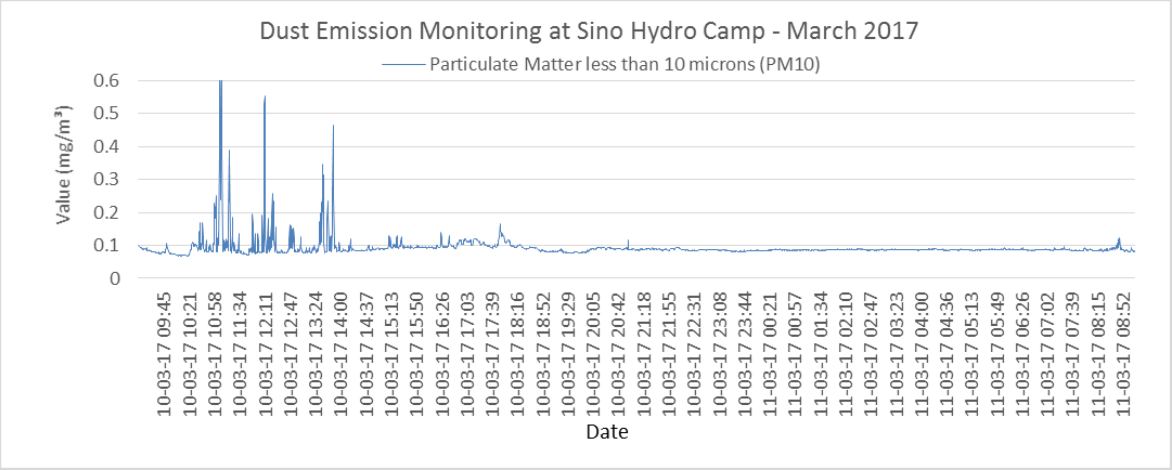


Figure B- 6: Dust Monitoring Results at the Sino Hydro Temporary Camp in March 2017

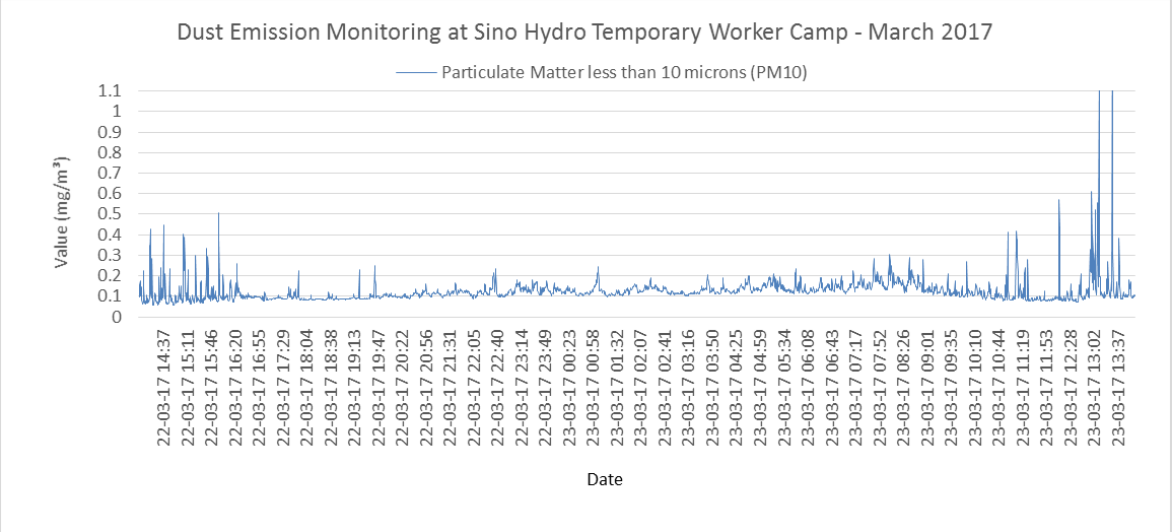


Figure B- 7: Dust Monitoring Results at the SongDa5 No.2 Camp in March 2017

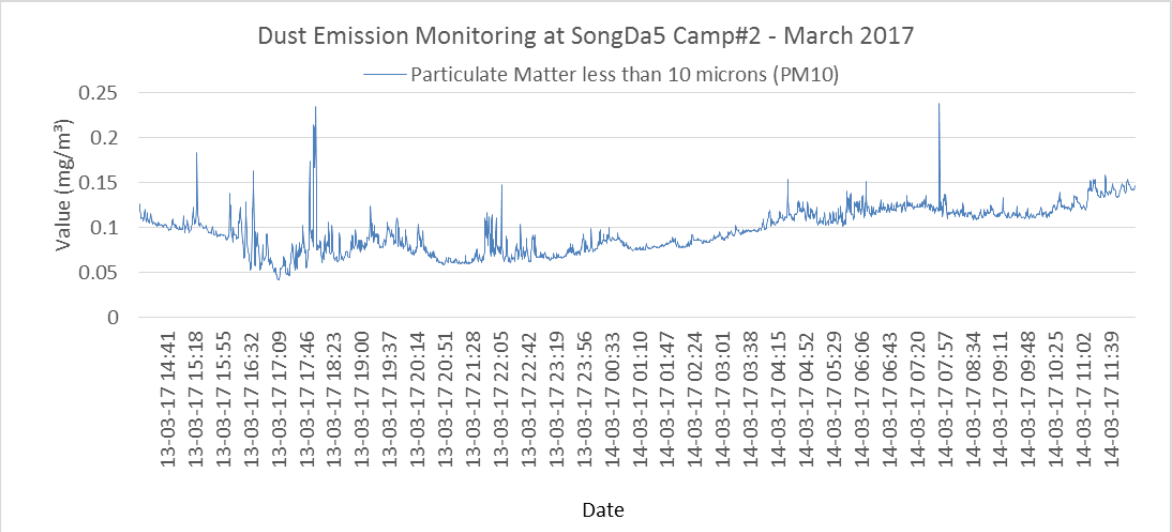


Figure B- 8: Dust Monitoring Results at Main Dam in March 2017

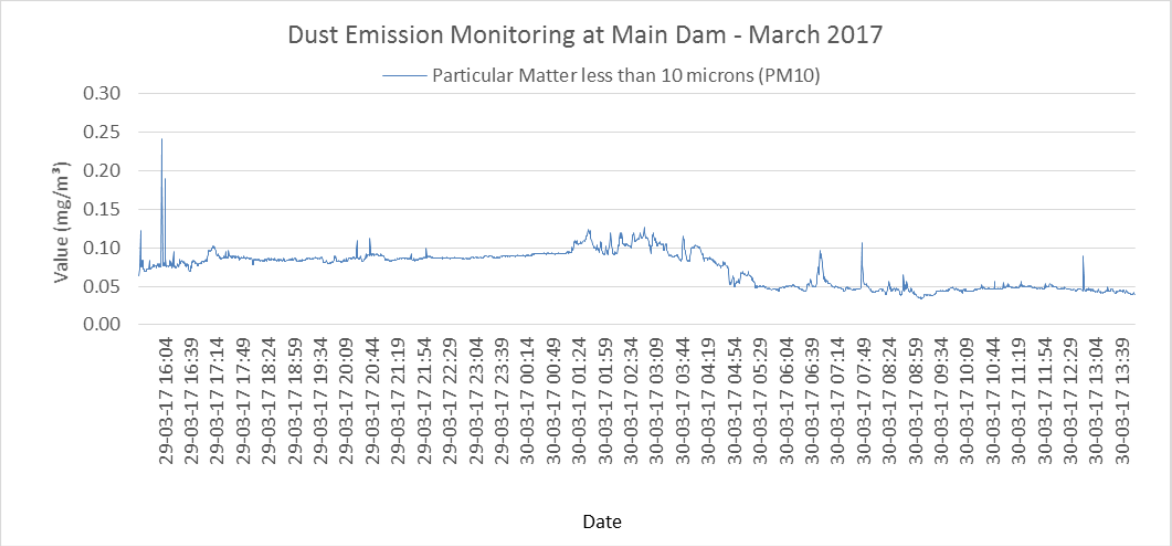
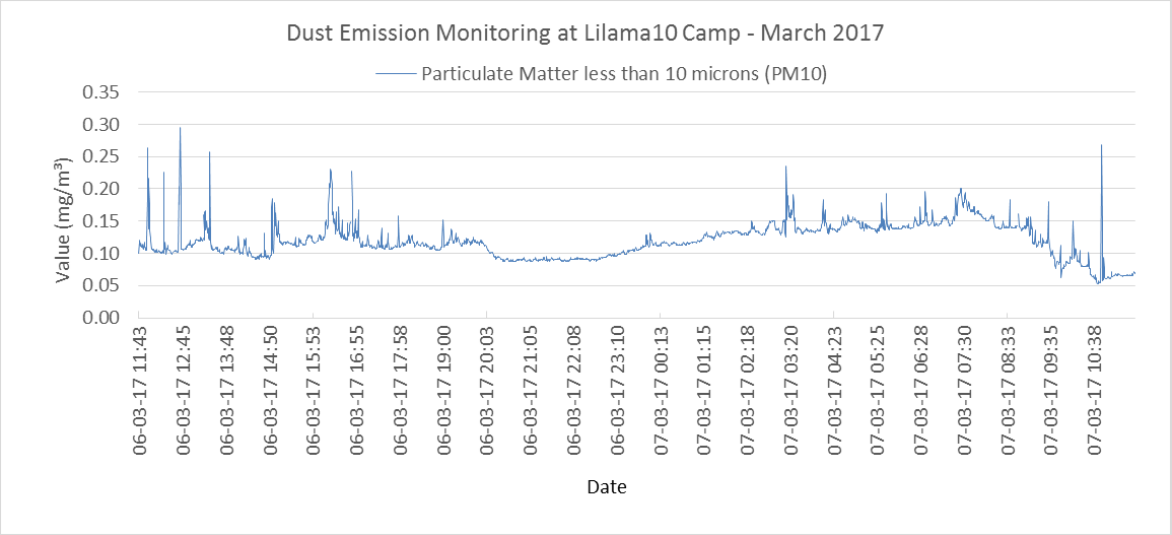


Figure B- 9: Dust Monitoring Results at the Lilama10 Camp in March 2017



ANNEX C: AMBIENT NOISE DATA

Table C- 1: Average Results of Noise Monitoring at Ban Hat Gnuin in March 2017

Noise Level (dB)	23-24/03/2017			24-25/03/2017			25-26/03/2017			26/03/2017
	16:34-18:00	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 - 13:58
Maximum Value Recorded	61.00	73.40	64.60	73.30	66.10	56.90	65.20	66.90	76.70	67.80
Guideline Max	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***
Average Data Recorded	47.72	50.72	43.05	49.30	46.00	42.34	48.13	47.20	44.08	47.49
Guideline Averaged	***55***	***55***	***45***	***55***	***55***	***45***	***55***	***55***	***45***	***55***

Figure C- 1: Result of Noise Level Monitoring at Ban Hat Gnuin in March 2017

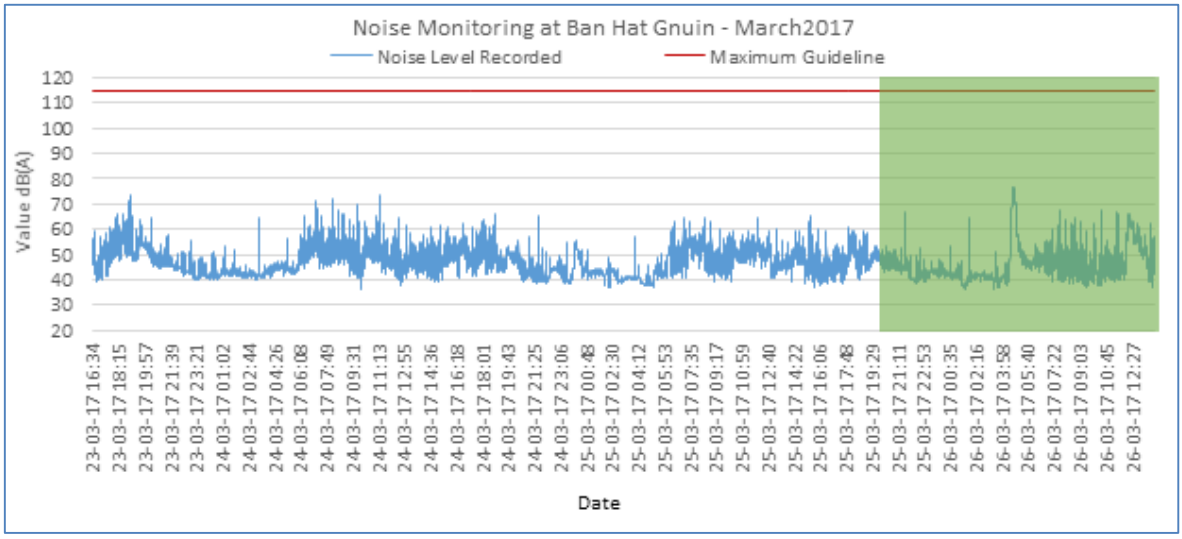


Table C- 2: Average Results of Noise Monitoring at Houay Soup Resettlement Area in March 2017

Noise Level (dB)	26-27/03/2017			27-28/03/2017			28-29/03/2017			29/03/2017
	15:07-18:00	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 - 15:07
Maximum Value Recorded	57.50	57.30	52.80	66.20	73.60	51.50	66.20	65.00	58.10	65.90
Guideline Max	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***
Average Data Recorded	42.87	39.53	37.79	40.50	44.44	39.84	41.46	47.64	39.60	42.55
Guideline Averaged	***55***	***55***	***45***	***55***	***55***	***45***	***55***	***55***	***45***	***55***

Figure C- 2: Result of Noise Level Monitoring at Houay Soup Resettlement Village in March 2017

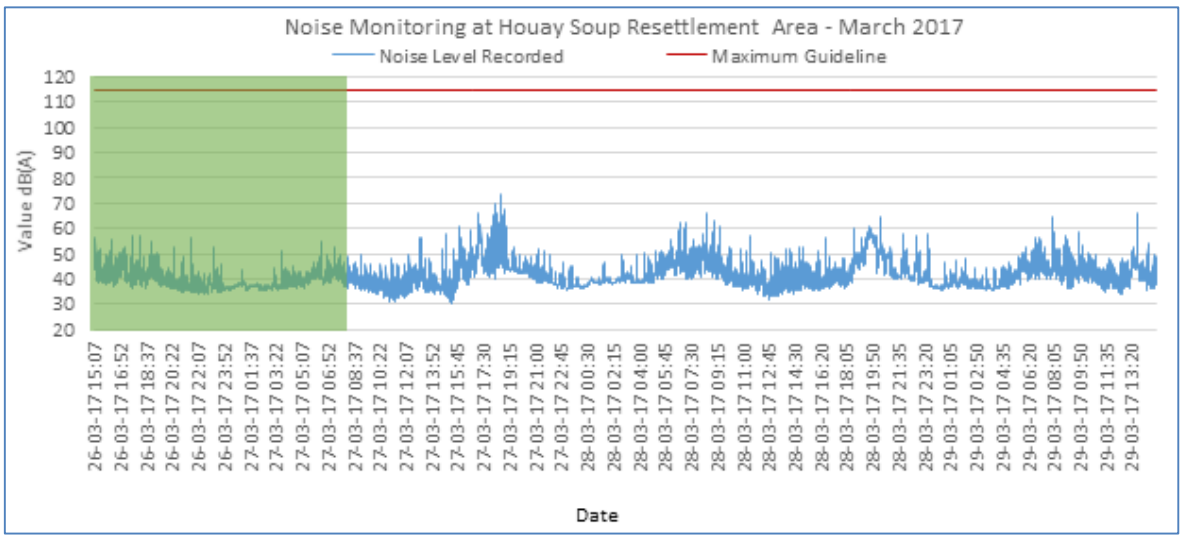


Table C- 2 and Table C-3: Average Results of Noise Monitoring at Aggregate Crushing Plant and RCC Plant in March 2017

Aggregate Crushing Plant

Noise Level (dB)	30-31/03/2017		31/03/2017
	17:40 – 22:00	22:01 – 06:00	06:01-17:33
Maximum Value Recorded	77.7	78	78.4
Guideline Max	***115***	***115***	***115***
Average Data Recorded	64.46	67.02	68.92
Guideline Averaged	***70***	***50***	***70***

RCC Plant

Noise Level (dB)	15-16/03/2017		16/03/2017
	15:36 – 22:00	22:01 – 06:00	06:01-15:36
Maximum Value Recorded	69.3	68.5	67.5
Guideline Max	***115***	***115***	***115***
Average Data Recorded	57.95	61.63	58.19
Guideline Averaged	***70***	***50***	***70***

Figure C- 3: Results of Noise Level Monitoring at the Aggregate Crushing Plant in March 2017

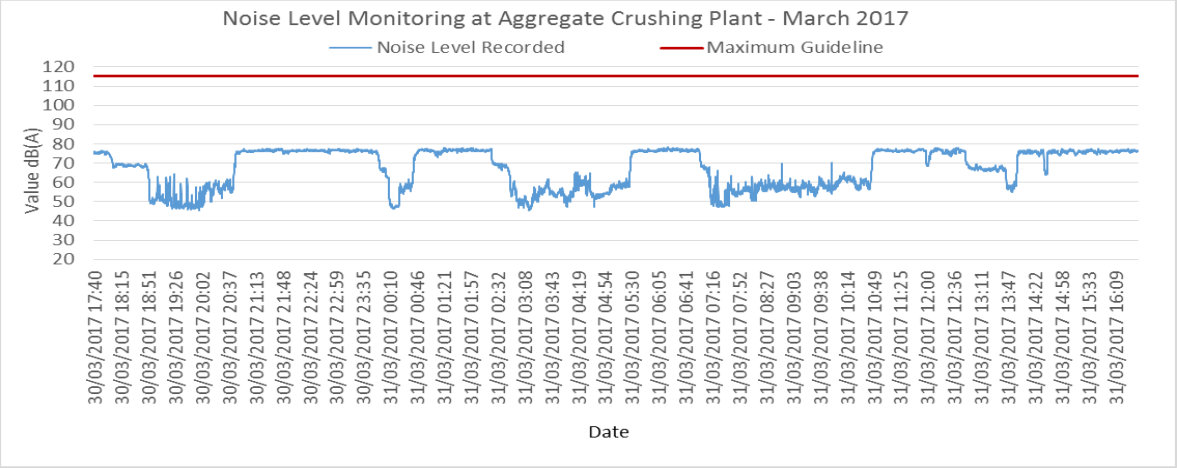


Figure C- 4: Results of Noise Level Monitoring at the RCC Plant in March 2017

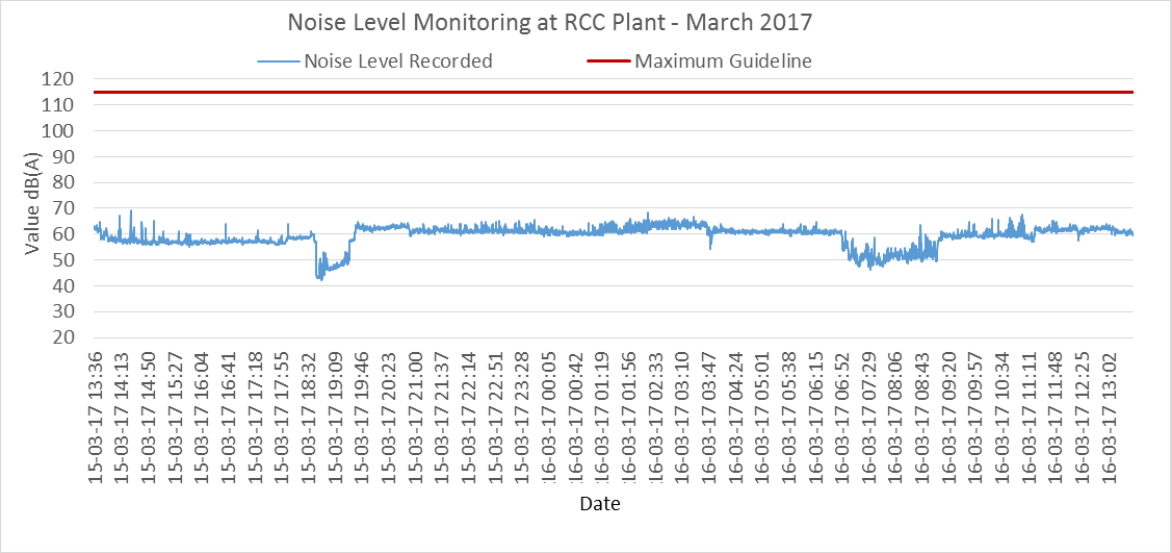


Table C- 5 and Table C- 6: Average Results of Noise Monitoring at Songda Camp#2 and Sino Hydro Camp in March 2017

Songda5 Camp No.2

Noise Level (dB)	13-14/03/2017		14/03/2017
	14:47 – 22:00	22:01 – 06:00	06:01-14:47
Maximum Value Recorded	61.3	59.7	65.4
Guideline Max	***115***	***115***	***115***
Average Data Recorded	49.57	54.44	48.99
Guideline Averaged	***70***	***50***	***70***

Sino Hydro Camp

Noise Level (dB)	10-11/03/2017		11/03/2017
	09:49 – 22:00	22:01 – 06:00	06:01-09:49
Maximum Value Recorded	88.2	72.8	70.7
Guideline Max	***115***	***115***	***115***
Average Data Recorded	59.61	60.90	58.17
Guideline Averaged	***70***	***50***	***70***

Figure C- 5: Results of Noise Level Monitoring at Songda5 Camp#2 in March 2017

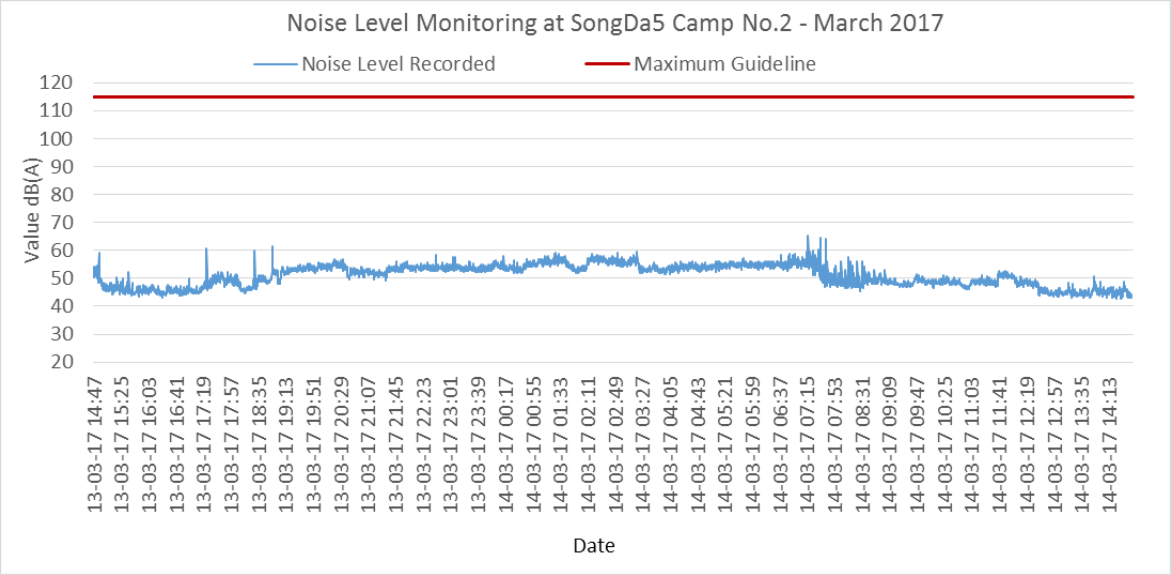


Figure C- 6: Results of Noise Level Monitoring at Sino Hydro Camp in March 2017

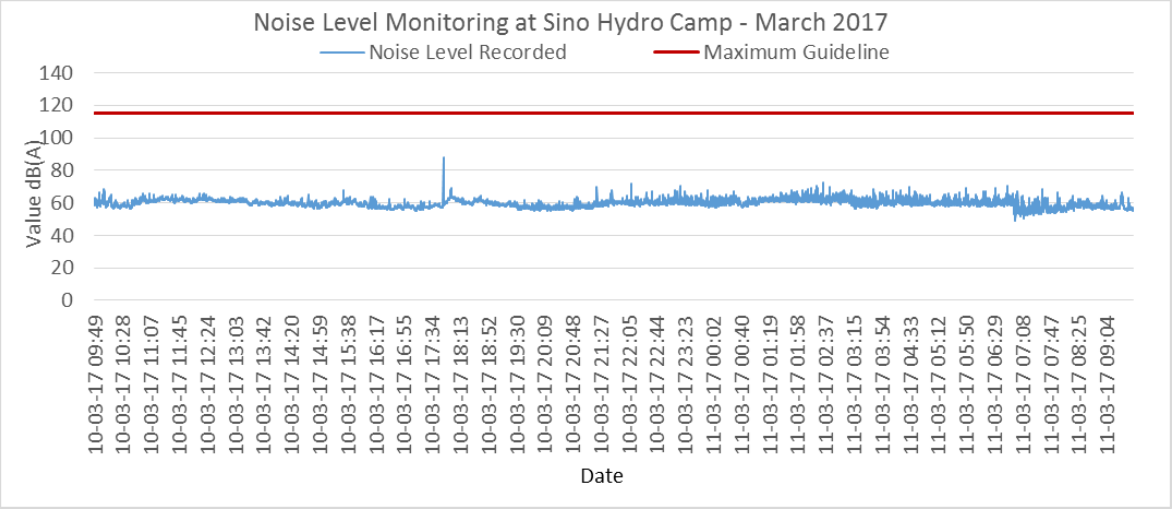


Table C- 7 and Table C- 8: Average Results of Noise Monitoring at the Owner's Site Office and Village and, the Main Dam in March 2017

Owner's Site Office and Village *Main Dam*

Noise Level (dB)	7-8/3/2017		08/03/2017
	14:11 – 22:00	22:01 – 06:00	06:01-14:10
Maximum Value Recorded	50.3	78	65.5
Guideline Max	***115***	***115***	***115***
Average Data Recorded	39.06	49.31	45.80
Guideline Averaged	***70***	***50***	***70***

Noise Level (dB)	29-30/03/2017		30/03/2017
	16:21 – 22:00	22:01 – 06:00	06:01-16:21
Data Record Max	64.7	75.9	64.5
Guideline Max	***115***	***115***	***115***
Data Record Average	51.12	52.65	50.41
Guideline Averaged	***70***	***50***	***70***

Figure C- 7: Results of Noise Level Monitoring at Owner's Site Office and Village in March 2017

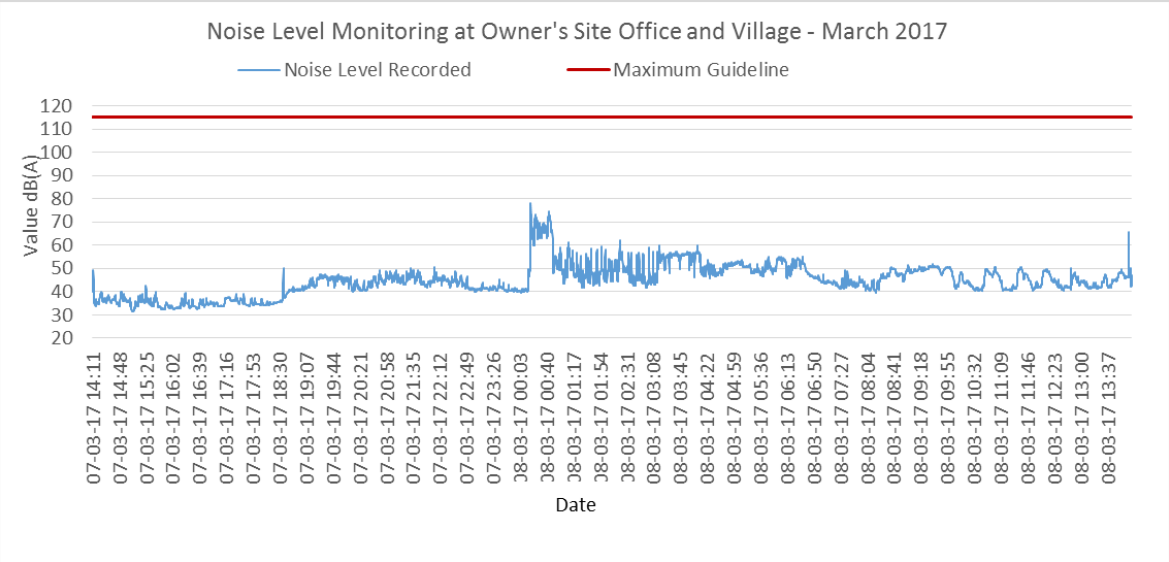


Figure C- 8: Results of Noise Level Monitoring at Main Dam in March 2017

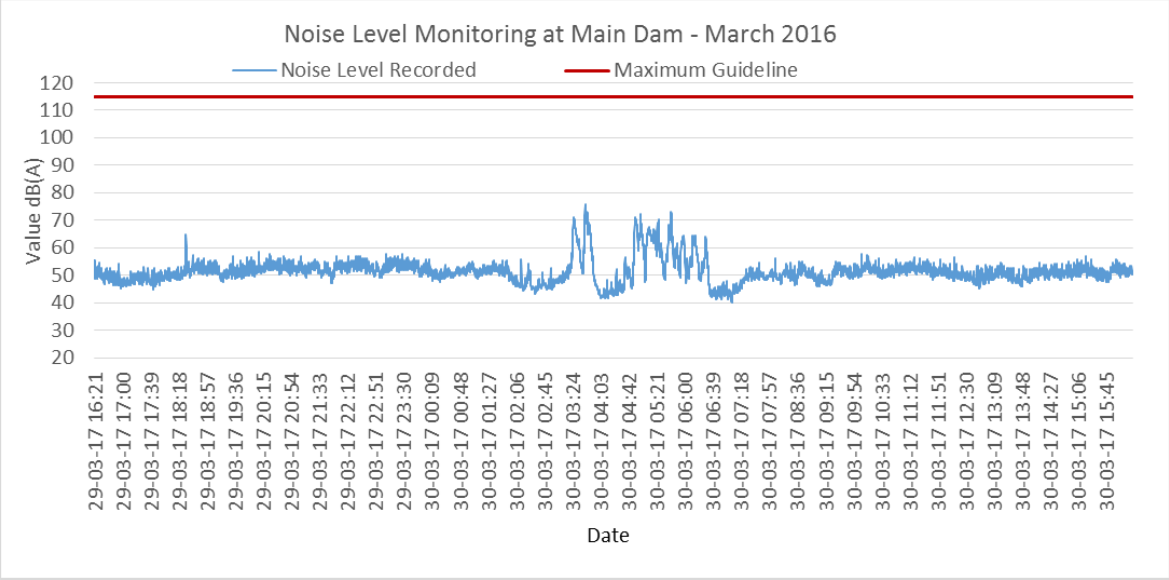


Table C- 9: Average Results of Noise Monitoring at the Sino Hydro Temporary Worker Camp and Lilama10 Camp in March 2017

Sino Hydro Temporary Worker Camp

Noise Level (dB)	22-23/03/2017		23/03/2017
	14:51 – 22:00	22:01 – 06:00	06:01-14:51
Maximum Value Recorded	85.3	70.2	71.8
Guideline Max	***115***	***115***	***115***
Average Data Recorded	58.01	60.65	54.75
Guideline Averaged	***70***	***50***	***70***

Lilama10 Camp

Noise Level (dB)	06-07/3/2017		07/03/2017
	12:30 – 22:00	22:01 – 06:00	06:01-12:31
Maximum Value Recorded	82	66.8	71.8
Guideline Max	***115***	***115***	***115***
Average Data Recorded	41.89	44.95	46.35
Guideline Averaged	***70***	***50***	***70***

Figure C-9: Results of Noise Level Monitoring at Sino Hydro Temporary Worker Camp

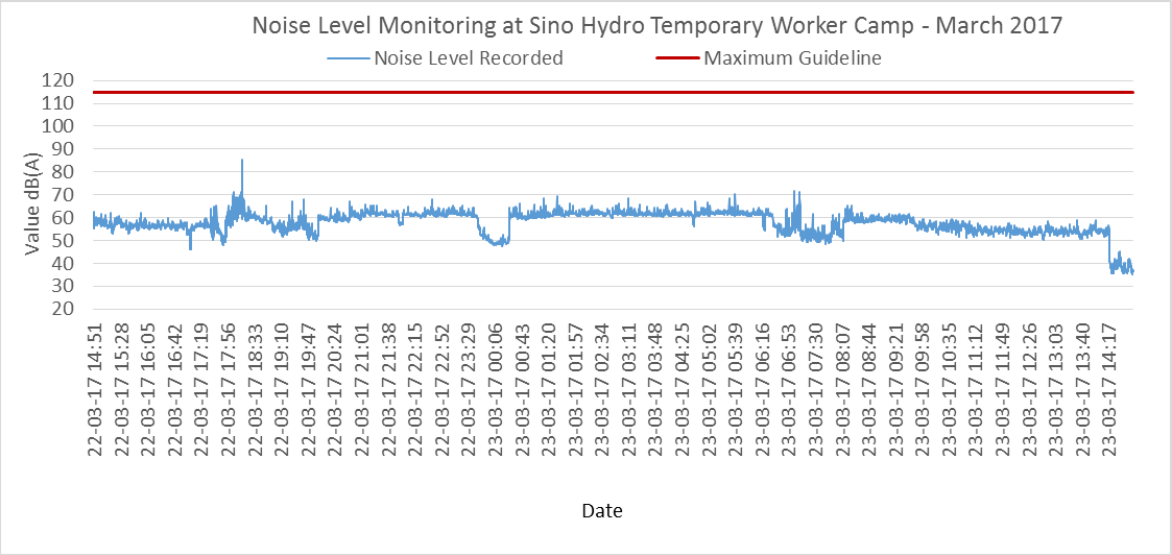


Figure C-10: Results of Noise Level Monitoring at Lilama10 Camp in March 2017