Environment Management Plan

Project Number: 41924-014
March 2015

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

Biodiversity Offset Framework

Prepared by Department of Forest Resources Management (DFRM), Ministry of Natural Resources and Environment (MoNRE), and Nam Ngiep 1 Power Company Limited for the Asian Development Bank.

ESD / NNP1PC

Received

Date 13 MAR 2015

Document Approval Sheet

No:.....

Subject: Submission for NNP1PC record of the Updated Biodiversity Offset Framework (Revised Version dated 11 March 2015).
This document is subjected for submission to ADB of the updated BOF on 13 March 2015.

MD

Article approved.
13th March 2015

Main [Environmental and Social Division]

DMD	Mgr/AM/Supervisor	Staff
P. Prapard PAN-ARAM 13 MAR 2015	Viengkeo 12.03.15	HENDRA 12.03.2015

CO/C.C[DMD]

	Mgr/AM/Supervisor	Staff

CO/C.C[DMD]

	Mgr/AM/Supervisor	Staff

ສາທາລະນະລັດ ປະຊາທິປະໄຕ ປະຊາຊົນລາວ
ສັນຕິພາບ ເອກະລາດ ປະຊາທິປະໄຕ ເອກະພາບ ວັດທະນາຖາວອນ

ກະຊວງຊັບພະຍາກອນທຳມະຊາດ ແລະ ສິ່ງແວດລ້ອມ
ກົມຄຸ້ມຄອງຊັບພະຍາກອນປ່າໄມ້

ເລກທີ 0479 - - - -/ ກຄຊປ

ນະຄອນຫຼວງວຽງຈັນ, ວັນທີ 17 MAR 2015

ໃບຍັ້ງຢືນ

ການຮັບຮອງກອບໜ້າວຽກ ການຊົດເຊີຍຊີວະນາໆພັນ ຂອງໂຄງການເຂື່ອນໄຟຟ້ານ້ຳງຽບ1
(ສະບັບປັບປຸງ ທີ່ 3)

- ອີງຕາມ ສັນຍາສຳປະທານ ລະຫວ່າງ ລັດຖະບານແຫ່ງ ສປປລາວ ກັບບໍລິສັດໄຟຟ້ານ້ຳງຽບ1 ຈຳກັດ ສະບັບ ລົງວັນທີ 27 ສິງຫາ 2013.
- ອີງຕາມ ຂໍ້ຕົກລົງຂອງລັດຖະມົນຕີວ່າການ ກະຊວງຊັບພະຍາກອນທຳມະຊາດ ແລະ ສິ່ງແວດລ້ອມ ວ່າດ້ວຍ ການຈັດຕັ້ງ ແລະ ເຄື່ອນໄຫວ ຂອງ ກົມຄຸ້ມຄອງຊັບພະຍາກອນປ່າໄມ້ ສະບັບເລກທີ 3121/ກຊສ, ລົງວັນທີ 18 ພຶດສະພາ 2012.
- ອີງຕາມ ບົດບັນທຶກກອງປະຊຸມ ຄັ້ງວັນທີ 04 ມີນາ 2015 ທີ່ ນະຄອນຫຼວງວຽງຈັນ ກ່ຽວກັບ ການຮັບຮອງ ເອົາກອບໜ້າວຽກການຊົດເຊີຍຊີວະນາໆພັນ ສະບັບປັບປຸງ (ຄັ້ງທີ 3).

ຫົວໜ້າ ກົມຄຸ້ມຄອງຊັບພະຍາກອນປ່າໄມ້ ຕົກລົງ:

1. ເຫັນດີຮັບຮອງເອົາ ກອບໜ້າວຽກ ການຊົດເຊີຍຊີວະນາໆພັນ ຂອງໂຄງການເຂື່ອນໄຟຟ້ານ້ຳງຽບ 1 (ສະບັບ ປັບປຸງ ທີ່ 3) ລົງວັນທີ 11 ມີນາ 2015 ກະກຽມ ໂດຍບໍລິສັດໄຟຟ້ານ້ຳງຽບ 1 ຈຳກັດ (ລາຍລະອຽດມີເອກະ ສານຊ້ອນທ້າຍຄັດຕິດ).
2. ເຈົ້າຂອງໂຄງການເຂື່ອນໄຟຟ້ານ້ຳງຽບ 1 ຕ້ອງປະຕິບັດຢ່າງເຂັ້ມງວດ ບັນດາເງື່ອນໄຂ ທີ່ໄດ້ກຳນົດໄວ້ໃນ ເອກະ ສານຊ້ອນທ້າຍຂອງໃບຍັ້ງຢືນ ກ່ຽວກັບ ການຮັບຮອງກອບໜ້າວຽກການຊົດເຊີຍຊີວະນາໆພັນ ຂອງໂຄງການ ເຂື່ອນໄຟຟ້ານ້ຳງຽບ 1 ສະບັບນີ້.

ຫົວໜ້າ ກົມຄຸ້ມຄອງຊັບພະຍາກອນປ່າໄມ້

ສາຍສະໝອນ ໂພທິສັດ

Lao People's Democratic Republic
Peace Independence Democracy Unity Prosperity

Ministry of Natural Resources and Environment
Department of Forest Resource Management

No. 0479 - - - 15 /DFRM
Vientiane Capital, Date 12 MAR 2015

Certificate

Regarding the Approval of Biodiversity Offset Framework under NNP1 Hydropower Project
(Updated Version 3)

- In reference to the concession agreement between Lao PRD and the NNP1 PC dated 27 August 2013.
- In reference to the Ministerial agreement of MoNRE No 3121/MoNRE, dated 18 May 2012 regarding the role and responsibility of DFRM.
- In reference to the agreement made during the meeting held on 03 March 2015 in Vientiane regarding the approval of BOF (updated version 3).

Director General of DFRM agrees:

1. Approve the updated BOF of NNP1 project (update version 3) dated 11 March 2015 prepared by NNP1PC (Detail in attached).

2. Project owner (NNP1) has to respect strictly all agreed actions provided in attached BOF.

D. Director General of DFRM

Saysamone PHOTHISAT

ສາທາລະນະລັດ ປະຊາທິປະໄຕ ປະຊາຊົນລາວ
ສັນຕິພາບ ເອກະລາດ ປະຊາທິປະໄຕ ເອກະພາບ ວັດທະນາຖາວອນ

ບົດບັນທຶກ

ກອງປະຊຸມປຶກສາຫາລື ກ່ຽວກັບ ກອບວຽກງານການຊົດເຊີຍຊີວະນາໆພັນ ສະບັບປັບປຸງ ແລະ ແຜນກິດຈະກຳ ເພື່ອການສ້າງແຜນຄຸ້ມຄອງອ່າງຮັບນ້ຳເຂື່ອນໄຟຟ້ານ້ຳງຽບ1 ທີ່ຫ້ອງປະຊຸມ ໂຄງການເຂື່ອນໄຟຟ້ານ້ຳງຽບ 1, ນະຄອນຫຼວງວຽງຈັນ, ຄັ້ງວັນທີ 04 ມີນາ 2015

ໃນວັນທີ 04 ມີນາ 2015, ກົມຄຸ້ມຄອງຊັບພະຍາກອນປ່າໄມ້, ກະຊວງຊັບພະຍາກອນທຳມະຊາດ ແລະ ສິ່ງແວດລ້ອມ ຮ່ວມກັບ ຄະນະຊີ້ນຳ ແລະ ກອງເລຂາ ຄຸ້ມຄອງອ່າງຮັບນ້ຳເຂື່ອນໄຟຟ້ານ້ຳງຽບ1 ຂອງ ແຂວງໄຊສົມບຸນ ແລະ ແຂວງ ບໍລິຄຳໄຊ ແລະ ທີມງານຫ້ອງການສິ່ງແວດລ້ອມ ໂຄງການເຂື່ອນໄຟຟ້າ ນ້ຳງຽບ 1 ໄດ້ຈັດກອງປະຊຸມປຶກສາຫາລື ກອບວຽກງານ ການຊົດເຊີຍຊີວະນາໆພັນ ສະບັບປັບປຸງ ແລະ ແຜນກິດຈະກຳ ເພື່ອການສ້າງແຜນການຄຸ້ມຄອງອ່າງຮັບນ້ຳເຂື່ອນໄຟຟ້ານ້ຳງຽບ1 ພາຍໃຕ້ການໃຫ້ກຽດເປັນປະທານຂອງ **ທ່ານ ສາຍສະໝອນ ໂພທິສັດ** ຮອງຫົວໜ້າກົມຄຸ້ມຄອງຊັບພະຍາກອນປ່າໄມ້ ເຊິ່ງມີຜູ້ ເຂົ້າຮ່ວມຈາກພາກສ່ວນທີ່ກ່ຽວຂ້ອງສູນກາງ ແລະ ທ້ອງຖິ່ນ ລວມທັງໝົດ 14 ທ່ານ (ລາຍລະອຽດມີລາຍຊື່ໄດ້ຄັດຕິດມາພ້ອມນີ້).

ກອງປະຊຸມໄດ້ສະເໜີຜ່ານ ກອບວຽກການຊົດເຊີຍຊີວະນາໆພັນ ສະບັບປັບປຸງ ໂດຍລະອຽດ ກ່ຽວກັບ ແນວຄວາມຄິດ, ມາດຖານການຄັດເລືອກພື້ນທີ່, ຄວາມຮັບຜິດຊອບຂອງບັນດາຂະແໜງການ, ໂຄງຮ່າງການຈັດຕັ້ງ ແລະ ງົບປະມານ ທີ່ຈະໃຊ້ເຂົ້າໃນວຽກງານການຊົດເຊີຍຊີວະນາໆພັນ ແລະ ແຜນກິດຈະກຳ ເພື່ອການສ້າງແຜນການຄຸ້ມຄອງອ່າງຮັບນ້ຳເຂື່ອນໄຟຟ້ານ້ຳງຽບ 1. ຈາກນັ້ນ, ໄດ້ມີການປຶກສາຫາລື ແລະ ປະກອບຄຳຄິດ, ຄຳເຫັນ ຈາກຜູ້ແທນກອງປະຊຸມ ຢ່າງກົງໄປກົງມາ ເຊິ່ງກອງປະຊຸມໄດ້ເຫັນດີ ເອກະພາບຮ່ວມກັນ ດັ່ງນີ້:

1. ຮັບຮອງເອົາ ກອບໜ້າວຽກການຊົດເຊີຍຊີວະນາໆພັນ ສະບັບປັບປຸງ (ສະບັບທີ 3) ແລະ ພາຍຫຼັງ ຮຽບລຽງເນື້ອໃນຄືນບາງຈຸດແລ້ວ ຈະໄດ້ສະເໜີໃຫ້ ກົມຄຸ້ມຄອງຊັບພະຍາກອນປ່າໄມ້ ເຊັນຮັບຮອງ ໃນວັນທີ 12 ມີນາ 2015 ແລະ ສົ່ງໃຫ້ ທະນາຄານພັດທະນາອາຊີ ໃນວັນທີ 13 ມີນາ 2015;
2. ສະເໜີໃຫ້ ກອງເລຂາ ຄຸ້ມຄອງອ່າງຮັບນ້ຳເຂື່ອນໄຟຟ້ານ້ຳ 1 ແຂວງໄຊສົມບຸນ, ແຂວງບໍລິຄຳໄຊ ແລະ ຄະນະປະສານງານ ກົມຄຸ້ມຄອງຊັບພະຍາກອນປ່າໄມ້ ປັບປຸງຄືນ ແຜນກິດຈະກຳ ເພື່ອການສ້າງແຜນການຄຸ້ມຄອງອ່າງຮັບນ້ຳເຂື່ອນໄຟຟ້ານ້ຳງຽບ 1 ຂອງແຕ່ລະພາກສ່ວນ ແລ້ວສົ່ງໃຫ້ ບໍລິສັດເຂື່ອນໄຟຟ້ານ້ຳງຽບ 1

ທິບທວນຄືນ ໃນວັນທີ 11 ມີນາ 2015, ຈາກນັ້ນ, ບໍລິສັດເຂື່ອນໄຟຟ້ານ້ຳງຽບ 1 ຈະມີຄຳເຫັນສິ່ງກັບຄືນ ໃຫ້ ແຕ່ລະພາກສ່ວນ ປັບປຸງຄືນ ໃນວັນທີ 18 ມີນາ 2015;

3. ພາຍຫຼັງແຜນກິດຈະກຳ ເພື່ອການສ້າງແຜນການ ຄຸ້ມຄອງອ່າງຮັບນ້ຳເຂື່ອນໄຟຟ້ານ້ຳງຽບ 1 ໄດ້ຜ່ານ ການ ເຫັນດີ ແລະ ຮັບຮອງ ຂອງຄະນະກຳມະການຊີ້ນຳ ຂັ້ນແຂວງ ແລະ ສູນກາງ, ກອງປະຊຸມໄດ້ເຫັນດີມອບ ໃຫ້ ກົມຄຸ້ມຄອງຊັບພະຍາກອນປ່າໄມ້ ເຮັດໜັງສືສະເໜີຫາ ໂຄງການເຂື່ອນໄຟຟ້ານ້ຳງຽບ 1 ເພື່ອສະເໜີ ຂໍງົບປະມານມາຮັບໃຊ້ໃຫ້ແກ່ການຈັດຕັ້ງປະຕິບັດກິດຈະກຳຂອງວຽກງານຄຸ້ມຄອງອ່າງຮັບນ້ຳເຂື່ອນ ໄຟຟ້ານ້ຳງຽບ 1 ເປັນແຕ່ລະໄລຍະ.

ກອງປະຊຸມໄດ້ປິດລົງ ໃນເວລາ 15:00 ໂມງ ຂອງວັນດຽວກັນ ດ້ວຍບັນຍາກາດອັນດີ, ມີການປະກອບຄຳເຫັນ ຢ່າງກ້ວາງຂວາງ ແລະ ໄດ້ຮັບຜົນສຳເລັດຕາມລະດັບຄາດໝາຍ.

ດັ່ງນັ້ນ, ຈຶ່ງໄດ້ເຮັດບົດບັນທຶກສະບັບນີ້ໄວ້ ເປັນຫຼັກຖານ ແລະ ເປັນບ່ອນອີງໃນການຈັດຕັ້ງປະຕິບັດ.

ທີ່ນະຄອນຫຼວງວຽງຈັນ, ວັນທີ 04 ມີນາ 2015

ປະທານກອງປະຊຸມ
ຮອງຫົວໜ້າ ກົມຄຸ້ມຄອງຊັບພະຍາກອນປ່າໄມ້

ສາຍສະໝອນ ໄພທິສັດ

ຜູ້ບັນທຶກ

ສຸລະພອນ ອິນທະວົງ

ລາຍຊື່ຜູ້ເຂົ້າຮ່ວມ ກອງປະຊຸມປຶກສາຫາລື (.....)

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ລ/ດ	Name and Surname (ຊື່ ແລະ ນາມສະກຸນ)	Organization (ອົງການຈັດຕັ້ງ)	Position (ຕຳແໜ່ງ)	Phone number (ເບີຕິດຕໍ່)	Email address (ທີ່ຢູ່ອີເມວ)	Signature (ລາຍເຊັນ)
1	...	...	...	22112451		
2	...	...	...	9999 2122	vomevilay-n@hotmail.co.th	
3	...	...	...	98288333		
4	...	PoNRE	...	22905333	vilayphanpaychan@gmail.com	
5	...	DFRM	...	99195996	tony-ntv@hotmail.com	
6	...	PONRE	...	97768879	Seng.thao25@hotmail.com	
7	...	NNPI	...	23240839		
8	...	NNPI		5535 1581		
9	P. Pan	NNPI	PMD - ESD			
10	Hendra Winasto	NNPI	Watershed - TL	2024998777		
11	Vongpaseuth	NNPI	Bio - TL	2222315		
12	...	...	...	94456501	Kongyang2016@hotmail.com	
13	...	...	...	95962111, 22259018		
14	...	DFRM	...	55336888		
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Minutes of Meeting

Of

Consultation meeting on the Updated Biodiversity Offset Framework and Action Plan for the Preparation of NNP1 Watershed Management

NNP1 meeting room, Vientiane Capital, 04 March 2015.

On March 04, 2015, the Department of Forest Resource Management, Ministry of Natural Resources and Environment in association with the NNP1 Watershed Management Committee and its Secretariat Office of Xaysomboun and Bolikhamxay Provinces, and the EMO team of NNP1 organized a consultation workshop to discuss the updated Biodiversity Offset Framework and the Action Plan for the preparation of the NNP1 Watershed Management Plan. The meeting was chaired by Mr. Saysamone Phothisath, Deputy Director of Forest Resource Management. The participants came from the central (MoNRE) and local concerned sectors (PoNRE) and totalized of 14 persons (the detail as the list attached herewith).

The workshop had presented in details the updated Biodiversity Offset Framework, particularly, the offset concept, offset site selection criteria, responsibility of concerned sectors, organization structure and budget for implementation of Biodiversity offset activities have been highlighted. The Action Plan for the preparation of the NNP1 Watershed Management Plan was presented in the afternoon session. After the presentation, comments and questions have been exchanged amongst the participants, the workshop has concluded the following:

1. Endorse the updated Biodiversity Offset Framework (edition 3). After few additional edition, the BOF will be proposed on 12 March 2015 for the approval of the Department of Forest Resource Management, and officially submitted to the ADB on 13 March 2015;
2. The NNP1 Watershed Management Secretariat of Xaysomboun and Bolikhamxay provinces and Coordination Unit of the Department of Forest Resource Management to improve the Action Plan for the preparation of the NNP1 Watershed Management Plan,

and then submit to NNP1 Company on 11 March 2015 for review. The NNP1 Company will review and provide comment on 18 March 2015;

3. Once the Action Plan for the preparation of the NNP1 Watershed Management Plan is approved by the central and provincial committees, the Department of Forest Resource Management to prepare letter and propose to the NNP1 Company for a budget support to the implementation of the NNP1 Watershed Management activities in a quarterly basis.

The workshop closed at 15:00 of the same day with the good atmosphere, the exchange of the experience was broadly and successfully.

Therefore, this minute is made for reference in future implementation.

Vientiane capital, March, 04, 2015

Chairman of meeting

Deputy Director of Forest Resource Management. **Recorder**

Mr. Saysamone Phothisath **Mr. Soulaphone Inthavong**

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Nam Ngiep1 Biodiversity Offset Framework

(UPDATE)

Prepared by :

Ministry of Natural Resources and Environment

Department of Forest Resource Management

In cooperation with

Nam Ngiep1 Power Company

11 March 2015

1. Introduction

1.1 Background

The Concession Agreement (CA) between the Government of the Lao PDR (GoL) and Nam Ngiep 1 Power Company (the Company) dated 27 August 2013 sets out the roles and responsibilities of the GoL and the Company with respect to biodiversity conservation for the Nam Ngiep 1 Hydropower Project (the Project) (Clause 54 of Annex C). The Company is obliged to provide financial and technical support to the GoL for the preparation and implementation of biodiversity conservation while the GoL shall take necessary actions to ensure that the recommended measures, including formalizing necessary biodiversity offset for both terrestrial and aquatic habitats, be effectively implemented in accordance with the timeline to be specified. Presently, as part of its obligation for providing technical support, the Company is conducting surveys and studies, and developing plans for biodiversity conservation.

The CA also sets out the Company's role and financial obligation for developing a watershed management plan for the Nam Ngiep 1 Watershed (as defined in the next section) to assist the GoL in its implementation (Clause 51 of Annex C). The CA allows the Company to (i) propose to local Government Authorities and MONRE effective solutions for terminating or reducing any activities that may adversely affect the Nam Ngiep 1 Watershed and (ii) request local Government Authorities, utilizing the fund provided by the Company to GoL, to carry out watershed management related to the Project.

This document, titled as 'Biodiversity Offset Framework' outlines necessary arrangements to implement actions contemplated in the CA for biodiversity conservation including biodiversity offset and watershed management.

1.2 Project Areas and Nam Ngiep1 Watershed

Clause 54 of Annex C of the CA requires that the Company shall prepare baseline biodiversity data for project areas including (i) downstream of the dam and up to confluence of the confluence of the Mekong River, (ii) inundation area, (iii) the Project catchment area excluding the catchments of upstream hydropower development projects (defined as the Nam Ngiep 1 Watershed [the NNP1 Watershed]), (iv) the transmission line corridor and adjoining areas, and (v) construction and quarry areas. The CA requires that the biodiversity losses in these areas associated with the Project be addressed through biodiversity conservation activities to achieve no net loss of biodiversity.

The NNP1 Watershed comprises (i) Protection Forests, (ii) Production Forests, and (iii) residential areas and farmlands. The Protection Forest is to protect the water sources and other forest functions, while the Production Forest is allowed for timber production. Figure 1 presents the NNP1 Watershed and other relevant details of adjoining areas.

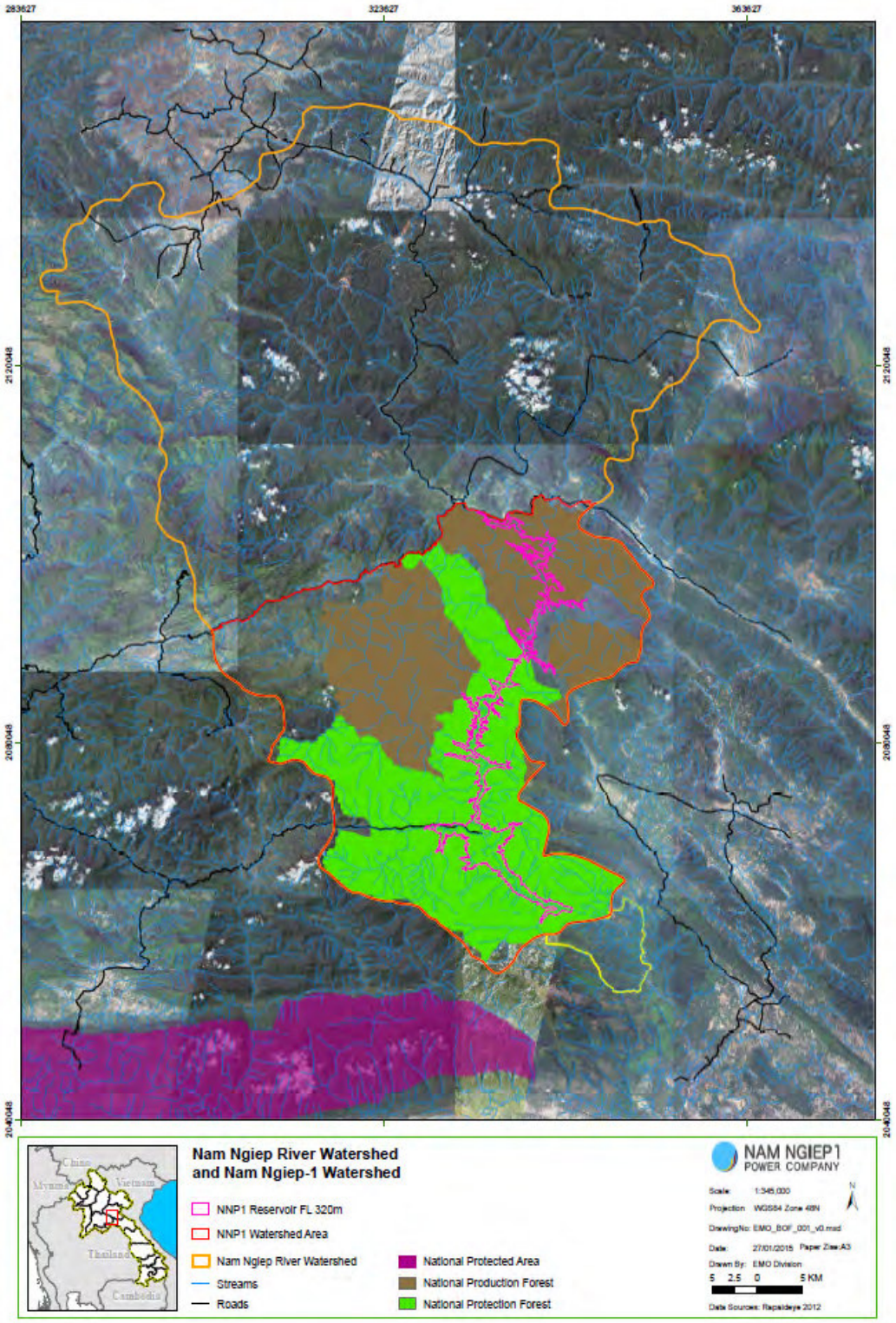

Figure 1: Nam Ngiep1 Watershed

1.3 Biodiversity Offset Framework Update

The first Biodiversity Offset Framework (BOF) was prepared by the Department of Forest Resources Management (DFRM), Ministry of Natural Resources and Environment (MoNRE), and the Company, and was issued in April 2014. The framework was based on (i) the analysis of the options undertaken in the environmental impact assessment (EIA) for the Project by Environmental Resources Management Siam (ERM); (ii) consultation with the GoL and relevant departments; and (iii) consultation with NGOs. It provided biodiversity conservation activities and the institutional arrangements for the implementation of biodiversity offsets focused on the NNP1 Watershed.

Due to time constraints, the first BOF was developed without fully completing a detailed biodiversity offset 'needs assessment'. A full biodiversity offset needs assessment should cover: (i) the biodiversity values of the Project areas; (ii) the detailed mitigation and management measures to protect the watershed and minimize the loss of biodiversity; (iii) the likely future scenarios for biodiversity (with and without the Project); and (iv) the likely residual impacts from the Project on biodiversity. Based on these, the need for additional measures to address the residual impacts that may remain after mitigation and management actions would be determined.

Given this, the GoL and the Company agreed to update the BOF to provide details on the approach to completing the biodiversity offset needs assessment and to provide further clarity on the relationship between the NNP1 Watershed management and biodiversity offsets.

Subsequently, this updated BOF provides updates on: (i) the basic approach for biodiversity offset planning including the offset needs assessment process; (ii) information on the approach for watershed management and the mitigation of biodiversity impacts in the NNP1 Watershed; (iii) criteria for the selection of biodiversity offset sites; (iv) the roles and responsibilities of the Company and the GoL, with a time-bound action plan, and (v) the financial arrangements.

2 Biodiversity Offset Approach

2.1 Application of the Mitigation Hierarchy

Biodiversity offsets are a "last resort" measure for addressing residual biodiversity impacts from a project. The project should in principle attempt to avoid adverse impacts by adopting suitable site selection and design measures; then where avoidance is not possible, impacts should be managed or mitigated; and finally, any residual impacts should be fully offset.

In the case of the Project, the EIA has identified that the Project may cause unavoidable adverse impacts on biodiversity values within the Nam Ngiep 1 Watershed. All efforts must be made to mitigate these adverse impacts and suitable biodiversity offset measures must be designed to address any residual impacts.

2.2 Biodiversity Offset Concept and Objectives

The concept of biodiversity offsets emanates from the realization that the loss of biodiversity values due to a large project impacting on a rich ecosystem, may not be fully overcome by mitigation measures targeting biodiversity conservation in the remaining habitat. It may therefore be necessary to identify areas with similar or higher biodiversity values for long term conservation outside of the project area in order to address the residual impacts. Identifying such areas and planning and implementing biodiversity conservation measures to achieve 'no net loss' or a 'net gain' in biodiversity values is the long term objective of biodiversity offsets[1].

No net loss shall be achieved for biodiversity by: (i) assessing the spatial extent of habitat lost or disturbed in the project affected area (i.e. area and condition); (ii) assessing the direct and indirect impacts to the size and long-term viability of populations of species, particularly for species of high conservation value or other indicator species; and (iii) designing an appropriate offset to addresses the residual impacts. Gains achieved by the offset, should as a minimum, be greater than the residual losses caused as a result of the Project impacts.

2.3 Biodiversity Offset Needs Assessment

The following steps are envisaged to achieve the biodiversity conservation and offset goals for the Project:

2.3.1. Assessment of existing biodiversity value of NNP1 Watershed: This step will involve (i) determination of the spatial distribution and condition of existing habitat types; (ii) establish the presence/absence, distribution and estimated population size of key indicator species, with a particular focus on species of high biodiversity conservation value (see Table A1.3 of Annex 1). The baseline assessment will use the established survey and evaluation methods and will consider condition and long-term viability of habitat for the species of high biodiversity conservation value.

2.3.2. Assessment of Project impacts on biodiversity: Under this step, building on the EIA, the loss of biodiversity due to the Project will be assessed. This will include direct impacts due to habitat inundation and clearing, habitat fragmentation, as well as indirect and induced impacts due to changes in land use and increase access to the riverine and forested habitats within the project affected area. This information will be used to determine the overall magnitude of expected impacts from the Project in the long-term in the absence of mitigation measures.

2.3.3. Review of proposed mitigation and management measures for the Project: This step will involve the review of proposed mitigation and management measures proposed in the EIA, as well as possible biodiversity related measures for consideration under the NNP1

[1] No net loss is generally defined as the point at which project-related impacts on biodiversity are balanced by measures taken to avoid and minimize the project's impacts, to undertake on-site restoration and finally to offset significant residual impacts, if any, on an appropriate geographic scale (e.g., local, landscape-level, national, regional) (IFC, 2012, Performance Standard 6 on Biodiversity Conservation and Sustainable Management of Living Natural Resources).

Watershed Management Plan. These measures will include: (i) measures to address anthropogenic impacts on remaining biodiversity that may occur as a result of changes in land-use and access to the NNP1 Watershed; and (ii) target areas for priority protection and monitoring. Together these measures will form a Biodiversity Management Sub-Plan of the NNP1 Watershed Management Plan. While developing and designing these measures, stakeholders likely to be affected by these measures will be consulted. A generic list of possible measures is detailed in Annex 1. Realistic targets for biodiversity conservations in the NNP1 Watershed will be developed as part of this process.

2.3.4. Determination of offset needs: After the baseline biodiversity conditions (step 2.3.1), likely project impacts (step 2.3.2) and mitigation measures (step 2.3.3) for biodiversity conservation in the NNP1 Watershed are detailed, future scenarios with-and-without the Project will be predicted and offset requirements will be calculated[2]

These estimates will compared the pre-Project biodiversity baseline values, to identify the estimated or potential 'loss of biodiversity' and any residual impacts following mitigation measures in the NNP1 Watershed. Based on these estimates, the need or suitability of biodiversity offsets outside the NNP1 Watershed will be determined. The biodiversity offset will aim to provide conservation benefits to an area of similar or preferably higher conservation value and size to the pre-Project biodiversity baseline. Where data is insufficient to quantify the exact impact on species diversity, a precautionary approach will be taken and a biodiversity offset will be selected to maximise conservation outcomes in an ecologically equivalent area or a site with recognized higher biodiversity values.

2.4 Site Selection Criteria

After the offset needs for outside of NNP1 Watershed are specified, offset site(s) will be selected. The following criteria will be used in comparing candidate offset sites.

(i) Ability to provide requisite biodiversity gains for use, cultural, and intrinsic values identified:

(a) Will the selected sites adequately compensate for the losses accrued at the impact site in terms of amount, diversity and quality?

(b) Do the selected sites have recognized high biodiversity values of local, national or international significance that are under threat?

(c) Are there pressures that threaten the viability of the offset and its biodiversity in the long term?

(ii) Ability to produce conservation 'additionality':

[2] The offset calculation will be undertaken using a recognized assessment methodology, which will be reviewed by the Project and discussed with the BAC, IAP and other relevant stakeholders to determine the best approach suitable for Lao PDR and the Project. This will include consideration of the habitat-hectares (HH) methods used in the EIA. This is a site-based assessment which measures the condition of native vegetation with reference to a benchmark for the same vegetation type. The condition combines with the area, to determine the amount of habitat hectares in a patch of vegetation.

(a) Will the biodiversity offset achieve conservation outcomes above and beyond results that would have occurred if the offset had not taken place.
(b) Will the biodiversity offset displace activities harmful to biodiversity to other locations (ie. will it reduce impacts in one location that then shift to another location).
(c) Does the biodiversity offset have potential for the Project offset funds to stimulate and leverage additional outside investment or technical support for conservation of the offset site?

(iii) Local capacity to implement the offset activities and practical likelihood of success:
(a) Is protection of the site a priority for the GoL, and consistent with the GoL's designated land-use classification for the site?
(b) Are there local communities and institutions working in the area available to assist in the design and implementation of the offset to a high conservation standard? Are they likely to be supportive?
(d) Would it be possible to establish workable legal, institutional and financial arrangements for the sites and activities concerned?

(v) Will local communities benefit or be supportive of the planned biodiversity offset?
(a) Will there be detrimental impacts on the livelihoods or welfare of local communities?
(c) Is there potential for local communities to participate and benefit from the implementation of the biodiversity offsets?

2.5 Offset Plan Development

After the offset sites are agreed to between the GoL and the Company, a Biodiversity Offset Management Plan will be developed for the biodiversity conservation measures. The detailed contents of the plans will be developed by suitably qualified and experienced consultants or conservation agencies who will work in consultation with the GoL, the Company and local stakeholders and communities.

2.6 Institutional Arrangement for Biodiversity Offset Management

Details of the legal requirements and institutional arrangements for implementing biodiversity offset at the identified sites will be developed and agreed between the GoL and the Company. It is currently envisaged that the organization structure will likely be as shown in Figure 2.

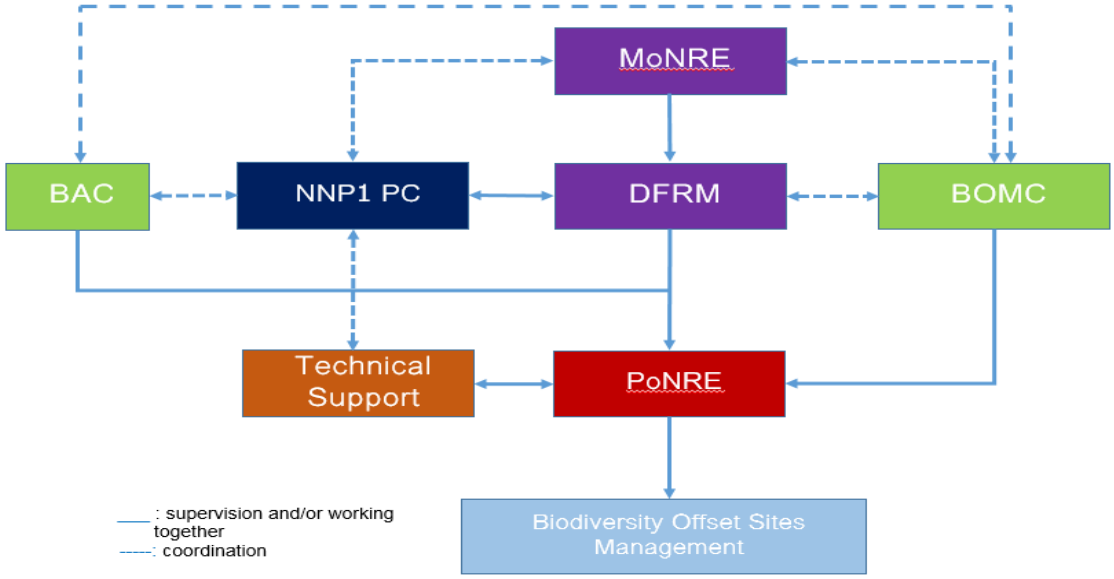

Figure 2. NNP1 Biodiversity Offset Management

2.6.1 Biodiversity Advisory Committee: A Biodiversity Advisory Committee (BAC) will be established to (i) provide advice on the "no net lost and/or net gain" evaluation; (ii) provide technical advice on the offset planning (including site selection) and development of the Biodiversity Offset Management Plan; (iii) monitor the implementation the Biodiversity Offset Management Plan, and (iv) evaluate the implementation effectiveness. Implementation of the offset activities may be entrusted to qualified conservation agencies in addition to measures to be implemented by the government entities. The BAC should be comprised of experienced and internationally recognised biodiversity experts. Preferably, BAC should consist of at least three members from different conservation organisations, and/or an international expert. The outline terms of reference (TOR) and administrative procedures of the BAC are presented in Annex 2 and 3, respectively. The BAC will also provide technical advice on implementation of Biodiversity Management Sub-Plan of the NNP1 Watershed Management Plan.

2.6.2 Biodiversity Offset Management Committee: Biodiversity Offset Management Committee (BOMC) will be established to advice PoNRE and other related agencies on the preparation and implementation of the Biodiversity Offset Management Plan. To effectively implement the plan, the BOMC is to be chaired by the Provincial Vice Governor, and comprised of key provincial agencies, such as, PoNRE, Provincial Agriculture and Forestry Department, Provincial Lao Front for National Construction, Provincial Defence and/or Police, and District Chief of concerned district. BOMC will be technically supported by DFRM/MoNRE and BAC.

3 NNP1 Watershed Management

3.1 Biodiversity Management in the NNP1 Watershed

Biodiversity conservation activities in the NNP1 Watershed will be dependent on successful implementation of the overall NNP1 Watershed Management Plan. The NNP1 Watershed Management Plan should include: (i) a land use management sub-plan; (ii) soil erosion prevention sub-plan; (iii) forest management sub-plan; (iv) water resource management sub-plan; (v) a fish resource management sub-plan; (vi) a community engagement and outreach sub-plan, and (vii) institutional arrangements for watershed management. The land use plan and water resource management plan must be consistent with biodiversity conservation activities in the Biodiversity Management Sub-Plan. The Company will support the GoL by developing a draft of the NNP1 Watershed Management Plan and its Biodiversity Management Sub-Plan.

3.2 Legal Requirements for NNP1 Watershed Management

The Protection Forests of the NNP1 Watershed currently do not have sufficient protection from illegal and inappropriate activities that may impact aquatic and terrestrial habitats. A legal mechanism should be established to: (i) secure the land tenure for conservation areas; (ii) manage land-use activities; and (iii) enable the administration and management of those areas.

The CA indicates that areas of high biodiversity value in NNP1 Watershed should be classified as a "Conservation Area". However, it is recommended that a "provincial regulation" be established first and used to secure the Protection Forests within the NNP1 Watershed. This provincial regulation, if possible, could then be upgraded in the future to a National Protected Area decree. This can be achieved under the provisions of the Forestry Law 1996 by declaring the forested areas and define to a "Total Protection Zone" or "Controlled Use Zone" under the existing Protection Forest classifications. The areas could also be declared as a "Provincial Protected Area" by the provincial governor in order for the areas to be legally protected. In addition, the Water Resources Law 1996, Land law 2003 and the Wildlife and Aquatic Animals Law 2007 may also be used to implement and enforce biodiversity management activities.

The NNP1 Watershed forests are located in Xaysomboun and Bolikhamxay provinces. Provincial regulations will be issued for protection of NNP1 Watershed. Because most of NNP1 Watershed forests are located in Xaysomboun province, Xaysomboun provincial regulations must be issued for protection of watershed within NNP1 Watershed. The need of Bolikhamxay provincial regulations will be identified when the NNP1 Watershed Management Plan is developed.

3.3 Institutional Arrangements for NNP1 Watershed Management

A Watershed Management Committee (WMC) has been established to oversee the implementation of the NNP1 Watershed Management Plan. Provincial regulations will be

developed and endorsed by Xaysomboun Provincial Governor for the NNP1 Watershed Management Plan. Details of WMC are provided in Annex 4. Figure 3 provides an organizational structure for biodiversity conservation activities in the NNP1 Watershed. At the central government, DFRM/MoNRE will be the lead agency and coordinate with the Company for preparation and implementation of the biodiversity management sub-plan of the NNP1 watershed management plan. In the province, WMC oversees the implementation biodiversity management activities. The Watershed Management Office will be established under PoNRE and consisted of staff from MONRE (DFRM), PoNRE, and DoNRE, and will act as the implementation unit. At the same time, technical assistant will be recruited to support implementation. The BAC will provide technical advice on the planning and implementation of biodiversity management in the NNP1 Watershed.

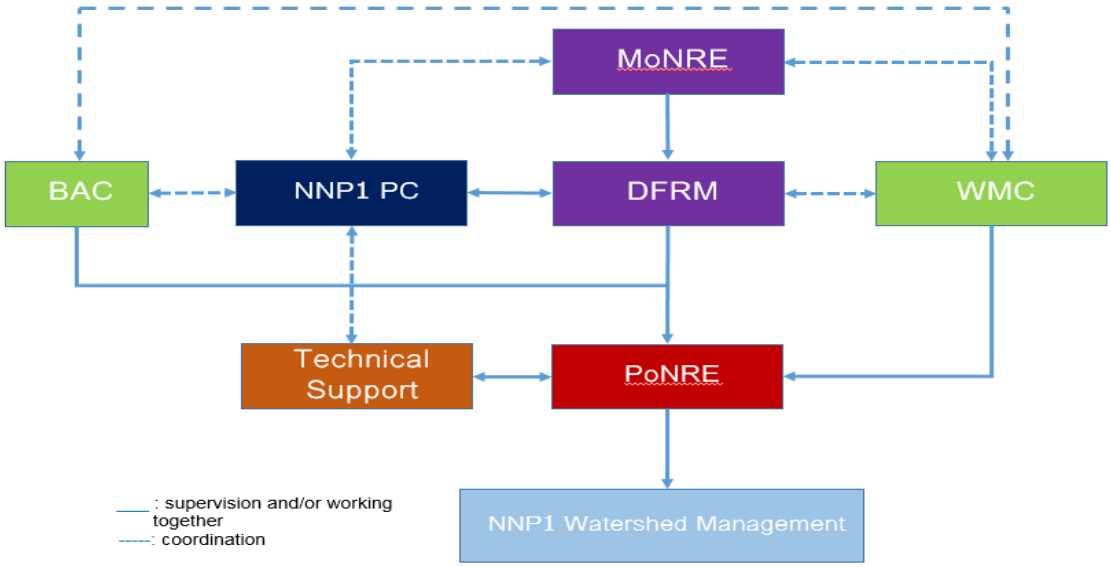

Figure 3. NNP1 Biodiversity Conservation Management in NNP1 Watershed

4. Role and Responsibilities, Time-bound Action Plan and Budget

4.1 Role and Responsibilities

The Table 1 indicates each party's roles and responsibilities for the biodiversity offset and watershed management as indicated.

Table 1: Outline of Roles and Responsibilities of key agencies for the activities

No	Task	NNP1PC	MoNRE	PoNRE	WMC/BOMC	BAC
1	Survey and Biodiversity Offset Needs Assessment (Rapid survey for Spatial	• Lead the survey and study • Provide fund as indicated in CA	• Review and approve TOR and survey plan	Provide logistic arrangement and participate in the survey	• Endorse TOR and survey plan • Support the survey work	• Review the survey work • Provide technical

No	Task	NNP1PC	MoNRE	PoNRE	WMC/BOMC	BAC
	Condition, Species Survey, Residual Impacts Study, Spatial residual, Species residual, Watershed study*)	• Develop TOR • Recruit consultants • Involve in survey and studies • Facilitate and coordinate for the survey	• Coordinate and monitor the survey		within area responsible	opinion (if any) to improve the survey
2	Development and implementation of NNP1 Watershed Management Plan	• Develop draft Watershed Management • Develop TOR • Recruit consultants • Involve in studies • Facilitate and coordinate for the survey	• Oversee and guide the preparation and implementation of NNP1 Watershed Management Plan • Monitor the preparation and implementation of NNP1 Watershed Management Plan	• Propose for approval of Watershed Management Plan • Participate in plan preparation • Lead** in the implementation of NNP1 Watershed Management Plan	• Endorse the plan • Oversee the implementation of NNP1 Watershed Management Plan	Provide technical opinion (if any) to improve the plan
3	Development and implementation of the Biodiversity Management Sub-Plan of the NNP1 Watershed Management Plan	• Develop activity plans for biodiversity conservation in NNP1 watershed area • Develop TOR • Recruit consultants	• Oversee the biodiversity conservation activities in NNP1 watershed area	• Participate in plan preparation • Lead** in the implementation of biodiversity conservation in NNP1 watershed area	• Oversee and support the biodiversity conservation activities in NNP1 watershed area	• Review and provide opinion on biodiversity conservation in NNP1 watershed area

No	Task	NNP1PC	MoNRE	PoNRE	WMC/BOMC	BAC
		• Involve in studies • Facilitate and coordinate for the survey				
4	Offset site selection	• Develop site selection criteria • monitor the survey work and site selection process • Carry out survey and supplement studies	• Agree the site selection criteria • Oversee the site selection process	• Involve in the survey and all field works for offset site selection	• Discuss and agree the criteria • oversee the site selection process	• Provide advice on the “no net lost and/or net gain” evaluation • Provide opinion on the selection of the offset site
5	Development and Implementation of the Biodiversity Offset Management Plan	• Develop Biodiversity Offset Management Plan • Develop TOR • Recruit consultants • Involve in survey and studies • Facilitate and coordinate for the survey	• Oversee and guide the preparation and implementation of Biodiversity Offset Management Plan • Monitor the preparation and implementation of Biodiversity Offset Management Plan	• Propose for approval of Biodiversity Offset Management Plan • Lead** and participate in plan preparation • Lead in the implementation of Biodiversity Offset Management Plan	• Endorse the plan • Oversee the implementation of Biodiversity Offset Management Plan	• Visit and provide opinion on preparation and implementation of Biodiversity Offset Management Plan

* Watershed study will include wildlife, land use, erosion and sedimentation, water resource and quality, reservoir, forestry, fishery and water related disaster

** The implementation of the NNP1 Watershed Management plan, including the Biodiversity Management Sub-Plan, requires involvement of different agencies, such as, Agriculture and Forestry sector, Lao Front for National Construction, Lao Women Union, National Defence and Police, and local communities. The PoNRE is a center for watershed management, hence leading the implementation of the activities.

4.2 Time-bound action plan

The time-bound action plan outlines the key tasks with the time as indicated in Table 2.

Table 2: Time-bound action plan

No.	Task	Start	End
1	Survey and Biodiversity Offset Needs Assessment		
1.1	Rapid survey for Spatial Condition	Mar-15	July-15
a	Recruitment of consultant for the Survey	Mar-15	Mar-15
b	Survey	Apr-15	July-15
1.2	Species survey	Mar-15	Mar-16
a	Recruitment of consultant for the survey	Mar-15	Mar-15
b	Survey	Apr-15	Mar-16
1.3	Residual impacts study	Mar-15	Sep-15
a	Recruitment of consultant for the survey	Mar-15	Mar-15
b	Survey	Apr-15	Sep-15
c	Consensus building on residual impacts and offset needs followed by workshops* on residual impact and offset needs assessment	Aug-15	Aug-15
1.4	Watershed study	Mar-15	Mar-16
a	Recruitment of consultant for the watershed study	Mar-15	Mar-15
b	Study	Mar-15	Mar-16
2	Development and implementation of NNP1 Watershed Management Plan		
a	Consultant recruitment	Mar-15	Mar-15
b	Planning	Mar-15	Mar-16
c	Implementation	Mar-16	
3	Development and implementation of the Biodiversity Management Sub-Plan of the NNP1 Watershed Management Plan		
a	Consultant recruitment	Mar-15	Mar-15
b	Planning	Mar-15	Mar-16
c	Implementation	Apr-16	
4	Offset site selection	Jul-15	Sep-15
5	Development and Implementation of the Biodiversity Offset Management Plan		
a	Consultant recruitment	Jul-15	Jul-15
b	Planning	Sep-15	Jun-16
c	Workshop	May-16	May-16
d	Implementation	Jul-16	

* The workshops on residual impact study and offset needs will discuss the candidate sites as well

4.3 Budget

4.3.1 Watershed Management and Biodiversity Offset Budget: in accordance with Annex C of CA, the Company shall provide the GoL with a total of $3,872,000 for the biodiversity offset under Clause 54 of Annex C (items 12-16 of Table 1-5, Appendix 3 of the Annex C), and a total of $6,550,020 for the Watershed Management Fund (items b of Table 1-8, Appendix 3 of the Annex C). These funds will be transferred from the Company to the GoL and will be utilized by the GoL in accordance with Clause 83 of Annex C. In addition, the Company will directly incur expenditures for watershed management and biodiversity offset in the amount of $2,176,920 (Table 1-6, Appendix 3 of the Annex C). The breakdown of these expenditures are indicated in Table 3.

Table 3: Budget Allocation to the Activities

No.	Task	Expenditures through GoL	Expenditures by NNP1PC
1	Survey and Offset Needs Assessment Studies		
1.1	Rapid survey for Spatial Condition		100,000
1.2	Species Survey		400,000
1.3	Residual Impacts Study		50,000
1.4	Watershed study	120,000*	100,000
2	Development and implementation of NNP1 Watershed Management Plan		
2-1	Plan development		500,000
2-2	Implementation	4,430,020	
3	Development and implementation of the Biodiversity Management Sub-Plan of the NNP1 Watershed Management Plan		
3-1	Plan development		200,000
3-2	Implementation	2,000,000	
4	Offset site selection		25,000
5	Development and Implementation of the Biodiversity Offset Management Plan		
5-1	Plan development		300,000
5-2	Implementation	3,872,000	
	Total	10,422,020	1,675,000**

* PoNRE provides logistic arrangement and participates in the survey.

** The use of the remaining budget will be determined after further progress in the watershed management and biodiversity offset planning.

Based on the government budget's law, NNP1PC will disburse the funds from NNP1PC account to the National Bank owned by the Ministry of Finance (MOF); the budget will be provided to PoNRE through DFRM for activities implementation. Figure 4 indicates the Fund flow arrangements.

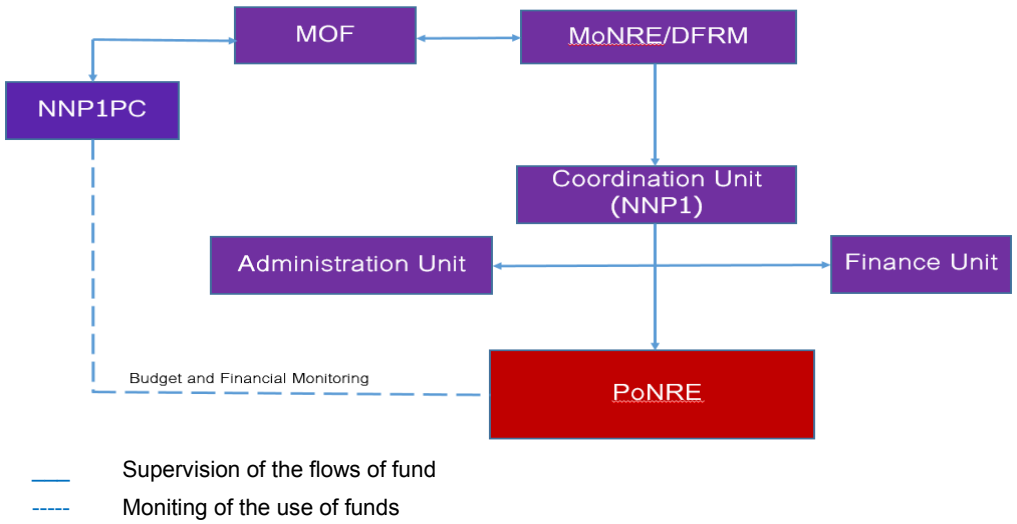

Figure 4: Fund Flows Structure for NNP1 Project

4.3.2 Environment Protection Fund: in addition, the Company has committed to contribute a total of $990,000 to the Environment Protection Fund (EPF). The GoL agrees that the Company's contribution to EPF be utilized to support the offset activities under this framework. The EPF is a financial mechanism established under the Prime Minister's Office, its Board of Director (BOD) is chaired by the Deputy Prime Minister, who is at the same time a chairman of the National Environment Committee, and Minister of Finance is a deputy chair of the EPF's BOD. Currently, the EPF is operated by different sources of funds, namely, the ADB endowments (about $6M), World Bank projects (about $45M), and other development partners of hydropower and mining in the Lao PDR. The EPF has its own procedure; at present, the funds are operated through two of five windows, which are the Policy Implementation and Capacity Enhancement and Community and Biodiversity Investment (CBI). The fund can be accessed by local government agencies at different levels, local communities and NGOs. A sub-project proposal has to be prepared according to the EPF format standard, a technical committee will review the proposal before the EPF's BOD approval, and fund can be released for activities implementation.

The fund provided by NNP1PC will be sited in the CBI window and provided for the protected area management and biodiversity conservation activities in Bolikhamxay and Xaysomboun provinces.

Annex 1

Biodiversity Management Sub-Plan of the Watershed Management Plan

1. Terrestrial Habitats

Standard management actions have been designed to achieve gains in biodiversity values for the terrestrial habitats of the Nam Ngiep1 Watershed (NNP1 Watershed). These actions should be further developed and incorporated into the Biodiversity Management Sub-plan of the NNP1 Watershed Management Plan. The actions are outlined in Table A1.1.

Table A1.1: Standard Management Actions for Terrestrial Habitats

Management Action	Purpose	Description
1. Biodiversity Management Plan preparation	Defines governance framework for management of offset projects.	The management plan is to provide the roles, responsibilities, accountabilities, actions, resources and budgets available to actively manage biodiversity in NNP1 Watershed Area. Clear goals and objectives linked to the monitoring and evaluation framework should be set.
2. Monitoring and evaluation	Defines approach to monitor the implementation of management actions	The monitoring and evaluation framework is to define an approach to determine the effectiveness of the management actions in achieving biodiversity conservation goals. The approach should look at the institutional, financial and governance frameworks applied as well as relevant biodiversity indicators (species richness, basal area). The monitoring and evaluation should directly relate to goals and objectives set for offset management. It is critical that the monitoring program be matched to the capacity of the parties that will use that information.
3. Management of hunting	Manages threats to animals from illegal hunting and poaching.	The management of hunting should monitor and prevent in conjunction with MoNRE and the community, activities that illegally hunt and poach wildlife within the NNP1 watershed . The approach should include: patrols and surveillance for illegal hunting activities; education and awareness; and incentives.
4. Sustainable forestry management	Manages unsustainable and illegal use of timber.	Sustainable forestry management should focus on the ecologically sustainable harvesting of timber from the offset site for the use within the local community. The approach should restrict impacts on known habitats to threatened species; sustainable yield assessment and harvesting approaches; patrols and surveillance for illegal forestry activities; education and awareness and incentives.

Management Action	Purpose	Description
5. Wildlife Corridors	Links habitats within the landscape	Development of appropriate wildlife corridors enables the movement of wildlife between discrete areas of habitat within the landscape. This can be achieved through land use planning or supplementary establishment of habitat.
6. Sustainable forest product use (NTFP)	Manages unsustainable NTFP use.	The sustainable use of NTFP should focus on documenting cultural and heritage usage of NTFP; analysis of sustainable yield for NTFP; identifying alternatives where sustainable collection is identified; and education and awareness on sustainable collection practices.
7. Management of weeds and pests	Manages threats to biodiversity from introduced weeds and pests.	Managing weeds and pests should: identify and monitor the distribution and abundance of weeds and pests in the area; identify appropriate controls at a spatial and temporal scale; define control techniques and actions. Actions may include active control of weeds or specific hunting programs for pest animals.
8. Fire management	Manages impacts on biodiversity from inappropriate use of fire.	Managing fire should: identify historical fire regimes within the offset site at a spatial and temporal scale; determine ecological fire regimes based on intensity and frequency of fire; defining and map exclusion zones; consider threatened species responses to fire; and design ecological fire control methods.
9. Sediment and erosion control	Manages impacts on water quality and soil integrity from sediments and erosion.	Sediment and erosion control should focus on key sources of sediment pollution within the watershed. Mapping of soils and erosion sources should be undertaken; and targeted management actions should be designed to manage sediment sources (natural surface roads, areas of existing erosion). A detailed maintenance and monitoring regime should also be designed to ensure the effectiveness of management control measures.
10. Assisted natural regeneration	Promotes biodiversity where natural regeneration is constrained due to past land use or ecological factors.	Assisted natural regeneration should focus on the establishment of relevant plant stock to assist natural regeneration of disturbed areas. Assessment and mapping of areas identified as being suppressed or degraded; determination of suitable plant stock and planting regime; collection and propagation of plant stock; preparation and management of regeneration areas. Local community engagement in horticultural activities is recommended.
11. Habitat installation (eg.	Provides habitat for species where natural	Habitat enhancement should focus on restoring critical habitat features such nesting hollows that have been impacted or removed from the forest. An assessment

Management Action	Purpose	Description
nest boxes and salt licks)	habitats have been removed.	should be undertaken of the presence of habitat features (such as nesting tree hollows, shelter and refuge sites) within the offset area. A program of habitat installation should occur to mimic the natural presence of these features within the landscape. An example is the installation of nest boxes for hollow dependant birds or salt licks for terrestrial mammals.
12. Community engagement and development	Provides consultative mechanisms and engages the community in active participation in biodiversity conservation.	Community engagement and development is designed to involve the local community in the management actions developed for each the offset sites. Consultation during the preparation of the management plans is required to ensure that the management actions and approaches are acceptable to the community. This can include direct engagement in undertaking actions (hunting patrols, employment at the nursery; manufacture of nest boxes). Community engagement is an essential component in determining the appropriateness and ensuring success of the sustainable forest practices and NTFP development.
13. Education and awareness	Provides education and awareness for local communities to promote biodiversity conservation.	Education and awareness approaches are integral to the success of offset management. This should include community engagement surveys; education seminars; posters and flyers; identification of community champions and incentives. Each management action should include an education and awareness component.

2 Aquatic Habitats

In relation to managing aquatic habitats within the NNP1 Watershed, the standard management actions in Table A1.2 have been developed. These are intended to be implemented in the NNP1 Watershed Management Plan and incorporated into the environmental flow management regime (as outlined in the Concession Agreement).

Table A1.2: Standard Management Actions for Aquatic Habitats

Activity	Actions
Monitoring and evaluation	Monitoring and evaluation of the impacts on aquatic species and habitats will be undertaken. This will include: Research into the fishery health of the Nam Ngiep River; Analysis of the fishery yield of the Nam Ngiep River; Research into the lifecycle of CR and EN fish within the lower Nam Ngiep; Water quality monitoring; Watershed protection activities; and Watershed risk mapping.
Sediment and erosion control	Sediment and erosion control activities from natural surface roads, agriculture and developments in offset areas and the Nam Ngiep river will be targeted. This will include: Education and awareness of best practices for sediment and erosion control; Dissemination of best practice guides for sediment and erosion control; Engagement with MoNRE regarding the design and maintenance of natural surface roads; Engagement with DFRM on sediment and erosion control in Production Forests; and Agricultural extension activities.
Riparian area protection	Targets the protection of riparian areas to enhance habitats and prevent degradation of water quality from overland diffuse sources of pollution. This will include Watershed management activities that protect riparian habitat; management of diffuse and point source pollution; land use management activities; education and awareness; workshops and engagement with landholders to promote sustainable land use practices, including agricultural and forestry extension activities.
Management of fish habitat	Targets the management of fish habitat to protect and enhance habitat for species lifecycle. Management of fish habitat includes the preservation of in- stream habitat from clearance; active enhancement of existing habitats; Watershed management activities to manage diffuse and point pollution sources; and sustainable fisheries management techniques.
Community engagement and development	Community engagement and development is key to improving watershed management and habitat quality. The diffuse nature of water pollution and its impact on water quality requires community extension activities aimed at: Awareness of land use activities on water quality; Extension activities with major land use activities (agriculture, forestry, hydro and mining developments); and Fisheries awareness and sustainable management.
Education and awareness	Education and awareness activities should be aimed at Government (MoNRE; PoNRE and DFRM); industry and the local community. Engagement of MoNRE and PoNRE through the administration of offsets will improve capacity and understanding of watershed management activities. At a local level, community engagement and development activities should be aimed at improving the knowledge and understanding of watershed management activities and key threats to aquatic ecosystems.

3 Species Specific Management Actions

Table A1.3 outlines the presence of species values within NNP1 Watershed and the management program required for those species to manage and recover these populations.

Table A1.3: Species Management Framework

	Species	Nam Ngiep 1 Watershed	Offset Management Required (included Species Offset Management Plan)
Category 1 species where the species are more restricted in their range or specific lifecycle elements indicate that the residual impacts remaining after mitigation on habitats for the species is likely to be more significant than for Category 2 species.			
Mammals	Asian small clawed otter	✓	Survey and monitoring of species presence within offset areas. Identification of core habitat and management of identified populations Species specific management actions identified to manage identified populations. Targeted campaigns to manage key threats (eg. education and awareness activities for individual species). Alignment of conservation priorities to National and International management plans and requirements Monitoring the effectiveness of offset management activities on species populations
	Asian elephant	✓	
	Smooth coated otter	✓	
	Sunda panGoLin	✓	
	Leopard	*	
	Tiger	✓	
	Fishing cat	✓	
	Phayre's leaf monkey	✓	
	White-cheeked gibbon	✓	
Birds	Green peafowl	*	
Reptiles	Elongated tortoise	*	
	Big-headed turtle	✓	
Category 2 species have a wide distribution and the residual impacts remaining after mitigation on habitats for the species from the project is a relatively small proportion of the total distribution of habitat for the species			
Flora	Dipterocarpust urbinatus	✓	Supplementary planting of individuals.
	Shorearoxburg hii	✓	
	Afzeliaxylocar pa	✓	
Mammals	GoLden jackal	*	Survey and monitoring of species presence within offset areas. Targeted survey for species not identified (particularly birds). Management of key threats. Identification of core habitat and management of populations Monitoring the effectiveness of offset management activities on species populations Alignment of conservation priorities to National and International management plans and requirements
	Southwest China serow	✓	
	Dhole	✓	
	Sun bear	✓	
	Bengal slow loris	✓	
	Pygmy slow loris	✓	
	Asiatic GoLden cat	*	
	Leopard cat Sambar	*	
	Himalayan black bear	✓	
Birds	Wreathed hornbill	*	
	Great hornbill	*	
	White winged duck		
	Greater coucal	*	

	Species	Nam Ngiep 1 Watershed	Offset Management Required (included Species Offset Management Plan)
	Siamese fireback	*	
	Silver pheasant	*	
	Grey peacock pheasant	*	
	Red-breasted parakeet	*	
	Darter	*	
	Rufous necked hornbill	✓	
	Crested argus	*	
	Spot-bellied eagle owl	*	
	Red-collared woodpecker	*	
	Hoopoe	*	
Reptiles	Reticulated python	*	
	King cobra	✓	

✓ Denotes survey or literature has identified the presence of the species

* Denotes likely habitat present for the species

The Environment Impact Assessment (EIA) has identified number of important fish species in the upper and lower Nam Ngiep catchment areas. A survey conducted by Dr. Kottelat (March 2014) mentioned that the giant pike-carp (*Luciocyprinus striolatus*) is present in the inundation zone. The survey will be taken place in the upper NNP1 reservoir and its tributaries to identify their habitats including spawning area. A separate management plan will be developed once the sites are identified for the management of targeted fish species as listed in the Table A1.4.

Table A1.4 List of Fish Species Targeted for Conservation in the Upper and Lower Nam Ngiep Catchment

No.	Common Name	Scientific Name	IUCN Category
1	Giant pike-carp	*Luciocyprinus striolatus*	CR
2	Giant barb	*Catlocarpio siamensis*	CR
3	Leaping barb	*Laubuca caeruleostigmata*	EN
4	Striped catfish	*Pangasianodon hypothalamus*	EN
5	Yellow tail brook barb	*poropuntius deauratus*	EN
6	Thricklipped barb	*Probarbus labeamajor*	EN
7	Leaping barb	*Laubuca caeruleostigmata*	EN
8	Yellow tail brook barb	*poropuntius deauratus*	EN

9	Mrigal carp	*Cirrhinus cirrhosis*	VU
10	Common carp	*Cyprinus carpio*	VU
11	Bandan sharp-mouth barb	*Scaphognathops bandanensis*	VU
12	Jaguar loach	*Yasuhikotakia splendida*	VU
13	Common carp	*Cyprinus carpio*	VU
14	Bandan sharp-mouth barb	*Scaphognathops bandanensis*	VU
15	Mrigal carp	*Cirrhinus cirrhosis*	VU
16	Jaguar loach	*Yasuhikotakia splendida*	VU

Annex 2

Biodiversity Advisory Committee (BAC) Terms of Reference

A Biodiversity Advisory Committee (BAC) will be established to (i) provide technical advice on the offset planning (including site selection), (ii) monitor the implementation of the offset program, and (iii) evaluate the implementation effectiveness. The BAC also provide technical advice on biodiversity management in NNP1 Watershed. The BAC will review the bi-annual implementation progress report on biodiversity offset and management activities, and advise the GoL and NNP1PC for the improvement of the NNP1 biodiversity offset management plan as it is appropriated.

The BAC has the following specific role:

- Review all project's related documents, particularly the EIA/ESMMP, Biodiversity Offset Design Report, Biodiversity Baseline Assessment Report, the Biodiversity Offset Framework, and the relevant Laos' legislations.
- Provide advice on the "no net lost and/or net gain" evaluation. Review the biodiversity baseline survey method and ongoing survey, the biodiversity offset management plan, and the implementation of the biodiversity offset management plan carried by NNP1PC and the GoL.
- Produce an "opinion" and recommendations on the suitability of the biodiversity baseline survey design and the biodiversity offset management plan (adding clarification or details as the BAC feels appropriate), and the effectiveness of implementation of the biodiversity offset management plan.
- Provide an overall independent "opinion" on the quality of the biodiversity survey implementation and implementation of the biodiversity offset management plan. This would require one annual field visit by at least two of the three members.
- Advise the NNP1PC and the GoL as requested on implementation of the biodiversity offset management plan and provide input on the design of the longer term biodiversity offset management under the Project.
- Monitor and provide adequate technical advices to the related government agencies and NNP1 on proper implement the biodiversity plans under NNP1 project.
- Advice related government agencies on how to improve NNP1 biodiversity offset management program as the BAC sees appropriated.

Qualification of BAC members are as follows:

- All BAC members must have biological academic background and work experience in field indicated in the TOR;
- Have more than 15 years international experiences in biological and protected area management;
- Knowledgeable about GoL policies and experiences working in Lao PDR; and
- Ability to work and travel to remote area in the project areas.

Annex 3

Biodiversity Advisory Committee (BAC) Administrative Procedure

1 Organization and Administration

NNP1PC will contract the BAC and coordinate the BAC's activities, including all logistics during their visit. The BAC will issue a brief reports after each visit to reflect an "Opinion" on biodiversity offset management activities that are prepared and implemented by the NNP1 and GoL.

NNP1PC will draft a TOR, process for recruitment, provide finance support and coordinate activities of BAC during their mission. MoNRE/DFRM will review and endorse the TOR, provide their opinion on proposed candidate for BAC members, and facilitate their mission in the country. PoNRE will accompany the BAC for field visit.

2 Member Selection Procedure:

The following steps are proposed for the recruitment of BAC member. Potential candidates will be identified, the shortlisted members will be approached for their interest, and the name of selected candidates will be submitted to ADB and GoL for their approval prior to the final selection. The following table provides steps, dates and responsible agencies toward the selection of the BAC.

3. Working process:

It was indicated in the TOR that the BAC will visit the biodiversity offset site several times to review the (a) design of the biodiversity baseline survey and actual survey activities carried out in the field, (b) preparation of the biodiversity offset management plan, and (c) implementation of the biodiversity offset management plan. Their findings and recommendations will be provided to GoL, NNP1PC and lenders for further improvement of the NNP1 biodiversity offset program. Figures 5.1 and 5.2 indicate the supervision and coordination line for NNP1 biodiversity offset program.

NNP1PC will assist and coordinate for the BAC missions. The communication should be done between the Team Leader of BAC and NNP1PC for all works, including sharing of information, coordinating for BAC mission, setting up all appointment with GoL's counterparts, and other logistics. At the end of each mission, a wrap up meeting will be organized by NNP1PC so that the BAC can to inform NNP1PC and GoL of their opinion and recommendations to improve the implementation of biodiversity offset activities.

A report covering their field activities, findings, opinion, and recommendations will be provided to NNP1PC within 30 days of the end of each of mission.

Annex 4

Watershed Management Committee (WMC)

The WMC members were appointed in Xaysomboun province by the Provincial Governor's letter number 752/Governor/Xaysomboun dated 27 August 2014, and in Bolikhaxay by the Provincial Governor's letter number 538/Bolikhamxay dated 9 September, 2014 to oversee the implementation of the Nam Ngiep 1 watershed management activities.

The WMC is comprised of 11 members in Xaysomboun and six in Bolikhamxay. Additional members will be appointed from MoNRE and NNP1PC. The committee is chaired by Vice Governor of Xaysomboun Province and co-chaired by the Vice Governor of Bolikhamxay, the Head of PoNRE of Xaysomboun and Deputy Head of PoNRE of Bolikhamxay provinces are Vice Chair to the WMC, and comprised of related provincial departments and governor of districts concerned as members. At ministerial meeting on 3 October 2014, the decision was made that an additional committee be established at the central level (MoNRE) to supervise the overall activities.

Table A4.1: NNP1 Watershed Management Committee Members

Xaysomboun province	Bolikhamxay province
Vice Governor, Xaysomboun Province, Chairman.	Vice Governor, Bolikhamxay Province, Chairman.
Head of PoNRE, Xaysomboun Province, Deputy Chair.	Deputy Head, PoNRE, Bolikhamxay Province, Deputy Chair.
District Governor, Hom District, Member.	Deputy Head, Agriculture Department, Bolikhamxay Province, Member.
District Governor, Anouvong District, Member.	Deputy Governor, Bolikhanh District, Bolikhamxay Province, Member.
District Governor, Thathom District, Member.	Deputy Governor, Pakxan District, Bolikhamxay Province, Member.
Head Department of Energy and Mines, Xaysomboun Province, Member.	Head of Forest Resources Management Division, Bolikhamxay Province, Member and Head of BAC's secretariat
Head of Department of Agriculture and Forestry, Xaysomboun Province, Member.	
Deputy Head, Provincial Police, Xaysomboun Province, Member.	
Deputy Head, Provincial Army, Xaysomboun Province, Member.	
Representative of NNP1PC, Member.	
Head of Forest Resources Management Division, PoNRE, Xaysomboun Province, Member and Head of BAC's secretariat.	