NAM NGIEP 1
POWER COMPANY

Nam Ngiep 1 Hydropower Project

Environment Monitoring Report
First Quarter of 2017

January to March 2017

REV	DATE	PREPARED	REVIEWED	APPROVED	MODIFICATION DETAILS
A					
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A	27 July 2017	Viengkeo Phetnavongxay	Peter.G.Jensen	Prapard PAN- ARAM	Final

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☐	Confidential

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BBREVIATIONS / ACRONYMS

ADB	Asian Development Bank
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
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
DSRP	Dam Safety Review Panel
EC	Electrolytic Conductivity
EDL	Electricite du Laos
EGAT	Electricity Generating Authority of Thailand
EGATi	EGAT International Company Limited
EIA	Environmental Impact Assessment
EMO	Environmental Management Office of ESD within NNP1PC
EMU	Environmental Monitoring Unit
EMWC	Electrical-Mechanical Works Contract
EPF	Environmental Protection Fund
ESD	Environmental and Social Division of NNP1PC
ESMMP	Environmental and Social Monitoring and Management Plan
GOL	Government of Lao PDR
GIS	Geographic Information Systems
HH	Household
HMWC	Hydraulic Metal Works Contract
IEE	Initial Environmental Examination
IMA	Independent Monitoring Agency
ISP	Intergraded Spatial Planning
LEPTS	Lao Electric Power Technical Standard

LHSE	Lao Holding State Enterprise
LTA	Lender's Technical Advisor
MAF	Ministry of Agriculture and Forestry
MONRE	Ministry of Natural Resource and Environment, Lao PDR
MOU	Memorandum of Understanding
NCR	Non-Compliance Report
NNP1PC	Nam Ngiep 1 Power Company Limited
NTFP	Non-Timber Forest Products
OC	Obayashi Corporation
ONC	Observation of Non-Compliance
OSOV	Owners' Site Office and Village
PAFO	Provincial Department of Agriculture and Forestry
PONRE	Provincial Department of Natural Resource and Environment, MONRE
RCC	Roller Compacted Concrete
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

1 EXECUTIVE SUMMARY

The finalisation of the Environmental and Social Management and Monitoring Plan for the Construction Phase (ESMMP-CP) is in progress and it is expected that the final ESMMP-CP will be submitted to the Ministry of Natural Resources and Environment (MONRE) during the second quarter of 2017.

During the first quarter of 2017, NNP1PC-EMO reviewed 25 SS-ESMMP, one ESMMP and one Site Decommissioning Plan and two additional supporting documents. Out of these, 21 SS-ESMMP, one ESMMP, one Site Decommissioning Plan and two additional supporting documents were approved; four SS-ESMMP are under review and carried over to the Second Quarter of 2017.

All SS-ESMMP for camps and other temporary facilities received since June 2016 have been required to include decommissioning plans.

A total of 31 Observations of Non-Compliances (ONC), three Non-Compliance Level-1 (NCR1) and five Non-Compliance level-2 (NCR2) were issued during the reporting period. Out of these, 14 ONCs, one NCR1 and one NCR2 were carried over from the fourth Quarter of 2016; 17 ONCs, two NCR1 and four NCR2 were newly issued. A total of 11 ONC, two NCR1 and one NCR2 could not be resolved in the reporting period and will be carried forward into the Second Quarter of 2017.

By the end of December 2016, WWTS at the new Kenber Camp, IHI Camp, Song Da 5 Camp No. 1 and No. 2 were completed in accordance with the conceptual design prepared by the external consultant, the NNP1PC Instruction Letter (reference No. NNP1/0750-016/OBA/EPC-CE dated 12 October 2016) and the design drawings that were cleared by NNP1PC in November 2016. Improvements of the Wastewater Treatment Systems (WWTS) have continued to progress during the reporting period, however, an assessment of the effluent results revealed that more efforts toward the WWTS improvement are required in order for all contractor's camps, excluding the Owner's Village and Site Office to comply with the effluent standard. The principle Contractors agreed to try to complete the improvements of the remaining WWTS by the Second Quarter of 2017.

The development of the Nam Ngiep 1 Watershed Management Plan (WMP) has continued during the reporting period. The progress until the end of March 2017 includes: analysis on the updated land use / land cover classification, improvements to the biodiversity and fishery section with respect to meeting No Net Loss, preparation of draft budget for the entire concession period, and addressing comments from ADB's consultant. The plan will be discussed with relevant GOL authorities after review and approval by ADB.

NNP1PC is in the process of recruiting a consultant for development of a Biodiversity Offset Management Plan (BOMP). NNP1 advertised for expression of interests in the second week of January 2017. The TOR was revised in the first week of February 2017 based on comments from IAP. The TOR was further revised elaborating the comments from BAC received on 20 February 2017 and per discussion with ADB on 21-23 February 2017. The revised TOR was circulated to the applicants in the middle of March 2017 and two applicants submitted a full proposal on 30 March 2017.

Biomass clearance continue to progress. The target is around 1,269 ha out of 1,649 ha to be fully cleared in 2017. The progress by the end of March 2017 is that around 527 ha have been cleared, which fall short 29 ha of meeting the target for the first quarter of 2017. The biomass burning in Zone 2UR is expected to start in the second quarter 2017, while vegetation cutting will continue in 2LR area. The GOL also conducted the inspection and monitoring of the extraction of trees with diameter greater than 20 cm within priority biomass clearance area for further utilization by GOL.

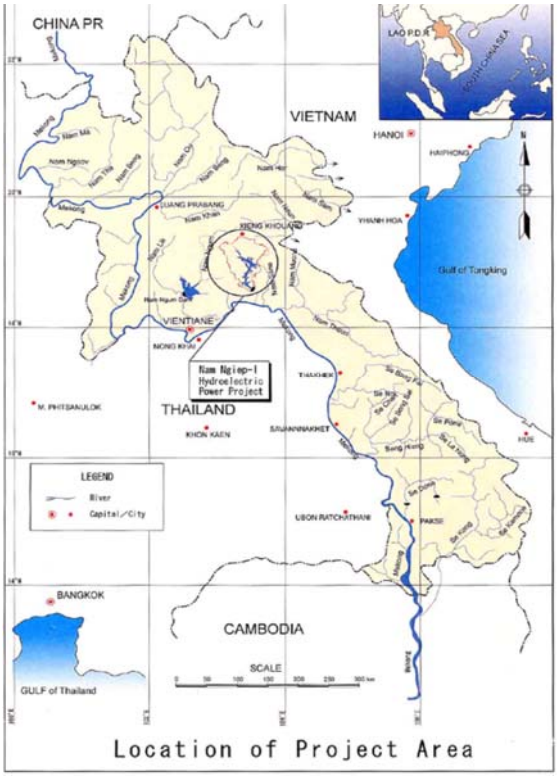
The fishery monitoring program is progressing, and a database has been developed to support the future fish management programme as part of the Nam Ngiep 1 Watershed Management Plan. Three types of surveys were conducted in the first quarter 2017 including daily fish catch logbook monitoring, catch logbook verification survey, and fish migration and spawning survey. The gathered information is being entered 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.

2 INTRODUCTION

The Nam Ngiep originates in the mountains of Xieng Khuang 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 (Fig. 2-1).

FIGURE 2-1: 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 Quarterly Monitoring Report provides a summary of environmental management and monitoring activities from 01 January to 31 March 2017. The report was prepared by the Project's Environmental Management Office (EMO). It has been internally reviewed and cleared by EMO senior technical staff and management prior to submitting the report to the Lenders' Technical Adviser (LTA) and ADB.

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

3 CONSTRUCTION PROGRESS

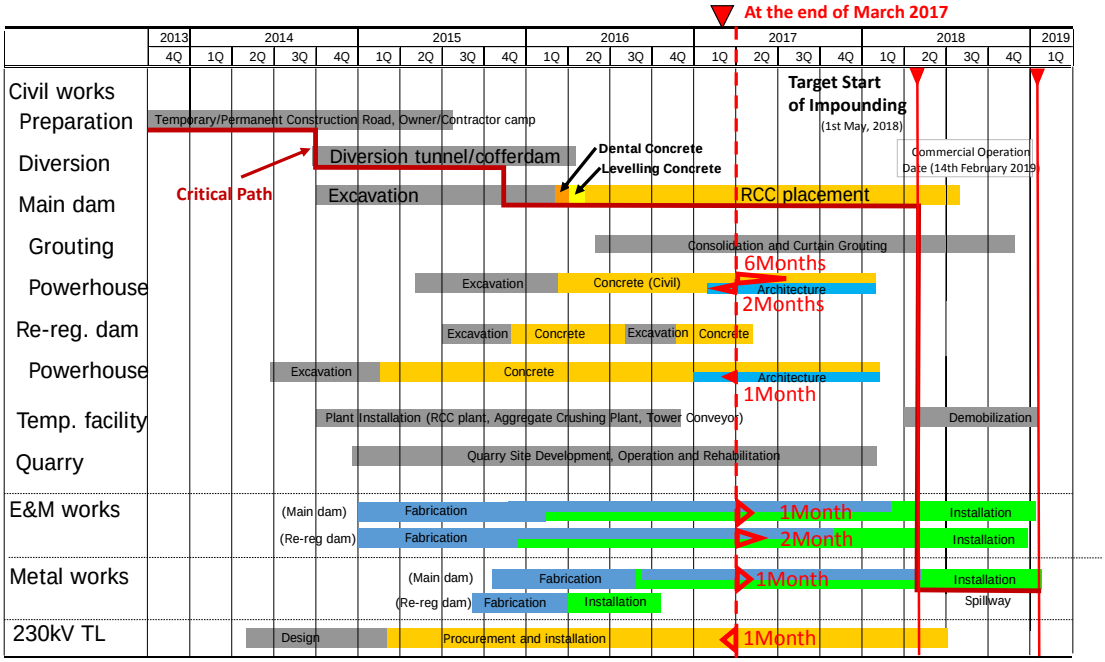
Construction Works for the Project are being carried out through four separate main construction contracts under the supervision of the Technical Division of NNP1PC. The four contracts are the Civil Works, the Electrical and Mechanical Works, the Hydraulic Metal or Hydro-mechanical Works and the 230 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

[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.

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 **Error! Reference source not found.**.

FIGURE 3-1: *OVERALL CONSTRUCTION SCHEDULE*



3.1 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.

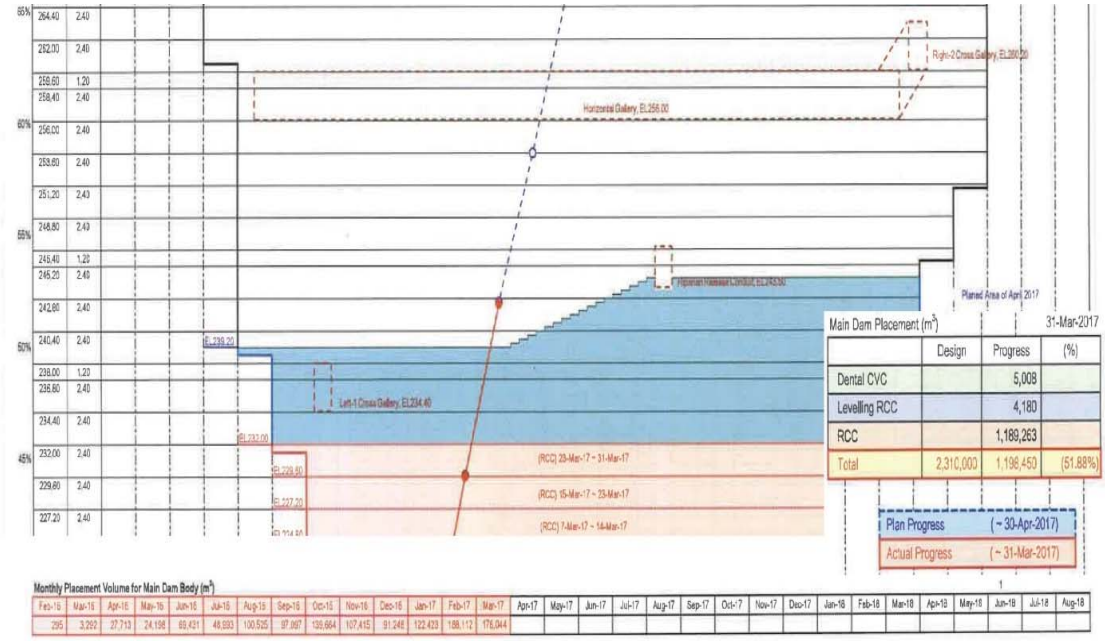
The cumulative actual work progress of the Civil Works until the end of March 2017 was 70.4% (compared to planned progress of 69.9 %) calculated in the same manner as described above for the value of achieved Interim Milestone Payments excluding advance payment.

3.2 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.

[2]The progress to-date is calculated as (Cumulative Value Achieved for Completed Work by Variation Order or Other Adjustment) / (Total Budget Contingency Amount)

FIGURE 3-2: *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 3-1: *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 **Error! Reference source not found.** below:

TABLE 3-2: *PROGRESS OF MAIN POWERHOUSE SUB-STRUCTURE CONCRETE WORKS TO 31 MARCH 2017*

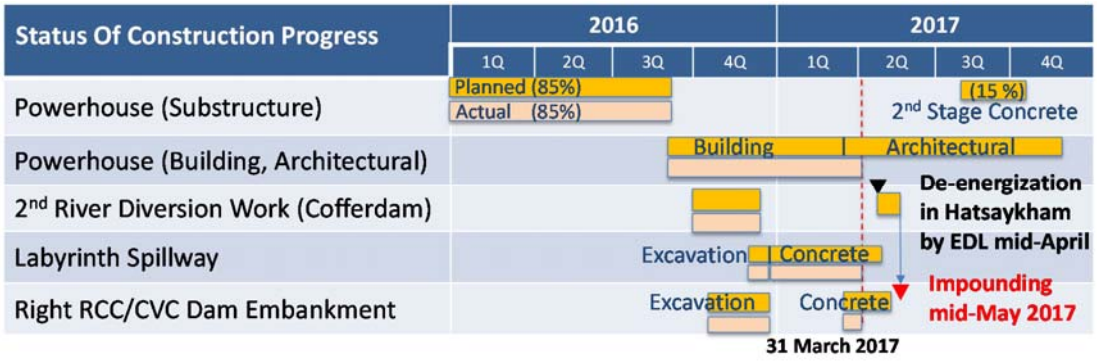
Location	Total Anticipated Volume (m^3)	Completed (m^3)	Progress (%)
Main Powerhouse	32,600	24,645	75
Penstock Embedment	10,117	7,150	70

3.2.1 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 below

FIGURE 3-3: 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.

3.3 TEMPORARY WORK FACILITY

3.3.1 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.

3.3.2 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.

3.3.3 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.

3.3.4 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.

3.4 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 3-4: *PREPARATION FOR INSTALLATION OF STAY RING FOR UNIT 1 AT THE MAIN POWERHOUSE ON 24 MARCH 2017*

FIGURE 3-5: INSTALLATION OF 80 TONNE OHTC AT THE RE-REGULATION POWERHOUSE

3.5 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 3-3*** below.

TABLE 3-3: *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

3.6 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 **Error! Reference source not found.**6 below).

FIGURE 3-6: *CUMULATIVE WORK PROGRESS OF TOWER FOUNDATION (ORIGINAL PLANNED AND ACTUAL)*

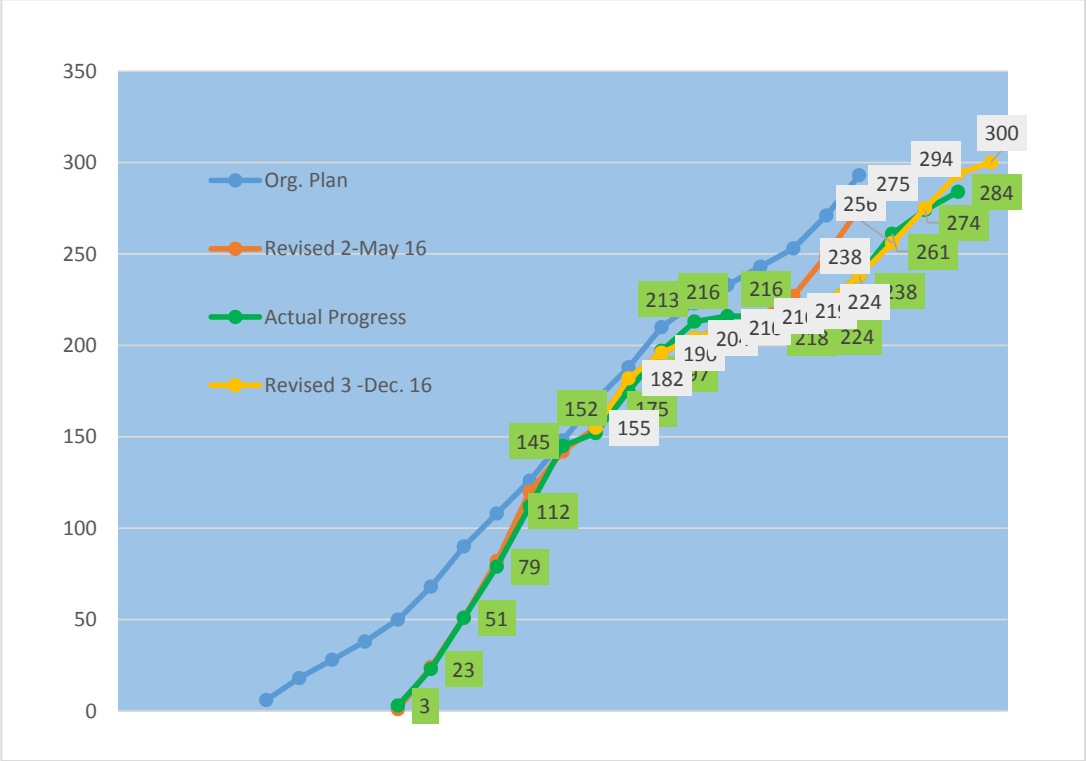


FIGURE 3-7: *CUMULATIVE WORKS PROGRESS OF TOWER FOUNDATION (REVISED PLANNED & ACTUAL)*

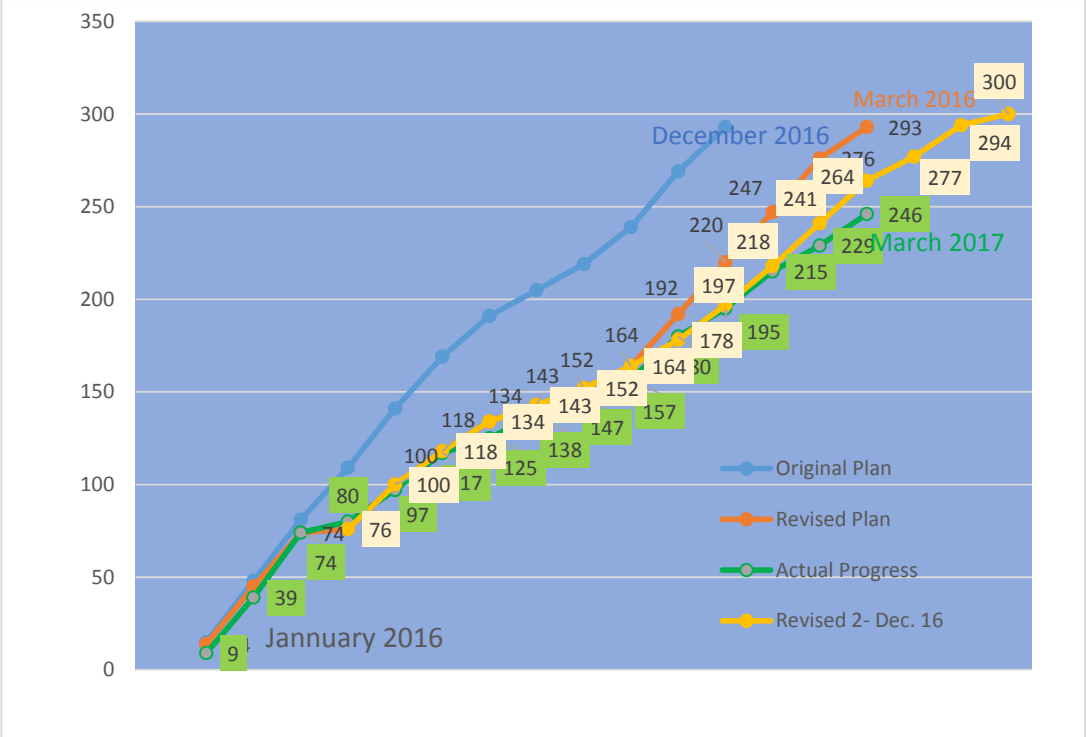


FIGURE 3-8: *REVISED CUMULATIVE WORKS PROGRESS OF TOWER ERECTION (PLANNED & ACTUAL)*

4 ENVIRONMENTAL MANAGEMENT AND MONITORING

4.1 ESMMP-CP

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 final ESMMP-CP will be submitted to the Ministry of Natural Resources and Environment (MONRE) during the second quarter of 2017.

4.2 Contractor SS-ESMMPs

During the first quarter of 2017, NNP1PC-EMO reviewed 25 SS-ESMMP, one ESMMP and one Site Decommissioning Plan and two additional supporting documents. Out of these, 21 SS-ESMMP, one ESMMP, one Site Decommissioning Plan and two additional supporting documents were approved; four SS-ESMMP are under review and carried over to the second quarter of 2017.

All SS-ESMMP for camps and other temporary facilities received since June 2016 have been required to include decommissioning plans.

TABLE 4-1: SS-ESMMP AND ESMMP REVIEWED DURING THE FIRST QUARTER OF 2017

Name of SS-ESMMP/EMP Document	Rev. 1	Rev. 2	Rev. 3	Approved
SS-ESMMP for NNP1 Project Solid Waste Landfill Construction (Stage 2)	√	Under review		
SS-ESMMP for supplemental information for Curtain Grouting Works at the Main Dam (7th submission)	√	√	√	√

Name of SS-ESMMP/EMP Document	Rev. 1	Rev. 2	Rev. 3	Approved
HM Hydro's Environmental and Social Monitoring and Management Plan (4th submission)	√	√	√	√
SS-ESMMP for Installation Work of Spiral Case and Stay Ring for Main Power Station	√			√
SS-ESMMP for HM Hydro Worker Camp No. 2 (LILAMA10) (4th submission)	√	√	√	√
SS-ESMMP for Installation Work of Embedded Piping for Main Power Station	√	√	√	√
SS-ESMMP for Closing of Borrow Pit Area at Corner of P1 & P1A Road beside the Re-regulation Dam	√	√		√
SS-ESMMP for Building Construction at Main Powerhouse (4th submission)	√	√	Under review	
SS-ESMMP for Installation Work of Stay Corn for Channel Liner and Hatch Cover for Re-regulation Power Station	√			√
SS-ESMMP for Land Levelling (Cutting and Filling) for 90 House Plots at 2LR-Lower Reservoir Village and Health Centre at Resettlement Site	√	√	√	√
SS-ESMMP for Land Levelling (Clearing /Grubbing/Cutting and Filling) for 28 House Plot Zone A and Extended Areas	√			√
SS-ESMMP for 1.2km Road Construction to landfill at Houay Soup Resettlement Site	√	√		√
SS-ESMMP for the Supply and Installation Material for Natural Grass Soccer Field	√	√		√
SS-ESMMP for Installation of 360 Ton Electrical Overhead Traveling Crane for Main Power Station	√	√		√
SS-ESMMP for Construction of EMO Water Quality Laboratory Building Construction at NNP1 Owner's Site Office and Village	√	√	√	√
SS-ESMMP for House Construction of Seven (07) Units for 2LR Resettlement Site	√			√
SS-ESMMP for House Construction of Lot No. 4 at HSRA	√			√
SS-ESMMP for House Construction of Lot No. 5 at HSRA	√			√
SS-ESMMP for Construction of Resource Center and Pilot Plan Improvement at HSRA	√			√
SS-ESMMP for Extension of Main Road 1.357 km, Phase 2 for HSRA	√	√		√
SECC Contractor's Site Decommissioning Plan	√	√		√

Name of SS-ESMMP/EMP Document	Rev. 1	Rev. 2	Rev. 3	Approved
SS-ESMMP for Construction of Irrigation Dam, 1 Spillway & Outlet Pipe Culvert	√	√		√
SS-ESMMP for Improvement of the Internal Road for Ban Pou, Ban Hatsamphone and Ban Phiengta at Zone 2 (2UR)	√	√	√	√
SS-ESMMP for Operation and Maintenance Works of RCC Plant (4th submission)	√	√	under review	
SS-ESMMP for Construction of Re-regulation Power Station Building (Super Structure) Re-regulation Powerhouse Station (B1)	√	√	√	√
SS-ESMMP for Adit Closure at Right Bank of Main Dam	√	√		√
Appendix 9.17 Additional document for a disposal of waste material at the Main Dam Body	√			√
Annex of DWP & SSESMMP for Construction of Re-regulation Power Station, Closing of Dyke Borrow Pit No 7	√			√
SS-ESMMP for Irrigation Dam Reservoir land Clearance at HSRA	Under review			

4.3 Results of Non-Compliance Inspections

During January to March 2017, EMO conducted bi-weekly and weekly follow-up inspections of 31 construction sites and camps including temporary camps at Houay Soup Resettlement Areas (HSRA), the 230 kV Transmission Line and biomass removal areas as listed below.

FIGURE 4-1: SITE INSPECTION LOCATION

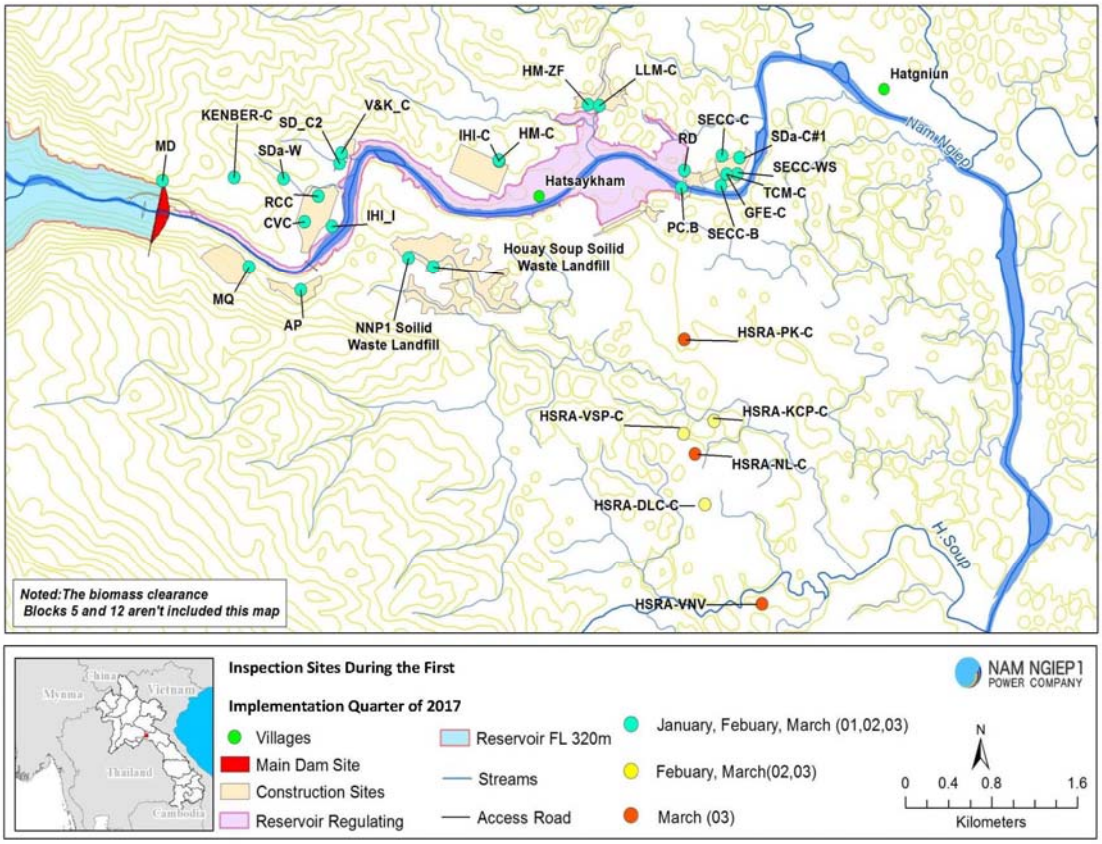
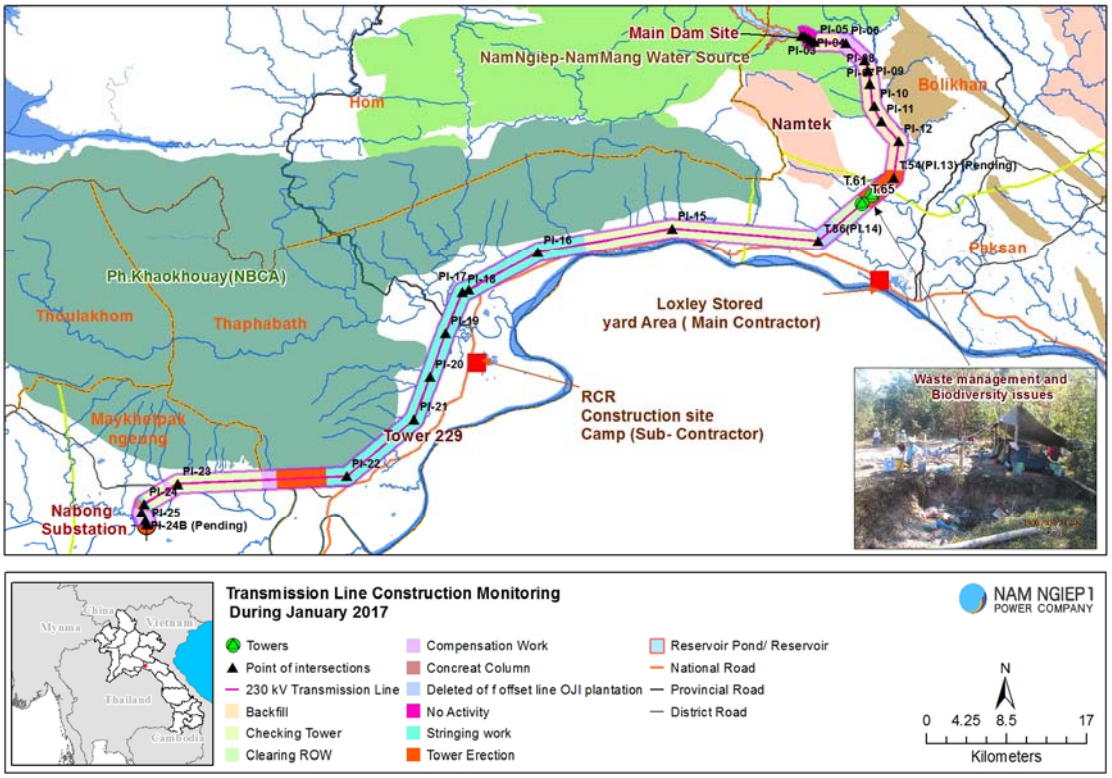


FIGURE 4-2: 230 KV TRANSMISSION LINE CONSTRUCTION MONITORING



A total of 31 Observations of Non-Compliances (ONC), three Non-Compliance Level-1 (NCR1) and five Non-Compliance level-2 (NCR2) were issued during the reporting period. Out of these, 14 ONCs, one NCR1 and one NCR2 were carried over from the Quarter four of 2016; 17 ONC, two NCR1 and four NCR2 were newly issued. A total of 11 ONC, two NCR1 and one NCR2 could not be resolved in this quarter and will be carried forward into the second quarter of 2017. More details on the issued ONC and NCR as well as the corrective actions can be found in the Error! Reference source not found. and **Error! Reference source not found.**4 and in the **Appendix 2: Environmental Monitoring Corrective Actions 2016**.

TABLE 4-2: NON-COMPLIANCE STATUS DURING THE FIRST QUARTER OF 2017

Environmental Non-Compliance Status	ONC	NCR-Level 1	NCR-Level 2
Carried over ONC/NCR	14	1	1
Newly opened ONC/NCR	17	2	4
Total ONC/NCR	31	3	5
Resolved ONC/NCR	20	1	4
Unresolved ONC/NCR carried forward to the next Quarter	11	2	1

FIGURE 4-3: STATUS OF ONC DURING THE FIRST QUARTER OF 2017

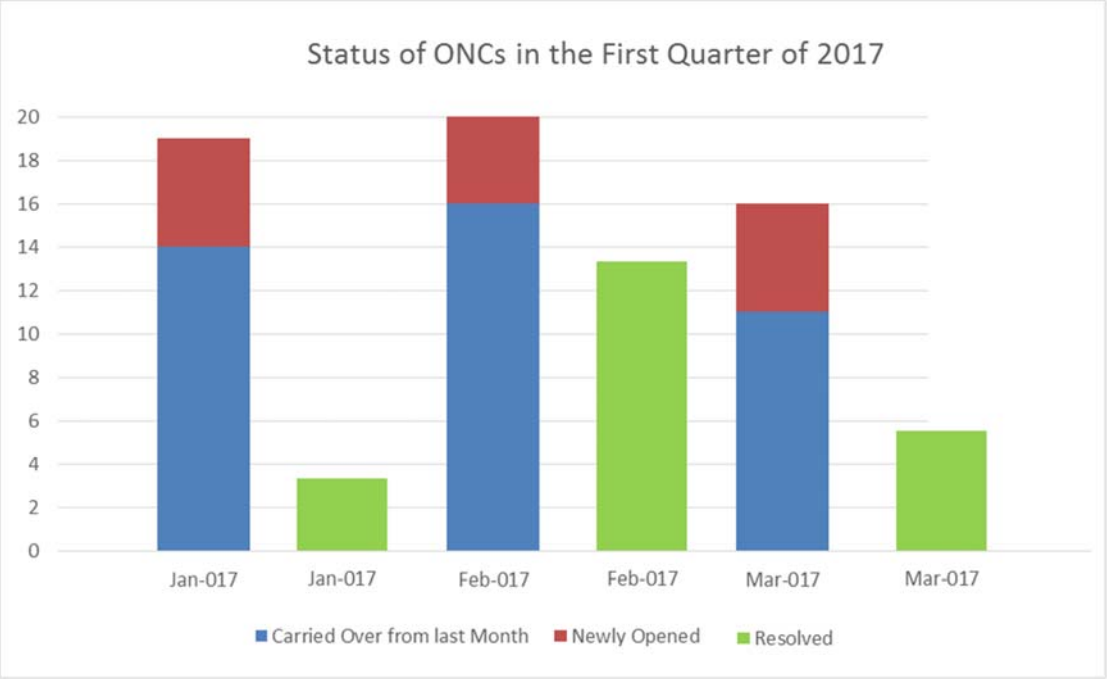


Photo 1: Installation of concrete walls at RCC Plant's sediment ponds was to prevent turbid water leakage in January 2017 	**Photo 2: Two discussion meetings on the WWTS and RCC Plant's sediment ponds improvement were held in February 2017** 
Photo 3: NNP1PC and HM Hydro Contractor joint inspection for WWTS improvement in February 2017 	**Photo 4: Improvement of the WWTS embankment at Song Da5 Camp No. 1 in February 2017** 

4.4 WASTE MANAGEMENT AT THE CONSTRUCTION SITES

4.4.1 General Waste Management

During January to March 2017, approximately 432.7 m^3 of solid waste were disposed of at the NNP1 Project Landfill (**See Photo** 5: **and 6 below**).

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

TABLE 4-3: AMOUNTS OF RECYCLABLE WASTE SOLD DURING THE FIRST QUARTER OF 2017

N0.	Recycled Waste Type	Unit	Total in First Quarter of 2017 (A)	Sold (B)	Remaining Amount (A - B)
1	Scrap metal	kg	22,586	6,700	15,886
2	Glass	kg	867	450	417
3	Plastic bottles	kg	568.5	315	253.5
4	Aluminum	kg	230.5	116	114.5
5	Paper/Cardboard	kg	456	245	211
	Total	**kg**	**24,708**	**7,826**	**16,882**

A total of 95 m^3 of black water and grey water and a total of 3 m^3 of sludge from the E&M Contractors' camps were disposed of at the designated Spoil Disposal Area No. 6 following NNP1PC-EMOs Standard Operating Procedure (SOP) for Sewage/Black Water Disposal.

Photo 07: Sewage sludge/black water from HIH and HM Hydro contractors were disposed of at the designated Spoil Disposal Area No. 6	Photo 08: Scrap metal from SECC contractor was sold to Khounmixay Process Factory in Paksan District, Bolikhamxay province
	

4.4.2 Hazardous Materials and Waste Management

The hazardous materials generated at construction sites and camps continued to be sold to new vendors (Saysana and Xiengkhouane Processing Factory in the Vientiane Capital) for disposal in January 2017 only**.** This was later stopped and the previous authorized vendor (Khounmixay Processing Factory) resumed following NNP1PC'sofficial letter to the Contractor in March 2017 to halt the sale of both hazardous and

non-hazardous wastes to new vendors until they are audited and confirmed by the NNP1PC-EMO. The hazardous waste recorded for the first quarter of 2017 are presented Table 4-4.

TABLE 4-4: HAZARDOUS MATERIALS RECORDED DURING THE FIRST QUARTER OF 2017

No.	Hazardous Waste Type	Unit	Total in First Quarter 2017 (A)	Disposal by Selling (B)	Remaining (A - B)
1	Used Oil (Hydraulic and Engine)	Litre	9,790	260	9,530
2	Cement bag	Bag	2,880	2,700	180
3	Empty used chemical drum/container	Drum (20 litre)	2,500	0	2,500
4	Used oil filters	Piece	803	24	779
5	Used oil mixed with water	Litre	0	0	0
6	Ink cartridge	Unit	274	0	274
7	Used tyre	Piece	442	80	362
8	Empty contaminated bitumen drum/container	Drum (200 litre)	82	0	82
9	Empty paint and spray cans	Can	252	13	239
10	Empty used oil drum/container	Drum (20 litre)	139	48	91
11	Empty used chemical drum/container	Drum (200 l)	42	0	42
12	Empty used oil drum/container	Drum (200 l)	57	24	33
13	Contaminated soil, sawdust and concrete	Bag	33	9	24
14	Battery	Unit	11	0	11
15	Halogen/fluorescent bulbs	Unit	26	0	26
16	Contaminated textile and material	Bag	24	0	24
17	Acid and caustic cleaners	Bottle	12	0	12
18	Clinical Waste	kg	36	34	2

NNP1PC-EMO carried out Waste Management Awareness and Training for 32 NNP1PC's staff in Vientiane Office. The objective of the training was to raise awareness and build understanding of the waste management programme (both non-hazardous, and hazardous waste) at the NNP1 Project sites.

Photo 09 & 10: Waste management awareness and training for NNP1PC's staff in Vientiane Office

4.4.3 Medical Waste Management

During the First Quarter of 2017, a total of 36 kg of medical waste was generated at the site clinics (Owners' Site Office and Village, Song Da5 Camp 1, 2 and OC Camp). Out of this, a total of 34 kg was collected and incinerated at the incinerator located in Vientiane landfill.

4.5 COMMUNITY WASTE MANAGEMENT SUPPORT

4.5.1 Animal Fodder (Pig Feed) Collection Programme

During the first quarter of 2017, the villagers from Hatsaykham collected a total of 16,259 kg of food waste from the Owner's Site Office and Village and Contractors' camps to feed their animals. This is an increase of 4,998 kg compared to the fourth quarter 2016 as shown in Table 4-5.

TABLE 4-5: AMOUNT OF FOOD WASTE COLLECTED BY LOCAL VILLAGERS FOR USE AS PIG FEED DURING THE FIRST QUARTER OF 2017

NO.	SITE NAME	UNIT	TOTAL
1	Song Da5 Camp No. 2	kg	7,002
2	Song Da5 Camp No. 1	kg	5,110
3	Obayashi Corporation Camp	kg	2,686
4	Owner's Village and Site Office (OSOV)	kg	987
5	LILAMA 10 Camp	kg	443
6	HSRA-DLC-C	kg	31
Total		**kg**	**16,259**

In addition, NNP1PC produced a total of 30 kg of compost made from leaves, cow dung, rice husks, molasses, bio-enzyme (BE), water and discarded vegetables and fruits from the canteens of OSOV, selected Contractors and subcontractors. The compost will be used as organic fertilisers for grasses, plants and flowers in the OSOV.

Photo 11 & 12: NNP1PC Staffs produced Compost at NNP1 Project Landfill

4.5.2 Community Recycling Programme

A total of 4,435 kg of recyclables were collected from villagers and 2,887 kg were sold to Khounmixay Processing Factory as presented in Table 4-6.

TABLE 4-6: AMOUNTS OF RECYCLABLES SOLD AT THE COMMUNITY RECYCLE WASTE BANK

Types of Waste	Unit	Purchased Amount During the First Quarter of 2017 (A)	Sold (B)	Remaining Amount (A - B)
Scrap metal	kg	1,887	1,343	544
Glass	kg	970	410	560
Paper/cardboards	kg	627	400	227
Plastic bottles	kg	459	334	125
Aluminium	kg	492	400	92
Total	**kg**	**4,435**	**2,887**	**1,548**

Photo 13: Glass bottles from the Recycle Waste Bank were sold to Keo Lao Factory in Vientiane

Photo 14: Recyclable waste sold to a local vendor in Paksan, Bolikhamxay Provinc

4.5.3 Waste Management Training

During 21 to 29 March 2017, NNP1PC-ESD staff and Hat Gniun Village authorities continued to carry out waste management induction for the camp followers and shops at Hat Gniun Village. The main purpose was to increase the participants' knowledge about waste management including waste segregation, reduction of waste generation (reduce, reuse and recycle principle), solid waste that needs to be disposed at the Houay Soup landfill, and the types of waste that the Community Recycle Waste Bank will accept to receive. A total of 17 shop owners participated in these inductions. Amongst the shop owners, five are local villagers and the rest are Vietnamese.

Photo 15: Waste management inductions conducted for camp followers (shop owners) at Hat Gnuin Village

Photo 16: Waste management induction carried out for camp followers at Hat Gnuin Village

NNP1PC-EMO continued to provide waste management introduction and buy recyclable waste from villagers at Houay Soup Resettlement Area (HSRA). The waste management introduction included raising awareness about waste segregation, waste generation reduction and the types of solid waste that should be disposed at the Houay Soup landfill.

Photo 17: Waste management induction was conducted for resettles at HSRA

Photo 18: Recycle waste was collected from villagers in HSRA

4.6 ENVIRONMENTAL MONITORING

The environmental quality monitoring undertaken from January to March 2017 followed the environmental quality monitoring programme presented in the ESMMP-CP Volume III. The monitoring programme consists of the following components:

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

All the monitoring results have been assessed against the 2009 National Environmental Standards and the Effluent Standards specified in the Concession Agreement Annex C[2], as applicable. For the purposes of simplifying the report, this Section focuses on the key results that did not meet the mentioned Standards. However, all monitoring results can be found in Appendix 5.

The construction of NNP1PC Environmental Laboratory at the Owner's Site Office and Village area to carry out basic water quality analyses (Total Coliforms, E.Coli, Biochemical Oxygen Demand (BOD_5), and Total Suspended Solid (TSS) started in October 2016 and was completed in March 2017. Prior to completion, the laboratory equipment was temporary installed and preliminary tests were conducted in a warehouse at Owner's Site Office and Village. The equipment has been relocated to NNP1PC Environmental Laboratory in mid-March 2017. The NNP1 Project laboratory in collaboration with United Analysis and Engineering Consultant Company Ltd (UAE) has conducted performance verification of its analyses for Total Suspended Solids since the end of March 2017.

A part-time local consultant is being recruited to provide training on laboratory operation including performance verification in collaboration with UAE laboratory, data analysis and Quality Assurance/Quality Control (QA/QC).

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

Photograph 19 NNP1 Project Laboratory (external view)

Photograph 20 Inside NNP1 Project Laboratory

4.6.1 Surface Water (River) Quality

Water quality monitoring was conducted at 13 stations in the Nam Ngiep 1 watershed area as follows:

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

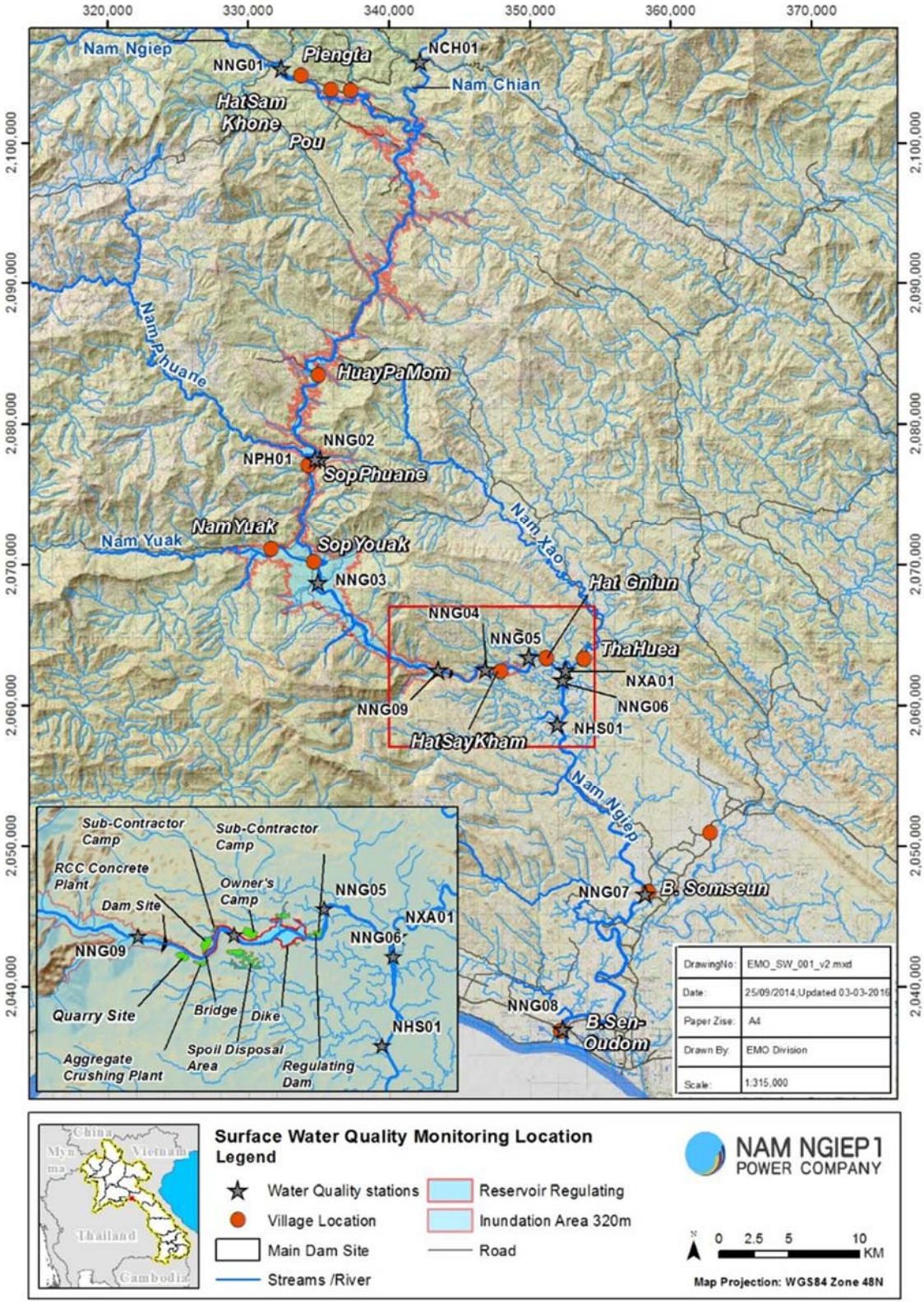
ii. seven stations located downstream of the NNP1 Main Dam including five stations along Nam Ngiep, a station at lower Nam Xao and a station at lower Nam Houay Soup.

The frequency of monitoring for group of parameters is presented in the Table 4-7 and the locations of monitoring stations are shown in Figure 4-4.

TABLE 4-7: MONITORING FREQUENCY FOR SURFACE WATER QUALITY PARAMETERS

Frequency of Monitoring	Parameters (Unit)	Monitoring Sites
Weekly	pH, DO (%), DO (mg/l), Conductivity (µs/cm), TDS (mg/l), Temperature (°C), Turbidity (NTU)	3 stations: Nam Ngiep Upstream Main Dam (NNG09), Nam Ngiep Downstream RT Camp (NNG04) and Nam Ngiep Upstream Ban Hat Gniun (NNG05)
Fortnightly	pH, DO (%), DO (mg/l), Conductivity (µs/cm), TDS (mg/l), Temperature (°C), Turbidity (NTU)	All 13 stations
Monthly	TSS (mg/l), BOD5 (mg/l), COD (mg/l), NH3-N (mg/l), NO3-N (mg/l), Total Iron (mg/l), Manganese (mg/l), total coliform (MPN/100 ml), faecal coliform (MPN/100 ml)	All 13 stations
Quarterly	Total Kjeldahl Nitrogen (mg/l), Chloride (mg/l), Sulphate (mg/l), Alkalinity (mg/l), Lead (mg/l), Arsenic (mg/l), Mercury (mg/l), Calcium (mg/l), Magnesium (mg/l), Potassium (mg/l), Sodium (mg/l)	All 13 stations

FIGURE 4-4: SURFACE WATER QUALITY MONITORING LOCATIONS



Descriptions of each monitoring station and surface water quality monitoring parameters can be found in **Error! Reference source not found.**.

During the first quarter of 2017, the results of the monitoring programme indicated that Chemical Oxygen Demand (COD) and faecal coliforms exceeded the Lao National Environmental Standard for Surface Water Quality.

4.6.1.1 Chemical Oxygen Demand (COD)

The COD levels measured in Nam Ngiep River since the start of the monitoring programme in 2014 indicate substantial spatial and temporal variation from 'not detected' to double-digit mg/l.

It is unlikely that the current construction works of the NNP1 would cause the increase of COD levels in the Nam Ngiep River. The purpose of the monitoring is therefore to establish a baseline prior to the formation of the reservoir, after which it will be important to monitor and assess changes in water quality of Nam Ngiep downstream the dam.

TABLE 4-8: COD RESULTS OF SURFACE WATER MONITORED FROM JANUARY TO MARCH 2017.

		River Name	Nam Ngiep									Nam Chiane	Nam Phouan	Nam Xao	Nam Houay Soup
		Station	NNG01	NNG02	NNG03	NNG09	NNG04	NNG05	NNG06	NNG07	NNG08	NCH01	NPH01	NXA01	NHS01
		Zone	Upstream of Project Construction Area				Within Construction Area	Downstream of Project Construction Area				Tributaries Upstream of Project Construction Area		Tributaries Downstream of Project Construction Area	
Date	Parameter (Unit)	Guideline													
11-01-17	COD (mg/l)	<5.0	7.6	6.5	8.3	5.9	11.7	ND[16]	9.3	ND[16]	ND[16]	6.3	ND[16]	6.3	8.7
08-02-17	COD (mg/l)	<5.0	ND[16]	ND[16]	13.4	ND[16]	ND[16]	ND[16]	ND[16]	ND[16]	ND[16]	8.3	ND[16]	ND[16]	8
03-03-17	COD (mg/l)	<5.0	8.9	7.3	10	5.9	15.9	5.1	5.9	5.5	5.9	10.4	17.5	11.2	6.3

Note: ND[16] less than the detection limit (<5.0 mg/l)

4.6.1.2 Faecal Coliforms

During the first quarter of 2017, the levels of faecal coliforms in the Nam Ngiep and its tributaries were all below the standard except for one sample collected in January 2017 at the Nam Chiane station (NCH01 – Tributary Nam Ngiep upstream of the main reservoir)

TABLE 4-9: RESULTS OF THE SURFACE WATER FAECAL COLIFORMS FROM JANUARY TO MARCH 2017.

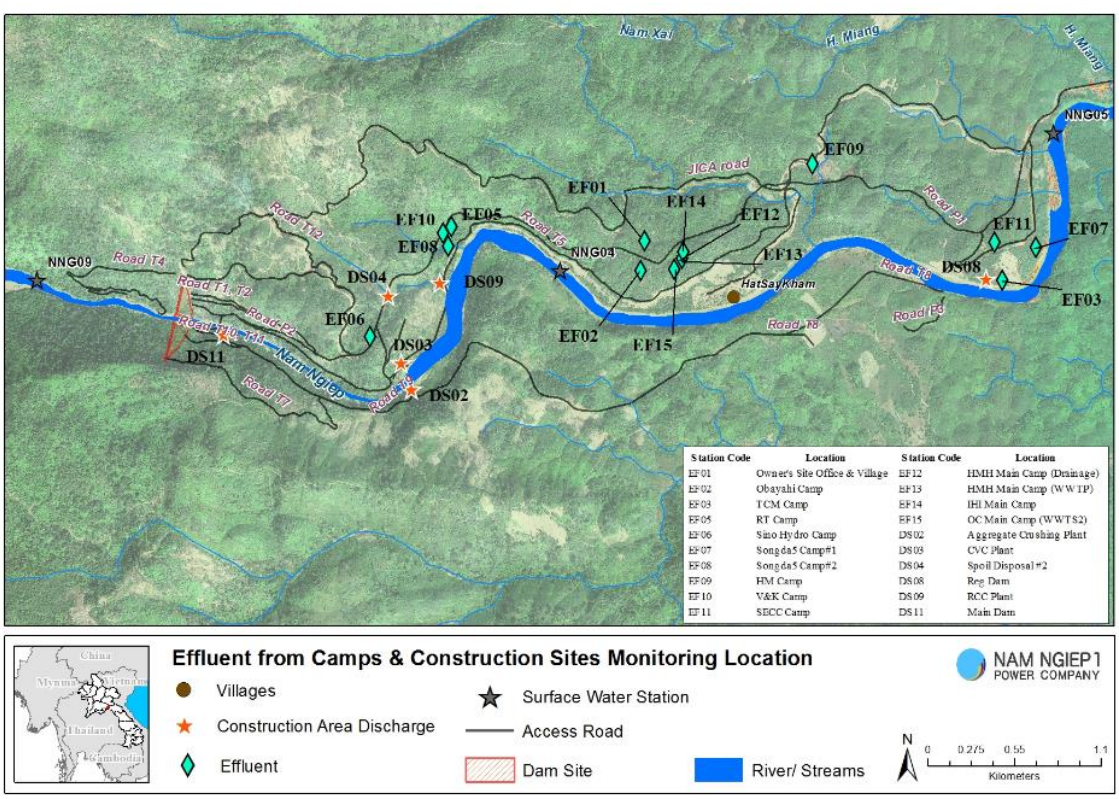
		River Name	Nam Ngiep									Nam Chiane	Nam Phouan	Nam Xao	Nam Houay Soup
		Station	NNG01	NNG02	NNG03	NNG09	NNG04	NNG05	NNG06	NNG07	NNG08	NCH01	NPH01	NXA01	NHS01
		Zone	Upstream of Project Construction Area				Within Construction Area	Downstream of Project Construction Area				Tributaries Upstream of Project Construction Area		Tributaries Downstream of Project Construction Area	
Date	Parameter (Unit)	Standard													
11-01-17	Faecal coliform (MPN/100 ml)	<1,000	240	790	490	490	490	790	220	49	49	1,300	33	170	33
08-02-17	Faecal coliform (MPN/100 ml)	<1,000	170	130	170	4.5	33	79	46	21	33	79	46	33	4.5
03-03-17	Faecal coliform (MPN/100 ml)	<1,000	130	130	240	94	130	33	23	79	13	490	79	33	27

4.6.2 Effluent Discharge Quality Monitoring

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

During the First Quarter of 2017, effluents were monitored in 12 camps (13 sampling sites) including the Owner's Site Office and Village (EF01), the Obayashi Corporation Camp (EF02 and EF15), TCM Camp (EF03), the Sino Hydro Camp (EF06), the Song Da 5 Camp No.1 (EF07), the Song Da 5 Camp No.2 (EF08), the Zhefu Camp (EF09), the V&K Camp (EF10), the SECC Camp (EF11), HMH Main Camp (EF13), the IHI Camp (EF14) and Kenber Camp (EF16) (see *Error! Reference source not found.***6**). During the reported Quarter, the effluent monitoring was conducted for the Owner's Site Office and Village (EF01) as a discharge condition.

FIGURE 4-5: MAP OF EFFLUENT MONITORING LOCATIONS DURING THE FIRST QUARTER OF 2017



Results of the effluent water quality monitoring of selected camps during the first quarter of 2017 are presented in *Error! Reference source not found.***0**. The results indicate that only the Owner's Site Office and Village and TCM Camp have a reasonable record of compliance d with the effluent standards. The corrective actions are summarized in Error! Reference source not found. below.

TABLE 4-10: RESULTS OF THE EFFLUENT WATER QUALITY MONITORING OF THE CAMPS FROM JANUARY TO MARCH 2017.

Date	Parameter (Unit)	Site Name	Owner's Site Office and Village	Obayashi Camp WWTS1	TCM Camp	Sino Hydro Camp	Song Da5 Camp No.1	Song Da5 Camp No.2
		Station Code	EF01	EF02	EF03	EF06	EF07	EF08
		Guideline in the CA						
13-01-17	TSS (mg/l)	<50	ND[16]	18.2	N/A	29.4	15	16.8

Date	Parameter (Unit)	Site Name	Owner's Site Office and Village	Obayashi Camp WWTS1	TCM Camp	Sino Hydro Camp	Song Da5 Camp No.1	Song Da5 Camp No.2
		Station Code	EF01	EF02	EF03	EF06	EF07	EF08
		Guideline in the CA						
18-01-17		<50	ND[16]	29.4	7.4	23	78.8	16.7
09-02-17		<50	ND[16]	19.4	N/A	22.4	14.6	15.4
21-02-17		<50	ND[16]	26.1	N/A	16.6	34	20.6
09-03-17		<50	ND[16]	35.2	N/A	25.7	15.9	77.1
21-03-17		<50	ND[16]	22.1	N/A	26.5	21.2	42.2
13-01-17	BOD (mg/l)	<30	5.1	58.5	N/A	35.7	39.2	59.2
18-01-17	BOD (mg/l)	<30	ND[13]	57.4	ND[13]	53.1	47.2	41.5
09-02-17	BOD (mg/l)	<30	ND[13]	72.3	N/A	43	14.2	ND[13]
21-02-17	BOD (mg/l)	<30	ND[13]	64.5	N/A	43.5	16.7	11.1
09-03-17	BOD (mg/l)	<30	ND[13]	73.6	N/A	45.4	13.8	4.1
21-03-17	BOD (mg/l)	<30	8.5	39.9	N/A	32.1	12.5	71.7
13-01-17		<125	ND[18]	146	N/A	68.9	95.2	145
18-01-17		<125	ND[18]	129	ND[18]	93.5	198	145
09-02-17	COD (mg/l)	<125	ND[18]	144	N/A	91.9	41.2	100
21-02-17		<125	ND[18]	142	N/A	95.2	48.8	100
09-03-17		<125	ND[18]	160	N/A	104	44.6	104
21-03-17		<125	ND[18]	103	N/A	108	57.1	170
13-01-17		<10.0	11	30	N/A	20	29	41
18-01-17		<10.0	6	29	ND[12]	24	31	45
09-02-17		<10.0	6	36	N/A	40	17	27
21-02-17		<10.0	5	29	N/A	36	10	40
09-03-17	Ammonia-Nitrogen (mg/l)	<10.0	10	25	N/A	31	20	41
21-03-17		<10.0	7	23	N/A	39	18	36
13-01-17		<10.0	17.2	28.5	N/A	23.3	27.9	28.2
18-01-17		<10.0	13.3	27.5	0.54	22	37.3	31.5
09-02-17	Total Nitrogen (mg/l)	<10.0	15.4	36.4	N/A	40.7	20.4	29.5
21-02-17		<10.0	23.8	39.6	N/A	44.4	16.9	46.2
09-03-17		<10.0	17.8	28.9	N/A	35.2	23	41.3
21-03-17		<10.0	19.6	30	N/A	42.7	21.5	40.5
13-01-17		<2.0	1.57	1.8	N/A	1.79	0.6	1.93
18-01-17		<2.0	1.94	2.54	0.02	1.88	2.57	8.03
09-02-17	Total Phosphorus (mg/l)	<2.0	2.61	2.32	N/A	3.39	0.81	1.45
21-02-17		<2.0	1.39	2.55	N/A	2.96	0.49	2.97
09-03-17		<2.0	1.13	1.32	N/A	1.74	0.86	1.39
21-03-17		<2.0	1.59	1.67	N/A	1.23	1.3	1.48
13-01-17			140	160,000	N/A	160,000	160,000	79
18-01-17			49	160,000	3,300	160,000	160,000	49
09-02-17	Faecal Coliform (MPN/100 ml)		110	160,000	N/A	160,000	2,100	22,000
21-02-17			49	160,000	N/A	160,000	490	160,000
09-03-17			240	160,000	N/A	160,000	4,900	7,000
21-03-17			4,900	160,000	N/A	160,000	92,000	160,000
13-01-17		<400	170	160,000	N/A	160,000	160,000	22,000
18-01-17		<400	49	160,000	3,300	160,000	160,000	230
09-02-17	Total coliform (MPN/100 ml)	<400	110	160,000	N/A	160,000	11,000	22,000
21-02-17		<400	49	160,000	N/A	160,000	1,700	160,000
09-03-17		<400	240	160,000	N/A	160,000	4,900	35,000
21-03-17		<400	4,900	160,000	N/A	160,000	160,000	160,000
09-03-17	Total Iron (mg/l)	< 2.0	ND[10]	0.188	N/A	0.686	1.44	1.22

Date	Parameter (Unit)	Site Name	Owner's Site Office and Village	Obayashi Camp WWTS1	TCM Camp	Sino Hydro Camp	Song Da5 Camp No.1	Song Da5 Camp No.2
		Station Code	EF01	EF02	EF03	EF06	EF07	EF08
		Guideline in the CA						
21-03-17	Total Iron (mg/l)	< 2.0	ND[10]	0.187	N/A	0.791	2.06	0.456

Date	Parameter (Unit)	Site Name	Zhefu Camp	V & K Camp	SECC Camp	HMH Main Camp WWTP	IHI Camp	Obayashi Camp WWT2	Kenber Camp
		Station Code	EF09	EF10	EF11	EF13	EF14	EF15	EF16
		Guideline in the CA							
13-01-17	TSS (mg/l)	<50	2.5	12.1	24	71.4	11.3	64.3	N/A
18-01-17		<50	ND[16]	ND[16]	10.7	17.5	17.5	29.7	N/A
09-02-17		<50	ND[16]	10.4	13.4	36.6	22.5	32.1	N/A
21-02-17		<50	ND[16]	55.2	5.6	33.9	41.3	15.56	11.3
09-03-17		<50	5.3	55.2	9.8	68.2	31.5	21.2	N/A
21-03-17		<50	18.9	139	12.6	57.1	26.1	41.2	43
13-01-17	BOD (mg/l)	<30	1	5	ND[13]	96.3	71.2	71.4	N/A
18-01-17		<30	ND[13]	4.6	4.5	73	83.2	82	N/A
09-02-17		<30	ND[13]	4.1	6.1	69	91.5	83.2	N/A
21-02-17		<30	ND[13]	6.2	4.4	97	83.7	62.8	145
09-03-17		<30	ND[13]	20.4	4.5	84.2	89.8	75.2	N/A
21-03-17		<30	5.3	9	3.8	68.2	44.2	44.7	74
13-01-17	COD (mg/l)	<125	ND[18]	26.5	27.8	187	165	219	N/A
18-01-17		<125	ND[18]	ND[18]	47.4	178	171	172	N/A
09-02-17		<125	ND[18]	ND[18]	50.5	134	179	214	N/A
21-02-17		<125	ND[18]	38.4	38.2	178	168	161	258
09-03-17		<125	ND[18]	57.9	36	198	172	218	N/A
21-03-17		<125	ND[18]	43.7	38.4	165	123	126	190
13-01-17	Ammonia-Nitrogen (mg/l)	<10.0	ND[12]	9	10	8	15	ND[12]	N/A
18-01-17		<10.0	ND[12]	5	11	11	12	ND[12]	N/A
09-02-17		<10.0	ND[12]	2	8	17	16	ND[12]	N/A
21-02-17		<10.0	ND[12]	2	5	15	16	ND[12]	10
09-03-17		<10.0	2	3	ND[12]	18	22	ND[12]	N/A
21-03-17		<10.0	ND[12]	12	ND[12]	14	17	10	10
13-01-17	Total Nitrogen (mg/l)	<10.0	6.35	18	10.4	15	17.3	5.44	N/A
18-01-17		<10.0	5.38	4.8	12	14.4	14.5	5.06	N/A
09-02-17		<10.0	4.43	3.16	11.1	20.5	18.6	5.01	N/A
21-02-17		<10.0	5.02	5.11	9.8	25.9	22.3	6.69	15.4
09-03-17		<10.0	2.88	5.27	3.23	23.9	23.7	6.2	N/A
21-03-17		<10.0	7.4	16	3.7	19.1	19.9	14.4	13.6
13-01-17	Total Phosphorus (mg/l)	<2.0	1.21	0.22	0.28	1.38	1.42	0.61	N/A
18-01-17		<2.0	1.1	0.14	0.26	1.45	1.09	0.54	N/A
09-02-17		<2.0	1.11	0.16	0.31	1.46	1.3	0.1	N/A
21-02-17		<2.0	1.01	0.15	0.54	1.49	1.13	0.69	1.29
09-03-17		<2.0	0.48	0.34	0.12	0.86	0.98	0.48	N/A
21-03-17		<2.0	1.2	0.66	0.05	1.44	1.33	0.89	0.24
13-01-17	Faecal Coliform (MPN/100 ml)		7,000	3,300	4,600	160,000	160,000	160,000	N/A
18-01-17			1,700	3,300	54,000	92,000	160,000	2,300	N/A
09-02-17			1,300	4,900	3,900	160,000	160,000	160,000	N/A
21-02-17			330	1,700	490	160,000	160,000	160,000	92,000
09-03-17			1,100	160,000	490	160,000	160,000	160,000	N/A
21-03-17			160,000	160,000	79	160,000	160,000	160,000	160,000
13-01-17		<400	17,000	4,600	35,000	160,000	160,000	160,000	N/A

Date	Parameter (Unit)	Site Name	Zhefu Camp	V & K Camp	SECC Camp	HMH Main Camp WWTP	IHI Camp	Obayashi Camp WWT2	Kenber Camp
		Station Code	EF09	EF10	EF11	EF13	EF14	EF15	EF16
		Guideline in the CA							
18-01-17	Total coliform (MPN/100 ml)	<400	3,300	7,900	54,000	160,000	160,000	2,300	N/A
09-02-17		<400	1,300	92,000	160,000	160,000	160,000	160,000	N/A
21-02-17		<400	330	3,300	1,700	160,000	160,000	160,000	160,000
09-03-17		<400	1,700	160,000	1,100	160,000	160,000	160,000	N/A
21-03-17		<400	160,000	160,000	1,700	160,000	160,000	160,000	160,000
09-03-17	Total Iron (mg/l)	< 2.0	0.131	2.25	0.808	0.666	0.385	0.202	N/A
21-03-17		< 2.0	ND[10]	2.62	1.37	0.644	0.405	0.35	0.756

Note: *N/A no data available.*

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 4-11: COMPLIANCE STATUS OF EFFLUENT DISCHARGE AND CORRECTIVE ACTION DURING THE FIRST QUARTER OF 2017

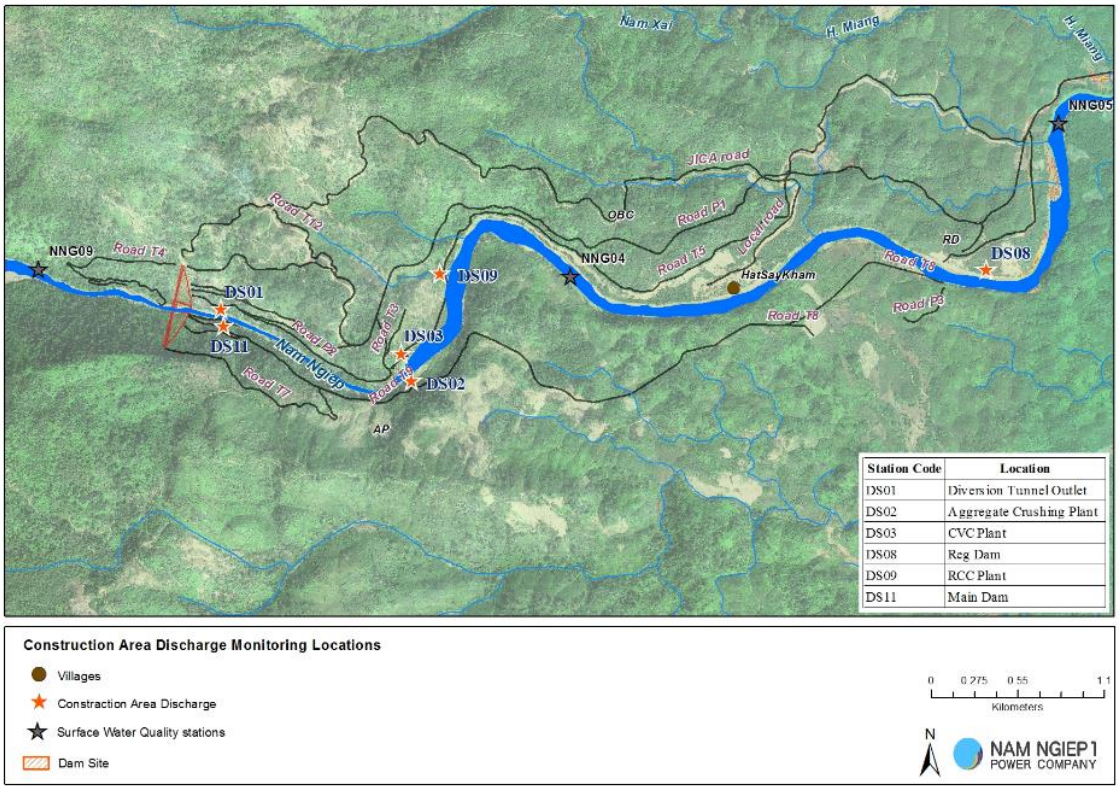
Site	ID	WWTS	Compliance Status	Corrective Actions
Owner's Site Office and Village (NNP1PC)	EF01	Septic tanks (kitchen and black water) and wetland (grey water), discharged 70 m^3/day	Minor Non-compliances: Ammonia nitrogen, total phosphorus, total coliforms and total nitrogen.	EMO will continue to monitor the effluent discharge from this camp
OC Camp – WWTS01	EF02	Septic tanks (kitchen and black water) and wetland (grey water)	Significant non-compliances: BOD_5, COD, Ammonia Nitrogen, total nitrogen and total coliforms	The Contractor needs to improve its WWTS in accordance with the Owner's instruction letter of November 2016. A number of meetings were held with the Contractor to agree on the completion date.
OC Camp – WWTS02	EF15	Septic tanks (kitchen and black water) and wetland (grey water)	Significant non-compliance: BOD, COD and total coliforms	As above
TCM Camp	EF03	Septic tank (kitchen and black water), sediment ponds (grey water)	Minor non-compliance: total coliforms	As above
Sino Hydro Camp	EF06	Septic tank (kitchen and black water),	Significant non-compliance:	As above

Site	ID	WWTS	Compliance Status	Corrective Actions
		sediment ponds (grey water)	Total phosphorus, BOD, Ammonia nitrogen and total coliforms exceeded the standard	
Zhefu Camp (HMH Worker Camp No.1)	EF09	Septic tank (kitchen and black water), sediment ponds (grey water)	Significant 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 of November 2016
V&K Camp	EF10	Septic tank (kitchen and black water), sediment ponds (grey water)	Significant non-compliances: The TSS, ammonia nitrogen, total nitrogen, total coliforms	It was agreed that the WWTS at this camp will have to be improved by the end of May 2017
SECC Camp	EF11	Septic tank (kitchen and black water), sediment ponds (grey water)	Minor non-compliances: Ammonia nitrogen, total nitrogen and total coliforms	The camp was decommissioned in December 2016. Five workers are staying at the camp until the end of the Houay Soup Bridge defect warranty period in December 2017. NNP1PC will continue to monitor the waste water quality at this camp.
HMH Main Camp – WWTS01	EF13	Septic tank (kitchen and black water), sediment ponds (grey water)	Minor non-compliances: TSS, BOD, COD, ammonia nitrogen, total nitrogen and total coliforms	During March 2017, the Contractor started its WWTS improvement in accordance to the Owner's instruction letter of November 2016. The improvement is expected to be completed by April 2017
IHI Camp	EF14	Septic tank (kitchen and black water), sediment ponds (grey water)	Minor non-compliances: BOD, COD, NH_3-N, total nitrogen and total coliforms	Chlorination with sodium hypochlorite has been used. However, the breakpoint for chlorination could not be finalized yet and still being conducted by EMO.
Song Da 5 Camp No. 1	EF07	Septic tank (kitchen and	Minor non-compliances:	Dosing with calcium hypochlorite will be

Site	ID	WWTS	Compliance Status	Corrective Actions
		black water), sediment ponds (grey water)	TSS, total phosphorus and COD, BOD, NH3-N.	monitored on daily basis by EMO until a suitable dosage can be identified
Song Da 5 Camp No. 2	EF08	Septic tank (kitchen and black water), sediment ponds (grey water)	Significant non-compliances: TSS, BOD, total phosphorus and NH_3 –N, total nitrogen and total coliforms	As above
Kenber Camp	EF16	Septic tank (kitchen and black water), sediment ponds (grey water)	Significant non-compliances: BOD, COD, total nitrogen and total coliforms	The contractor repaired the WWTS in March 2017. Chlorination has not started due to a low inflow into the last wetland pond
Aggregate Crushing Plant	DS02	Sediment pond	Significant non-compliance: TSS	A follow up meeting will be organized with the contractor in April 2017 on further improvement.
CVC Plant	DS03	Sediment ponds	No water discharge during the quarter	
Spoil Disposal No.2	DS04	Sediment pond	Minor non-compliance: pH and TSS	
Re-regulating Dam	DS08	pH adjustment and chemical flocculation	Significant non-compliance: pH, TSS	The Contractor was instructed to operate the treatment system properly to ensure all wastewater from this site is treated prior to discharging
RCC Plant	DS09	Sediment ponds	Significant non-compliance: TSS However, significant reduction in TSS levels have been achieved since beginning of March 2017 due to the improvements of the sedimentation ponds	Improvement of sediment ponds located at the lower slopes next to Nam Ngiep was completed in mid-February 2017. The Contractor confirmed that sediments from all sediment ponds are cleaned up at least once a day.
Main Dam Construction Area (Treatment Plant No.1)	DS11	pH adjustment and chemical flocculation 6,000 m^3/day	Minor non-compliance: pH and TSS	The Contractor was notified to ensure that the wastewater from the main dam is properly treated
Main Dam Construction Area	DS12	pH adjustment and chemical flocculation	Minor non-compliance: TSS	The Contractor was notified to ensure that the wastewater from

Site	ID	WWTS	Compliance Status	Corrective Actions
(Treatment Plant No.2)				the main dam is properly treated

FIGURE 4-6: EFFLUENT MONITORING LOCATIONS AT CONSTRUCTION AREAS



Key results of the construction area discharge monitoring are described below. Parameters that are above the prescribed Standards are highlighted in yellow and presented in *Error! Reference source not found.* below:

TABLE 4-12: RESULTS OF THE CONSTRUCTION AREA DISCHARGE MONITORING FROM JANUARY TO MARCH 2017

Date	Parameter (Unit)	Site Name	Aggregate Crushing Plant	CVC Plant	Spoil Disposal No.2	Reg. Dam	RCC Plant	Main Dam (Treatment Plant - No.1)	Main Dam (Treatment Plant - No.2)
		Station Code	DS02	DS03	DS04	DS08	DS09	DS11	DS12
		Guideline							
06-01-17	pH	6.0 - 9.0	N/A	N/A	6.55	N/A	8.15	6.68	N/A
11-01-17	pH	6.0 - 9.0	7.8	N/A	5.84	6.82	6.37	6.68	N/A
17-01-17	pH	6.0 - 9.0	N/A	N/A	7.2	6.76	6.81	6.17	N/A
25-01-17	pH	6.0 - 9.0	7.81	N/A	6.87	6.21	6.92	10.45	N/A
01-02-17	pH	6.0 - 9.0	7.3	N/A	6.04	9.95	7.01	11.18	N/A
08-02-17	pH	6.0 - 9.0	7.89	N/A	6.13	11.24	6.72	6.13	7.24
14-02-17	pH	6.0 - 9.0	7.18	N/A	7.28	6.86	7.51	8.93	6.13
24-02-17		6.0 - 9.0	6.91	N/A	6.72	6.57	7.48	6.05	N/A
03-03-17		6.0 - 9.0	7.96	N/A	8.21	7.37	7.71	11.39	N/A
09-03-17		6.0 - 9.0	6.77	N/A	7.95	6.93	6.92	6.8	N/A

Date	Parameter (Unit)	Site Name	Aggregate Crushing Plant	CVC Plant	Spoil Disposal No.2	Reg. Dam	RCC Plant	Main Dam (Treatment Plant - No.1)	Main Dam (Treatment Plant - No.2)
		Station Code	DS02	DS03	DS04	DS08	DS09	DS11	DS12
		Guideline							
17-03-17		6.0 - 9.0	7.98	N/A	6.35	6.29	7.60	12.21	N/A
22-03-17		6.0 - 9.0	7.47	N/A	6.65	7.2	7.46	11.88	N/A
06-01-17	TSS (mg/l)	<50	N/A	N/A	11	N/A	19	10	N/A
11-01-17		<50	1,338	N/A	13	10	1,398	21	N/A
17-01-17		<50	N/A	N/A	ND[16]	ND[16]	12,514	22	N/A
25-01-17		<50	1,138	N/A	5	13	5,952	30	N/A
01-02-17		<50	3,980	N/A	5.4	8	52,571	16.5	N/A
08-02-17		<50	2,432	N/A	114	21.3	1,036	28.7	1,506
14-02-17		<50	3,606	N/A	108	6	1,226	67	447
24-02-17		<50	2,000	N/A	21	18	486	45	N/A
03-03-17		<50	445	N/A	1	17	4,420	4,215	N/A
09-03-17		<50	746	N/A	26	15	3,362	60	N/A
17-03-17		<50	3,927	N/A	67	1,736	906	60	N/A
22-03-17		<50	1,383	N/A	153	34	170	77	N/A
30-03-17		<50	4,134	N/A	189	1,437	619	35	N/A

Note: N/A means data 'not available' due to no discharge into the environment. N/A means data 'not available' due to there is no sampling schedule for the parameter.*

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)			

4.6.3 Groundwater Quality Monitoring

The groundwater quality monitoring program includes groundwater for community water supply and since July 2016 also groundwater at the landfill sites.

During the First Quarter 2017, the community groundwater quality was monitored in two boreholes at Hatsaykham Village installed by NNP1PC and six boreholes at Houay Soup Resettlement Area (HSRA). The boreholes at Hatsaykham Village and Houay Soup Resettlement Area (HSRA) are used for drinking, washing, cooking and bathing purposes. The community groundwater samples were tested for 18 parameters including:

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

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

The landfill groundwater monitoring included four boreholes at the NNP1 Project Landfill for assessing the potential risk of leachate seepage and contamination of the groundwater below the landfills. The monitoring well at the Houay Soup Landfill (MW5) could not be accessed.

FIGURE 4-7: GROUNDWATER SAMPLING LOCATIONS

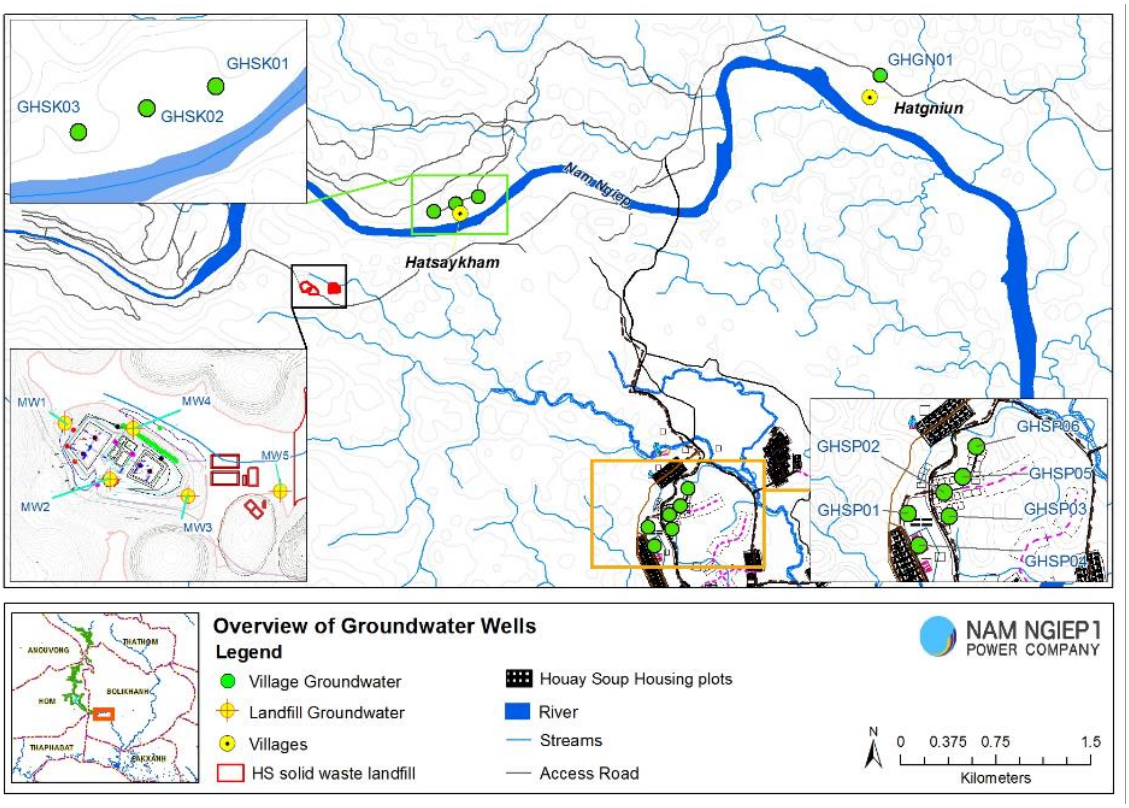


TABLE 4-13: RESULTS OF THE GROUNDWATER QUALITY MONITORING FROM JANUARY TO MARCH 2017

Date	Parameter (Unit)	Site Name	Hatsaykham Village			Houay Soup Resettlement Area					
		Station	GHSK01	GHSK02	GHSK03	GHSP01	GHSP02	GHSP03	GHSP04	GHSP05	GHSP06
		Guideline									
16-01-17	pH	6.5-9.2	5.8	N/A	N/A	7.08	6.79	7.24	5.82	6.54	6.28
02-02-17		6.5-9.2	5.77	5.67	N/A	7.11	6.53	7.17	5.96	6.75	6.41
10-03-17		6.5-9.2	5.91	5.82	N/A	7.03	6.78	7.18	5.8	6.5	7.21
16-01-17	Faecal coliform (MPN/100 ml)	0	0	N/A	N/A	0	230	0	0	0	0
02-02-17		0	0	0	N/A	0	0	0	0	0	0
10-03-17		0	0	0	N/A	0	0	0	0	0	0
16-01-17	E. Coli Bacteria (MPN/100 ml)	0	0	N/A	N/A	0	230	0	0	0	0
02-02-17		0	0	0	N/A	0	0	0	0	0	0
10-03-17		0	0	0	N/A	0	0	0	0	0	0

Note: *N/A means no data available due to no water sampling as the water pump broken.*

Key findings from the groundwater quality monitoring are summarized as the follows:

Ban Hatsaykham: The samples from the two boreholes (GHSK01 & GHSK02) had a pH level lower than the standard. The low pH level does not pose any risk to human health.

Houay Soup Resettlement Area: The pH level at two boreholes namely GHSP04 and GHSP06 were slightly lower than the Standard. In addition, the borehole GHSP02 for January 2017 contained faecal coliform and E.coli bacteria that exceeded the Standard, and the villagers have been advised through NNP1PC-SMO to boil the water before drinking.

The low pH does not pose any risk to human health.**NNP1PC and Houay Soup Landfills' Groundwater**: The pH level was found to be slightly lower than the standard for the monitored well at NNP1PC Landfill which is similar to the results found in other wells. In addition, the amount of lead at MW1, MW2, MW3

and MW4 exceeded the standard. There is no sample taken at Houay Soup Landfill due to the disrupted access road, the access path from landfill pit down to the wells is being renovate.

It is highly unlikely that the elevated levels of lead are caused by the landfill. Based on measurements of the groundwater table in July 2016, the groundwater table is about 40 m below the bottom of the landfill pit and the flow direction is southwestern, which means that MW2 is located downstream pit no 1 and MW3 and MW 4 are upstream the landfill. All monitoring wells have in 4-5 out of 7 measurements had slightly elevated levels of lead. Note also that MW5 had elevated lead levels in all three measurements in Q4 2016. Furthermore, lead has not been detected in the leachate from landfill treatment ponds and the waste pit and all ponds are lined with a HDPE liner protecting the groundwater against infiltration of leachate. NNP1PC will continue to monitor the situation, but has no plans to establish mitigation measures.

TABLE 4-14: RESULTS OF GROUNDWATER MONITORING AT THE NNP1 PROJECT AND HOUAY SOUP LANDFILLS

	Site Name	NNP1 Landfill				Houay Soup Landfill
	Station Code	MW1	MW2	MW3	MW4	MW5
	Date	28/03/17	28/03/17	28/03/17	28/03/17	28/03/17
Parameters (Unit)	**Guideline**					
pH		6.14	5.36	6.34	5.36	N/A
Lead (mg/l)	<0.01	0.097	0.014	0.039	0.023	N/A
Total Coliform (MPN/100 ml)		0	0	110	79	N/A
Faecal Coliform (MPN/100 ml)		0	0	110	79	N/A

4.6.4 Gravity Fed Water Supply (GFWS) Monitoring

The GFWS monitoring aims to assess the quality of water that is being used for bathing and washing by the villagers at Hat Gniun and Thahuea Villages. Water samples were taken from the tap for analysis and the results are shown in **Error! Reference source not found.**4 below.

TABLE 4-15: THE GFWS MONITORING RESULT FROM JANUARY TO MARCH 2017

Date	Parameter (Unit)	Site Name	Thaheua Village	Hat Gnuin Village
		Station	WTHH02	WHGN02
		Guideline		
16-01-17	E. Coli Bacteria (MPN/100 ml)	0	33	20
02-02-17		0	13	110
10-03-17		0	33	79
16-01-17	Faecal coliform (MPN/100 ml)	0	33	20
02-02-17		0	13	110
10-03-17		0	33	79

Tha Huea Village (WTHH02): All parameters complied with the National Drinking Water Standard, except with respect to faecal coliform and E. Coli bacteria.

Hat Gniun Village (WHGN02): All parameters complied with the National Drinking Water Standard, except with respect to faecal coliform and E.Coli bacteria.

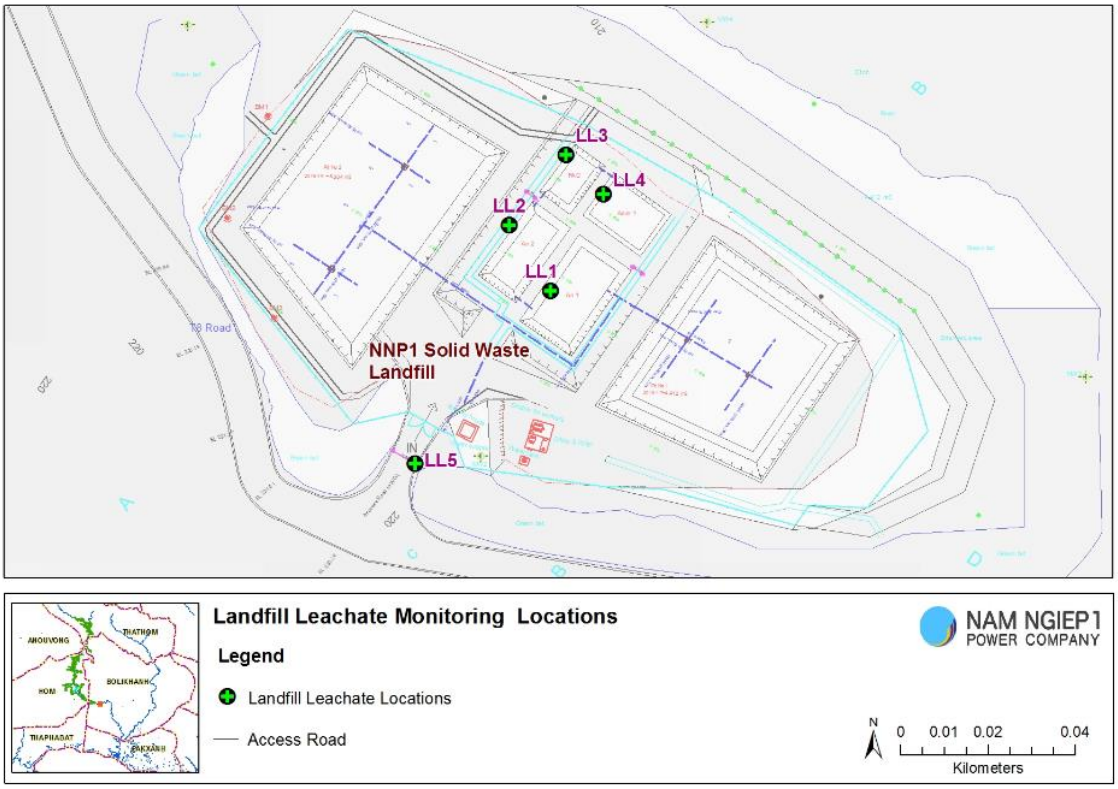
The villagers have been advised through NNP1PC-SMO to boil the water before drinking.

4.6.5 Landfill Leachate Monitoring

There was no discharge of leachate during the first quarter of 2017. The landfill leachate monitoring was conducted to check the effectiveness of the treatment ponds.

The parameters monitoring for landfill leachate were carried out according to the ESMMP-CP Volume III updated 2016. The monitoring locations are presented in the ***Figure 4-8***.

FIGURE 4-8: LANDFILL LEACHATE MONITORING LOCATION



Key results of the landfill leachate monitoring are described below. Parameters that are above the prescribed Standards are highlighted in yellow.

TABLE 4-16: RESULTS OF LANDFILL LEACHATE MONITORING DURING JANUARY TO MARCH 2017

	Site Name	NNP1 Landfill (Leachate Pond Number 4)		
	Station Code	LL4		
	Date	20/01/2017	09/02/2017	14/03/2017
Parameters (Unit)	**Guideline**			
COD (mg/l)	<125	38.1	296	248

During the reported Quarter, the monitoring results showed that all parameters monitored complied with the Standard, except COD for February and March 2017.

4.6.6 Air Quality (Dust) Monitoring

4.6.6.1 Ambient Air Quality in the Host Villages

The ambient air quality monitoring for dust was carried out for 72 consecutive hours in the village closest (Hat Gniun Village and Houay Soup Resettlement Area) to the project construction sites. The monitoring was also carried out during a weekend to obtain a record of at least 20 hours of background conditions. The main purpose of the dust monitoring in Hat Gniun and Houay Soup Resettlement Area are to assess if the project construction works and the project related traffic passing through the villages caused elevated levels of dust in the ambient air.

The records in village were within the Lao National Environmental Standard for Air Quality of 0.12 mg/m^3. The average results of dust emission monitoring in 24 hours during the first quarter of 2017 are shown in *Error! Reference source not found.*9 and summarized in *Error! Reference source not found.**17***.

FIGURE 4-9: NOISE AND DUST MONITORING LOCATIONS AT THE CONSTRUCTION SITES AND NEARBY VILLAGES

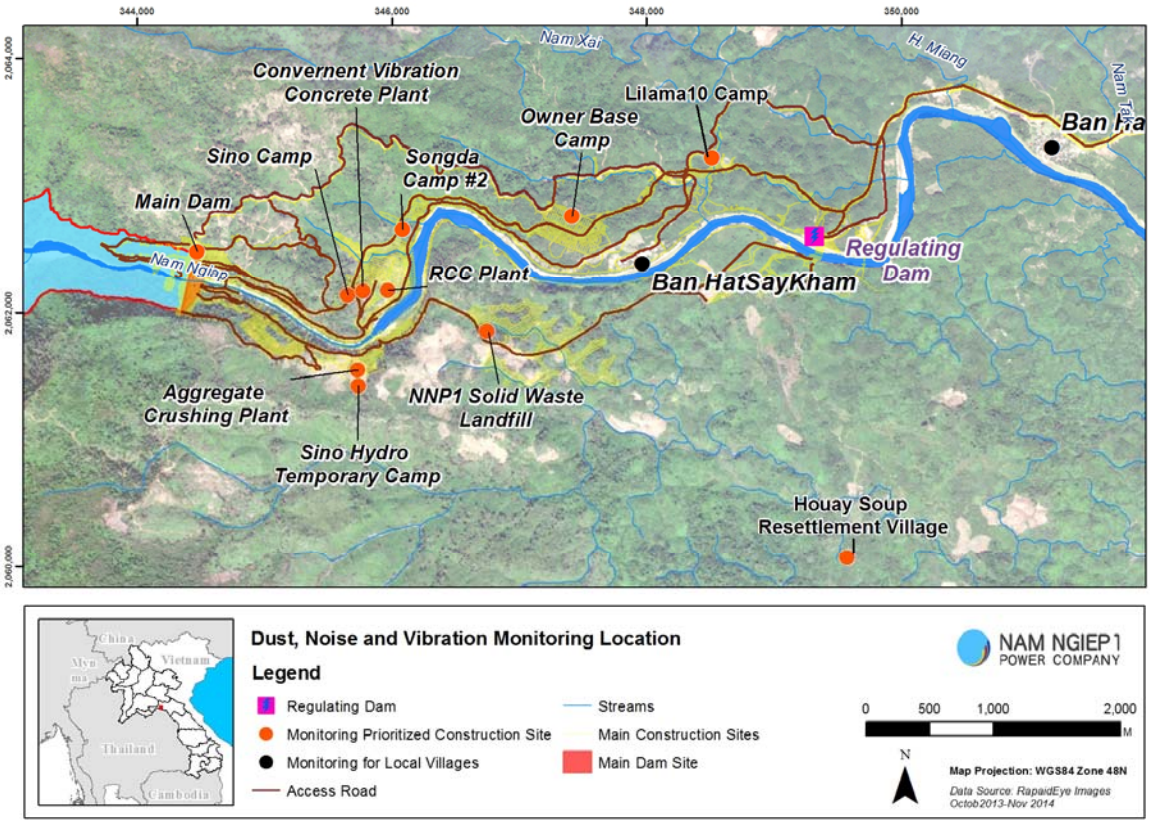


TABLE 4-17: RESULTS OF AIR QUALITY (DUST) MONITORING AT THE VILLAGES NEAR THE PROJECT CONSTRUCTION SITES DURING JANUARY TO MARCH 2017

Site Name	Hat Gnuin Village								
Start Time	05/01/17 11:03	06/01/17 11:03	07/01/17 11:03	05/02/17 10:12	06/02/17 10:12	07/02/17 10:12	23/03/17 15:55	24/03/17 17:05	25/03/17 17:05
End Time	06/01/17 11:03	07/01/17 11:03	08/01/17 11:03	06/02/17 10:12	07/02/17 10:12	09/02/17 09:51	24/03/17 02:26	25/03/17 17:05	26/03/17 13:09
Average Data Record - 24 hours	0.05	0.02	0.04	0.04	0.06	0.07	0.11	0.08	0.03
Guideline	***0.12***	***0.12***	***0.12***	***0.12***	***0.12***	***0.12***	***0.12***	***0.12***	***0.12***

Site Name	Houay Soup Resettlement Area					
Start Time	19/02/17 10:32	20/02/17 10:32	21/02/17 10:33	26/03/17 14:30	27/03/17 14:30	28/03/17 14:30
End Time	20/02/17 10:32	21/02/17 10:32	22/01/17 10:33	27/03/17 14:30	28/03/17 14:30	29/03/17 14:18
Average Data Record -24 hours	0.07	0.06	0.10	0.03	0.04	0.08
Guideline	***0.12***	***0.12***	***0.12***	***0.12***	***0.12***	***0.12***

4.6.6.2 Project Construction Sites

Dust monitoring was carried out on a monthly basis for 24 hours consecutively at eight priority construction sites including the Aggregate Crushing Plant, RCC Plant, Main Dam, Sino Hydro Camp, Sino

Hydro Temporary Work Camp, Lilama 10 Camp, Songda 5 Camp No. 2 (to assess possible impact on worker's health) and Owner's Site Office and Village (to monitor the ambient dust levels). The results of dust monitoring at these construction sites are summarized in Table 4 21. Most of the results complied with the Lao National Environmental Standard for Air Quality of 0.12 mg/m^3 (24 hour average), except Aggregate Crushing Plant, RCC Plant (March 2017), Sino Hydro Camp (February 2017) and Sino Hydro Temporary Worker Camp (March 2017). Staff have been advised to wear dusk masks while working in the areas at risk, and the contractor will be requested to use dust suppression more frequently when needed.

TABLE 4-18: DUST MONITORING RESULTS AT THE CONSTRUCTION SITES DURING JANUARY TO MARCH 2017

Site Name	**Aggregate Crushing Plant**		
Period	00-24 Hours	00-24 Hours	24 Hours
Start Time	26/01/17 10:32	02/02/17 11:29	30/03/17 16:45
End Time	27/01/17 10:32	03/02/17 11:29	31/03/17 16:45
Average Data Record -24h	0.157	0.249	0.115
Guideline	***0.12***	***0.12***	***0.12***

Site Name	**RCC Plant**		
Period	00-24 Hours	00-24 Hours	00-24 Hours
Start Time	23/01/17 11:16	15/02/17 14:40	15/03/17 13:05
End Time	24/01/17 11:16	16/02/17 14:40	16/03/17 13:05
Average Data Record -24h	0.043	0.088	0.143
Guideline	***0.12***	***0.12***	***0.12***

Site Name	**Main Dam**		
Period	00-24 Hours	24 Hours	24 Hours
Start Time	12/01/17 10:39	16/02/17 15:31	29/03/17 15:30
End Time	13/01/17 10:38	17/02/17 15:31	30/03/17 15:30
Average Data Record -24h	0.028	0.067	0.071
Guideline	***0.12***	***0.12***	***0.12***

Site Name	**Sino Hydro Camp**		
Period	00-24 Hours	00-24 Hours	00-24 Hours
Start Time	17/01/17 11:45	01/02/17 14:05	10/03/17 09:09
End Time	18/01/17 11:45	02/02/17 13:54	11/03/17 09:09
Average Data Record -24h	0.04	0.014	0.093
Guideline	***0.12***	***0.12***	***0.12***

Site Name	**Sino Hydro Temporary Worker Camp**		
Period	00-24 Hours	00-24 Hours	24 Hours
Start Time	30/01/17 10:24	01/02/17 09:44	22/03/17 14:03
End Time	31/01/17 10:24	02/02/17 09:44	23/03/17 14:03
Average Data Record -24h	0.057	0.079	0.125
Guideline	***0.12***	***0.12***	***0.12***

Site Name	**Song Da5 Camp No.2**		
Period	00-24 Hours	00-24 Hours	00-24 Hours
Start Time	19/01/17 09:15	13/02/17 11:30	13/03/17 14:05
End Time	20/01/17 09:15	14/02/17 09:36	14/03/17 14:05
Average Data Record -24h	0.029	0.102	0.099

Site Name	**Song Da5 Camp No.2**		
Period	00-24 Hours	00-24 Hours	00-24 Hours
Start Time	19/01/17 09:15	13/02/17 11:30	13/03/17 14:05
End Time	20/01/17 09:15	14/02/17 09:36	14/03/17 14:05
Guideline	***0.12***	***0.12***	**0.12**

Site Name	**Owner's Site Office and Village**		
Period	00-24 Hours	00-24 Hours	00-24 Hours
Start Time	16/01/17 10:10	10/02/17 10:11	07/03/17 13:24
End Time	17/01/17 10:10	11/02/17 10:11	08/03/17 13:18
Average Data Record -24h	0.018	0.032	0.065
Guideline	***0.12***	***0.12***	**0.12**

Site Name	**Lilama10 Camp**	
Period	00-24 Hours	00-24 Hours
Start Time	27/02/17 10:01	06/03/17 11:43
End Time	28/02/17 10:01	07/03/17 11:37
Average Data Record -24h	0.018	0.119
Guideline	***0.12***	***0.12***

4.6.7 Noise Monitoring

4.6.7.1 Host Villages

The noise monitoring was carried out in Hat Gniun and Houay Soup Resettlement Villages for 72 consecutive hours. The monitoring was carried out on a non-working day (Sunday), to obtain a record of at least 20 hours of background conditions. The recorded values were measured against the Standards (maximum average noise levels for daytime during 06:00-18:00, evening during 18:00-22:00 and night time during 22:00-06:00; and the maximum peak noise level). The noise monitoring results are shown in Table 4-19.

The results indicate that all recorded results from the monitored villages were within the allowable maximum peak value of 115 dB(A). The average noise level measured at Hat Gniun in January 2017 occasionally exceeded the standard.

TABLE 4-19: NOISE MONITORING RESULTS FROM JANUARY TO MARCH 2017 AT THE HOST VILLAGES

Hat Gnuin Village - January 2017										
Noise Level (dB)	**05-06/01/2017**			**06-07/01/2017**			**07-08/01/2017**			**08/01/2017**
	11:45-18:00	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 - 11:45
Maximum Value Recorded	72.80	77.20	81.70	79.00	76.10	75.50	84.60	68.50	76.30	74.30
Guideline Maximum	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***
Average Data Recorded	46.62	59.76	66.52	49.66	58.19	58.04	50.51	51.25	49.37	48.92
Guideline Average	***55***	***55***	***45***	***55***	***55***	***45***	***55***	***55***	***45***	***55***
Hat Gnuin Village - February 2017										
	05-06/02/2017			06-07/02/2017			07-08/02/2017			08/02/17
Noise Level (dB)	10:56-18:00	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 - 10:56
Maximum Value Recorded	67.5	68.3	67.1	73.2	72.2	60.3	73.6	66.1	54.4	71
Guideline Maximum	115	115	115	115	115	115	115	115	115	115

Average Data Recorded	49.39	48.49	41.02	49.01	48.00	39.77	46.17	44.80	36.56	43.43
Guideline Average	***55***	***55***	***45***	***55***	***55***	***45***	***55***	***55***	***45***	***55***
Hat Gnuin Village - March 2017										
	23-24/03/2017			24-25/03/2017			25-26/03/2017			26/03/17
Noise Level (dB)	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	73.4	64.6	73.3	66.1	56.9	65.2	66.9	76.7	67.8
Guideline Maximum	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 Average	***55***	***55***	***45***	***55***	***55***	***45***	***55***	***55***	***45***	***55***

Houay Soup Resettlement Area - February 2017										
Noise Level (dB)	**05-06/02/2017**			**06-07/02/2017**			**07-08/02/2017**			**08/02/2017**
	10:56-18:00	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 - 10:56
Maximum Value Recorded	67.50	68.30	67.10	73.20	72.20	60.30	73.60	66.10	54.40	71.00
Guideline Maximum	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***
Average Data Recorded	*49.39*	*48.49*	*41.02*	*49.01*	*48.00*	*39.77*	*46.17*	*44.80*	*36.56*	*43.43*
Guideline Average	***55***	***55***	***45***	***55***	***55***	***45***	***55***	***55***	***45***	***55***
Houay Soup Resettlement Area - March 2017										
	26-27/03/2017			27-28/03/2017			28-29/03/2017			**29/03/2017**
Noise Level (dB)	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 Maximum	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 Average	55	55	45	55	55	45	55	55	45	55

4.6.7.2 Project Camps and Construction Sites

During the First Quarter of 2017, noise monitoring was also conducted at the Aggregate Crushing Plant, RCC Plant, Sino Hydro Camp and Song Da 5 Camp No.2, Main Dam, Sino Hydro Temporary Worker Camp, Lilama 10 Camp (new additional site) and Owner's Site Office and Village mainly in order to assess possible impacts on workers' health as well as to estimate any potential impact on the ambient noise levels in the surrounding areas.

The noise monitoring results are presented in Table 4-20.

The results indicate that all maximum peak noise levels were within the National Standard, and that the average noise levels during 22:00-06:00 at the Aggregate Crushing Plant, Sino Hydro Camp, Sino Hydro Temporary Camp, RCC Plant and Song Da 5 Camp No.2 and Main Dam were higher than the National standard (<50 dB(A)). In addition, the average noise level at the Aggregate Crushing Plant during 12:08-22:00 on 02 February 2017 exceeded the standard (70 dB(A)). All average noise level at Lilama 10 Camp and Owner's Site Office & Village during the Quarter monitoring complied with the National standard.

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

TABLE 4-20: NOISE MONITORING RESULTS FOR PROJECT CONSTRUCTION SITES FROM JANUARY TO MARCH 2017.

Site Name	Aggregate Crushing Plant								
Noise Level (dB)	25-26/01/2017		26/01/17	02-03/02/2017		03/02/17	30-31/03/2017		31/03/17
	05:00 – 22:00	22:01 – 06:00	06:01- 05:00	12:08 – 22:00	22:01 – 06:00	06:01- 11:07	17:40 – 22:00	22:01 – 06:00	06:01- 17:33
Maximum Value Recorded	77.1	85.5	70.9	86.5	84.7	88	77.7	78	78.4
Guideline Max	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***	***115***
Average Data Recorded	53.58	50.53	54.17	75.49	82.52	63.49	64.46	67.02	68.92
Guideline Averaged	***70***	***50***	***70***	***70***	***50***	***70***	***70***	***50***	***70***

Site Name	RCC Plant								
Noise Level (dB)	29-30/01/2017		30/01/17	15-16/02/2017		16/02/17	15-16/03/2017		16/03/17
	16:06 – 22:00	22:01 – 06:00	06:01- 16:02	15:25 – 22:00	22:01 – 06:00	06:01- 15:25	15:36 – 22:00	22:01 – 06:00	06:01- 15:36
Maximum Value Recorded	74.20	71.10	78.60	71.80	69.90	75.50	69.30	68.50	67.50
Guideline Max	115	115	115	115	115	115	115	115	115
Average Data Recorded	67.15	68.43	65.96	65.45	66.51	63.31	57.95	61.63	58.19
Guideline Averaged	***70***	***50***	***70***	***70***	***50***	***70***	***70***	***50***	***70***

Site Name	Main Dam								
Noise Level (dB)	12-13/01/2017		13/01/17	16-17/02/2017		17-02-17	29-30/03/2017		30/03/17
	10:09 – 22:00	22:01 – 06:00	06:01- 10:09	16:17 – 22:00	22:01 – 06:00	06:01- 16:17	16:21 – 22:00	22:01 – 06:00	06:01- 16:21
Maximum Value Recorded	64.8	68.4	65.7	68.2	68.1	68.3	64.7	75.9	64.5
Guideline Max	***115***	***115***	***115***	115	115	115	115	115	115
Average Data Recorded	54.67	53.96	53.93	55.82	61.09	58.39	51.12	52.65	50.41
Guideline Averaged	***70***	***50***	***70***	70	50	70	70	50	70

Site Name	Sino Hydro Camp								
Noise Level (dB)	17-18/01/2017		18/01/17	01-02/02/2017		02-02-17	10-11/03/2017		11/03/17
	12:27 – 22:00	22:01 – 06:00	06:01- 12:27	14:41 – 22:00	22:01 – 06:00	06:01- 14:33	09:49 – 22:00	22:01 – 06:00	06:01- 09:49
Maximum Value Recorded	74.5	70.4	76.9	70.9	75.3	75.6	88.2	72.8	70.7
Guideline Max	***115***	***115***	***115***	115	115	115	115	115	115
Average Data Recorded	54.82	53.48	57.76	54.27	57.80	53.69	59.61	60.90	58.17
Guideline Averaged	***70***	***50***	***70***	70	50	70	70	50	70

Site Name	Sino Hydro Temporary Worker Camp								
Noise Level (dB)	30-31/01/2017		31/01/17	01-02/02/2017		02-02-17	22-23/03/2017		23/03/17
	10:42 – 22:00	22:01 – 06:00	06:01- 10:42	10:27 – 22:00	22:01 – 06:00	06:01- 10:27	14:51 – 22:00	22:01 – 06:00	06:01- 14:51
Maximum Value Recorded	65	63.6	64.4	73.9	71.8	71.2	85.3	70.2	71.8
Guideline Max	115	115	115	115	115	115	115	115	115
Average Data Recorded	56.07	55.98	55.49	61.80	63.65	59.13	58.01	60.65	54.75

Site Name	Sino Hydro Temporary Worker Camp								
Noise Level (dB)	30-31/01/2017		31/01/17	01-02/02/2017		02-02-17	22-23/03/2017		23/03/17
	10:42 – 22:00	22:01 – 06:00	06:01-10:42	10:27 – 22:00	22:01 – 06:00	06:01-10:27	14:51 – 22:00	22:01 – 06:00	06:01-14:51
Guideline Averaged	70	50	70	70	50	70	70	50	70

Site Name	Song Da 5 Camp No. 2								
Noise Level (dB)	19-20/01/2017		20/01/17	13-14/02/2017		14-02-17	13-14/03/2017		14/03/17
	09:59 – 22:00	22:01 – 06:00	06:01-09:59	12:14 – 22:00	22:01 – 06:00	06:01-12:14	14:47 – 22:00	22:01 – 06:00	06:01-14:47
Maximum Value Recorded	61.20	62.10	63.80	71.80	62.80	62.30	61.30	59.70	65.40
Guideline Max	115	115	115	115	115	115	115	115	115
Average Data Recorded	53.75	57.74	54.42	52.17	54.24	50.83	49.57	54.44	48.99
Guideline Averaged	***70***	***50***	***70***	***70***	***50***	***70***	***70***	***50***	***70***

Site Name	Owner's Site Office and Village								
Noise Level (dB)	16-17/01/2017		17/01/17	10-11/02/2017		11-02-17	7-8/3/2017		08/03/17
	10:51 – 22:00	22:01 – 06:00	06:01-10:51	10:56 – 22:00	22:01 – 06:00	06:01-10:56	14:11 – 22:00	22:01 – 06:00	06:01-14:10
Maximum Value Recorded	57.1	53.2	41.9	57.5	45.6	61.4	50.3	78	65.5
Guideline Max	***115***	***115***	***115***	***115***	***115***	***115***	115	115	115
Average Data Recorded	40.47	43.38	34.42	36.91	38.87	39.85	39.06	49.31	45.80
Guideline Averaged	***70***	***50***	***70***	***70***	***50***	***70***	70	50	70

Site Name	Lilama 10 Camp					
Noise Level (dB)	27-28/02/2017		28-02-17	06-07/3/2017		07/03/17
	10:50 – 22:00	22:01 – 06:00	06:01-10:50	12:30 – 22:00	22:01 – 06:00	06:01-12:31
Maximum Value Recorded	63.6	52.8	65	82	66.8	71.8
Guideline Max	***115***	***115***	***115***	115	115	115
Average Data Recorded	41.18	41.33	43.78	41.89	44.95	46.35
Guideline Averaged	***70***	***50***	***70***	70	50	70

4.6.8 Vibration

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

5 WATERSHED AND BIODIVERSITY MANAGEMENT

2.1. Watershed Management

Obligations	Status by end of the First Quarter of 2017
Full draft Nam Ngiep 1Watershed Management Plan by 15 November 2016	Completed - as confirmed by ADB on 16 February 2017

Obligations	Status by end of the First Quarter of 2017
Prepare draft Watershed Management Regulations by 15 November 2016	The draft was submitted to ADB on 13 January 2017. The discussion will be resumed after approval of Watershed Management Plan by ADB
Final Watershed Management Plan by 23 December 2016	After series of revisions based on the inputs from NNP1PC and ADB's consultant a further revised version of the plan was submitted to NNP1PC on 27 March 2017. The plan will be discussed with GOL line agencies after review and approval by ADB.
1) A draft provincial regulation submitted to Provincial Justice Department by 23 December 2016. **2) Start of public hearing process by 10 January 2017**	These processes will be continued after acceptance of draft provincial regulation by ADB.

Activities in the First Quarter of 2017	Results
Data and Information Collection and Analysis for Watershed Management Plan (WMP) Development	• In January 2017, the plan preparation continued with a focus on finalizing Section 7 - baseline and trend analysis. o NNP1 Consultant and EMO met with Watershed and Reservoir Protection Office (WRPO), Provincial Office of Natural Resource and Environment (PONRE), Provincial Office of Agriculture and Forestry (PAFO), and Integrated Spatial Planning (ISP) team of Xaysomboun Province on 17-18 January 2017. The meeting noted that: ▪ The Watershed Management Plan (WMP), provincial regulation, and ISP should be in line with each other and therefore NNP1 requested continuous efforts and collaboration from Xaysomboun officials. ▪ Xaysomboun Province will restructure WRPO following the transfer of Department of Forest Resource Management (DFRM) to Ministry of Agriculture and Forestry (MAF). ▪ The future NNP1 reservoir management plan needs cooperation and collaboration from Xaysomboun officials. • A meeting to agree on the geographical extent of NNP1 watershed area was held on 27 January 2017 at NNP1 Office with the participation from WRPO DFRM, Xaysomboun WRPO, Bolikhamxay WRPO BLX, representatives from Ministry of Energy and Mine (MEM) and Department of Energy Business (DEB), and Nam Ngiep 2 (NN2) Company. • The meeting addressed the concern on the overlapping area and management responsibility between NNP1 and Nam Ngiep 2. The key notes from the discussion: o As recommended by Central GOL recommended NNP1, the meeting agreed to continue with WMP finalization using the existing definition of NNP1 watershed area

Activities in the First Quarter of 2017	Results
	o Central and Provincial authorities will have further discussion with other project developers in the upper Nam Ngiep watershed. • The approach to continue with WMP finalization using the existing delineation of NNP1 watershed area was accepted by ADB in the first week of February 2017. • The progress of WMP finalization until end of March 2017 includes: o Incorporated an analysis of the updated land use and land cover classification from Department of Forestry. o Improved the Biodiversity and Fishery Section with respect to No Net Loss. o Prepared a draft budget for the entire concession period. o Addressed all comments submitted by ADB's consultant. • The plan will be discussed with GOL line agencies after review and approval by ADB.
Prepare draft Watershed Management Regulations by 15 November 2016	• The draft Watershed Management Regulation was submitted to ADB on 13 January 2017. • It was recommended by ADB's consultant that the discussion on the regulations should be resumed after the plan have been reviewed and approved by ADB. • The regulations will be discussed with GOL at the upcoming workshop
WRPO Activities	• In January 2017, Xaysomboun WRPO completed village land-use planning at three villages: Thamlo, Om, and Kohai in Anouvong District, Xaysomboun Province, and in February 2017, Xaysomboun WRPO submitted the draft village land-use plan for the three villages to Anouvong District Authority for review and approval. • Due to the recent restructuring of Ministry of Natural Resource and Environment (MONRE) and Ministry of Agriculture and Forestry (MAF), the ministries are reviewing the structure and composition of Xaysomboun WRPO;
Xaysomboun ISP	• Xaysomboun ISP team submitted the draft ISP to MONRE Department of Environmental Quality Promotion (DEQP) in the second week of January 2017. The team also submitted a budget proposal to MONRE DEQP for activities necessary to finalize the ISP. • A workshop between DEQP and Xaysomboun ISP team on improving the draft Xaysomboun ISP was held on 27-30 March 2017 at MONRE DEQP office. • A meeting was held on 31 March 2017 with participations from DEQP, Xaysomboun ISP team, and NNP1PC representatives with the following notes: o Xaysomboun ISP team will improve the plan by incorporating the comments provided by NNP1 EMO especially related to environmental monitoring and compliance of development projects, land-use zoning, water resources and biodiversity protection within the

Activities in the First Quarter of 2017	Results
	NNP1 watershed as well as village land-use planning of the villages surrounding NNP1 watershed area; o The final draft ISP will be shared with NNP1-EMO on 27 April 2017 for final review and further process for obtaining approval from Provincial leadership and provincial and district authorities;

2.2. Biodiversity Management

Obligations[3]	Status by end of the First Quarter of 2017
Final Biodiversity Offset Survey Report by 30 June 2016	• Completed on 1 September 2016
Start of the Boundary Confirmation Baseline Survey by 20 September 2016	• Completed on 20 September 2016
The Boundary Confirmation Baseline Survey preliminary report is issued	• Completed on 01 December 2017 (this report is prepared by a consultant hired by ADB)
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. • The TOR was further revised elaborating the recommendations and comments from IAP and BAC. • The revised TOR was circulated to the applicants in the middle of March 2017 and two applicants submitted a full proposal on 30 March 2017.
Issuance of the Boundary Confirmation Baseline Survey draft final report by 31 January 2017	• This report will be prepared by ADB
Submission of a draft legal agreement to the government by 31 January 2017	• On 28 November 2016, NNP1PC submitted a draft Memorandum of Understanding to ADB for comments. • 16 February 2017, ADB completed their review of the draft agreement and recommended NNP1PC to start negotiations with GOL
Issuance of the Boundary Confirmation Baseline Survey final report by 15 February 2017	• This report will be prepared by ADB (as of 31 March 2017, NNP1PC had not received the final report)

[3] The biodiversity offset obligations were revised and agreed with ADB in August 2016. The Table only shows the current near term obligations up to end of March 2017

Obligations[3]	Status by end of the First Quarter of 2017
Executes legal agreement between government and the Company by 15 February 2017	• In March 2017, the draft legal agreement was translated to Lao and being reviewed by Bolikhamxay Provincial Authorities
Baseline survey for summer (observations during March and April 2017) starts by 28 February.	• It was confirmed by ADB on 21 February 2017 to reschedule the summer baseline survey as part of BOMP implementation.

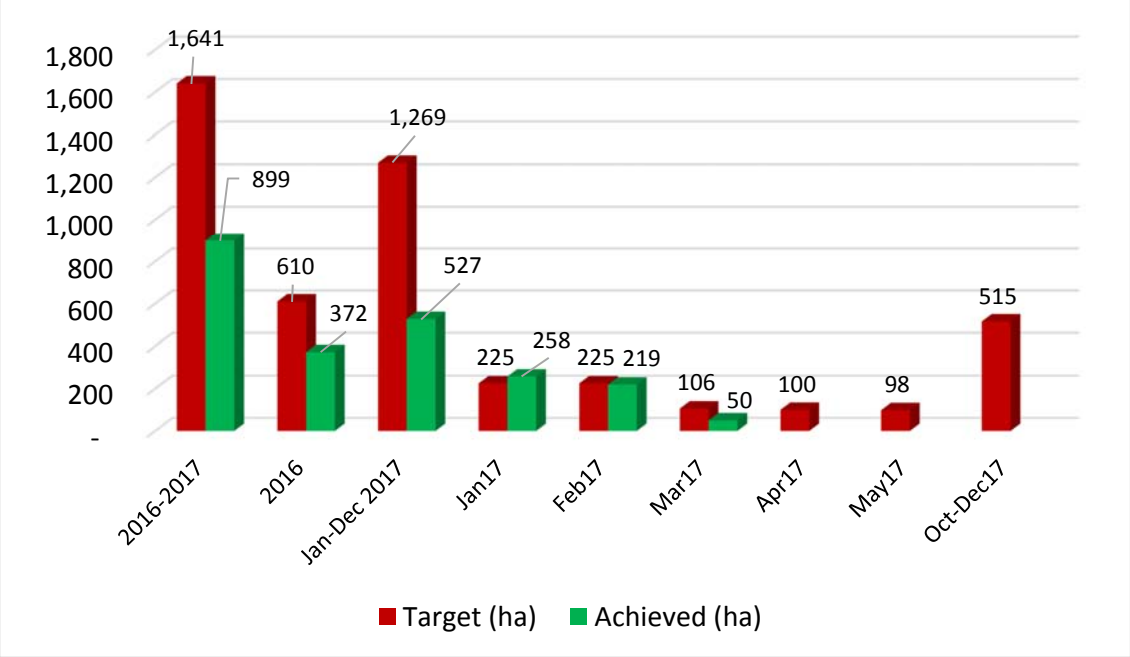
Activities in the First Quarter of 2017	Results
Consultant acceptable to ADB is engaged as technical consultant for preparation of biodiversity offset management plan by 30 November 2016	• NNP1 advertised for expression of interests in the second week of January 2017. Four applicants expressed their interest by the end of January 2017. • Bolikhamxay Province through Biodiversity Offset Management Committee (BOMC) issued an official letter to NNP1 at the end of January 2017 to follow up on the status of BOMP Consultant recruitment as well as request the involvement of Bolikhamxay Province in the review of technical proposals and selection of the BOMP Consultant. This official notification is based on the discussion and agreement with Vice Governor of Bolikhamxay Province in December 2016. • The TOR was revised in the first week of February 2017 based on the comments from IAP. The TOR was further revised reflecting comments from BAC received on 20 February 2017 and as per discussion with ADB on 21-23 February 2017. o The scope of work was simplified to exclude the baseline survey, to present only baseline and trend analysis most relevant to BOMP, and to focus mainly on the species relevant to achieving No Net Loss. o The consultant is also tasked to provide technical advice to NNP1PC for biodiversity related matters during the period of assignment. • The revised TOR was circulated to the applicants in the middle of March 2017 and two applicants submitted a full proposal on 30 March 2017.
Preparation of legal agreement between GOL and NNP1PC on biodiversity management in Nam Chouane – Nam Xang Offset Site	. • In March 2017, the draft legal agreement was translated to Lao and being reviewed by Bolikhamxay Provincial Authorities.
Activities pre-BOMP period of 1 October 2016 – 31 September 2017	• ADB approved the pre-BOMP proposal and fund disbursement in the second week of January 2017. • In February 2017, BOMC created an official bank account under Ministry of Finance for the fund transfer and established bidding committee for the procurement of equipment under pre-BOMP proposal following the GOL procurement guideline. The funds were transferred on 28 February 2017.

Activities in the First Quarter of 2017	Results
	• BOMC drafted the TOR for Consultancy Service to support pre-BOMP implementation in early February 2017. o The TOR was updated based on NNP1 EMO inputs in the middle of February 2017 and translated to English for further review by BAC, ADB and IAP. o The TOR was further updated based on the comment from BAC received on 17 February 2017. o ADB and IAP accepted the TOR per confirmation on 24 and 26 February 2017 respectively. o BOMC initiated the advertisement process in the first March 2017. • BOMC together with NNP1 EMO prepared a detailed proposal for some pre-BOMP activities: 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 establishment of a local coordination unit were 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 on 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. • A workshop on establishment of a local coordination unit was held on 27-29 March 2017 at Xaychomphone and Viengthong District, Bolikhamxay Province. A 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, detailed TOR, and appointment of key positions at district and village level. • BOMC together with NNP1 EMO also prepared a detailed operational and financial procedure for office operations.

6 BIOMASS CLEARANCE

The progress of Biomass Clearance is presented in **Error! Reference source not found.**Error! Reference source not found..

FIGURE 6-1: BIOMASS CLEARANCE PROGRESS AS OF 31 MARCH 2017



Activities in the First Quarter of 2017	Results
Labour recruitment	January 2017: • 31 people from Longsan District were contracted with lump-sum payment for biomass clearance in Block 1 and Block 2. • 227 people from Nam Youak, Nong, Houaypamom, Hatsamkhone and Pou Villages were contracted with lump-sum payment for biomass clearance work in Block 2, Block 5, and Block 11 to Block 16. • Daily contracts were signed with 4 villagers from Nong Village for piling and re-burning waste wood in Block 4. • Daily contracts were signed with 69 village labourers from Phiengta and Hatsamkhone Villages for vegetation clearing in Block 14, Block 16 and Block 17. February 2017: • Three groups totalling around 38 workers from Phalavek and Longsan District were contracted with lump-sum payment to continue biomass clearance in Block 2 and Block 3 of 2LR. • 129 villagers from Nong Village and 45 villagers from Houaypamom Village were contracted for biomass clearance in Block 2, Block 3 Block 5, and Block 10 & 11 of 2RL.

Activities in the First Quarter of 2017	Results
	• 50 villagers from Hatsamkhone Village were contracted to continue biomass clearance in Block 13 of 2UR. • 19 villagers from Nahong Village were contracted to continue biomass clearance in Block 18 of 2UR. March 2017: • 31 workers from Ban Houaypamom continued with vegetation cutting in Block 10 and 11. • 11 workers from Longsan were mobilized from Block 2 to support the vegetation cutting in Block 10. • 25 workers from Longsan resumed vegetation cutting in Block 12 on 18 March 2017. • 10 workers from Ban Hatsamkhone were recruited to complete 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	• There was no UXO found during the reporting period • QA/QC was undertaken and documented by Field Supervisor and Field Manager. • At the end of March 2017, the overall UXO search and clearance has been completed for around 1,487 ha out of the total target of 1,500 ha. • The overall progress of UXO work at the end of first quarter 2017 is presented in **Error! Reference source not found.**
Perform biomass clearance	In January 2017: • The vegetation cutting was completed for around 258 ha or about 114% of target in January 2017. • As per advice from Xaysomboun province in November 2016, the Biomass Clearance Contractor will stockpile (where possible) the trees with diameter greater than 20 cm that were cut within the biomass clearance priority area for domestic use by Hom district. Hom District then requested to also collect trees with diameter greater than 20 cm within the main reservoir area, this including in the area outside the biomass clearance priority areas but below 320 masl. A letter was sent from Hom District to Xaysomboun Province requesting logging permission based on timber inventory survey carried out by the district, but the Province had not yet issued an approval. In February 2017: • Vegetation cutting was completed for around 219 ha out of the target for February of 225 ha. Biomass Clearance at 2UR: • Vegetation cutting in the 6 Blocks (203 ha) was completed. • As agreed with Xaysomboun province (WMC) in Nov 2016, the Biomass Clearance Contractor and Thathom District Contractor

Activities in the First Quarter of 2017	Results
	(Xayakhue Company) are stockpiling the cut trees with diameter greater than 20 cm in priority biomass clearance blocks. Around 112 logs were recorded. • Piling of waste biomass and setting up firebreak are being completed. • Full biomass clearance in 2UR is expected before wet season of 2017. Biomass Clearance at 2LR: • Biomass Clearance Contractor continues with harvesting the trees with diameter greater than 20 cm in Block 1 and 4. Around 1,547 logs were recorded. • The Hom and Thathom district authorities are processing paperwork requesting approval from the Provincial authorities to remove the piled logs (with diameter grated than 20 cm) into identified GOL log yards in their respective administrative area at 2LR and 2UR for further utilization. In March 2017: • There was less progress on biomass clearance because: 1) 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 join inspection and monitoring of cutting and stockpiling trees 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 on site because the difficulties with 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 join inspection and monitoring of cutting

Activities in the First Quarter of 2017	Results
	and stockpiling tree with diameter greater than 20 cm in the priority biomass clearance blocks in 2UR. o 865 trees were cut and stockpiled within the biomass clearance blocks. o Around 825 trees within the blocks will be cut and stockpiled. o Thathom District has issued an official agreement with GOL Contractor (Xayakhue Company) to transport of 117 logs from biomass clearance blocks to GOL log-yard No. 2 in Ban Hatsamkhone. • The overall progress of Biomass Clearance at the end of first quarter 2017 is presented in **Error! Reference source not found.**.

TABLE 6-1: 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 31 Mar 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 community land - 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 community land 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 community land and 14 ha of forest - Fire break of cut biomass area is under completion - 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

Priority Area	Zone	Total Area (ha)	Island & Buffer Zone (315-320 m ASL)	Priority Biomass Clearance Area			Completed UXO Clearance as of 31 Mar 2017	Status of Biomass Clearance as of 31 Mar 2017 (ha)	
				Forests	Fallow-shifting Cultivation and Garden-Plantation Lands	Total			
									- 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
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

Priority Area	Zone	Total Area (ha)	Island & Buffer Zone (315-320 m ASL)	Priority Biomass Clearance Area			Completed UXO Clearance as of 31 Mar 2017	Status of Biomass Clearance as of 31 Mar 2017 (ha)	
				Forests	Fallow-shifting Cultivation and Garden-Plantation Lands	Total			
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 - 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

Priority Area	Zone	Total Area (ha)	Island & Buffer Zone (315-320 m ASL)	Priority Biomass Clearance Area			Completed UXO Clearance as of 31 Mar 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 - 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 - 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.
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	
Total		**1,912.01**	**271.38**	**658.55**	**982.08**	**1,640.63**	**1,487.68**	**899**	

7 FISHERY MONITORING PROGRAM

The fishery monitoring program is progressing, and a database has been developed to support the future fish management program as part of the in Nam Ngiep 1 Watershed Management Plan. Three types of surveys were conducted in the first quarter 2017 including daily fish catch logbook monitoring, catch logbook verification survey, and fish migration and spawning survey. The gathered information is being inputted into the database.

The overall progress of fish monitoring programme is illustrated in Figure 7-1 below. The overall

FIGURE 7-1: GANTT CHART OF FISH MONITORING PROGRAMME AS OF 31 MARCH 2017

	Task List / Steps of work		Weight (%)	YEAR 2017											
				Q1			Q2			Q3			Q4		
				01	02	03	04	05	06	07	08	09	10	11	12
1	**Daily catch logbook and Verification Survey**	Planed	-												
		Actual	-												
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
		Actual	7	1.50	2.00	3.00									
1.2	Daily catch logbook verification survey for Q2 2016 to Q1 2017 on 144 HHs	Planed	4	2		2									
		Actual	5	2		3									
1.3	GPS for Fishing location cover 25 villages	Planed	8				2	2	2	2					
		Actual	-												
1.4	Make the posters for fish species and fishing gear composition along Nam Ngiep River	Planed	2											2	
		Actual	-												
2	**Species Veification Survey**	Planed	-												
		Actual	-												
2.1	Survey design, interview form design, test and development	Planed	2		2										
		Actual	-												
2.2	Data collection and validation on 108 HHs	Planed	8		2	3	3								
		Actual	-												
3	**Fish Migration and Spawning Survey**														
3.1	Survey design, interview form design, test and development	Planed	2	2											
		Actual	2	2											
3.2	Data collection and validation on 88 experience fishers	Planed	12	6	6										
		Actual	12	2	7	3									
4	**Data management and report**														
4.1	Data input to database system	Planed	24	2	2	2	2	2	2	2	2	2	2	2	2
		Actual	6	1	2	3									
4.2	Annual Data analysis and draft annual report for 2016-2017	Planed	5							5					
		Actual	-												
4.3	Disemination/presentation the report for 2016-2017	Planed	5							5					
		Actual	-												
4.4	Final Annual Report for 2016-2017	Planed	4								4				
		Actual	-												
	Total	Planed	100												
		Actual	32												

Activities in the First Quarter of 2017	Results
Daily Catch Logbook and Verification Survey	In January 2017: • Completed the daily catch logbook survey in 110 households out of the total target of 162 households. 3,878 forms were used in the survey. • Conducted daily catch logbook survey for round 6 on 144 households. In February 2017: • Target household was reduced to 108 households from February 2017 onward. Completed the survey with 4,317 forms. In March 2017: • Completed the daily catch logbook survey in 108 households with 4,175 forms. • Conducted daily catch logbook survey for round 7 with household exit interview on 144 households. • The overall mean daily fish catch in the Nam Ngiep and the estimated total fish catch in the Nam Ngiep basin could be seen in Figure 7-2 and Figure 7-3.
Household Catch Assessment Survey	• Completed households catch assessment for 121 households • Completed data input both household catch assessment survey and exit interview • Data is being analysed by fisheries consultant
Village Community Interview	• Completed village community interview in total 35 target villages. • Completed data entry and the data is being analysed by fishery consultant
Gillnet Sampling Survey	• Gillnet survey in 2017 will be conducted by EMO fishery monitoring team under the supervision of fishery consultant. • The survey designed was modified from the previous work and scheduled for quarterly sampling. • In preparation for the survey including procurement of equipment and service for fishery taxonomist. • The first sampling will be started in late April or early May 2017

FIGURE 7-2: MEDIAN DAILY HOUSEHOLD CATCH BY FISHING ZONE AND NAM NGIEP MEAN VALUE FOR ALL FISHING ZONES COMBINED (KG/HH/DAY)

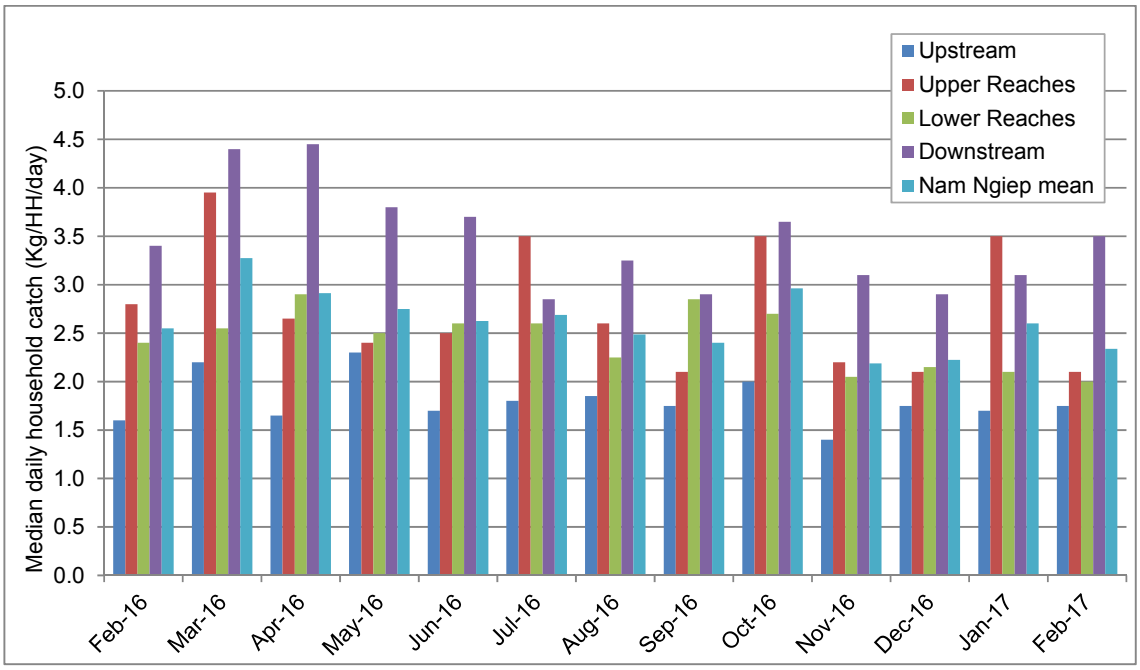
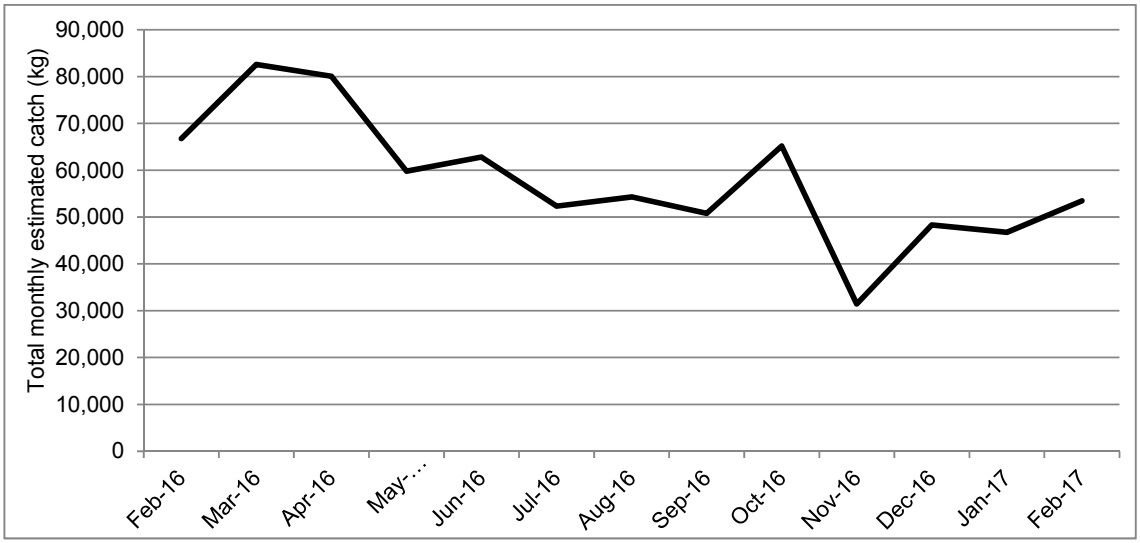


FIGURE 7-3: TOTAL ESTIMATED FISH CATCH FOR NAM NGIEP BY MONTH (KG)



8 OTHER SUPPORT PROGRAMMES

8.1 NABONG SUBSTATION UPGRADE - DUE DILIGENCE ASSESSMENT (DDA)

After the discussion with ADB held on 17 December 2016 on way forward to conclude the DDA process. A follow up email was sent to ADB on 23 December 2016 describing how this DDA report will be concluded and asking for ADB opinion. ADB responded to NNP1 suggesting a way to conclude the DDA on 05 January 2017. Revisions were made by NNP1 and the DDA was sent back for ADB review on 18 January 2017. ADB had accepted the DDA report on 19 January 2017.

The signed version of Nabong Sub-Station Environmental and Social DDA was sent to ADB for their record on 6 February 2017 and so this obligation is closed.

8.2 115 kV Transmission Line IEE Due Diligence Assessment

A schedule for the 115 kV Transmission Line development, including the requirement of IEE revision and DDA process was developed in January 2017. An additional meeting was held in January 2017 between NNP1PC (TD). However, there was no further update on the progress of the IEE revision until the end of March 2017. 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.

8.3 External Monitoring

The IAP and LTA submitted their monitoring reports for their mission in December 2016 for NNP1PC review. NNP1PC completed the review and submitted the response to the IAP and LTA mission reports on 13 and 24 February 2017 respectively.

8.4 Independent Monitoring Agency (IMA) Mission

There was no mission conducted by the IMA during the reporting period.

8.5 Environmental Protection Fund (EPF)

In January 2017, EPF requested a meeting with the three Provinces (Bolikhamxay, Xaysomboun, and Xieng Khuang) and NNP1 to discuss the overall status of development and implementation of the EPF supported subprojects. NNP1 also expressed concern about continued degradation of Houay Ngua Provincial Protected Area (PPA) that will be supported under the Bolikhamxay EPF sub-project.

The meeting was held on 6 February 2017 and it further highlighted the need to conclude the development of the EPF subprojects in Xaysomboun and Xieng Khuang provinces and to be updated about the implementation of the EPF subproject in Bolikhamxay Province. It was also noted and agreed that Bolikhamxay Province will provide further clarification on the latest issues within and surrounding Houay Ngoua Provincial Protected Area (PPA) as well as detailed implementation plan for the key targets and overall timeframe.

NNP1 EMO completed a review of the revised EPF proposals prepared by Xaysomboun and Xieng Khuang provinces on 23 March 2017.

Bolikhamxay Province held a kick-off meeting on 10 February 2017 for the EPF Project Implementation with the key notes as follow:

- To re-survey the boundary of Houay Ngoua PPA in accordance with the Agreement of Bolikhamxay Governor, No.0294/BLX, dated 24 June 2010 on boundary of protected area.
- To conduct a joint survey between Houay Ngoua PPA project team and village authorities to deal with 62 ha of eucalyptus plantation within Houay Ngoua Protected Area that was managed by encroachers.
- PPA management should apply a participatory approach with engagement of district authorities and surrounding villages in patrolling and law enforcement.

Bolikhamxay Province submitted a progress report for February 2017 to EPF. NNP1 EMO team also inquired EPF Bolikhamaxay Team to share the document for next progress reporting.

8.6 Biodiversity Advisory Committee

BAC provided comments on: 1) the expected table of content of Biodiversity Offset Option Paper that will be prepared by ADB's consultant, and 2) the biodiversity management plan for NNP1 Watershed Management plan.

BAC also submitted the 5th BAC mission report in the first week of February 2016. NNP1 EMO provided comments to 5th BAC mission report in the second week of March 2017. BAC Team Leader further revised the report in the last week of March 2017. It is currently under final review by NNP1 EMO and expected to be issued in May 2017 and distributed to relevant parties including the BOMC, IAP, IMA, LTA and ADB.

9 OCCUPATIONAL HEALTH AND SAFETY

9.1 SAFETY INCIDENTS

A summary of the safety incidents reported to the end of March 2017 are provided in ***Table 9-1*** and ***Figure 9-2*** below. Two Motor Vehicle Incidents were reported in March 2017.

TABLE 9-1: *SAFETY INCIDENTS REPORTED IN THE MONTH TO 31 MARCH 2017*

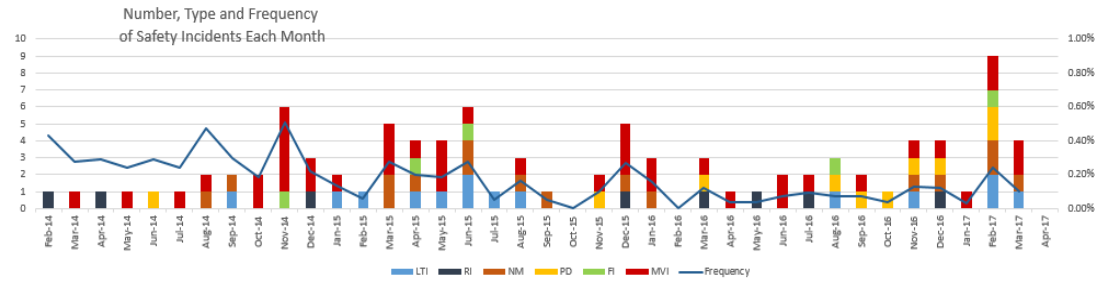
Type of Incidents	LTI	RI	NM	PD	FI	MVI	Total
No. of Incidents in March 2017	1	0	1	0	0	2	**4**
Cumulative Total Incidents to 31 March 2017	13	9	16	10	5	42	**95**

LEGEND:

LTI	-	Lost Time Incident
RI	-	Recordable Injury
NM	-	Near Miss
PD	-	Property Damage
FI	-	Fire Incident
MVI	-	Motor Vehicle Incident

One Lost Time Incident, one Near Miss and two Motor Vehicle Incidents occurred in the calendar month of March 2017, a cumulative total of 95 incidents to-date, of which 42 (almost 45 %) have been MVI.

FIGURE 9-1: *NUMBER, TYPE AND FREQUENCY OF SAFETY INCIDENTS TO 31 MARCH 2017*



9.2 CORRECTIVE ACTION PLANS (CAP)

In respect of the serious injuries sustained on 20 September 2014 to a linesman at the 22 kV Distribution Line Upgrade Works, the fatality of the sand supplier driver on 02 January 2015, the head injury to the tunnel worker on 06 February 2015, the Lost Time Incidents and head injuries due to the falls from height in both July and August 2015 and May 2016, and truck falling down the valley slope from the access road and front wheeled loader incidents in April 2016 and August 2016 respectively, all were reported directly to the Lenders and in appropriate Monthly Progress Reports, corrective actions disclosed and agreed where appropriate and completed.

Since then, four further safety incidents occurred on Site or the Site access roads, where an injured worker has spent one night or longer in hospital, as agreed with the Lenders, were reported to them for the following accidents, all involving motorcycles driven by workers or local villagers. One worker sustained leg injuries when his motorcycle was hit by another motorcycle carrying two villagers at an access road intersection (Incident No.74 on 12 November 2016); Another (No.79 on 08 December 2016) occurred at an access road junction and involved a pick-up truck and a villager's motorcycle; the

third (No.86 on 09 February 2016) occurred when a motorcycle driven by a worker and another driven by a villager collided on the main access road near the entrance to the Owner's and Civil Contractor's Camps; the last (No. 87 on 11 February 2017) was a motorcycle carrying two off-duty workers fell while leaving Site on the main access road.

In addition, the Project has taken the initiative of also reporting to the Lenders six Motor Vehicle Incidents of Project-related vehicles on public roads where a fatality or such overnight hospital stays of the injured were necessary. These comprise (1) the collision of a Project cement supplier lorry and a Hyundai truck on national Road 4B late at night on 28 October 2016 which resulted in the truck driver fatality; (2) a Company vehicle involved in a fatal accident with a motorcycle driver on national Road 13 South on a Sunday morning on 06 November 2016; (3) a motorcyclist suffered fatal injuries in a collision with a fly-ash lorry on national Road 13 South on 25 November 2016; (4) one worker died and another suffered minor injuries while off-duty following a single motorcycle accident on the national Road 4B near the Nonsomboun junction at night on 15 December 2016; (5) an accident occurred at the main access road and national road 4B Nonsomboun Junction on 24 January 2017 when a villager tractor collided with the V&K cement truck and the driver of the tractor suffered minor injuries; and (6) a fatal accident occurred on 17 February 2017 on national Road 13 South when two passengers riding in the cargo bed died and two others were seriously injured after a pick-up carrying 15 passengers collided with an Project supplier's empty fly-ash truck in convoy during a failed overtaking manoeuvre.

The subjects of all safety incidents continue to be used by Owner and Contractors' safety staff as topics for training and tool-box talks when necessary. Drivers of vehicles involved in Motor Vehicle Incidents in particular are interviewed, trained further, and in some cases disciplined or dismissed.

APPENDICES

1. Environmental Monitoring

APPENDIX 1: STATUS OF SS-ESMMPS APPROVAL DURING JANUARY TO MARCH, 2017

No	Site name	List of ESMMP and SS-ESMMP	Subcontractor	Approval Status by EMO/NNP1 (date)	Detailed Site Information	Monthly Construction & Operation Status
Electrical and Mechanical works (Hitachi-Mitsubishi Hydro)						
1	Main dam and re-regulating dam	SS-ESMMP for HM's Sub-Contractor Labour Camp #2	Lilama 10 joint stock Company (LILAMA)	No objection with comments on 12 January 2017 (3rd Revision)	Installing the camp for workers	On-going installation of the camp platform
2	Re-regulating dam	SS-ESMMP for installation of stay corn, for channel liner and hatch cover for Re-regulation power station	Lilama 10 joint stock Company (LILAMA)	No objection with comments on 05 April 2017 (1st Revision)	Installation of stay corn, for channel liner and hatch cover for Re-regulation power station	On-going
3	Re-regulating dam Power Station	SS-ESMMP for Installation work of embedded piping for main power station	Lilama 10 joint stock Company (LILAMA)	No objection with comments on 27 January 2017 (2nd Revision)	Piping work for main powerhouse	On-going
4	HM Hydro Contractor's sites	ESMMP update (R4) from HM Hydro Contractor	HM Hydro Contractor	No objection on 16 February 2017 (4th Revision)	ESMMP update	Completed
5	Main Dam Power Station	SS-ESMMP for installation of 360 Ton Electrical	Lilama 10 joint stock Company (LILAMA)	No further comments on 07 March 2017 (2nd Revision)	Installation Work of Electrical Overhead Traveling Crane	Completed

		Overhead Traveling Crane for Main Power Station				
6	Main Dam Power Station	SS-ESMMP for installation work of spiral case and stay ring for main power station	Lilama 10 joint stock Company (LILAMA)	No objection with comments on 22 February 2017 (1st Revision)	Installation work of spiral case and stay ring for main power station	On-going
Civil Works Contractor (Obayashi Corporation)						
7	Main Dam	SS-ESMMP for supplemental information for Curtain Grouting Works at the Main Dam	Kenber Subcontractor	No objection with comments on 14 February 2017 (6th Revision) No objection with comments on 09 April 2017 (7th Revision)	Grouting Works at the Main Dam	On-going
8	Re-regulating Dam	SS-ESMMP for Closing of Borrow Pit Area at Corner of P1 & P1A Road beside the Re-regulation Dam	Civil Works Contractor (Obayashi Corporation)	No objection with comments on 14 March 2017 (2nd Revision)	Spoil disposal from left bank coffer dam removal	On-going
9	Main Dam	SS-ESMMP for Building Construction at Main Powerhouse	Civil Works Contractor (Obayashi Corporation)	No objection with comments on 08 February 2017 (3rd Revision) Under review	Building Construction at Main Powerhouse	On-going
10	RCC Plant	SS-ESMMP for Operation and Maintenance Works of RCC Plant	Songda 5 Subcontractor	Under review		

11	Re-regulating Dam	SS-ESMMP for Construction of Re-regulation Power Station Building (Super Structure) Re-regulation Powerhouse Station (B1)	Civil Works Contractor (Obayashi Corporation)	No objection with comments on 07 February 2017 (3rd Revision)	Super Structure construction for Re-regulation Powerhouse Station	On-going
12	Main Dam Body	SS-ESMMP for Adit Closure at Right Bank of Main Dam	Civil Works Contractor (Obayashi Corporation)	No further comment on 16 March 2017	Adit Closure at Right Bank of Main Dam	Completed
13	Main Dam Body	Appendix 9.17 Additional document for the disposal of waste materials at the main dam body	Civil Works Contractor (Obayashi Corporation)	No objection with comments on 22 February 2017 (1st Revision)	Disposal of waste materials at the main dam body	On-going
14	Re-regulation Dam	Annex of the DWP for construction of Re-regulation power station, closing of dyke borrow pit no. 7	Civil Works Contractor (Obayashi Corporation)	No objection with comments on 05 April 2017 (1st Revision)	Dyke borrow pit no. 7 closure	On-going
Houay Soup Resettlement Area (NNP1PC-ESD Contractors)						
15	Houay Soup Resettlement Area	SS-ESMMP for land levelling (clearing/grabbing/ cutting/filling) for 28 house plots (zone A) and extended areas	VSP Construction Co., Ltd	No objection with comments on 31 March 2017 (1st Revision)	Land levelling (clearing/grabbing/ cutting/filling) for 28 house plots (zone A) and extended areas	On-going
16	Houay Soup Resettlement Area	SS-ESMMP for Irrigation dam, 1 spill way & outlet pipe culvert	VSP Construction Co., Ltd	No objection with comments on 24 March 2017 (2nd Revision)	Construction of irrigation dam and associated facilities at HSRA	On-going

17	Houay Soup Resettlement Area	SS-ESMMP for house construction Lot 4 at HSRA	Vannavong Co., Ltd	No objection with comments on 05 April 2017 (1st Revision)	House construction Lot 4 at HSRA	On-going
18	Houay Soup Resettlement Area	SS-ESMMP for house construction Lot 5 at HSRA	Vannavong Co., Ltd	No objection with comments on 05 April 2017 (1st Revision)	House construction Lot 4 at HSRA	On-going
19	Houay Soup Resettlement Area	SS-EMMP for Land Levelling (Cutting and Filling) for 90 House Plots at 2LR-Lower Reservoir Village and Health Center at Resettlement Site	DLC Road and Bridge Construction Company Limited	No further comment and closed this DWP & SSESMMP on 24 March 2017 (3rd Revision)	Land Levelling (Cutting and Filling) for 90 House Plots at 2LR-Lower Reservoir Village and Health Center at Resettlement Site	Completed
20	Houay Soup Resettlement Area	SS-ESMMP for 1.2 Km road construction to landfill at HSRA	VRC Construction Co., Ltd	No further comment and closed this DWP & SSESMMP on 24 March 2017 (2nd Revision)	Road construction to landfill at HSRA	Completed
21	Houay Soup Resettlement Area	SS-ESMMP for extension of main road construction 1.375Km phase 2for HSRA	VRC Construction Co., Ltd	No further comment and closed this DWP & SSESMMP on 24 March 2017 (2nd Revision)	Extension of main road construction 1.375Km phase 2for HSRA	Completed
22	Houay Soup Resettlement Area	SS-ESMMP for construction of Resource Center and Pilot Plan improvement at HSRA	ST Construction Co., Ltd	No objection with comments on 05 April 2017 (1st Revision)	Resource Center and Pilot Plan improvement at HSRA	On-going
23	Houay Soup Resettlement Area	SS-ESMMP for House construction of seven (07) units for 2LR	Vannavong Construction Co., Ltd	No objection with comments on 14 February 2017 (1st Revision)	House construction at HSRA	On-going

24	Upper reservoir (2 UR area)	SS-ESMMP for improvement of the internal road of Ban Pou, Ban Hatsamkhone and Ban Phiengta at zone 2 (2UR)	Soukxana Development Co., Ltd	No further comment and closed this DWP & SSESMMP on 09 March 2017	Road improvement	Completed
25	Houay Soup Resettlement Area	SECC Contractor's Site Decommissioning Plan	SECC., Ltd	No objection with comments on 24 February 2017 (2nd Revision)	Bridge construction	On-going decommissioning activity
26	Houay Soup Resettlement Area	SS-ESMMP for Irrigation Dam Reservoir Land Clearance at HSRA	PK Road-Bridge Construction and Irrigation SOLE Co., Ltd	Under review during the reporting period		
NNP1PC-TD Contractor						
27	Owner Site Office (OSO)	SS-ESMMP for the Supply and Installation Material for Natural Grass Soccer Field (2nd stage)	PK Construction	No further comments on 30 March 2017 (1st Revision)	Supply and Installation Material for Natural Grass Soccer Field at OSO	On-going
28	Owner Site Office (OSO)	SS-ESMMP for EMO Water Quality Laboratory Building Construction at NNP1 Owner's Site Office and Village	Viengoudomxap Construction Co., Ltd	No further comments and closed this DWP & SS-ESMMP on 16 March 2017 (3rd Revision)	Construction of EMO Water Quality Laboratory Building at OBC	Completed
29	NNP1PC's Landfill	SS-ESMMP for the Construction of NNP1 Solid Waste Landfill	PhouKham Chanvong Construction Co. Ltd (PKC)	No objection with comments on 13 March 2017 (1st Revision) Under review during the reporting period	Construction of landfill phase 2 stated in January 2017	On-going

APPENDIX 2: ENVIRONMENTAL MONITORING CORRECTIVE ACTIONS Q1-2017

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
ONC_OC-0085	02.06.2015	Song Da 5 Camp No. 2	The waste water treatment system does not follow the proposed design.	i. Contractors needs to follow the proposed plan, submitted on 31 Mar 2015; ii. Contractor should fix the drainage system with the sediment pond. It needs to separate the drain of surface water run-off and wastewater from bathroom and kitchen.	16.06.2015	21.03.2017	Resolved
ONC_OC-0087	02.06.2015	V&K Camp	Refer the previous site inspection report ref; NNP1-ESD-EMO-SIR-OC-0005 on SI-0036 dated 03 Mar 2015, the issue has been repeated. No improvement on the design of wastewater treatment system. The camp has insufficient facilities for the long-term operation. There is an evidence of grey water has been released from the septic tank to the open ditch. This is observed to be non-compliance to the project's environmental guideline.	i. Contractor needs to improve the submitted plan on 31 Mar 2015 which EMO has been commended and advised. ii. Contractor shall install the wastewater treatment system following the improved system under the EMO's recommendation.	16.06.2015	21.03.2017	Pending
ONC_OC-0217	28.06.2016	RCC Plant Yard	1). Referring to previous site inspection reports on turbid water at the RCC plant which have been issued: - SIR-0018, 18 /07/2015 - SIR- 0023, 06/10/2015	The Contractor is required to: Follow the agreed actions specified in earlier issued SIRs above. These include the frequency adjustment of the sediment clean-up from the sedimentation ponds when observed	20.07.2016	21.02.2017	Pending

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
			- SIR-0028, 15/12/2015 - SIR-0032, 09/02/2016 and - SIR-0040, 25/05/2016 2). Referring to the approved SS-ESMMP for the RCC Plant Foundation and Installation (note that this document does not cover the operation stage of the RCC Plant) The Contractor has implemented simple corrective actions to improve the turbid water quality generated from the RCC material washing area including cleaning-up of the sediment from the first and second sediment ponds which they are full. However, it was found that no proper sedimentation control facilities were installed to improve the turbid water discharge and inadequate cleaning-up and removal of sediment. Specifically, no cleaning-up of these sediment ponds was carried out whilst the RCC plant was temporary shut-down and no removal of sediment from the drying yards. EMO conducted water discharge sampling and testing at the last sediment pond prior to discharging into the drainage canals and found the results as follows: - Monthly testing dated 08/06/2016 detected 64,000 NTU of turbidity and 27,850 mg/L of TSS. - Field testing dated 25/06/ 2016,	that they are 60% full; Regularly remove dried sediment from the drying yards to keep space for incoming sediment cleaning-up from the ponds; Prepare/update the Site Specific Environmental and Social Management Plan (SS-ESMMP) for the operation stage of the RCC plant and submit to NNP1 for review and approval. Note: the mentioned SS-ESMP needs to fully address the areas of Sedimentation Control and Water Availability & Pollution control. If these issues are still not fixed by this agreed timeline, a NCR level 1 will be issued.			

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
			detected 2186 NTU of turbidity. By comparing/ converting the Turbidity of the latest field tested (2186 NTU on 25/06/2016) to/from the monthly sampling and laboratory testing (64,000 NTU on 08/06/2016), the TSS value of 951 mg/l was obtained. 64,000 NTU 27,850 mg/L 2,186 NTU X Þ X=(27,850 * 2,186)/64,000 = 951 mg/l This shows that the concentration of the TSS in the turbid water being discharged continues to exceed the effluent standard specified in the Concession Agreement Annex C.				
ONC_OC-0232	30.08.2016	Re-regulation Dam Borrow Pit	During the past couple of weeks, EMO conducted routine and follow up site inspections and observed that the Contractor started operating a borrow pit with inadequate environmental management practices as the following: 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	1. The Contractor is required to submit a revised SS-ESMMP to include this borrow pit and provide the following information: - Estimated quantity of materials to be used; - Biomass clearing and topsoil management; Spoil management and disposal (stockpiling, excavation, etc.); Detail design of slope stabilization including cut-off drains and berm; Site environmental rehabilitation and site closure plan,	27.09.2016	21.02.2017	Pending

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
			measures on the excavation of this borrow pit was included in the two (02) approved SS-ESMMPs for the Re-Regulation Dam (i.e. the Re-Regulation Dam Left Bank Excavation and Re-Regulation Dam Power Station).EMO received a verbal complaint from a ESD's Contractor (SECC company) that the Contractor has pushed the spoil and blocked the access road to their temporary spoil disposal area. The Company has maintained this assess	2. Clean up spoil that was pushed and blocked the access to of the SECC's waste pit.			

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
			road twice, but it was damaged again so far.	The contractor is required to take immediate actions without waiting for the above-mentioned documents to be completed by OC as the following: Separate and designate an area that is easily accessible as a topsoil stockpile to minimise the soil erosion and preserve for borrow pit rehabilitation in the later stage; Install borrow pit berms, cut-off drains and sediment ponds where feasible to prevent landslide and retain the sediment from being washed downstream; Submit the revised SS-ESMMP for the Re-regulation Dam together with the Borrow Pit Management and Closure Plan within 2 weeks after this inspection date, i.e. 11 October 2016 for review and approval by NNP1PC. The first two requests need to be started immediately. NNP1PC-EMO will follow up on the progress of the actions on 03/09/2016. The NCR level 1 will be issued if no actions are implemented.			
ONC_SECC-0039	06.09.2016	SECC Camp	During this site inspection and wrap up meeting, it was noted that the SECC Contractor would finish its	The Contractor was required to prepare and submit the site decommissioning plan covering all SECC's sites (SECC	19.09.2016	28.02.2017	Pending

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
			construction activities by the end of September 2016. To ensure that SECC's site demolition is done properly, the Contractor was instructed to prepare and submit a Site Decommissioning Plan to EMO for review and approval at least 7 days prior to the commencement of decommissioning work.	Camp, Temporary Waste Pit, SECC's Workshop and SECC Batching Plant) to EMO for review and approval Note: The Infra team would forward the EMO's presentation on site decommissioning requirements (presented by EMO during the July Monthly Meeting) to the SECC as a reference.			
ONC_OC-0236	11.10.2016	Re-regulation dam	During this inspection, it was observed that there was a land leveling activity for permanent spoil disposal from the excavation of left bank coffer dam behind the SECC camp. The Contractor will check if this spoil disposal plan was previously included in the existing SS-ESMMP for the Re-regulation Dam Construction. If not, please refer to the Corrective Actions as below:	The Contractor is required to include this spoil disposal management plan in the revised SS-ESMMP for the Re-regulation Dam which will be submitted by 11/10/2016 to the EMO for review and approval. The spoil disposal management needs to follow ESMMP-CP 2014 and Draft Updated ESMMP-CP 2016 Vol. III and IV, SP10 Spoil Disposal.	11.10.2016	21.02.2017	Pending
ONC_OC-0237	11.10.2016	Aggregate Plant Yard	It was observed during this inspection that the Contractor did a good job in storing removed sediment from drainage lines into piles for easy removal and disposal at the spoil disposal area No. 6. However, these sediment stockpiles along open ditches shall be cleaned up regularly. If not being removed soon, it is very likely that these sediment stockpiles will collapse into the open ditches	The Contractor is required to clean up sediment from the open ditches and remove sediment stockpiles more frequently. Otherwise, sufficient sandbags along the roadside shall be provided to prevent the overflowing of turbid water.	24.10.2016	21.02.2017	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
			again causing overflowing of turbid water to the road T11 and subsequently Nam Ngiep River.				
NCR_OC-0013	08.11.2016	Aggregate Plant Yard	Description of Non-compliance: 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 monitor and maintenance of the said sediment pond resulted in continuously discharging the turbid water from the sediment pond into the adjacent of Nam Ngiep River, and this is seriously none-compliance with CA annex C and ESMMP-CP 2014. More details on the non-compliance are provided below: 1) On 13 January 2016 , the NCR level 1 was issued to the Contractor and agreed to be closed on 22 February 2016 with the following condition: "The Contractor was required to carry out basic self-monitoring and record the water quality (pH and turbidity) from construction sites that will be discharged into the river and resolve waste water leakage from the sediment pond to Nam Ngiep River;…" (see enclosed NCR Ref. no: NNP1-ESD_EMO-NCR-0012).	The contractor is strongly required to take following actions by specified deadlines, failure to fully implement the recommended corrective actions by the given deadlines, a Non-Compliance Report level 3 (NCR Level 3) will be elevated: 1. Repair sedimentation pond's embankment to stop turbid water discharge into to Nam Ngiep River completely by 25 November 2016; 2. Clean up sediment in the sediment pond before it reaches 60% of sediment pond capacity and dispose at designated spoil disposal area no.6 on a daily basis; 3. Provide the sediment clean up record to NNP1 including (1) daily clean up frequency and (2) amount of collected sediment on a Weekly basis; 4. A design for installing at least four (04) baffles in the sediment pond to aid proper sediment settlement shall be proposed by 22 November 2016. If the effluent quality results still show no significant improvement (turbidity remains to be high), the baffles need to be installed.	25.11.2016	17.03.2017	Pending

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
			2) On 27 September 2016, during a joint site inspection carried out with OC (Environmental staff and engineers) and Sinohydro, the Contractor was instructed by NNP1PC-EMO to: - Immediately fix the sediment pond's embankment to stop turbid water leakage into Nam Ngiep River; - Clean up sediment deposit, when it is 60% full, and disposed at designated spoil disposal no.6; - Provide at least 4 baffles in the sediment pond to aid sediment settlement (see enclosed SIR Ref. No.: NNP1-ESD-EMO-SIR-OC-0050). 3) On 05 November 2016, the NNP1PC-EMO conducted environmental follow up of this sediment pond, there was no implementation of any agreed corrective actions as per the NNP1PC-EMO's requirements. As a result, the wastewater from the sediment pond leaked to the Nam Ngiep River and was detected at 10,520 NTU for Turbidity (see enclosed record of water discharge quality monitoring 2016). 4) On 08 November 2016, the latest joint bi-weekly inspection observed that the pond was so full as the				

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
			sediment was not cleaned–up for months, the embankment was not fixed and no installation of baffles. This allowed a direct discharge of turbid water into Nam Ngiep River (see Photos below).				
ONC_OC-0240	22.11.2016	CVC Plant Yard	The slurry from the RCC Plant was cleaned up and disposed at the areas above the CVC plant (the junction of Road P1 and P2). Some slurry has already been flushed into the road side drainage lines which are connected directly to the Nam Ngiep river. This practice breached the agreement and the latest submitted SS-ESMMP for the RCC Plant Operation on 10 November 2016 that all cleaned up slurry from the RCC plants and construction sites must be disposed of at a designated spoil disposal area no.6. Note: this area is not suitable for either sludge drying bed or permanent stockpile of sediment because of the topographic condition (steep slope on the drainage lines).	The Contractor is required to clean up slurry at this area and removed it to the spoil disposal no.6. Please be cautious that in the future, there should be no slurry disposal in any areas other than the designated spoil disposal area no. 6. If a similar evidence is observed, a NCR level 2 will be issued.	05.12.2016	21.02.2017	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
ONC_OC-0241	06.12.2016	Aggregate Plant Yard	During the improvement of the aggregate crushing plant's sediment pond below spoil disposal area no.7, sand bags were installed in the drainage ditch to create additional small sediment retention ponds (photo 1). However, all the sediment retention ponds were 100% full of sediment and the wastewater which overflew from these ponds, was diverted to Nam Ngiep River directly by a 100 mm dimeter pipe (photo 2). This allowed direct discharge of turbid water from the aggregate crushing plant's sediment ponds into Nam Ngiep River without sufficient settlement time. Note that a NCR level 2 response submitted by the Contractor (PCL-2775) on 08 December 2016 is being evaluated by the Owner. A formal response will be provided by 23 December 2016.	Whilst an official response to the Contractor's letter on the NCR2 (PCL-2775) dated 08 December 2016, the Contractor is required to: - Clean up the sediment from all ponds along the drainage line on a daily basis to create space for sediment deposit while working on the larger pond; - Record the frequency and volume of sediment being disposed at spoil disposal area No. 6.	14.12.2016	21.02.2017	Resolved
ONC_OC-0242	06.12.2016	Aggregate Plant Yard	The improvement of the aggregate crushing plant's sediment pond below spoil disposal area No.7 was not consistent with NNP1PC's recommendations stating in the NCR level 2 (Document No. NNP1-ESD-EMO-NCR-OC-0013, dated 08	The Contractor is required to take corrective action based on: 1. NNP1 recommendations stating in the NCR level 2 (Document No. NNP1-ESD-EMO-NCR-OC-0013, dated 08 November 2016) and; 2. LTA's recommendations during LTA	14.12.2016	21.02.2017	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
			November 2016) as the following: 1. The improvement of the above mentioned sediment pond was carried out without submitting a design drawing to NNP1 for prior review and concurrence; 2. The construction activities did not address the requirement for (i) repairing the sediment pond's embankment to stop turbid water leakage into Nam Ngiep River, (ii) installing at least four (04) baffles in the sediment pond to aid proper sediment settlement. If the effluent quality results still show no significant improvement (turbidity remains to be too high than the applicable effluent standard), the Contractor needs to discuss with NNP1PC on the final improvement plan and submit a drawing.	mission dated 13 December 2016. The given deadline for complete action is 15th January 2017			
ONC_OC-0243	06.12.2016	Aggregate Plant Yard	There was no dust suppression during the operation of the aggregate crushing plant. As a result, dust emission was observed covering the Sino Hydro Camp located 30 m West from the crushing plant and surrounding vegetation. This presented high health and safety risk to workers. Approximately 50 people	The Contractor is required to take the following actions: - Spray the water at the aggregate crushing plant to suppress dust; - Monitor and ensure that all workers living in the Sino Hydro Camp and working at aggregate crashing plant are provided with proper PPEs including masks and safety glasses in accordance	20.12.2016	24.01.2017	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
			are known to work at this site and live in the above mentioned camp.	to Contractor's SS-ESMMP on dust management.			
ONC_OC-0244	06.12.2016	RCC Plant Yard	During this joint site inspection, it was observed that sediment deposit was not cleaned up from the first three sediment ponds on a daily basis as stated in the 2nd version of the RCC Plant's SS-ESMMP for the operation phase. In addition, the embankment between pond# 2 and pond#3 did not aid the surface flow of turbid water. As a result, all sediment ponds were 100% filled up with slurry which ended up discharging to Nam Ngiep River.	The Contractor is required to clean up sediment deposit from all sediment ponds on a daily basis and more cleaning up of sediment is required if the water discharge water testing results reveal significant high turbidity.	20.12.2016	24.01.2017	Resolved
ONC_OC-0245	06.12.2016	Spoil Disposal #8	The spoil disposal area No. 8 is no longer active due to the situation of Sino Hydro Workers Camp and completion of landscaping work (levelling and permanent drainage control system). However, it was observed that the slurry from the RCC Plant was cleaned up and disposed of at this areas. This practice breached the agreement and the latest submitted SS-ESMMP for the RCC Plant Operation on 10 November 2016 that all cleaned up slurry from the RCC plants and construction sites must be disposed of at a designated spoil disposal area no.6.	The Contractor is required to clean up the slurry at this area and removed it to the spoil disposal no.6. Please be cautious that in the future, there should be no slurry disposal in any areas other than the designated spoil disposal area no. 6. The Contractor shall identify appropriate drying areas that are not at risk from being washed off site into the drains. If a similar evidence is observed, a NCR level 1 will be issued.	20.12.2016	21.02.2017	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
ONC_PK-0001	13.12.2016	PK Camp	The workers camp was not built as proposed in the DWP & SSESMMP for Paddy Field Development Of 48 ha for 2LR People in the Resettlement Site. There were cooking, bathing and toilet facility	With reference to the EMO comment on the DWP & SSESMMP for Paddy Field Development Of 48 ha for 2LR People in the Resettlement Site. The Contractor is required to: - Construct toilet facility as per design proposed in the DWP & SSESMMP, - Provide a layout of drainage control system (diversion canal) surrounding the camp, oil/grease trap and pipe line from the kitchen to the sediment pond.	27.12.2016	24.01.2017	Resolved
ONC_OC-0246	10.01.2017	Songda5 Camp N#1	The improvement of the Waste Water Treatment System (WWTS) was completed in mid-December 2016 and laboratory testing for chlorine dosing is underway. However, there was a significant concern on the stability of the embankment of wetland ponds as the following: - The elevation was not properly measured causing the waste water from the first and second wetland ponds to not flowing to the subsequent ponds (3, 4 and 5). In addition, earth bunds of these ponds were relatively low and not compacted (based on the submitted – working drawings. These resulted in the grey water leakage from the ponds to an open ditch connected to Nam	The Contractor is required to take actions urgently to secure the embankment of wetland ponds for long-term operation as the following: - Increase and compacted embankments of the wetland ponds No.1 and No. 2 to be able to ensure no waste water overflowing during the rainy season and daily peak loads; - Lining the embankment of the wetland ponds No.1 and No. 2 and a disturbed embankment between the fourth and last wetland ponds to ensure zero seepage and overflow of waste water into the drainage ditch and Nam Ngiep.	24.01.2017	21.02.2017	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
			Ngiep and has a potential risk of collapsing (see photo 1 and 2). - In addition, the embankment between the fourth and last wetland ponds was disturbed by the installation of an outlet pipe but has not been repaired after the work completion (see photo 3). This will allow the seepage of grey water during a full operation of the WWTS.				
ONC_SECC-0041	17.01.2017	SECC Camp	It was observed that some construction waste including broken tiles, water pipes, rubber and off-cut wood were left behind where the SECC worker camp was decommissioned.	The Contractor is required to segregate the waste based on the NNP1 Project's waste management hierarchy (Reduce, Re-use, and Recycle) and the leftover construction waste need to be buried at designated areas at a spoil disposal No. 6.	31.01.2016	14.02.2017	Resolved
ONC_DLC-0001	17.01.2017	DLC Camp	During this bi-weekly joint site inspection, it was observed poor hazardous material management at the LDC temporary worker's camp was observed. The A diesel oil container storage tank with 20,000 liters capacity was stored on the bare ground (no impermeable surface, concrete bund and proper roofing material). As a result In addition, the joint between connecting pipes and the tank was not tightened causing, petrol some diesel was to drip and	The Contractor is required to construct related facilities, such as increasing the existing bund to be able to contain a 120% capacity secure of diesel oil storage capacity, with impermeable floor, bund, signage (no smoking, etc.) and proper roof. Additional fencing is required to prevent students or other non-authorized persons to access this area. From the picture, the floor is already concrete? The issue is only increase the bund to handle the 120% capacity and roofing	01.02.2016	14/02/2016	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
			spilled on ground the concrete floor inside the storage area.				
NCR_HM-0002	18.01.2017	HM Camp	On 14 January 2017 during an environmental follow up at IHI and HM Hydro Main Camps, it was found that the sewage from IHI camp was being pumped using a local Contractor from Pakxan (See Photo1). EMO asked IHI Admin Lao staff who stood there supervising the work to understand the issue and advised them to dispose sewage at a designated spoil disposal No #6 according to a Standard Operating Procedure (SOP) on the Sewage and Black Water Disposal issued since June 2016 (See Photo2). In addition, it was learned that HM Hydro also used the same Contractor to pump out the sewage from their camp for disposal at a local villager's rice fields in Pakxan. An invoice of the Contractor submitted to HM Hydro after completing the service showed a total of 119 m3 of sewage (17 trucks at 7 m3 each). HM Hydro staff were called in to explain the situation and explained that the septic tanks were full and it was urgent for them to dispose the sewage immediately. EMO has the following concerns:	The Contractor is required to act on the following: • Obtain a consent in writing from the land owner where the sewage was disposed of as an evidence; • Check the level of the sewage tanks visually on a monthly basis during the dry season and weekly basis during the rainy season to better estimate the disposal period; • Consult NNP1PC's staff and follow a Standard Operating Procedure on the Sewage Sludge and Black Water Disposal Prior to pumping and disposing of sewage/black water. • There is an urgent need to improve the waste water treatment system (WWTS) and install a chlorine contact tank and a monitoring tank in accordance to the Owner's instruction letter (Document Ref. No.: NNP1/0130-016/HMH/EPC/EC, dated 12 October 2016) to prevent overflowing and non-compliance in the incoming wet season and remaining camp operation period.	28.02.2017	03.07.2017	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
			• The SOP on Sewage Sludge and Black Water Disposal was disseminated and explained to HM Hydro in details a number of times since the commencement of camp operation and included in their ESMMP document. This is a breach of their own ESMMP and NNP1PC's policies; • The black water was pumped from the second chamber of the septic tank which consisted of some wet sludge that are high in faecal coliform concentration and patrogens; • The local Contractor (service provider) didn't have appropriate PPE to handle the sewage (i.e. closed shoes and gloves) which exposed them to bacteria during the handling of connection pipes and sewage tanks; • Even though HM Hydro claimed that the local villager already "agreed" to use the disposed sewage as "fertiliser" in his/her rice fields in Pakxan, it is important to note that this local farmer probably does not comprehend potential environmental and/or health risks associated with this untreated sewage disposal on his/her land, neigbouring areas and surface water/groundwater. There is relatively weak enforcement of environmental regulatory framework				

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
			in Bolikhamxay Province. Thus, NNP1PC's policies and guidelines should prevail.				
ONC_LS-0018	19.01.2017	TL 230 KV	During this joint bi-weekly inspection, it was observed that the waste management at this site was inadequate. There was no proper waste pit and general waste was mixed and disposed on the ground at the RCR mobile camp at Tower number 65. This have a potential risk on workers' personal health as a result of odor and vectors as well as causing environmental impacts in the area that they work.	The Contractor is required to: i. Collect general waste around the RCR mobile camp and store in proper waste bins or plastic waste bags for proper waste disposal; ii. Provide sufficient waste bins/waste bags for recycle waste, general waste and food waste for proper waste separation	27.01.2016	2/02/2016	Resolved
ONC_LS-0019	19.01.2017	TL 230 KV	Fishing net/gear was observed at a temporary mobile camp located at the Tower 61. This breached NNP1PC's policies on Biodiversity Management SP09.12 stating that: "All project staff are prohibited from harvesting any forest products and hunting wildlife (terrestrial and aquatics)" and Contractor's ESMMP.	The Contractors is required to provide training and awareness to field staff related to biodiversity subject and prohibit staff from the harvest of any forest products and hunting wildlife (both terrestrial and aquatics).	27.01.2016	2/02/2016	Resolved
NCR_OC-0014	24.01.2017	Songda5 Camp N#2	More than 500 workers live in SongDa5 Camp No. 2.NNP1PC has observed that the grey water continues to overflow from the holding tanks to the opened ditches	The Contractor is strongly required to take the following actions by specified deadlines, failure to fully implement the recommended corrective actions by the given deadline will lead to the issuance	27.01.2017	28.03.2017	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
			during peak usage period (see photos). Stagnant grey water created unpleasant odour and attracted disease vectors. This poor housekeeping can create high risks on the workers' health and surrounded environment. Stagnant waste water would also be flushed into the Nam Ngiep River during the rainy season. During this bi-weekly joint site inspection, EMO followed up on the Contractor's corrective actions for this pending Observation of Non-Compliance (ONC) on grey water management. This ONC was also raised during the previous two Government of Lao PDR's (EMU) missions during October and November 2016 (see captured photos), and during various bi-weekly joint site inspections. However, the latest following-up revealed that there was no corrective action implemented by the Contractor. This is breached environmental obligation, SP02.11 of the Owner's ESMMP-CP which stipulates that: "the construction worker camps, office and construction sites will be equipped with adequate temporary sanitary facilities to avoid potential discharge of both grey and black water to ground or nearby surface watercourses…"	of a Non-Compliant Report level 3 (NCR Level 3) which will result in a temporary closure of the camp until this issue is resolved: 1. Immediately repair the grey water holding tanks to stop the grey water from overflowing to the opened ditch during daily peak loads; 2. Check the grey water piping system to ensure that no grey water seepage into the environment; 3. Pump stagnant grey water from the opened ditch to the existing pond no. 1 of the Waste Water Treatment System (WWTS); 4. Maintain the opened ditch in a clean and tidy condition for upcoming rainy season.			

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
NCR_OC-0015	24.01.2017	Spoil Disposal #8	During this Joint Bi-Weekly Site Inspection, EMO conducted a follow up of environmental remedial actions implemented by the Contractor for the slurry disposal at an area above CVC Plant and a Spoil Disposal Area No. 8 as per EMO's instructions provided in the Site Inspection Report ref. no: NNP1-ESD-EMO-SIR-OC-0053 dated 24 November 2016 and NNP1-ESD-EMO-SIR-OC-0054 dated 16 December 2016. Findings are as follows: Neither environmental remedial actions were implemented nor any clarification provided by the Contractor as per NNP1PC-EMO's instruction provided in the Site Inspection Reports dated 24 November 2016 and 16 December 2016; Some slurry that seeped from the sand stockpile was deposited in the road side drainage and road surface. This stockpile was surrounded by permanent roads and diversion drainage lines that lead to Nam Ngiep River about 400 m downstream (see photo 1 & 2); - These temporary stockpiles were not mentioned in the 3rd submission of the DWP & SS-ESMMP for the RCC Plant Operation dated 08 November	The Contractor shall provide in the revised DWP & SS-ESMMP for the RCC Plant Operation (a) proposed areas for all temporary stockpiles for sand and slurry that are being and will be removed from the sediment ponds, (b) an estimated volume of materials to be stockpiled, and (c) mitigation measures for erosion and sediment controls. Those measures should follow the requirements related to erosion control stated in the draft ESMMP-CP Updated in 2016 as below provision: (a) SP01.31: "the contractor shall seek approval from NNP1 to use any proposed stockpile sites prior to commencing stockpiling. NNP1 shall inspect and approve correctly located sites" (b) SP01.3: "Initial erosion and sediment control shall be installed prior to or as early as possible …..Major control measures such as sediment basins shall be surveyed and pegged. The Contractor or its nominated Sub-contractor shall then seek approval for the major control from NNP1 Site Manager prior to constructing each measures…"	27.01.2017	28.03.2017	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
			2016 An OC's Site Engineer (Iyota-san) insisted that was not a slurry disposal but a stockpile of washed sand that was sourced from the RCC plant sediment ponds. A silt fence and sand bags would be installed to prevent erosion during the rainy season but not now. - EMO raised potential impacts of sediment being transported from either sand stockpiles or roadside drainage lines to natural streams and finally deposited in Nam Ngiep River at the location to be a future NNP1 Re-regulation Pond. NNP1PC-EMO, therefore, required the contractor to provide management measures of any temporary slurry and sand stockpiles removed from the RCC Plant in the next revision of the DWP & SS-ESMMP for the RCC Plant Operation as well as remedial actions for erosion controls including cleaning up slurry in the drainage lines and road surface, installing silt fence and sand bags to secure the area regardless of the weather condition.	(c) SP01.22: "Sediment fences and traps with adequate capacity shall be provided at each construction site, material storage area, camp sites, etc"			
NCR_SECC-0002	27.01.2017	PC Bridge	1. **On 22 November 2016**, SECC Contractor submitted the Site Decommissioning Plan to NNP1PC-	NNP1PC-EMOrequires that the revised Site Decommissioning Plan is submitted by the Contractor before this agreed	01.02.2017	28.02.2017	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
			EMO proposing to demobilize workshop facilities, concrete batching plant and half of workers' camp after completion of the Houay Soup Bridge Construction; 2. On 30 November 2016, NNP1PC-EMO provided comments to the submitted Site Decommissioning Plan with the agreed re-submission deadline of 08 December 2016; 3. NNP1PC-EMO conducted a Bi-Weekly Joint Site Inspection at the decommissioned SECC Contractor's site and kept following up with the Contractor on the revised Site Decommissioning Plan which supposed to be submitted by the mentioned deadline; 4. On 11 January 2017, a follow-up email was sent to SECC Director and copied the Infra Team (see captured photo); 5. During the joint GOL-EMU mission and a Bi-Weekly Joint Site Inspection on 17 January 2017, it was found that construction waste remained to be scattered on site as a result of incomplete camp decommissioning process (see below photographs). NNP1PC- EMO, therefore, provided a	deadline for NNP1PC record and reference. The revised Site Decommissioning Plan shall include all SECC's completed and currently active sites (including SECC Camp, Temporary Waste Pit, SECC's Workshop and SECC Batching Plant).			

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
			final warning to the SECC's representative to clean-up remaining construction waste and submit the revised Site Decommissioning Plan as soon as possible. However, there was no response to any EMO's attempts as mentioned above.				
ONC_VSP-0004	01.02.2017	HSRA Irrigation Dam	During a joint bi-weekly site inspection carried out on 31 January 2017, it was found that the Contractor did not apply appropriate measures for turbid water generated from the irrigation dyke excavation area. The turbid water was directly pumped from the excavation area into the Houay Soup Noi (a tributary of Nam Ngiep).	The Contractor is required to: - Stop pumping up the turbid water immediately. - Install sediment pond or similar sediment control devices by specified deadline to retain and settle turbid water before discharging to Houay Soup Noi by following the Contractor's SS-ESMMP, SP01: Erosion and Sediment Control, where it was written that a sediment pond: 4 m (length) x 2 m (width) x 3 m (depth) will be contructed near a construction site to settle and retain sediment before discharge to watercourses;	10.02.2017	28/02/2017	Resolved
ONC_VRC-0007	07.02.2017	VRC Camp	An electricity generation was operated without any measures for oil spill protection in accordance to the Contractor's SS-ESMMP for SP06: Hazardous Material Management. As a result, oil continued to seep through the generator causing soil contamination.	The Contractor is required to: - Clean up the hydrocarbon contaminated soil andstored in a secure facility for proper elimination; - Provide an oil protective tray for the electricity generator and absorb oil spill immediately using absorbent pads or fine soil that can easily be found at the	10.02.2017	28.03.2017	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
				remote site in accordance to its SS-ESMMP.			
ONC_OC-0247	07.02.2017	Songda5 Camp N#1	There was an evidence of grey water leakage and stagnancy from washing/bathing areas along drainage canals that connect to Nam Ngiep River. Note: This issue was resolved during the last two months. However, it became an issue again due to a lack of regular housekeeping practices	The Contractor is required to: - Check and fix the leaking sources to avoid accumulation of stagnant waste water in the drainage which will become breeding sites for mosquitoes. - Waste water from camp operation needs to be treated in the Waste Water Treatment System prior to releasing to natural drainage or the environment.	21.02.2017	07.03.2017	Resolved
ONC_OC-0248	07.02.2017	KENBER Camp	The Waste Water Treatment System (WWTS) has been malfunctioned. The piping system was clogged and consequently caused the waste water to overflow from the first wetland pond to outside and the planted reeds were dead due to a lack of maintenance.	The Contractor is required to: - Check the elevation and piping system's connection to ensure smooth gravity feed of the waste water from the first to last wetland ponds; - Improve the wetland pond embankment (by increasing the bunds) and manholes to avoid waste water leakage/seepage. - Regularly maintain the treatment materials (sand and gravel) to prevent from clogging/blocking the piping system.	21.02.2017	07.03.2017	Pending

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
ONC_OC-0249	01.02.2017	Quarry Site	During this bi-weekly Joint Site Inspection, NNP1PC-EMO followed up on an issue concerning the over burden management at the main quarry. It is observed that the sub-contractor continues to push the over burden down to the slopes of Nam Ngiep. The existing bund along the Road T11 already collapsed and some were too low to prevent falling overburden from the quarry exploitation into Nam Ngeip. The deposited overburden on the slope of Nam Ngiep is likely to cause severe erosion and sediment being washed down to Nam Ngiep during the rainy season. A meeting was held between NNP1PC (TD and EMO) and OC on 01 February 2016 to discuss this pending issue which OC representatives agreed to immediately repair the existing bunds and in the medium to longer terms consider the engineering method to reduce the fly rocks from blasting. During this inspection, it was found that the agreed immediate corrective action was not implemented so far.	The Contractor was required to repair the existing earth bunds that have collapsed and reinforce the existing earth bunds to prevent sub-contractor on pushing the over burden over the slopes and from falling.	21.02.2017	21.03.2017	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
ONC_UCC-0001	23.02.2017	Main Dam Reservoir	During this joint inspection between the EMO's Compliance and Biomass Clearance teams at the biomass clearance Clearance teams at the biomass clearance area (Block 04 at Ban Sophuane and Block 11 at Ban Houaypamom), the following environmental issues were observed: § A 1,200 litres oil tank and some smaller oil containers were installed smaller oil containers were installed at a temporary workers camp without proper storage facility. This resulted in some minor oil spill and oil contaminated soil at handling point; § The current storage facility for electricity generator is not adequate. Roofing was provided but no impermeable bund and floor. As a result, a continuing oil dripping has occurred during fuel handling observed and contained by plastic sheet. This has a potential risk of soil and water contamination if not being cleaned up promptly should a rain event occur.	The Contractor is required to: - Provide an impermeable oil collective tray to prevent oil dripping into the ground during fuel handling; - Provide impermeable storage area or material such as a steel tray for the electricity generator to prevent soil contamination; - Clean up oil contaminated soil and store in the oil storage for proper elimination (such as incineration) by authorized NNP1PC vendor.	15.03.2017	Not applicable	Pending
ONC_VSP-0005	28.02.2017	Irrigation Dam	During a joint bi-weekly site inspection carried out on 28/02/2017, it was observed that electricity generator and a 20 liters of oil container were not provided with proper impermeable	The Contractor is required to: - Provide impermeable storage area or material such as a steel tray for the electricity generator to prevent soil contamination; Clean up oil	14.03.2017	28.03.2017	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
			floor (wooden frame with plastic sheet as a floor). This has a potential for a continuing oil dripping into the ground.	contaminated soil and store in the oil storage for proper elimination (such as incineration) by authorized NNP1PC vendor.			
ONC_OC-0250	07.03.2017	Sand Stockpile	During this bi-weekly joint site inspection, it was observed that: - Another sand stockpile sourced from the RCC plant sediment pond (the first two sediment ponds) has been established at the former RT Camp without introducing or installing of erosion and sediment control devices/facilities. In absence of sound environmental practices in accordance to the ESMMP-CP SP01: Erosion and Sediment Control, this sand stockpile is likely to be washed into the adjacent Nam Ngiep River which is located about 50 m downstream (see photos); - The latest submitted DWP & SS-ESMMP (4th revision) for RCC Operation and Maintenance on 09 March 2017 did not incorporate NNP1PC-EMO's instructions stated in the NCR level 2 for RCC plant's slurry/sand disposal at area above CVC and spoil disposal area No. 8 (NCR2 Ref. No.: NNP1-ESD-EMO-NCR-OC-0015) dated 26 January 2017, for the CWC to submit the management plan	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.	28.03.2017	Not applicable	Pending

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
			for erodible construction material stockpile.				
NCR_OC-0016	07.03.2017	Songda5 Camp N#1	During this Joint Bi-Weekly Site Inspection, NNP1PC-EMO conducted a follow up of environmental remedial actions implemented by the Contractor on the grey water leakage and stagnancy from washing/bathing areas along drainage canals that connect to Nam Ngiep River as per EMO's recommendation provided in the Site Inspection Reports Ref. No.: NNP1-ESD-EMO-SIR-OC-0056 dated 07 February 2017. Key environmental findings are as the following: 1. Site Observation: - Environmental remedial actions have not been implemented since 07 February 2017 as per the Site Inspection Report. - Grey water from washing and bathing areas of the extended Song Da 5 Camp No. 1 continues flow to open ditches that lead to Nam Ngiep River about 70 m downstream (see photo). - It was noted that Song Da5 Camp No. 1 had experienced grey water leakage in November 2016 (SIR Ref. No.: NNP1-ESD-EMO-SIR-OC-0053 dated 22 November 2016). The issue was closed for a short period of time and repeated	The Contractor shall implement the following remedial actions by this agreed deadline: - Check and repair the leaking sources to avoid accumulation of stagnant waste water in the drainage which will become breeding sites for mosquitoes; - All waste water including grey water and black water shall be diverted and treated by the Waste Water Treatment System prior to releasing to the environment; - Regular check the waste water connection pipes and drainage canals (at least weekly during the dry season and twice a week during the wet season) to avoid similar issue from happening again in the future.	21.03.2017	28.03.2017	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
			again. This indicated an inappropriate operation and maintenance of the workers' camp.				
ONC_LS-0020	16.03.2017	RCR Temporary Camp	Poor housekeeping and improper management of hazardous material and wastes were observed at the workshop: - A mixture of hazardous wastes (used oil filters, hydraulic hoses, and 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.	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. Designate vehicle fixing and maintenance only inside the workshop area; 4. Improve the extended parts of the workshop by providing proper roofing material, impermeable floor and bund. Noted: 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).	30.03.2017	Not applicable	Pending
NCR_OC-0016	07.03.2017	Songda5 Camp N#1	During this Joint Bi-Weekly Site Inspection, NNP1PC-EMO conducted a follow up of environmental remedial actions implemented by the Contractor on the grey water leakage and stagnancy from washing/bathing areas along drainage canals that	The Contractor shall implement the following remedial actions by this agreed deadline: - Check and repair the leaking sources to avoid accumulation of stagnant waste water in the drainage which will become breeding sites for mosquitoes;	21.03.2017	28.03.2017	Resolved

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
			connect to Nam Ngiep River as per EMO's recommendation provided in the Site Inspection Reports Ref. No.: NNP1-ESD-EMO-SIR-OC-0056 dated 07 February 2017. Key environmental findings are as the following: 1. Site Observation: - Environmental remedial actions have not been implemented since 07 February 2017 as per the Site Inspection Report. - Grey water from washing and bathing areas of the extended Song Da 5 Camp No. 1 continues flow to open ditches that lead to Nam Ngiep River about 70 m downstream (see photo). - It was noted that Song Da5 Camp No. 1 had experienced grey water leakage in November 2016 (SIR Ref. No.: NNP1-ESD-EMO-SIR-OC-0053 dated 22 November 2016). The issue was closed for a short period of time and repeated again. This indicated an inappropriate operation and maintenance of the workers' camp.	- All waste water including grey water and black water shall be diverted and treated by the Waste Water Treatment System prior to releasing to the environment; - Regular check the waste water connection pipes and drainage canals (at least weekly during the dry season and twice a week during the wet season) to avoid similar issue from happening again in the future.			
ONC_OC-0251	21.03.2017	V&K Camp	The maintenance of the waste water treatment system was not undertaken at the V&K camp. The grey water pipeline was observed to be disconnected causing the grey water discharge into the open ditch which directly flow into Nam Ngiep	It is understood that this camp's wetland ponds (WWTS) are subject to improvement and under discussions with NNP1PC. Until a new design and improvement plan is finalized and construction commenced, the existing WWTS needs to be maintained regularly	04.04.2017	Not applicable	Pending

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
			(Photograph A). In addition, the ponds are not lined with concrete, weeds block the open ditches and take up spaces inside the wetlands, and dead reeds were not replaced (Photograph B).	to ensure that it works properly by the following: - Remove the weeds surrounding and inside the wetland pond to keep areas clear and tidy; and - Collect and segregate the dead reeds in the wetland ponds and replace with new healthy reeds.			
ONC_OC-0252	21.03.2017	Songda5 Camp N#2	During this week's bi-weekly joint site inspection, it was observed that the waste water collection tanks from the kitchen are nearly full (about 10 cm left). This was due to the fact that the check bunds of waste water collection tanks (pre-wetland ponds) was lower than the surrounded surface level and the improved wetland ponds (at their full capacities). Without increasing the check bund, this has a high potential risk of waste water over-flow during heavy rain events.	The Contractor was instructed to increase the bunds of the waste water collection tank to at least 20 cm above the surrounding surface level.	04.04.2017	Not applicable	Pending
ONC_OC-0253	21.03.2017	Sino Hydro Worker Camp	During this Bi-weekly Joint Site Inspection, it was observed that the Contractor did not properly manage their waste on site as the following: - Insufficient number of waste bins were provided- food waste was stored in thin plastic bags; Insufficient of frequency to transport and dispose waste off-site, resulting in fly and worm concentration.	The Contractor is instructed to: - Provide 2-3 more waste bins with lids/covers; - Schedule for waste collection, transportation and disposal to the landfill regularly (i.e. daily, bi-daily, etc.)- Provide specific temporary food waste storage on site away from the cooking area to prevent flies/mice/worms and odor.	28.03.2017	Not applicable	Pending

List of Environmental Issues Recorded and Corrective Action Progressed

Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
			- No specific location for temporary waste storage on site- food waste was stored around the washing and cooking areas which attracted flies and caused odour. Note: The food waste from this camp is not part of the Animal Fodder Programme run by Hatsaykham villagers because of the spices being added to food. These villagers claimed to NNP1PC-EMO that they were concerned on the health of their pigs when too much chili and spices were added. Therefore, the food waste from this camp is disposed of at the NNP1 Project landfill.				
NCR_OC-0017	21.03.2017	Sino Hydro Workshop	During last week's Monthly Hazardous Material Inventory which was carried out on 15 March 2017 jointly by NNP1PC and the CWC, poor housekeeping and improper hazardous waste management was observed at the Sino Hydro's workshop, Aggregate Crushing Plant's Yard. NNP1PC-EMO instructed the Contractor to implement good housekeeping and hazardous material/waste management practices including moving the hazardous waste and containers to a designated hazardous storage area.	The Contractor shall implement the following remedial actions by the agreed deadline: - Segregate used tyres and store properly at a designated area away from flammable materials; - Perform machinery and equipment maintenance in a designated maintenance area that has permeable floor and rain protection or else drip trays and spillage protection facilities must be provided; - Move the used oil drums to a designated hazardous material storage	28.03.2017	Not applicable	Pending

List of Environmental Issues Recorded and Corrective Action Progressed

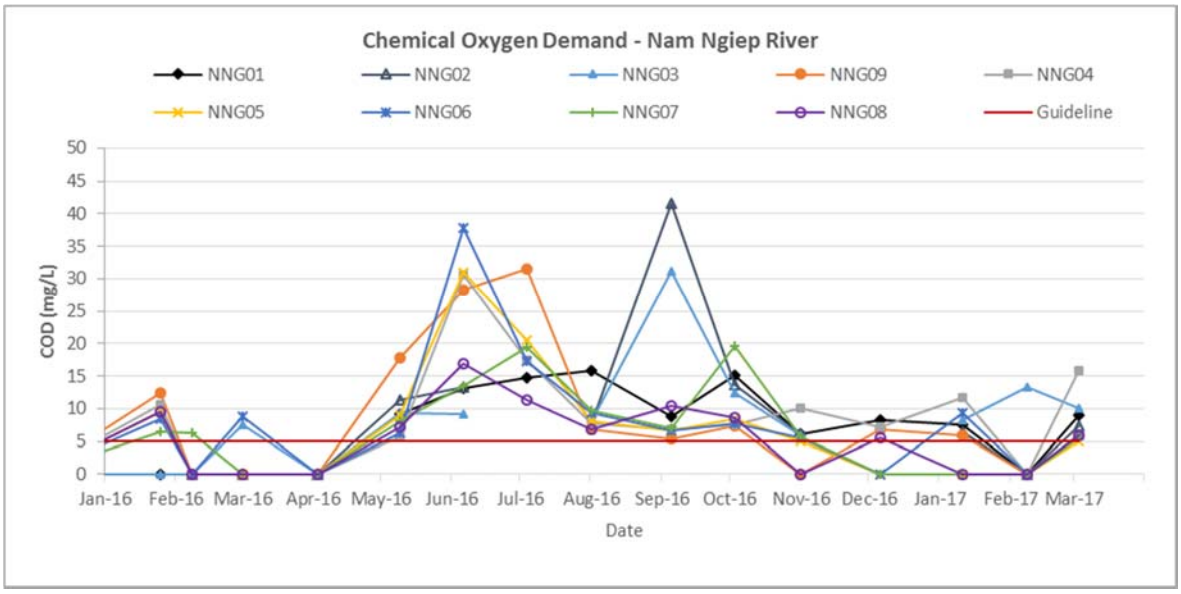
Issue ID	Inspection Date	Site Name	Issue/ Description	Action Required / Recommendation	Deadline	Latest Follow up dated	Final Status
			During this week's Bi-weekly Joint Site Inspection on 21 March 2017, there was no improvement being made by the Contractor; for example, poor housekeeping and some oil spills were still observed, used oil and oily rags were stored in open areas and used tyres were not properly stacked away from hazardous materials (see below Photographs). These are likely to create hazards in the workshop should a fire accidentally occur during the dry season. Note that this similar issue was previously raised on 24 August 2016 (Ref. No. NNP1-ESD-EMO-SIR-OC-0047) and was closed on 27 September 2016.	area; - Completely clean up the contaminated ground with hydrocarbon by using absorbent pads/dry sand and store contaminated materials in designated hazardous storage area for proper elimination; - Regularly monitor and instruct the subcontractor to comply with the proposed and approved SS-ESMMP for Worker Camp. Note that failure to address the above corrective actions by agreed deadline may lead to an escalation of this NCR-1 to NCR-2.			

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

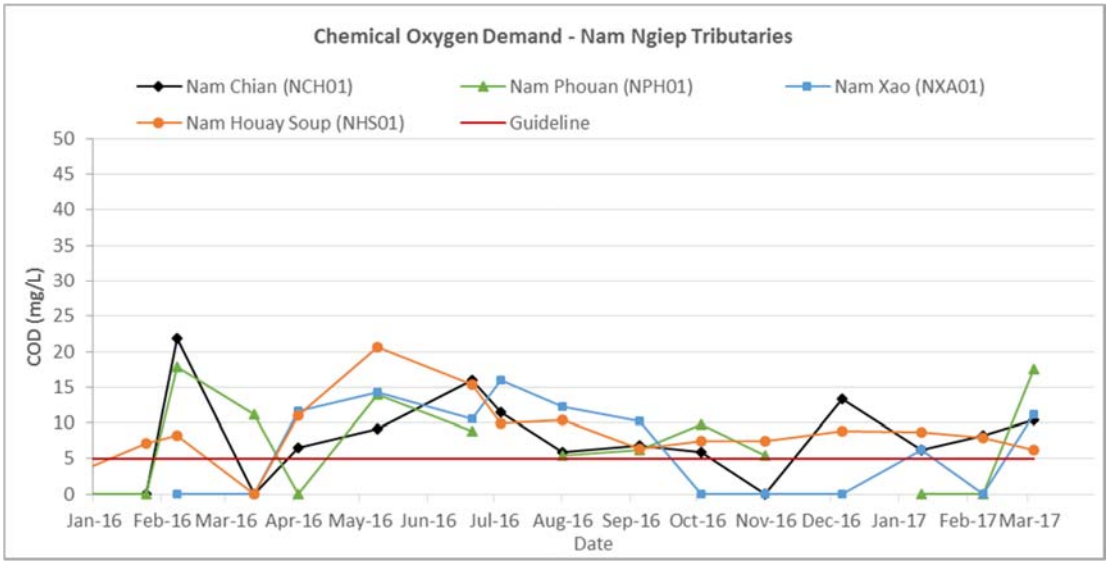
Site Code	Location station	Zone
NNG01	Nam Ngiep Upstream of Ban Phiengta	Upstream Project Construction Site
NNG02	Nam Ngiep Upstream of Nam Phouan Confluence	
NNG03	Nam Ngiep Downstream of Ban Sop-Yuak	
NNG09	Nam Ngiep Upstream Main Dam	
NNG04	Nam Ngiep Downstream RT Camp	Within Project Construction Site
NNG05	Nam Ngiep Upstream of Ban Hat Gniun	Downstream Project Construction Site
NNG06	Nam Ngiep Downstream of Nam Xao Confluence	
NNG07	Nam Ngiep at Ban Somsuen	
NNG08	Nam Ngiep at the Bridge of Road 13	
NCH01	Nam Chiane at the Bridge of Road 1D	Tributaries Upstream of Project Construction Site
NPH01	Nam Phouan Upstream of Nam Ngiep Confluence	
NXA01	Nam Xao Upstream of Nam Ngiep Confluence	Tributaries Downstream of Project Construction Site
NSH01	Nam Houay Soup Upstream Nam Ngiep Confluence	

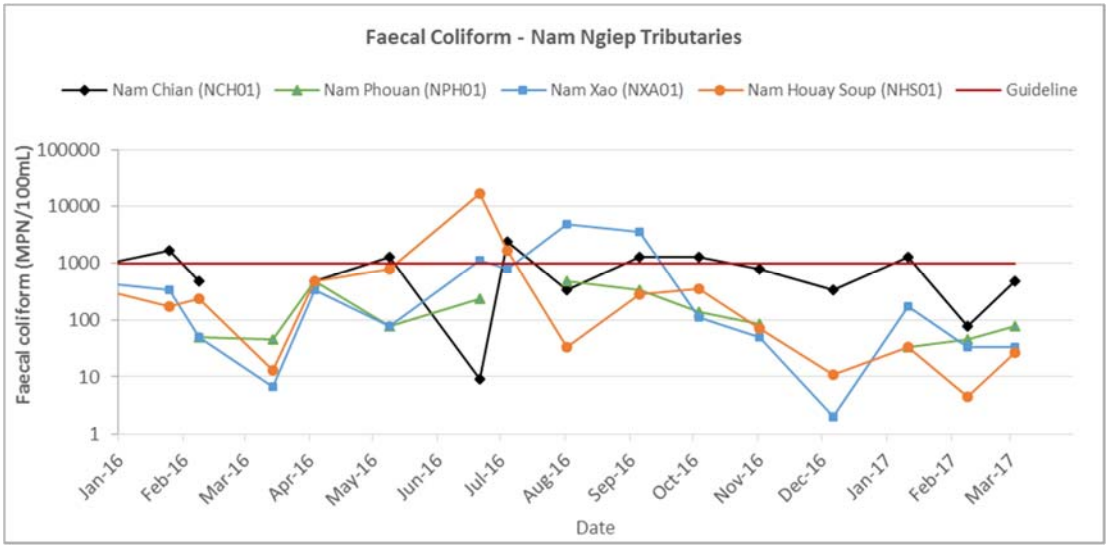
APPENDIX 4: KEY TRENDS OF WATER QUALITY MONITORING FROM SEPTEMBER 2015 TO END OF DECEMBER 2016 (ONLY PARAMETERS THAT EXCEEDED GUIDELINE STANDARDS)

Nam Ngiep Surface Water main channel

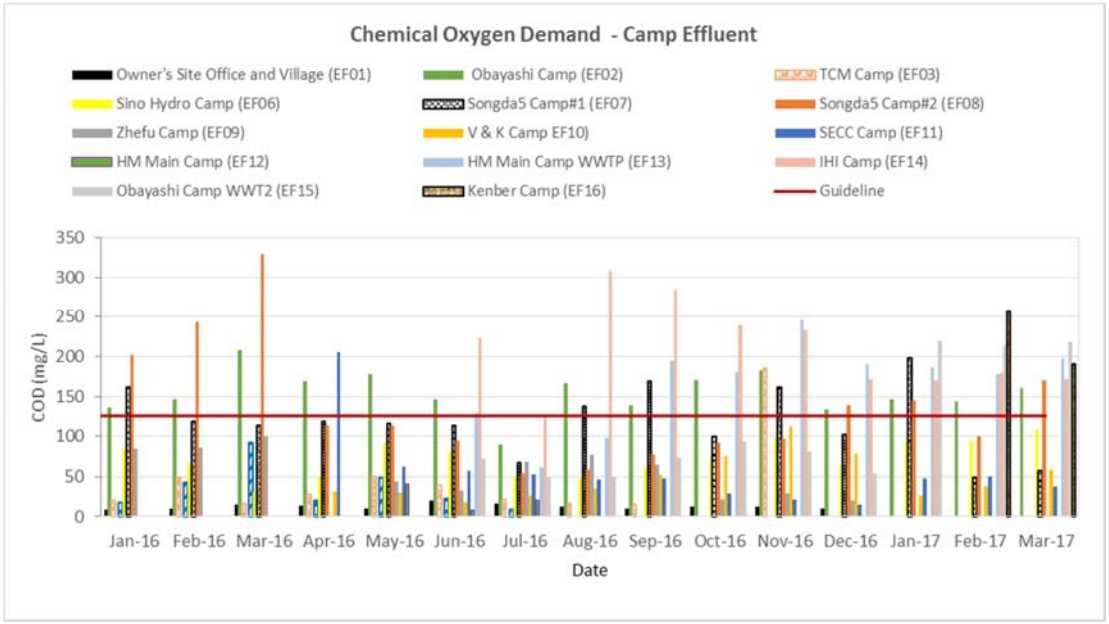


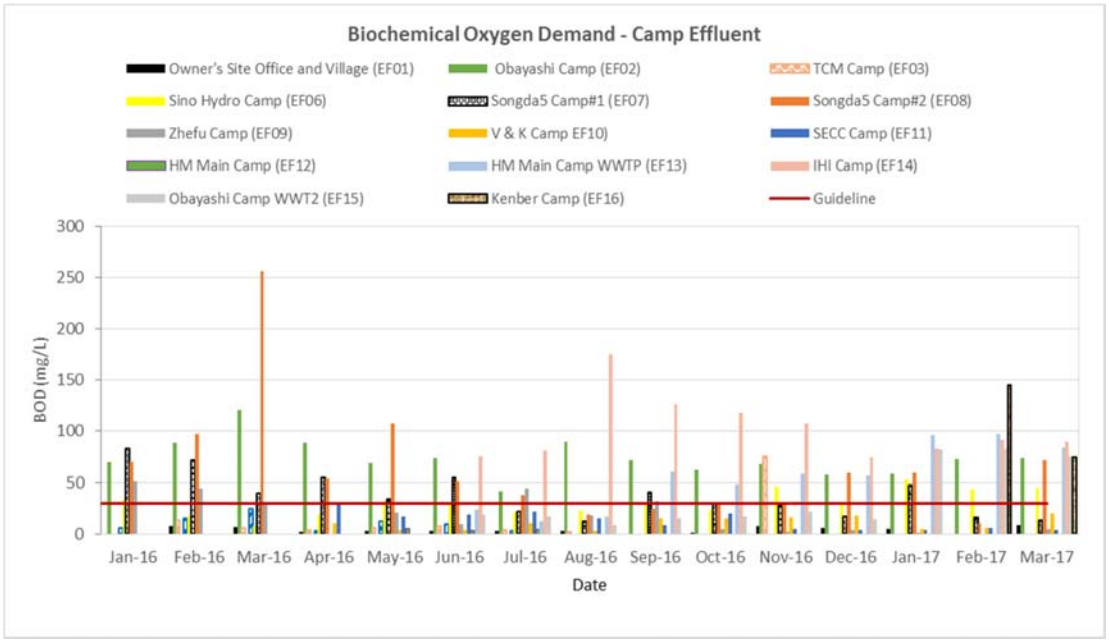
Key Water Quality Parameters for the Nam Ngiep Tributaries: Nam Chian, Nam Phouan, Nam Xao, Nam Houay Soup

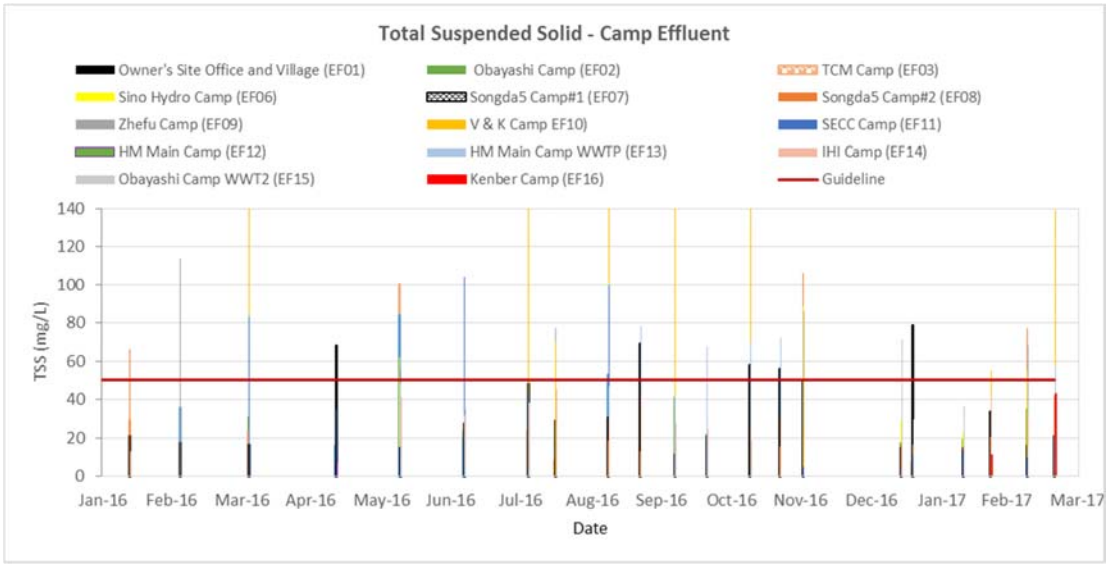


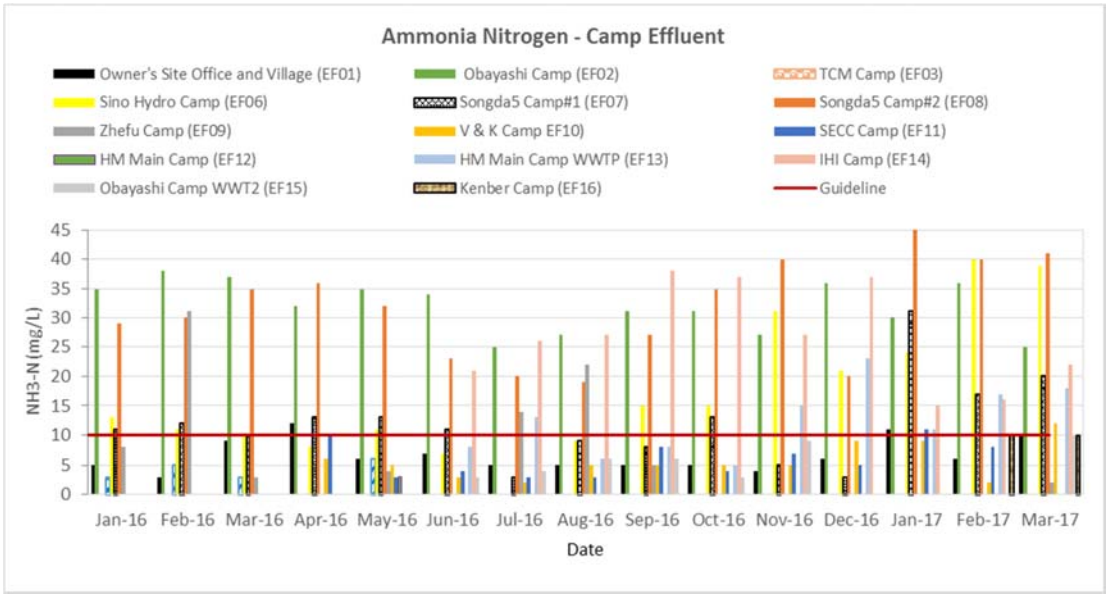


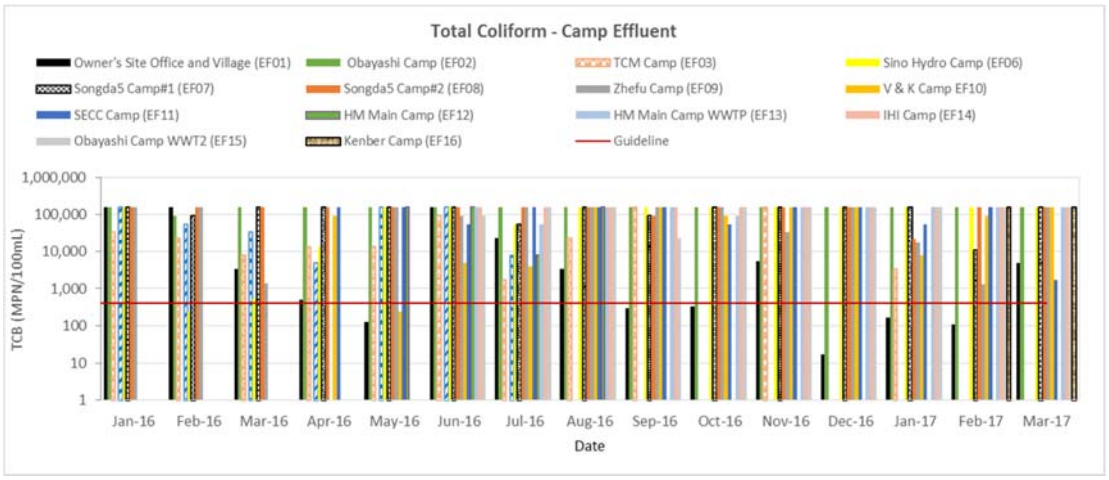
Camps' Effluent Water Quality Trends




Biochemical Oxygen Demand - Camp Effluent
Owner's Site Office and Village (EF01)
Obayashi Camp (EF02)
TCM Camp (EF03)
Sino Hydro Camp (EF06)
Songda5 Camp#1 (EF07)
Songda5 Camp#2 (EF08)
Zhefu Camp (EF09)
V & K Camp EF10)
SECC Camp (EF11)
HM Main Camp (EF12)
HM Main Camp WWTP (EF13)
IHI Camp (EF14)
Obayashi Camp WWT2 (EF15)
Kenber Camp (EF16)
Guideline
BOD (mg/L)
300
250
200
150
100
50
0
Jan-16 Feb-16 Mar-16 Apr-16 May-16 Jun-16 Jul-16 Aug-16 Sep-16 Oct-16 Nov-16 Dec-16 Jan-17 Feb-17 Mar-17
Date


Total Suspended Solid - Camp Effluent
Owner's Site Office and Village (EF01)
Obayashi Camp (EF02)
TCM Camp (EF03)
Sino Hydro Camp (EF06)
Songda5 Camp#1 (EF07)
Songda5 Camp#2 (EF08)
Zhefu Camp (EF09)
V & K Camp EF10)
SECC Camp (EF11)
HM Main Camp (EF12)
HM Main Camp WWTP (EF13)
IHI Camp (EF14)
Obayashi Camp WWT2 (EF15)
Kenber Camp (EF16)
Guideline
TSS (mg/L)
140
120
100
80
60
40
20
0
Jan-16 Feb-16 Mar-16 Apr-16 May-16 Jun-16 Jul-16 Aug-16 Sep-16 Oct-16 Nov-16 Dec-16 Jan-17 Feb-17 Mar-17
Date


Ammonia Nitrogen - Camp Effluent
Owner's Site Office and Village (EF01)
Obayashi Camp (EF02)
TCM Camp (EF03)
Sino Hydro Camp (EF06)
Songda5 Camp#1 (EF07)
Songda5 Camp#2 (EF08)
Zhefu Camp (EF09)
V & K Camp EF10)
SECC Camp (EF11)
HM Main Camp (EF12)
HM Main Camp WWTP (EF13)
IHI Camp (EF14)
Obayashi Camp WWT2 (EF15)
Kenber Camp (EF16)
Guideline
NH3-N (mg/L)
0
5
10
15
20
25
30
35
40
45
Jan-16
Feb-16
Mar-16
Apr-16
May-16
Jun-16
Jul-16
Aug-16
Sep-16
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Date


Total Coliform - Camp Effluent
Owner's Site Office and Village (EF01)
Obayashi Camp (EF02)
TCM Camp (EF03)
Sino Hydro Camp (EF06)
Songda5 Camp#1 (EF07)
Songda5 Camp#2 (EF08)
Zhefu Camp (EF09)
V & K Camp EF10)
SECC Camp (EF11)
HM Main Camp (EF12)
HM Main Camp WWTP (EF13)
IHI Camp (EF14)
Obayashi Camp WWT2 (EF15)
Kenber Camp (EF16)
Guideline
TCB (MPN/100mL)
1
10
100
1,000
10,000
100,000
1,000,000
Jan-16
Feb-16
Mar-16
Apr-16
May-16
Jun-16
Jul-16
Aug-16
Sep-16
Oct-16
Nov-16
Dec-16
Jan-17
Feb-17
Mar-17
Date

Construction Area Discharge Water Quality