

# Environmental Monitoring Report

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**PUBLIC**

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October 2024

## Bhutan: Water Flagship Program Support Project

Prepared by the Project Management Unit, Water Flagship Program Support Project, Ministry of Infrastructure and Transport, Royal Government of Bhutan for the Asian Development Bank (ADB).

## CURRENCY EQUIVALENTS

(as of 28 July 2023)

Currency unit	–	Bhutanese Ngultrum (Nu.)
Nu.1.00	=	\$ 0.01216
\$1.00	=	Nu.82.2400

## ABBREVIATIONS

ADB	-	Asian Development Bank
BoQ	-	bill of quantity
CEMP	-	Contractor's Environmental Management Plan
DBO	-	design-build-operate
DES	-	Department of Engineer Services
EAA	-	Environmental Assessment Act
EC	-	Environmental Clearance
EMP	-	environmental management plan
GESI	-	gender equity and social inclusion
GRC	-	Grievance Redress Committee
GRM	-	grievance redress mechanism
IEE	-	initial environmental examination
JFPR	-	Japan Fund for Prosperous and Resilient Asia and the Pacific
MOWHS	-	Ministry of Works and Human Settlement
MOAF	-	Ministry of Agriculture and Forestry
MOAL	-	Ministry of Agriculture and Livestock
MOIT	-	Ministry of Infrastructure and Transport
NEC	-	National Environment Commission
NECS	-	National Environment Commission Secretariat
NEPA	-	National Environmental Protection Act
NOC	-	no objection certificate
ODS	-	ozone-depleting substance
O&M	-	operation and maintenance
PMSC	-	Project Management and Supervision Consultant
PMU	-	project management unit
PIU	-	project implementation unit
RGOB	-	Royal Government of Bhutan
RP	-	Resettlement Plan
SCADA	-	Supervisory Control and Data Acquisition
SEMP	-	site-specific environmental management plan
SEMR	-	semi-annual environmental monitoring report
SPS	-	safeguard policy statement
WFP	-	Water Flagship Program
WSC	-	Water Sharing Committee
WSD	-	Water and Sanitation Division
WUA	-	Water Users Association

## **WEIGHTS AND MEASURES**

lps    liter per second

### **Dzongkha Terminologies**

Dzongkhag	District
Thromde	Municipality
Tsogpa	Village Headman

### **NOTE**

In this report, "\$" refers to United States dollars.

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## I. INTRODUCTION

### A. Overall project description and objectives

1. For the Water Flagship Support Project, the ADB approved a loan for \$14 million from ADB's concessional ordinary capital resources, a grant for \$6 million from ADB's Asian Development Fund (ADF 13), and a grant of \$2 million from Japan Fund for Prosperous and Resilient Asia and the Pacific (JFPR) (to be administered by ADB) on 12 December 2022. The loan and grant agreements were signed on 14 December 2022 and become effective on 14 January 2022. The loan and grant closing are on 30 June 2030. The government will contribute \$1.8 million to the investment cost of the project to finance (i) taxes and duties, (ii) land acquisition and resettlement costs, (iii) incremental administration costs, and (iv) contingencies. The total project cost was estimated at \$23.8 million.

2. Impact and outcome. The project will be aligned with the following impacts: (i) sustainable water access achieved and (ii) food self-sufficiency and nutrition security enhanced.<sup>1</sup> The project will have the following outcome: Resilience of residents and farmers to climate and disaster risks strengthened.

3.

4. Output 1: Climate- and disaster-resilient drinking water supply and irrigation infrastructure developed. The project will develop two gravity-fed integrated drinking water supply and irrigation systems in the Hetsotsamchu area (total design capacity 608 liters per second [lps]), and Zhemgang town and villages (total design capacity 250 lps). The project will also develop a drinking water supply system in Thimphu-Pamtsho area to benefit 1,378 households, which will include a new water treatment plant (1.4 million liters per day capacity), and a new district metering area-based distribution network (at least 16 kilometers) with 300 automatic meter reading household connections to improve access to safe and continuous drinking water supply that meets national standards.

5. Output 2: Climate smart water management systems established. The project will establish user-friendly climate smart water management (digital) systems for each of the three schemes established under output 1, which will integrate (i) climate and hydrological information such as rainfall, temperature, and upstream and intake river flow data with (ii) Supervisory Control and Data Acquisition (SCADA) or smart devices such as flow meters, pressure control, and flow valves connected to the infrastructure. These will enable remote real-time monitoring and operation (including automatic control) for early warning and prompt response to extreme events (floods). The systems will also strengthen the overall capacity of local communities to adapt to long-term climate change through improved information for planning and managing water allocation and utilization.

6. Output 3: Capacity, governance, and awareness of inclusive, resilient, and sustainable water management strengthened. To improve resilience, sustainability, and quality of water service delivery, the project will strengthen the capacity of at least 20 staff (at least 33% women) from the MoIT (formerly Ministry of Works and Human Settlement), Ministry of Agriculture and Livestock (formerly Ministry of Agriculture and Forests), municipal units, Dzongkhags, and Thimphu Thromde, in climate resilient and sustainable water service delivery, and their awareness of PPP.<sup>2</sup> The project will train local communities (200 people at least 33% women and disadvantaged persons) and/or water users associations (WUAs) in rural areas in sustainable operation and maintenance (O&M), asset management, water governance and allocation, and climate adaptation (in synergy with output 2). Service level

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<sup>1</sup> Royal Government of Bhutan, Gross National Happiness Commission. 2019. [Twelfth Five-Year Plan 2018–2023](#). Thimphu.

<sup>2</sup> Workshops will be held to explain public private partnership (PPP), with examples of successes and challenges in water and agriculture PPPs from other countries, and map out local private sector capacity to participate in PPP.

sustainability plans, with clear responsibilities and financing mechanisms and revenue improvement for O&M, and water and sanitation safety plans will be developed for the schemes. The project will raise community awareness (1,500 people at least 50% women and disadvantaged persons) on water resources conservation, integrated water resource management, water, sanitation, and hygiene (including limiting the spread of infectious diseases such as COVID-19), and climate change, to maximize the health and economic impact of the investments in the water supply. Women and adolescent girls will also benefit from tailored awareness-raising programs on menstrual health.

7. Output 4: Solutions for improved and climate resilient farmers' livelihoods introduced. The project will assist farm-level support activities to strengthen farmers' livelihood resilience to climate change and realize economic benefits from irrigation service improvement through crop diversification, production upscaling, processing, marketing, and extension service. This will include tailored training, extension, and mobilization of at least 300 farmers (50% women, youth, and disadvantaged persons) and implementation of a minimum of 10 pilots per irrigation scheme covering key issues for resilient agriculture such as crop diversification (e.g., the combination of food crops and trees), pest control, marketing, local processing to increase shelf-life, and climate smart agriculture applications.

**B. Environmental category as per ADB Safeguard Policy Statement, 2009**

8. The project is being implemented through the following subprojects

- (i) Thimphu- Drinking water supply infrastructure development for selected areas (Pamtsho) in the northern section of Thimphu thromde
- (ii) Hetsotsamchu Integrated drinking water supply and irrigation scheme
- (iii) Zhemgang- Drinking water to the town and irrigation water to the adjacent villages (Integrated drinking water supply and irrigation scheme)

**C. Environmental category of each subproject as per national laws and regulations**

9. The environmental category of the project is 'B' for all sub projects.

## D. Project Safeguards Team

10. The PMU has designated relevant Engineers as the focal for each subproject. Table 1 details the project safeguards officers.

**Table 1: Project Safeguard Team**

#	Name	Designation/Office	Email Address	Contact Number	Roles
<b>PROJECT MANAGEMENT UNIT</b>					
1	Mr. Sonam Gyeltshen	Engineer, Irrigation Division, MoAL	sgyeltshen@moal.gov.bt	17912108	Irrigation focal for Zhemgang & Social Safeguards Officer
2	Ms. Ugyen Dema	Engineer, Irrigation Division, MoAL	udemama@moal.gov.bt	17353290	Irrigation focal for Hesotshamchu & Environmental Safeguards Officer
3	Ms. Ugyen Yangchen	AE, WSD, MoIT	uyangchen@moit.gov.bt	77659698	Focal link between PMU and Thimphu PIU
4	Mr. KB Rana	AE, WSD, MoIT	kbrana@moit.gov.bt	17110352	Focal link between PMU and Zhemgang PIU
5	Mr. Karma	Principal Engineer, WSD, MoIT	Karma1@moit.gov.bt	17618505	Focal link between PMU and Wangdue Phodrang PIU
<b>PROJECT IMPLEMENTATION UNIT</b>					
<b>THIMPHU SUBPROJECT</b>					
1	Ms. Kelzang Lhamo Dorji,	Offtg. Chief Environment Officer, Thimphu Thromde	kldorji@thimphucity.gov.bt	17115117	Environment safeguards focal
2	Mr. Kezang Dorji	Urban Planner, Thimphu Thromde	kezangd@thimphucity.gov.bt	77812324	Social Safeguards Focal
<b>HESOTSAMCHU SUBPROJECT</b>					
1	Mr Sonam Wangchuk	Offtg. District Environment Officer	Somchuksonam558@gmail.com	17491489	Environment safeguards focal
2	Mr. Tashi Dorji	Offtg District Planning Officer	tashid@wangduephodrang.gov.bt	17611891	Social Safeguards Focal
<b>ZHEMGANG SUBPROJECT</b>					
1	Mr. Tandin Dorji	Offtg. District Environment Officer	tandin@zhemgang@gov.bt	17610297	Environment safeguards focal
2	Mr. Yeshey Rinzin	Assistant Engineer	yesheeryigzaay55@gmail.com	17823434	Social Safeguards Focal

## **E. Overall project and subproject progress and status**

11. The PMU and the PIUs have been established. The Project management team comprises of the following officers (in addition to those mentioned under Section #4). With the merger of the Irrigation Division, with the DOID of the MoIT, two staff from the Irrigation Division working on Zhemgang and Hetsotsamchu (in addition to the current irrigation focal) have been added to the PMU, as well as a focal for agriculture from the Ministry of Agriculture and Livestock, considering the agricultural development interventions of the project. The members of the Project Steering Committee include the following:

### **Project Management Unit (Executing agency, WSD, DoID, MoIT)**

- (i) Project Director: Mr. Karma Dupchuk, Director, DoID
- (ii) Project Coordinator: Ms. Tshering Chhoden, Offtg. Chief Engineer, WSD
- (iii) Project Manager: Ms. Chimi Dema, Dy. EE, WSD
- (iv) Accountant: Mr. Yad Bdr. Rai, Accountant, Finance Section
- (v) Irrigation focal for both projects: Mr. Thinley Gyamtsho, Specialist, Irrigation Division
- (vi) Agriculture focal (MOAL): Mr. Tsheltrim, Dy. Chief Agriculture Officer
- (vii) GESI Focal person: Mr. Pema Rabgay, PPD, MoIT

### **Project Implementation Unit (Thimphu Thromde)**

- (i) Project manager: Mr. Yeshey Wangdi (Chief Engineer, Infrastructure Division)
- (ii) Project Coordinator: Mr. Ngawang Tashi, Executive Engineer
- (iii) Project engineer: Mr. Pema Tashi, Engineer & Mr. Thukten Thinley, Engineer
- (iv) GESI focal person: Ms. Phub Dem, Legal Officer

### **Project Implementation Unit (Zhemgang)**

- (i) Project manager: Mr. Luv Kumar Chettri, Chief Dzongkhag Engineer
- (ii) Project engineer: Mr. Yeshey Rinzin, Assistant Engineer
- (iii) GESI focal person: Mr. Prem Lal Sharma, Asst. District Agriculture Officer

### **Project Implementation Unit (Wangdue Phodrang)**

Project manager: Mr. Nidup Tshering, Officiating District Engineer  
Project engineer: Mr. Singay Dorji, Asst. Engineer

12. The Project Steering Committee was instituted vide order # MoIT/DoID/WSD/WFP-39/2022-2023/1210 on 15/06/2023.

13. The PMU and PIUs are being supported by the PMSC, which was engaged by the project in February 2024 for a duration of 42 months.

**F. Description of subprojects (package-wise) and status of implementation (preliminary, detailed design, on-going construction, completed, and/or O&M stage)**

14. DB-01-Design, build and Operate of Water Treatment Plant for Thimphu Pamtsho with 2-year O&M -The contract was awarded on 8 August 2023 with site possession on 17 August. The work is expected to be complete by 18 April 2025.

15. CW-01-Construction of Distribution Network for Pamtsho, Thimphu- The contract was awarded on 16 August 2023 to Bhutan Engineering Co. Pvt. Ltd (BEC) and work commenced from 18 August. The project is for a duration of 20 months up to 18 April, 2025. The work order is attached in Appendix 3b. The work involves pipelaying for 24.6km (DI-5.4km and HDPE pipes 14.2km). 66% of the physical work progress has been achieved during the reporting period.

**Table 2: Status of all subprojects/packages**

Package/ Subproject	Subproject / Package components	PIU	Current Status	Bid / contract type
DB-01-Design, build and Operate of Water Treatment Plant for Thimphu Pamtsho with 2-year O&M	(i) Construction of administrative building (ii) Construction of staff quarters building (iii) Construction of Water Treatment Plant for	Thimphu Thromde	Under implementation	DBO
CW-01-Construction of Distribution Network for Pamtsho, Thimphu	(i) Topographic survey (ii) Purchase of pipes of all diameters recommended as per design. (iii) Excavation works for the pipe trenches continued in the quarter. (iv) Installation of mainline pipes in trenches		Under implementation	Works
CW-02-Construction of Integrated drinking water and irrigation for system for Zhemgang including 2 years O&M	(i) Survey, geo-technical investigation, and miscellaneous items (ii) Irrigation (iii) Drinking water supply system rehabilitated and improved (iv) Irrigation efficiency improved (v) Design, supply and installation of instrumentation, SCADA system (vi) Operation and Maintenance for 2 years (vii) Supply of equipment, tools and spares	Zhemgang Dzongkhag	In the process of awarding the bid to contractor	Works
DB-02: Construction of integrated drinking water and irrigation system for Hesotsamchu including 3 years O&M	(i) Topographic survey (ii) Purchase of pipes of all diameters recommended as per design. (iii) Excavation works for the pipe trenches continued in the quarter. (iv) Installation of mainline pipes in trenches	Wangdue Phodrang Dzongkhag	Bid preparation for design work is being discussed whether it will be done in house or contracted out in the form of DBO.	DBO not yet finalised

Package/ Subproject	Subproject / Package components	PIU	Current Status	Bid / contract type
CW-03: Efficiency and resilience improvement for irrigation and drinking water supply (distribution) in Hesotsamchu scheme	(i) Topographic survey (ii) Purchase of pipes of all diameters recommended as per design. (iii) Excavation works for the pipe trenches continued in the quarter. (iv) Installation of distribution pipes in trenches		Bid document preparation	Works
G-01-Design, Supply and Install and Operation of Climate Smart Water management system including 3-year O&M	(i) Supervisory Control and Data Acquisition (SCADA) or smart devices such as flow meters, pressure control and flow valves connected to the infrastructure. (ii) Climate and hydrological information such as rainfall, temperature, and upstream and intake river flow data	All three PIUs	Detailed design	Works

**Table 3: Status of activities**

Package	Package status: 1. Date of Award 2. Date of mobilization 3. Scheduled completion 4. Duration 5. Contractor	Design progress to date	Construction progress to date	Works conducted during the reporting period
DB-01	1. 7-Aug-2023 2. 17-Aug-2023 3. 17-Feb-2025 4. 18 months 5. M/s EW Construction Pvt. Ltd. & Granus Water and Environmental Solution Pvt. Ltd. (JV)	100%	64%	<ul style="list-style-type: none"> <li>Site mobilization</li> <li>Topographical survey of WTP location</li> <li>Geotechnical exploration</li> <li>Sampling and raw water quality analysis</li> <li>Preliminary design</li> <li>Designs and drawings of staff quarter</li> <li>Construction of stilling chamber and staff quarter</li> </ul> 40% physical progress achieved in the quarter
CW-01	1. 8-Aug-2023 2. 4-Sep-2023 3. 18-April-2025 4. 18 months 5. M/s Bhutan Engineering Company Pvt. Ltd.	100%	66%	<ul style="list-style-type: none"> <li>Site mobilization</li> <li>Surveying and layout of main transmission line from Dechencholing WTP till Samtenling, including location of two reservoir tanks</li> <li>80% procurement of 150mm and 100mm dia DI pipes</li> <li>Dismantling works for the pre-sedimentation tank</li> <li>Trenching of 2.041km length for laying 150mm DI pipe and carrying pipe near the trenches</li> <li>Trenching of 80m length for laying 80mm DI pipe</li> <li>Trenching of 304m length for laying 63mm HDPE pipe</li> </ul>

**CW-02-Construction of Integrated drinking water and irrigation for system for Zhemgang including 2 years O&M**

16. The evaluation of the bid for the Zhemgang sub-project is underway, with contract selection and bid award to follow. It is anticipated that the contract agreement will be signed and work awarded by August 2024.

**DB-02-Construction of integrated drinking water and Irrigation system for Hesotsamchu including 3 years O&M**

17. The Bid Submission date was re-scheduled, and the actual dates related to Procurement activities, including Updated dates have been reflected in Procurement schedule monitoring sheet of the Quarterly Progress Report.

18. Discussions are ongoing between the PMSC design experts and PMU to decide the contract award modality for the Wangdue sub-project. It is being debated whether to award the contract entirely as DBOT or partially. Meanwhile, the integrated water and irrigation system design for Hesotsamchu is almost complete, thanks to the PMU's in-house design experts. The PMSC design experts caution against awarding the contract as DBOT, including the design component to a contractor, as it has led to inferior designs in the past and may take considerable time to meet client expectations.

**Project Management and Supervision Consultants (PMSC)**

19. The PMSC was recruited in February 2024 and will provide assistance to the PMU and PIU for project management and implementation as well as compliance monitoring for environmental and social safeguards for 42 months.

## II. COMPLIANCE STATUS WITH NATIONAL/STATE/LOCAL STATUTORY ENVIRONMENTAL REQUIREMENTS

20. Compliance with national statutory environmental requirements are summarized in table 4.

**Table 4: Status of Clearances**

Requirement	Project location	Contract package	Status
Environmental clearance	Thimphu	CW-01 and DB-01	Obtained on 6 October 2023 and is valid up to 5 October 2025. This is attached in Appendix 1a
	Zhemgang	CW-02	Obtained on 29 January 2024 and is valid up to 28 January 2025. This is attached in Appendix 1b.
	Hetsotsamchu	DB-02 and CW-03	The application for EC for Hetsotsamchu Subproject will be processed once the alignment for the subproject is finalized.
Forestry clearance	Thimphu	CW-01	Issued on 17 August 2023 for 20 (10 blue pine and 10 oak species)- Appendix 2
		DB-01	Issued on 25 August 2023 for 33 blue pine trees-Appendix 2b
	Zhemgang	CW-02	To be processed after final design is complete
	Hetsotsamchu	DB-02 and CW-03	To be processed after final design is complete

**Table 5: Status of compliance with national/state/local statutory environmental requirements**

Package No.	Subproject Name	Statutory Environmental Requirements <sup>3</sup>	Status of Compliance <sup>4</sup>	Validity if obtained	Action Required	Specific Conditions that will require environmental monitoring as per Environment Clearance, Consent/Permit to Establish <sup>5</sup>	Compliance
<b>THIMPHU SUBPROJECT</b>							
CW-01	Construction of Distribution Network for Pamtsho, Thimphu	National EC	EC clearance obtained On 6 October 2023 for both packages		EC clearance required a detailed implementation plan to be submitted within 3 months to the DECC	-Compliance with national environmental standards -Avoid disrupting the waterflow and pollution of water bodies -Maintain 30m buffer from water resources -Waste management as per 4R (Reduce, reuse, recycle, and responsibility) and ensure proper waste storage -Disposal of excess excavated soil at pre-identified sites only -Put appropriate measures to minimize soil erosion and landslides -Undertake adequate measures to minimize noise -Prepare and submit a detailed implementation plan to be submitted within 3 months to the DECC -Monitoring of compliance with EC conditions by designated environmental focal person -Maintain proper records of waste generated (type, quantities, characteristics) and submit to DECC annually -Obtain prior approval in case of modification to the application submitted.	-Complied
DB-01	Design, build and Operate of Water Treatment Plant for Thimphu Pamtsho with 2-year O&M						-Complied
CW-01	Construction of Distribution Network for Pamtsho, Thimphu		Issued on 17 August 2023 for 20 (10 blue pine and 10 oak	One time	Compliance with FC conditions	<ul style="list-style-type: none"> <li>Any damage caused to private or public property shall be borne by the clearance holder</li> <li>any waste generated from the activity shall be properly disposed of as part of existing</li> </ul>	-Being complied

<sup>3</sup> Specify (environmental clearance? Permit/consent to establish? Forest clearance? Etc.)

<sup>4</sup> Specify if obtained, submitted and awaiting approval, application not yet submitted.

<sup>5</sup> Example: Environmental Clearance requires ambient air quality monitoring, Forest Clearance/Tree-cutting Permit requires 2 trees for every tree, etc.

Package No.	Subproject Name	Statutory Environmental Requirements <sup>3</sup>	Status of Compliance <sup>4</sup>	Validity if obtained	Action Required	Specific Conditions that will require environmental monitoring as per Environment Clearance, Consent/Permit to Establish <sup>5</sup>	Compliance
			species)- Appendix 2			waste prevention and management regulations	-(No tree felling was required)
DB-01	Design, build and Operate of Water Treatment Plant for Thimphu Pamtsho with 2-year O&M		Issued on 25 August 2023 for 33 blue pine trees- Appendix 2b	On time	Compliance with FC conditions	<ul style="list-style-type: none"> <li>Any damage caused to private or public property shall be borne by the clearance holder</li> <li>any waste generated from the activity shall be properly disposed of as part of existing waste prevention and management regulations</li> </ul>	- Complied  - Being complied
<b>HESOTSAMCHU SUBPROJECT</b>							
DB-02	Construction of integrated drinking water and Irrigation system for Hetsotsamchu including 3 years O&M	National EC	Design is yet to be finalized		N/A	N/A	-
<b>ZHEMGANG SUBPROJECT</b>							
CW-02	Construction of Integrated drinking water and irrigation for system for Zhemgang including 2 years O & M	National EC	EC has been renewed on 29 January 2024 by the Department of Agriculture (Attached in appendix 1 b)	Valid till 28 January 2025	Compliance with EC conditions	<ul style="list-style-type: none"> <li>The channel construction must be in line with the National Irrigation Policy;</li> <li>The original alignment should be followed and no deviations must be made without prior DoA approval;</li> <li>The gross abstraction of water from the source should not exceed 105 litres per second;</li> <li>Wherever the soil structure is weak the channel must be lined with cement or HDPE pipe to prevent soil erosion and that the channel bed-slope must not exceed 1:100;</li> </ul>	- Contract is yet to be awarded to the contractor

Package No.	Subproject Name	Statutory Environmental Requirements <sup>3</sup>	Status of Compliance <sup>4</sup>	Validity if obtained	Action Required	Specific Conditions that will require environmental monitoring as per Environment Clearance, Consent/Permit to Establish <sup>5</sup>	Compliance
						<ul style="list-style-type: none"> <li>• To avoid landslides and instability the channel alignment must conform to the technical survey report;</li> <li>• Structures like Drop/cascade, retaining walls and aqueducts must be constructed as per the plan/design specifications;</li> <li>• Waste materials (timber, soil, stones etc.) must be disposed off in designated areas and as per the Forest &amp; Nature Conservation Act, 1995;</li> <li>• Occupational Health and Safety measures must be strictly maintained at all times and</li> <li>• Any disputes arising due to the construction of the channel shall be the responsibility of the project proponent.</li> </ul>	

### III. COMPLIANCE STATUS WITH ENVIRONMENTAL LOAN COVENANTS

21. The status of the environmental loan covenants is presented in the following table.

**Table 6: Status of compliance with environmental loan covenants**

No. (List schedule and paragraph number of Loan Agreement)	Covenant	Status of Compliance	Action Required
Schedule 4. Execution of Project: Financial Matters. 3. Conditions for award of Contract	The Borrower shall not award any Works contract that involves environmental impact until the Project Executing Agency has a) obtained the final approval of the IEE for such works from the Borrowers NEC. b) incorporated the relevant provisions from the EMP into the relevant works contract.	Complied for Thimphu subproject  Being complied for the other sub-project	No additional action required
Para 4.	The Borrower may award a works contract involving environmental impacts with its respective IEE on preliminary design having been cleared to and cleared by ADB if the contract (a) is of 'design and build' or 'turnkey' b) expressly provides the installation and construction phase (and commencement thereof) is conditional upon (i) a final RP for the works contract detailed design having been submitted to and cleared by ADB, (ii) the Borrower having notified ADB and the contractor in writing that due consultation has been carried out, all required physical and/or economic displacement has been completed, and compensation and other entitlements have been provided to affected people in accordance with the RP.	Complied for Thimphu subproject  Being complied for the other sub-project	
Safeguards Environment. Para 7.	The Borrower shall ensure, or cause each subnational government to ensure that the preparation, design, construction, implementation, operation and decommissioning of the project and all project facilities comply with (a) all applicable laws and regulations of the Borrower relating to environment, health and safety; (b) the environment safeguards, and (c) all measures and requirements set forth in the IEE, the EMP, and any corrective measures or preventive actions set forth in a Safeguards Monitoring Report.	Being complied	
Human and Financial Resources to Implement Safeguard Requirements. Para 11.	The Borrower shall make available necessary budgetary and human resources to fully implement each EMP and RP	Being complied	
Safeguards-Related Provisions in Bidding	The Borrower shall ensure, or cause each Subnational Government to ensure, that all bidding documents and contracts for Works contain provisions that require Contractors to:	Being complied for all sub-projects	Budget provisions have been made

No. (List schedule and paragraph number of Loan Agreement)	Covenant	Status of Compliance	Action Required
Documents and Works Contracts Para 12.	<p>(a) comply with the measures and requirements relevant to the contractor set forth in each IEE, EMP, and RP (to the extent they concern impacts on affected people during construction), and any corrective or preventative actions set forth in a Safeguards Monitoring Report</p> <p>(b) Make available a budget for all such environment and social measures.</p> <p>(c) provide the Borrower and the relevant Subnational Government, with a written notice of any unanticipated environmental, resettlement or indigenous peoples risks or impacts that arise during construction, implementation or operation of the Project that were not considered in the relevant IEE, EMP or RP.</p> <p>(d) adequately record the condition of roads, agricultural land and other infrastructure prior to starting to transport materials and construction, and fully reinstate pathways, other local infrastructure, and agricultural land to at least their pre-project condition upon completion of construction.</p>		<p>As ascertained during project preparation, there are no involuntary resettlement impacts</p> <p>d) no data has been recorded</p>
Safeguards Monitoring and Reporting Para 13.	<p>The Borrower shall do the following, or shall cause each Subnational Government to do the following:</p> <p>(a) Submit semi-annual Safeguards Monitoring Reports to ADB and disclose relevant information from such reports to affected persons promptly upon submission</p> <p>(b) If any unanticipated environmental and/or social risks and impacts arise during the construction, implementation or operation of the Project that were not considered in the relevant IEE, EMP or RP, promptly inform the ADB of the occurrence of such risks and impacts, with detailed description of the event and proposed corrective action plan; and</p> <p>(c) Report any actual or potential breach of compliance with measures and requirements set forth in any EMP or RP promptly after becoming aware of the breach.</p>	Being complied	
Prohibited List of Investments Para 14.	<p>The Borrower shall ensure, or cause each Subnational Government to ensure, that no proceeds of the Loan are used to finance any activity included in the list of prohibited investment activities provided in Appendix 5 of the SPS</p>	Being complied	
Labor Standards, Health and Safety. Para 15.	<p>The Borrower shall ensure, or cause each Subnational Government to ensure, that that core labor standards, the Borrowers applicable laws and regulations, and any applicable laws and regulations of any Subnational Government, are complied with during Project</p>	Being complied	Contractor orientation on compliance to Labor standards, health and

No. (List schedule and paragraph number of Loan Agreement)	Covenant	Status of Compliance	Action Required
	<p>implementation. The Borrower shall include specific provisions in the bidding documents and contracts financed by ADB under the Project requiring that contractors, among other things: (a) comply with the Borrowers applicable labor laws and regulations, and any applicable laws and regulations, and incorporate applicable workplace occupational safety norms; (b) do not use child labor; (c) do not discriminate workers in respect of employment and occupation; (d) do not use forced labor; (e ) allow freedom of association, and effectively recognize the right to collective bargaining; and (f) disseminate, or engage appropriate service providers to disseminate information on the risks of sexually transmitted diseases, including HIV/AIDS, to the employees of contractors engaged under the Project and to members of the local communities surrounding the Project area, especially women.</p>		<p>safety was undertaken as part of the ESS orientation by the Safeguard consultants and Thromde On 24 August and 1 September 2023 for both contractors (Thimphu sub-project)</p>
Para 16.	<p>The Borrower shall strictly monitor compliance with the requirements set forth in paragraph 15 above and provide ADB with regular reports.</p>	Being complied	<p>Worker accommodation has been constructed, with proper sanitation facilities, drinking water is sourced from Thromde and adequate lighting. PPE has been issued and PPE issuance register is maintained by the contractors. First aid boxes are available onsite.</p>

**A. Status of IEE Reports**

22. The status of the IEE reports is presented in the following table.

**Table 7: Status of IEEs**

Package	Status of draft IEE	Draft IEE included in bid and contract	Updated / final IEE		
			Requirement	status	Provided to contractor
CW-01 – Construction of Distribution Network for Pamtsho, Thimphu	Prepared, cleared by ADB and disclosed <a href="https://www.adb.org/projects/documents/bhu-42173-017-iee-0">https://www.adb.org/projects/documents/bhu-42173-017-iee-0</a>	Yes	Required if there are any changes during implementation	Due to some changes in the alignment of the main trunk or transmission line. IEE will be updated accordingly.	Yes Updated IEE/EMP will be provided
DB-01-Design, build and Operate of Water Treatment Plant for Thimphu Pamtsho with 2-year O&M		Yes	Required based on detailed design and any further changes during implementation	Designs are in progress, IEE will be updated	Yes
CW-02 – Construction of Integrated drinking water and irrigation for system for Zhemgang including 2 years O & M		Yes	Required based on detailed design and any further changes during implementation	Design is finalized	Selection of the contractor is yet to be finalized

#### IV. STATUS OF ENVIRONMENTAL MANAGEMENT PLAN IMPLEMENTATION

##### A. Contractor details

23. For Thimphu, the contracts were awarded to the technically responsive lowest evaluated bidder in July.

**Table 8: Contractors nodal and safeguard staff**

Package Name	Contractor	Nodal Person	Email Address	Contact Number
DB-01-Design, build and Operate of Water Treatment Plant for Thimphu Pamtsho with 2-year O&M	M/s E.W & Grannus Water & Environmental Solutions Pvt. Ltd JV	Tashi Nyibum	nyibumt@gmail.com	17641452
	Safeguards person	Ms Yeshe Bumkyid		17258686
CW-01-Construction of Distribution Network for Pamtsho, Thimphu	M/s Bhutan Engineering Co. Pvt. Ltd	Lotay	lotay.sksktj@gmail.com	17120422
	Safeguards person	Mongal Yang Subba		17810225
CW-02 – Construction of Integrated drinking water and irrigation for system for Zhemgang including 2 years O&M	Contractor selection yet to be finalized	-	-	-
	Safeguards person	-	-	-

##### B. Preparation of Site-Specific Environmental Management Plans (SEMPs), implementation and monitoring

24. Monitoring of the contract activities is delegated to the PIU safeguard officers as well as by the contractors EHS officers.

25. The contractors have prepared the site specific EMPs and these have been approved by the PIU. Compliance with the EMP has been reported by DB-01 but details on how or what measures have been undertaken are not reported for all activities. For CW-01, the reporting of ESS compliance is lacking (refer Appendix 7a and 7b).

**Table 9: Status of EHS Staff, SEMP Preparation and Monitoring**

S. No	Package	Contractor's EHS Supervisor	SEMP submitted by contract or	SEMP approved by PIU/PM SC	SEMP includes health and safety plan	EMP implement's report submitted by contractor	EMP monitoring on site Conducted by PIU /PMC/PMU Safeguard Staff
1	DB-01-Design, build and Operate of Water Treatment Plant for Thimphu Pamtsho with 2-year O&M	Appointed - Ms Yeshe Bumkyid 17258686	Yes	Yes	Yes	Being complied	Yes (regular site visits are conducted by the PIU/PMSC)

<b>S. No</b>	<b>Package</b>	<b>Contractor's EHS Supervisor</b>	<b>SEMP submitted by contract or</b>	<b>SEMP approved by PIU/PM SC</b>	<b>SEMP includes health and safety plan</b>	<b>EMP implement's report submitted by contractor</b>	<b>EMP monitoring on site Conducted by PIU /PMC/PMU Safeguard Staff</b>
2	CW-01 – Construction of Distribution Network for Pamtsho, Thimphu	Appointed - Mr. Nado Rinchen 1712042	Yes	Yes	Yes/	Being complied	Yes (regular site visits are conducted by the PIU)

**C. Implementation of EMP measures and compliance status**

**Table 10: Status of EMP mitigation measures for DB-01-Design, build and Operate of Water Treatment Plant for Thimphu Pamtsho with 2-year O&M**

Subproject Activities / Field	Potential Environmental Impacts	Mitigation Measures	Responsible for Implementation	Compliance rating for implementation of EMP Measures	
				Rating	Remarks
<b>Design / Pre-construction</b>					
Extreme weather events	Future climate changes can result to more intensified extreme weather events, can also potentially damage the usability or affect the efficient functioning of the subproject components such as pipelines, pumps, and other related infrastructures of the subproject.	<ul style="list-style-type: none"> <li>Integrate in the subproject design appropriate climate change adaptation measures, such as, but not limited to, use of climate-resilient structural arrangements, construction methods, and/or materials designed to withstand future climate-related changes such as flooding due to extended monsoon seasons and increased level of precipitation, droughts, and increased global temperature, among others.</li> <li>Position all structures in the most stable area and provide additional structural protection in areas with potential for landslides (either because of earthquakes or floods), particularly in hilly areas (e.g. location of one proposed reservoir tank).</li> <li>Integrate in the subproject design a user-friendly climate smart water management (digital) system envisaged under Output 3 of the Water Flagship Project.</li> </ul>	PMU	S	Incorporated during project design
Source sustainability and seasonal water availability	Shortage in raw water supply due to higher variability in stream flows in the future.	<ul style="list-style-type: none"> <li>Continuing identification and assessment of other sources that could augment raw water supply in case flow from the main intake source becomes insufficient in the future.</li> <li>Assessment for competing water use in the future to determine the appropriate allocation of water in case of shortage.</li> </ul>	PMU	S	This is a continuing activity.

Subproject Activities / Field	Potential Environmental Impacts	Mitigation Measures	Responsible for Implementation	Compliance rating for implementation of EMP Measures	
				Rating	Remarks
Water resource allocation	Additional withdrawal of water from Dechenphu river could impact downstream ecology and other users.	<ul style="list-style-type: none"> <li>Continuing measurements of the flow and sustainability assessment will be undertaken during the detailed design phase. This will ensure more reliable data sets to justify that withdrawal rate is indeed sustainable, and the same will be recorded and documented under the subproject.</li> </ul>	PIU, PMU	S	This is a continuing activity.
Consents, clearances, and permits	Without obtaining the necessary permits, consents and clearances on time, the implementation of the subproject will be delayed.	<p>Prior to any construction activity, the following consents, clearances and permits need to be obtained (or renewed if already obtained):</p> <ul style="list-style-type: none"> <li>Environmental Clearance</li> <li>Forestry Clearance</li> </ul>	PIU, PMU	S	EC and FC obtained
Construction work camps, stockpile, storage and disposal areas	Inappropriate siting of Contractors' facilities for the works on the intakes and transmission mains including disposal areas could harm or disturb physical environment around and the residents in the immediate vicinities.	<p>Ensure to include in the bidding and contract documents the condition that Contractors will be required to implement the following measures during pre-construction phase:</p> <ul style="list-style-type: none"> <li>Prepare a detailed layout plan for the development of construction camps, including workers' accommodation sites, if any will be established under the subproject, showing the relative locations of all temporary structures and facilities that are to be constructed together with the location of site roads, fuel storage areas (for use of construction equipment or machines, and power supply generators, if any), solid waste management and dumping locations, and drainage facilities, prior to the development of the construction camps. This will need to be approved by the PIU;</li> </ul>	<p>PMU</p> <p>Contractor</p>	S	<p>No detailed layout is available for Thimphu subprojects, but Contractors sought the approval of Thromde prior to construction of worker camps</p> <p>Worker camp have been inspected by Thromde and approved</p> <p>Camps for site supervisors and workers are located within the WTP premises, above a small stream that flows</p>

Subproject Activities / Field	Potential Environmental Impacts	Mitigation Measures	Responsible for Implementation	Compliance rating for implementation of EMP Measures	
				Rating	Remarks
		<ul style="list-style-type: none"> <li>• Locate the construction camps, if any will be established under the subproject, at areas which are acceptable from environmental, cultural or social point of view;</li> <li>• Maximize the employment of people from the project area and immediate vicinities, so that the need for workers' accommodation is avoided or minimized;</li> <li>• Construction camps, storage areas, and disposal areas should not be located within or near ecologically sensitive areas, and productive agricultural lands. Locations should also be at least 20m from water bodies, natural drainage channels, and groundwater recharge areas, etc.;</li> <li>• Local authorities responsible for health, religious and security shall be duly informed on the set up of camp facilities so as to maintain effective surveillance over public health, social and security matters;</li> <li>• Locate the garbage pit/waste disposal site approved by the government and at considerable distance from the nearest residence, so that the people are not disturbed with the odor likely to be produced;</li> <li>• Provide adequate drainage facilities throughout the camps to ensure that disease vectors such as stagnant water bodies and puddles do not form;</li> <li>• Dismantle camps in phases and as the work gets decreased and not wait for the entire work to be completed. Restore the site to at least its original condition; and</li> </ul>			<p>through the WTP site. The site was selected to avoid cutting trees and because there are no other alternative options within the premises</p> <p>All workers are foreign workers</p> <p>Excavated soil was used for leveling works so there was no need for spoil disposal</p> <p>Waste is collected in a pit, which is covered, and this is transported to the waste drop off centre located in Dangrina (less than a km away) each week. However, waste is segregated into biodegradable and non-biodegradable as required by Thromde.</p> <p>Spoil has been reused for leveling works so</p>

Subproject Activities / Field	Potential Environmental Impacts	Mitigation Measures	Responsible for Implementation	Compliance rating for implementation of EMP Measures	
				Rating	Remarks
		<ul style="list-style-type: none"> <li>• Prepare a spoil management plan to ensure excess excavated materials are properly handled, transported and disposed of. Ensure that disposal sites for spoils are identified beforehand and approved by the local government, and secured from unauthorized entry of people, including children.</li> </ul>			there was no need for spoil disposal
Project disclosure and community awareness	Lack of awareness by the public and communities on subproject activities or GRM	<ul style="list-style-type: none"> <li>• Disclose project information/brief on MoIT website, along with GRM mechanism and contact numbers.</li> <li>• Continue stakeholder engagement and consultations to present any updates or developments about the subproject.</li> <li>• Make project brief available at the site office and/or PIU office.</li> </ul>	PMU	S	<p>IEE report disclosed on MOWHS/MOIT website</p> <p>Activities are being carried out in close consultation with Thomde</p> <p>-project documents are available at PIU office.</p>
Compliance with ADB Loan Agreement and SPS	Lack of technical capacity on environmental safeguards	<ul style="list-style-type: none"> <li>• Conduct briefing/orientation for new project staff (if any) on ADB safeguard policies and RGOB regulations relevant for the subproject, including EMP, and compliance monitoring and reporting requirements.</li> </ul>	PMU	S	Orientation and training were conducted with the contractors by the safeguard consultants
	Lack of awareness by the Contractors on ADB environmental safeguard policies and EMP requirements and therefore mitigation measures not budgeted	<ul style="list-style-type: none"> <li>• Inclusion of the EMP into the bid documents for contractors to estimate and incorporate cost of EMP implementation</li> <li>• Conduct of pre bid meeting with all contractors to inform about ADB safeguard policies, relevant RGOB regulations especially those related to forest, biodiversity conservation, environmental protection, pollution, waste management and regulations governing occupational health and safety,</li> </ul>	PMU	S	<p>IEE, which includes the EMP, was attached as part of the bid documents.</p> <p>Pre-bid meeting was conducted informing bidders of the safeguard requirements.</p>

Subproject Activities / Field	Potential Environmental Impacts	Mitigation Measures	Responsible for Implementation	Compliance rating for implementation of EMP Measures	
				Rating	Remarks
		EMP requirements and Contractors self-monitoring reporting.			
<b>Construction Phase</b>					
Establishment of Contractors' site Facilities	Construction of site facilities could involve clearing of vegetation, require electrical and water supply and sanitation facilities. Improper management will result to environmental pollution and damage, and diseases.	<ul style="list-style-type: none"> <li>• Build any site office, storage facilities and/or workers' camps as close as possible to the newly constructed road so as to minimize vegetation clearance;</li> <li>• Avoid or minimize cutting of trees when setting up these facilities. Any tree cut will be compensated with replanting of trees at the replacement ratio of two trees per tree cut. Budget for the replanting program will be provided to the DOFPS;</li> <li>• Provide temporary pit latrines and kitchen wastes disposal pits within these facilities for proper solid waste management and prevent the indiscriminate discharge of wastes to the surroundings;</li> <li>• Provide diversion drains, catch drains and silt-traps around camps to avoid siltation of nearby water bodies, if any;</li> <li>• Ensure a very strict compliance of the pandemic COVID-19 safety protocols of the country at all times.</li> </ul>	Contractor	S	<p>Temporary site office structures have been demolished and shifted to the permanent building constructed some 120m downstream.</p> <p>No trees were cut for setting up worker camps</p> <p>Proper sanitation facilities have been provided with septic tanks</p> <p>There is no diversion drain at the worker camp</p> <p>A health and safety plan that includes a COVID-19 management plan was submitted to PIU and approved by PIU</p>
Physical Cultural Resources – chance finds	Excavation activities may impact underground and undiscovered cultural artifacts.	<p>For any chance finds during excavation activities, the Contractors shall strictly implement the following protocol:</p> <ul style="list-style-type: none"> <li>• Stop work immediately to allow further investigation;</li> </ul>	Contractor	S	No chance findings at both contractor sites were found.

Subproject Activities / Field	Potential Environmental Impacts	Mitigation Measures	Responsible for Implementation	Compliance rating for implementation of EMP Measures	
				Rating	Remarks
		<ul style="list-style-type: none"> <li>• Coordinate with PIU and/or PMU and local Department of Culture; and</li> <li>• Through PIU and/or PMU, request authorized person from the local Department of Culture to observe when excavation resumes for the identification of the potential chance finds, and comply with further instructions.</li> </ul>			Contractors were briefed on and are aware of the chance find protocol. However, there is no more excavation work remaining.
Transport of construction materials	Material transport and storage will generate noise, vehicle emission and dust that could disturb the subproject immediate receptors	<ul style="list-style-type: none"> <li>• All construction material will be stacked temporarily by the roadsides leaving adequate space for the vehicles to ply safely at work sites.</li> <li>• Dusty areas will be sprinkled with water especially on dry windy days.</li> <li>• Vehicles transporting sand, soil and aggregates will be covered with tarpaulin to reduce the release of dust along transport routes.</li> <li>• To minimize air emissions, ensure regular maintenance of equipment to prevent smoke belching and compliance with the RSTA emission test.</li> <li>• All stockpiles that will be left idle for a long time will be covered.</li> </ul>	Contractor	S	<p>All materials are stored well.</p> <p>No dust was visible during the site visit although sand piles are not covered.</p> <p>Contractor is following BCTA regulations for transportation of construction material.</p>
Soil Erosion and Sedimentation	Exposed soil at construction sites can be washed away by runoff and could clog the receiving bodies of water and drainage system in the areas.	<ul style="list-style-type: none"> <li>• Minimize exposed areas at work sites.</li> <li>• Ensure proper compacting of backfilled areas.</li> <li>• Use structural erosion prevention and sediment control practices such as temporary sedimentation canals around the exposed areas. This will prevent sediments from moving offsite and reduce the erosive forces of runoff waters.</li> </ul>	Contractor	S	Not relevant for DB-01

Subproject Activities / Field	Potential Environmental Impacts	Mitigation Measures	Responsible for Implementation	Compliance rating for implementation of EMP Measures	
				Rating	Remarks
		<ul style="list-style-type: none"> <li>Immediately remove all excess spoils from sites and dispose the same in designated disposal site.</li> </ul>			
Surface water quality	Runoff from stockpiled materials and chemicals from fuels and lubricants during construction works can contaminate surface water quality in these bodies of water.	<ul style="list-style-type: none"> <li>Provide silt traps or temporary sedimentation canals along alignments that are adjacent to receiving bodies of water.</li> <li>Ensure proper compaction of refilled soil and there shall not be any loose soil particles on the top; the material shall be refilled in layers and compacted properly layer by layer.</li> <li>Minimize transport and disposal of excess spoils. Where possible, use excess spoils for beneficial purposes such as in any other construction activities, or to raise the level of low-lying areas near the subproject sites.</li> <li>Avoid scheduling of excavation work during the monsoon season. Earthworks should be undertaken during dry season.</li> <li>Confine construction area including the material storage (sand and aggregate) so that runoff from upland or elevated areas will not enter the site.</li> <li>Ensure that drains are not blocked with excavated soil.</li> <li>Stockyards at least 20 meters away from watercourses.</li> <li>Fuel and other petroleum products stored at storage areas away from water drainage and protected by impermeable lining and bunded 110% by volume.</li> <li>For effluents from work sites, camps, and offices, provide treatment arrangements such as retention ponds and septic tanks which</li> </ul>	Contractor	S	<p>Construction materials are stored away from stream/river but brush and rock is clogging the stream in the WTP site.</p> <p>No petroleum or fuel is being stored at site</p> <p>Contractors has constructed septic tanks for the toilets</p> <p>Water quality testing has been carried out as required by DB-01</p> <p>Water quality monitoring is being carried out for the Stream and not required for the workers as the treated water is being provided to workers</p> <p>To prevent erosion of stream bank 40m retaining wall has been constructed along the</p>

Subproject Activities / Field	Potential Environmental Impacts	Mitigation Measures	Responsible for Implementation	Compliance rating for implementation of EMP Measures	
				Rating	Remarks
		<p>should be incorporated in the facility designs. A sewage management plan has to be prepared by the Contractors and agreed with PIU.</p> <ul style="list-style-type: none"> <li>• Monitor water quality according to the environmental management plan.</li> </ul>			left bank of the stream adjacent to existing WTP sedimentation tank and site office.
Air quality	Emissions from construction vehicles, equipment, machineries used for excavation and construction, and the excavation activities will produce pollutants (dust, smaller particulate matters, etc.) that could impact the air quality.	<ul style="list-style-type: none"> <li>• Take every precaution to reduce the levels of dust at construction sites, and not exceeding the pre-project ambient air quality standards.</li> <li>• Barricade the construction area particularly in relation to distribution network improvement within the affected LAPs. Initiate site clearance and excavation work only after barricading of the site is done.</li> <li>• Limit the stocking of excavated material at the site; remove the excess soil from the site immediately to the designated and government-approved disposal area.</li> <li>• Conduct work sequentially - excavation, pipe laying, backfilling; conduct pipe testing section-wise (for a minimum length as possible) so that backfilling, stabilization of soil can be done.</li> <li>• Remove the excavated soil of first section to the disposal site; as the work progresses, sequentially, by the time second section is excavated, the first section will be ready for back filling.</li> <li>• Backfilled trench at any completed section after removal of barricading will be the main source of dust pollution. The traffic, pedestrian movement and wind will generate</li> </ul>	Contractor	PS	<p>As the work was halted during the site visit, no dust or vehicle emission was noted.</p> <p>The work is being monitored by Thomde</p> <p>Stockpiles are not covered</p>

Subproject Activities / Field	Potential Environmental Impacts	Mitigation Measures	Responsible for Implementation	Compliance rating for implementation of EMP Measures	
				Rating	Remarks
		<p>dust from the backfilled section. Restoration should be undertaken immediately.</p> <ul style="list-style-type: none"> <li>● Provide all heavy equipment and machinery with air pollution control devices that function properly.</li> <li>● Vehicles travelling to and from the construction site must adhere to speed limits to avoid excessive dust that may go airborne.</li> <li>● Reduce dust by spraying stockpiled soil, excavated materials, and spoils.</li> <li>● Cover with tarpaulin the dump body of trucks or vehicles when transporting soil and sand.</li> <li>● Cover stockpiled construction materials with tarpaulin or plastic sheets.</li> <li>● Trenching and transport vehicles shall move only in designated areas and roads.</li> <li>● Water spraying of access roads, camp sites and work sites to reduce dust emissions.</li> <li>● Machines and vehicles must be regularly examined and maintained to ensure efficient functioning, and use them within their design limits and specifications.</li> <li>● All vehicles, equipment, and machinery used for construction will be regularly maintained to ensure that pollution emission levels comply with the relevant requirements of the government. Compliance with this requirement will be included in Contractors' reports to PIU and PMU.</li> <li>● Monitor air quality according to the environmental management plan.</li> </ul>			<p>Baseline air quality data is yet to be collected.</p> <p>Material when transported along the highway are covered, as required by BCTA.</p> <p>The contractor has mechanical staff who is responsible for O &amp; M of machines and vehicles</p> <p>Need to collect air quality data</p>
Noise and Vibration	Noise and vibration impacts are expected in most of the	<ul style="list-style-type: none"> <li>● Plan activities in consultation with PIU or PMU so that activities with the greatest</li> </ul>	Contractor	S	

Subproject Activities / Field	Potential Environmental Impacts	Mitigation Measures	Responsible for Implementation	Compliance rating for implementation of EMP Measures	
				Rating	Remarks
	pipeline route, affecting nearby establishments and residents.	<p>potential to generate noise are conducted during daytime in the biological corridor and forest areas, and along alignments near residential areas and/or noise-sensitive institutions such as hospitals. Nighttime works may also be considered in alignments adjacent schools and places of worship.</p> <ul style="list-style-type: none"> <li>• Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and use portable street barriers to minimize sound impact to surrounding sensitive receptors.</li> <li>• Identify any structures such as houses or buildings at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity.</li> <li>• Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach.</li> <li>• Consult local communities in advance of the work to identify and address key issues, and avoid working during sensitive occasions, such as religious and cultural festivals.</li> </ul>			For the DB-01 site, there are no residential communities in the vicinity of the WTP.
Community health and safety	These work sites can be easily accessed by the community people. There may be a risk of accidents to community people or passersby without adequate warnings and precautions. There may also be risk of accidental	<ul style="list-style-type: none"> <li>• Follow a code of conduct for workers, which should include restricting workers in designated areas, no open defecation, no littering, no firewood collection, no setting of fire except when needed but in designated places, no trespassing, no unauthorized overstaying at construction sites, and no obligation to undertake potentially dangerous</li> </ul>	Contractor	S	<p>The Health and Safety Plan was prepared by both contractors which include a COVID 19 HS plan as well.</p> <p>No written code of conduct for workers</p>

Subproject Activities / Field	Potential Environmental Impacts	Mitigation Measures	Responsible for Implementation	Compliance rating for implementation of EMP Measures	
				Rating	Remarks
	fall of pedestrians in excavated areas. Proper diversion system and appropriate temporary access for pedestrians will minimize the risk of accidents.	<p>work without the use of proper personal protective equipment, among others.</p> <ul style="list-style-type: none"> <li>● Follow International best practices on community health and safety such as those in Section 4.3 of World Bank Environmental Health and Safety (EHS) Guidelines on Construction and Decommissioning Activities.</li> <li>● Follow the established community and occupational health and safety protocol on emerging infectious diseases such as COVID-19. See Appendix 5 for a sample guidance note in responding to COVID-19.</li> <li>● Maintain a complaint logbook in workers' camp and take action promptly of complaints.</li> <li>● Schedule transport and hauling activities by avoiding busy areas of the town.</li> <li>● Clean wheels and undercarriage of haul trucks prior to leaving construction site.</li> <li>● Educate drivers and comply with speed limit between 20-25 km/h near settlements or sensitive institutional establishments and avoid use of horn unless necessary to prevent accidents.</li> <li>● Earmark parking place for construction equipment and vehicles when idling; no parking shall be allowed on the roads, that may disturb the traffic movement.</li> <li>● Provide prior information to local people about work.</li> <li>● No night time construction activities including material/waste haulage near or within residential areas. Construction activities in</li> </ul>			<p>Construction equipment and vehicles are parked at the camp and material storage area only.</p> <p>No construction is being carried out at night</p> <p>Workers grievance register I maintained. No Grievances were received.</p> <p>Every Monday workers are briefed on health and safety guidelines with regard to the construction activities.</p> <p>Not relevant for DB-01</p> <p>Not relevant for DB-01</p>

Subproject Activities / Field	Potential Environmental Impacts	Mitigation Measures	Responsible for Implementation	Compliance rating for implementation of EMP Measures	
				Rating	Remarks
		<p>these areas must be prohibited from 9pm to 7am.</p> <ul style="list-style-type: none"> <li>• Noise barriers must be installed in housing areas to reduce the noise level.</li> <li>• Temporary access such as planks with handrails will be provided at excavation areas, particularly in locations where access to residential, commercial and institutional establishments is affected.</li> </ul>			Not relevant for DB-01
Occupational health and safety	Health risks and safety problems for workers is likely due to various construction activities such as storage, handling and transport of hazardous construction material, excavation, and other construction related activities. Workers may also be exposed to high level of pollution from dust, exhaust of vehicles and machinery and noise. Further, if workers do not keep to regulated working hours, the risk of accidents will be higher due to fatigue. COVID-19 is also a major issue at construction and camp sites that is detrimental to the workers.	<ul style="list-style-type: none"> <li>• All relevant provisions of the Labour and Employment Act of Bhutan 2007, Regulation on Occupational Health, Safety and Welfare 2012, and relevant WHO guidelines will be adhered to, concerning the provision of adequate measures to avoid contracting and/or spreading diseases.</li> <li>• Follow international best practices on occupational health and safety such as those in Section 4.2 of World Bank EHS Guidelines on Construction and Decommissioning Activities.</li> <li>• Implement an occupational health and safety protocol on emerging infectious diseases such as the corona virus disease (COVID-19) as approved by the PIU or PMU. See Appendix 5 for a sample guidance note in responding to COVID-19.</li> <li>• Provide at every workplace, a readily available first aid unit, including an adequate supply of sterilized dressing material and appliances. Suitable transport will be provided to facilitate the transfer of injured or ill persons to the nearest hospital or clinic.</li> </ul>	Contractor	S	The contractor has prepared and submitted the Health and Safety Plan including a COVID-19 plan to the Thromde which has been approved. In terms of OHS, the following measures are in place. Worker health and safety plan submitted and approved. Workers are provided with PPE and there is a first aid kit at site and emergency transportation to the hospital in case of emergencies is being provided.

Subproject Activities / Field	Potential Environmental Impacts	Mitigation Measures	Responsible for Implementation	Compliance rating for implementation of EMP Measures	
				Rating	Remarks
		<ul style="list-style-type: none"> <li>● Make available emergency medical equipment and nursing staff at all times.</li> <li>● Provide regular health check-ups, sanitation and hygiene, health care, and control of diseases for the workforce.</li> <li>● Provide at cost all labor and materials, and construct/install and maintain site safety, hard barricading, flexible green net, signboards, temporary day/light traffic diversions throughout the construction activities according to the specifications and provide personal protective equipment (PPE) to all the laborers working at the construction site.</li> <li>● Launch awareness programs concerning human trafficking and the possibility of spread of sexually transmitted diseases (STDs) and HIV/AIDS using brochures, posters, and signboards.</li> <li>● Make available first aid kits, ambulance facilities or standby emergency vehicles, and fire extinguishers in camp sites.</li> <li>● Compensation for the loss of life (a zero tolerance to loss of life policy should be developed and implemented) or for any type of injuries.</li> <li>● Provide insurance to the workers. Health and safety training for all site personnel is very important and must be mandatory.</li> </ul>			<p>Emergency staff is not required as the nearest PHC is within 10 minutes of the worksite, and the hospital is less than 1km from the sites – for which transportation is being provided</p> <p>Contractors of DB-01 and CW-01 have planned to carry out HIV/AIDS awareness campaign in the coming reporting period.</p> <p>Worker retention is difficult with workers leaving after 1-2 months. - so regular checkups are not possible.</p> <p>Insurance documents have been submitted to Thromde.</p>

## DB-01- Water Treatment Plant

### Location of construction work camps, stockpile, storage areas

26. Camps for site supervisors and workers are located within the WTP premises, above a small stream that flows through the WTP site. The site was selection to avoid cutting trees and because there are no other alternative options within the premises. The location has been approved by the Thromde.

27. Office, Material and machinery storage are all located within the WTP premises.

**Figure 1: Map showing contractor campsite locations**



**Photo 3. Site office for DB-01 package**



## Worker Recruitment

28. Work recruitment commenced in August. Since then, monthly reports are submitted to the Thromde on the number of employees and workers at each site.
29. The contractor employs regular national employees and foreign workers with only one female. After a winter break that lasted from December 2023 to February 2024, work resumed only in March 2024.
30. The number of workers each month is detailed in the table below.

**Table 11: Details on employee and worker numbers (January – July 2024)**

Month	No. of Employees		No. of Workers		Total
	Foreign	National	Foreign	National	All Male
January	0	7	0	0	7
February	0	7	0	0	7
March	0	7	20	0	27
April	0	7	20	0	27
May	0	7	20	0	27
June	0	7	20	0	27

Source: Contractor's Monthly reports for March, April, May & June 2024

## Facilities for workers

31. Within the site, camps workers have been constructed. The camp houses 4 workers in each room. The temporary site office has been demolished to give way for the construction of desilting and settler tank. The office space has been shifted to the newly constructed building some 120m near the existing staff quarter of the existing 1MLD Dechencholing LAP WTP.
32. Electricity and sanitation facilities (with septic tanks) have also been provided. The electrical fixtures have been safely installed. No trees were cut to construct worker camps.

**Photo 4 a & b. Worker camps and site supervisors room**



**Photo 5 a & b. Staff toilets with septic tank**



**Photo 6 a, b and c. Workers toilets with septic tank**



### **Water quality**

33. Drinking water is sourced from the treated water from the WTP for the workers. Water quality testing has been carried out by the DB-01 contractor from the source of the stream. The results are attached in Appendix 9. While all parameters are within environmental limits, E-coli is reported in both instances in the stream, but the water be treated once it reaches the treatment plant.

### **Drainage**

34. No site drainage was observed at the worker camp or at the work site.

### **Waste management**

35. Waste is gathered in a covered pit at the WTP site and sorted into biodegradable and non-biodegradable wastes. The non-biodegradable waste is taken to the Dangrina waste drop off center, situated less than a kilometer away, while the biodegradable waste is deposited into the pit. The recent problem of littering that was reported in the last reporting period has been rectified.

**Photo 7 a - Waste pit and 7 b - waste littering issue resolved**



### **Occupational health and safety**

36. The contractor has prepared and submitted the Health and Safety Plan including a COVID-19 plan to the Thromde which has been approved. In terms of OHS, the following measures are in place.

- Worker health and safety plan submitted and approved (Appendix 6)
- Provision of PPE to workers
- First aid kit
- Emergency transportation to the hospital in case of emergencies

37. Health screening of foreign workers is conducted prior to their entry into Bhutan and arrival at the worksite. Since most workers do not remain at the site for more than 2 months a time, the contractor has not found the need to recheck them.

**Photo 8 a& b. - Use of PPE and first aid kit at site**



### **Accidents, record keeping and reporting**

38. There is no accident or incident register/log that the contractor maintains. However, there was no report of any accidents or injuries occurring at the site during the reporting period. If a worker has an accident or injury, they are promptly transferred to the health facilities at Dechencholing using the site's vehicle.

39. Worker insurance is not required because health services are free in the country for all nationalities.

### **Worker trainings/briefings and orientation**

40. The contractor reported that briefing and orientation on health and safety, work code, proper behavior, littering, use of PPE and work safety is provided each time a new batch of workers arrives at the site. However, details of these briefings and orientation are not recorded or reported.

### **Worker and community grievances**

41. Although the grievance register has been maintained, the contractor has not received any grievances so far.

### **Tree cutting**

42. With the forestry permit, 33 trees in DB-01 WTP site have been cut. The contractor has paid the required royalty and retained the cut trees for their construction purpose.

**Photo 9 - Cut trees being seasoned and stored.**



43. During the tree felling and site clearance process, unwanted brush was dumped along the small stream flowing through the site, clogging it. However, the drain has since been cleaned, and a 40-meter-long retaining wall has been constructed to prevent stream bank erosion.

**Photo 10 a and b - Clogged Drain and Retaining wall constructed and Drainage cleaned**



### **Project disclosure and community awareness**

44. The signboard has been installed and approved by Thromde. However, the contact details of the contractor have not been included on the signboard. The community has been informed about the WTP construction during public consultation (10 September 2023), wherein the contractor presented the details of the contract package.

**Photo 11 - Project signboard**



### **Construction material transportation**

45. Construction materials are transported to the site only when required (due to lack of space) and stacked at the work site. Since the premises is isolated, this does not cause any obstruction to traffic or public. The contractors have their mechanics to check and maintain all vehicles, equipment, and machinery used for construction to ensure that pollution emission levels comply with the relevant requirements of the government. Contractors have undertaken the required vehicle emission tests and obtained the pollution under control certificates, which are mandatory for renewal of motor vehicle registration and roadworthiness certificate.

### **Fuel storage**

46. The DB-01 contractor does not store any fuel at the site, as only the required quantity is purchased in drums as and when required.

### **Excavation works**

47. Soil that was excavated was used for backfilling of the civil water tank and for leveling work in the staff quarters and the access road for the DB-01.

### **Air quality and dust emission and noise**

48. No baseline air quality data has been collected. The WTP is more than 400m from the nearest settlement, and so far, there have been no complaints from the Thromde or the neighboring community. Dust and noise impacts were limited to the premises for a few weeks when excavation and levelling works were being carried out.

49. Currently, there is no ongoing work at the site as workers have left for the winter break and work has halted at the site.

### **Community health and safety**

50. As the WTP site is located away and gated, there are no risks to Community health and safety except during material transportation. No construction equipment and vehicles are parked on the street as these are within the construction camps and drivers are advised to follow the speed limit. Also, all construction work is being carried out during the daytime and no work is being conducted at night. The contractors do not have a written code of conduct for workers. So far, there have been no issues or grievances from the neighboring community.

**Table 12: Status of EMP mitigation measures for CW-01 – Construction of Distribution Network for Pamtsho, Thimphu**

Subproject Activities / Field	Potential Environmental Impacts	Mitigation Measures	Responsible for Implementation	Compliance rating for implementation of EMP Measures	
				Rating	Remarks
<b>Design / Pre-construction</b>					
Extreme weather events	Future climate changes can result to more intensified extreme weather events, can also potentially damage the usability or affect the efficient functioning of the subproject components such as pipelines, pumps, and other related infrastructures of the subproject.	<ul style="list-style-type: none"> <li>Integrate in the subproject design appropriate climate change adaptation measures, such as, but not limited to, use of climate-resilient structural arrangements, construction methods, and/or materials designed to withstand future climate-related changes such as flooding due to extended monsoon seasons and increased level of precipitation, droughts, and increased global temperature, among others.</li> <li>Position all structures in most stable area and provide additional structural protection in areas with potential for landslides (either because of earthquakes or floods), particularly in hilly areas (e.g. location of one proposed reservoir tank).</li> <li>Integrate in the subproject design a user-friendly climate smart water management (digital) system envisaged under Output 3 of the Water Flagship Project.</li> </ul>	PMU	S	Incorporated during project design
Source sustainability and seasonal water availability	Shortage in raw water supply due to higher variability in stream flows in the future.	<ul style="list-style-type: none"> <li>Continuing identification and assessment of other sources that could augment raw water supply in case flow from the main intake source becomes insufficient in the future.</li> <li>Assessment for competing water use in the future to determine the appropriate allocation of water in case of shortage.</li> </ul>	PMU	S	This is a continuing activity.
Water resource allocation	Additional withdrawal of water from Dechenphu river could impact downstream ecology and other users.	<ul style="list-style-type: none"> <li>Continuing measurements of the flow and sustainability assessment will be undertaken during the detailed design phase. This will ensure more reliable data sets to justify that withdrawal rate is indeed sustainable, and the same will be recorded and documented under the subproject.</li> </ul>	PIU, PMU	S	This is a continuing activity.
Consents, clearances, and permits	Without obtaining the necessary permits, consents and clearances on time, the	Prior to any construction activity, the following consents, clearances and permits need to be obtained (or renewed if already obtained):	PIU, PMU	S	FC obtained

Subproject Activities / Field	Potential Environmental Impacts	Mitigation Measures	Responsible for Implementation	Compliance rating for implementation of EMP Measures	
				Rating	Remarks
	implementation of the subproject will be delayed.	<ul style="list-style-type: none"> <li>Environmental Clearance</li> <li>Forestry Clearance</li> </ul>			
Construction worker camps, stockpile, storage and disposal areas	Inappropriate siting of Contractors' facilities for the works on the intakes and transmission mains including disposal areas could harm or disturb physical environment around and the residents in the immediate vicinities.	<p>Ensure to include in the bidding and contract documents the condition that Contractors will be required to implement the following measures during pre-construction phase:</p> <ul style="list-style-type: none"> <li>Prepare a detailed layout plan for the development of construction camps, including workers' accommodation sites, if any will be established under the subproject, showing the relative locations of all temporary structures and facilities that are to be constructed together with the location of site roads, fuel storage areas (for use of construction equipment or machines, and power supply generators, if any), solid waste management and dumping locations, and drainage facilities, prior to the development of the construction camps. This will need to be approved by the PIU;</li> <li>Locate the construction camps, if any will be established under the subproject, at areas which are acceptable from environmental, cultural or social point of view;</li> <li>Maximize the employment of people from the project area and immediate vicinities, so that the need for workers' accommodation is avoided or minimized;</li> <li>Construction camps, storage areas, and disposal areas should not be located within or near ecologically sensitive areas, and productive agricultural lands. Locations should also be at least 20m from water bodies, natural drainage channels, and groundwater recharge areas, etc.;</li> <li>Local authorities responsible for health, religious and security shall be duly informed on the set up of camp facilities so as to maintain effective surveillance over public health, social and security matters;</li> <li>Locate the garbage pit/waste disposal site approved by the government and at considerable distance from the nearest residence, so that the people are not disturbed with the odor likely to be produced;</li> </ul>	<p>PMU</p> <p>Contractor</p>	S	<p>Included</p> <p>No detailed layout is available. The Contractor sought the approval of Thromde prior to construction of worker camps .</p> <p>The worker camps are situated in acceptable locations within the Jungshina town area.</p> <p>All workers are non-nationals, but the contractor's regular employees are nationals.</p> <p>Camp and storage areas are away from sensitive areas and agricultural land.</p> <p>Thromde is aware of the site location</p> <p>Garbage disposal is properly managed by segregating non-degradable and degradable waste, which is then taken to</p>

Subproject Activities / Field	Potential Environmental Impacts	Mitigation Measures	Responsible for Implementation	Compliance rating for implementation of EMP Measures	
				Rating	Remarks
		<ul style="list-style-type: none"> <li>• Provide adequate drainage facilities throughout the camps to ensure that disease vectors such as stagnant water bodies and puddles do not form;</li> <li>• Dismantle camps in phases and as the work gets decreased and not wait for the entire work to be completed. Restore the site to at least its original condition; and</li> <li>• Prepare a spoil management plan to ensure excess excavated materials are properly handled, transported and disposed of. Ensure that disposal sites for spoils are identified beforehand and approved by the local government, and secured from unauthorized entry of people, including children.</li> </ul>			<p>the nearby waste collection center.</p> <p>- No drainage observed with water flowing onto the road from the campsite and water taps.</p> <p>Applicable only in the post construction period.</p> <p>No spoil management plan exists. However, the excavated soil is currently piled up near the trenches of distribution network and will be reused for filling them within 2-3 working days.</p>
Project disclosure and community awareness	Lack of awareness by the public and communities on subproject activities or GRM	<ul style="list-style-type: none"> <li>• Disclose project information/brief on MoIT website, along with GRM mechanism and contact numbers.</li> <li>• Continue stakeholder engagement and consultations to present any updates or developments about the subproject.</li> <li>• Make project brief available at the site office and/or PIU office.</li> </ul>	PMU	S	<p>IEE report disclosed on MOWHS/MOIT website</p> <p>-project documents are available at PIU office.</p> <p>The public, especially landowners along the alignment are being consulted as the pipeline excavation work progresses. Contractor is</p>

Subproject Activities / Field	Potential Environmental Impacts	Mitigation Measures	Responsible for Implementation	Compliance rating for implementation of EMP Measures	
				Rating	Remarks
					maintaining the grievances register. The Bhutan Power Corporation is also being consulted for power lines
Compliance with ADB Loan Agreement and SPS	Lack of technical capacity on environmental safeguards	<ul style="list-style-type: none"> <li>Conduct briefing/orientation for new project staff (if any) on ADB safeguard policies and RGOB regulations relevant for the subproject, including EMP, and compliance monitoring and reporting requirements.</li> </ul>	PMU	S	Orientation and training have been done with the contractors by the safeguard consultants
	Lack of awareness by the Contractors on ADB environmental safeguard policies and EMP requirements and therefore mitigation measures not budgeted	<ul style="list-style-type: none"> <li>Inclusion of the EMP into the bid documents for contractors to estimate and incorporate cost of EMP implementation</li> <li>Conduct of pre bid meeting with all contractors to inform about ADB safeguard policies, relevant RGOB regulations especially those related to forest, biodiversity conservation, environmental protection, pollution, waste management and regulations governing occupational health and safety, EMP requirements and Contractors self-monitoring reporting.</li> </ul>	PMU	S	IEE, which includes the EMP, is attached as part of the bid documents.  Pre-bid meeting was conducted informing bidders of the safeguard requirements.
<b>Construction Phase</b>					
Establishment of Contractors' site Facilities	Construction of site facilities could involve clearing of vegetation, require electrical and water supply and sanitation facilities. Improper management will result to environmental pollution and damage, and diseases.	<ul style="list-style-type: none"> <li>Build any site office, storage facilities and/or workers' camps as close as possible to the newly constructed road so as to minimize vegetation clearance;</li> <li>Avoid or minimize cutting of trees when setting up these facilities. Any tree cut will be compensated with replanting of trees at the replacement ratio of two trees per tree cut. Budget for the replanting program will be provided to the DOFPS;</li> <li>Provide temporary pit latrines and kitchen wastes disposal pits within these facilities for proper solid waste management and prevent the indiscriminate discharge of wastes to the surroundings;</li> <li>Provide diversion drains, catch drains and silt-traps around camps to avoid siltation of nearby water bodies, if any;</li> <li>Ensure a very strict compliance of the pandemic COVID-19 safety protocols of the country at all times.</li> </ul>	Contractor	S	<p>No vegetation clearance was required to establish worker camps</p> <p>No trees were cut for setting up worker camps</p> <p>Proper sanitation facilities have been provided with septic tanks</p> <p>Waste management is an issue resolved</p> <p>No drainage observed</p>

Subproject Activities / Field	Potential Environmental Impacts	Mitigation Measures	Responsible for Implementation	Compliance rating for implementation of EMP Measures	
				Rating	Remarks
					The contractor's health and safety plan include a COVID-19 management plan
Physical Cultural Resources – chance finds	Excavation activities may impact underground and undiscovered cultural artifacts.	<p>For any chance finds during excavation activities, the Contractors shall strictly implement the following protocol:</p> <ul style="list-style-type: none"> <li>• Stop work immediately to allow further investigation;</li> <li>• Coordinate with PIU and/or PMU and local Department of Culture; and</li> <li>• Through PIU and/or PMU, request authorized person from the local Department of Culture to observe when excavation resumes for the identification of the potential chance finds, and comply with further instructions.</li> </ul>	Contractor	S	<p>No chance findings at both contractor sites were found.</p> <p>Contractor was informed and is aware of Chance find protocols</p>
Transport of construction materials	Material transport and storage will generate noise, vehicle emission and dust that could disturb the subproject immediate receptors	<ul style="list-style-type: none"> <li>• All construction material will be stacked temporarily by the roadsides leaving adequate space for the vehicles to ply safely at work sites.</li> <li>• Dusty areas will be sprinkled with water especially on dry windy days.</li> <li>• Vehicles transporting sand, soil and aggregates will be covered with tarpaulin to reduce the release of dust along transport routes.</li> <li>• To minimize air emissions, ensure regular maintenance of equipment to prevent smoke belching and compliance with the RSTA emission test.</li> <li>• All stockpiles that will be left idle for a long time will be covered.</li> </ul>	Contractor	S	<p>All materials are stored well.</p> <p>No dust was visible during the site visit although sand piles are not covered.</p> <p>The contractor is complying with BCTA regulations</p> <p>The Contractor has a mechanic to ensure vehicle and machinery maintenance</p>
Soil Erosion and Sedimentation	Exposed soil at construction sites can be washed away by runoff and could clog the receiving bodies of water and drainage system in the areas.	<ul style="list-style-type: none"> <li>• Minimize exposed areas at work sites.</li> <li>• Ensure proper compacting of backfilled areas.</li> <li>• Use structural erosion prevention and sediment control practices such as temporary sedimentation canals around the exposed areas. This will prevent sediments from moving offsite and reduce the erosive forces of runoff waters.</li> <li>• Immediately remove all excess spoils from sites and dispose the same in designated disposal site.</li> </ul>	Contractor	PS	<p>The Contractor was instructed to leave the trenches open until the pipelines are tested.</p> <p>However, during the next monsoon, there is a potential of rain causing soil runoff onto the street</p> <p>The trenches along road crossings have been filled up to minimize traffic obstruction</p>

Subproject Activities / Field	Potential Environmental Impacts	Mitigation Measures	Responsible for Implementation	Compliance rating for implementation of EMP Measures	
				Rating	Remarks
Surface water quality	Runoff from stockpiled materials and chemicals from fuels and lubricants during construction works can contaminate surface water quality in these bodies of water.	<ul style="list-style-type: none"> <li>● Provide silt traps or temporary sedimentation canals along alignments that are adjacent to receiving bodies of water.</li> <li>● Ensure proper compaction of refilled soil and there shall not be any loose soil particles on the top; the material shall be refilled in layers and compacted properly layer by layer.</li> <li>● Minimize transport and disposal of excess spoils. Where possible, use excess spoils for beneficial purposes such as in any other construction activities, or to raise the level of low-lying areas near the subproject sites.</li> <li>● Avoid scheduling of excavation work during the monsoon season. Earthworks should be undertaken during dry season.</li> <li>● Confine construction area including the material storage (sand and aggregate) so that runoff from upland or elevated areas will not enter the site.</li> <li>● Ensure that drains are not blocked with excavated soil.</li> <li>● Stockyards at least 20 meters away from watercourses.</li> <li>● Fuel and other petroleum products stored at storage areas away from water drainage and protected by impermeable lining and bunded 110% by volume.</li> <li>● For effluents from work sites, camps, and offices, provide treatment arrangements such as retention ponds and septic tanks which should be incorporated in the facility designs. A sewage management plan has to be prepared by the Contractors and agreed with PIU.</li> <li>● Monitor water quality according to the environmental management plan.</li> </ul>	Contractor	PS	<p>The contractor has planned the trenching works in consultation with Thromde.</p> <p>Construction materials are stored at the storage area near the workers camp and site office.</p> <p>Spoil has not been disposed as it is being retained for backfilling</p> <p>Trenchwork commenced after the rains and is ongoing</p> <p>200 litres of diesel is stored at a time at the site, in the mechanical shed, which is away from water sources but the floor is not bunded.</p> <p>Septic tanks have been constructed at both sites, but drainage is lacking</p> <p>Water quality testing has not been carried out</p>
Air quality	Emissions from construction vehicles, equipment, machineries used for excavation and construction, and the excavation activities will produce pollutants (dust, smaller particulate matters,	<ul style="list-style-type: none"> <li>● Take every precaution to reduce the levels of dust at construction sites, and not exceeding the pre-project ambient air quality standards.</li> <li>● Barricade the construction area particularly in relation to distribution network improvement within the affected LAPs. Initiate site clearance and excavation work only after barricading of the site is done.</li> </ul>		PS	<p>For the distribution network, as the workers are constantly moving along as the trenchwork is being carried out.</p> <p>For precautionary measures, the contractor has purchased</p>

Subproject Activities / Field	Potential Environmental Impacts	Mitigation Measures	Responsible for Implementation	Compliance rating for implementation of EMP Measures	
				Rating	Remarks
	etc.) that could impact the air quality.	<ul style="list-style-type: none"> <li>• Limit the stocking of excavated material at the site; remove the excess soil from the site immediately to the designated and government-approved disposal area.</li> <li>• Conduct work sequentially - excavation, pipe laying, backfilling; conduct pipe testing section-wise (for a minimum length as possible) so that backfilling, stabilization of soil can be done.</li> <li>• Remove the excavated soil of first section to the disposal site; as the work progresses, sequentially, by the time second section is excavated, the first section will be ready for back filling.</li> <li>• Backfilled trench at any completed section after removal of barricading will be the main source of dust pollution. The traffic, pedestrian movement and wind will generate dust from backfilled section. Restoration should be undertaken immediately.</li> <li>• Provide all heavy equipment and machinery with air pollution control devices that are functioning properly.</li> <li>• Vehicles travelling to and from the construction site must adhere to speed limits so as to avoid excessive dust that may go airborne.</li> <li>• Reduce dust by spraying stockpiled soil, excavated materials, and spoils.</li> <li>• Cover with tarpaulin the dump body of trucks or vehicles when transporting soil and sand.</li> <li>• Cover stockpiled construction materials with tarpaulin or plastic sheets.</li> <li>• Trenching and transport vehicles shall move only in designated areas and roads.</li> <li>• Water spraying of access roads, camp sites and work sites to reduce dust emissions.</li> <li>• Machines and vehicles must be regularly examined and maintained to ensure efficient functioning, and use them within their design limits and specifications.</li> <li>• All vehicles, equipment, and machinery used for construction will be regularly maintained to ensure that pollution emission levels comply with the relevant</li> </ul>			<p>cones, but these were not seen to be in use.</p> <p>The work is being monitored by Thromde</p> <p>Backfilling of trenches is scheduled after testing as described above.</p> <p>No visible signs of dust.</p> <p>Stockpiles are not covered</p> <p>Being complied</p> <p>Material when transported along the highway are covered, as required by BCTA.</p> <p>For local transportation to the site, materials are carried in sacks</p> <p>The contractor has a water tanker on standby but has not had to use it since excavation is progressive and trenches are small.</p> <p>The contractors have a mechanical staff as a member of the team who is responsible</p>

Subproject Activities / Field	Potential Environmental Impacts	Mitigation Measures	Responsible for Implementation	Compliance rating for implementation of EMP Measures	
				Rating	Remarks
		<p>requirements of the government. Compliance with this requirement will be included in Contractors' reports to PIU and PMU.</p> <ul style="list-style-type: none"> <li>• Monitor air quality according to the environmental management plan.</li> </ul>			<p>for O &amp; M of machines and vehicles</p> <p>Baseline air quality data is yet to be collected.</p>
Noise and Vibration	Noise and vibration impacts are expected in most of the pipeline route, affecting nearby establishments and residents.	<ul style="list-style-type: none"> <li>• Plan activities in consultation with PIU or PMU so that activities with the greatest potential to generate noise are conducted during daytime in the biological corridor and forest areas, and along alignments near residential areas and/or noise-sensitive institutions such as hospitals. Nighttime works may also be considered in alignments adjacent schools and places of worship.</li> <li>• Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and use portable street barriers to minimize sound impact to surrounding sensitive receptors.</li> <li>• Identify any structures such as houses or buildings at risk from vibration damage and avoiding any use of pneumatic drills or heavy vehicles in the vicinity.</li> <li>• Horns should not be used unless it is necessary to warn other road users or animals of the vehicle's approach.</li> <li>• Consult local communities in advance of the work to identify and address key issues, and avoid working during sensitive occasions, such as religious and cultural festivals.</li> </ul>		S	<p>Excavation works in the forest areas have been completed with no issues.</p> <p>Trenching work near Jungshinga School is planned for the winter holidays to avoid disruption</p> <p>Work is being monitored by Thromde at least two to three times a week.</p> <p>To minimize noise, the contractor (CW-01) is carrying out manual excavation.</p> <p>Work is not carried out at night</p> <p>Consultation with local communities, particularly those that may be affected by the trenchwork is being carried out as a continuous process.</p>
Community health and safety	These work sites can be easily accessed by the community people. There may be a risk of accidents to community people or passersby without adequate warnings and precautions. There may	<ul style="list-style-type: none"> <li>• Follow a code of conduct for workers, which should include restricting workers in designated areas, no open defecation, no littering, no firewood collection, no setting of fire except when needed but in designated places, no trespassing, no unauthorized overstaying at construction sites, and no obligation to undertake</li> </ul>		S	<p>The Health and Safety Plan was prepared by both contractors which include a COVID 19 HS plan as well.</p> <p>No written code of conduct for workers</p>

Subproject Activities / Field	Potential Environmental Impacts	Mitigation Measures	Responsible for Implementation	Compliance rating for implementation of EMP Measures	
				Rating	Remarks
	also be risk of accidental fall of pedestrians in excavated areas. Proper diversion system and appropriate temporary access for pedestrians will minimize the risk of accidents.	<p>potentially dangerous work without the use of proper personal protective equipment, among others.</p> <ul style="list-style-type: none"> <li>● Follow International best practices on community health and safety such as those in Section 4.3 of World Bank Environmental Health and Safety (EHS) Guidelines on Construction and Decommissioning Activities.</li> <li>● Follow the established community and occupational health and safety protocol on emerging infectious diseases such as COVID-19. See Appendix 5 for a sample guidance note in responding to COVID-19.</li> <li>● Maintain a complaint logbook in workers' camp and take action promptly of complaints.</li> <li>● Schedule transport and hauling activities by avoiding busy areas of the town.</li> <li>● Clean wheels and undercarriage of haul trucks prior to leaving construction site.</li> <li>● Educate drivers and comply with speed limit between 20-25 km/h near settlements or sensitive institutional establishments and avoid use of horn unless necessary to prevent accidents.</li> <li>● Earmark parking place for construction equipment and vehicles when idling; no parking shall be allowed on the roads, that may disturb the traffic movement.</li> <li>● Provide prior information to local people about work.</li> <li>● No nighttime construction activities including material/waste haulage near or within residential areas. Construction activities in these areas must be prohibited from 9pm to 7am.</li> <li>● Noise barriers must be installed in housing areas to reduce the noise level.</li> <li>● Temporary access such as planks with handrails will be provided at excavation areas, particularly in locations where access to residential, commercial and institutional establishments is affected.</li> </ul>			<p>Construction equipment and vehicles are parked at the camp and material storage area only.</p> <p>No construction is being carried out at night</p> <p>Grievance Register is being maintained</p> <p>Every time a new group of workers arrive at the site. they are briefed but no documentation is available.</p> <p>Work in areas near shops has not commenced, the contractor is proposing the existing ducts to avoid trenching. This will be done in consultation with Thomde.</p> <p>No issues with speeding</p> <p>All machinery and equipment are parked at the contractor's construction camp area</p>

Subproject Activities / Field	Potential Environmental Impacts	Mitigation Measures	Responsible for Implementation	Compliance rating for implementation of EMP Measures	
				Rating	Remarks
Occupational health and safety	Health risks and safety problems for workers is likely due to various construction activities such as storage, handling and transport of hazardous construction material, excavation, and other construction related activities. Workers may also be exposed to high level of pollution from dust, exhaust of vehicles and machinery and noise. Further, if workers do not keep to regulated working hours, the risk of accidents will be higher due to fatigue. COVID-19 is also a major issue at construction and camp sites that is detrimental to the workers.	<ul style="list-style-type: none"> <li>• All relevant provisions of the Labour and Employment Act of Bhutan 2007, Regulation on Occupational Health, Safety and Welfare 2012, and relevant WHO guidelines will be adhered to, concerning the provision of adequate measures to avoid contracting and/or spreading diseases.</li> <li>• Follow international best practices on occupational health and safety such as those in Section 4.2 of World Bank EHS Guidelines on Construction and Decommissioning Activities.</li> <li>• Implement an occupational health and safety protocol on emerging infectious diseases such as the corona virus disease (COVID-19) as approved by the PIU or PMU. See Appendix 5 for a sample guidance note in responding to COVID-19.</li> <li>• Provide at every workplace, a readily available first aid unit, including an adequate supply of sterilized dressing material and appliances. Suitable transport will be provided to facilitate the transfer of injured or ill persons to the nearest hospital or clinic.</li> <li>• Always make available emergency medical equipment and nursing staff.</li> <li>• Provide regular health check-ups, sanitation and hygiene, health care, and control of diseases for the workforce.</li> <li>• Provide at cost all labor and materials, and construct/install and maintain site safety, hard barricading, flexible green net, signboards, temporary day/light traffic diversions throughout the construction activities according to the specifications and provide personal protective equipment (PPE) to all the laborers working at the construction site.</li> <li>• Launch awareness programs concerning human trafficking and the possibility of spread of sexually</li> </ul>		S	<p>Being complied</p> <p>The contractor is implementing the following</p> <ul style="list-style-type: none"> <li>-Maintenance of OHS register (CW-01)</li> <li>-First Aid kit</li> <li>-PPE</li> <li>- transportation to the hospital</li> </ul> <p>Emergencies numbers are not posted but EHS officer is also at the site working alongside the workers</p> <p>Emergency staff is not required as the nearest PHC is within 10 minutes of the worksite, and the hospital is less than 1km from both sites – for which transportation is being provided</p> <p>There are four groups with a site supervisor who has the EHS number.</p> <p>Workers are screened at the entry point.</p> <p>Worker retention is difficult with workers leaving after 1-2 months - so regular checkups is not possible.</p>

Subproject Activities / Field	Potential Environmental Impacts	Mitigation Measures	Responsible for Implementation	Compliance rating for implementation of EMP Measures	
				Rating	Remarks
		<p>transmitted diseases (STDs) and HIV/AIDS using brochures, posters, and signboards.</p> <ul style="list-style-type: none"> <li>• Make available first aid kits, ambulance facilities or standby emergency vehicle, and fire extinguishers in camp sites.</li> <li>• Compensation for the loss of life (a zero tolerance to loss of life policy should be developed and implemented) or for any type of injuries.</li> <li>• Provide insurance to the workers. Health and safety training for all site personnel is very important and must be mandatory.</li> </ul>			<p>Overall insurance by the contractor has been submitted to Thromde.</p> <p>No documentation on awareness/briefing provided to workers</p> <p>Signboard has been installed but lacks contact number</p> <p>Worker are provided with PPE and PPE register is being maintained</p> <p>No details on worker awareness or briefings maintained by the contractor although the manager says that this is being carried out</p> <p>First aid kit is available at the site and workers are provided with transportation in case of emergencies</p> <p>Contractor is insured.</p>

## **D. Overall compliance with the EMP/CEMP or SEMP**

### **Inclusion of EMP into bid documents**

51. For the Thimphu sub-projects, the Environmental Management Plan (EMP) was included in the bid documents, and a pre-bid meeting was conducted with the contractors. Similarly, for the Zhemgang sub-project, the EMP is also being made a mandatory part of the bid document.

### **Project disclosure and community awareness**

52. The project information is disclosed on the MoIT website, and the project documents are available at the Thromde office.

53. Thimphu sub-projects information was disclosed to the public during the public consultation organized by the Thromde on 10 September 2023 at the Zilukha School, chaired by the Thrompon, with participants from the PIU and Environment and Social Safeguard Consultants. There were 36 community members/participants (24 male and 12 females) including the local community representatives. The participant list and the record of the meeting is attached in Appendix 4a and 4b.

**Photo 12 a & b. public consultation for both Thimphu sub packages**



54. Similarly, the project intends to disclose information about the Zhemgang sub-project to the public before the start of construction works in Zhemgang.

### **Contractor orientation**

55. For the Thimphu sub-projects, a meeting was held on August 24, 2023, at the Thromde office. The attendees included representatives from the Thromde, the Environmental Safeguards consultant, and the contractors. The meeting covered various topics, including the Grievance Redress Mechanism (GRM), public consultation, information disclosure, baseline studies, monitoring reports, and contractor training.

56. An orientation on ADB environmental and safeguard policies, RGOB regulations relevant for the subproject, including EMP, and compliance monitoring and reporting requirements was organized by the Thromde on 1 September in the Thromde conference hall for both contractors (nodal and EHS focal persons). The orientation was conducted by the Environmental and Social Safeguard consultants. The participant list is attached in Appendix 5.

57. The contractor orientation for the Zhemgang sub-project is scheduled for September 2024, following the selection of the contractor and the awarding of the contract.

**Photo 13. Contractor orientation both Thimphu subpackages**



58. Contractor Compliance to the EMP and CEMP/SEMP is detailed below.

#### **Consents, clearances, and permits**

59. The required environmental and forestry clearances and permits for the Thimphu sub-projects have been obtained for both contract packages. For the Zhemgang sub-project, the environmental clearance has been obtained, while the forestry clearance is still in process.

#### **Site-Specific Environment Management Plans**

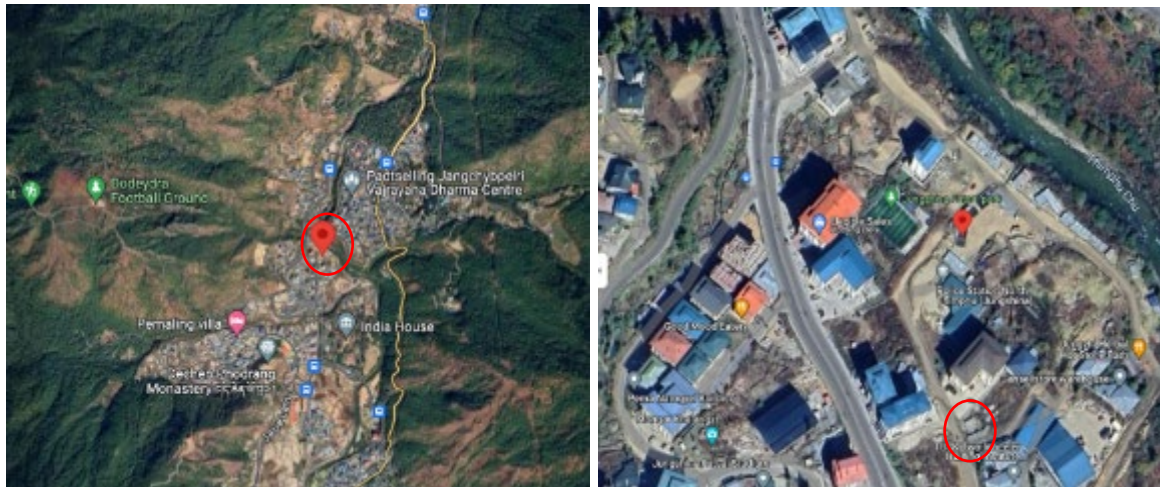
60. The Site-Specific Environment, Health, and Safety Management Plan, along with the Health and Safety Plan and COVID-19 health and safety plans, were prepared for the Thimphu sub-projects by both contractors and approved by the Thromde in September 2023. These are attached in Appendix 6a and 6b and 7a and 7b. The Contractors also conducted risk assessment of their sites and identified mitigation measures and submitted this to Thromde (Appendix 8a and 8b). Similar plans will be developed for the Zhemgang sub-project in due course.

#### **CW-01-Construction of Distribution Network for Pamtsho, Thimphu**

##### **Location of construction work camps, stockpile, storage areas**

61. Camps for site supervisors, drivers and workers are located in Jungshina, near the working site as approved by Thromde.

**Photo 14. CW-01 Site office and Camp site location**



**Office, Material and machinery storage**

62. The site office, store and stockyard as well as machinery as located with the same premises.

**Photo 15 a & b. Site office and toilet**



**Photo 16 a, b & c. Material storage and machinery**



## Worker Recruitment

63. Work recruitment commenced in August. Since then, monthly reports are submitted to the Thromde on the number of employees and workers at each site. The contractor has national employees, but all workers are foreign, and all males. The EMP recommends the employment of locals wherever possible. However, the contractors reported that it is very hard to find Bhutanese workers. Also, the wage rates demanded by Bhutanese is much higher (Nu.1000) as compared to non-Bhutanese workers (Nu.580). The Contractor is paying an additional incentive of Nu.100 to retain foreign workers during the winter months. The number of workers each month is detailed in the table below.

**Table 13: Details on employee and worker numbers (Jan-June 2024)**

Month	No. of Employees		No. of Workers		Total
	Foreign	National	Foreign	National	All Male
January	0	9	0	0	9
February	0	9	0	0	9
March	0	10	40	0	50
April	0	10	48	0	58
May	0	10	55	0	55
June	0	10	58	0	58

## Facilities for workers

64. Within the site, the site office, rooms for site supervisor and workers have been constructed. The camp houses 4 workers in each room. Sanitation facilities (with septic tanks) have also been provided. The worker camps are electrified but the electrical fixtures require rectification to ensure safety. No trees were cut to construct worker camps.

**Photo 17 a & b. Worker camps and electrical appliances being used**



**Photo 18 a & b. Worker toilets have septic tanks**



**Photo 19 a, b & c. Tapped drinking water plus water storage for toilets and Electrical fixtures**



### **Water quality**

65. Drinking water is sourced from the same source as all other users in Jungshina but this is not treated, and the water quality has not been tested.

### **Drainage**

66. No site drainage was observed at either of the worker camps. This is a problem especially for CW-01 site as the water from the tap flows into the untarred road. The problem is exacerbated because in the locality there is no municipal drain, to which the site drains can be connected.

**Photo 20 a & b. Water flowing out of the worker camp (left) and the tap (right) onto the road**



### **Waste management**

67. Despite being located within the collection area, waste management is not practiced in the site. There are no visible dustbins or waste segregation, and waste was observed being burnt and discarded downslope of the worker camps.

**Photo 21 a & b. Waste being burnt and discarded**



### **Occupational health and safety**

68. The contractor has prepared and submitted the Health and Safety Plan including a COVID-19 plan to the Thromde which has been approved. In terms of OHS, the following measures are in place.

- Worker health and safety plan submitted and approved (Appendix 6)
- Provision of PPE to workers
- First aid kit
- Emergency transportation to the hospital in case of emergencies

**Photo 22 a, b & c. First Aid Kit and PPE issue register and log**



**Photo 23 a & b. Worker using PPE camps and electrical appliances being used**



69. Health screening of foreign workers is conducted prior to their entry into Bhutan and arrival at the worksite. Since most workers do not remain at the site for more than 2 months a time, the contractor has not found the need to recheck them.

#### **Accidents, record keeping and reporting**

70. The contractor does not maintain an accident/incidence register/log. During the reporting period, there was one minor injury for which the first aid kit was used.

71. Worker insurance is not required because health services are free in the country for all nationalities.

#### **Worker trainings/briefings and orientation**

72. The contractor reported that briefing and orientation on health and safety, work code, proper behavior, littering, use of PPE and work safety is provided each time a new batch of workers arrives at the site. However, details of these briefings and orientation are not recorded or reported.

#### **Worker grievances**

73. The contractor has had no grievances from workers but also does not maintain a complaint logbook for workers.

#### **Tree cutting**

74. The earlier survey required a forestry permit to cut 30 trees along the pipeline from Jungshina to Dechhencholing sites. However, due to careful pipeline laying, no trees needed to be cut. Similarly, no trees were cut to construct worker camps.

#### **Photo 24 a & b. Worker camps and electrical appliances being used**



#### **Project disclosure and community awareness**

75. The signboard has been installed and approved by Thromde. However, the contact details of the contractor have not been included on the signboard. The community has been informed about the WTP construction during public consultation (10 September 2023), wherein the contractor presented the details of the contract package.

**Photo 25. Project signboard**



### **Construction material transportation**

76. Construction materials are transported to the site only when required (due to lack of space) and stacked at the work site. Since the premises is barricaded, this does not cause any obstruction to traffic or public.

### **Fuel storage**

77. One drum of diesel is stored in the storage shed by the CW-01 contractor. Plastic tarpaulin and drip tray is being used for lubricants and used lubricant is stored in a drum outside the shed, without an impermeable lining.

**Photo 26 a, b & c. Storage of diesel, collection tray and drum**



### **Excavation works**

78. Soil that was excavated was used for backfilling of the civil water tank and for leveling work in the staff quarters and the access road for the DB-01.

79. Trenching works are ongoing by the CW-01 contractor for the distribution network. The contractor has 3-4 teams working simultaneously in various locations. The works along the forest areas have been almost completed. Where trenches have been dug along road crossing, these have been filled up to minimize traffic obstruction. In consultation with the Thromde, the pipeline

alignment was moved from immediately above the road by at least 10-30 meters (depending on location) to avoid damaging the road.

**Photo 27 a & b. Completed trenches in the forest above the highway to Dechhencholing**



80. The trenches for the distribution pipelines have been left open based on the instruction from Thromde and will remain so until the final testing of the water pipeline once completed is carried out.

**Photo 28 a & b. 230 and 100 cum reservoir tanks**



81. On the other hand, for the smaller pipelines through the settlement areas, trenches are covered once pipelines are laid, especially at road crossings.

**Photo 29 a & b. Manual digging of trenches to minimize the damages private properties.**



82. One issue faced by the Contractor is that where sewerage works are being carried out simultaneously in the same area, the buried pipelines have been dug out but the sewerage contractor.

83. To avoid damaging the road as well as any existing structures and to minimize noise pollution, trenches are being dug manually.

84. In some areas, the contractor has had to realign the trench to avoid private plots or damaging the numerous existing pipelines and, in some cases, moving pipelines away from the alignment.

### **Air quality and dust emission and noise**

85. Baseline data on air quality and noise has not been collected. To minimize air emissions from material transportation and congestion, the CW-01 contractor packs sand and aggregates in gunny bags and transports them to all sites once every morning. The contractor also uses a water tank to sprinkle water for dust suppression.

86. The contractors employ their own mechanics to check and maintain all vehicles, equipment, and machinery used for construction, ensuring that pollution emission levels comply with the relevant government requirements. They have also conducted the required vehicle emission tests and obtained the Pollution Under Control certificates, which are mandatory for renewing motor vehicle registration and roadworthiness certificates.

## Community health and safety

87. No construction equipment and vehicles are parked on the street as these are within the construction camps. The contractor in consultation with the Thromde provides prior information to the community representative regarding the work scheduling so that the community is given prior information. All construction work is being carried out during the daytime and no work is being conducted at night.

88. There is no written code of conduct for workers, but workers are briefed on SOP and work ethics.

89. In addition to this the CW-01 contractor is in constant contact with the local representatives during trenching works. Also, the Bhutan Power Corporation was given prior information about the trenching works and have also visited the site twice.

## Use of barricades and safety signs

90. The CW-01 office, storage and worker camps are barricaded. For the trenchwork, as the team is constantly moving along the pipeline alignment, the contractor is using safety cones to signal that work is being done. However, this is not being utilized at all sites. Also, safety signs indicate ongoing works being used.

**Photo 30 a & b. Barricade and safety signs employed while digging trenches with settlement areas.**



## Construction related accidents for both construction sites

91. During the reporting period no construction related incidents were reported.

**Table 14: construction related incidents**

Particulars	Number of cases (previous reporting period)	Number of cases (this reporting period)	Cumulative up to end of this reporting period
Minor / first aid cases	0 (CW-01) 0 (DW-01)	0 (CW-01) 0 (DW-01)	0 (CW-01) 0 (DW-01)
Major accidents	0	0	0
Fatal accidents	0	0	0
Other accidents (only damage to assets, does not involve personnel injuries)	0	0	0
Near miss cases	0	0	0
<b>Total</b>			

**Table 15: Details of Construction work related Incidents in the reporting period**

Occurrence (date/ time, contract package and site)	Description of the incident	Consequence	Action Taken and present status
(DW-01)	None	NA	NA
CW-01)	None	NA	NA

### Safeguard activities carried out for CW-02-Construction of Integrated drinking water and irrigation for system for Zhemgang including 2 years O&M

92. The Initial Environmental Examination (IEE) and Environmental Management Plan (EMP) have been included in the bid documents. The Project Management Unit (PMU) is in the process of selecting the contractor and plans to award the contract by August 2024. The Environmental Clearance (EC) was renewed on January 29, 2024, and is valid for 12 months from the date of issuance.

### Safeguard activities carried out for DB-02-Construction of integrated drinking water and Irrigation system for Hetsotsamchu including 3 years O&M

93. For Hetsotsamchu, the design, build, operate, and transfer (DBOT) modality is under further discussion between the Project Management and Supervision Consultant (PMSC) and the Project Management Unit (PMU). This discussion particularly focuses on the survey and design of the integrated irrigation and drinking water scheme. The PMU has nearly completed the survey and design using in-house expertise. Contracting out the survey and design to the contractor could lead to an inferior design and delay the project in achieving the desired quality.

## V. ENVIRONMENTAL MONITORING OF THE PROJECT

94. Environmental monitoring for the Thimphu packages is being monitored by the Thimphu Thromde, who receives reports on activities from the contractors monthly, based on which feedback is to be given back.

95. However, compliance with the Contractor's SEMP is currently being filled in only by DB-01 contractor, which also lacks details on the specific measures being undertaken for all activities.

96. The Project Management Supervision Consultant (PMSC) has been hired and began supervising and monitoring the project in March 2024.

97. Monitoring of the general condition of surroundings at the project sites during pre-construction phase (baseline) was to be undertaken by the contractors after the award of contracts. This was to be followed with subsequent monitoring once construction begins.

98. Baseline water quality parameters were carried out on 21 November by the WTP Contractor. All the parameters are within acceptable national standards except that e-coli is present (12 CFU/100ml) in the water, suggesting potential fecal contamination of the possible presence of pathogens. As per national environmental standards, there should be no ecoli. Therefore, the contractor must ensure that the water being provided for drinking is from the water treatment plant and not from the stream or treat the water to make it safe for drinking.

**Table 16: Results of the Drinking water test (DB-01)**

Group	National Drinking Water Quality Standards, 2016* (for Urban Drinking Water Supply)			Test results 21.11.24 DB-01
	Parameter	Unit	Max. Concentration Limits	
Physical	Turbidity	NTU	5	0.45
	pH		6.5 – 8.5	7.2
	Color (TCU)	Hazen Unit	15	
	Taste and Odor		Non-objectionable	
Chemical	Iron	mg/l	0.3	
	Manganese	mg/l	0.4	.0005
	Arsenic	mg/l	0.01	
	Fluoride <sup>^</sup>	mg/l	1.5	0.11
	Lead	mg/l	0.01	0.0030
	Nitrate	mg/l	50	0.9
	Calcium	mg/l	75	0.987
	Mercury	mg/l	0.006	
	Residual Chlorine	mg/l	0.2 - 0.5	
	Sulphate	mg/l	250	0
Microbiological	E-coli	CFU/100ml	0	12

99. Other than water, measurements of pre-construction air quality or noise levels were not obtained. The C-01 contractor did not carry out any tests on either water or air quality. The contractor cited a lack of qualified personnel to conduct air and noise quality sampling. As per the

plans, the contractors were expected to collect baseline data on air, noise, and water quality for the reporting period of January to June 2024. However, they were unable to gather the required baseline data, for the same reason mentioned in the last reporting period.

### Training and capacity building activities

100. Staff training, awareness sessions, and toolbox talks are being conducted by the contractors every Monday; however, these sessions are not being recorded.

**Table 17: Construction related incidents**

Particulars	DW-01	CW-01
Staff training	Conducted but not recorded	Conducted but not recorded
Awareness	Conducted but not recorded	Conducted but not recorded
Toolbox talks	Conducted but not recorded	Conducted but not recorded
<b>Total</b>		

### Contractor training

101. A meeting was held between the Thromde (3 staff), contractors (DB-01 and CW-01) and safeguard consultant on 24 August 2023 at the Thromde Office at 11.00 AM. The contractors were briefed on the GRM mechanism, photo documentation of road conditions prior to construction, sharing of workplan with Bhutan Power Corporation, public consultation meeting, contractor training, baseline data collection, compliance monitoring.

102. The Training on the ESMP and GRM for the contractors was organized on 1st September 2023, at the Thromde Conference Hall. Topics covered include environmental and social safeguard requirements, pre- during and post construction, monitoring and reporting, PCRs and Chance find protocols and GRM.

### Public consultation

103. As and when required the C-01 contractor consults the individual landowners to discuss the pipeline alignment. The contractor is also in touch with the water representatives and provide them with prior information before commencing work in a designated area so that the representatives in turn can notify the respective landowners.

**Table 18: Public consultation**

Particulars	Date of consultation	Remarks
DW-01	No formal consultation	
CW-01	Weekly	Consultations are conducted depending on the location of the excavation work, with private landowners, community representatives and Thromde

## VI. GRIEVANCE REDRESS

### A. Grievance Redress Mechanism

104. The GRM process was discussed internally for the Thimphu Subproject and accordingly, GRC committee members were nominated for the level 2 Grievance committee. These include Chief engineer, PIU Coordinator, Supervising Engineer, and Tsogpa.

105. The Government order on GRM committee at the PMU level has been issued. At the subproject level, the GRM committee was established on 3 August 2023 (Appendix 10). Members of the GRM committee include the Thrompon, urban planner, supervision engineers, legal officer, environment officer and the community representative.

106. The Thromde officers have been actively involved in resolving the grievances with the Contractor.

### B. Complaints Received

107. As the infrastructure work at the WTP site is totally within the premises, there were no grievances at this site. For the distribution network, the contractor has maintained a grievance register in which four grievances have been recorded. All grievances were addressed through the Thromde office in consultation with the affected parties.

**Table 19: Grievances logged by CW-01-Construction of Distribution Network for Pamtsho, Thimphu**

Date of Grievance	From/Aggrieved person	Grievance	Action taken	Date of informing the aggrieved person	Status
02/02/2024	Plot owner	Pipe alignment running through plot (n107 – n117)	Realigned pipe outside plot	05/02/2024	Closed
18/02/2024	Plot owner	Pipe alignment running through the new construction building (n400-n251)	Pipe realigned outside plot	25/02/2024	Closed
18/03/2024	Plot owner	Pipe alignment running through the private plot (n324-n295)	Realigned pipe outside the plot	19/03/2024	Closed
21/05/2024	Plot owner	Excavation work for the pipeline Infront of building may lead to water leakage into the basement of the building.	Immediate backfilling and concreting the excavated area to prevent the water seepage and leakage.	21/05/2024	Closed

Photo 32. GRM logbook

S/No	Date	Grievance Issued by	Grievance / Complaint	Corrective Action Taken	Reply Date Issued	Reviewed by	Remarks
7	2/2/24	Churcha	Pipe alignment running through plot (n107-n117)	realigned plot	5/2/24	Pema Tashi Thimphu Throndae	Closed
8	19/2/24	plot owner	Pipe alignment running through the new construction building (n100-n25)	realigned pipe outside plot	25/2/24	Pema Tashi Thimphu Throndae	Closed
9	18/2/24	plot owner	Pipe alignment running through the private plot. (n329-n295)	realigned pipe outside the plot	19/3/24	Pema Tashi Thimphu Throndae	Closed
10	21/5/24	Pema Tashi	Excavation instead of his building under sewage in the basement due to excavations	To be backfilled and deconcreting immediately because there is no sewage in the basement of the building	21/5/24	Pema Tashi Thimphu Throndae	concreting completed

### C. GRC Meetings

108. All grievances are addressed at site and PIU level, therefore GRC meeting was not convened.

## VII. COMPLIANCE TO THE KEY OBSERVATIONS AND ISSUES FROM 2<sup>ND</sup> SEMP REPORT

109. The compliance of the significant observations and concerns highlighted in the Semi-annual monitoring report for the reporting period of July to December 2023.

**Table 20: Key observations, issues, and remedial actions**

#	Issue	Remedial action	Responsibility To implement	Timeline	Responsibility to monitor	Latest Compliance status
<b>Both contractors - Thimphu</b>						
1	The signage does not include contractor's focal person's contact number.	Include contact number on sign	Both contractors	Immediate	Thromde/PIU	To be complied (Contractors have been asked to put official project contact number)
2	Pre-construction air and noise baseline data has not been collected.	Ensure air, noise parameters are collected.	Both contractors	Immediate	Thromde/PIU	Not Complied (Contractors could not find the environmental lab conducting the ambient air quality and noise level).
3	Waste segregation is not practiced, and littering is an issue.  Also, burning of waste has been observed at the worker camp	Waste must be segregated into degradable, non-degradable, plastics, hazardous and construction waste, stored properly in bins/buckets and disposed of at the waste collection centres or follow the Waste pick up timing.	Both contractors	Immediate	Thromde/PIU	Complied
4	Site drainage near worker camp has not been constructed	Construct site drains.	Both contractors	Immediate	Thromde/PIU	Not applicable to DB-01 campsite site anymore as the camp has been abandoned as result of August 2024 flash flood and the labourers have been

#	Issue	Remedial action	Responsibility To implement	Timeline	Responsibility to monitor	Latest Compliance status
						<p>shifted to safer place – in the empty units within the DB-01 office building.</p> <p>For CW-01, the contractor is maintaining and cleaning the drain which is close to the campsite that is prone to choking and flooding the camp area during the rainy season.</p>
5	There is no written code of conduct and no workers complaint register, or record of accidents/injuries	Prepare written code of conduct, brief workers and ensure compliance	Both contractors	Immediate	Thromde/PIU	Being complied (under preparation)
6	Details on sensitization/briefings for workers, incidences/accidents and actions taken	Ensure that all EMP activities are reported.	Both contractors	Next SEMR report	Thromde/PIU	Being complied
7	Worker insurance	Provide insurance to the workers.	Both contractors	Next SEMR report	Thromde/PIU	Complied
8	Emergency numbers	Provide emergency contact details to site supervisors and EHS focal persons	Both contractors	Next SEMR report	Thromde/PIU	Complied
9	No data recorded for condition of roads	Photo document and record road conditions	Both contractors	Next SEMR report	Thromde/PIU	Being complied
10	Work Plan and Progress report submission of Contractor	Contractors are to submit ESS compliance reports each month detailing out the mitigation	Both contractors	Next SEMR report	Thromde/PIU	Being complied

#	Issue	Remedial action	Responsibility To implement	Timeline	Responsibility to monitor	Latest Compliance status
		measures carried out for review by PIU				
<b>DB-01-Design, build and Operate of Water Treatment Plant for Thimphu Pamtsho with 2-year O&amp;M</b>						
1	The stream at the WTP site has been clogged with trees, boulders	Remove all obstruction to ensure minimal disruption to the stream	Contractor	Noted and resolved	Thromde/PIU	Complied
2	Grievance Register is not maintained	Maintain GRM register	Contractor	immediate	Thromde/PIU	Complied
<b>CW-01-Construction of Distribution Network for Pamtsho, Thimpu</b>						
1	The electrical connections in the worker camps are not safe (CW -01)	Repair electrical connections to minimize electrical hazards	Contractor	Immediate	Thromde/PIU	Complied
2	There has been no reporting on the SEMP activities	Ensure that all EMP activities are reported.	Contractor	Next SEMR report	Thromde/PIU	Being complied
3	The excavated trenches have been left open based (except at road crossings) on the instruction from the Thromde, until final testing is completed.  The soil will possibly run off onto the street during the next monsoon season	Ensure exposed soil piles are covered before the rainy season.	Contractor	Next Quarter	Thromde/PIU	Being complied
4	Safety cones are not used at the work site.	Use safety cones at work sites to inform pedestrians/commuters of ongoing work.	Contractor	Immediate	Thromde/PIU	Partially complied
5	Drinking water quality has not been tested	Test the quality of the drinking water to ensure that it is safe for drinking	Contractor	Immediate	Thromde/PIU	To be complied during in the last quarterly reporting period of 2024.

#	Issue	Remedial action	Responsibility To implement	Timeline	Responsibility to monitor	Latest Compliance status
6	Issues with private land, steep slopes, utilities	Conduct a joint survey of proposed alignment prior to start of works at every location must be carried out	Contractor, consultant and PIU, and local people as needed	Immediate	Thromde/PIU	Being complied

## VIII. SUMMARY OF KEY ISSUES AND REMEDIAL ACTIONS

### A. Overall Implementation and compliance

110. Construction activities for both DB-01 and CW-01 are currently underway. DB-01 is 64% complete, while CW-01 is 66% complete. Both projects are expected to meet their respective deadlines. Loan covenants and national regulations compliance are being followed, but the compliance with the ESMP is partially complied with. Baseline data collection regarding physical parameters, except for water quality tests by DB-01 in the pre-construction phase, is yet to be conducted.

111. The last SEMR report revealed various issues in the construction works of DB-01 and CW-01, such as the absence of contact numbers on signage, waste segregation, and site drainage, written code of conduct and worker complaint register, and non-safety electrical connections, among others. While some of these issues have been resolved by the contractors, there are pending issues that still need to be addressed to ensure compliance.

112. To enhance compliance, contractors for DB-01 and CW-01 are required to perform ambient monitoring of air quality and noise levels at their respective project sites. Additionally, the CW-01 contractor must conduct the necessary testing of drinking water. As the contractors were previously unaware of the environmental laboratory service provider in Bhutan, the address for ECO Lab, located in Phuentsholing Thromde, has been provided. The contractors will carry out monitoring of ambient air quality, noise levels, and water quality during the final quarterly reporting period to ensure safeguard compliance. Refer table 21 for the details.

**Table 21: Summary of Issues that need to be implemented for the better safeguard compliance**

#	Issue	Remedial action	Responsibility To implement	Timeline	Responsibility to monitor	Remarks
1	The signage does not include contractor's focal person's contact number.	Include contact number on sign	Both contractors	Immediate	Thromde/PIU	To be complied (Contractors have been asked to put official project contact numbers)

#	Issue	Remedial action	Responsibility To implement	Timeline	Responsibility to monitor	Remarks
3	There is no written code of conduct and no workers complaint register, or record of accidents/injuries	Prepare written code of conduct, brief workers and ensure compliance	Both contractors	Immediate	Thromde/PIU	Being complied (Written code of conduct for workers is under preparation.
4	Drinking water quality has not been tested	Test the quality of the drinking water to ensure that it is safe for drinking	Both contractors	Last quarter of 2024	Thromde/PIU	To be complied during in the last quarterly reporting period of 2024.



1. Manage waste generated from the activity with the application of 4R (Reduce, Reuse, Recycle, Responsibility) principle and other environmentally friendly methods of waste management;
2. Ensure that import and use of hazardous wastes are strictly prohibited; and
3. Ensure that wastes are properly stored prior to disposal/dispatch.

#### **VI. Management of excavated materials and raw materials**

The holder shall:

1. Dispose of excess excavated materials generated during the activity only at the pre-identified approved dumpsite; and
2. Put appropriate measures to avoid erosion and landslides.

#### **VII. Others**

The holder shall ensure that adequate measures are taken to reduce the noise generated from the activity.

#### **VIII. Implementation plan**

The holder shall prepare a detailed implementation plan focusing on the implementation of the terms and conditions of this EC and submit to DECC within three (3) months from the date of issue of this EC as per the reporting format attached herewith.

#### **IX. Monitoring and reporting**

The holder shall:

1. Ensure that the effective day-to-day monitoring of the EC terms and conditions are carried out by the environmental unit or designated environment focal person; and
2. Maintain proper records on wastes generated and its management – stating types (industrial and general wastes), quantities, and characteristics and submit to DECC annually.

#### **X. Renewal and modification**

The holder shall:

1. Ensure that application for the renewal of EC is submitted at least three (03) months prior to its expiry along with a copy of EC, a report on the implementation of its terms and conditions as per the format attached and payment of prescribed renewal application fee, failing which the applicant shall be liable for penalty as per the RECOP 2016;
2. Obtain prior approval from DECC for any modification to the existing proposal/application including, but not limited to, increase in production capacity, change in location of the project, change in ownerships, etc.

#### **Reservation**

1. The DECC may stop the activity or impose additional terms and conditions, as may be deemed necessary; and
2. The EC shall be subjected to periodic review and modifications as per Article 25 of the EA Act 2000, without any liability on the part of the Royal Government.

The holder may adopt best practices in executing these terms and conditions to avoid adverse environmental impacts.

P.O Box No. 141, Telephone (975) 323384/324323/326993



Failure to comply with any of the above terms and conditions shall constitute an offense and the proponent shall be liable in accordance with the Environmental Assessment Act 200 and/or existing environmental laws.

**Validity:**

This EC is valid from October 06, 2023, until October 05, 2025, only for the construction of the following:

- a) Pre-sedimentation tank (60 m<sup>3</sup>) at the existing intake tank at Dechenphu;
- b) Compact-type Water Treatment Plant (1.4 MLD)
- c) Reservoir tanks (230 m<sup>3</sup> & 100 m<sup>3</sup>)
- d) 3.531 Km of Treated Water Transmission Mains from Dechencholing to Pamtsho; and
- e) 18 Km of Distribution Network in Pamtsho and Jungzhina LAP.

*This EC is issued solely pursuant to the EA Act, 2000 and its Regulations and in no way intends to overrule or alter the provisions of any laws or rules in force. The Holder of this EC shall be responsible to adhere to the requirement under other laws and the issuing authority assumes no liability resulting from non-compliance or omission of any laws or rules.*

  
(Tashi Pem)  
DIRECTOR GENERAL

To,  
Executive Secretary  
Thromde Administration  
Thimphu Thromde

**Copy to:**

1. Guard-file (EACD/Tphu-Thromde/4223) DECC, MoENR for record.



P.O Box No. 141, Telephone (975) 323384/324323/326993

## Appendix 1b: Environmental clearance for Zhemgang sub-project



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མོན་མོན་ལམ་ལུང་ལྷན་ཁག་

DEPARTMENT OF AGRICULTURE  
Ministry of Agriculture and Livestock  
Royal Government of Bhutan  
Tashichhodzong, Thimphu: Bhutan



DoA/PD/PSP-04/ 364

29 January 2024

**Subject: Environmental Clearance for Sershong Irrigation Channel, Trong Gewog, Zhemgang.**

Exercising the powers granted under Article 33.1 of the EA Act, the Department of Agriculture (DoA), Ministry of Agriculture & Livestock hereby renews Environmental Clearance (EC) for the construction/renovation of **Sershong Irrigation Channel, Trong Gewog, Zhemgang Dzongkhag** with the following terms and conditions:

1. The channel construction must be in line with the National Irrigation Policy;
2. The original alignment should be followed and no deviations must be made without prior DoA approval;
3. The gross abstraction of water from the source should not exceed 105 litres per second;
4. Wherever the soil structure is weak the channel must be lined with cement or HDPE pipe to prevent soil erosion and that the channel bed-slope must not exceed 1:100;
5. To avoid landslides and instability the channel alignment must conform to the technical survey report;
6. Structures like Drop/cascade, retaining walls and aqueducts must be constructed as per the plan/design specifications;
7. Waste materials (timber, soil, stones etc.) must be disposed off in designated areas and as per the Forest & Nature Conservation Act, 1995;
8. Occupational Health and Safety measures must be strictly maintained at all times and
9. Any disputes arising due to the construction of the channel shall be the responsibility of the project proponent.

Non-compliance of any of the above conditions shall constitute an offence under the EA Act 2000. This shall result in annulment of the EC without any liability on the part of the DoA. This EC is valid for a period of 12 months from the date of issue. In case of non-completion of the activity within the given period, the EC must be renewed one month prior to the date of its expiry.



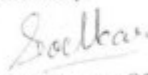
*This renewal is issued based on initial EC DoA-/Eng-19/2020-2021/619 dated 15 Feb 2021 and subsequent late renewal penalty paid vide RC492489568971 dated 22/01/24 and compliance report of 24/01/24 from Zhemgang dzongkhag.*

  
Yonten Gyamtsho

Director.

Department of Agriculture PABX: 322228, 331316; Fax No. 323562; Director: 322805; Chief Agriculture Officer: 321291; Chief Engineer: 329122; Chief Horticulture Officer: 336946; Horticulture Division PABX: 323183,323184 Fax No: 325837

**Appendix 2a: Forestry clearance: CW-01- Distribution Network for Pamtsho**



	<p>ཐིམ་ཕུ་ཐྲོམ་གྲོ་ Thimphu Thromde 220 Gongdzin Lam SE, Norzin Thimphu -11001: Bhutan</p>	
TT/Env/UF/2023-24/ ༠༡༥༩		17 <sup>th</sup> August, 2023
<b>Infrastructure Division, Thimphu Thromde</b>		
<b>Subject: Issuance of Forest Clearance</b>		
Sir,		
<p>This has reference to your application dated 31<sup>st</sup> July, 2023 regarding the laying of water supply pipelines in government land from Dechencholing to Pamtsho. Environment Division of Thimphu Thromde inspected the site and found 10nos. of pole-sized blue pine trees and 10nos. of pole-sized oak trees are required to be felled. However, the applicant is requested to avoid the felling of trees if possible. There is no adverse effect in issuing the forest clearance however, the applicant should strictly adhere to the terms and conditions mentioned in this clearance and form (Annexure III).</p>		
<p>In this regard, Environment Division would like to request Thimphu Forest Division to mark <b>20nos. of trees</b> (detailed attached) from the proposed site and the trees may be allotted to NRDCL.</p>		
<p>In any case, if the applicant fails to comply with any of the terms and conditions mentioned in this clearance and the form it shall constitute an offence under the Forest and Nature Conservation Rules and any other relevant laws. Penalties for such offenses shall include suspension and or revocation of forest clearance in any part or whole.</p>		
<p>The clearance granted shall be valid for a period of one year from the date of issue of this notification.</p>		
<p>Please find attached the details of the inspection report.</p>		
Thanking you,		
Yours sincerely,		
		
<b>Dy. Chief Forestry Officer, Environment Division, TT</b>		
Cc:		
<ul style="list-style-type: none"><li>• DASHO THROMPON, TT for kind information</li><li>• Executive Secretary, TT for kind information</li><li>• Chief Forest Officer, Thimphu Forest Division, DoFPS for kind information.</li><li>✓ Regional Manager, Wang Region, NRDCL to execute the felling immediately</li><li>• Office copy.</li></ul>		
<hr/>		
PABX Phone: +975-2-336310/330001 Toll free-1009 <a href="http://www.thimphucity.bt">www.thimphucity.bt</a>		

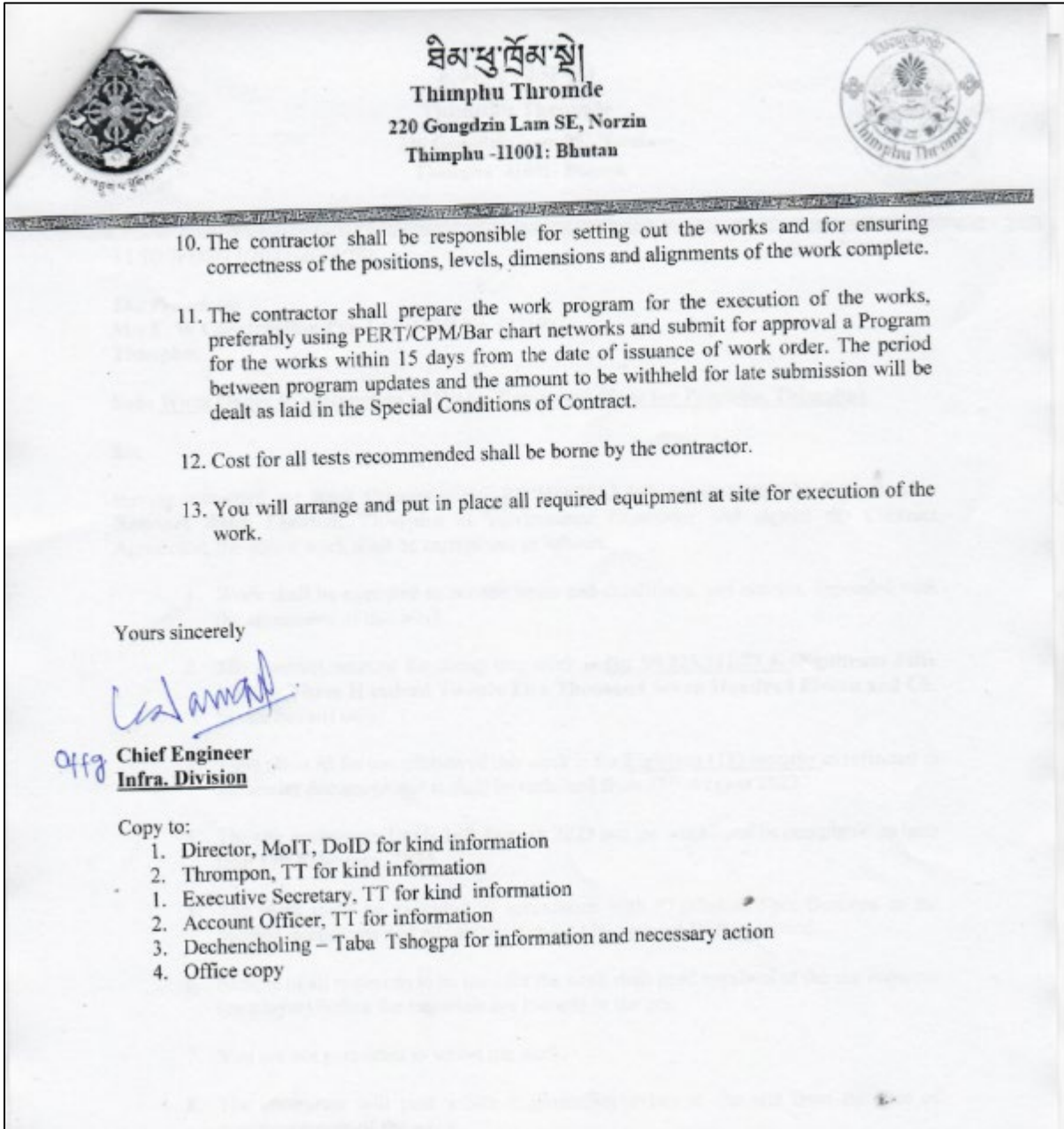
**Appendix 2b: Forestry clearance: DB-01- Water Treatment Plant**

	<p>ཐིམ་ཕུ་བྲོམ་གླིང་། Thimphu Thromde 220 Gongdzin Lam SE, Norzin Thimphu -11001: Bhutan</p>	
TT/Env/UF/2023-2024/ 0241		25 <sup>th</sup> August 2023
<p>The Chief Forest Officer, Thimphu Forest Division, Thimphu.</p>		
<p><b>Subject: Marking Order</b></p>		
<p>Dear Sir,</p>		
<p>As per the application dated 25<sup>th</sup> August 2023 by the Infrastructure Division regarding the felling of trees for the extension of the water treatment plant at Dechencholing in government land bearing Thram No. 675 and Plot no. KAW- 558, the Environment Division of TT has inspected the site and found that there are 33nos. of blue pine trees are required to be felled.</p>		
<p>In this regard, Thimphu Thromde would like to recommend your office to mark 33nos. of trees (detailed attached) from the proposed site and the trees may be handed over to the NRDCL.</p>		
<p>Please find enclosed the inspection report.</p>		
<p>Thanking you,</p>		
<p>Yours sincerely,</p>		
<p><b>Dy. Chief Forestry Officer</b> Environment Division, TT</p>		
<p>Cc:</p>		
<ul style="list-style-type: none"><li>• Executive Secretary, TT for kind information</li><li>• Regional Manager, Wang Region, NRDCL for executing the felling.</li><li>• Applicant to plant equal number of trees in unaffected area.</li><li>• Office copy.</li></ul>		
<p><i>Thrs/Env/UF/2023/172 Dated: 25/8/2023</i></p>		
<p><i>BO, Dechencholing Please conduct field verification and submit report on the following: - Species, no &amp; volume - GPS coordinates.</i></p>		
<p><i>[Signature] 25/8/23</i></p>		
<p>PABX Phone: +975-2-336310/330001 Toll free-1009 <a href="http://www.thimphucity.bt">www.thimphucity.bt</a></p>		

Appendix 3a: Work order- DB-01- Water Treatment Plant



Page 1/2



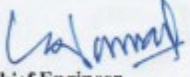
	<p>ཐིམ་ཕུ་ཁྲོམ་གྲྭ། Thimphu Thromde 220 Gongdzin Lam SE, Norzin Thimphu -11001: Bhutan</p>	
TT/ID/IPDS-17/2023-2024/31		Date: 7/08/2023
<p><b>The Proprietor</b> M/s E. W Construction Pvt. Ltd (CDB No. (2319) Thimphu.</p>		
<p><b>Sub: <u>Work Order (Construction of Water Treatment Plant for Pamtsho, Thimphu)</u></b></p>		
<p>Sir,</p>		
<p>Having submitted the Bank Guarantee No: <b>PG/HO/2023-259 dated 3/08/2023</b> from <b>Bhutan National Bank Limited, Thimphu</b> as performance Guarantee and signed the Contract Agreement, the above work shall be carried out as follows:</p>		
<ol style="list-style-type: none"><li>1. Work shall be executed as per the terms and conditions, and clauses, appended with the agreement of this work.</li><li>2. The contract amount for doing this work is <b>Nu 50,325,711.77 /-</b> (Ngultrum Fifty Million Three Hundred Twenty Five Thousand Seven Hundred Eleven and Ch. Seven Seven) only.</li><li>3. Time allowed for completion of this work is for <b>Eighteen (18) months</b> as reflected in the tender document and it shall be reckoned from <b>17<sup>th</sup> August 2023</b>.</li><li>4. The site possession date is <b>16<sup>th</sup> August, 2023</b> and the work must be completed no later than <b>17<sup>th</sup> February, 2025</b>.</li><li>5. The work must be executed in accordance with "Technical Specifications in the bidding documents and all materials should be updated BSB approved.</li><li>6. Sample of all materials to be used for the work shall need approval of the site engineer (employer) before the materials are brought to the site.</li><li>7. You are not permitted to sublet the work.</li><li>8. The contractor will post a Site Engineer/Supervisor at the site from the date of commencement of the work.</li><li>9. The mobilization advance of 10% of the contract amount will be given upon request from the contractor. However, the payment will be made only upon submission of an unconditional <b>Bank Guarantee</b> in the form and by a bank acceptable to the Employer in the amount equal to the advance payment;</li></ol>		
<p>PABX Phone: +975-2-336310/330001 Toll free-1009 <a href="http://www.thimphuacity.bt">www.thimphuacity.bt</a></p>		
<p><i>Contractor</i></p>		



Appendix 3b: Work order: CW-01- Distribution Network for Pamtsho

Page 1/2

	<p>ཐིམ་ཕུ་ཁྲོམ་གྲོང་ཁྱེར། Thimphu Thromde 220 Gongdzin Lam SE, Norzin Thimphu -11001: Bhutan</p>	
TT/ID/IPDS-17/2023-2024/36		Date: 8/08/2023
<p><b>The Proprietor</b> M/s Bhutan Engineering Company Pvt. Ltd Thimphu.</p>		
<p><b>Sub: <u>Work Order (Construction of Distribution Network at Pamtsho, Thimphu)</u></b></p>		
<p>Sir,</p>		
<p>Having submitted the Bank Guarantee No: PG/HO/2023-258 (A) dated 2/08/2023 from <b>Bhutan National Bank Limited, Thimphu</b> as performance Guarantee and signed the Contract Agreement, the above work shall be carried out as follows:</p>		
<ol style="list-style-type: none"><li>1. Work shall be executed as per the terms and conditions, and clauses, appended with the agreement of this work.</li><li>2. The contract amount for doing this work is <b>Nu 70,323,897.11 /-</b> (Ngultrum Seventy Million Three Hundred Twenty Three Thousand Eight Hundred Ninety Seven and Ch. One One) only.</li><li>3. Time allowed for completion of this work is for <b>Twenty (20) months</b> as reflected in the tender document and it shall be reckoned from <b>18<sup>th</sup> August 2023</b>.</li><li>4. The site possession date is <b>17<sup>th</sup> August, 2023</b> and the work must be completed no later than <b>18<sup>th</sup> April, 2025</b>.</li><li>5. The work must be executed in accordance with "Technical Specifications in the bidding documents and all materials should be updated BSB approved.</li><li>6. Sample of all materials to be used for the work shall need approval of the site engineer (employer) before the materials are brought to the site.</li><li>7. You are not permitted to sublet the work.</li><li>8. The contractor will post a Site Engineer/Supervisor at the site from the date of commencement of the work.</li><li>9. The mobilization advance of 10% of the contract amount will be given upon request from the contractor. However, the payment will be made only upon submission of an unconditional <b>Bank Guarantee</b> in the form and by a bank acceptable to the Employer in the amount equal to the advance payment;</li></ol>		
<p>PABX Phone: +975-2-336310/330001 Toll free-1009 <a href="http://www.thimphuclty.bt">www.thimphuclty.bt</a></p>		
<p><i>Colman</i></p>		

	<p style="text-align: center;"><b>ཐིམ་ཕུ་ཁྲོམ་གླེ།</b> <b>Thimphu Thromde</b> 220 Gongdzin Lam SE, Norzin Thimphu -11001: Bhutan</p> 
<p>10. The contractor shall be responsible for setting out the works and for ensuring correctness of the positions, levels, dimensions and alignments of the work complete.</p> <p>11. The contractor shall prepare the work program for the execution of the works, preferably using PERT/CPM/Bar chart networks and submit for approval a Program for the works within 15 days from the date of issuance of work order. The period between program updates and the amount to be withheld for late submission will be dealt as laid in the Special Conditions of Contract.</p> <p>12. Cost for all tests recommended shall be borne by the contractor.</p> <p>13. You will arrange and put in place all required equipment at site for execution of the work.</p>	
<p>Yours sincerely</p> <p> <b>Chief Engineer</b> <b>Infra. Division</b></p>	
<p>Copy to:</p> <ol style="list-style-type: none"><li>1. Director, MoIT, DoID for kind information</li><li>2. Thrompon, TT for kind information</li><li>1. Executive Secretary, TT for kind information</li><li>2. Account Officer, TT for information</li><li>3. Dechencholing – Taba Tshogpa for information and necessary action</li><li>4. Office copy</li></ol>	
<p style="text-align: center;">PABX Phone: +975-2-336310/330001 Toll free-1009 <a href="http://www.thimphucity.bt">www.thimphucity.bt</a></p>	

## Appendix 4a: Minutes of the Public consultation in Thimphu for the Water Flagship Project

Date	Location	Total Participants
10 October 2023	Zilukha HSS School	

The meeting commenced with a welcome speech by the Thrompon/Mayor, followed by presentation on the following:

- Project details and layout by the Thromde,
- Project alignment and workplan by the contractors
- Environmental and social impacts and safeguards, and GRM by the ADB consultants.

This was followed by discussion.

Topic	Discussion/clarification	Response from Thromde
Project	The participants thanked the Thromde for the project and said that the presentation was very clear. Till date, Pamtso had faced a lot of water shortage problems in the past, and the project is very much appreciated as the water issue has been a matter of grave concern in the past.	
Pipe size	There were several participants that raised concerns on the pipe size and request to increase the pipe size, as the population in the area may increase in the future, especially in Thimphu and the pipe size may be inadequate.	Thromde clarified that the current population of 961 households and 4131 persons was taken into consideration and the design has estimated at 5000 persons. Accordingly, the capacity was increased from 1.9 to 2.8 MLD.  The pipe size has also taken the population expansion into account.
Adequacy of the water supply	There are many opportunities in the future for businesses such as swimming pool, hot stone baths and it was requested to ensure that there is adequate water to meet future requirements as well. There was a query on the design capacity and whether this has considered future population increase.	The Thromde also explained about how new technology will be used to detect leakages in the distribution line so any issues with water supply can be detected immediately and repaired.
Tank location	There was a clarification on the location of the tank. Three participants requested that the tank location be shifted to Pamtso as it was felt that this was a more suitable location.  One participant expressed concern regarding the risk to the tank because of the red soil.	Thromde clarified that the tank location was selected to ensure that the tank is centrally located to supply water to both the upper and lower sections of the community. If the tank is shifted, it will not be possible to reach the upper community.  The Thromde also explained how the water would be distributed to all sections of the community from the tanks.

Topic	Discussion/clarification	Response from Thomde
Damage to existing pipelines	There is water association, and the project was requested to inform the association when the works are about to commence so that the association in turn could meet with the community and project implementor to identify where other pipelines are laid so that disturbance to this could be minimized.	This was noted by the Thomde. Both the Thomde and the contractor appealed to the community to identify the existing pipelines in advance to avoid any damage in the future.
Distribution line	Participants requested the Thomde to share the map of the distribution lines.	The Thomde provided the map for those interested to take photos.
Sewerage line	There was a request for the sewerage line to also be shared by the Thomde, if available. Although the sewerage lines have been constructed- there has been no further information on the status of this.	The Thomde explained that the sewerage treatment plant is under construction in Jungshina and that all the construction of the sewerage lines has not been completed. The current difficulty in connecting sewerage line connection was detailed and the Thomde is working to resolve this. It is anticipated that this will be completed in 3-4 months.
Water source	Two participants enquired on why the source was from Dechenphu and not from the Samtenling stream.	The Thomde explained how the Samtenling source is already being tapped by various users. If the Dechenphu source is found inadequate in the future, the Samtenling water could be tapped.

### Participant list for the Public Consultation

Attendance Sheet for 10/09/2023 Public Consultation Meeting

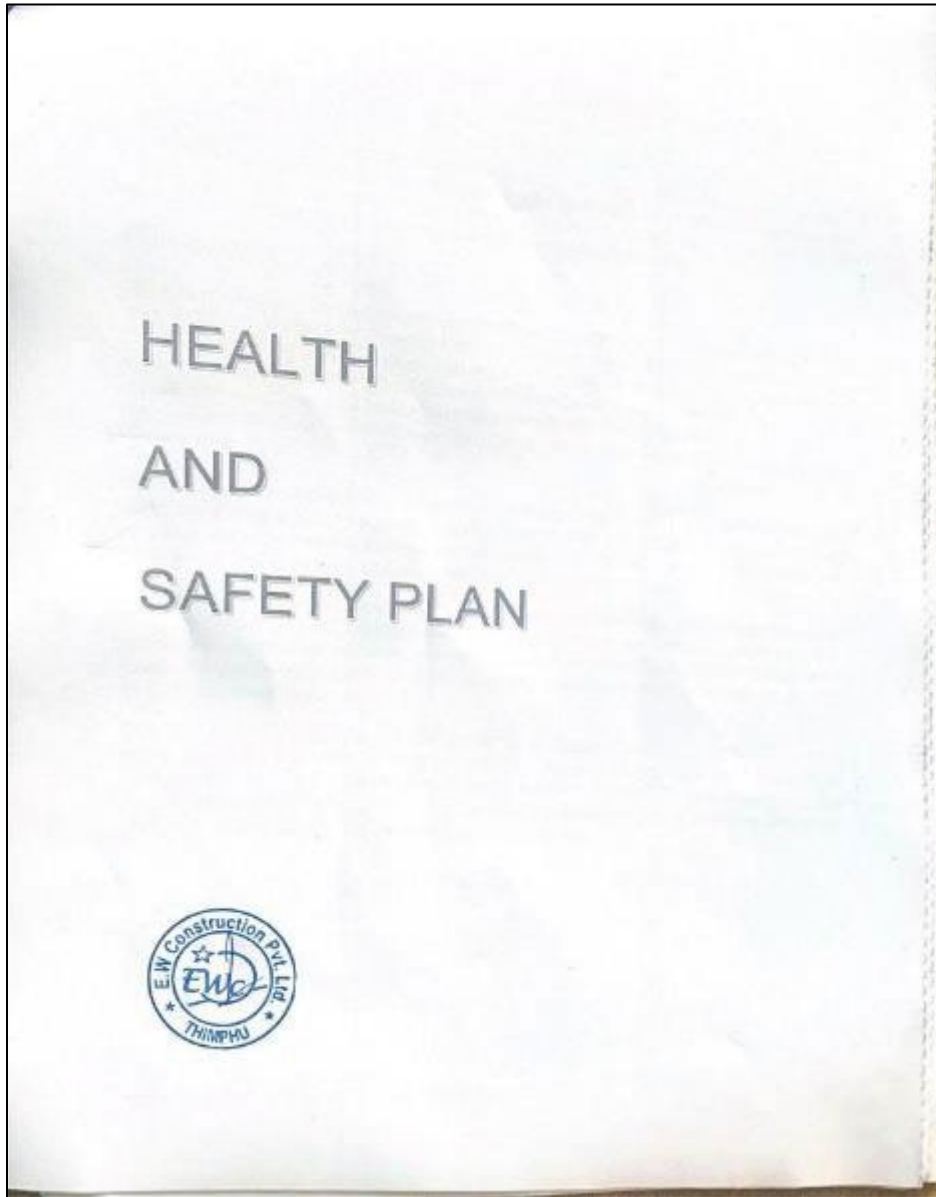
Sl.No	Name	Contact No./Email address	Signature
1	Sangay Wangdi	Jungkhina, 1762854	[Signature]
2	Tashi Dorji	" 17119644	[Signature]
3	Ugyen	17674872	[Signature]
4	Chada Rinchen	17618677	[Signature]
5	galdanchoyi	17629986	[Signature]
6	Tashi Wangmo	17411539	[Signature]
7	Yeshey	877203010	[Signature]
8	Thirley Zom	17534505	[Signature]
9	Peray	17946496	[Signature]
10	Tshewang Dorji	17747299	[Signature]
11	Minsho	17600256	[Signature]
12	Karma Tenzin	17521512	[Signature]
13	Kunja Debla	17117477	[Signature]
14	Nangdi Gyelken	17608625	[Signature]
15	Karma Tenzin	17612983	[Signature]
16	Chanda Thering Pam	17643173	[Signature]
17	Kinley Zom	17604011	[Signature]
18	Tshering Dorji	17162323	[Signature]
19	Sangay Dorji	17125936	[Signature]
20	Debla Sangay	17633232	[Signature]
21	Kuanda Dorji		[Signature]
22	Rinzin Dorji	17655412	[Signature]
23	Tshewang Midun	17110898	[Signature]
24	Karmelchoden	17248266	[Signature]
25	Kunzang Lhaden	17636110	[Signature]
26	Dechen Wangdi	17600246	[Signature]
27	Sithup	88231361	[Signature]
28	Sangay Tenzin	17330426	[Signature]
29	Chayen Rinzen	17669806	[Signature]
30	Ugyen Penjor	17174720	[Signature]
31	Ugye Dorji	17464522	[Signature]
32	Tashi Chhoy	17927047	[Signature]
33	Phub Dorji	17880464	[Signature]
34	Dema	17562314	[Signature]
35	Kibgo Thang	1701347	[Signature]

36	Soren Wangden	Jungkhina (17607143)	[Signature]
37			
38			

**Appendix 5: Participant list for the Contractor orientation on ESS**

ENVIRONMENT & SOCIAL SAFEGUARDS TRAINING ORIENTATION FOR WESP-PIU & CONTRACTORS 01/09/2023		
1) Lotay Tsheten	BECPL	Lotay.becpl@gmail.com
2) Budha Mani	EWCPPL	budhamani2011@yahoo.com
3) Pema Tashi	T.T	ptashi@thimphu.gov.bt
4) Mongal Yang Subba	BE CPL	wongalyang@gmail.com
5) Yeshe Bumkyid	EWCPPL	Bumkyid@gmail.com
6) Tasni Nyikum.	EWCPPL	nyikumt@gmail.com
7) Saroj K. Nepal	ADB Consultant (Social)	gongela@gmail.com
8) Deki P. Yonden	ADB Consultant, P.C.S.	-
9) Jigme Sonam	PCS. PCS.	-
10) Thukten Thinley	T. T.	thuktenthinley77@gmail.com
11) Ngurvang Tashi	TT	ntashi@thimphu.gov.bt
12) Pema Thokcho	TT	pthokcho@thimphu.gov.bt

**Appendix 6a: Health and safety plan-DB-01- Water Treatment Plant**  
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COVID-19 PLAN "CONSTRUCTION OF 1.40 MLD WATER TREATMENT PLANT FOR PAMTSHO"

## Health and Safety Plan Guidance

Health and Safety Plan that addresses how it will maintain the health and safety of labors and other staff that are involve in the Project. The Officer Incharge (Health and safety Officer) will serve as local guidelines for all labors and staffs involve in the construction of 1.40 MLD Water Treatment Plant. The Health and Safety Plan should be tailored to the unique needs of each sites.

### 1 BACKGROUND

Coronavirus is a large family virus causing respiratory illness from common cold to more severe illness similar to novel MERS-CoV detected in 2012 in Saudi Arabia and SARS-CoV in China in 2002. The novel corona virus (COVID-19) was first detected from the outbreak of unexplained viral pneumonia in Wuhan city, Hubei Province in China and reported to the WHO China Country Office on 31<sup>st</sup> December 2019. The common signs and symptoms are fever, cough, sore throat and shortness of breath and breathing difficulties. However, in some cases, it manifests as severe infections leading to pneumonia, severe acute respiratory syndrome, kidney failure and even death.

Initially, many patients from the outbreak epicenter, Wuhan city, China reportedly had some epidemiological link to a large seafood and animal market, suggesting spillover of the virus from animal to human. However, with the evolution of the disease epidemic, it is being recently reported that increased number of confirmed cases having no exposure to animal markets, indicating person to-person transmission.

In order to mount effective and efficient response to COVID-19 in the country, the National Preparedness and Response Plan (NPRP) for COVID-19 is prepared with the objective to enhance the health sector's capacity in surveillance, early detection, control and prevention, response, and recovery from COVID-19 outbreak in the country. The plan shall be reviewed and updated as and when required by the Technical Advisory Group (TAG) for COVID-19, Ministry of Health.

This NPRP is linked and aligned to the Health Emergency and Disaster Contingency Plan 2016 and National Disaster Management Act 2013. In addition to this plan, Paro International Airport has a Public Health Emergency Preparedness Plan, which was simulated and tested in November 2019. All the hospitals including Primary Health Center (erstwhile BHU-II) in western region also have Public Health Emergency Contingency Plans which will be activated depending on the types of emergency.



Prepared & Submitted By: EWCPL and GWESPL

**COVID-19 PLAN " CONSTRUCTION OF 1.40 MLD WATER TREATMENT PLANT FOR PAMTSHO"**

**2. STAGING OF COVID-19 OUTBREAK**

The Ministry of Health, Bhutan define the stages/phases of the COVID-19 as shown below. At this stage, the country is in Orange stage.

Current stage  Green  Yellow  Orange  Red

Color	COVID-19 status	Impact on daily life	Advice to public
Green	No confirmed case in Bhutan and COVID-19 outbreak is limited to few countries (subject to risk assessment)	No disruption	Be socially responsible: maintain good personal hygiene (hand hygiene & cough etiquette); follow travel advisories.
Yellow	No confirmed case in Bhutan but COVID-19 is reported in the multiple countries (subject to risk assessment)	Minimal disruption (Enhanced surveillance by screening of travelers at the airport and ground crossing; and mandatory reporting and investigation of SARI cases)	Be socially responsible: minimize mass gathering, maintain good personal hygiene (hand hygiene & cough etiquette); follow travel advisories and limited travel restriction only if necessary
Orange	One or more isolated confirmed cases in Bhutan without secondary transmission	Moderate disruption (isolation, quarantine, visitor restrictions at hospitals; limited closure of schools, institutions and public gatherings in the affected localities)	Be socially responsible: avoid mass gathering, comply with quarantine and other control measures; travel restriction to & fro affected countries. Maintain good personal hygiene (hand hygiene & cough etiquette)
Red	Multiple cases with local transmission	Major disruption (Lock down of all the affected places).	Be socially responsible: avoid Mass gathering, comply with quarantine and other control measures; travel restriction to & fro affected countries. Maintain good personal hygiene (hand hygiene & cough etiquette)

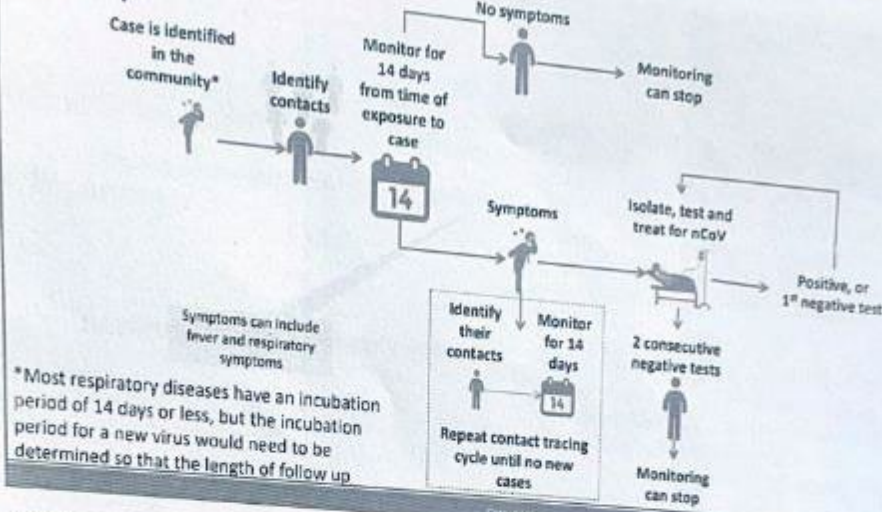
The Royal Govt. of Bhutan rules require Health and Safety plans include the following components:



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### COVID-19 PLAN " CONSTRUCTION OF 1.40 MLD WATER TREATMENT PLANT FOR PAMTSHO "

If a case is identified in the community:



The Royal Govt. of Bhutan rules require Health and Safety plans include the following components:


- Universal and correct wearing of masks ;
- Modifying facilities to allow for physical distancing
- Hand washing and respiratory etiquette.
- Cleaning and maintaining healthy facilities, including improving ventilation ;
- Contact tracing in combination with isolation and quarantine , in collaboration with Ministry of Health.
- Diagnostic and screening testing;
- Efforts to provide COVID-19 vaccinations to labors and communities.



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**COVID-19 PLAN " CONSTRUCTION OF 1.40 MLD WATER TREATMENT PLANT FOR PAMTSHO"**

ARP ESSER Requirement	Strategies, Policies, and Procedures
a. <u>Universal and correct wearing of masks</u> ;	We are mandating face coverings for everyone in the building. We will review all CDC and local recommendations.
ARP ESSER Requirement	Strategies, Policies, and Procedures
b. <u>Modifying facilities to allow for physical distancing</u>	our weekly COVID Team meetings. We will be setting up at 3 feet of distance for each individual. Movement through the hallways will be monitored by an safety officer and at 3 feet of distancing will be used.
c. <u>Hand washing and respiratory etiquette</u> ;	24 hrs water supply line will be provided for hand washing, as will hand sanitizer. The new addition is the use of soap and water in the bathrooms. We also do hygiene breaks before and after lunch is served/eaten.
d. <u>Cleaning</u> and maintaining healthy facilities, including improving <u>ventilation</u> ;	Ventilation was adjusted and regular cleaning of rooms, bathrooms, kitchen for maintaining health hygen.
e. <u>Contact tracing</u> in combination with <u>isolation</u> and <u>quarantine</u> , in collaboration with the State and local health departments;	We will continue to work with our local CDC Rep on contact tracing. We will identify a designated isolation area in the camps who present as ill during working time. We will follow CDC guidelines for quarantine. A doctor's notes will be required for return to work place.
f. <u>Diagnostic</u> and screening testing;	We will continue to benchmark new labors as they enroll, we will utilize our safety officer for testing needs and will continue to provide services as outlined/needed to our labors
g. Efforts to provide <u>vaccinations</u>	We will work with our safety officer to make sure that adults are aware of vaccination sites in our community. We will continue to be a resource for our families and our communities that we serve.



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9 PLAN "CONSTRUCTION OF 1.40 MLD WATER TREATMENT PLANT FOR PAMTSHO"

Health and Safety measure:

Any staffs who is asymptomatic and has a travel history to any affected countries in the last 14 days shall be put under home quarantine. The duration of the quarantine shall be for 14 days. The following shall be the measures taken for the home quarantine:

- The person to be home quarantined shall receive all necessary health education and precautionary measures
- Persons in home quarantine must be able to monitor their own symptoms (or have them monitored by a health staff)
- If he/she begin to feel unwell and develop a fever or shortness of breath, a cough or a respiratory illness during your period of self-quarantine, immediately call 112 and seek medical attention
- Household members require no specific precautions as long as the quarantined person(s) remains asymptomatic. However, it is recommended to minimize interactions with other household members to prevent exposure during the incubation period (2-14 days).

Precautions include:

- sleeping and eating in a separate room,
- using a separate bathroom,
- wearing a surgical mask when in a room
- practicing good cough etiquette

**Actions for person of non-compliance**

- When staff on duty encounter non-compliant cases at the designated facility, the Following actions shall be taken:
- Provide counselling to the non-complaint case
- After repetitive non-compliance, the staff on duty should report to immediate supervisor
- The supervisor then shall report to Team Leader of Quarantine & Isolation Section, HEMC for appropriate actions
- The team leader communicates to MoH's legal authorities



Prepared & Submitted By: EWCPL and GWESP

**CONSTRUCTION OF DISTRIBUTION NETWORK FOR PAMTSHO.**

**HEALTH AND SAFETY PLAN.**

**CONTENTS:**

- 1) **Introduction.**
- 2) **Purpose of H&S plan.**
- 3) **Responsibilities.**
- 4) **Accident review.**
- 5) **Safety Record keeping.**
- 6) **Health and Safety Education/Awareness.**
- 7) **Safety Inspection.**
- 8) **Health and Safety Plan and review.**

This Health and safety plan is made in compliance with the Minister of Labour and Human Resources General rules and regulations on Occupational Health and safety (OHS) in construction, Manufacturing, Mining and Service Industries.


**1. Introduction:**

The prevention of all kinds of accidents, injuries and disease outbreaks in and around the project site is very important for the project to function smoothly. It is the policy of the company to always maintain the good Health and Safety of employee first before the work by providing the required Awareness, PPE kits and maintaining safe work area and safe surroundings. Not only the employees but also the Health and Safety of people dwelling in the project area are also taken into consideration.

**2. Purpose of Health and Safety Plan.**

The mandate of the Health and Safety plan is to

- a. Prevent any kind of mishap that may take place while executing work.
- b. To educate the workers about the health and safety risk at the work site.
- c. To educate the importance of OHS.



Mangal Yang Subba  
The above people

- d. To create a reporting system in case of accident or an outbreak of disease.
- e. To create an emergency plan in case of accident, disease outbreak etc.
- f. To maintain the records of all Health and Safety activities like accident, disease outbreak, OHS training and briefings.

### **3. Responsibility Assignment.**

#### **Contractor Responsibilities**

Develop, implement and maintain Construction Site health and safety plan  
Designate a worksite OHAS Officer  
Develop, deliver and maintain a training course as outlined in the Plan for all site personnel and visitors  
Fund to the level appropriate the Plan to ensure compliance with this Plan and the applicable OHAS Standards, Ministry of Health guidance and instruction; this includes funds for purchasing of vital equipment, disinfectants and cleaners and additional workers where necessary as well as funding of all related procedures

#### **OHS officer responsibilities**

The implementation, enforcement, supervision and record maintaining pertaining to Health and Safety polices at project site will be carried out by Mr. Mongal Yang Subba, OHAS officer.  
In the absence of Mr. Mongal Yang Subba, Mr. Lotay Tsheten will delegate the responsibility.

### **4. Accident Review.**

The accidents, health and safety issue occurring at site will be maintained in an OHAS logbook and reviewed on monthly basis at project site. Here the frequency, area and trend of accidents, health and safety issues related to diseases will be recorded along with the steps taken to resolve it.

The management and the Project Manager of the company will review all the accident records/log book maintained at site quarterly and will recommend corrective actions if necessary.

### **5. Safety Record keeping.**

The OHAS officer will be responsible for keeping and maintaining all the records and log books pertaining to the Health and Safety issues.



The blank forms related to complain and documentation will be readily available for immediate usage.

The following Log book will be maintained:

1. Accident at site.
2. Illness and Injury.
3. PPE kit issued.

All necessary accident reports, health and safety reports will be recorded within 24 hours and shall be kept at site office.

#### **6. Health and Safety Education/Awareness.**

The OHAS officer will conduct meeting at site every month and educate the employees about Health and safety issues, do's and don'ts at the work site including the importance of PPE. The briefing will be given every time a new employee/labour joins the work before sending to field. Apart from it the employees will be briefed and checked every morning before commencing the work regarding the health and safety.

Health and Safety education and awareness will be given on following topics but not limited to

1. Personal Protective Equipment.
2. Housekeeping
3. First Aid.
4. Equipment Guarding
5. Instruction to Drivers
6. Maintenance of Vehicle
7. Hazardous material.

Safety meeting will be documented.

#### **7. Safety Inspections.**

The OHAS officer will make sure that all employee adhere to the OHS plan and it is being followed strictly. The OHAS officer will carry out inspection on daily basis and record findings on his daily log book. Apart from inspection of employees, OHAS officer should also take note of potential hazard and inform the employees about it. The OHAS officer should also check all the machines, vehicles and power tools in order to avoid any accidents.



The OHAS officer shall document and maintain all his inspection reports, corrective measures put in place and findings till the end of the project.

**8. Health and Safety Plan and Review.**

The OHAS officer will plan and review the project site health and safety monthly by conducting meeting at site and discuss thoroughly. At the same time employees will also be given chance to raise their concern about potential threats.

The management will review the health and safety plan quarterly and discuss/review the monthly meeting findings. During the meeting it will be checked if all the previous shortcoming at the site pertaining to Health and safety are resolved. Any help needed from management to implement the Health and Safety Plans at site shall also be resolved during the meeting.



**Appendix 7a: Contractors EMP compliance report: DB-01- Water Treatment Plant**

S I N O	Activities	Potential Negative Impacts	Proposed mitigation measures	Responsible Agency		Remarks	
				Implementation	Monitoring	Client	Contractor
<b>1</b>	<b>Labor Camp Location and Operation:</b>						
a	Labor camp location	Improper location of the camps	Camps to be constructed at designated/approved location	M/s E W Construct ion Pvt. Ltd.	Thimphu Thromde,	Thimphu Thromde ,	Camps construct ed in approved location given by the client
b	Latrines	Conflict with nearby vicinity for water resources contamination, surrounding sanitation and unhygienic living condition.	Proper latrine to be provided with adequate water supply, surrounding to be maintained clean with proper drainage facilities.	M/s E W Construct ion Pvt. Ltd.	Thimphu Thromde,	Thimphu Thromde ,	Provided with adequate water
c	Drinking water Supply	Health problems and spread of diseases	Safe drinking water to be provided with 25mm water line for 24 hours supply at about 1 km away from the construction site	M/s E W Construct ion Pvt. Ltd.	Thimphu Thromde,	Thimphu Thromde ,	Complied
d	Waste Disposal	Improper disposal of domestic waste, spread of diseases, unhygienic living condition and water pollution of nearby stream & river	Use of proper waste disposal site of earthen pit and collect the waste every weekend to memilakha disposal site.	M/s E W Construct ion Pvt. Ltd.	Thimphu Thromde,	Thimphu Thromde ,	Complied
e	Health Awareness	Get affected with water borne diseases, spread of other disease like STD/HIV/AIDS	First AID and medical supply to be kept at site, Labors to be briefed about the spread of diseases, identified the location of nearby hospital.	M/s E W Construct ion Pvt. Ltd.	Thimphu Thromde,	Thimphu Thromde ,	Complied

S I N O	Activities	Potential Negative Impacts	Proposed mitigation measures	Responsible Agency		Remarks	
				Impleme ntation	Monitoring	Client	Contract or
f	Awarenes s on the Law of the Country	Illegal hunting, illegal fishing and collection of timber from the forest.	Staff and the labors to be educated on the law of the country and collection of timber from the forest. The staffs and labors to be provided with cooking firewood/electricity after getting the permit from authorized department.	M/s E W Construct ion Pvt. Ltd.	Thimphu Thromde,	Thimphu Thromde ,	Complied
2							
a	Disruption of road traffic by excavatio n operations	Cause injuries and accident	Provision of advance information to the public on the timing and duration of construction operations that will affect traffic flow, and use of suitable temporary signaling system	M/s E W Construct ion Pvt. Ltd.	Thimphu Thromde,	Thimphu Thromde ,	Complied
3.							
a	Excessive cutting	Instabilities of local landscape, production of excess spoil, slope failure and soil erosion	Minimize the cutting to required height and the operator to be briefed properly before start of cutting. Proposed retaining wall to retain the fill areas.	M/s E W Construct ion Pvt. Ltd.	Thimphu Thromde,	Thimphu Thromde	Complied
b	Spoil materials	Air pollution, Road blockage, water pollution and soil erosion.	All excess excavated material to be disposed at identified dumping yard and provide protection wall wherever necessary.	M/s E W Construct ion Pvt. Ltd.	Thimphu Thromde,	Thimphu Thromde , Thimphu Thromde ,	Complied

S I N O	Activities	Potential Negative Impacts	Proposed mitigation measures	Responsible Agency		Remarks	
				Impleme ntation	Monitoring	Client	Contract or
c	Safety	Injury and accident.	Safety gadgets like helmet, gloves and safety boots to be used during work. Sign boards, information boards and barricade tape to be erected at work side.	M/s E W Construct ion Pvt. Ltd.	Thimphu Thromde,	Thimphu Thromde ,	Complied
4.							
a	Constructi on Waste Disposal	Scarring of Landscape, Damage of vegetation, water pollution, disruption of natural flow, blockage of road and disturbance to aquatic ecology.	Proper disposal of waste at identified location, should not be disposed in streams and rivers.	M/s E W Construct ion Pvt. Ltd.	Thimphu Thromde,	Thimphu Thromde ,	Complied
5.	<b>Materials:</b>						
a	Storage	Huge stock piling can slump down and cause land slip and damage existing vegetation and infrastructure.	Stock piling area to be not erosion prone, away from residential area, construction materials to be covered by tarpaulin to protect from rain and wind.	M/s E W Construct ion Pvt. Ltd.	Thimphu Thromde,	Thimphu Thromde ,	Complied
b	Handling	Caused injury and accident	Provision of proper construction gloves, goggles, face mask, safety boots as required. Supervisor to be engaged with labors.	M/s E W Construct ion Pvt. Ltd.	Thimphu Thromde,	Thimphu Thromde ,	Complied
6.	<b>Water:</b>						
a				M/s E W Construct	Thimphu Thromde,	Thimphu Thromde ,	Complied

S I N O	Activities	Potential Negative Impacts	Proposed mitigation measures	Responsible Agency		Remarks	
				Impleme ntation	Monitoring	Client	Contract or
	Water managem ent	Soil erosion, land slid and flooding of area.	Proper drainage to be constructed.	ion Pvt. Ltd.			
b	cross drain and diversion	Flooding of downstream area, increase sediments in the stream and rivers	Provision of appropriate drainage and proper restoration of original course of water after construction.	M/s E W Construct ion Pvt. Ltd.	Thimphu Thromde,	Thimphu Thromde ,	Complied
<b>7.</b>	<b>Vehicle and Machinery:</b>						
a	Pollution	Air pollution, noise pollution, dust pollution and water pollution.	Regular maintenance of vehicle. Used oil/grease to be disposed off properly and proper mask to the workers.	M/s E W Construct ion Pvt. Ltd.	Thimphu Thromde,	Thimphu Thromde ,	Complied
b	Safety	Injury and accident.	Provision of safety gear such as gloves, boots, helmets, face mask, ear plugs to the construction workers. Ensuring that vehicle and equipment operators are properly licensed and trained.	M/s E W Construct ion Pvt. Ltd.	Thimphu Thromde,	Thimphu Thromde ,	Complied

**Appendix 7b: Contractors EMP compliance report: CW-01- Distribution Network for Pamtsho**

Sl no	Activities	Mitigation	Location of implement	Remarks
1	Orientation for contractor's workers on EMP	PIU and Contractor will conduct awareness program and Contractor will strictly follow the EMP	Camp Area	1) Briefed every time new workers join the site. 2) every Monday morning workers are briefed,
2	Site Clearence	Felling of Trees	Construction site	Not applicable
		Clearing of Forest	Construction site	Not applicable
3	Earth work	1) We will do excavation as per specification and maintain slope as required	Construction site	Complied and excavated manually
		2) Embankment filling will be done as specification with required proper slope		Complied
		3) In the area of Deep Excavation and trench Excavation Caution tape will be used around the excavated area.	Construction site	Caution tape provided
4	Material exploitation and management of quarry	1) All construction materials, particularly stone and aggregate are to be source from BSAF or Singye Quarry (Approve by DGM)	Approved Quarry	
		2) Sand will be procured from NRDCL (Authorised supplier)	Wangdi Quarry	sand from Wangdiphodrang after approval from NRDCL
		3) All vehicle used for transportation will be covered by tarpaulin	Quarry to Site	Covered
5	Waste	1) We will dispose Construction waste and surplus earth at identified disposed site.	Construction site	Complied
		2) Waste Generated from labour and staff camp will be collected and hand over to Thomde waste collecting truck	Construction site	Waste Dropped when the Thomdoe vehicle comes and others are taken to waste drop-in centre, Jungshina
6	Dust Pollution	We will sprinkle water if necessary	Construction site	Tanker kept at site ready
7	Air Pollution	All vehicle and machine have fitness and emission test certificate	Construction site	all emission test are done
8	Noise pollution	We will avoid noise pollution like unnecessary horn.	Construction site	instructed drivers and complied

9	Stock piling of Materials	Stockpiling will be done in Appropriate locations where, there will be no soil erosion or damaged to vegetation	Construction site	complied and stored on stable ground
10	Construction camp and canteen facilities	1)Construction camp will be construct at designated area provided by Thromde or rented private place	Camp area	complied
		2) Adequate drinking water, and other basic require item will be provided	Camp area	provided
		3) Proper pit latrine is constructed for hygiene propose, Waste will dispose to city waste collector	Camp area	complied
		4) instruct the labour regarding illegal work like fishing and hunting	Camp area	briefed every Monday and every time new labour arrive at site
		5) After completion of project, Camp area will be clean and bring back to original state	Camp area	
12	Safety measure	Will provide adequate safety gear, Such as Ear plugs, masks, gumboots, gloves and safety helmets etc.....to the workers. Provide full PPE kit to workers	Construction site	provided
13	Injury/Illness	Render first Aid, Call emergency if needed, notify OHAS officer	Construction site	provided
14	Disease outbreak	Render first aid, contact emergence, cordon off the area.	Construction site	
15	Machinery Accident	Render first Aid, Call police, emergency if needed, notify OHAS officer	Construction site	complied
16	Fire prevention and protection	Awareness program by OHAS officer, no burning of fire in open area, forest area. Highly flammable material to be disposed properly	Construction site	briefed every Monday and every time new labour arrive at site about the fire prevention and Do's and don'ts.
17	Public health and safety	Construction site near settlement will be provide safety tape and sign board whenever necessary.	Construction site	provided at necessary area
18	Operations of Vehicles, Machinery and equipment'	Regular maintenance of Vehicle & Machinery	-	complied
		Emission test to be carried out	-	Complied

## Appendix 8a: Risk assessment report: DB-01- Water Treatment Plant

Table 4 below describes some of the typical risks that have been identified during the design phase, their impacts, assessed levels of risk and control measures that have been taken to mitigate them to acceptable levels

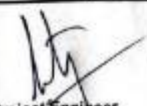
Table 4 Risk Assessment -

Construction Element	Description of Risk	Potential Impacts	Likelihood/Frequency	Consequence Severity Rating	Level of risk	Design Control Measures
General	Travel of personnel to and from the site.	Extensive human injuries.	2	4	High	Co-ordination between construction and landfill operations contractors. Awareness of all site users, standard operation procedures and use of appropriate visibility gear.
General	Contamination of site with hydrocarbons or polluted water.	Polluted water source.	2	2	Low	The storage and handling of chemicals and fuels will be monitored at all times.

## Appendix 8b: Risk assessment report: CW-01- Distribution Network



**Name of Work : CONSTRUCTION OF TRANSMISSION AND DISTRIBUTION**  
**Client : THIMPHU THROMDE.**  
**Contractor. : Bhutan Engineering Company Private Limited.**  
**RISK ASSESSMENT.**

Sl. No	RISK	Description	Risk	Mitigation measure / risk management plan	Remarks
1	Pipe Alignment	Before trench excavation the pipe alignment and route are to be checked.	Medium	Check the alignment provided using the survey and if not as per the requirement recheck it by involving the client.	PIU and Contractor.
2	Alignment in Private Plot	The pipe line near the private plots are to be checked by survey using Total station	High	Inform the plot owner and check the proper pipe alignment around the plot using the survey coordinates. If any problem Contractor consult with the PIU for further checking	PIU, plot owner and Contractor.
3	Nature.	Trees and water bodies to be not disturbed.	Medium	While excavating as far as possible the trees should be avoided and the water bodies shall not be disturbed/littered. Also while excavating no stones or boulders should be rolled down towards valley.	PIU and Contractor.
4	Public utility	Risk of damaging the the public utility like water pipes.	Medium	Inform all the workers about the pipe line and other utilities. In case of damage repair immediately. If near the building ask the owner about the utility line.	plot owner and Contractor.
5	Accident	Vehicle accident while on duty	Medium	Inform/brief all the Drivers about the safety dos and donts while driving. In case of accident keep 1st aid supplies and keep a vehicle at site for taking to hospital immediately. Also keep the emergency Numbers.	Contractor
6	Pollution	Air and Noise pollution by labour and vehicle	Low	Instruct Labour to maintain discipline and not move around and shout unnecessarily. Instruct Drivers to maintain speed limit of vehicle and restrict the vehicles moving without work. Keep the vehicle fitness upto date. Follow the work timing set by the government strictly.	Contractor
7	Safety	Staff and Labour safety at site while working.	Low	Provide necessary safety clothings and equipment while at work and Inform/brief all the workers about the safety dos and donts while at work. In case of accident keep 1st aid supplies and keep a vehicle at site for taking to hospital immediately. Also keep the emergency Numbers.	Contractor
8	Worker Health	Risk of getting sick.	Low	Instruct Labour to maintain cleanliness, drink boil water, maintain dustbin, keep 1st aid kit for emergency.	Contractor

  
**Project Engineer**  
**Bhutan Engineering Co. Pvt.Ltd.**

(8-8)



## Appendix 9a: water testing report: db-01- water treatment plant

	<b>ME TESTING LAB PVT. LTD.</b>																														
(AN ISO 9001:2015, 14001:2015 & NABL Accredited Lab.) LAB-Plot No.78, Udyog Kendra Extn.-1, Ecotech III, Greater Noida (U.P.)																															
<b>GURGAON OFFICE :-</b> Shop No. 17 Sec-106 Opposite of ATS Kocoon Society Gurgaon Hr.	<b>ALLAHABAD OFFICE :-</b> Shakti Nagar, in front of Bara Chaka Gate FCI Road, Naini Allahabad 211008 (U.P.)																														
Email - metgnoida@gmail.com / info@metestinglab.com Contact - 8010301330 / 9319012155 / Website - www.metestinglab.com																															
<h3 style="margin: 0;"><u>TEST REPORT</u></h3>																															
<b>Description of sample :</b> Raw Water <b>Sample Condition:</b> Good Site: Bhutan 1.4 MLD WTP	<b>Report No.:</b> METL/21122023/120 <b>Date of Receipt:</b> 21/12/2023 <b>Date of Testing:</b> 21-25/12/2023 <b>Date of Reporting:</b> 25/12/2023																														
<b>Issue to:</b> Grannus Water and Environmental Solutions Pvt. Ltd. Okhla, Delhi																															
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1. The Result listed refer only to the tested samples & applicable parameters enforcement of products is neither inferred nor implied. 2. Total liability of our Labs. is limited to the involved amount. 3. This report is not to be reproduced wholly or in part & cannot be used as an evidence in the court of law & should not be used in any advertising media without our special permission in writing																															

## Appendix 9b: water testing report: DB-01- Water Treatment, MOH Report

Page 1/3


	<p>དངམ་ལྷན་འབྲུག་གཞུང་། གསོ་བ་ལྷན་ཁག། ཐིམ་ཕུ</p>	<p>ROYAL GOVERNMENT OF BHUTAN MINISTRY OF HEALTH DEPARTMENT OF PUBLIC HEALTH <b>Royal Centre for Disease Control</b> Serbithang, Thimphu-BHUTAN P.O BOX: 667</p>	
<h3>Drinking Water Quality Testing Laboratory Result</h3>			
<p>Royal Centre For Disease Control : Thimphu</p>			
<p>Other Surveillance Report</p>			
Record #	AREC_001788	Test Requested By	EWCP
Collected By	Tandin Wangmo	Collection Date & Time	2023-11-21 11:00:00
Analyzed By	Pema Chopel And Tandin Wangmo	Analysis Date & Time	2023-11-21 14:00:00
Sampling Point : <b>Dechencholing</b>	Source : <b>Others</b>	Acceptable Value	
Alkalinity(mg/L as CaCO <sub>3</sub> )	5.2	20 - 200	
Aluminium(mg/l)	0	0.0 - 0.9	
Barium(mg/L)	0.0020	0.0 - 1.3	
Boron(mg/L)	0	0.0 - 2.4	
Cadmium(mg/L)	0.0088	0.000 - 0.003	

		<p>དཔལ་ལྷན་འབྲུག་གཞི་རྒྱུད། གསོ་བ་རྒྱན་ལག། ཐེམ་ཕུ</p>		<p>ROYAL GOVERNMENT OF BHUTAN MINISTRY OF HEALTH DEPARTMENT OF PUBLIC HEALTH <i>Royal Centre for Disease Control</i> Serbithang, Thimphu-BHUTAN P.O BOX: 667</p>			
Calcium(mg/L)	0.987	<75mg/l					
Calcium Hardness(mg/L as CaCO3)	7.4	0 - 75					
Conductivity(us/cm)	16.37	0 - 1000					
E. Coli(CFU/100mL)	12	0					
Fluoride(mg/L)	0.11	0.0 - 1.5					
Nitrates(mg/L)	0.9	0 - 50					
pH()	7.2	6.5 - 8.5					
Sulphate(mg/L)	0	0 - 250					
TDS(mg/L)	10.32						
Total Hardness(mg/L as CaCO3)	38						
Turbidity(NTU)	0.45	0 - 5					
Chromium(mg/L)	0	0.00 - 0.05					
Cobalt(mg/L)	0	0.000 - 0.005					
- 2 -   Water Quality Monitoring Information System   EPABX: +975-2-3505-7778   www.rcdc.gov.bt							



དབལ་ཕྱན་འབྲུག་གཞི་རྒྱུད།  
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ཐེན་ཕུ

ROYAL GOVERNMENT OF BHUTAN  
MINISTRY OF HEALTH  
DEPARTMENT OF PUBLIC HEALTH  
**Royal Centre for Disease Control**  
Serbithang, Thimphu-BHUTAN  
P.O BOX: 667





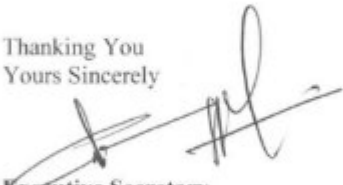
  

Copper(mg/L)	00	0 - 2
Lead(mg/L)	0.0030	0.00 - 0.01
Magnesium(mg/L)	0.305	
Manganese(mg/L)	0.0005	0.0 - 0.4
Pottassium(mg/L)	0.457	
Sodium(mg/L)	0.985	<20mg/L
Zinc(mg/L)	00	0 - 3


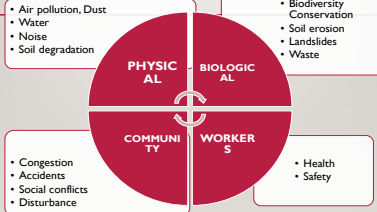
**Remarks :**  
AV : Acceptable Value

Printed By : wtandin on 2023-12-12

Appendix 10: Notification on formation of GRM committee

	<p>ཐིམ་ཕུ་ཁྲོམ་གྲོང་ཁྲུང་། Thimphu Thromde 220 Gongdzin Lam SE, Norzin Thimphu -11001: Bhutan</p>	
TT/ID/IPDS/Water-11/2023-2024/ 23		03/08/2023
The Director Department of infrastructure Development Ministry of Infrastructure and Transport Thimphu		
<b>Sub: Formation of Grievance Redressal Committee (GRC)</b>		
Sir		
In response to letter No: MoIT/DoID/WSD/WFP-39/2023-2024/45 dated 10/07/2023, Thimphu Thromde institute the following members for Grievance Redressal Committee to the ADB funded project under water Flagship Program Support Project.		
<ol style="list-style-type: none"><li>1. Dasho Thrompon – Chairman</li><li>2. Mr. Kelzang Dorji, Urban Planner</li><li>3. Mr. Yeshe Wangdi, Chief Engineer, Infrastructure Division</li><li>4. Mr. Pema Thekcho, Asst. Engineer</li><li>5. Mr. Penjor Dukpa- Executive Engineer, Operation and Maintenance Division</li><li>6. Mr. Ugyen Penjor – Kawajangsa-Jungshina Tshogpa</li><li>7. Mrs. Kelzang Lhamo Dorji, Officiating Chief, City Environment Division</li><li>8. Mr. Ugyen Dorji Tshechu, Offg. Chief Legal Officer</li></ol>		
The list of members for the Grievance Redressal Committee (GRC) has been submitted for your kind reference.		
Thanking You Yours Sincerely		
		
<b>Executive Secretary Thimphu Thromde</b>		
Copy:		
<ol style="list-style-type: none"><li>1. Dasho Thrompon, Thimphu Thromde for kind information</li><li>2. Officials Concerned for your information and necessary action</li></ol>		

## Appendix 11: Slides from the contractor training

<h3 style="text-align: center;">BHU: WATER FLAGSHIP PROGRAM SECTOR PROJECT</h3> <hr style="width: 50%; margin: auto;"/> <p style="text-align: center; font-size: small;">THIMPHU SUBPROJECT – CONTRACTOR ORIENTATION 1<sup>ST</sup> SEPTEMBER 2023</p>	<h3 style="text-align: center;">AGENDA</h3> <hr style="width: 50%; margin: auto;"/> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Environment Safeguard requirements</li> <li>• Social Safeguard requirements</li> <li>• Discussion</li> </ul>
<h3 style="text-align: center;">OBJECTIVE</h3> <hr style="width: 50%; margin: auto;"/> <ul style="list-style-type: none"> <li>• Enhance the understanding of the safeguard policies</li> <li>• Know Safeguard Requirements</li> <li>• Unanticipated impacts</li> <li>• Grievance Redress Mechanism</li> <li>• Monitoring and Reporting</li> </ul>	<h3 style="text-align: center;">LINK TO DOCUMENTS</h3> <hr style="width: 50%; margin: auto;"/> <p style="text-align: center; font-size: small;"><a href="https://www.adb.org/projects/documents/bhu-42173-017-iec-0">https://www.adb.org/projects/documents/bhu-42173-017-iec-0</a></p>
<h3 style="text-align: center;">5 WHY SAFEGUARDS ARE IMPORTANT?</h3> <hr style="width: 50%; margin: auto;"/> <ul style="list-style-type: none"> <li>• Prevent and mitigate harm to people and the environment</li> <li>• Improve environmental &amp; social sustainability of projects</li> <li>• Address risks to the government and ADB</li> </ul>	<h3 style="text-align: center;">INCORPORATE ENVIRONMENTAL AND SOCIAL SAFEGUARDS IN ALL ACTIVITIES</h3> <div style="display: flex; align-items: center; justify-content: center;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg); background-color: green; color: white; padding: 5px; font-weight: bold; margin-right: 10px;">PROJECT</div>  <div style="background-color: blue; color: white; padding: 10px; border-radius: 5px; margin-left: 10px;"> <ul style="list-style-type: none"> <li>• Protection of environment</li> <li>• Protection of workers</li> <li>• Welfare of community</li> <li>• Prior information</li> <li>• Stakeholders participation</li> </ul> </div> </div>
<h3 style="text-align: center;">SAFEGUARD RESPONSIBILITIES</h3> <hr style="width: 50%; margin: auto;"/> <p style="font-size: x-small;"><b>PMU and PIU</b> To ensure the environmental soundness and sustainability of projects, and to support the integration of environmental considerations into the project decision-making process.</p> <p style="font-size: x-small;"><b>Contractor Obligation</b> Fulfill environmental and social safeguards to avoid, minimize and mitigate negative impacts while delivering quality services.</p> <p style="font-size: x-small;">Full time EHS Officer (or equivalent) responsible for compliance to ADB SPS requirements, national regulations and the EMP. The officer/staff must have a clear terms of reference and responsibilities to ensure that all environmental and social concerns are properly managed;</p>	<h3 style="text-align: center;">ENVIRONMENTAL AND SOCIAL IMPACTS</h3> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid red; padding: 5px; font-size: x-small;"> <ul style="list-style-type: none"> <li>• Air pollution, Dust</li> <li>• Water</li> <li>• Noise</li> <li>• Soil degradation</li> </ul> </div> <div style="border: 1px solid red; padding: 5px; font-size: x-small;"> <ul style="list-style-type: none"> <li>• Biodiversity Conservation</li> <li>• Soil erosion</li> <li>• Landslides</li> <li>• Waste</li> </ul> </div> </div> <div style="display: flex; justify-content: center; margin: 10px 0;">  </div> <div style="display: flex; justify-content: space-around; align-items: center; font-size: x-small;"> <div style="border: 1px solid red; padding: 5px;"> <ul style="list-style-type: none"> <li>• Congestion</li> <li>• Accidents</li> <li>• Social conflicts</li> <li>• Disturbance</li> </ul> </div> <div style="border: 1px solid red; padding: 5px;"> <ul style="list-style-type: none"> <li>• Health</li> <li>• Safety</li> </ul> </div> </div>

<p><b>KEY CONTRACTORS ACTIVITIES</b></p> <hr/> <ol style="list-style-type: none"> <li>1. Baseline physical parameters</li> <li>2. Worker recruitment</li> <li>3. Worker Health and Safety</li> <li>4. Community health and safety</li> <li>5. Transport and storage of Construction Materials</li> <li>6. Construction Activities and closure</li> <li>7. Physical cultural resources</li> <li>8. Unanticipated incidents</li> <li>9. Address grievances</li> </ol>	<p><b>BASELINE INFORMATION – PHYSICAL PARAMETERS</b></p> <hr/> <table border="1"> <thead> <tr> <th>WATER QUALITY</th> <th>AIR QUALITY</th> <th>NOISE</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> <li>pH, water temperature, dissolved oxygen, total alkalinity, chlorides, silicates, calcium</li> <li>Upstream and downstream of the project area to Compared to upstream baseline</li> <li>Before construction and Semi-annual</li> </ul> </td> <td> <ul style="list-style-type: none"> <li>PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>x</sub>, CO</li> <li>High volume sampler to be located 50 m from the selected locations in the downwind direction. Use method specified by NEC</li> <li>At least two locations (location is determined by the availability of electricity) within</li> <li>50 meters from the road edge and 150m towards the populated area.</li> <li>Before construction and Semi-annual</li> </ul> </td> <td> <ul style="list-style-type: none"> <li>Equivalent Noise levels on dB(A)</li> <li>50 meters from the road edge and 150m towards the populated area.</li> <li>Before construction and Semi-annual</li> </ul> </td> </tr> </tbody> </table>	WATER QUALITY	AIR QUALITY	NOISE	<ul style="list-style-type: none"> <li>pH, water temperature, dissolved oxygen, total alkalinity, chlorides, silicates, calcium</li> <li>Upstream and downstream of the project area to Compared to upstream baseline</li> <li>Before construction and Semi-annual</li> </ul>	<ul style="list-style-type: none"> <li>PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>x</sub>, CO</li> <li>High volume sampler to be located 50 m from the selected locations in the downwind direction. Use method specified by NEC</li> <li>At least two locations (location is determined by the availability of electricity) within</li> <li>50 meters from the road edge and 150m towards the populated area.</li> <li>Before construction and Semi-annual</li> </ul>	<ul style="list-style-type: none"> <li>Equivalent Noise levels on dB(A)</li> <li>50 meters from the road edge and 150m towards the populated area.</li> <li>Before construction and Semi-annual</li> </ul>
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<p><b>PERMITS, CLEARANCES, LEASE AGREEMENTS</b></p> <hr/> <ul style="list-style-type: none"> <li>All clearances, permits, lease agreements must be obtained prior to commencing work</li> <li>Copies of all documents to be submitted to PIU</li> <li>Including # of trees cut</li> </ul>	<p><b>WORKER RECRUITMENT</b></p> <hr/> <p>Contractor to abide by the</p> <ul style="list-style-type: none"> <li>The Labour and Employment Act of Bhutan 2007</li> <li>Regulation on Occupational Health and Safety for the Construction Industry, 2022</li> <li>Regulations on Occupational Health, safety and welfare 2022</li> <li>Regulations on Working Conditions, 2022.</li> <li>Regulation on Foreign Workers Management, 2022</li> </ul>						
<p><b>WORKER RECRUITMENT</b></p> <hr/> <ul style="list-style-type: none"> <li>Clearance /lease from Thromde for worker camps;</li> <li>Locations should also be at least 20m from water bodies</li> <li>Prepare detailed layout plan for the development of construction camps (accommodation sites, location of site roads, fuel storage, solid waste management and dumping locations, and drainage facilities) – submit to PIU;</li> </ul>	<p><b>ESTABLISHMENT OF SITE OFFICE AND STORAGE SHEDS AND HOUSING FOR STAFF AND WORKERS</b></p> <hr/> <ul style="list-style-type: none"> <li>Provide workers with good quality (climate suitable and weatherproof) temporary housing with electricity for lighting, cooking (or LPG), drinking water, and temporary sanitation facilities as required under the relevant Regulation.</li> </ul> <p>Completion of works</p> <ul style="list-style-type: none"> <li>Dismantle camps in phases and as the work gets decreased and not wait for the entire work to be completed. Restore the site to at least its original conditions</li> </ul>						
<p><b>WORKER HEALTH AND SAFETY</b></p> <hr/> <ul style="list-style-type: none"> <li>Follow international best practices (section 4.2 of World Bank EHS Guidelines on Construction and Decommissioning Activities) + Protocol on emerging infectious diseases such as the corona virus disease (COVID-19) as approved by the PIU or PMU</li> <li>Provide PPE, first aid unit, fire extinguishers, transport for of injured or ill persons to the nearest hospital or clinic.</li> <li>Construct/install barricades, signboards, temporary day/night traffic diversions</li> <li>Awareness programs - human trafficking, spread (STDs) and HIV/AIDS using brochures, posters etc.</li> <li>Provide health insurance to the workers.</li> <li>Health and safety training</li> <li>Compensation for the loss of life -a zero tolerance to loss of life policy should be developed and implemented</li> <li>Follow national regulation for reporting accidents and deaths</li> </ul>	<p><b>COMMUNITY HEALTH AND SAFETY</b></p> <hr/> <ul style="list-style-type: none"> <li>Provide prior information to local people about work.</li> <li>Follow a code of conduct for workers,</li> <li>Maintain a complaint logbook and take action to promptly resolve complaints</li> <li>Schedule transport and hauling activities by avoiding busy areas of the town.</li> <li>Clean wheels and undercarriage of haul trucks prior to leaving construction site.</li> </ul>						

<p><b>COMMUNITY HEALTH AND SAFETY</b></p> <hr/> <ul style="list-style-type: none"> <li>Educate drivers and comply with speed limit (20-25 km/h) -settlements or sensitive institutional establishments</li> <li>Earmark parking place for construction equipment and vehicles when idling; avoid disturbing traffic movement.</li> <li>No nighttime construction activities within residential areas - follow thromde timing (9pm to 8am) Act-10PM-8 AM.</li> <li>Temporary barricades at excavation areas, particularly in residential, commercial and near institutional establishments</li> </ul>	<p><b>NOISE</b></p> <hr/> <ul style="list-style-type: none"> <li>Public consultation - to identify and address key issues,</li> <li>Identify any structures such as houses or buildings at risk from work and avoiding using pneumatic drills or heavy vehicles in the vicinity</li> <li>Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and use portable street barriers to minimize sound impact to surrounding sensitive receptors.</li> </ul>
<p><b>AIR QUALITY</b></p> <hr/> <ul style="list-style-type: none"> <li>Take precautions to reduce dust levels</li> <li>Barricade the construction area</li> <li>Conduct work sequentially</li> <li>Limit the stocking of excavated material at the site- reuse or remove immediately to government-approved disposal area.</li> <li>Cover stockpiled construction materials with tarpaulin or plastic sheets.</li> <li>Reduce dust by spraying stockpiled soil, excavated materials, and spoils.</li> </ul>	<p><b>SOIL EROSION</b></p> <hr/> <ul style="list-style-type: none"> <li>Minimize exposed areas at work sites.</li> <li>Ensure to undertake proper compacting of backfilled areas.</li> <li>Use structural erosion prevention and sediment control practices such as temporary sedimentation canals around the exposed areas.</li> <li>Minimize transport and disposal of excess spoils. Where possible, reuse excess spoils</li> <li>Immediately remove all excess spoils from sites and dispose the same in designated disposal site.</li> <li>Drainage</li> </ul>
<p><b>SURFACE WATER QUALITY</b></p> <hr/> <ul style="list-style-type: none"> <li>Provide silt traps or temporary sedimentation canals along alignments that are adjacent to receiving bodies of water.</li> <li>Ensure proper compaction of refilled soil layer by layer</li> <li>Construct drains and ensure regular clearance and maintenance</li> <li>Fuel and other petroleum products stored at storage areas away from water drainage and protected by impermeable lining and banded 110% by volume.</li> <li>No disposal of materials/waste into streams or rivers</li> </ul>	<p><b>TRANSPORT AND STORAGE OF CONSTRUCTION MATERIALS</b></p> <hr/> <ul style="list-style-type: none"> <li>All construction material will be stacked temporarily by the roadsides leaving adequate space for the vehicles to ply safely at work sites.</li> <li>Dusty areas will be sprinkled with water especially on dry windy days.</li> <li>Vehicles transporting sand, soil and aggregates will be covered with tarpaulin to reduce the release of dust along transport routes.</li> <li>To minimize air emissions, ensure regular maintenance of equipment to prevent smoke belching and compliance with the RSTA emission test.</li> <li>Cover all stockpiles that will be left idle for a long time</li> </ul>
<p><b>WASTE</b></p> <hr/> <ul style="list-style-type: none"> <li>Waste act prohibits the illegal dumping or release of waste Waste regulation Section 85 and 86 detail the responsibilities of the Construction and Business Sector.</li> </ul> <p>Minimum requirements</p> <ul style="list-style-type: none"> <li>Provide facilities for waste segregation into bio-degradable and non-biodegradable waste- bins for waste storage and safe collection.</li> <li>Segregate hazardous wastes within the premises.</li> <li>Transport construction wastes without spillage.</li> <li>Dispose construction waste and excavated soil in designated sites.</li> <li>Hazardous waste - follow labelling, pre-treatment, storage, record keeping, transportation, and disposal procedures for hazardous waste</li> </ul>	<p><b>COMPLETION OF WORK</b></p> <hr/> <ul style="list-style-type: none"> <li>After work completion, remove the construction wastes from the sites. The entire site must be free of any construction wastes.</li> <li>Implement the required surface restoration through bioengineering works.</li> <li>All surplus excavated soil shall be disposed in designated disposal sites identified and approved during the design/pre-construction phase.</li> </ul>

## UNANTICIPATED INCIDENTS

The Contractor is fully responsible for any damage to property (government of privates) caused during the construction process

## 26 PHYSICAL CULTURAL RESOURCES (PCRS)

Defined as movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance

Chance findings- During project implementation Chance finds shall not be disturbed until an assessment by a competent specialist is made and actions consistent with these requirements are identified

## MONITORING AND REPORTING

- Self monitoring by Contractors - monthly reports to PIU,
- PIU - quarterly reports to PMU.
- PMU – Submit environmental monitoring reports to ADB, within 30 days of end of corresponding monitoring period, on a semi-annual basis
- Record all incidents and grievances

## CLARIFICATIONS AND DISCUSSION

### WHAT IS GRM?

Grievance redress mechanism are institutions, instruments, methods, and processes by which a resolution to a grievance is sought and provided.

### WHY

To ensure that all affected peoples concerns, complaints and grievances are received and resolved

## GRIEVANCE REDRESS MECHANISM

In case of complaints related to construction-related nuisances.

- Framework with Feedback loop,
- Timeline for resolution of issues
- Transparent
- Readily accessible
- At no costs or retribution to complainant
- Recorded and Reported in Monitoring reports

## GRIEVANCE REDRESS MECHANISM

## GRIEVANCE REDRESS MECHANISM

### MEMBERS OF GRC LEVEL 2

- PMU Head- Project Director
- Chief engineer (PIU project managers) as member secretary
- PIU Project Engineer
- Legal officer;
- Environmental officer;
- Town representatives
- Gender focal person of PIU

### MEMBERS OF GRC LEVEL 3

Secretary, MoIT (Chairman)  
Director, DES (Member secretary);  
Project manager, PMU;  
Project coordinator, PMU;  
Legal officer, MOWHS;  
Focal engineer  
Gender officer (MOWHS).

## FIRST LEVEL

- Complaint can be lodged either in writing or by Phone (Complaint Form) to the Contractors site representative
- Recorded in the site register and the Contractor should provide a resolution to the complaint within 2 days.
- In case, the complaint is not resolved at this level, the aggrieved persons can then file a complaint with the PIU.
- Complaints made to the PIU should be resolved within 3 days (Recorded by the PIU, including actions taken to resolve the complaint)
- Complaints, their nature, and resolution should be mentioned in the quarterly progress reports.

## 2ND LEVEL

- PIU will coordinate with the GRC.
- Call the aggrieved person to present his/her case and deliberate through proper hearing or mediation.
- Resolve the issue within 15 days from the date the complaint is received.
- MCM and resolution must be recorded for purposes of project monitoring.
- If the complaint is unresolved -inform the aggrieved person accordingly and assist them in elevating the complaint to the PMU or Central Grievance Committee.

## LEVEL 3

- Grievances not redressed within 15 days will be brought to the Central Grievance Redress Committee at the MoIT
- Central GC - Resolve the issue within 10 days
- If the grievance is still not resolved- seek recourse through the legal system at any stage of the GRM process.