

Environmental Monitoring Report

PUBLIC

Semestral report: January to June 2025 Report
July 2025

Pakistan: Balakot Hydropower Development Project

Prepared by the Project Implementation Unit of the Pakhtunkhwa Energy Development Organization, for the Islamic Republic of Pakistan and the Asian Development Bank (ADB).

ABBREVIATIONS

ADB	Asian Development Bank
AIIB	Asian Infrastructure Investment Bank
AQMS	Air Quality Monitoring System
CO	carbon monoxide
dB	decibel
DFO	Divisional Forest Officer
EE	Environment Expert
EEM	External Environmental Monitor
EIA	Environmental Impact Assessment
EPC	engineering, procurement and construction
GHG	greenhouse gases
HPP	hydropower project
HSE	health, safety, and environment
IRRE	Institute for Research on River Ecology
km	kilometer
KP	Khyber Pakhtunkhwa
MW	megawatt
NEQS	National Environmental Quality Standards
NOC	No Objection Certificate
OHS	occupational health and safety
PD	Project Director
PEDO	Pakhtunkhwa Energy Development Organization
PIU	Project Implementation Unit
PM	particulate matter
PMC	Project Management Consultant
SAEMR	Semi-Annual Environmental Monitoring Report
SDFO	Sub-Divisional Forest Officer
SO ₂	Sulphur dioxide
SSEMP	Site-Specific Environmental Management Plan
WHO	World Health Organization

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1. INTRODUCTION

1.1. Preamble

1. This is the eighth Semi-Annual Environmental Monitoring Report (SAEMR) for the Balakot Hydropower Project (HPP, 300 megawatt [MW]) covering the reporting period from January to June 2025.

1.2. Headline Information

2. During the reporting period, detailed engineering design—including muck disposal area planning—and the review of the EPC Contractor's method statements and technical reports remained ongoing. Construction activities advanced steadily at key sites, including the dam, residential colony, access roads, powerhouse, and headrace tunnel. Additionally, protection works and the establishment of a powerhouse camp continued.

3. Following thorough due diligence, the PMC granted environmental consent on February 11, 2025, for the spoil disposal site designated for the upstream inclined surge tunnel. The detailed design for this site remained in progress. Also, on May 26, 2025, the PMC environmental team conducted due diligence on the spoil disposal area identified for the powerhouse site, while the consent will be granted upon receipt of clarifications requested from the EPC Contractor.

4. The ADB Safeguard team conducted a site visit on February 5, 2025, and held discussions with the PIU and PMC HSE team. While no major non-compliances with SSEMP/EMP provisions were observed, the PIU submitted an updated Site-Specific Environmental Management Plan (SSEMP) to ADB on March 23, 2025. After incorporating ADB's feedback, the revised SSEMP was shared with the PIU on June 4, 2025, and remained under review at the end of the reporting period.

5. On February 20, 2025, the External Environmental Monitor (EEM) visited the construction sites. The delay in finalization of the sedimentation tanks design and subsequent construction was the major observation recorded during the site visit. The PIU and PMC have jointly taken up the issue with the EPC Contractor for finalization at the earliest.

6. During the first and second quarters of the reporting period, the EPC Contractor conducted instrumental environmental monitoring at the work sites and camps, including the newly constructed camp at the powerhouse site. A detailed description of the results obtained has been given in **Section 5.2**, while the signed scan copies are in **Annexure 2** to the report.

7. On April 25 and 26, the ADB organized two days OHS training sessions at the project site which were mainly focused on: (i) Occupational Health and Safety (OHS), emphasizing the importance of maintaining a safe working environment, hazard identification, and preventive measures; and (ii) Core Labor Standards, highlighting key aspects of the labor rights.

8. Consequent upon incorporation of the review comments, the ADB safeguard team cleared the updated EIA report of the Balakot HPP (300 MW) on May 6, 2025, and subsequently disclosed it on its website on May 23, 2025.

9. In May 2025, the EPC Contractor launched a six-month vocational training program at the Government Skill Development Centre, Hassa Balakot, for eligible candidates from Paras village. The program, concluding in November 2025, includes 18 trainees in computer operations and electrician trades.

10. To reinforce safety compliance, two HSE Champion Award ceremonies were held on April 18 and June 20, 2025, recognizing 18 workers with cash prizes for exemplary adherence to safety protocols from January to June 2025.

11. A total of 38 incidents were recorded during the reporting period. While four cases required hospitalization, most affected workers resumed duties shortly after.

2. PROJECT DESCRIPTION AND CURRENT ACTIVITIES

2.1. Project Description

12. Balakot HPP (300 MW) is a run-of-the-river scheme to be constructed on the Kunhar River in its 12-kilometer (km) stretch from Paras to Sangar village in District Mansehra of Khyber Pakhtunkhwa (KP) province. Upon completion, 1,143 gigawatt hours of clean energy will be delivered to the national grid yearly.

13. The Project dam site is in Paras village, around 2 km downstream of the Sukki Kinari HPP (884 MW) tailrace, while the powerhouse site is proposed in Ganhool village of Balakot. The 9.1 km-long headrace tunnel of 8-meter (m) diameter will divert 154 m³/second design flow of the Kunhar River water to the powerhouse to generate 300 megawatts of electricity. The Project residential colony is identified in Sangar village.

14. Access road to the dam and power intake is proposed to off-take from National Highway (N-15) on the left side of the Kunhar River in Paras village.

15. As exhibited in the EPC Contract, the following is the brief scope of works:

- Project basic and detailed design
- Temporary works
- Diversion works
- Construction of dam
- Intake structures
- Adit tunnels (adits-1,2 and 3)
- Headrace tunnel
- Surge shaft
- Powerhouse
- Access roads (temporary and permanent)
- Residential colony
- Switchyard
- Transmission line

16. The Project brief salient features are in **Table 2.1** followed by location maps and the Project setting in **Figure 2.1** to **2.5**.

Table 2.1: Brief Salient Features

S/NO	DESCRIPTION	UNIT	DETAIL
1	HYDROLOGY AND DESIGN FLOWS		
1.1	River		Kunhar
1.2	Catchment area of the dam site	km ²	1939
1.3	(Average) flow at the intake	m ³ /s	87
1.4	Design Discharge	m ³ /s	153.9
1.5	Design Flood T=10,000 years	m ³ /s	3706
1.6	Probable Maximum Flood	m ³ /s	5043
2	RESERVOIR		
2.1	Normal Operating Level (NOL)	masl	1288.0
2.2	Minimum Operating Level (Min. OL)	masl	1283.0
2.3	Surface area (at NOL)	km ²	0.28
2.4	Reservoir length (at NOL)	km	2.2
2.5	Gross storage capacity (at NOL)	X10 ⁶ m ³	3.65
2.6	Regulating storage capacity (NOL)	X10 ⁶ m ³	1.2
3	DAM STRUCTURE		
3.1	Dam type		Curved Concrete Gravity Dam
3.2	Dam crest elevation	masl	1292.0
3.3	Maximum height above the riverbed	m	35.0
3.4	Maximum height above foundation	m	49.0
3.5	Crest length	m	146.0
4	SPILLWAYS AND LOW-LEVEL OUTLETS/FLUSHING SLUICES		
4.1	Spillway type		Upper WES spillway + bottom outlet
4.2	Upper spillway crest elevation	masl	1278.0
4.3	Upper spillway gates no. and type		3 (radial gates)
4.4	Upper spillway gates size (W x H)	mxm	11 X 10
4.5	Bottom outlet invert elevation	masl	1253.0
4.6	Bottom outlet gates no. and type		2 ∇ sluice gate + 2 radial gate
4.7	Low-level spillway size (W x H)	mxm	6x8
5	RIVER DIVERSION		
5.1	Construction Flood	m ³ /s (T=20 years)	900
5.2	Diversion type		Diversion tunnel + bottom outlet, with cofferdam
5.3	Upstream Cofferdam type		CSG cofferdam
5.4	Upstream coffer dam crest elevation	masl	1272.0
5.5	Downstream coffer dam type		CSG cofferdam
5.6	Downstream coffer dam crest elevation	masl	1252.5
5.7	Diversion tunnel type		Archway
5.8	Diversion tunnel no. (-)		1
5.9	Diversion tunnel size (W x H)	mxm	Archway (7,5 x 8,0)
5.10	Diversion tunnel length	m	650
5.11	Diversion tunnel slope	%	1.5

S/NO	DESCRIPTION	UNIT	DETAIL
5.12	Diversion tunnel inlet invert elevation	masl	1261.0
5.13	Diversion tunnel outlet invert elevation	masl	1248.0
6	POWER INTAKE STRUCTURE		
6.1	Intake type		Bank-type intake
6.2	Trash racks no.		4
6.3	Trash rack size (W x H)	mxm	8x10
6.4	Service gates no.		2 (1 emergency gate)
6.5	Service gate size (W x H)	mxm	4 x 8
6.6	Intake crest elevation	masl	1271.0
7	HEADRACE TUNNEL		
7.1	Tunnel section		Circular concrete lined (8.0 m inner diameter)
7.2	Length up to surge tank	m	9137
7.3	Tunnel slope		0.56%、0.00%、1.11%
8	UPSTREAM INCLINED SURGE TUNNEL		
8.1	Type		Concrete lined circular surge shaft+inclined surge tunnel
8.2	Internal diameter	m	14.5
8.3	Length of surge tunnel	m	568
8.4	Bottom elevation of surge shaft	masl	1203
9	PRESSURE TUNNEL/SHAFT & PENSTOCK		
9.1	Pressure tunnel/shaft main section type and size		Steel-lined circular cross-section (5.6 m internal diameter)
9.2	Pressure tunnel/shaft length	m	375
9.3	Penstock length	m	88
9.4	Branch Section Type		Manifold (3 branches)
9.5	Size of each branch	m	2.2m internal diameter conduits
9.6	Max. Length of branch	m	~30
10	POWERHOUSE AND SUBSTATION		
10.1	Powerhouse type		Conventional underground cavern
10.2	Main cavern general dimensions (L x W x H)	m	89.28x20.40x37.86
10.3	Turbine type		Francis
10.4	Number of units		3
10.5	Turbine axis elevation	masl	1054.0
10.6	Transformer/Substation type		Underground cavern (adjacent to the main powerhouse cavern)
10.7	Transformer cavern general dimensions (L x W x H)	m	94.82 x17.40 x31.79
11	DOWNSTREAM INCLINED SURGE TUNNEL		
11.1	Type		Concrete-lined inclined surge tunnel
11.2	Internal diameter	m	7.5x9.125
11.3	Length of surge tunnel	m	505
11.4	Surge tunnel bottom elevation	masl	1028.0
12	TAILRACE		

S/NO	DESCRIPTION	UNIT	DETAIL
12.1	Type		Circular tunnel with transition to an archway section at the final length and Outlet portal
12.2	Tunnel section		Circular concrete lined (8.0 m diameter)
12.3	Length up to the final transition section	m	1646.5
12.4	Tunnel slope up to the final transition section	%	0.122%, -18.45% (ascending slope)
12.5	Tunnel final section		Archway concrete lined section (8.0 W x 8.0 H)
12.6	Length from transition to outlet	m	50
12.7	Tunnel slope up to the outlet portal	%	0.23 (ascending slope)
13	POWER AND ENERGY		
13.1	Gross Head	m	229.0
13.2	Design Net Head (m)	m	217.6
13.3	Installed plant capacity	MW	300 (at the generator)
13.4	Average annual energy production	GWh	1144 (average of 55 years)
14	PROJECT ACCESS FACILITIES		
14.1	Access road to dam Left side R1 (length)	m	512 m (from Sharan Road, connection to National Highway N-15 at the left side of Kunhar River, nearby Paras village)
14.2	Access road to Diversion tunnel R2 (length)	m	138m (from the dam bridge deck up to the Sediment by-pass tunnel intake)
14.3	The access road to the Main Access tunnel Power House R3 (length)	m	3254m (From Sangar connection from National Highway N-15 to Main Access tunnel Power House)
14.4	The access road to Surge tank R4 (length)	m	290m (from National Highway N-15 to access road Surge tank)
14.5	The access road to Tailrace Tunnel R5 (length)	m	823m (from R3 connection to tailrace tunnel)
14.6	Access road to Permanent staff Residential Colony R6 (length)	m	611m (from N15 connection to the Resident colony)
14.7	Permanent Staff Residential Colony	m ²	Covered area= 11995.5 m ²

Figure 2.1: Project Location in Pakistan



Figure 2.2: Project Location in District Mansehra

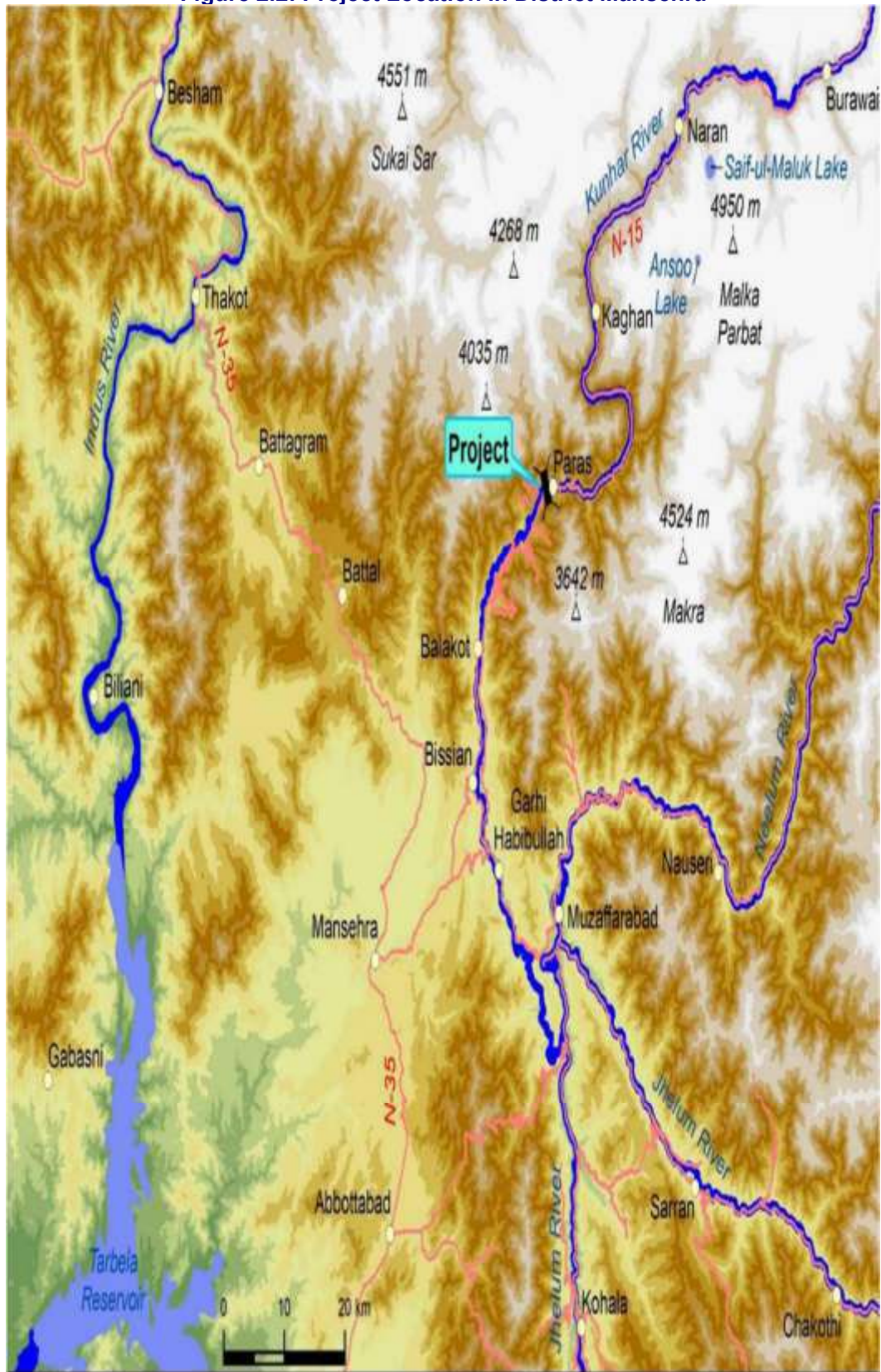


Figure 2.3: Project Layout Map

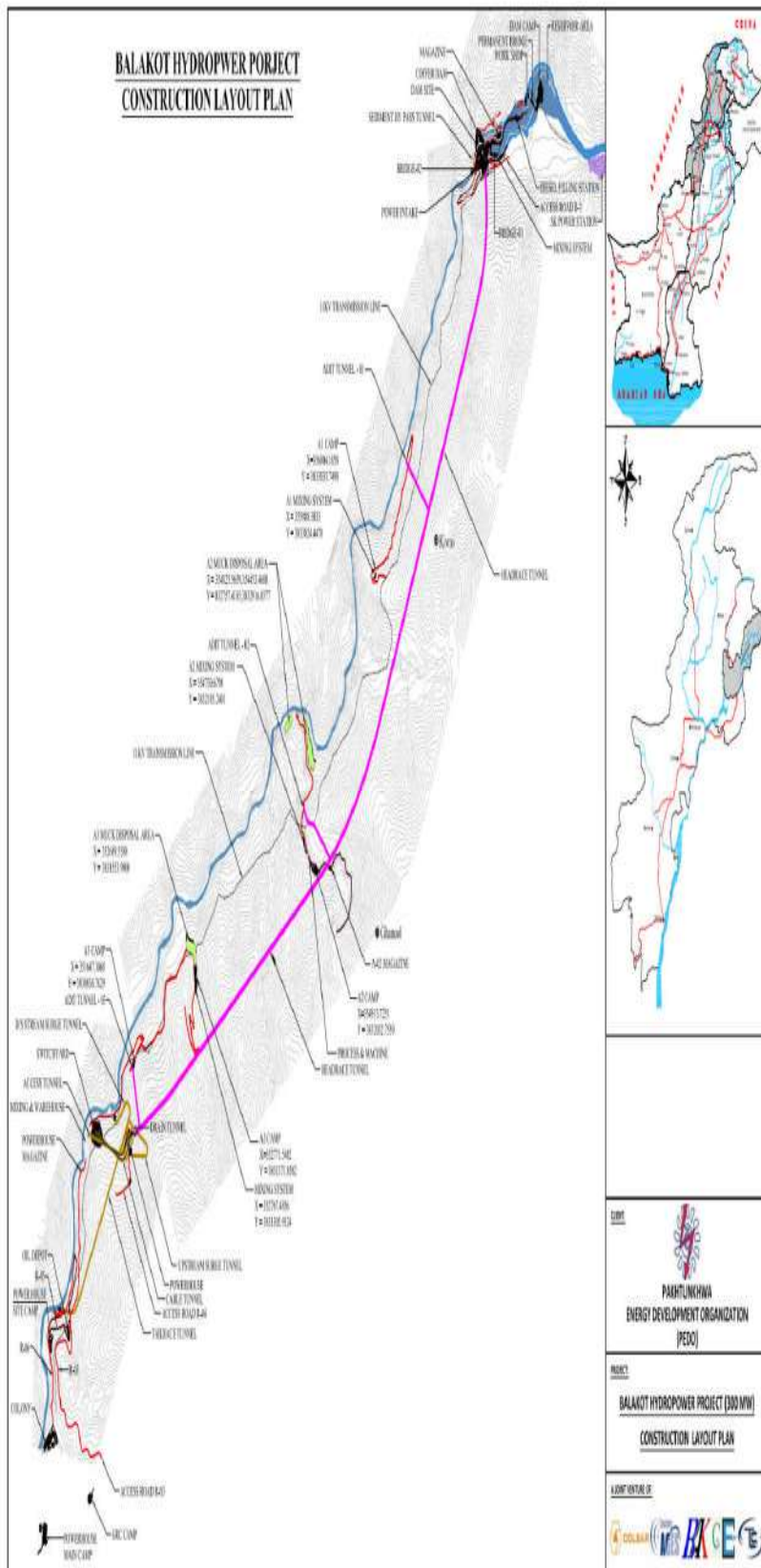


Figure 2.4: Project Setting-Dam site

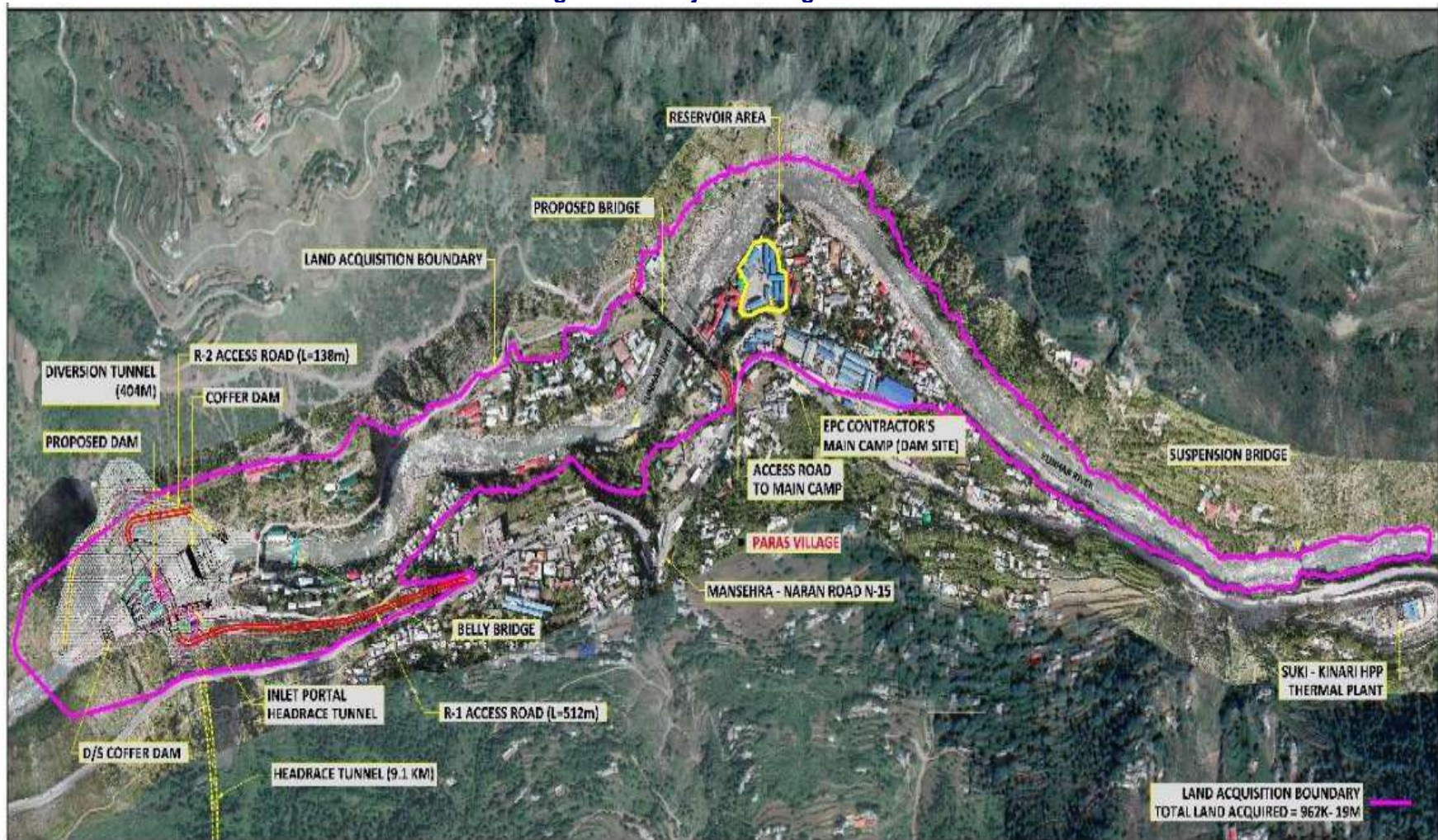
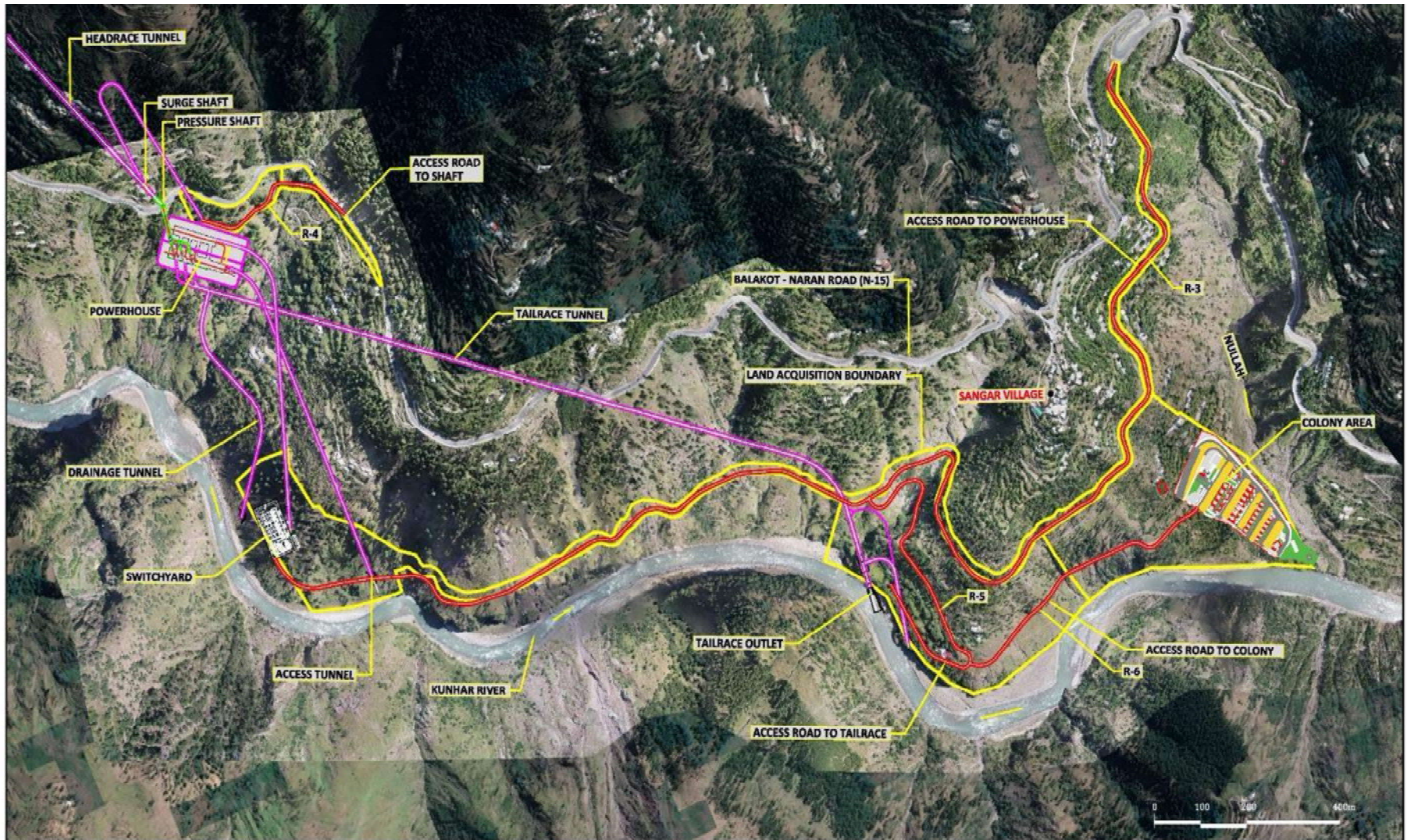


Figure 2.5: Project Setting-Powerhouse and Colony sites



2.2. Project Contracts and Management

2.2.1. Project Implementation Arrangements

17. Balakot HPP (300 MW) is being implemented through the arrangements in **Table 2.2**.

Table 2.2: Project Implementation Arrangement

Arrangement	Organization/Agency
Funding Sources	- Asian Development Bank (ADB) and Asian Infrastructure Investment Bank (AIIB) through a loan to the Government of Pakistan (Loan No: 4057/8397 (AIIB)-PAK) - Government of Khyber Pakhtunkhwa
Executing Agency	Energy and Power Department, Government of Khyber Pakhtunkhwa
Implementing Agency	Pakhtunkhwa Energy Development Organization (PEDO), Government of Khyber Pakhtunkhwa
Project Management Consultant	Joint Venture of: - DOLSAR Engineering Inc. Co. (Turkey) Lead Firm - AGES Consultants - BAK Consulting Engineers - CivTech Associates - Electra Consultants - Techno Legal Consultants (Pvt.) Limited from Pakistan
EPC Contractor	Joint Venture of China Gezhouba Group Company (CGGC), China & Ghulam Rasool and Company Pvt. Ltd (GRC), Pakistan

18. For the Project development, the government of KP signed a loan agreement with ADB on May 21, 2021, which became effective on July 7, 2021.

19. As AIIB is the co-financier of the Project, the loan agreement was also signed with AIIB, which is effective from October 25, 2021.



Consultancy Services Contract Award (2020)



Construction Contract Award (2021)

20. Brief details of the PIU, PMC, and the EPC Contractor are given hereunder.

21. **PIU.** The PIU of Balakot HPP (300 MW), responsible for procurement and supervision of the Project, is currently under establishment by the Implementing Agency (IA), i.e., Pakhtunkhwa Energy Development Organization (PEDO).

22. **Figure 2.6** shows the organogram of the PIU wherein, as exhibited in **Table 2.3**, the PD, deputy directors, and assistant directors, along with some of the support staff, are already on board, while procurement of the remaining personnel will be initiated when the need arises.

Figure 2.6: PIU Organogram

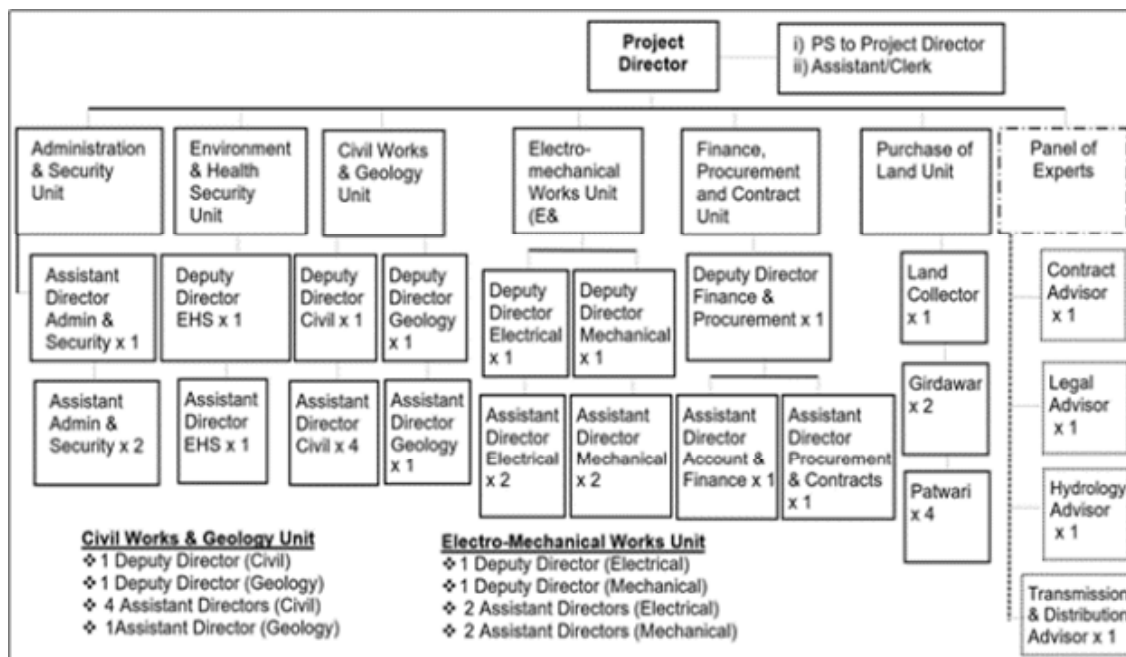


Table 2.3: PIU Staff Deployed During the Reporting Period

Staff Designation	Male/Female	No
Project Director (PD)	M	1
Deputy Director (Civil)	M	2
Deputy Director (Social & Resettlement)	M	1
Deputy Director (Environment Health, Safety, and Gender)	F	1
Deputy Director (Finance)	M	1
Deputy Director (Geology)	M	1
Deputy Director (Monitoring and Evaluation)	M	1
Assistant Director (Finance)	M	1
Assistant Director (Electrical)	M	2
Account Assistant	M	1
Land Patwari	M	1
Assistant Director (Social and Resettlement)	F	1

23. As evident from the table above, PIU is headed by the PD with whom the overall responsibility of environmental management and monitoring rests. He is assisted by the Environment and Health Security Unit in matters about the environmental, health, and safety (HSE) aspects of the Project. In this regard, Ms. Ibtesam Zaima, the Deputy Director, HSE and Gender is on board since March 2022 with full-time inputs and can be reached via:

Phone No: +92-3319844851

Email ID: ibtesamzaima3@gmail.com

24. The Deputy Director, HSE and Gender will be assisted by an Assistant Director (Social and Resettlement) who joined PIU in the last week of December 2022.

25. Under the provisions of the EPC Contract, the PIU project office was established in Balakot at the address given below and has been operational since June 2022.

PIU Balakot HPP (300 MW) Site Office

County Hotel, Shohal Najaf Khan
Kaghan Road Balakot
District Mansehra
Khyber Pakhtunkhwa, Pakistan
Phone No. 0997-360003

26. **PMC.** On September 3, 2020, PEDO entered into a Management Consultancy Service Agreement for Balakot HPP (300 MW) with the joint venture (JV) of DOLSAR Engineering Inc. Co. (Turkey), AGES Consultants, BAK Consulting Engineers, CivTech Associates, Electra Consultants, and Techno Legal Consultants (Pvt.) Limited from Pakistan. The JV is led by DOLSAR Engineering Inc. Co. (Turkey).

27. Consultancy services have been effective for 84 months since the commencement of services on September 11, 2020. During this period, the JV will provide services specified in the consultancy contract as PMC, and will act on behalf of PEDO as the "Project Manager/Engineer".

28. **Table 2.4** shows the chronological order of the procurement of consultancy services.

Table 2.4: PMC Procurement Milestones

S/No	Description	Date
1	Expression of Interest	July 29, 2019
2	Technical & Financial Proposals	November 29, 2019
3	Opening of Financial Proposals	May 19, 2020
4	Contract Negotiation Meetings	August 6 and 07, 2020
5	ADB Comments on / Concurrence to Negotiated Contract	August 25, 2020
6	Signing of Contract for Consultancy Services	September 3, 2020
7	Commencement of Services	September 11, 2020

29. **Table 2.5** exhibits details of the PMC's personnel deployed during the reporting period.

Table 2.5: PMC's Personnel Deployed to the Project

S/No	Designation	Inputs
Key Staff (International)		
1.	Project Manager - Team Leader	Full Time
2.	Procurement Expert	Intermittent
3.	Contract Manager	Intermittent
4.	Geotechnical Expert	Intermittent
5.	Hydraulics Expert	Intermittent
6.	Sediment Management Expert	Intermittent
7.	Hydro-Mechanical Expert	Intermittent
8.	Electrical Expert	Intermittent
Key Staff (National)		
1.	Deputy Team Leader	Full Time
2.	Contract Specialist	Full Time
3.	Document Controller (Monitoring)	Full Time

S/No	Designation	Inputs
4.	Chief Engr. (Dam & Surface Works)	Full Time
5.	Chief Engr. (Underground Works)	Full Time
6.	Civil Engineer (Other Surface Works)	Full Time
7.	Quality Assurance Engr. (Dam & Surface Works)	Full Time
8.	Civil Engineer (Tunnel)	Full Time
9.	Quality Assurance Engr. (Underground Works)	Full Time
10.	Health and Safety Monitor	Full Time
11.	Geologist - A	Full Time
12.	Electricity Tariff and PPA Expert	Intermittent
13.	Transmission Line Engineer	Intermittent
14.	Resettlement Expert	Intermittent
15.	Gender/Community Mobilization Expert	Intermittent
16.	Environmental Expert	Intermittent
17.	Structural Engineer	Intermittent
Non-Key Staff (National)		
1.	Planning Engineer	Full Time
2.	Cost / Time Controller	Full Time
3.	Environmental Officer	Full Time
4.	CAD Operators	Full Time
5.	Resettlement Assistant	Full Time
6.	Office Assistant	Full Time
7.	Accounts Assistant	Full Time
8.	Computer Operator	Full Time
9.	Office Manager	Full Time
10.	Inspectors (Dam & Surface Works)	Full Time
11.	Inspectors (Dam & Surface Works)	Full Time
12.	Inspectors (Dam & Surface Works)	Full Time
13.	Inspectors (Dam & Surface Works)	
14.	Inspectors (Underground Works)	Full Time
15.	Inspectors (Underground Works)	Full Time
16.	Inspectors (Underground Works)	Full Time
17.	Inspectors (Underground Works)	Full Time
18.	Inspectors (Underground Works)	Full Time
19.	Lab. Technician	Full Time
20.	Lab. Technician	Full Time
21.	Lab. Technician	Full Time
22.	Lab. Technician	Full Time
23.	Junior Engineer	Full Time
24.	Junior Engineer	Full Time
25.	Junior Engineer	Full Time
26.	Junior Engineer	Full Time
27.	Junior Engineer	Full Time
28.	Architecture	Intermittent
29.	Junior Geologist	Full Time
30.	Junior Geologist	Full Time

S/No	Designation	Inputs
31.	Junior Geologist	Full Time
32.	Junior Geologist	Full Time
33.	Office Assistant	Full Time
34.	Accountant	Full Time
35.	Computer Operator	Full Time
36.	Patwari-1	Full Time
37.	Patwari-2	Full Time

30. Since the commencement of the consultancy services, Engineer Assad Ali Khan, the PMC's Environmental Expert (EE), is on board with intermittent inputs. The EE can be approached through:

Phone No: +92-3369555505

PMC official email ID: dtlbalakothpp@yahoo.com

31. Najum-us-Saqib, an Environmental Officer, joined the PMC environmental team on December 12, 2024, and is now stationed at the PMC's field office in Paras village (Dam site). He is supervising the environmental portfolio activities at the site and can be reached via:

Phone No: +92- 3469750663

PMC official email ID: dtlbalakothpp@yahoo.com

32. Also, the Health and Safety Monitor, Mr. Syed Ali Fawad Shah, who joined PMC on December 27, 2022, can be reached via:

Phone No: +92- 3331162119

PMC official email ID: dtlbalakothpp@yahoo.com

33. The PMC has established two offices in the project area and at the site at the address given below. These offices are operational since June 2022 and August 2023, respectively.

PMC Office in the Project Area

Four Seasons Hotel, Near PTCL Exchange

Kaghan Road Balakot

District Mansehra

Khyber Pakhtunkhwa, Pakistan

Phone No: +92-997-360155

PMC Site Office

Royal Paras Hotel, Opposite Sohail Filling Station,

Kaghan Road Paras, Tehsil Balakot

District Mansehra

Khyber Pakhtunkhwa, Pakistan

Phone No: +92-997-360155

34. **EPC Contractor.** The construction contract of Balakot HPP (300 MW) was awarded to the JV of China Gezhouba Group Company (CGGC), China & Ghulam Rasool and Company Pvt. Ltd (GRC), Pakistan on March 9, 2021.

35. Consequent to fulfillment of the requisite conditions of the EPC Contract, PEDO notified September 27, 2021, as the Effective Date for the EPC Contract.

36. Various milestones achieved during the procurement process of the EPC Contract are in **Table 2.6**.

Table 2.6: EPC Contract Procurement Milestones

S/No	Description	Date
1.	Invitation for Bids	November 23, 2019
2.	Site visit to Bidders	December 10, 2019
3.	Pre-Bid Meeting	December 13, 2019
4.	Bid Submission	June 15, 2020
5.	Technical Bid Opening	June 15, 2020
6.	Financial Bid Opening	December 15, 2020
7.	Notification of Award	February 10, 2021
8.	Contract Signing	March 09, 2020
9.	Effective Date	September 27, 2021

37. The EPC Contractor's environmental obligations are mainly specified in Volume-01 of 07 (Appendix-9) and Volume-03 of 07 (GCC & SCC) of the EPC Contract.

38. Under the provisions of the conditions of the contract, preparation of the SEMP is one of the EPC Contractor's contractual obligations. Accordingly, the EPC Contractor prepared the SEMP, which is primarily based on the essence of the approved EIA report and site requirements, with due emphasis given to the Safeguard Policy Statement 2009 guidelines and conditions contained in the "Environmental Approval" granted by the Khyber Pakhtunkhwa Environmental Protection Agency (KPEA) on July 6, 2021. The Employer approved the SEMP on December 30, 2022, before the initiation of the construction activities at the site.

39. In the last week of December 2024, after the EPC Contractor had finalized the locations for camps, batching plants, access roads, sedimentation tanks, and magazines, and had obtained approval for two muck disposal sites, the PMC instructed the EPC Contractor to update the approved SEMP by January 15, 2025. The EPC Contractor accordingly updated the SEMP and submitted it to the PMC for review. Upon the PMC review and recommendations, the updated SEMP was submitted to the ADB for further review. The ADB review comments were subsequently incorporated, and on June 04, 2025, a revised version was submitted to the PIU for review and approval thereof. Till the end of the reporting period, the updated SEMP remained under the PIU review.

40. During all three phases of the project i.e. pre-construction, construction, and the defects liability period (DLP), the EPC Contractor will manage the health, Safety, and Environment (HSE) portfolio by implementing the measures outlined in the SEMP, adhering to good practices, following issued instructions, and addressing gaps identified in monitoring reports throughout the duration of the contract.

41. **Figure 2.7** exhibits the EPC Contractor's HSE organogram, followed by **Table 2.7** showing details of the HSE team on board so far.

Figure 2.7: EPC Contractor's HSE Team Organogram

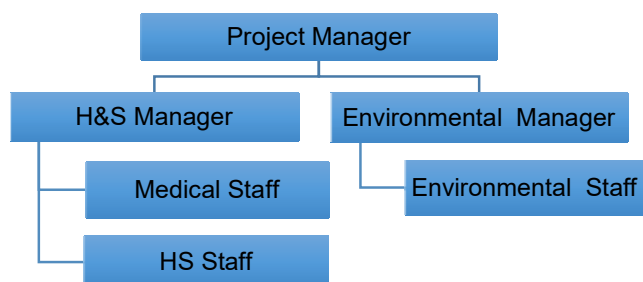


Table 2.7: EPC Contractor's HSE Team

S/NO	Name	Designation	Duty Station	Contact Number
1.	Qi Xiu Feng	H & S Manager	Office and Site	+92-345-5386888
2.	Li Yong	QHSE Director	Office and Site	+92-344-1789770
3.	Hai Xinglong	Quality and Environment Engineer	Office and Site	+92-341-407665
4.	Irshad Saeed	Environmental Manager	Office and Site	+92-305-9028481
5.	Fazli Zul Jalal	HSE Manager	Office and Site	+92-324-5890426
6.	Wang Chaowei	QHSE Officer	Office and Site	+92-344-1783042
7.	Wu Qiaojin	HSE Officer	Office and Site	+92-341-0407671
8.	Saeed ul Haq	HSE Officer	Dam Site	+92-346-8292024
9.	Momin Khan	HSE Officer	A-3 Adit Tunnel	+92-315-1855378
10.	Syed Hassan Shah	HSE Officer	Dam Site (Night)	+92-343-2152402
11.	Rashid Hussain	HSE Officer	A-3 Adit Tunnel	+92-341-9304247
12.	Muhammad Ajmal	HSE Officer	A-2 Adit Tunnel	+92-301-3381622
13.	Ahsan Ali	HSE Officer	A-2 Adit Tunnel	+92-341-4351519
14.	Ali Haider Shah	HSE Officer	Office and Site	+92-310-5005803
15.	Naeem Yousaf	HSE Officer	Office and Site	+92-345-3845827
16.	Tayyab Ur Rehman	HSE Officer	Dam Site	+92-343-9560113
17.	Zeeshan Sadique	HSE Officer	Upstream Surge Shaft Tunnel	+92-349-5323408
18.	Zeeshan Ahmed	HSE Officer	Downstream Surge Shaft Tunnel	+92-347-2229888
19.	Saddam Hussain	HSE Officer	Main Access Tunnel	+92-345-6321546
20.	Shahmeer Jan	Assistant HSE Officer	Powerhouse	+92-342-7274498
21.	Shahbaz Riaz	HSE Officer	Dam Site	+92-347-8388535
22.	Ahmed Raza Khan	HSE Officer	Dam Site	+92-332-8589253
23.	Syed Adnan Shah	HSE Officer	Powerhouse	+92-310-5479434
24.	Mehmood ul Hassan	HSE Officer	Powerhouse	+92-346 1340289
25.	Shafaqat Ali	HSE Officer	Powerhouse	+92-346 9652566
26.	Ameer Hamza	HSE Officer	Powerhouse	+92-344 3669141
27.	Usman Rasheed	HSE Officer	Upstream Surge Shaft Tunnel	+92-310 5022413

2.2.2. Project HSE Safeguard Team

42. From the details given above, the HSE personnel responsible for the HSE safeguards are collectively detailed in **Table 2.8**.

Table 2.8: Details of HSE Personnel

Organization	Job Title	Name	Contact Details
ADB	Principal Environmental Specialist (Country Environment Focal)	Nurlan Djenchuraev	ndjenchuraev@adb.org
	Environment Specialist (Consultant) Pakistan Resident Mission	Shazia Shahid	sshahid.consultant@adb.org
PIU	Deputy Director HSE and Gender	Ibtesam Zaima	ibesaamzaima3@gmail.com
PMC	Environmental Expert	Assad Ali Khan	dtlbalakothpp@yahoo.com
	Health and Safety Monitor	Fawad Ali Shah	
	Environmental Officer	Najum-Us-Saqib	
EPC Contractor	H & S Manager	Qi Xiu Feng	cggcgrcjvbk@gmail.com
	QHSE Director	Li Yong	
	Quality and Environment Engineer	Hai Xinglong	
	Environmental Manager	Irshad Saeed	
	HSE Manager	Fazli Zul Jalal	
	QHSE Officer	Wang Chaowei	
	HSE Officer	Wu Qiaojin	
	HSE Officer	Saeed ul Haq	
	HSE Officer	Momin Khan	
	HSE Officer	Syed Hassan Shah	
	HSE Officer	Rashid Hussain	
	HSE Officer	Muhammad Ajmal	
	HSE Officer	Ahsan Ali	
	HSE Officer	Ali Haider Shah	
	HSE Officer	Naeem Yousaf	
	HSE Officer	Tayyab Ur Rehman	
	HSE Officer	Zeeshan Sadique	
	HSE Officer	Zeeshan Ahmed	
	HSE Officer	Saddam Hussain	
	Assistant HSE Officer	Shahmeer Jan	
	HSE Officer	Shahbaz Riaz	
	HSE Officer	Ahmed Raza Khan	
	HSE Officer	Syed Adnan Shah	
	HSE Officer	Mehmood ul Hassan	
	HSE Officer	Shafaqat Ali	
	HSE Officer	Ameer Hamza	
	HSE Officer	Usman Rasheed	

2.3. Project Activities during the Current Reporting Period

43. During the reporting period, the detailed engineering design, including the design of muck disposal areas and sedimentation tanks, and review of EPC Contractor's method statements/technical reports, remained in progress. On-site, construction activities continued robustly at the dam site, residential colony, access roads, powerhouse, and the headrace tunnel. Also, protection works and the establishment of a camp at the powerhouse sites remained in progress during the reporting period.

44. **Table 2.9** summarizes the EPC contract and overall works progress achieved so far. **Table 2.10** exhibits component-wise progress achieved till the end of the reporting period against planned targets.

Table 2.9: Summary of Overall Works Progress till End of the Reporting Period

Contract Signing	SSEMP ¹ Approval	Personnel		Civil Works ²		Progress as of	
		Environmental Manager	Health and Safety Manager	Start	End	December 31, 2024	June 30, 2025
March 9, 2020	December 30, 2022	Irshad Saeed	Qi Xiu Feng	September 28, 2022	January 1, 2027	13.83%	19.30%

Table 2.10: Component-wise Summary of Works Progress till End of the Reporting Period

Description	Physical Progress in % up to June 30, 2025	Progress Variance %
Overall Progress	19.30	48.12
Basic Design	100.00	0.00
Detailed Design	38.30	33.02
Preparatory Works	94.10	5.90
Road and Bridge	65.85	2.73
Permanent Staff Residential Colony	46.45	33.77
Diversion Tunnel Works	41.59	58.41
Dam & Associated Works	1.00	55.33
Power Intake Works	16.00	84.00
Headrace Tunnel	20.80	52.46
Underground Main Access Tunnel, Ventilation & Cable Tunnel	8.96	57.89
Tailrace Tunnel & Downstream Surge Shaft	6.52	67.87
Upstream Surge Tank, Pressure Shaft & Penstocks	3.53	93.09
Powerhouse Works	0.00	81.42
Procurement, Production, Test & Transportation of E&M Equipment	0.00	76.18
Switchyard	0.00	100.00
Transmission Line Works	0.00	94.55
Main transformers and other equipment installation	0.00	0.00
Erection of Unit1,2,3	0.00	0.00
Completion & Taking-over	0.00	0.00

45. The manpower deployed at the site during the reporting period is in **Table 2.11**, followed by the staff deployment trend in the current reporting period in **Figure 2.8**. The comparison between the staff deployment trends in the current and previous reporting periods is exhibited in **Figure 2.10**.

¹ The SSEMP, approved by the Employer, contained requisite plans. The updated SSEMP has been submitted to the PIU for review and onward transmission to the ADB for further review and consent thereof.

² The start and end dates of the civil works are those contained in the last approved Work Schedule.

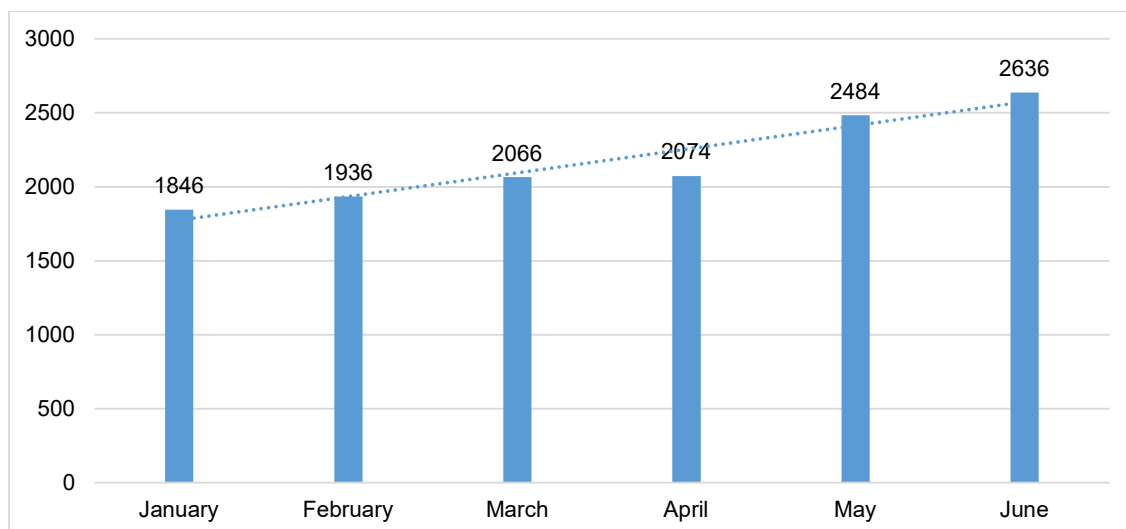
Table 2.11: Manpower Deployed to the Project during the Reporting Period

S/No	Staff	Reporting Month					
		Jan	Feb	Mar	Apr	May	Jun
1.	Project Manager	1	1	1	1	1	1
2.	Planning, Engineering & Technical Director (DPM)	2	2	2	2	2	2
3.	QHSE Director (DPM)	1	1	1	1	1	1
4.	Contract & Commercial Director (DPM)	1	1	1	1	1	1
5.	Equipment and Material Director (DPM)	1	1	1	1	1	1
6.	Deputy Director of Technical & Engineering	2	2	2	2	2	2
7.	Deputy Director of Contract & Commercial	1	1	1	1	1	1
8.	Deputy Director of Administrative	1	1	1	1	1	1
9.	Environmental Manager	1	1	1	1	1	1
10.	Contract & Commercial Management Department	11	11	11	11	11	11
11.	Planning, Engineering Management	30	30	31	31	32	34
12.	Design & Technical Management Department	28	30	30	30	32	32
13.	QHSE Management Department	48	52	54	54	58	61
14.	Equipment and Materials Department	24	24	24	24	24	24
15.	Financial Management Department	11	11	11	11	11	11
16.	Administration & Human Resources Department	53	54	54	54	60	62
17.	Dam Site Managements	0	0	0	0	12	12
18.	Powerhouse Managements	0	0	0	0	10	10
19.	Survey Team	20	20	20	20	20	20
20.	Laboratory Team	21	21	21	21	21	21
21.	Diversion Tunnel & Dam Skilled & unskilled	223	258	282	282	442	531
22.	Mechanical team Operators, Driver & Mechanic at Dam	116	132	134	134	146	146
23.	Steel Yard Processing Team Dam	39	39	39	39	39	39
24.	Batching Plant at Dam	20	20	30	30	30	30
25.	Grouting team at Dam	37	37	37	37	37	37
26.	Mechanical team Operators, Driver & Mechanic at, A2 & A3	128	135	142	142	145	146
27.	General Team Electricity, water supply, A2 & A3 Dam	55	55	55	55	65	65
28.	Batching Plant team A2	16	16	16	16	16	16
29.	Adit 2 Tunnel Skilled & Unskilled Labors	98	98	98	98	159	160
30.	Adit 3 tunnel skilled & unskilled labors	85	85	85	85	96	107
31.	Batching Plant team A3	25	25	25	25	25	25
32.	Powerhouse retaining Wall Skilled & unskilled Labors	69	99	105	105	105	105
33.	Main Access Tunnel Power House, Downstream Surge tunnel	190	190	204	204	266	281
34.	Batching Plant Powerhouse Skilled and Unskilled	25	25	25	25	25	25
35.	Operator, Driver & Mechanic at Powerhouse	84	87	91	91	91	107
36.	General Team Electricity, water supply, at Upstream, Main Access Tunnel Powerhouse	23	15	22	22	32	32
37.	Upstream Surge Tunnel Skill and Unskilled labor	0	0	51	51	96	106
38.	Site Manager	1	1	1	1	1	1
39.	Planning Engineer	3	3	3	3	3	4
40.	Construction Manager	1	1	1	1	1	1

S/No	Staff	Reporting Month					
		Jan	Feb	Mar	Apr	May	Jun
41.	Admin Manager	2	2	2	2	2	2
42.	Quantity Surveyor	1	1	1	1	1	1
43.	Site Engineer	7	7	7	7	7	3
44.	Chief Surveyor	2	2	2	2	2	4
45.	Land Surveyor	4	4	4	4	4	2
46.	Assistant Surveyor	1	1	1	1	1	4
47.	Material Engineer	1	1	1	1	1	1
48.	Senior Engineer Technical	1	1	1	1	1	1
49.	Structure Engineer	1	1	1	1	1	1
50.	Senior Planning Engineer	3	3	3	3	3	1
51.	Senior Accountant	1	1	1	1	1	3
52.	Lab technician	2	2	2	2	2	1
53.	Electrical Engineer	1	1	1	1	1	2
54.	Health & Safety	2	2	2	2	2	1
55.	Geologist	5	5	5	6	6	2
56.	Store Keepers	2	2	2	2	2	6
57.	Quantity Surveyor	1	1	1	1	1	2
58.	Mechanical Purchaser	1	1	1	1	1	1
59.	Senior Engineer	1	1	1	1	1	1
60.	Date Entry Operator	0	0	0	1	1	1
61.	Finance Manager	0	0	0	1	1	1
62.	Skilled Labor	173	173	175	180	180	182
63.	Unskilled Labor	139	139	139	139	140	140
Total (No)		1846	1936	2066	2074	2484	2636
Out of Total, Local Employed Workforce (No)		1122	1252	1286	1286	1471	1546
Percentage of Local Employed Workforce		61%	65%	62%	62%	59%	59%

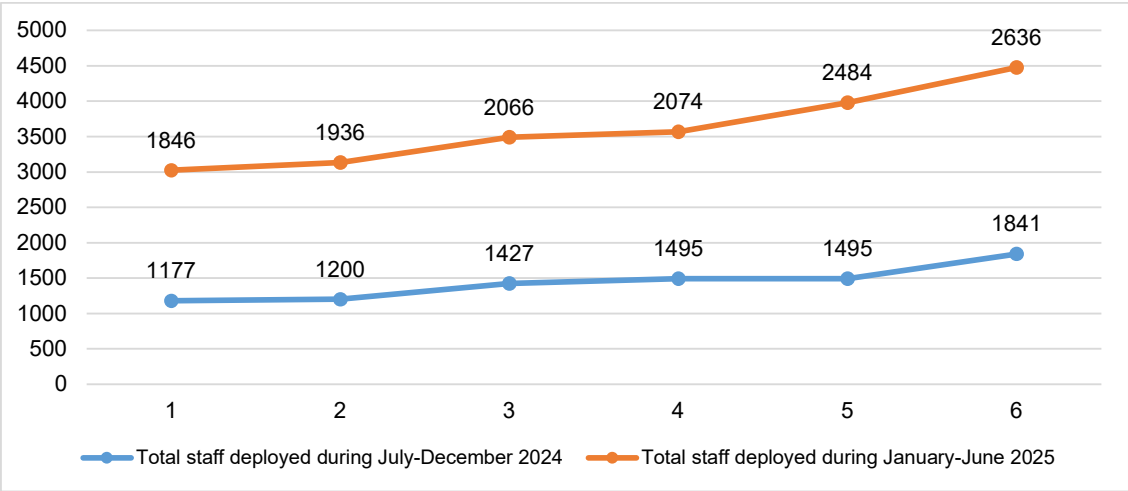
Source: Data provided by the EPC Contractor

Figure 2.8: Staff Deployment Trend during the Current Reporting Period



46. As shown in the figure above, there is a steady increase in the EPC Contractor's workforce. This growth reflects both an uptick in ongoing construction activities and the commencement of new activities at various sites, especially at the headrace tunnel, diversion tunnel, upstream inclined surge tunnel, dam, and powerhouse locations.

Figure 2.9: Comparison between the Staff Deployment Trends in the Current and Previous Reporting Periods.



47. When comparing staff deployment trends, although a noticeable increase can be observed in June 2025 however, there is a sharp increase in May 2025, where the EPC Contractor increased the workforce by 410 persons including 185 local staff (**Figure 2.9**). This surge is primarily attributed to the rise in underground construction activities.

48. Statistics of locals employed by the EPC Contractor during the reporting period are in **Figure 2.10** followed by comparison of trends between the two reporting periods.

Figure 2.10: Local People Employed during the Reporting Period

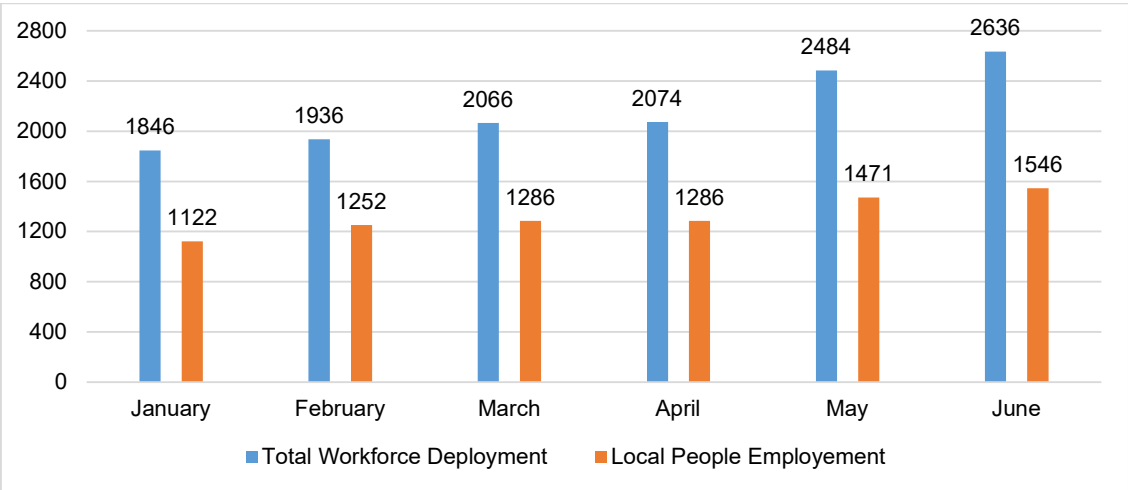
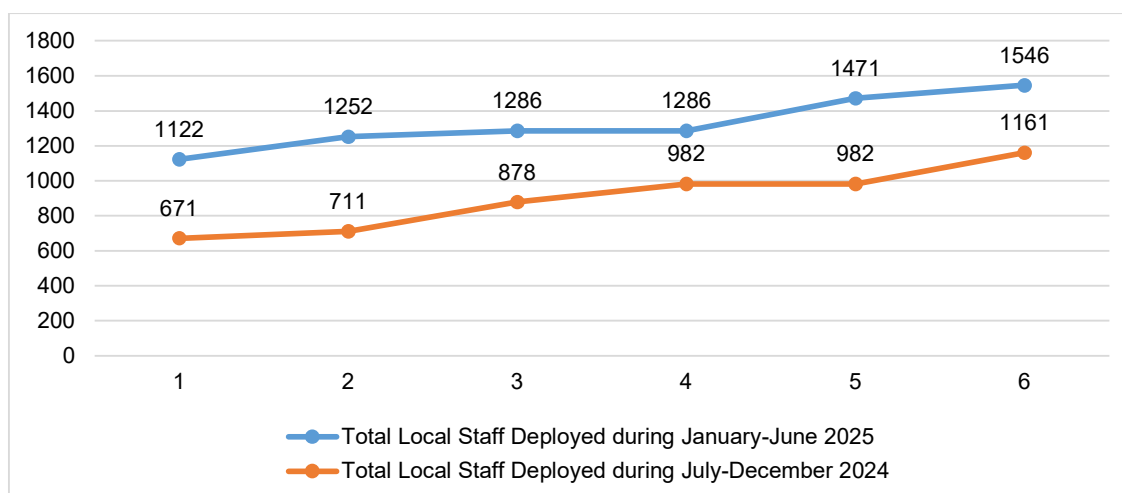


Figure 2.11: Comparison between Local Staff Deployed during the Current and Previous Reporting Periods



49. As evident from the presentation, there is a vivid increase in the local employment during the current reporting period.

50. **Table 2.12** exhibits the EPC Contractor machinery and major equipment deployed to the site. The heavy machinery was mainly deployed for underground earthwork activities and transporting materials, including concrete to the construction sites. Due to the initiation of construction activities at new sites, there is a significant increase in the EPC Contractor's equipment and construction machinery at the site.

Table 2.12: Machinery Deployed to Project during the Current Reporting Period

S/No	Machine	Model	Total No. Deployed	Deployment Month					
				Jan	Feb	Mar	Apr	May	Jun
1	Crawl Excavator	CDM 6225	1	1	1	1	1	1	1
2	Excavator	Doosan 210,225	4	4	4	4	4	4	4
3	Dump truck		2	2	2	2	2	2	2
4	Pile boring machine		1	1	1	1	1	1	1
5	Generator		1	1	1	1	1	1	1
6	Crawler single bucket excavator	PC-200,335	2	2	2	2	2	2	2
7	Excavator	210,323&323	3	3	3	3	3	3	3
8	Automatic grouting recorder	GJY-VI	4	4	4	4	4	4	4
9	Geological drilling rigs	XY-2	4	4	4	4	4	4	4
10	Bolt grouting machine	EVMP	7	7	7	7	7	7	7
11	Grouting pumps	3SNS-A	2	2	2	2	2	2	2
12	Double-walled mixing drum	YJ-200A	2	2	2	2	2	2	2
13	Slurry storage barrels	YJ-1200	2	2	2	2	2	2	2
14	Down-the-hole drilling rigs	KSZ100	2	2	2	2	2	2	2
15	Diesel generators	KPG 275K VA L8	1	1	1	1	1	1	1
16	Loader	LW300FN	12	10	10	11	12	12	12
17	Dump truck	SX3255DR384R	32	29	31	31	32	32	32

S/No	Machine	Model	Total No. Deployed	Deployment Month					
				Jan	Feb	Mar	Apr	May	Jun
18	Wheeled excavators	DOOSAN DX210W-9C	1	1	1	1	1	1	1
19	Hydraulic drilling rigs	FT35	1	1	1	1	1	1	1
20	Crawler bulldozer	SD22	5	5	5	5	5	5	5
21	Small Crane	806	1	1	1	1	1	1	1
22	Mobile crane	100ton/25 ton	2	2	2	2	2	2	2
23	Concrete Mixer Truck	ZZ5257GJBM3247C/LB2	1	1	1	1	1	1	1
24	Wheeled Excavator	DX210W-9C,W-90	2	2	2	2	2	2	2
25	Batching Plant	Dual host HZS90	1	1	1	1	1	1	1
26	Light Truck		1	1	1	1	1	1	1
27	Side dump loader	WA380-6	4	4	4	4	4	4	4
28	Single arm drill	Boomer K111	1	1	1	1	1	1	1
29	Crawler Excavator	PC200LC-8M0	1	1	1	1	1	1	1
30	Crawler Excavator	CAT 336GC	1	1	1	1	1	1	1
31	Crawler Excavator	PC300-8M0	2	2	2	2	2	2	2
32	Concrete Mixer truck	FYG5253GJBC	23	20	21	21	23	23	23
33	Flatbed truck	DONGFENG 5T	1	1	1	1	1	1	1
34	Wet spray Machine	CYP.90	2	2	2	2	2	2	2
35	Crawler Excavator	CAT336GC	1	1	1	1	1	1	1
36	Power Transformer	630KVA	7	7	7	7	7	7	7
37	Power Transformer	315KVA	1	1	1	1	1	1	1
38	Excavator	HITACHI 200	10	6	7	9	10	10	10
39	Excavator	Hyundai	1	1	1	1	1	1	1
40	Wheel Loader		2	2	2	2	2	2	2
41	Mini Dumper		2	2	2	2	2	2	2
42	Generator	65 KV 15 KV,250	17	12	14	16	17	17	17
43	Batching plant	0.5m3	2	2	2	2	2	2	2
44	Transit Mixer	Nissan, Hino	4	4	4	4	4	4	4
45	Compressor /12Bar		2	2	2	2	2	2	2
46	Trolley Crane		1	1	1	1	1	1	1
47	Skid Dumper		1	1	1	1	1	1	1
48	Water Bozer		1	1	1	1	1	1	1
49	Mobile Shotcrete Pump		1	1	1	1	1	1	1
50	Shotcrete Pump		2	2	2	2	2	2	2
51	Ventilation Fan		1	1	1	1	1	1	1
52	Power Generator	375KVA	1	1	1	1	1	1	1
53	Air Compressor		2	2	2	2	2	2	2
54	Skid Dumper		1	1	1	1	1	1	1
55	Water Bozer		1	1	1	1	1	1	1
56	Mobile Shotcrete Pump		1	1	1	1	1	1	1
57	Skid Dumper		1	1	1	1	1	1	1
58	Water Bozer		1	1	1	1	1	1	1
59	Frequency Inverter		1	1	1	1	1	1	1
60	Dump truck		3	3	3	3	3	3	3
61	Crush Plant		1	1	1	1	1	1	1

S/No	Machine	Model	Total No. Deployed	Deployment Month					
				Jan	Feb	Mar	Apr	May	Jun
62	Excavator	Hitachi 200, Hitachi 220	2	2	2	2	2	2	2
63	Wheel Loader	LW500	1	1	1	1	1	1	1
64	Diesel generators	V550C2,HDG22	2	2	2	2	2	2	2
65	Concrete Mixture Machine		2	2	2	2	2	2	2
66	Flatbed truck	FG1JKPB	1	1	1	1	1	1	1
67	Air Compressors		2	2	2	2	2	2	2
68	Concrete Pump	HBT80.13.112RSD, HBT60.16.110SU	2	2	2	2	2	2	2
69	Power Transformer	500,800KV,100,1200KV&1250	5	5	5	5	5	5	5
70	Single Arm Rock Drilling Rig	D7	1	1	1	1	1	1	1
71	Binding Machine		1	1	1	1	1	1	1
72	Shaper	BC6063	2	2	2	2	2	2	2
73	Jib crane	BZD-2	2	2	2	2	2	2	2
74	Oil storage tank	5170 Gallon 19500L	1	1	1	1	1	1	1
75	Dump truck Volvo		1	1	1	1	1	1	1
76	Pickup double cabin		1	1	1	1	1	1	1
77	Batching Plant	50m3/h	1	1	1	1	1	1	1
78	Ventilation Fan		1	1	1	1	1	1	1
79	Electric Air Compressor	XAMS850E	8	8	8	8	8	8	8
80	Transit Mixer Machine	ZZ1257N3641W	4	4	4	4	4	4	4
81	Wheel Excavator	Doosan DX210W	1	1	1	1	1	1	1
82	Wet Spray Trolley	TSR 2010	1	1	1	1	1	1	1
83	Robotic Arm Wet Spray Machine	Sika Alive 272	1	1	1	1	1	1	1
84	Screw Air Compressor	XAS 186	1	1	1	1	1	1	1
85	Large Axial Flow Fan	AVH140.90.4	1	1	1	1	1	1	1
86	Dynamo	V550C2	3	3	3	3	3	3	3
87	Dynamo	J110 kva	1	1	1	1	1	1	1
88	Diesel generators	1106A-70TG1/UCI274F	1	1	1	1	1	1	1
89	Cantilever jib crane	SQ8SK3Q	1	1	1	1	1	1	1
90	Power transformers	YBP-11/0.4-315	3	3	3	3	3	3	3
91	Transit Mixture	636, 625,6981,6982,6983,6942	6	6	6	6	6	6	6
92	Transit Mixture	69,416,952	2	2	2	2	2	2	2
93	Punching Machine	CCHJ70/50C	1	1	1	1	1	1	1
94	Concrete Mixer Truck	LZZ5BLNB3KD575216	1	1	1	1	1	1	1
95	Truck Crane	XCT8L4	1	1	1	1	1	1	1
96	Dump Trucks	SCHMAN	7	4	6	6	7	7	7
97	Excavator	CATN320D,Hyundai 210	2	2	2	2	2	2	2
98	Excavator	Komatsu 200,Komatsu 100	2	2	2	2	2	2	2
99	Wheel Loader	LW500FN, LW300FN	3	3	3	3	3	3	3
100	Diesel generators	Perkins 121hp,1106A-70TG1	4	4	4	4	4	4	4
101	Water tank	SCS5160GSS	2	2	2	2	2	2	2
102	Diesel tank	Foton Daimler,M600	2	2	2	2	2	2	2
103	Water truck	DLQ5161GSSZ4	1	1	1	1	1	1	1

S/No	Machine	Model	Total No. Deployed	Deployment Month					
				Jan	Feb	Mar	Apr	May	Jun
104	Concrete Mixture Machine		3	3	3	3	3	3	3
105	Road Roller	XS183JPD	1	1	1	1	1	1	1
106	Crawler Drilling machine	T35	1	1	1	1	1	1	1
107	Diesel Air Compressor	XRHS666CD,XAHS750	2	2	2	2	2	2	2
108	Mobile truck crane 25ton	QY25K5-I	1	1	1	1	1	1	1
109	Digital Underground Scale	SCS-60	1	1	1	1	1	1	1
110	Low voltage switch box	380V 1600A	1	1	1	1	1	1	1
111	Low voltage switch box	380V 2000A	1	1	1	1	1	1	1
112	Low voltage switch box	UAN111-354-111	1	1	1	1	1	1	1
113	Ordinary lathe	C6160C	1	1	1	1	1	1	1
114	Vertical lifting table milling machine	ZX7045	1	1	1	1	1	1	1
115	Sewage pump	TS200-125-365	1	1	1	1	1	1	1
116	Lathe	CY6166B-3000	1	1	1	1	1	1	1
117	Shaper	B6065	1	1	1	1	1	1	1
118	Vertical lifting table milling machine	XQ6232W-B	1	1	1	1	1	1	1
119	Radial drilling machine	Z5140A	1	1	1	1	1	1	1
120	Single column press	YX41-100T	1	1	1	1	1	1	1
121	Other hydraulic presses (pipe crimping machines)	XM91-C1	1	1	1	1	1	1	1
122	Lathe		1	1	1	1	1	1	1
123	Lifter		1	1	1	1	1	1	1
124	Wet spray trolley	TSR2010	2	2	2	2	2	2	2
125	Robotic arm wet spray concrete pump	Sika aliva702+Aliva302.1	3	3	3	3	3	3	3
126	Dynamo	CUPP640(S)	2	2	2	2	2	2	2
127	Screw compressor	XAS186	1	1	1	1	1	1	1
128	Axial Fan	2*AVH125.90.4.8	1	1	1	1	1	1	1
129	Three arm Trolley	BOOMER XL3D	1	1	1	1	1	1	1
130	Concrete Mixer truck		2	2	2	2	2	2	2
131	Van Type Transformer	500 KVA	1	1	1	1	1	1	1
132	Electric Air Compressor	20m3	1	1	1	1	1	1	1
133	mini truck	VIGO CHAMP GX TRD	2	2	2	2	2	2	2
134	power transformer	ETO800/11	1	1	1	1	1	1	1
135	low voltage switch box	380V 1000A	1	1	1	1	1	1	1
136	Ordinary lathe	C6140C	1	1	1	1	1	1	1
137	Forklift	CPSCD50	1	1	1	1	1	1	1
138	Batching Plant at A3		1	1	1	1	1	1	1
139	Excavator		1	1	1	1	1	1	1
140	Carter Excavator	CAT320	5	5	5	5	5	5	5
141	Batching Plant at Main Access tunnel Power House		1	1	1	1	1	1	1
142	Concrete pump	HBT60.16.110SU	6	6	6	6	6	6	6

S/No	Machine	Model	Total No. Deployed	Deployment Month					
				Jan	Feb	Mar	Apr	May	Jun
143	Robotic arm wet spraying machine	Sika aliva272+Aliva302.1	3	3	3	3	3	3	3
144	Vibrating Roller	SCA610D	3	3	3	3	3	3	3
145	Concrete mixer truck	LZZ5BLNBKD575215	3	3	3	3	3	3	3
146	Concrete mixer truck	6m³	16	13	15	16	16	16	16
147	Electric air compressor	XAMS-466E	4	4	4	4	4	4	4
148	Mobile explosives storage	YKF-1-001	3	3	3	3	3	3	3
149	Mobile explosives storage	YKF-1-003	3	3	3	3	3	3	3
150	Electric air compressor	Electric air compressor	2	2	2	2	2	2	2
151	Tank Truck	HINO DUTRO WU720	1	1	1	1	1	1	1
152	Crawler Excavator	PC300-8	1	1	1	1	1	1	1
153	Loader	ZL50GN	1	1	1	1	1	1	1
154	Dump truck	SX3255DT384R	1	1	1	1	1	1	1
155	Electric Air Compressor	ATLAS 466E	2	2	2	2	2	2	2
156	Loader	CAT924K	2	2	2	2	2	2	2
157	Loader	LW500FN	1	1	1	1	1	1	1
158	Power Transformer	800KVA	1	1	1	1	1	1	1
159	Dump Truck	FAW 280	1	1	1	1	1	1	1
160	Roller		1	1	1	1	1	1	1
161	Excavator	Mobile Sunny/SAY155UU	1	1	1	1	1	1	1
162	Water Bozer								
163	Shotcrete Pump Truck #14	Spritz Z1(A) Zoom line	4	4	4	4	4	4	4
164	Excavator	CAT, HYUNDAI	5	5	5	5	5	5	5
165	Excavator	Volvo 145, Sunny	3	3	3	3	3	3	3
166	Drilling Equipment		2	2	2	2	2	2	2
167	Peter Engine	25HP	2	2	2	2	2	2	2
168	Bulldozer		1	1	1	1	1	1	1
169	Dumper skid Fiori		1	1	1	1	1	1	1
170	Power Generator 200 KVA		1	1	1	1	1	1	1
171	Dumper	Mini Hino	1	1	1	1	1	1	1
172	Generator	Cat	1	1	1	1	1	1	1
173	Air Compressor		1	1	1	1	1	1	1
174	Tractor		1	1	1	1	1	1	1
175	Transit Mixer		1	1	1	1	1	1	1
176	Weighing Bridge		2	2	2	2	2	2	2
177	Dumper		1	1	1	1	1	1	1
178	Loader	420	1	1	1	1	1	1	1
179	Hand mixing machine		1	1	1	1	1	1	1
180	Grader		1	1	1	1	1	1	1
181	Crawl Excavators	PC200-8	2	2	2	2	2	2	2

2.4. Material Resource Utilization

51. During the reporting period, several major construction materials were utilized in constructing permanent and temporary works. These materials include reinforced steel, cement, sand, and coarse aggregates. All these materials were sourced from approved suppliers to ensure their quality and compliance with the Project standards. The EPC Contractor procured construction materials from the approved sources mentioned against each type of construction material.

- i. Coarse aggregate: Black Dimond, Ghuman, and Bhangian Kasi
- ii. Fine aggregate: Lawrencepur, Maira, and Thakot
- iii. Cement: Askari, Fauji
- iv. Reinforced steel: FF Steel, Amreli, Siraj, SJ and Pak steel

52. Water used for concrete production was supplied from the local water sources with prior written permission from the owner(s) of the source/users.

53. **Table 2.13** and **2.14** show month-wise and cumulative details of the materials used in the Project construction activities including those stored at the site. During the current reporting period, due to an increase in construction activities, there is a vivid increase in the quantum of construction materials.

Table 2.13: Month-wise and Cumulative Details of Construction Materials

S/No	Month	Steel (Ton)	Cement (Bag)	Sand (cft)	Aggregates (cft)
1	January	169.565	107907.2	267954	407313
2	February	4.523	11803.25	226265	131506
3	March	254.45	11106.8	172863	208212
4	April	133.826	79040	173711	181651
5	May	208.531	101520	195646	189029
6	June	372.204	72407	171506	159254
Total for Reporting Period (January-June 2025)		1143.099	383784.25	1207945	1276965
Total for Previous Reporting Period (July-December 2024)		806.888	213981	719603	745507
Cumulative for the Project		1949.987	597765.3	1927548	2022472

Table 2.14: Month-wise and Cumulative Details of POL and Water Used (in liters)

S/No	Month	Diesel	Petrol	Water
1	January	463397	944.7	2308750
2	February	403052	1240.43	2306760
3	March	334429	1443.18	2739516
4	April	365922	1385.68	2750124
5	May	308784	1367.78	2913732
6	June	231062	1690.26	3426800
Total for Reporting Period (January-June 2025)		2106646	8072.03	16445682
Total for Previous Reporting Period (July-December 2024)		1395065	6792.99	11723452
Cumulative for the Project since Commencement of Works		3501711	14865.02	28169134

Glimpses of the Construction Activities



Lining steel in Diversion Tunnel



Construction of Main Access tunnel at the Powerhouse site



Concrete work at the Batching Plant 2, Dam site



Fixing of Frame beam at the Left Abutment of Dam



Overview of the Employer Colony



Concrete Pouring in Diversion Tunnel

2.5. Description of Any Changes to the Project Design

54. There were no design changes in the reporting period.

2.6. Description of Any Changes to the Agreed Construction Methods

55. Since the approval of the basic engineering design on March 31, 2023, the EPC Contractor has been regularly submitting method statements for the PMC's review and approval. Although no changes have been proposed in the approved method statements so far, the approved changes will be reported in the corresponding SAEMR.

3. ENVIRONMENTAL SAFEGUARD ACTIVITIES

3.1. General Description of Environmental Safeguard Activities

56. During the reporting period, construction activities remained continued at the dam site, residential colony, access roads, powerhouse and the headrace tunnel. Also, protection works and the establishment of camp at the powerhouse sites remained in progress during this period. HSE aspects of these activities were regularly monitored and supervised by the PMC and PIU staff. Also, during the reporting period, the PMC supervisory staff monitored quarterly instrumental environmental monitoring conducted by the KPEPA approved laboratory at the pre-identified locations at the site.

57. Following is a brief of the safeguard activities in chronological order.

- i. Following comprehensive due diligence of the spoil disposal site identified for the upstream inclined surge tunnel on January 23, 2025, the PMC granted environmental consent to the proposed site on February 11, 2025. The detailed engineering design of this site remained in progress during the reporting period.
- ii. On February 05, 2025, the ADB Safeguard team visited the site and held a meeting with the PIU and PMC HSE team. Although the visiting team did not observe any major non-compliance with the SSEMP/EMP provisions, the PIU provided an updated SSEMP to the ADB on March 23, 2025, as requested during the visit. The ADB review comments were subsequently incorporated, and the revised version was shared with the PIU on June 4, 2025, for review and further transmission to the ADB. Till the end of the reporting period, the updated SSEMP remained under the PIU review.
- iii. The PMC environmental team conducted due diligence on the spoil disposal area identified for the powerhouse site on May 26, 2025. Due to discrepancies in the information pertaining to the agricultural land and built-up property provided in the design document of the spoil area and on-ground facts, the EPC Contractor was asked to mark the location of these on the maps, enabling the HSE team to finalize the environmental consent in the matter. The EPC Contractor's response remained awaited till the end of the reporting period.
- iv. On February 19, 2025, the Environmental Expert (EE) and the Environmental Officer of the PMC held a detailed meeting with the EPC contractor HSE to ascertain the updated status of the CAPs. After the meeting, the updated status of the CAPs containing new dates for completion of the pending activities was submitted to the PIU for onward sharing with the quarter concerned at the ADB.
- v. On February 20, 2025, the External Environmental Monitor (EEM) visited the construction sites. Alongside minor observations, the delay in finalization of the sedimentation tanks design and subsequent construction was the major observation recorded during the site visit. The PIU and PMC have jointly taken up the issue with the EPC Contractor for finalization at the earliest. The matter was subsequently brought to the EPC Contractor's notice during the HSE progress

review meetings and through correspondence. The EPC Contractor's action in the matter is still awaited.

- vi. During the first and second quarters of the reporting period, the EPC Contractor conducted instrumental environmental monitoring at the work sites and camps, including the newly constructed camp at the powerhouse site. A detailed description of the results obtained has been given in **section 5.2**, while the signed scan copies are in **Annexure 2** to the report. The results obtained for the EPC Contractor's main camp show compliance with the National Environmental Quality Standards (NEQS) guiding values. Also, at work sites, though there was an increase in CO, SO_x, and NO_x concentration, the results still fall within the World Health Organization (WHO) and NEQS guiding values.
- vii. On April 25 and 26, the ADB organized a two days training sessions at the project site focusing on: (i) Occupational Health and Safety (OHS), emphasizing the importance of maintaining a safe working environment, hazard identification, and preventive measures; and (ii) Core Labor Standards, highlighting key aspects of the labour rights.
- viii. Consequent upon incorporation of the review comments, the ADB safeguard team cleared the updated EIA report of the Balakot HPP (300 MW) on May 06, 2025, and subsequently disclosed it on its website on May 23, 2025.
- ix. The EPC Contractor's six-month vocational training program for eligible candidates from the project-affected community of Paras village began in May 2025 at the Government Skill Development Centre Hassa Balakot, and is scheduled to be completed in November 2025. A total of 18 students have been admitted to computer operations and the electrician trades.
- x. On May 25, 2025, a joint meeting was held at the PMC office in Paras village, involving the HSE team from the PMC and the HSE team of the EPC Contractor. During this meeting, the PMC H&S team provided detailed instructions and guidance to the EPC Contractor's HSE team regarding the Monsoon Contingency Plan for 2025. The meeting emphasized proactive planning to mitigate potential risks associated with heavy rainfall, flash floods, and landslides during the monsoon season of 2025. Focused areas included site drainage management, securing construction materials, emergency response preparedness, and ensuring workers' safety during adverse weather conditions.
- xi. During the reporting period, two HSE champion award ceremonies were held on April 18 and June 20, 2025, whereby cash prizes were awarded to 18 champions for the period from January through June 2025.
- xii. During the reporting period, a total of 38 incidents occurred at various work sites. Except in four instances, whereby the injured were hospitalized for a couple of days, most of the injured labors resumed their duties on the following days. The incident details are in **Annexure 3**.
- xiii. The onsite job trainings, toolbox talks, and various emergency drills were regularly held during the reporting period.
- xiv. Regular fortnightly HSE progress review meetings among PIU, PMC, and EPC Contractor were held wherein HSE activities were prioritized, action plans were furnished, and targets were set for rectifying non-compliant activities observed during HSE supervision by the PMC/PIU supervisory staff. A copy of the minutes from one of such meetings is in **Annexure 1**.

Glimpses of the HSE Safeguard Activities



PIU and EPC Contractor meeting about Corrective Action Plans (February 19, 2025)



PIU, PMC, and EPC Contractor's HSE Review Meeting (January 22, 2025)



PMC HSE team meeting with the EPC Contractor HSE Team on Monsoon Contingency Plan (MCP), May 25, 2025

PMC and EPC Contractor joint visit to the Proposed Spoil Disposal Area for Powerhouse (May 26, 2025)



ADB HSE Audit Team Meeting with PIU, PMC, and EPC Contractor (February 05, 2025)



Air and Noise Instrumental Monitoring near Sensitive Receptors at A3 Site (First Quarter of 2025)



ADB Safeguard team visit to the A3 Adit Tunnel (February 05, 2025)

3.2. Site Audit

58. **Table 3.1** exhibits the site visits undertaken by the EEM, PIU, PMC, EPC Contractor's environmental staff, and the ADB safeguard mission as part of the site audit. Since the PMC's HSE team visits the site on an almost daily basis, hence, their routine inspection and supervision visits are not reflected herein.

59. During these visits, HSE aspects of the construction activities at permanent access roads, the Employer's residential colony, camp facilities, batching plants, adit tunnels, headrace tunnel, and dam sites were audited.

Table 3.1: Site Audit Conducted during the Reporting Period

Visit Date	Auditor		Purpose of Audit	Summary of Findings
	Title	Name		
January 23, 2025	PMC: i. Environmental Expert ii. Environmental Officer	i. Assad Ali Khan ii. Najum Us Saqib	Due diligence of the spoil disposal site identified for the Upstream Surge Tunnel	- Obtain No Objection Certificates (NOCs) from the Forest Department or Kunhar Watershed Division (as applicable) prior to commencing muck disposal operations. - Execute lease agreements with landowners, encompassing provisions for compensation, land reclamation, and access road usage. - Relocation of electric pole (11kV). - Tree plantation and protection of slopes.
	EPC Contractor: i. Environmental Manager ii. Technical Engineer	i. Irshad Saeed ii. Muhammad Usama		
February 05, 2025	ADB: i. Mission Leader, Director, Office of Safeguards (OSFG)/Regional Operations Services 1 (OSR1) ii. Principal Safeguards Specialist, OSFG iii. Principal Safeguards Specialist (Environment) iv. Principal Safeguards Specialist (Social) v. Senior Safeguards Officer	i. Zehra Abbas ii. Felix Oku iii. Nurlan Djenchuraev iv. Jose Tiburcio Nicolas v. Ma. Roserillan Robidillo vi. Ashfaq Khokhar	HSE site Audit	No major non-compliance was observed; however, some minor issues were noted, such as the need to increase the length of the vent pipe for the generator at the powerhouse batching plant site, and to enhance the lighting (lux level) in the A3 adit tunnel.

Visit Date	Auditor		Purpose of Audit	Summary of Findings
	Title	Name		
	vi. Senior Safeguards Officer (Social)			
	vii. Safeguards Officer (Environment), OSFG/OSR1	vii. Shazia Shahid		
	PIU: i. Project Director ii. Deputy Project Director iii. Deputy Director, HSE and Gender iv. Deputy Director Social and Resettlements v. Deputy Director Civil vi. Deputy Director Geology	i. Aziz Raza ii. Muhammad Asif Khan iii. Ibtesaam Zaima iv. Dr Naveed v. Muhammad Zubair vi. Sharifuddin		
	PMC: i. Team Leader ii. Deputy Leader iii. H&S Monitor iv. Environmental Expert v. Environmental Officer	i. Zafer DEMİRSELÇUK ii. Muhammad Hussain iii. Syed Ali Fawad Shah iv. Assad Ali Khan v. Najum us Saqib		
	EPC Contractor: i. Director QHSE CGGC ii. Environmental manager iii. HSE officer iv. HSE Officer v. HSE Manager	i. Li Yong ii. Irshad Saeed iii. Ali Haider iv. Naeem Yousaf v. Fazal- Zuljalal		
February 18, 2025	PIU: Deputy Director, HSE and Gender	Ibtesam Zaima	HSE compliance audit of construction works at the site	i. Confined Space Attendant was not present or deputed at the following confined spaces. ➤ Inclined Surge Tunnel ➤ Main Access Tunnel Power House. ii. The record of the explosive magazine was not maintained. iii. Workers were working at height without collective and personal protective equipment at the colony site.
	PMC: i. Environmental Expert ii. Health and Safety Monitor iii. Environmental Officer	i. Assad Ali Khan ii. Syed Ali Fawad Shah iii. Najum us Saqib		
	EPC Contractor: i. Director QHSE ii. Environmental Manager iii. HSE Manager	i. Li Yong ii. Irshad Saeed iii. Fazal- Zuljalal iv. Ali Haider		

Visit Date	Auditor		Purpose of Audit	Summary of Findings
	Title	Name		
	iv. HSE Officer v. HSE Officer	v. Naeem Yousaf		iv. The exhaust pipes of the generators were short and ineffective in size to protect workers from the emissions of the exhaust engine of the generator.
February 20, 2025	EEM: EEM Auditor	Dr. Abdul Qayyum	HSE safeguard audit of the works.	During the visit, several key observations were noted. i. No NOCs were obtained from the Environmental Protection Agency (EPA) or other relevant authorities for the retaining wall construction near the river at the Main Access Tunnel and Inclined Surge Tunnel Powerhouse. ii. The sedimentation tank was not properly constructed, which is essential for treating wastewater before discharge into nearby water bodies. iii. It was emphasized that the local community must be notified in advance of any blasting activities to ensure their safety.
	PIU: Deputy Director, HSE and Gender	Ibtesam Zaima		
	PMC: i. Environmental Expert ii. Health and Safety Monitor iii. Environmental Officer	i. Asad Ali Khan ii. Syed Ali Fawad Shah iii. Najum us Saqib		
	EPC Contractor: i. Environmental Manager ii. HSE Officer	i. Irshad Saeed ii. Ali Haider		
May 26, 2025	PMC: i. Environmental Expert ii. Civil Engineer iii. Environmental Officer	i. Asad Ali Khan ii. Hamid Iqbal iii. Najum Us Saqib	Due diligence of the spoil disposal sites identified for the Powehouse site	The following are the main findings. i. Obtaining NOC from the Forest/watershed division, and the Irrigation departments. ii. Relocation of the drinking water supply pipe.

Visit Date	Auditor		Purpose of Audit	Summary of Findings
	Title	Name		
				iii. Signing of lease agreements with the locals. iv. Detailed joint visit for accurate estimation of the potentially affected trees. v. Need for slope protection measures. vi. Measures shall be taken for air and noise pollution control. vii. No impact on built-up property.

60. The observations noted by the EEM during his site audit on February 20, 2025, were mostly addressed; however, the EPC Contractor has not yet fully resolved the design and construction of the sedimentation tanks.

Glimpses of Site Audits



EEM Visit to the Downstream inclined surge tunnel and Batching plant Dam Site on February 20, 2025



ADB Safeguard Team Visit to the Powerhouse Batching Plant (February 05, 2025)

3.3. Issues Tracking Based on Non-conformance Notices

61. As reported in the previous SAEMR for the period from July to December 2024, out of 61 minor non-compliances, 3 remained open at the end of that reporting period. However, during the current reporting period, all of those issues were resolved. This included the delayed replacement of expired fire extinguishers, the maintenance of defaced safety sign boards, and helpers sitting with excavator operators during the activity. The PMC's Health and Safety Monitor is continuously monitoring progress and compliance on the PPE issue.

62. The minor non-compliances recorded during the current reporting period include the following.

- The electrical distribution board (DB) was found open and not properly fixed in place.
- Diesel drums were placed in the compressor area and other locations without secondary containment, such as dip trays.
- Electrical cable was connected to the socket without a plug.
- The homemade heater was used by the security staff.
- Scrap was scattered on the walkway at the batching plant.
- Some workers were freely working on the batching plant without PPE.
- The shotcrete worker and operator were using surgical masks instead of respirators/N95 masks.
- Mobil oil dropped on the surface of the tunnel and contaminated the soil.
- The parking area was not marked by the signboard.
- Rest area not provided to workers.

63. Major non-compliances recorded during the current reporting period include: (i) workers have been provided substandard PPEs (ii) the wind/exhaust pipe of the generator was observed short in size, and (iii). ventilation system was not installed in the upstream inclined surge tunnel; and (iv) the drainage system inside the tunnels was damaged and improperly maintained.

64. **Table 3.2** exhibits the status of major issues surfaced during the current reporting period.

Table 3.2: Tracking of Non-Compliances for the Current and Previous Reporting Periods

Issue	Reporting Period		Remarks
	July-December 2024	January-June 2025	
Number of open issues	3	4	
Number of closed issues	58	72	
Total number of non-compliances	61	76	
Total number of major non-compliances	3	4	Out of the three major non-compliances, the issue of: i. the EPC Contractor has started providing standard PPEs to the workers;

Issue	Reporting Period		Remarks
	July-December 2024	January-June 2025	
			ii. EPC contractor will increase the size of the exhaust pipe to the standard size to ensure compliance with HSE requirements; iii. the EPC Contractor has started working on the installation of the ventilation system at the upstream inclined surge tunnel; and iv. the EPC Contractor has been cleaned the drainage properly inside the tunnels with an excavator to ensure smooth water flow.
Percentage of issues closed	95%	95%	

65. **Table 3.2** shows that out of 76 non-compliances observed, 72 (95%) were resolved till the end of the reporting period, while rectification of the remaining non-compliances is in progress. The issues under observation for rectification or where improvement is needed include the implementation of an effective root cause analysis process to ensure that incidents and non-conformities are carefully investigated and preventive measures are properly established; improvements of emergency preparedness through regular drills, including fire evacuation and rescue scenarios; to build the response capacity of site personnel and improve coordination among emergency response teams.

3.4. Trends

66. As evident from **Table 3.2**, the number of non-compliances recorded during the current reporting period exceeds that of the previous reporting span. This increase is primarily attributed to the expansion of work fronts compared to the last reporting period. In response, the PMC's HSE team has conducted multiple training sessions to address the rise of non-conformances and assess the performance of all HSE officers, and routinely carries out Training Needs Analysis (TNA) to ensure targeted capacity building.

67. Additionally, to reverse the trend, PMC has scheduled several trainings in July and August 2025 with emphasis on the training of the newly inducted workforce of the EPC Contractor.

3.5. Unanticipated Environmental Impacts or Risks

68. No unanticipated environmental impacts or risks were observed during the reporting period.

4. STATUS OF COMPLIANCE WITH COVENANTS

69. **Table 4.1** exhibits the compliance status of the environmental safeguards-related covenants in the Project Agreement signed on May 21, 2021, between ADB and the KP government.

Table 4.1: Compliance Status with Environmental Covenants³

Covenant	Reference in Project Agreement	Compliance Status
Procurement. PEDO shall not award any Works contracts which involves environmental impacts until: (a) Khyber Pakhtunkhwa Environmental Protection Agency (KPEPA) has granted the final approval of the EIA; and (b) the Borrower has, or has ensured that PEDO has, incorporated the relevant provisions from the EMP and BAP into the Works contract.	Para. 3, page 8	Complied (a) KPEPA granted "Environmental Approval" to the project EIA report on July 6, 2021. (b) The EHS safeguards-related provisions have mainly been incorporated in (i) Volume-01 of 07 (Appendix-9), and (ii) Volume-03 of 07 (GCC and SCC) of the EPC Contract.
Environment. Khyber Pakhtunkhwa and PEDO shall 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 and Khyber Pakhtunkhwa relating to environment, health and safety; (b) the Environmental Safeguards; and (c) all measures and requirements set forth in the EIA, the EMP, the BAP, and any corrective or preventative actions set forth in a Safeguards Monitoring Report.	Para. 5, page 9	Compliance in progress (a) KPKEPA granted "Environmental Approval" to the project EIA report on July 6, 2021. Requisite NOCs, from the Forest, Fisheries, Wildlife, and Mining & Mineral departments of the government of KP, were obtained. (b) SSEMP, based on the EMP, site data, and the project requirement, was approved by the Employer on December 30, 2022. In the last week of December 2024, after the EPC Contractor had finalized the locations for camps, batching plants, access roads, sedimentation tanks, and magazines, and had obtained approval for two muck disposal sites, the EPC Contractor updated the SSEMP, which the PIU submitted to the ADB on March 23, 2025. The ADB review comments were subsequently incorporated, and the revised version was shared with the PIU on June 4, 2025, for review and further transmission to the ADB. Till the end of the reporting period, the updated SSEMP remained under the PIU review. (c) Consequent upon incorporation of the review comments, the ADB safeguard team cleared the updated EIA report of the Balakot HPP (300 MW) on May 06, 2025, which was subsequently disclosed on May 23, 2025.
Human and Financial Resources to Implement Safeguards Requirements Khyber Pakhtunkhwa and PEDO shall make available necessary budgetary and human resources to fully implement the EMP, the BAP and the RP.	Para. 9 page 10	Complied. The requisite human and financial resources are available with the PIU, PMC, and EPC Contractor. The EO supervises the environmental field activities on a daily basis and provides support to the EE.

³ Project Agreement for Loan 4057-Pak: Balakot Hydropower Development Project
<https://www.adb.org/sites/default/files/project-documents/49055/49055-007-pra-en.pdf>

Covenant	Reference in Project Agreement	Compliance Status
		For BAP implementation, a budgetary provision exists in Project PC-1, whereas for the EMP implementation, the EPC Contractor has allocated a lump sum amount in his bid. This allocation is also reflected in the EPC Contract, where it has been segregated across various milestones.
Safeguards – Related Provisions in Bidding Documents and Works Contracts. PEDO shall ensure that all bidding documents and contracts for Works contain provisions that require contractors to: (a) comply with the measures relevant to the contractor set forth in the EIA, the EMP, the BAP and the 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; (b) make available a budget for all such environmental and social measures; (c) provide the Borrower, Khyber Pakhtunkhwa and PEDO 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 EIA, the BAP, EMP and the RP; (d) adequately record the condition of roads, agricultural land and other infrastructure prior to starting to transport materials and construction; and (e) reinstate pathways, other local infrastructure, and agricultural land to at least their pre-project condition upon the completion of construction.	Para. 10, page 10	Compliance in progress The EHS safeguards-related provisions have mainly been incorporated in (i) Volume-01 of 07 (Appendix-9), and (ii) Volume-03 of 07 (GCC and SCC) of the EPC Contract. (a) Implementation of the SSEMP provisions is in progress at the site for the protection of the environment, health, and safety of the construction crew, community, etc. (b) Budgetary provision exists in the EPC Contract for implementation of HSE-related mitigation/preventive measures proposed in the SSEMP, EMP, BAP, or those identified in periodic safeguards monitoring reports. (c) So far, no unanticipated risk(s) have been identified, but provisions of the covenant, SSEMP, and conditions of the contract will strictly be followed if any unforeseen risk is identified. (d) Construction activities were mostly undertaken within the permanently acquired land. Under the EPC Contract provisions, any damage to the private/public property or utilities due to the EPC Contractor's works will be reinstated/compensated at the EPC Contractor's cost. Nevertheless, the covenant will be taken care of before initiating permanent works at the site. (e) The temporary land acquired by the EPC Contractor for his facilities will be reinstated under the conditions of the temporary lease contract(s), and in full compliance with the requirements of the EPC Contract. In this regard, copies of the lease agreements have been made part of the SSEMP.
Safeguards Monitoring and Reporting PEDO shall: (a) submit semi-annual Safeguards Monitoring Reports to ADB and disclose relevant information from such reports to affected persons promptly upon submission; (b) if any unanticipated environmental and/or social risks and impacts arise during construction, implementation or operation of the Project that were not considered in the EIA, the EMP, the BAP and the RP, promptly inform ADB of the occurrence of such risks or impacts, with detailed description of the event and proposed corrective action plan;	Para. 11, pages 10 and 11	Compliance in progress. (a) This is the eight SAEMR furnished in compliance with the mentioned loan covenant. The previous seven reports were disclosed on the ADB website. (b) Till the reporting period, no unanticipated environmental risks identified. (c) EEM has been onboard since September 2022 whose external environmental monitoring report for the previous reporting period remained under the ADB review till end of the reporting period. (d) External experts specified in the PAM are on board in compliance with the covenant provisions.

Covenant	Reference in Project Agreement	Compliance Status
(c) no later than the commencement of works by the Works contractor, engage qualified and experienced external experts under a selection process and terms of reference acceptable to ADB, to verify information produced through the Project monitoring process, and facilitate the carrying out of any verification activities by such external experts; (d) no later than the commencement of works by the Works contractor, engage external experts to monitor and report upon Project implementation, and facilitate the carrying out of any monitoring activities by such external experts; and (e) report any actual or potential breach of compliance with the measures and requirements set forth in the EMP, the BAP or the RP promptly after becoming aware of the breach.		(e) No breach of compliance has occurred so far.
Prohibited List of Investments Khyber Pakhtunkhwa and PEDO 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 Safeguard Policy Statement.	Para. 12, page 11	Complied. Loan proceeds are solely being used for developing the Balakot HPP (300 MW).
Grievance Redress Mechanism Khyber Pakhtunkhwa and PEDO shall ensure that a joint safeguards grievance redress mechanism acceptable to ADB is established and functional in accordance with the provisions of the EIA, the EMP, the BAP and the RP no later than the date of award of the Works contract to consider safeguards complaints. The safeguards grievance redress mechanism referred to in paragraph 13 above will function to: (a) review and document eligible complaints of project stakeholders; (b) proactively address grievances; (c) provide the complainants with notice of the chosen mechanism and/or action; and (d) prepare and make available to ADB upon request periodic reports to summarize (i) the number of complaints received and resolved, (ii) chosen actions, and (iii) final outcomes of the grievances.	Paras. 13 and 14, page 11	Complied PEDO has notified the Grievance Redress Mechanism (GRM) contained in the approved EIA for the Balakot HPP (300 MW), which is operational since September 2022. The EPC Contractor's internal GRM has also been notified and is operational since the commencement of works. The notified GRM is effectively performing the intended functions.
Labor Standards, Health and Safety Khyber Pakhtunkhwa and PEDO shall ensure that the core labor standards and the Borrower's applicable laws and regulations are complied with during Project implementation. Khyber Pakhtunkhwa and PEDO shall include specific provisions in the bidding documents and contracts financed by	Para. 15, page 11	Compliance in progress. Provisions from the law of the land dealing with labor have appropriately been made part of the EIA report and EPC Contract.

Covenant	Reference in Project Agreement	Compliance Status
ADB under the Project requiring that the contractors, among other things: (a) comply with the Borrower's applicable labor law 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, particularly women.		

5. RESULTS OF ENVIRONMENTAL MONITORING

5.1. Overview of Monitoring Conducted during the Current Period

70. The prime objectives of environmental monitoring are to:
- i monitor project impacts on physical, biological, and socio-economic indicators, and assess the adequacy of the EMP/SSEMP in identifying and mitigating the project's adverse impacts;
 - ii recommend mitigation measures for any unforeseen impact, or where the impact level exceeds those anticipated in EMP/SSEMP; and
 - iii ensure legal compliance, including the safety of the workforce and community.
71. During the project execution, two types of monitoring activities were undertaken.
- i **Compliance Monitoring:** To ensure that mitigation/preventive measures proposed in EMP/SSEMP are adhered to; and
 - ii **Effect Monitoring:** To monitor the effect of construction activities on various components of the environment such as air, water, noise, soil, etc.
72. Compliance with the specifications and implementation of the mitigation measures proposed in the EMP/SSEMP was regularly supervised by the PMC. Effect monitoring-which includes air pollution, noise level, water, and soil analysis-was carried out by the EPC Contractor through third-party services. It should be noted that the PMC not only supervises the field activities of the third-party laboratory but also regularly reviews its instrumental environmental monitoring reports.
73. The instrumental environmental monitoring carried out during the reporting period is detailed in the succeeding paragraphs.

5.2. Instrumental Environmental Monitoring

74. The quarterly instrumental environmental monitoring under the Balakot HPP (300 MW) was carried out by the KPEPA-certified laboratory, namely the Integrated Environment Laboratory (IEL) at the locations pinpointed in the SSEMP. The first quarter monitoring was conducted in March 2025, while the second quarter monitoring was undertaken in June 2025.
75. The IEL conducted quarterly instrumental environmental monitoring for air quality, noise level, water quality, and soil analysis at the locations pinpointed in the SSEMP, where baseline instrumental monitoring was done in December 2022, and at locations near sensitive receptors at the A3 Adit site. Also, samples of drinking water used by the EPC Contractor's workforce on-site, as well as from the Contractor's main camp in Paras village and powerhouse site camp, were also collected and analysed at the IEL laboratory. The analysis encompassed physical, chemical, and biological parameters.
76. The first quarter monitoring was conducted in March 2025, while the second quarter monitoring was undertaken in June 2025.
77. The instrumental environmental monitoring points and the monitoring plan are in **Figure 5.1** and **Table 5.1** respectively.

Figure 5.1: Instrumental Monitoring Points

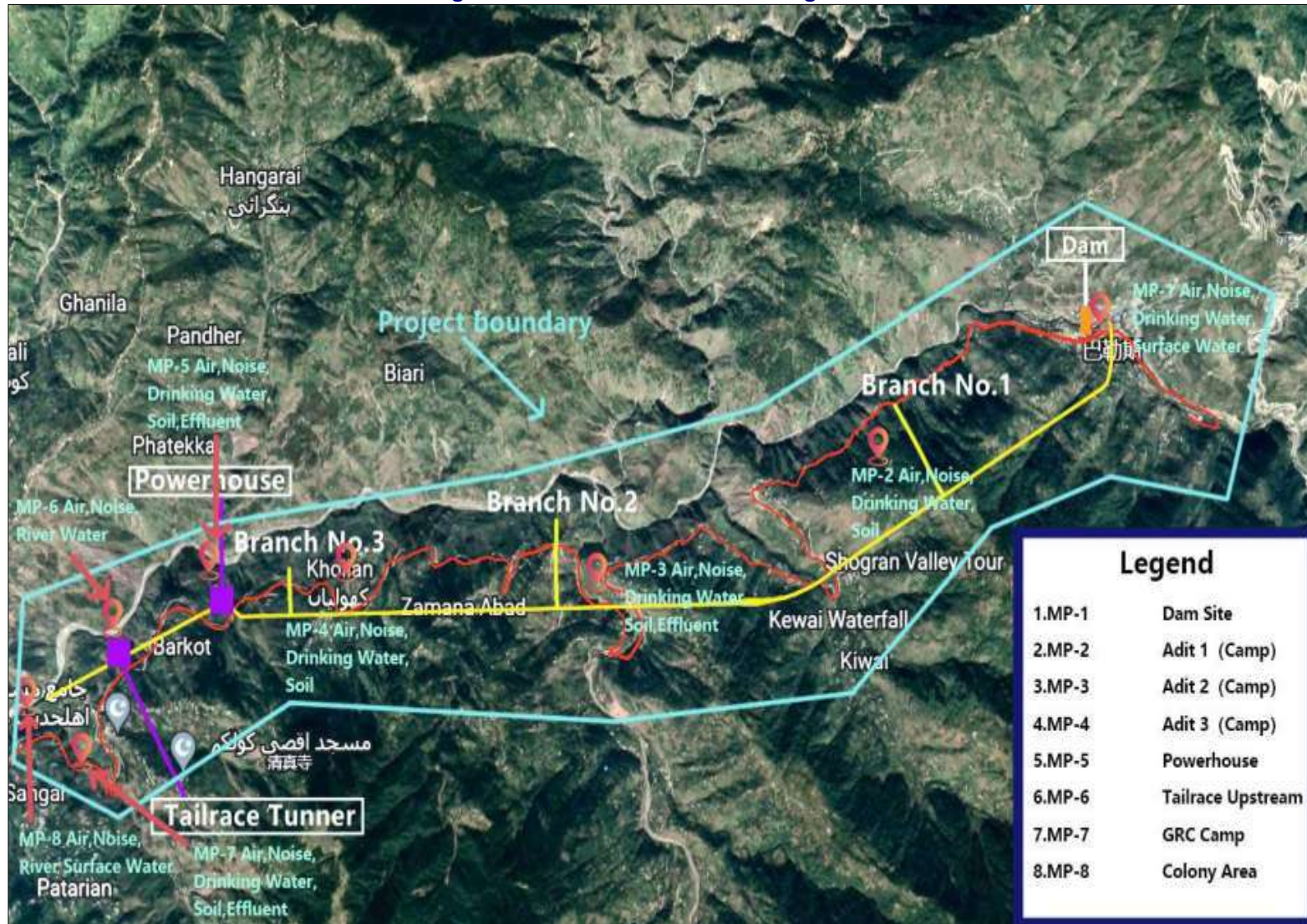


Table 5.1: Instrumental Environmental Monitoring Plan

Environmental Quality	Parameters	Standards/ Guidelines	Location	Monitoring Period/Frequency/ Sampling No/Year	Responsibility	
					Implementation	Monitoring
Pre-Construction Phase						
Air quality, noise level, water quality (drinking, and surface water of the Kunhar River), soil and effluent	The same as given for the construction phase	The same as given for the construction phase	Same as shown on the map	Once	EPC Contractor	PIU and PMC
Construction Phase						
Air quality	SO ₂ , NO _x , CO, O ₃ , SPM, PM ₁₀ , PM _{2.5} , humidity, wind direction, wind speed, temperature etc.	Air quality standards by NEQS, WHO	Same as shown on the map	Quarterly (24-hour Duration)	EPC Contractor	PIU and PMC
Dust	Dust control	Air quality standards by NEQS, WHO		Quarterly (24-hour duration)	EPC Contractor	PIU and PMC
Noise level	dB(A)	Noise pollution control NEQS, WHO		Quarterly (24-hour duration)	EPC Contractor	PIU and PMC
Water quality	Surface water, temperature, turbidity, pH, TDS, EC, TSS, DO, COD, BOD ₅	Water quality standards by NEQS, WHO		Quarterly	EPC Contractor	PIU and PMC
	Groundwater: color, odor, taste, temperature, turbidity, pH, TDS, EC, TSS, CaCO ₃ , Hardness, potassium, nitrate, nitrite (as NO ₂), phosphate, arsenic, COD, DO, TSS, total <i>coil form</i> , <i>fecal coliform</i> and <i>e. coli</i>	Water quality standard by NEQS, WHO		Quarterly	EPC Contractor	PIU and PMC
Soil pollution	Soil texture, pH, EC, available phosphorus and SAR.	NEQS, Government of Pakistan		Twice a year	EPC Contractor	PIU and PMC

78. Comparison of the two quarters instrumental environmental monitoring results with the baseline results, and NEQS, WHO, International Finance Corporation, and United States Environmental Protection Agency standard values (where applicable) are briefly given hereunder. The signed copies of the results are in **Annexure 2**.

5.3. Monitoring of Air, Noise, Water, and Soil analysis

5.3.1. Ambient Air Monitoring

a. Particulate Matter Monitoring

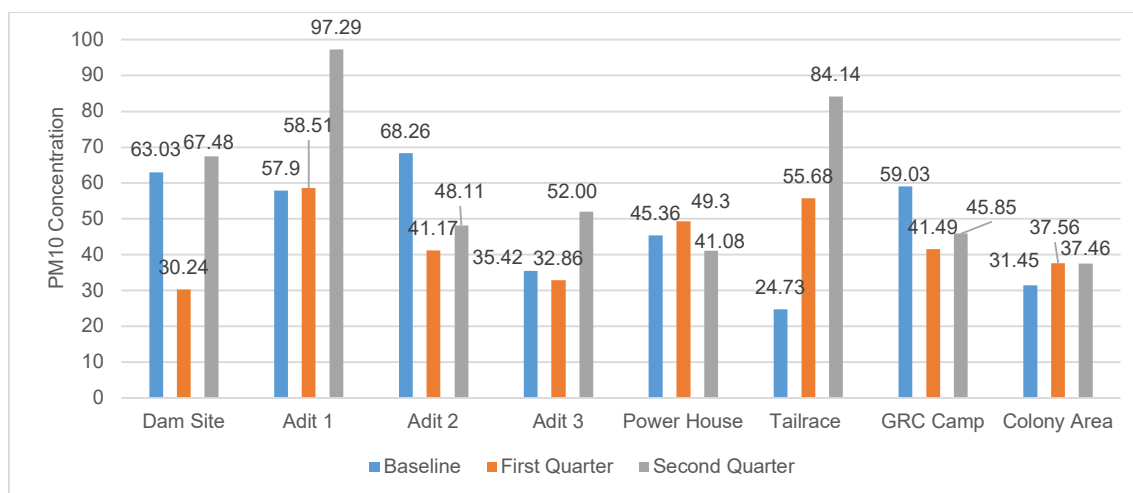
79. **Methodology and instruments used.** Ambient particulate matter (PM) monitoring was carried out to assess PM₁₀ and PM_{2.5} concentrations at the pre-identified locations within the Project reach. The Air Quality Monitoring System (AQMS-65) employed for PM₁₀ and PM_{2.5} is a fully integrated air monitoring station that delivers 'near reference levels' of performance parameters. With the size of a large suitcase, it can measure up to 20 different gases, particulate pollutants, and environmental parameters simultaneously. The AQMS-65 offers an optimal balance between performance and measuring criteria pollutants.

80. **Comparison of results.** Ambient PM₁₀ and PM_{2.5} were monitored for 24 hours at the pre-identified locations as in **Figure 5.1**. **Figure 5.2** exhibits the intended comparison.

81. The monitoring results of PM₁₀ concentrations across different sites for the first and second quarters indicate degradation in air quality over time, particularly when compared against the WHO standard. While no any sites exceeded the NEQS limit, several locations exceeded the WHO threshold during the second quarter. Significant increases were observed at Adit 1, Tailrace, and the Dam site, signifying a rise in construction activities during that period. Adit 1 recorded the highest, followed by Tailrace. In contrast, Adit 3 and the Colony area remained relatively within standard guiding values, although a slight increase in trend was still noted.

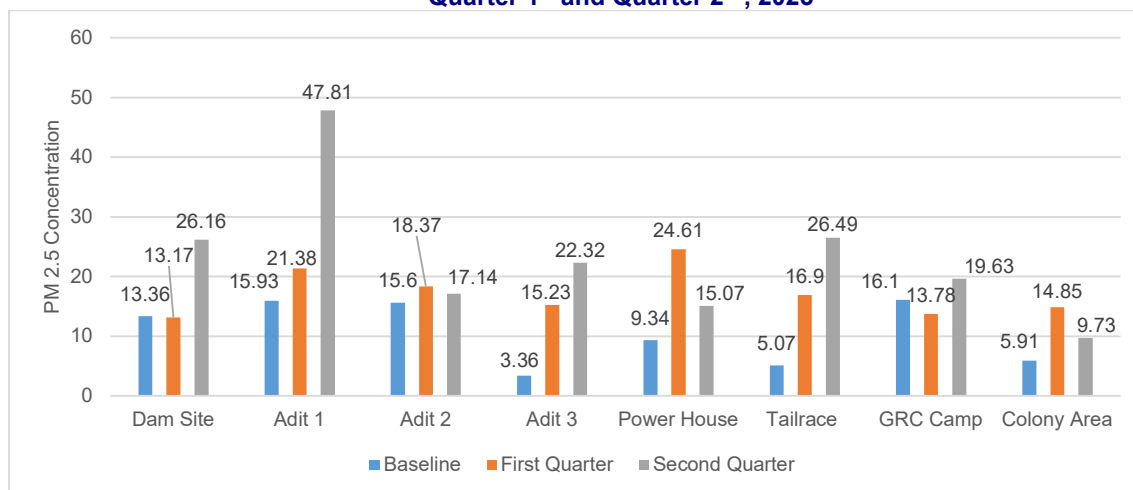
82. The prevailing weather conditions during the monitoring period had a significant impact on dust generation. For instance, the second-quarter monitoring results recorded in June generally exceeded the first-quarter results recorded in March.

Figure 5.2: Particulate Matter (PM₁₀) µg/m³ Concentrations in Quarter 1st and Quarter 2nd, 2025



NEQS: 150 µg/m³, WHO: 45 µg/m³

Figure 5.3: Particulate Matter (PM_{2.5}) µg/m³ Concentrations in Quarter 1st and Quarter 2nd, 2025



NEQS: 35 µg/m³, WHO: 15 µg/m³

83. The PM_{2.5} results show a significant rise during the second quarter, particularly at Adit 1, which exceeded both WHO and NEQS guiding values. Tailrace, GRC Camp, and Adit 3 also crossed the WHO guideline values but show compliance with NEQS. In contrast, the powerhouse site showed improvement, dropping to within safe limits. As evident from **Figure 5.3**, even baseline results recorded at some locations exceeded the WHO guideline values.

84. To mitigate excessive particulate matter concentration and reduce dust generation, the EPC Contractor was instructed to ensure regular sprinkling of water on unpaved access roads. During the HSE progress review, the EPC Contractor was specifically directed to carry out regular water sprinkling on unpaved roads, as well as at the spoil disposal area and the drilling sites located at both the right and left abutments of the dam site. It was clearly instructed that failure to perform regular sprinkling and maintain proper records may result in deductions in the IPC.

b. Gas Monitoring

85. **Methodology and instruments used.** The ambient gas monitoring was carried out by assessing carbon monoxide (CO), sulfur dioxide (SO₂), and nitrogen oxides (NO_x) at the pre-determined locations. AQMS-65 was also employed for monitoring.

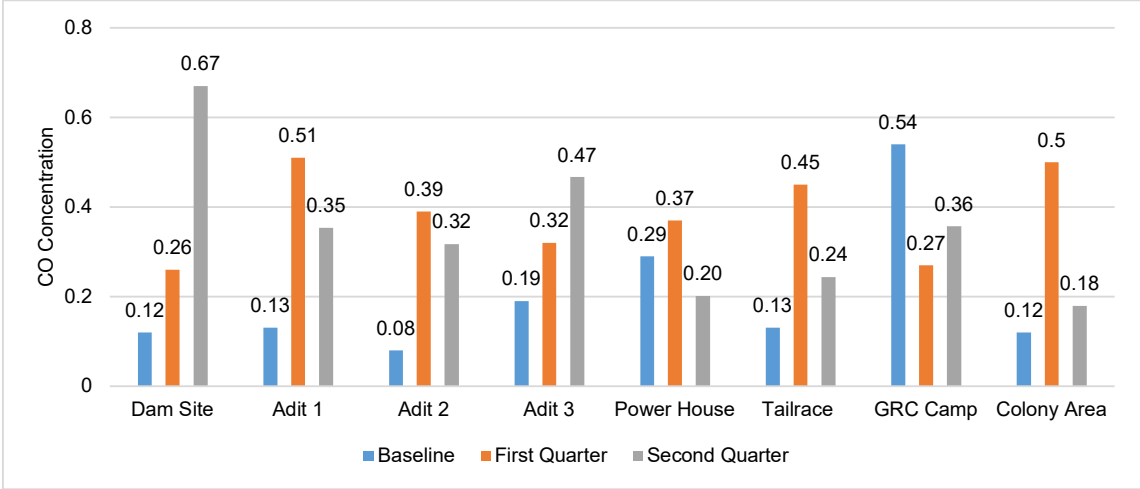
86. **Comparison of results.** The 24-hour ambient gas monitoring for the foregoing gases was carried out during the first and second quarters of 2025 at the pre-identified locations in the project area. A comparison of the results obtained is exhibited in **Figure 5.4** to **Figure 5.7**.

87. The results recorded during the first and second quarters show a consistent increase in CO, NO_x, NO₂, and SO₂ concentrations compared to the baseline levels. As evident from the **Table 2.12**, this increasing trend is primarily due to increased construction activities across the project sites, particularly at Dam site, Adit 1, Adit 3, and Tailrace, where increased use of construction machinery, diesel generators, and vehicular movement was observed.

88. A significant rise in NO_x and SO₂ was recorded at Adit 1, Dam site, Adit 3, and GRC Camp, where second-quarter values notably exceeded those of the first quarter. This increase is mainly credited to new operations, underground excavation, and continuous use of fuel-powered machinery at these sites. Emissions from diesel generators and confined construction activities contributed to the elevated concentrations observed during the monitoring period.

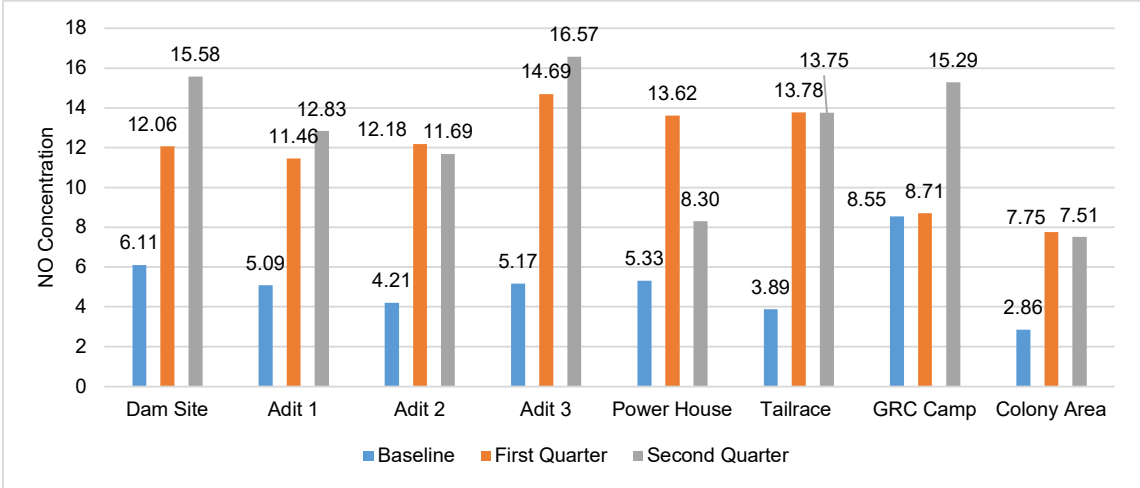
89. Although there is a visible rise in the concentration of the NO_x and SO₂ in the last half of the reporting period, the results indicate that the increase in emissions still falls well below the NEQS and WHO guideline values.

Figure 5.4: Carbon Monoxide (CO) (mg/m³) Concentrations in Quarter 1st and Quarter 2nd, 2025



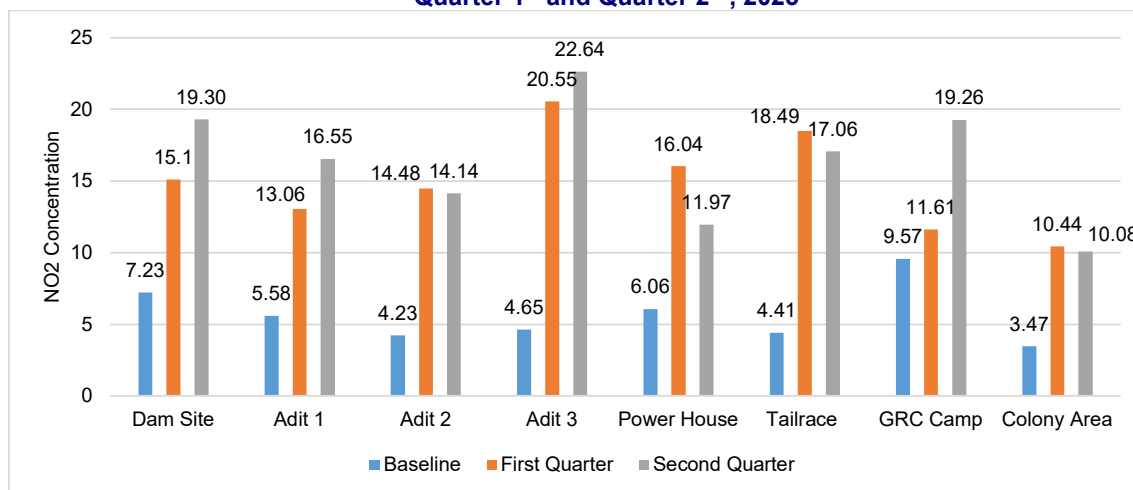
NEQS: 5 mg/m³, WHO: 4 mg/m³

Figure 5.5: Nitrogen Oxide (NO) (mg/m³) Concentrations in Quarter 1st and Quarter 2nd, 2025



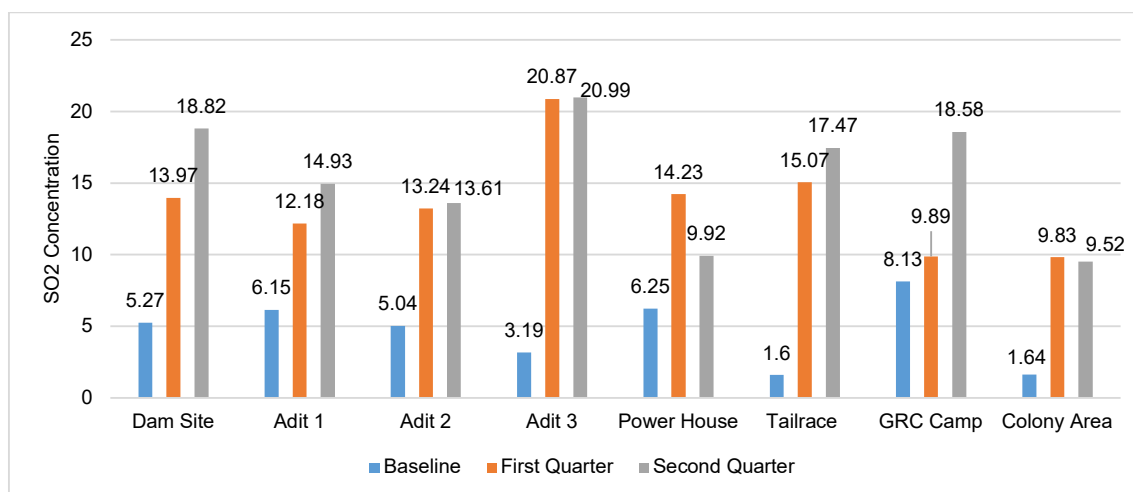
NEQS: 40 mg/m³, WHO: 40 mg/m³

Figure 5.6: Nitrogen Dioxide (NO₂) (µg/m³) Concentrations in Quarter 1st and Quarter 2nd, 2025



NEQS: 80 µg/m³, WHO: 25 µg/m³

Figure 5.7: Sulfur Dioxide (SO₂) (µg/m³) Concentrations in Quarter 1st and Quarter 2nd, 2025



NEQS: 120 µg/m³, WHO: 40 µg/m³

5.3.2. Noise Monitoring

90. **Methodology.** The 24-hour noise level monitoring was carried out at the pre-identified locations as shown in **Figure 5.1**. It is worthwhile to mention here that the A3 noise monitoring was undertaken at the nearest sensitive receptor (house).

91. A digital sound level meter with the following specifications was employed during the noise monitoring (i) HME® 9011 Sound Levels Meter, and (ii) IEC651 Type 2 & ANISI.4TYPE2 (Japan). The features of the equipment are:

- Accuracy: ± 1.5 dB (under reference condition)
- Frequency range: 31.5 Hz to 8.5K Hz
- Linearity range: 50 dB
- Measuring level: 30 – 130 dB(A), 35 – 130 dB(C)
- Digital display: 4 digits
- Resolution: 0.1 dB
- Display: 0.5 secretary
- Bar graph: 50 dB scale at 1 dB step for monitoring current sound pressure level, display period: 50 mS

92. **Comparison of results.** Table 5.2 and Figure 5.8 show noise level monitoring results obtained during the instrumental environmental monitoring carried out in the first and second quarters of the reporting period. Figure 5.8 exhibits a comparison of the two-quarter results with the baseline monitoring results.

93. The 24-hour noise results for the first and second quarters indicate that the recorded noise levels at most of the active construction sites, particularly the Dam site, Adit-3, and the powerhouse, approached or slightly exceeded the NEQS guideline value of 55 dB for residential areas. This increase is primarily due to the operation of heavy construction machinery and equipment actively engaged in excavation and civil works.

94. The hourly data generally reflect higher noise levels during daytime working hours, while off-hours typically show a drop below 65 dB, remaining within the NEQS range. However, due to ongoing night shift activities at tunnel sites such as Adit-1 and Adit-3, some elevated noise levels were recorded even during off-peak hours, occasionally exceeding the residential NEQS limit of 55 dB.

95. At the GRC Camp, noise levels remained relatively stable across both quarters, with values close to the NEQS threshold but showing no sharp increase. This is likely due to the absence of high-frequency traffic on N-15 during the monitoring period.

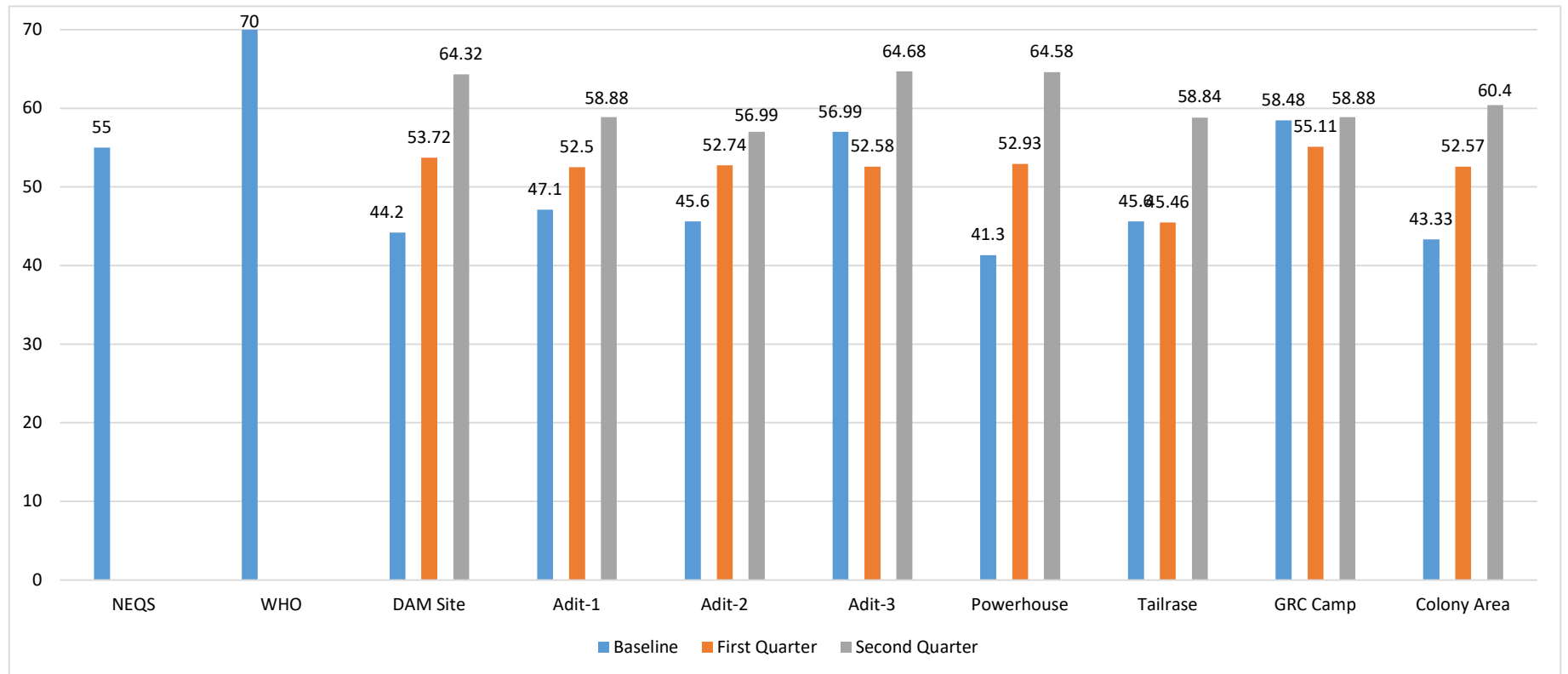
96. Noise monitoring at the Colony Area and near sensitive receptors close to Adit-3 generally complied with NEQS guidelines. Minor exceedances were observed at times, mostly due to the movement of construction vehicles along access roads passing near or in front of these receptors, especially during material transport and excavation works.

Table 5.2: Ambient Noise Monitoring Results in Quarter 1st and Quarter 2nd, 2025

S/No	Monitoring Time	Unit	Sampling Points																							
			Dam Site			Adit -1			Adit-2			Adit-3			Powerhouse			Tailrace Upstream			GRC Camp			Colony Area		
			Results (Leq)																							
			Baseline	First Quarter	Second Quarter	Baseline	First Quarter	Second Quarter	Baseline	First Quarter	Second Quarter	Baseline	First Quarter	Second Quarter	Baseline	First Quarter	Second Quarter	Baseline	First Quarter	Second Quarter	Baseline	First Quarter	Second Quarter	Baseline	First Quarter	Second Quarter
1.	9:00 AM	dB(A)	46.70	60.25	65.7	49.60	60.0	65.55	48.10	63.1	68.7	48.00	63.7	71.85	43.80	62.5	67.1	48.10	51.4	64.6	61.00	63.4	65.55	42.50	58.1	60.9
2.	10.00AM		46.50	60.10	67.6	49.40	58.6	65.35	47.90	62.2	70.6	47.80	63.0	71.6	43.60	61.9	66.85	47.90	50.6	65.65	60.80	63.2	65.35	43.60	57.0	62.8
3.	11.00 AM		46.30	59.55	67.95	49.20	59.6	65.15	47.70	61.5	70.95	47.60	62.4	71.35	43.40	61.7	66.6	47.70	50.2	62.95	60.50	61.1	65.15	40.90	57.0	63.15
4.	12.00AM		46.10	59.35	64.1	49.00	58.4	64.95	47.50	60.8	67.1	47.40	61.7	71.15	43.20	61.4	66.4	47.50	49.8	63.75	60.30	62.1	64.95	41.70	56.1	59.3
5.	1:00 PM		45.80	58.15	69.45	48.70	59.7	64.7	47.20	60.1	72.45	47.10	60.7	70.95	42.90	60.0	66.2	47.20	49.6	67.4	60.10	61.5	64.7	45.30	55.6	64.65
6.	2:00 PM		45.60	57.55	69.7	48.50	54.2	64.45	47.00	59.6	72.7	46.90	59.6	70.75	42.70	58.3	66	47.00	48.7	66.3	59.90	62.2	64.45	44.20	55.3	64.9
7.	3:00 PM		45.40	56.85	69.45	48.30	54.5	64.25	46.80	59.2	72.45	46.70	58.9	70.55	42.50	57.4	65.8	46.80	47.6	62.95	59.70	62.3	64.25	40.90	55.3	64.65
8.	4:00 PM		45.20	56.55	66.7	48.10	54.4	64.05	46.60	58.6	69.7	46.50	58.8	70.3	42.30	56.8	65.55	46.60	46.9	65.25	59.50	59.4	64.05	43.20	53.5	61.9
9.	5:00 PM		45.00	55.90	58.1	47.90	53.1	57.55	46.40	56.8	66.15	46.30	56.2	69.05	42.10	55.9	65.3	46.40	46.7	68.45	59.20	61.0	57.55	46.40	56.7	58.6
10.	6:00 PM		44.80	55.25	62.35	47.70	54.4	57.35	46.20	54.4	48.45	46.10	55.1	68.85	41.90	55.3	65.1	46.20	46.5	55.4	59.00	60.4	57.35	45.40	53.8	62.85
11.	7:00 PM		44.50	53.95	60.8	47.40	55.0	57.1	45.90	53.2	46.9	45.80	53.7	68.65	41.60	54.5	64.9	45.90	45.7	58.65	58.80	59.3	57.1	48.70	59.3	61.3
12.	8:00 PM		44.30	53.65	61.2	47.20	52.4	56.85	45.70	53.1	47.3	45.60	51.0	68.45	41.40	53.4	64.7	45.70	45.1	52.4	58.60	60.0	56.85	42.40	59.9	55.7
13.	9:00 PM		44.10	53.35	63.45	47.00	50.1	56.65	45.50	52.7	49.55	45.40	50.3	68.25	41.20	52.3	64.5	45.50	44.7	50.2	58.40	59.0	56.65	40.20	56.0	57.95
14.	10.00 PM		43.90	53.00	64.15	46.80	51.4	56.45	45.30	51.9	50.25	45.20	49.6	68	41.00	51.5	64.25	45.30	44.4	54.65	58.20	58.9	56.45	44.70	61.5	58.65
15.	11.00 PM		43.70	52.15	63.8	46.60	50.3	56.25	45.10	50.9	49.9	45.00	48.0	57.95	40.80	50.6	64	45.10	44.2	52.05	57.90	51.1	56.25	42.10	48.9	58.3
16.	12.00 PM		43.40	51.15	66.25	46.30	51.9	56.05	44.80	49.7	52.35	44.70	47.7	57.65	40.50	50.1	63.8	44.80	43.6	54	57.70	49.8	56.05	44.00	48.1	60.75
17.	1:00 AM		43.20	50.55	60.55	46.10	50.0	55.85	44.60	47.7	46.65	44.50	47.4	57.45	40.30	48.3	63.6	44.60	43.3	56.15	57.50	48.9	55.85	46.20	47.8	55.05
18.	2:00 AM		43.00	50.20	63.3	45.90	49.1	55.65	44.40	47.0	49.4	44.30	47.2	57.25	40.10	48.0	63.4	44.40	43.2	51.65	57.30	46.7	55.65	41.70	47.2	57.8
19.	3:00 AM		42.80	49.60	64.65	45.70	47.4	55.45	44.20	45.1	50.75	44.10	46.7	57.05	39.90	47.0	63.2	44.20	42.4	54.1	57.10	44.5	55.45	44.10	46.8	59.15
20.	4:00 AM		42.60	49.25	62.5	45.40	48.6	55.2	44.00	44.7	48.6	43.80	45.3	56.8	39.70	46.8	62.95	44.00	41.8	52.85	56.90	48.8	55.2	42.90	46.9	57
21.	5:00 AM		42.30	49.15	61.6	45.20	46.0	54.95	43.70	44.0	47.7	43.60	44.9	56.55	39.40	45.9	62.7	43.70	41.6	50.95	56.60	44.5	54.95	41.00	46.0	56.1
22.	6:00 AM		42.10	48.45	63.35	45.00	47.0	54.75	43.50	43.6	49.45	43.40	43.7	56.35	39.20	44.7	62.5	43.50	41.5	50.8	56.40	44.6	54.75	40.40	44.8	57.85
23.	7:00 AM		41.90	48.05	62.45	44.80	48.6	55.4	43.30	43.3	49.15	43.20	43.5	56.15	39.00	43.5	62.3	43.30	41.1	63.45	56.20	45.4	55.4	44.30	45.1	62.5
24.	8:00 AM		41.70	47.40	64.55	44.60	45.4	53.25	43.10	42.5	50.65	43.00	42.9	59.35	38.80	42.6	62.1	43.10	40.4	67.6	56.00	44.5	53.25	43.30	45.0	59.05
Average for 24 hrs			44.20	53.72	64.32	47.10	52.5	58.88	45.60	52.74	56.99	56.99	52.58	64.68	41.30	52.93	64.58	45.60	45.46	58.84	58.48	55.11	58.88	43.33	52.57	60.04

Leq: Log Equivalent Continuous Sound Level

Figure 5.8: 24-hour (average) Ambient Noise Monitoring Results (dB) in Quarter 1st and Quarter 2nd, 2025



5.3.3. Water Monitoring

a. Drinking Water

97. **Methodology.** During the reporting period, the drinking water quality tests were conducted at the sample points identified in the map in **Figure 5.1**, and those collected from the sources used by the labors at site.

98. American Public Health Association (APHA) standard methods were followed for the sampling and preservation of water, and analysis. The standard methods of the American Water Works Association were also used for analysis.

99. **Comparison of drinking water results.** The two quarters of drinking water monitoring results of the sample points, and their comparison with the baseline results are in **Table 5.3**.

100. As evident from the results of the drinking water analysis in the project area, almost all of the monitored parameters fall within the guiding values of WHO and the National Standards for Drinking Water Quality (NSDWQ). The minor variation in monitored parameters appears to be due to temperature/seasonal variation as drinking water was mostly extracted from natural streams in the project area.

101. As evident from **Table 5.3**, though there is variation in the results obtained during the first and second quarters, however, all the recorded results fall within the WHO and NSDWQ guideline values.

b. Surface Water Results of the Kunhar River

102. For the Kunhar River water monitoring, samples were collected from three locations i.e. dam site (upstream of the temporary diversion dam, just downstream of the Suki Kinari HPP tailrace), tailrace upstream (Barkot), and downstream side of the Project residential colony area. The purpose of Kunhar River water monitoring is to know the river water quality at these locations, and to make a comparison between the baseline results recorded in December 2022 and the quarterly results, enabling us to evaluate the impact of the construction activities on the river water quality.

103. Due to the non-availability of the surface water parameters under NEQS, the Kunhar River water was compared against the NEQS effluent parameters.

104. The results obtained from the instrumental environmental monitoring carried out in the third and fourth quarters of the reporting period are presented in **Table 5.4**.

Table 5.3: Drinking Water Monitoring Results in Quarter 1st and Quarter 2nd, 2025

S/No	Parameters	Standard Method	Units	WHO	NSDWQ	Sampling Points																	
						Dam Site			Adit-1			Adit-2			Adit-3			Powerhouse			GRC Camp		
						Results																	
						Baseline	First Quarter	Second Quarter	Baseline	First Quarter	Second Quarter	Baseline	First Quarter	Second Quarter	Baseline	First Quarter	Second Quarter	Baseline	First Quarter	Second Quarter	Baseline	First Quarter	Second Quarter
1.	pH	APHA-4500H+ B	--	6.5-8.5	6.5-8.5	7.4	7.8	7.6	7.7	7.7	7.9	7.3	7.3	7.6	7.7	7.4	7.8	7.5	7.6	7.3	7.7	7.4	7.5
2.	Temperature	---	°C	---	----	7	12	13	6	10	15	8	9	13	8	9	11	7	10	9	7	11	10
3.	Taste & Odor	In-house	--	Non-Objecti onable	Non-Objectio nable	Non-Objecti onable	Non Objecti onable	Non Objectio nable	Non Objecti onable	Non Objecti onable	Non Objectio nable	Non Objecti onable	Non Objecti onable	Non Objecti onable	Non Object ionabl e	Non Objecti onable	Non Objecti onable	Non Objecti onable	Non Objecti onable	Non Objecti onable	Non Object ionabl e	Non Objecti onable	Non Objecti onable
4.	Color	APHA-2120 B/C	TCU	≤ 15	<15	4	5	4	6	5	6	5	6	5.9	6	4	6.3	10	4	4	6	5	6
5.	Turbidity	APHA-2130 B	NTU	<5	<5	3	4.4	3.8	4	2.6	4.4	4	3.1	4.1	4	2.3	4.8	4	2.6	2	3	2.2	3.4
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/l	< 1000	<1000	359	254	313	381	245	364	363	279	352	377	278	389	402	268	243	384	270	384
7.	Total Hardness as CaCO ₃	APHA-2340 C	mg/l	-----	<500	294	156	199	217	165	209	261	139	269	258	144	277	316	133	167	347	124	361
8.	Nitrate (NO ₃)	APHA-4500NO3 B	mg/l	50	≤50	2.2	3.33	1.04	1.9	3.80	1.72	1.03	1.85	5.68	1.06	7.70	4.13	1.2	1.64	1.39	1.46	1.41	1.57
9.	Nitrite (NO ₂)	APHA-4500NO2 B	mg/l	3	≤3	0.04	0.44	0.003	0.06	0.38	0.19	0.07	0.29	0.37	0.08	1.69	0.73	0.37	0.42	0.42	0.58	0.44	0.66
10.	Arsenic (As)	APHA-3500As B	mg/l	0.01	≤0.05	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.
11.	Nickel (Ni)	ASTM E3047-16	mg/l	0.02	≤0.02	0.001	0.002	N.D.	0.003	0.004	0.007	0.005	0.004	N.D.	0.008	0.050	N.D.	0.009	0.006	N.D.	0.006	0.004	0.009
12.	Antimony (Sb)	APHA-3500Sb B	mg/l	0.005	<0.005	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.
13.	Chloride (Cl)	APHA-4500Cl- B	mg/l	250	<250	128	141	83.9	131	125	105	138	138	139	129	141	116	105	141	131	117	143	159
14.	Chlorine	APHA-4500 CL	mg/l		0.5-1.5	0.2	0.38	0.47	0.09	0.48	0.42	0.1	0.41	0.3	0.03	0.29	0.37	0.1	0.43	0.42	0.05	0.49	0.47
15.	Lead (Pb)	APHA-3500 Pb-B	mg/l	0.01	≤0.05	0.006	N.D	N.D	0.001	N.D	N.D.	0.004	N.D	N.D.	0.005	N.D	N.D.	0.003	N.D	0.006	N.D	N.D	N.D.
16.	Fluoride	APHA-4500F- C	mg/l	1.5	≤1.5	0.73	0.36	0.47	0.58	0.55	0.65	0.86	0.59	0.59	0.75	0.84	0.59	0.91	0.46	0.24	0.64	0.49	0.53
17.	Aluminium	APHA-3500 Al	mg/l	≤ 0.2	≤0.2	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.
18.	Manganes e (Mn)	APHA-3500 MN-B	mg/l	0.5	≤0.5	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.

S/No	Parameters	Standard Method	Units	WHO	NSDWQ	Sampling Points																	
						Dam Site			Adit-1			Adit-2			Adit-3			Powerhouse			GRC Camp		
						Results																	
						Baseline	First Quarter	Second Quarter	Baseline	First Quarter	Second Quarter	Baseline	First Quarter	Second Quarter	Baseline	First Quarter	Second Quarter	Baseline	First Quarter	Second Quarter	Baseline	First Quarter	Second Quarter
19.	Cadmium (Cd)	APHA-3500 Cd-B	mg/l	0.003	0.01	N.D	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D.	N.D	N.D.	N.D	N.D.
20.	Barium (Ba)	APHA-3500 Ba B	mg/l	0.3	0.7	0.16	0.17	0.27	0.08	0.38	0.18	0.12	0.27	0.06	0.16	0.56	0.26	0.11	0.13	0.06	0.2	0.17	0.22
21.	Mercury (Hg)	APHA-3500 Hg-B	mg/l	0.001	≤0.001	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.
22.	Copper (Cu)	APHA-3500 Cu-B	mg/l	2	2	0.03	0.34	0.19	0.07	0.13	0.066	0.04	0.27	0.093	N.D.	0.22	N.D.	0.06	0.06	N.D.	0.05	0.04	0.06
23.	Zinc (Zn)	APHA-3500 Zn B	mg/l	3	5	1.01	1.76	1.25	1.06	2.21	0.93	1.1	1.58	1	1.3	1.47	0.94	1.08	1.13	1.13	1.06	1.16	1.2
24.	Boron (B)	APHA 4500 B- C	mg/l	0.3	0.3	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.
25.	Chromium (Cr)	APHA 3500 cr B	mg/l	0.05	≤0.05	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.
26.	Selenium (Se)	APHA-3500 Se C	mg/l	0.01	0.01	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.
27.	Cyanide (CN)	APHA 4500-CN	mg/l	0.07	≤0.05	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.	N.D.	N.D	N.D.
28.	E-Coli	APHA:922 2 D	Numb er/100 mL	Must not be detect able in any 100 ml sampl e	0 Number /100 ml	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29.	Total Coliform	APHA:922 2 B	Numb er/100 ml	Must not be detect able in any 100 ml sampl e	0 Number /100 ml	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

ND = not detected, NSDWQ = National Standards for Drinking Water Quality, WHO = World Health Organization

Table 5.4: Surface Water Results of the Kunhar River in Quarter 1 and Quarter 2, 2025

S/No	Parameters	Standard Method	Units	NEQS	Sampling Points								
					Dam Site			Tailrace			Colony Area		
					Results								
					Baseline	First Quarter	Second Quarter	Baseline	First Quarter	Second Quarter	Baseline	First Quarter	Second Quarter
1.	Temperature	-----	°C	40	5	8	8	6	8	8	4	9.5	8
2.	pH	APHA-4500H+ B	--	6.5-8.5	8.3	7.9	7.9	7.9	7.8	8	8.1	7.9	8.1
3.	Chemical Oxygen Demand (COD)	APHA-5220-D	mg/l	150	113	48	59	108	51	61.7	86	55	63.9
4.	Biological Oxygen Demand (BOD5) at 20 °C	APHA, 5210	mg/l	80	62.8	34.2	42.1	54.7	36.4	44.02	42	37.5	45.6
5.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/l	3500	2637	959	1094	2492	1038	1341	1864	924	1359
6.	Total Suspended Solids (TSS)	APHA-2540 D	mg/l	200	129	106	104	108	117	116	117	112	119
7.	Total Hardness	APHA-2340 C	mg/l	--	164	97.3	99	157	142	134	161	162	137
8.	Oil & Grease	Separation Method	mg/l	10	2.8	1.2	1.9	2	1.29	1.34	1.3	1.26	1.39
9.	Chromium (Hexa & Trivalent)	APHA-3500Cr B	mg/l	1	0.61	0.38	0.28	0.55	0.56	0.37	0.41	0.43	0.4
10.	Total Iron	APHA-3500-Fe-B	mg/l	8	3.8	3.11	3.1	3.2	3.21	3.37	2.6	2.61	3.4
11.	Chloride	APHA-4500Cl- B	mg/l	1000	256	161	143	234	184	154	209	188	158
12.	Fluoride	APHA-4500F- C	mg/l	10	2.4	1.85	3.02	1.8	1.76	3.17	1.1	2.06	3.2
13.	Ammonia	ASTM-D1426-15	mg/l	40	4.9	3.24	3.5	3.7	3.53	3.92	2.9	3.27	4.01
14.	Cadmium	APHA-3500 Cd-B	mg/l	0.1	0.01	N.D	N.D	0.008	N.D	N.D	0.006	N.D	N.D
15.	Lead	APHA-3500-Pb B	mg/l	0.5	0.08	N.D	N.D	0.03	N.D	N.D	0.01	N.D	N.D
16.	Arsenic	APHA-3500As B	mg/l	1	N D	N.D	N.D	N D	N.D	N.D	N D	N.D	N.D
17.	Copper	APHA-3500Cu B	mg/l	1	0.27	N.D	0.24	N D	N.D	N.D	N D	N.D	N.D

S/No	Parameters	Standard Method	Units	NEQS	Sampling Points								
					Dam Site			Tailrace			Colony Area		
					Results								
					Baseline	First Quarter	Second Quarter	Baseline	First Quarter	Second Quarter	Baseline	First Quarter	Second Quarter
18.	Barium	APHA-3500Ba B	mg/l	1.5	0.07	0.06	0.06	0.04	0.002	0.12	0.03	0.006	0.14
19.	Selenium	APHA-3500 Se C	mg/l	0.5	N.D	N.D	N.D	N.D	N.D	N.D	N D	N.D	N.D
20.	Silver	APHA-3500Ag-B	mg/l	1	N.D	N.D	N.D	N.D	N.D	N.D	N D	N.D	N.D
21.	Manganese	APHA-3500-Mn B	mg/l	1.5	0.33	0.31	0.29	0.28	0.34	0.35	0.26	0.29	0.39
22.	Zinc	APHA-3500-Zn B	mg/l	5	0.58	0.54	0.46	0.37	0.57	0.57	0.31	0.50	0.6
23.	Nickel	ASTM E3047-16	mg/l	1	0.15	0.02	0.09	0.11	0.006	0.1	0.08	0.003	0.1
24.	Boron	APHA-4500B-C	mg/l	6	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
25.	Mercury	APHA-3500 Hg-B	mg/l	0.01	N.D	N.D	N.D	N.D	N.D	N.D	N D	N.D	N.D
26.	Sulfide (S ⁻²)	APHA-4500 S ₂	mg/l	1	0.35	0.28	0.33	0.31	0.41	0.46	0.29	0.42	0.49
27.	Sulphate (SO ₄)	APHA-4500-SO ₄ C	mg/l	600	429	324	291	354	325	322	349	383	329
28.	An Ionic Detergent (as MBAS)	----	mg/l	20	1.1	1.08	0.63	0.9	1.01	0.71	0.4	1.02	0.78
29.	Phenolic Compound (as Phenol)	APHA-5530-D	mg/l	0.1	0.06	0.05	0.005	0.02	0.01	0.02	0.01	0.01	0.02
30.	Cyanide (as CN) total	APHA 4500-CN	mg/l	1	N.D	N.D	N.D	N.D	N.D	N.D	N D	N.D	N.D
31.	E-Coli	APHA:9222 D	Number/100 ml	---	Uncountable	Uncountable	Uncountable	Uncountable	Uncountable	Uncountable	Uncountable	Uncountable	Uncountable
32.	Total Coliform	APHA:9222 B	Number/100 ml	---	Uncountable	Uncountable	Uncountable	Uncountable	Uncountable	Uncountable	Uncountable	Uncountable	Uncountable

ND = not detected, NEQS = National Environmental Quality Standards

5.3.4. Soil Analysis

105. During quarterly instrumental environmental monitoring, the soil analysis of camps and workshop areas was also carried out to record conditions of the soil at these sites, and track changes resulting from construction activities. These would oblige the EPC Contractor to restore the soil of the facilities to its original condition upon completion of the Project or handing over the site back to the owner(s).

106. A comparison of the soil analysis results obtained during the reporting period is in **Table 5.5**. The results obtained generally show consistency with slight variations in various parameters.

Table 5.5: Soil Analysis Results in Quarter 1 and Quarter 2, 2025

S/No	Parameters		Sampling Points and Results														
			Adit-1			Adit-2			Adit-3			GRC Camp			Powerhouse		
			Baseline	First Quarter	Second Quarter	Baseline	First Quarter	Second Quarter	Baseline	First Quarter	Second Quarter	Baseline	First Quarter	Second Quarter	Baseline	First Quarter	Second Quarter
1	Soil Texture	Sand %	14	27	26	8	25	21	17	35	34	16	23	21	12	26	29
		Silt%	57	47	51	58	46	46	49	49	46	43	39	53	61	42	42
		Clay %	29	26	23	34	29	33	34	16	20	41	38	26	37	32	29
		Texture Class	Silty Clay Loam	Silty Clay Loam	Silty Clay Loam	Silty Clay Loam	Silty Clay Loam	Silty Clay Loam	Silty Clay Loam	Silty Clay Loam	Silty Clay Loam	Silty Clay Loam	Silty Clay Loam	Silty Clay Loam	Silty Clay Loam	Silty Clay Loam	Silty Clay Loam
2	pH		8.1	7.9	8.1	8.4	7.8	7.8	8.1	8.4	8.4	8.0	8.5	7.9	8.1	8.12	8
3	Electrical Conductivity EC (μSm^{-1})		238	225	236	251	245	259	238	254	273	231	222	245	229	245	262
4	Phosphorus (mgkg^{-1})		2.01	2.76	3.81	1.64	2.84	2.42	2.01	1.41	2.34	3.2	2.51	1.98	2.9	3.52	3.06
5	Sodium Absorption Ratio		4.07	3.29	3.64	3.53	3.18	3.97	4.07	3.91	3.07	3.54	4.1	3.96	3.37	3.46	3.48

μSm^{-1} : Micro siemens/meter

mgkg^{-1} : milligram per Kilogram

5.3.5. Trends

107. Due to the propagation of construction activities and the deployment of heavy construction machinery at the site, an increase in particulate matter concentration and gaseous emissions were recorded at most of the monitored points, particularly during the second quarter of 2025. It is expected that after the development of access roads to construction sites and the application of regular water sprinkling on these roads, the intensity of particulate matter will be significantly decreased.

108. Similarly, with the continued application of third-party inspections of the EPC Contractor's equipment and construction machinery, emission levels from these sources are expected to be significantly reduced.

Glimpses of the Instrumental Environmental Monitoring at the Site



Ambient air and Noise Monitoring at the Dam Site and A2 Camp



Kunhar River Water Sampling at the Dam and Tailrace Sites



Drinking Water Sampling at Source and Consumer End Points

5.3.6. Summary of Monitoring Outcomes

109. The instrumental environmental monitoring results show that the ongoing construction activities and deployment of heavy machinery collectively affected the baseline air quality at the monitoring points of the project area. However, such impacts are short-term term associated with the construction period, as evident from the comparison between the hourly noise levels and particulate matter concentration results obtained during working and off-working hours.

110. To suppress fugitive dust at the site, the EPC Contractor was strictly instructed to increase water sprinkling intensity, particularly at access roads leading to construction sites, and ensure tuning of the construction equipment to reduce GHG emissions. Additionally, the payment related to water sprinkling at the sites has been made conditional with the provision of a documentary record of sprinkling duly signed by the EPC Contractor and the PMC staff.

5.4. Waste Management

111. In accordance with the EPC Contractor's contract signed with the Kaghan Development Authority (KDA), the latter collected waste from camps and workshops. The collected waste was then transported to the designated site for further disposal.

112. The main sources of solid waste generation are biodegradable kitchen waste and general waste. For waste collection, the EPC Contractor has provided waste bins at prominent locations. Solid waste from these bins is regularly emptied by the Contractor's garbage collectors into a large garbage collection dumpster provided by the KDA. Currently, there are large dumpsters available for A1, GRC Sangar camp, A2, A3, and the EPC Contractor's main camp.



Dumpster provided by the KDA for the Collection of Solid waste (Adit-2 site).

113. For hazardous waste disposal, the EPC Contractor identified a firm, namely "M/S 3R Green Services (Waste Collector)" from Sindh province, and in February 2025, entered into an agreement with it for the collection and disposal of hazardous waste, including lubricants and plastic waste. The EPC Contractor's intimation of hiring services of the hazardous waste firm and the renewal certificate issued by the Environmental Protection Agency, Sindh province, are in **Annexure 6**. The firm will periodically collect the hazardous waste from the site and will transport it to the approved disposal site for final disposal. The EPC Contractor

will provide copies of the receipts of such collection in the monthly HSE progress report, enabling the PMC to ascertain the quantum of hazardous waste generated at the site.

114. For the safe disposal of medical waste, the EPC Contractor has already engaged a certified firm, namely ARAR (Assisting Remarkable Accomplishment Results). Under obligations of the contract, the EPC Contractor transports medical waste to the Balakot Tehsil hospital, from where ARAR collects the waste and transports it to Peshawar for final disposal at the government of KP-approved disposal site.

115. As evident from **Table 5.6**, compared to the previous reporting period, there is a vivid increase in the number of tires used during the current reporting period. This is due to increase in the EPC Contractor's vehicle fleet. Also, there is considerable increase in the biodegradable waste at the camp which shows the number of camp occupants have increased.

116. During the reporting period, the EPC Contractor's main dispensary, established in the Paras Camp, remained fully operational. The dispensary is stocked with essential medical equipment and medicines, and two medical doctors registered with the Pakistan Medical and Dental Council (PMDC) are performing their duties at the facility. A fully furnished ambulance is also available as part of the dispensary. As the dispensary is now fully functional, an increasing number of EPC Contractor workers will avail the medical services, which may result in an increase in the generation of medical waste.

117. For the primary treatment of camp sewage, the EPC Contractor has constructed a septic tank where sewage undergoes anaerobic treatment. Additionally, provisions are in place for surface drainage in the main and site camps. The effluent from the septic tanks of the site camps flows to the soakage pit. The Contractor regularly emptied these septic tanks through the KDA-approved service providers.

118. No groundwater contamination was observed as a consequential effect of the EPC Contractor's waste management aspect of the SSEMP.

119. Despite the above, during the monitoring period, some shortcomings were also observed in the EPC Contractor's waste management operation. For example, gaps were observed in the EPC Contractor's site waste storage and housekeeping.



Colored Solid waste bins for the Kitchen Waste at the EPC Contractor's Main Camp



Poor Waste Management in the Pakistani Staff Section of the Main Camp

120. **Table 5.6** and **5.7** show month-wise and cumulative details of waste generated at camp(s) and sites.

Table 5.6: Solid and Lubricant Waste Generated at Camps and Sites

S/N o	Type of Waste	Quantity			Disposal
		This Reporting Period	Previous Reporting Period (July-December 2024)	Cumulative for the Project	
1	Plastic waste	63.44kg	58.72kg	254.16 kg	Initially collected in the KDA-supplied waste container and then transported to the approved waste disposal site.
2	Used tires	62 Nos	43 Nos	192 Nos	Stored in a junkyard and will be transported by the M/S 3R Green Services (Waste Collector) for final disposal.
3	Used wooden sheets	0 Kg	0 Kg	0 kg	Not produced yet.
4	Used engine oil	360ltr	218ltr	2261ltr	Stored in barrels and will be transported by the M/S 3R Green Services (Waste Collector) for final disposal.
5	Biodegradable waste (vegetable food etc.)	532 Kg	485 Kg	1839 kg	Through KDA, for further processing and composting.

Table 5.7: Medical Waste and Sorbents Generated at Camps and Sites

S/No	Month	Medical Waste (kg)	Contaminated Sorbents (kg)
1	January	0.3	0.3
2	February	0.5	0.02
3	March	0.4	0.04
4	April	0.6	0.03
5	May	0.2	0.02
6	June	0.4	0.09
Total for Reporting Period (January-June 2025)		2.4	0.96
Total for Previous Reporting Period (July-December 2024)		2.6	0.29
Cumulative for the Project		11.15	2.75

5.5. Health and Safety

5.5.1. Community Health and Safety

121. During the reporting period, the EPC Contractor undertook several initiatives toward the community's health and safety. The utmost efforts were made to construct temporary facilities like camps, batching plants, and workshops at locations isolated from the nearest community to minimize risks associated with such facilities. For example, the A2 camp, batching plant, workshop, and magazine at Ganhool Nullah, and the GRC camp at Sangar village have been constructed in complete isolation from the community. All these facilities have dedicated approach roads guarded by the Special Security Unit (SSU). Similarly, the powerhouse site camp and batching plants have been installed in the permanently acquired land, away from the sensitive receptors.

122. Although instances of non-compliance have also been observed, to suppress dust, the EPC Contractor frequently sprinkles the katcha roads leading to various permanent facilities. For example, the entire access road R3 to the colony and powerhouse, and the katcha

sections of access road to the adit tunnel A3 were frequently sprinkled to suppress dust emanating from the heavy machinery movement. Also, some of the temporary roads, like the one at the A3 site, have been paved to eliminate dust generation.

123. Furthermore, the sections of unpaved tracks exposed to excess particulate matter concentration were sprinkled more frequently.

124. The EPC Contractor frequently interacts with the representatives of various local forums and GRCs to resolve the local issues swiftly and address complaints effectively.

125. To maintain the privacy of the houses near the construction sites, green shade nets have been provided to locals on demand.

126. To maintain good working relations with the project area community, the EPC Contractor has allocated some of the environmental mitigation cost for the provision of clean drinking water and sanitation facilities. Also, budgeted awareness campaigns regarding the health and safety of the community are part of the EPC Contractor's plans.

127. Although construction activities were also carried out during the night, however, such activities did not create a nuisance to the locals as they were mainly undertaken inside adit tunnels.

128. Throughout the construction sites, warning signs/messages in English and Urdu have been displayed at appropriate locations, enabling the community members to safeguard themselves from potential risks at worksites.

129. To prevent unauthorized access to construction sites, camps, workshops, batching plants, etc., these areas have been cordoned off with gates and fences and are being guarded 24/7 by personnel of the SSU.

130. The SSU maintains an in-and-out record of the community residing within the valley where the EPC Contractor's construction activities are ongoing. While this is primarily done to ensure the security of the EPC Contractor's staff, it has also created a sense of enhanced safety and security among the community members, as reported by some residents. For instance, the SSU keeps a daily record of the community residing in the Kholia Nullah valley, where the EPC Contractor's batching plant and access road to the adit tunnel A3 are located. Similar arrangements have also been made at the access roads to the main camp and other active sites.

5.5.2. Workers' Health and Safety

131. For the EPC Contractor's workforce health and safety, not only were PPEs provided to them, but also a variety of training sessions were imparted to ensure safe working, eliminate or minimize incidents, and overcome work-related risks.

132. To effectively implement HSE provisions contained in the SSEMP, management plans, and works-related method statements, EPC Contractor has deputed 20 HSE officers to support the H&S and Environment managers in supervising their field activities. To build the capacity of these HSE officers, in-house essential HSE trainings were provided to these officers from time to time.

133. To encourage workers to consistently follow safety protocols and implement safety measures at work sites, champion programs were regularly held where cash awards were distributed to the HSE (Health, Safety, and Environment) champions of the month. During the reporting period, two HSE champion award ceremonies were held on April 18 and June 20, 2025, whereby cash prizes were awarded to 18 champions for the period from January through June 2025.



Prize distribution under the HSE champion program at the EPC Contractor's Main Camp (April 18 and June 20, 2025)

134. During the reporting period, PMC ensured the availability of first aid boxes at all construction sites to provide first aid in case of any emergency. Also, to respond to fire outbreaks, fire extinguishers were made available at the camps, batching plants, and laboratories/offices, etc.

135. Although there were some deficiencies in the provision of clean drinking water and sanitation facilities at the construction sites, under the PMC's instructions and regular follow-up, the EPC Contractor provided sanitation facilities at most of the construction sites and ensured a regular supply of clean drinking water to the workers. As exhibited by the environmental monitoring results, drinking water complied with the NSDWQ. Also, the EPC Contractor's main camps were equipped with all necessities, like accommodation, dining halls, sanitation, and games.

5.6. Patient Records for the Current Reporting Period

136. Under the provisions of the construction contract, the EPC Contractor hired full-time services of the PMDC-registered medical doctor who remained available at the main camp dispensary round the clock. The record maintained at the dispensary covers medicines received and used, the name of the patient treated, and the type of disease, etc. **Table 5.8** exhibits month-wise patient records and types of common diseases treated at the dispensary.

137. During the reporting period, the medical doctor administered medicines to patients suffering from common headaches, vomiting, stomach pain, etc. As evident from the record, during the reporting period, three patients were referred to the DHQ and THQ Hospital Balakot for further treatment. The EPC Contractor fully assisted the patients in availing medical treatment from each hospital.

Table 5.8: Patient Records for the Current Reporting Period

S/No	Description	January	February	March	April	May	June
1	The EPC Contractor's monthly workforce deployment	1846	1936	2066	2074	2484	2636
2	Number of patients treated at Camp Medical Facility	144	132	185	160	250	214
3	Number of patients referred to DHQ Hospital, THQ Balakot (Mansehra Medical Complex)	5	3	2	0	4	0
4	Percentage of workforce illness/treated	8 %	7 %	9%	8%	10%	8%
5	Type of illness	Flu. Cough	Flu. cough, Sinusitis	Pain abdomen	Flu, cough, kidney pain, and diarrhea	Generalized body pains, Weakness	Hypertension, GBA
		Toothache	Kidney Pain	Burning micturition	Cough and constipation	Burning micturition, Chest infection	Sore throat
		Body aches	Leg pain	Stomach acidity	Scabies, Flu, Strep throat	Flu, cough, and fever	Headache, Hypertension
		Headache	Generalized body aches	Lethargy and body pain	minor injuries. Muscle sprains	Chest and abdominal Pain, Stomach acidity	Diarrhea. Vomiting

138. During the previous reporting period, a total of 820 patients were treated, however, during the current reporting period, a total of 1085 patients were treated exhibiting around 25% increase in the number of patients treated at the project dispensary. By comparing the data given in Table 2.11, with the data recorded at the end of the previous reporting period, there is around 30% increase in the EPC Contractor workforce which may be attributed to the rise in the number of patients. **Annexure 7** exhibits a sample from the record maintained at the project dispensary.

139. During the reporting period, a total of 38 accidents occurred at work sites, causing damage to equipment and injuries to the Contractor's workforce. However, unlike the previous reporting period, no fatal incident occurred during the current reporting period. Except in four instances, whereby the injured were hospitalized for a couple of days, most of the injured labors resumed their duties on the following days. The EPC Contractor's incident record is in **Annexure 3**. A few of the EPC Contractor's initial incident reports are also given in **Annexure 4** for information and reference.

1.1 Implementation Status of Environmental Management Plan

140. **Table 5.9** shows the implementation status of the pre-construction and construction phase mitigation measures in the disclosed EIA report of the Project, while the implementation status of corrective actions proposed in the previous monitoring period has been given separately in **Table 8.1**.

Table 5.9: Implementation Status of EMP (Pre-construction and Construction Phases)

S/No	Impact	EMP Requirements Mitigation Measures	Compliance Attained	Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
Pre-Construction Phase					
1	Terrestrial habitat loss caused by construction related activities	Minimize disturbance to, or movement of, soil and vegetation	Yes		
		Minimize project footprint.	Yes		
		Retain as much natural vegetation as possible.	Yes		
		Locate construction facilities based on knowledge of the soil.	Yes		
		slope and vegetation cover of the area to avoid disturbance to the natural environment	Yes		
2	Decline in abundance and diversity of terrestrial flora and fauna caused by construction related activities	Locate vehicle yards away from open soils and topsoil stockyard	Yes		
		Maximize use of locally sourced aggregate and borrow material	Yes		
		Minimize contact of non-local aggregate and borrow material with native soil.	Yes		
		Minimize disturbance to, or movement of, soil and vegetation.	Yes		
3	Blasting may pose a health hazard due to flying debris	A minimum buffer of 500 m should be provided between the settlements and point of blasting.	Yes		
4	Construction activities may cause alterations to groundwater flow patterns	Record location of the springs especially those in areas proximal to where the underground headrace tunnel will be closer to the ground level	Yes		
5	Use of local water resources for construction activities may reduce the water	Prepare a Water Sourcing and Abstraction Plan specifying the source, owner, total yield, current usage, allowable quantity and the duration for which water can be obtained.	Yes ⁴		

⁴ Water source permission(s) and other details annexed to the SSEMP.

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
	availability for the local communities.	To the extent possible avoid, and where unavoidable, minimize the use of water from local sources (springs) for the Project where local abstraction is unavoidable	Yes			
		Undertake an assessment of the local source identifying its total yield and current usage. If the abstraction from a single source extends three months, the assessment shall be repeated	Yes			
		Fix the allowable quantity to not more than 50% of the available yield (total yield minus current usage)	Yes			
		Enter into a formal agreement with the owner for the water source (or government if it is a public source)	Yes ⁵			
6	Increase in ambient noise levels due to operation of construction equipment, movement of construction traffic and blasting may create nuisance for nearby communities and visiting tourists.	Use visual alarms in preference to audible alarms.	Yes			
		Locate noisy equipment behind parking lots, parks or behind sound barriers or sound absorbers – for example, gravel stockpiles or constructed barriers. and away from potential sources of conflict	Yes			
		Using vibratory piling instead of impact piling.	Yes			
		Erect earth mounds around the site boundary can provide acoustic as well as visual screening	Yes			
7	Failure of spoil dumping sites resulting in increased erosion and sediment load entering river	Dumping sites should have a flood prevention design for a 20- year flood		Partial	The engineering design of the EPC Contractor's spoil disposal areas for powerhouse and upstream inclined surge tunnel has not yet been finalized.	The design documents of the powerhouse and upstream inclined surge tunnel are under the PMC design team review. The review and approval process is targeted to be

⁵ Agreements with the locals are annexed in the SSEMP report.

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
					- The EPC Contractor's response to the PMC comments on the A1 spoil disposal area is still awaited. - The Contractor has not yet submitted spoil proposal for the dam site spoil area.	completed till July 30, 2025. The EPC Contractor will submit response to the PMC's review comments by the end of July 2025 while submission of the dam site spoil area proposal is expected in mid-August 2025.
		Preparation of spoil management plan	Yes			
8	manent impact in aesthetics due to proposed developments	Develop and implement a Site Rehabilitation and Landscaping Plan	Yes			
		Use colors that better integrate with the landscape	Yes			
		Disguise elements with vegetation where possible	Yes			
		Retain as much natural vegetation as possible	Yes			
9	proved accessibility due to construction of Project internal roads	Consult communities during final design and location of site access roads	Yes			
10	ease in congestion, due to increased traffic volume will cause delays	Make roundabouts for the congestion points.	Yes			
		Retain as much natural vegetation as possible to reduce the impact of smoke due to vehicles.	Yes			
		Consult National Highway Authority for implementation of the above measures	Yes			
11	ss of assets and livelihood as a result of land acquired for the Project	LARP implementation		Partial	RP implementation is in progress.	

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
12	Emergence of the graveyard	Plaster the graves with mud or cement.	Yes ⁶			
		If relocation of the graveyard cannot be avoided, it shall be managed through the local religious authorities.	Yes			
13	Impact of climate change in possible enhancing of flood impacts such as during possible overtopping of spillway	Ensure minimal damage to dam structure from small amount of overtopping of spillway through design	Yes			
Construction Phase						
1	Construction Impacts	EMP exhibiting areas to be cleared, vegetated areas to be protected or fenced, slopes to be stabilized and solid waste disposal locations.	Yes			
2	Improvement of the river ecosystem through implementation of the BAP	Implement BAP		Partial	The works-related measures have been taken by the EPC Contractor while for the protection measures in the Area of Management, contract signing with the Fisheries and Wildlife departments remains awaited till approval of the updated EIA report by the Project financiers.	Consequent upon approval of the updated EIA report by the Project financiers on May 06, 2025, a meeting has been scheduled with the Wildlife and Fisheries departments on July 24, 2025 to discuss timelines for signing of contracts and initiation of field activities etc.
	Loss of riverine ecosystem due to inundation by Project Reservoir					
	Degradation of the river ecosystem in the low flow segment downstream of the Project dam					
	Degradation of the River Ecosystem Downstream of the Tailrace					
	Terrestrial habitat loss caused by construction related activities.					

⁶ All 19 graves from the Sangar area (Employer's colony site) have been relocated. The contract for relocation of 184 graves from the dam site has been awarded, but the relocation at this site is yet to be initiated.

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
3	Terrestrial habitat loss caused by construction related activities.	Provide awareness training to staff and contractors on: prevention of injury of animals; identification of likely species found on site; identifications of animal hazards (such as venomous snakes); and what to do if dangerous animals are encountered	Yes ⁷			
		Solid waste should only be disposed of at designated sites and a Waste Management Plan developed and implemented.	Yes ⁸			
		Prepare an Environmental Training Plan that contains awareness training to staff and contractors on: prevention of injury of animals; identification of likely species found on site; identifications of animal hazards (such as venomous snakes); and what to do if dangerous animals are encountered. Also see guidelines for the Environmental Training Plan in IR 5	Yes			
		Encourage personnel to report sightings of wildlife of conservation importance or incidents of poaching to PEDO	Yes			
		Minimize disturbance to, or movement of, soil and vegetation	Yes			
		Prevent soil damage and erosion	Yes			
		Prevent Alien Invasive Species (AIS) establishment on exposed stored soil (do not store bare soil near known sources of AIS). The habitat most at risk is the Riparian Habitat. The species that are highest risk include Parthenium Weed, Common Weed and Castor Oil Plant	Yes			

⁷ The annual HSE training is scheduled in September 2025.

⁸ The EPC Contractor has hired services of the Kaghan Development Authority (KDA) for the waste disposal at the approved location(s).

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
		Train and raise awareness regarding AIS among Project staff and contractors	Yes			
		Retain as much natural vegetation as possible	Yes			
		Solid waste should only be disposed of at designated sites	Yes			
		Minimize the project footprint, clearly delineate and restrict access beyond work sites and other areas to be disturbed				
		Within the quarry and borrow areas, activities will be restricted to areas at a distance from perennial water channels so as to avoid disturbances to them including the risk of siltation	Yes			
4	cline in abundance and diversity of terrestrial flora and fauna caused by construction related activities.	Large flood lights should not be installed outside 50 m of the Project fence.	Yes			
		Lights should be directed towards Project facilities and not towards the natural habitats.	Yes			
		Regulations for Project staff and contractors to avoid illegal poaching to be incorporated in contract documents	Yes			
		Provide awareness training to staff and contractors on: prevention of injury of animals; identification of likely species found on site; identifications of animal hazards (such as venomous snakes); and what to do if dangerous animals are encountered.	Yes			
		Incorporate regulations for Project staff and contractors to avoid illegal poaching in contract documents	Yes			
		Provide adequate knowledge to the workers on relevant government regulations and punishments for illegal poaching.	Yes			
		Encourage personnel to report sightings of wildlife of conservation importance or incidents of poaching to PEDO	Yes			

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
		Project staff and contractors to report kills of large mammals particularly designated species of conservation concern	Yes			
		Train and raise awareness regarding AIS among Project staff and contractors	Yes			
		The Contractor shall prepare an Environmental Training Plan for all construction workers: the Plan shall address the following items: • All Contractor's employees shall be required to comply with environmental protection procedures and they shall be able to provide evidence that they attended the training sessions detailed in the Plan; • The Plan shall educate all construction workers on the following issues but not limited to them: fire arm possession, traffic regulations, illegal logging and collection of non-timber forestry products, non-disturbance of resettlement communities, hunting and fishing restrictions, waste management, erosion control, health and safety issues, all prohibited activities, the Code of Conduct requirements and disciplinary procedures, and general information on the environment in which they will be working and living • Proposed methods for conducting the training program, which shall include formal training sessions, posters, data in newsletters, signs in construction and camp areas and 'tool box' meetings	Yes ⁹			

⁹ Detailed training plans have been given in the SSEMP.

S/No	EMP Requirements		Compliance Attained	Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance	
	Impact	Mitigation Measures				
		Equipment emitting excessive noise in comparison with other similar equipment will not be allowed to operate		Partial	Some of the generators at the site were producing noise	The EPC Contractor was instructed to repair the damaged silencers of the generators at the earliest.
		Equipment under use will be regularly maintained, tuned, and provided with mufflers to minimize noise levels.		Partial	There were instances where generators, particularly at the adit tunnels sites, were producing noise and air pollution.	Although the EPC Contractor addressed the issue in the previous reporting period however, the issue re-surfaced, for which the EPC Contractor was instructed to take remedial measures immediately.
		Equipment in poor state of maintenance, particularly without effective noise control will be checked to determine if it can be improved, and replaced with less noisy equipment as soon as practicable	Yes			
		Blowing of horn will be prohibited on all sensitive areas except under emergency conditions	Yes			
		Compensatory trees will be planted. The EPC Contractor will plant a minimum of ten trees for each tree removed in acquired land. PEDO will monitor and maintain the vegetation until it is established.		Partial	The updated tree plantation plan has been approved.	The first plantation is scheduled in the monsoon plantation period of 2025. The PMC has asked the EPC Contractor, with the subsequent reminder to submit the plan for the monsoon plantation covering: i.expected start date of the plantation; ii.plantation site(s);

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
						iii. sapling type and source (from where the plants are to be procured); iv. details of the plantation team; and v. allocation of the essential machinery and equipment for plantation and watch and ward. The EPC Contractor's submission however, remained awaited till end of the reporting period. Which is expected to be submitted by July 20, 2025. submission
5	Increase in ambient and ground level concentration of air pollutants from construction activities and vehicular movement may cause health impacts to the community.	Develop and implement an Air Pollution Control Plan	¹⁰			
		Prepare a SSEMP for each construction site and must outline areas to be cleared, vegetated areas to be protected or fenced, solid waste disposal locations, and sprinkling locations				
		Fugitive and exhaust emissions from transport vehicles: ☐ Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard (i.e., the minimum required		Partial	During the reporting period, instances of dust generation due to insufficient water sprinkling was observed at various locations particularly at the micro pile drilling location at the dam site and access roads.	EPC Contractor Environmental Manager was instructed to ensure regular sprinkling on the unpaved roads particularly at the dam site and all access roads.

¹⁰ Air pollution plan is part of the SSEMP.

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
		space between the top of the load and the top of the trailer). ☐ Install and maintain all vehicles and machinery with appropriate emission control equipment. ☐ Regularly maintain vehicles and equipment to keep emissions in check. ☐ Smoke from internal combustion engines should not be visible for more than ten seconds. ☐ To the extent possible, use new and low emission equipment and vehicles. ☐ Purchase best quality fuel and lubes and where possible use lead free oil and lubes. ☐ Sprinkle water on all unsealed roads used by Project vehicles that are within 200 m of any settlement. ☐ Cover loads and long-term piles of friable material to reduce fugitive dust emission. ☐ Reduce traffic speeds on all unpaved surfaces to 15 miles per hour or less. ☐ Paved roads shall be swept frequently if soil material has been carried onto adjacent paved, public thoroughfares from the Project site. ☐ Install wheel washers where vehicle exit onto paved road from unpaved. ☐ Wheel washing of vehicles leaving the site. ☐ Wash vehicles/equipment prior to each trip. ☐ Use catalytic converters on vehicles, an emission control device, used to convert				Although the EPC Contractor has provided respirators to the labor working at the micro pile drilling site however, suppression of dust has not fully been ensured. PMc Health and Safety monitor is regularly monitoring the site to ensure compliance to the instructions issued in the matter.

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
		harmful pollutants to less harmful pollutants e.g. it converts the nitrogen oxides back into nitrogen and oxygen. ☐ Appropriate maintenance of vehicles and machinery				
		Fugitive dust emissions from blasting ☐ Indicate the limits of a clearing land with highly visible markers. ☐ Leave a layer of about 5 m of undisturbed softs above the top of the overburden blasts. This will act as a blanket to contain air blast, dust and fly rock. ☐ Sprinkle water on the area where blasting is done to settle down the particulate matter emissions.		Partial	Same as above	Same as above
		Fugitive dust emissions from quarry areas ☐ Indicate the limits of a clearing land with highly visible markers. ☐ Avoid earth stripping or moving in periods of dry and windy weather. ☐ Carry out dust generating activities where maximum protection can be obtained through topography or in areas where prevailing winds will blow dust away from sensitive areas/uses. ☐ Water spraying of conveyors/conveyor transfer points, stockpiles and roads. ☐ Covering of fine dry loads or spraying of loads prior to exiting the site, and if necessary regular cleaning of public roads in the vicinity of the entrance.				
		Fugitive dust emissions from concrete batching plants				

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
		☐ Suspend earthwork operation when wind speed exceeds 20 km/hr. in areas within 500 m of any settlement. ☐ The whole process of weighing and mixing would be performed in a fully enclosed environment. ☐ The mixers would all equip with dust collectors, no dust emission would be expected. ☐ Siting the concrete batching plant out of prevailing high winds minimizing dust emissions. ☐ The prevailing wind direction should be considered to ensure that bunkers and conveyors are sited in the leeward direction to minimize the effects of the wind. ☐ The provision of natural or artificial wind barriers – such as trees, fences and landforms – to help control the emission of dust from the plant should be considered. ☐ Batching plants should be sited on land that is not flood prone. ☐ Batching plant should be kept as near to natural sinks to minimize emissions to ambient environment ☐ All stacks to be vertical and at least 3 m above ground Fugitive dust emissions from aggregate production and handling system ☐ Suspend operation when wind speed exceeds 20 km/hr. in areas within 500 m of any settlement. ☐ The prevailing wind direction should be considered to ensure that aggregate				

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
		handling systems located in the leeward direction to minimize the effects of the wind. ☐ Sprinkle water on all exposed surfaces, particularly those close and up-wind of settlements.				
		Wind-blown dust from exposed surfaces such as bare land and waste dumping sites ☐ Cover all exposed surfaces, particularly those close and up-wind of settlements. ☐ All grading operations on a project should be suspended when winds exceed 20 miles per hour. ☐ Minimize disturbance to, or movement of, soil and vegetation. ☐ Sprinkle water on all exposed surfaces, particularly those close and up-wind of settlements. ☐ Retain as much natural vegetation as possible				
		Wind-blown dust from stockpiles of dusty materials such as sand and other minerals ☐ On-site dirt piles or other stockpiled PM should be covered, wind breaks installed, and water and/or soil stabilizers employed to reduce wind-blown dust emissions. ☐ Adequately wet, cover with plastic, or provide with wind shield all stockpiles to reduce dust emission. ☐ Sprinkle water on all exposed surfaces, particularly those close and up-wind of settlements. ☐ Minimize disturbance to, or movement of, soil and vegetation. ☐ Prevent soil damage and erosion.				

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
		Retain as much natural vegetation as possible				
6	ation from blasting during the construction phase may disturb local communities.	Develop a Blasting and Explosives Management Plan and Vibration Monitoring Plan.				
		Conduct a pre-construction survey of structures at risk of vibration impacts households. - In the initial stages, the blasting induced vibration shall be measured as a function of maximum instantaneous charge and distance from the blasting site. This data shall be then used to refine the Blasting Induced Vibration Risk Zones on the basis of the adopted criteria. - Using, the refined Blasting Induced Vibration Risk Zones maps and the tunnel boring schedule, the Supervision Consultant in consultation with the PEDO and the Construction Contractor, shall identify the houses that will be affected and the impact duration and schedule. - For the houses that will fall in the Structural Damage Risk Zone, a temporary relocation plan will be developed. An amendment to the Land Acquisition and Resettlement Plan (LARP) will be commissioned for this purpose. Before start of blasting, all residents of houses in the Structural Damage Risk Zone will be relocated as per the LARP. - A survey will be undertaken in both zones, to determine the pre-blasting conditions of the buildings. The survey will be commissioned by the Supervision Consultant and will identify and record any existing				

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
		damage to the structures. The survey will cover the following aspects: ➤ Overall condition of the structures, both exterior and interior. ➤ Documentation of defects observed in the structure using digital imagery along with notes, measurements and sketches. ➤ Documentation of pre-existing cracks using digital imagery along with notes, measurements and sketches.				
		2 Following completion of the blasting, the survey will be repeated in the Structural Damage Risk Zone to determine the condition of the buildings and verify that they are safe for re-occupation. If the buildings are safe, the residents will be allowed to return to their houses following any necessary damage repairs. If the buildings are damaged beyond repair, compensation will be paid to the owners as per the LARP. If there are any claims or reports of damage in the Cosmetic Damage Risk Zone, the affected house will be surveyed against the pre-Project survey and repairs will be undertaken as appropriate.				
		2 Meaningful contact with the community shall be maintained and their grievance shall be attended to in a timely manner. In this regard: ○ A meaningful community engagement plan will be developed. The plan will cover identify the affected community; the key contact persons; frequency of engagement; the information to be shared; the responsibilities to manage the plan; and the				

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
		notice period to be giving to the community for various blasting related generating activities. The GRM will be used to record, investigate, and respond to any complaints. Investigation of the complaints will be undertaken by the Supervision Consultant.				
		- Develop a Vibration Monitoring Plan that will include monitoring of vibration levels and frequency around the blasting sites. The objectives of the monitoring will be to: - ensure that vibration levels in the communities are within the adopted criteria levels; - maintain record of vibration to settle any potential conflicts; and - monitor changes in the vibration levels due to possible changes in the rock formation and take appropriate corrective actions.				
7	sting may pose a health hazard due to flying debris.	A minimum buffer of 500 m should be provided between the settlements and point of blasting.				
		Leave a layer of about 5 m of undisturbed softs above the top of the overburden blasts. This will act as a blanket to contain air blast, dust and fly rock.				
		Ensure that the holes are correctly collared with respect to the back-break/inclination of the face and that digging alongside the initiation face well controlled.				
		Inadequate forward displacement of the front row burden arising out of the under charging of these holes will result in fly rock from vertical catering of the rear holes				
		Where fly rock possesses a serious problem, the stemming length should not be less than the whole burden. Also, an effective stemming				

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
		material like crushed angular rock should be used to prevent premature venting of explosion gases through the stemming column.				
		The forward fly rock could be fairly controlled to the commonly used 'inline open loop' pattern. The maximum inter-row delay interval consistent with the absence of cut off helped in minimizing the fly rock formation. As a thumb rule an inter-row delay of 4-8ms/m of burden could be used for this purpose.				
		Adequate care should be taken while connecting the delay devices in the holes/rows and the initiation sequence properly checked before firing to avoid initiation of blast holes out of sequence.				
		Blasts designed on a face length to width ratio in the range of 3 to 4 produces minimum fly rock.				
8	Disruptions of natural passage of springs due to blasting for tunnels may disrupt the water supply for mountain spring users.	Record location of the springs, especially those in areas proximal to where the underground headrace tunnel will be closer to the ground level i.e. high-risk areas.		¹¹		
		Monitor flow for located springs and maintain records.				
		Support the community in development of alternate water supply schemes through local NGOs				
		Ensure the availability of water to the communities and the access of the communities to the water resources being used by them is not adversely affected.				

¹¹ The PMC reviewed and approved the EPC Contractor's Hydro-census Report in July 2024.

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
9	Depletion of local water resources for construction activities may reduce the water availability for the local communities.	Develop a Water Sourcing and Abstraction Plan	\$			
		Source water for construction from authorized abstraction sources agreed between the local communities, local government and EPC contractor.	\$			
		Water conservation techniques will be developed and implemented by the EPC contractor.	\$			
		Access of community to water sources shall be kept clear so that the community's ability to meet its water requirements are not compromised.	\$			
		Exercise care while moving heavy machinery to avoid damage or blockage of natural waterways and channels.	\$			
		Maintain records of water usage in all Project activities.	\$ ¹²			
		Incorporate the above measures in the Construction SSEMP	\$			
10	Discharge from construction activities can potentially result in the contamination of soil, groundwater and surface water.	Develop and implement a Water Quality Management Plan	\$			
		Prepare and implement a Spill Prevention and Response Plan and inducted to the staff for any incident of spill.		Partial	Spill prevention plan is part of the SSEMP. There were some instances of oil spillage which were reported to the EPC Contractor for rectification.	The EPC Contractor was instructed, through CAPs, to construct hard flooring in workshops to avoid soil contamination. The EPC Contractor has partially rectified the gaps identified in the CAPs, particularly those pertain to A3 workshop

¹² For further details refer to Section 2.4 of the report.

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
						site. As reported by the Environmental Manager of the EPC Contractor, the hard flooring at the A3 workshop will be completed till end of July 2025.
		Provide and use spill prevention trays at refueling locations.				
		The runoff from maintenance workshops will be collected by impervious channels and passed through oil-water separators (OWS) before final disposal. The sludge and oil collected at the OWS will be disposed of properly.			i. The Grease trap is part of the EPC Contractor's washing yard. As the EPC Contractor has not scheduled the washing yard hence, the grease trap is also pending. ii. Also, the Contractor has not decided yet, whether to construct a washing yard or not.	
		Build separate impervious pits (with concrete walls and proper shed) at the construction sites for temporary handling and storage of contaminated soil and water if encountered during construction such as sludge from OWS.			Same as above	
		Keep all fuel storage tanks and lubricating oil drums in secondary containment impervious pits with impervious shed walls.		Partial	During the reporting period, at some locations like A3 and the dam site, oil drums were not stored properly; hence, the aspect was termed as partially complied.	EPC Contractor has largely rectified the gaps, while rectification of the remaining gaps was in progress till the end of the reporting period.
		Avoid on-site maintenance of construction vehicles and equipment, as far as possible.				
		Regularly inspect construction vehicles and equipment to detect leakages.				
		Store fuels and lubricants in covered and dyked areas, underlain with impervious lining.		Partial	Same as above	Same as above

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
		Spill control kits (shovels, plastic bags and absorbent materials) will be available near fuel and oil storage areas, vehicle parking, and vehicle maintenance areas as well as at construction sites.	\$			
		Remove contaminated soil from the site and dispose in a manner to ensure protection of water sources.	\$			
		Construct the bottom of any soak pit or septic tank at least 100 meters away from springs and water bores.	\$			
		Maintain records of spills and volume of removed contaminated soil.	\$			
		Maintain record of remedial measures taken.	\$			
		Use silt traps to prevent contamination of river and streams.		Partial	ough temporary sedimentation tanks are operational at the work sites, properly designed sedimentation tanks have not yet been constructed due to the non-finalization of their design.	PMC design team has taken the issue with the EPC Contractor's design team to finalize the design of the sedimentation tanks. er the design approval, the EPC Contractor will initiate the construction of properly designed sedimentation tanks. alization of the sedimentation tanks design is targeted for August 25, 2025.
		Incorporate the above measures in the Construction SSEMP	\$			
11		Develop a Noise and Vibration Control Plan	\$ ¹³			

¹³ Noise and Vibration plans are part of the approved SSEMP.

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
	increase in ambient noise levels due to operation of construction equipment, movement of construction traffic and blasting may create nuisance for nearby communities and visiting tourists.	Noise generated from construction sites from construction activities. ☐ Select the quietest available plant and equipment that can economically undertake the work required. ☐ Undertake maintenance of the equipment as simple maintenance can reduce noise levels by as much as 50%. Parts may become loose, creating more noise because of improper operation or scraping against other parts. Grinding noises may also occur as the result of inadequate lubrication. ☐ Equipment under use will be regularly maintained, tuned, and provided with mufflers to minimize noise levels. ☐ Use visual alarms in preference to audible alarms. ☐ Enclose noisy equipment. ☐ Provide noise attenuation screens, where appropriate. ☐ Build an enclosure around the noise source so that noise is contained. The enclosure should be free from gaps and made of dense material and be lined with noise-absorbing material like glass or polyester batts. ☐ Locate noisy equipment behind parking lots or parks. ☐ Close liaison with the community and regular monitoring of the noise levels in the community are key to successful implementation of the above mitigation measures. Specifically, inform communities of	s ¹⁴			

¹⁴ The mitigation measures have largely been implied at sites.

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
		all major construction activities three days in advance. Construction noise from traffic Fit and maintain appropriate mufflers on earth-moving and other vehicles on the site. Mobile plants such as excavators, front-end loaders and other diesel-engine equipment should be fitted with residential class mufflers and other silencing equipment, as applicable. Haul roads within the site should have as low a gradient as possible, and paving should be considered if practicable where noise-sensitive receptors are likely to be affected. Owners and operators of existing facilities should implement special noise reduction measures, such as erecting purpose-built acoustic barriers, restricting opening hours and maintaining transport vehicle				
		Construction noise from on-site plant operations and equipment All fixed plants at the work sites will be appropriately selected, and where necessary, fitted with silencers, acoustical enclosures and other noise attenuation measures. Modify the equipment or the work area to make it quieter by substituting existing equipment with quieter equipment; retro-fitting existing equipment with damping materials, mufflers, or enclosures; erecting barriers; and maintenance. Shifting to a quieter construction process for example pile driving is very loud as compared to boring which is a much quieter way to do the same work.				

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
		☐ Combine noisy operations to occur in the same time period. The total noise level produced will not be significantly greater than the level produced if the operations were performed separately. ☐ All plants and equipment should be regularly maintained. ☐ Move static plants and equipment as far as possible from sensitive boundaries, as work allows. A distance of four times further away lowers the noise by 12 dBA. A reduction of 10 dBA will sound half as loud. ☐ Sound attenuation measures should be used for plants and equipment such as baffles and specialized mufflers, acoustic enclosures or partial enclosure housings. ☐ Acoustic barriers need to be designed and purpose built if needed. Vegetated buffer zones can also be planted to mitigate noise from operations using suitably selected native plantings local to the area. ☐ Reduce workers' exposure to high noise levels by keeping moving workers away from the noise source; restricting access to areas; rotating workers performing noisy tasks; and shutting down noisy equipment when not needed. ☐ Use earplugs to reduce workers' exposure to high noise levels.				
		Noise generated from the blasting in quarry areas. ☐ Using vibratory piling instead of impact piling.	¹⁵			

¹⁵ Construction materials are being supplied from the government approved sources which are located outside of the Project area

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
		☐ Conveyor belts and crushing/screening equipment can be housed to provide acoustic screening. ☐ It is important that sound-reduction equipment fitted to machinery is used and maintained properly. ☐ Erect earth mounds around the site boundary can provide acoustic as well as visual screening. ☐ Soft ground (e.g. grassland and cultivated fields) attenuation can sometimes have a greater impact in reducing noise than barrier attenuation, especially if the ground supports sound absorbing vegetation. Noise emissions from concrete batching ☐ Locate noisy equipment away from potential sources of conflict. ☐ Locate noisy equipment behind sound barriers or sound absorbers – for example, gravel stockpiles or constructed barriers. ☐ Install silencing devices to all pressure operated equipment				
12	Contamination of soil as a result of accidental release of solvents, oils and lubricants can degrade soil fertility and agricultural productivity.	Prepare a Spill Prevention and Response Plans ¹⁶ and induct the staff for any incident of spill.				
		Appropriately mark fuel tanks by content and store in dyked areas with an extra 10% of the storage capacity of the fuel tank. The area will be lined with an impervious base.				
		Install grease traps on the site, wherever needed, to prevent flow of oily water.			The grease trap is not available	A grease trap will be constructed as part of the washing yard. EPC Contractor has not

¹⁶ The requisite plan is included in the approved SSEMP.

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
						scheduled the construction of the washing yard yet.
		Spill cleaning kit (shovels, plastic bags and absorbent materials) will be available near fuel and oil storage areas.	\$			
		Carry cleanup kits in all fuel trucks.	\$			
		Fueling should only take place over impermeable surfaces, other hazmat should be stored and used over impermeable surfaces.	\$			
		The bottom of any soak pit or septic tank shall be at least 10 m above the groundwater table. The distance can be reduced, based on the soil properties, if it is established that distance will not result in contamination of groundwater.	\$			
13	d clearing, excavation, tunnel boring and other construction activities may loosen the top soil in the project area resulting in loss of soil and possible acceleration of soil erosion and land sliding, especially in the wet season.	Develop an Erosion Control Plan.	\$			
		Limit vegetation loss to demarcated construction area.	\$			
		Cover areas such as muck disposal area, batching plant, labor camp and quarry sites after the closure shall with grass and shrubs.		17		
		Adopt slope stabilization measures such as adequate vertical and horizontal drains, drainage along roadsides, cross drainage and retaining walls.	\$			
		Monitor slope movements around excavation work areas.	\$			
		Salvage, store, and reuse all topsoil at all construction sites.	\$ ¹⁸			

¹⁷ The closure phase has not been reached yet.

¹⁸ As most of the temporary facilities have either been identified on the barren land or on mountainous land hence, this and the subsequent mitigation measures are so-far not applicable. The compliance status of these mitigation measures has however been termed "Yes" exhibiting such measures are in consideration for compliance at appropriate time.

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
		The height of the stockpile will be minimized to the extent possible by increasing the size of the land for the stockpile.				
		Topsoil will be carefully stripped to ensure that it is not mixed with subsoil.				
		The stockpiles will be revegetated to minimize loss of soil quality, minimizing weed infestation, maintaining soil organic matter levels, maintaining soil structure and microbial activity.				
		Topsoil stockpiles will be clearly signposted for easy identification and to avoid any inadvertent losses.				
		The establishment of declared plants on the stockpiles will also be monitored and control programs implemented as required.				
		The topsoil will be treated with temporary soil stabilization and erosion control measures.				
		During removal of topsoil stockpile for restoration of project affected areas, it is preferred that the soil is removed in layers (less than 0.5 m thick) under a gradual process.				
		The top layer will be mixed with the remainder of the stockpile to ensure that living organisms are distributed throughout the topsoil material at the time of final placement. The use of micro-organism inoculates may be necessary to re-establish micro-organisms in topsoil material.				
		Select local species for plantation to restore the biodiversity of the area in consultation with Forest Department after completion of respective activities.				

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
14	ure of spoil dumping sites resulting in increased erosion and sediment load entering river	Dumping sites should have a flood prevention design for a 20-year flood.				
		The water drainage works consist of the masonry structures, and shall be designed to drain a 5-year rainfall every 10 minutes.				
		Where constructed tailing hold structure will be of galvanized woven wire mesh gabions				
		All dumping sites will undergo vegetation restoration works comprising of surface leveling, covering and forest/grass planting or agricultural land rehabilitation	§ ¹⁹			
		Develop a Spoil Disposal Plan that includes the following measures: ? Slope movements will be monitored around excavation work areas. ? Restore to the maximum extent possible the hydrological regime and reinstate natural drainage of the land (including provisions to maintain the water balance of the site and protect from flooding where appropriate). ? Reinstall topsoil (in case it was stripped before construction activities). ? Revegetate sites with suitable native plant species. ? Drain spoil piles to prevent the concentration of flow and to prevent rill and gully erosion. ? Separate organic material (e.g., roots, stumps) from the dirt fill and store separately.	§ ²⁰			

¹⁹ All dumping sites will be rehabilitated under the terms of lease agreements while, where applicable, plantation will be undertaken on the dumping sites.

²⁰ Design documents of the two spoil disposal areas (A2 and A3) containing essential details have been reviewed and approved by the PMC . Environmental consent for the upstream inclined surge tunnel and powerhouse sites have already been given to the EPC Contractor.

S/No	EMP Requirements		Compliance Attained	Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures			
		Place this material in long-term, upland storage sites, as it cannot be used for fill. ☐ Store “clean” material in a short-term disposal site (stockpile) if it will likely be re-used for fill or shoulder widening projects. ☐ Where feasible, recycle asphalt material in embankments and shoulder backing. Place these materials where they will not enter the stream system. Asphalt that is 5 years old is considered “inert” (that is, all oils washed off). ☐ Do not add excess unusable material to permanently closed sites. ☐ Spread material not to be re-used in compacted layers, generally conforming to the local topography. ☐ Design the final disposal site reclamation topography to minimize the discharge of concentrated surface water and sediment off the site and into nearby watercourses. ☐ Cover the compacted surfaces with a 6-inch layer of organic or fine-grained soil, if feasible. ☐ After placement of the soil layer, track walk the slopes perpendicular to the contour to stabilize the soil until vegetation is established. Track walking creates indentations that trap seeds and decrease erosion of the reclaimed surfaces. (See figure on next page.). ☐ Revegetate the disposal site with a mix of native plant species. Cover the seeded and planted areas with straw compost, mulched with straw at a rate of 1 to 1 ½ tons per acre. Apply jute netting or similar erosion			

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
		control fabric on slopes greater than 1:2 if site is erosive. ☐ Locate stockpiles away from drainage lines, at least 10 meters away from natural waterways and where they will be least susceptible to wind erosion. ☐ Ensure that stockpiles and batters are designed with slopes no greater than 1:2 (vertical\ horizontal). ☐ Besides these measures, erosion can also be minimized by regular rehabilitation of areas not in use for Project activities during construction. These will include: re-grading and immediate re-vegetation (using fast-growing species and different functional groups of plants for keeping soil in place) of slopes to minimize erosion. ☐ Install erosion and sediment control measures, if possible before construction commences. · Identify drainage lines and install control measures to handle predicted stormwater and sediment loads generated in the mini-catchment. ☐ Design and install appropriate erosion and sediment run-off control measures appropriate to site conditions to handle a one-in-two-year storm event (a two-year ARI with an intensity of six hours), for temporary structures, and a one-in-fifty-year storm event, for permanent structures. ☐ Establish an adequate inspection, maintenance and cleaning program for sediment run-off control structures. Ensure that contingency plans are in place for unusual storm events.				

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
		Continually assess the effectiveness of sediment control measures and make necessary improvements. Keep temporary disposal sites out of wetlands, adjacent riparian corridors, and ordinary high-water areas as well as high risk zones, such as 100-year floodplain and unstable slopes. Anticipate a sufficient storage area with no risk for sediment delivery for piles that may slump. Stress cracks indicate that the pile is at risk of slumping. Cover the trucks that will be used for the transportation of spoil material to disposal sites.				
15	Deterioration of aesthetics and visual amenity of nearby receptors due to construction activities, including vehicular movement on roads, may cause disturbance in aesthetics for tourists, businesses and nearby communities.	Minimize disturbance to, or movement of, soil and vegetation.				
		Back fill to original levels.			Mitigation measures will be applied upon completion of activities at site(s).	
		Reshaping to match in with surrounding topography.				
		Reinstate vegetation around construction sites.			Implementation of the tree plantation plan has not been started yet.	The first plantation is scheduled in the monsoon plantation period of 2025. The PMC has asked the EPC Contractor with the subsequent reminder to submit the plan for the monsoon plantation the Contractor's submission however, remained awaited till end of the reporting period.

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
16	Permanent impact in aesthetics due to proposed developments.	Develop and implement a Site Rehabilitation and Landscaping Plan.	\$			
		Use colors that better integrate with the landscape.	\$			
		Disguise elements with vegetation where possible.	\$			
		Retain as much natural vegetation as possible.	\$			
17	Increase in congestion, due to increased traffic volume will cause delays.	Develop and implement a Traffic Management Plan. ²¹	\$			
		Make roundabouts for the congestion points.	\$			
		Retain as much natural vegetation as possible to reduce the impact of smoke due to vehicles.	\$			
		The vehicles going on the spoil routes and passing through the communities must be completely covered to avoid dust emissions.		Partial	Vehicles loaded with construction materials are generally covered however, some of the vehicles carrying spoil materials were observed without cover hence, the aspect is termed partially complied.	The EPC Contractor has been instructed to immediately cover materials loaded on vehicles, whether they are being transported for construction or dumping at the approved disposal sites.
		Strictly implement speed limits and defensive driving policies.				
18	Increase in traffic volume will deteriorate the air quality.	Keep speeds slow (30 km/hr) on unsealed roads.	\$			
		Sprinkle water on unsealed roads that are used for construction traffic.		Partial	The water sprinkling on the unpaved road is not regular.	The EPC Contractor was instructed in the HSE meetings and through written instructions to undertake regular sprinkling of water on the access roads particularly

²¹ Traffic management plan is part of the SSEMP.

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
						on the unpaved road leading to dam and powerhouse sites.
		Retain as much natural vegetation as possible to reduce the impact of smoke due to vehicles.				
		The vehicles going on the spoil routes and passing through the communities must be completely covered to avoid dust emissions.		Partial	vehicles loaded with construction materials are generally covered however, some of the vehicles carrying spoil materials were observed without cover hence, the aspect is termed partially complied.	EPC Contractor has been instructed to immediately cover materials loaded on vehicles, whether they are being transported for construction or dumping at the approved disposal sites.
		Strictly implement speed limits and defensive driving policies.				
		Promptly and properly repair and maintain roads that are subject to damage by Project activities.				
19	Increased risk to community safety due to increased traffic volume during the construction phase near communities.	Develop and implement a Traffic Management Plan.				
		Identify suitable times to transport equipment.		²²		
		Road safety awareness education will also be included during community visits or information sessions, so that communities can be familiarized with common road signs and the types of vehicles and equipment that will be moving through the area				
		Keep speeds slow (30 km/hr) where there is traffic exchange between roads.				
		Make roundabouts for the congestion points.				

²² Mostly day time transportation is undertaken

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
		Designate traffic wardens at roads on the transport route to manage traffic during school hours.	\$			
		Construction traffic will not travel during schools starting and ending hours on designated road segments in front of schools on the transport route.	\$			
		Strictly implement speed limits and defensive driving policies.	\$			
		Maintain vehicles especially brakes.	\$			
20	gradation of the pavement due to use by heavy construction traffic	Promptly and properly repair and maintain roads that are subject to damage by Project activities.	\$			
21	ect, indirect and induced employment at the local levels, resulting in increased prosperity and wellbeing due to higher and stable incomes of people.	Enhancement measures: ☐ ensure preferential recruitment of local candidates provided they have the required skills and qualifications. ☐ include an assessment of the contractor's demonstrated commitment to domestic and local procurement and local hiring in the tender evaluation process. ☐ coordinate recruitment efforts related to non-skilled labor, including for non-skilled labor positions required by contractors.	\$			
		Good practice measures: ☐ determine what constitutes 'fair and transparent' practices in recruitment and in distribution of jobs among different community groups, in consultation with local communities and their leaders.	\$			
22	crease in the stock of skilled human capital due to transfer of knowledge and skill	Support a 'Vocational Training Program' to assist local people to qualify for semi-skilled positions focusing on issues such as procurement, involvement of vulnerable	\$			

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
	under the Project resulting in enhanced productivity of the local labor.	groups in Project opportunities and continual professional development of staff.				
		Assist local people having practical skills but lacking qualifications to obtain their certificates and thus increase their employment opportunities.				
		Support initiatives promoting a culture of learning in local communities.				
		Plan and implement training program for vulnerable groups to encourage their participation in economic opportunities created by the Project.				
		Assist employees and local communities to improve basic personal financial life skills through training and awareness campaigns, respectively.				
		Consider further training programs to prepare retrenched workers to seek employment in sectors not related to dam construction.				
23	Decrease in recreational and subsistence fishing due to increase in catch of fish following creation of favorable habitats for the fish in the Kunhar River.	Implementation of the BAP		Partial	The works-related measures have been taken by the EPC Contractor while for the protection measures in the Area of Management, contract signing with the Fisheries and Wildlife departments remains awaited till approval of the updated EIA report by the Project financiers.	Subsequent upon approval of the updated EIA report by the Project financiers on May 06, 2025, a meeting has been scheduled with the Wildlife and Fisheries departments on July 24, 2025 to discuss timelines for signing of contracts and initiation of field activities etc.
24	Loss of income from sand and gravel mining due to	Sediment Mining and Management Guidelines ²³ are prepared and will be implemented as a				

²³ The preparation of sediment mining and management guidelines are part of the BAP implementation as included in the EIA report.

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
	change in pattern of sediment deposition following construction of the dam.	part of the BAP, which will identify possible sand and gravel mining spots along the Kunhar River to meet community needs without harming the river ecology.				
25	Increase in population due to in-migration of job seekers (in-migrants) leading to pressure on existing social infrastructure and services in the Study Area.	Development of a Grievance Redressal Mechanism	\$			
		Encourage local communities to use the grievance procedure for concerns related to deterioration of local services.	\$			
		Support local government in the implementation of infrastructure projects.	\$			
		Support NGOs specializing in development of infrastructure to assist local government.	\$			
26	Disputes over distribution of Project employment within and between Study Area inhabitants and the in-migrants resulting in social unrest.	Implement PEDO Stakeholder Engagement Plan including: ② maintaining regular communication with local communities and other stakeholders to minimize tensions arising from Project activities; ② maintaining a grievance procedure, and encourage and facilitate stakeholders to use the mechanism to express concerns; and ② providing sufficient resources to the community relations officers to enable them to monitor negative perceptions and associated tensions, and to address them in a timely fashion.	\$			
27	Potential social unrest in the Study Area due to conflicting socio-cultural norms amongst the	Plaster the graves with mud or cement.	\$ ²⁴			
		If relocation of the graveyard cannot be avoided, it shall be managed through the local religious authorities.	\$			

²⁴ All 19 graves from the Sangar area (Employer's colony site) have been relocated. The contract for relocation of 184 graves from the dam site has been awarded, but the relocation at this site is yet to be initiated.

S/No	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
	inhabitants and in-migrants.					

5.7. Training

141. On April 25 and 26, the ADB organized a two-day training sessions at the project site focusing on: (i) Occupational Health and Safety (OHS), emphasizing the importance of maintaining a safe working environment, hazard identification, and preventive measures; and (ii) Core Labor Standards, highlighting key aspects of the labor rights.

142. To raise awareness on the importance of safety, health, and environment among employees and inform them of the control measures put in place to prevent workplace accidents and incidents, the EPC Contractor held regular toolbox talks at every work sites. The Contractor also provides documentary evidence (attendance sheets and pictures) of the toolbox talks in monthly HSE progress report.

143. As evident from the pictures given below, the EPC Contractor also provides regular training on emergency response and spill prevention.

Glimpses of Trainings and Toolbox Talks



OHS Training imparted by the ADB Safeguard staff.
(April 25, 2025)



Training on Core Labor Standards imparted by the
ADB Safeguard team. (April 26, 2025)



Group Photo of the Two-Day OHS Training Session
Participants (April 26, 2025)



TBT regarding work at height, and the use of suitable
PPE (April 14, 2025)



TBT about Electric Hazards in Confined Spaces and Safety Measures (April 30, 2025)



Spill Prevention Drill at the A2 Batching Site (April 15, 2025)

144. In pursuance of the EMP/SSEMP requirements and under the vocational training program, the EPC Contractor got admission of 18 students for the second training at the Government Skill Development Center Hassa Balakot. The students selected from the project-affected communities will be trained in computer operation and electrical trades. The training is expected to be completed in November 2025.

145. A total of 10 such training courses are planned during the currency of the contract, i.e., till December 2027. It is worthwhile to mention here that the EPC Contractor is providing pick-and-drop, lunch, and training materials to each student free of cost.

5.8. Complaints

146. During the reporting period, PIU received a total of five complaints regarding the HSE issues. **Table 5.10** exhibits a brief of the complaints and their current status. Scanned copies of the GRM register are in **Annexure 5**.

Table 5.10: HSE Complaints Status at the End of the Reporting Period

S/No	Complaint Receipt Date	Complainant	Nature of Complaint	Status
1.	January 17, 2025	Paras Village Community	Dismantling of N-15 road at the Dam Site ²⁵ .	Resolved
2.	January 22, 2025	Mian Nisar (Local Community member)	The house was damaged (cracks) due to blasting	Resolved
3.	January 27, 2025	Divisional Forest Office, Mansehra	Damages to the plantation in the acquired land	Resolved
4.	January 28, 2025	Locals of Sangar Village	Generation of dust due to construction activities and the movement of construction machinery on the unpaved road	Resolved
5.	February 17, 2025	M. Sadiq (Local)	Dumping of spoil on private land	Resolved

147. During the reporting period, the social section of the PIU received five complaints from locals. As shown in the scanned copy of the GRM register maintained by the PIU (**Annexure 5**), four of these complaints have been resolved, while one is in the resolution process.

²⁵ The EPC Contractor dismantled and reconstructed a section of N-15 road at the Dam Site to increase its capacity against movement of the heavy construction machinery.

6. FUNCTIONING OF THE SSEMP

6.1. SSEMP Review

148. Generally, the SSEMP serves the intended purpose of mitigating/minimizing risks associated with construction activities.

149. Various plans contained in the approved SSEMP, like pollution prevention, waste management, instrumental environmental monitoring, and health and safety plans, were satisfactorily implemented by the EPC Contractor.

150. The updated SSEMP (which remained under the PIU review till the end of the reporting period) contains the latest information regarding the EPC Contractor's camps, batching plants, access roads, sedimentation tanks, magazines, approved building demolition protocols, and the latest project salient features, maps, etc. Once consented by the ADB and AIIB, approval of the same will be intimated to the EPC Contractor.

7. GOOD PRACTICE AND OPPORTUNITY FOR IMPROVEMENT

7.1. Good Practices

151. The EPC Contractor's consultation with the local area community before planning the facilities for temporary works and spoil disposal is a good initiative. For example, the consultation conducted for the upstream inclined surge tunnel and powerhouse sites remained fruitful in the finalization of the lease contracts for these sites.

152. Upon successful completion of the first vocational training, the EPC Contractor enrolled 18 eligible students in computer and electrical trades in the Government Skill Development Centre Hassa Balakot, in May 2025. The training will be completed in November 2025. Upon successful completion of the six-month training, the EPC Contractor will be encouraged to employ these trained computer operators and electricians. In the long run, such training will help the trained youngsters earn their livelihood outside the project area and abroad, particularly in Middle Eastern countries where many Pakistanis are engaged in these professions. Furthermore, these training courses have created good working relations between the affected communities and the EPC Contractor.

153. To preserve the local norms and cultural values, the EPC Contractor provided veils (green shade nets) to the houses near the work area. This initiative of the EPC Contractor created a sense of norm protection in the community, resulting in conducive relations.

154. Organizing a champion program is one of the tools to encourage workers to consistently follow safety protocols and implement safety measures at work sites. During the reporting period, two HSE champion award ceremonies were held on April 18 and June 20, 2025, whereby cash prizes were awarded to 18 champions for the period from January through June 2025. This initiative is indeed a commendable practice to promote a safe environment at the worksite. It recognizes and empowers individuals within the workforce who display exceptional commitment and dedication to HSE practices. By establishing HSE champions, the organization encourages a culture of safety and empowers employees to take an active role in identifying and addressing potential hazards or risks. These champions serve as role models and ambassadors for safety, promoting best practices, conducting safety inspections, and fostering a collaborative approach to mitigate risks. The HSE champion program fosters increased awareness, engagement, and accountability among the workforce, leading to a safer work environment, reduced accidents, and improved overall well-being. Also, the initiative has encouraged the EPC Contractor's supervisors and other staff to get

more and more training and to adhere to the safety protocols so that they could win cash prizes at the end of each month.

7.2. Opportunities for Improvement

155. Although the EPC Contractor has steadily increased the number of HSE field officers from zero at the start of the project construction activities to 22 by the end of the current reporting period, still occurrence of 38 minor incidents during the current reporting period emphasizes the need for regular OHS training for these officers.

156. Although the EPC Contractor has created good working relations with the community by providing jobs and skilled development training, there is room for improvement in cementing such relations. This can be achieved through regular communication, addressing community concerns, and implementing social responsibility initiatives. For example, as there exist budgetary provisions for the welfare of the affected communities hence, the EPC Contractor shall consult the affected communities and shall devise plans to implement those measures on the ground.

157. The EPC Contractor also needs to hold informal meetings with the project area communities to appraise them regarding progress on the construction activities, planned interventions, and various issues requiring support from the community to resolve them. This engagement will certainly help the EPC Contractor and the Employer in resolving social issues, creating a conducive working environment, eliminating communication gaps, and instilling a sense of the importance of stakeholders. In this regard, the EPC Contractor can jointly work out plans with the NGO already on board.

158. To implement the tree plantation plan in the project area, the EPC Contractor should consult the affected communities for the plantation of saplings at the identification sites. The engagement of communities will be fruitful in the watch and ward of the planted saplings and will give them a sense of ownership. The initiative will also sensitise the project area communities to understand the impacts of climate change and the importance of tree plantation to cope with related challenges.

8. SUMMARY AND RECOMMENDATIONS

8.1. Summary

159. During the reporting period, the detailed engineering design, including the design of muck disposal areas, and review of the engineering, procurement, and construction (EPC) Contractor's method statements/technical reports, remained in progress. On-site, construction activities continued robustly at the dam site, residential colony, access roads, powerhouse site, and the headrace tunnel. Also, protection works and the establishment of a camp at the powerhouse sites remained in progress during the reporting period.

160. During the reporting period, ADB disclosed the SAEMR for July-December 2024 and the updated EIA report on its website on April 10 and May 23, 2025, respectively. Similarly, the SSEMP updated in light of the ADB review comments is under the PIU review and is expected to be submitted to the ADB and AIIB safeguard team in the first week of July 2025.

161. On February 05, 2025, the ADB Safeguard team conducted a site visit and held a meeting with the PIU and PMC HSE team. No major observations were recorded during the site visit. The minor observations recorded during the site visit include insufficient height of the generator stake at the powerhouse batching plant site and low light in the A-3 adit tunnel.

162. The two days training organized by the ADB on April 25 and 26, at the Project site on : (i) Occupational Health and Safety (OHS), emphasizing the importance of maintaining a safe working environment, hazard identification, and preventive measures; and (ii) Core Labor Standards, highlighting key aspects of the labor rights; remained quite fruitful.

163. The EPC Contractor's six-month vocational training program for eligible candidates from the project-affected community of Paras village, which began in May 2025 at the Government Skill Development Centre Hassa Balakot, will be completed in November 2025. A total of 18 students has been admitted to computer operation and the electrician trades.

164. During the reporting period, two HSE champion award ceremonies were held on April 18 and June 20, 2025, whereby cash prizes were awarded to 18 champions for the period from January through June 2025

165. Out of 76 non-compliances observed, 72 (95%) were resolved till the end of the reporting period, while rectification of the remaining non-compliances was in progress. The issues under observation for rectification or where improvement is needed include the implementation of an effective root cause analysis process to ensure that incidents and non-conformities are carefully investigated and preventive measures are properly established; improvement of emergency preparedness through regular drills, including fire evacuation and rescue scenarios; to build the response capacity of site personnel and improve coordination among emergency response teams.

166. For hazardous waste disposal, the EPC Contractor finally identified a firm, namely "M/S 3R Green Services (Waste Collector)" from Sindh province, and in February 2025, agreed to the collection and disposal of hazardous waste, including lubricants and plastic waste.

167. During the reporting period, a total of 38 minor incidents occurred at various work sites. Except in four instances, whereby the injured were hospitalized for a couple of days, most of the injured labors resumed their duties on the following days.

168. Although there was no vivid progress on the finalization of the design of sedimentation tanks and initiation of tree plantation in the project area, the PMC has taken these issues with the EPC Contractor and are expected to be resolved by the end of August 2025.

169. Based on the HSE team's recommendations, the PMC granted environmental consent to the spoil disposal areas identified for the upstream inclined surge tunnel and powerhouse sites. The engineering design of both sites remained in progress till the end of the reporting period.

170. After the ADB approval of the updated EIA report, PIU has scheduled a meeting with the Fisheries and Wildlife departments on July 24, 2025, to discuss timelines for signing of contracts and initiation of field activities, etc.

171. Delay in finalization of the sedimentation tanks design was one of the EEM observations recorded by the EEM during his site visit on February 20, 2025. He also advised the EPC Contractor to obtain NOCs for the construction activities at the powerhouse site and inform the nearby communities before undertaking blasting operations.

172. The EPC Contractor conducted quarterly instrumental environmental monitoring in March and June 2025 at the site, focusing on points identified in the SSEMP and near sensitive receptors. Although exceedances in particulate matter and gaseous emissions were recorded at a few locations during the first and second quarters, the recorded results mostly fell within the guiding values of NEQS and WHO.

173. **Table 8.1** exhibits the status of implementing the targets set in the previous SAEMR during the current reporting period.

Table 8.1: Implementation Status of Corrective Action(s) Proposed in the Previous SAEMR

S/No	Issue	Required Action ²⁶	Responsibility	Timing (Target Date)	Description of Resolution and Timing (Actual)	Reason(s) of delay/non-achievement and further Action Required with Time frame
1.	Procurement of services of a registered and certified hazardous waste collection and disposal firm.	The EPC Contractor shall identify and sign a contract with a registered and certified hazardous waste collection and disposal firm to dispose of the hazardous waste generated at camps and sites.	EPC Contractor	February 15, 2025	February 24, 2024	
2.	Partial implementation of the CAP transmitted to the EPC Contractor in October 2024	The gaps identified by the ADB safeguard team during the site audit in October 2024 shall be implemented in full.	EPC Contractor	February 25, 2025.	Although the EPC Contractor has rectified most of the gaps however, the installation of hard barricades and lights on the access road leading to the Main Camp are yet to be rectified.	
3.	Non-rectification of gaps identified as a result of the EPC Contractor's main camp environmental audit (Annexure 6).	The gaps identified as a result of the EPC Contractor's main camp environmental audit conducted during November 2024 shall be implemented in totality.	EPC Contractor	February 25, 2025	Except for the installation of fencing around the Pakistani section of the camp, the EPC Contractor has rectified all gaps.	
4.	Implementation of tree plantation plan	The EPC Contractor shall submit plan exhibiting tree plantation schedule, species to be planted, and sites where plantation will be undertaken.	EPC Contractor	January 31, 2025	January 27, 2025	

²⁶ Actions proposed in the previous SAEMR

174. The Corrective Action Plan in **Table 8.2** shows issues identified during the current monitoring period and actions proposed to resolve them within the given time frame.

Table 8.2: Corrective Action Plan against issues identified during the Current Monitoring Period

S/ No	Issue	Required Action	Responsibility	Timing (Target Dates)
1	Finalization of the sedimentation tank(s) design and construction	The EPC Contractor shall finalize the design of the sedimentation tank(s) and shall construct them at the site as per the approved design	EPC Contractor	August 25, 2025
2	Finalization of the spoil disposal site identification for the Dam site	The EPC Contractor shall identify a suitable spoil disposal area for the dam site and shall submit a proposal to the PMC for review.	EPC Contractor	August 15, 2025
3	Implementation of the left-over gaps identified in the CAPs	As intimated by the PMC, the EPC Contractor shall implement the remaining gaps identified in the CAPs, i.e. i. providence of hard barricading and proper lighting along the access road near the Paras Camp and elsewhere as noted in the caps. ii. installation of a fence around a section of the main camp where Pakistani employees of the EPC Contractor reside; and iii. concreting in the parking area at Adit-3 workshop	EPC Contractor	August 12, 2025

8.2. Recommendations

175. Given the increased number of accidents that occurred during the reporting period, the PMC's OHS team should conduct training sessions for the EPC Contractor's field health and safety officers. The number of participants in the annual OHS training should be increased.

176. Consequent upon approval of the updated EIA report, the PIU should regularly interact with the wildlife and fisheries department to start field activities under the Project-specific BAP in the area of management.

177. The EPC Contractor should implement the budgeted activities aimed at raising awareness and improving the well-being of the affected community. The EPC Contractor should proactively engage the community by organizing events where updates on project activities, progress, issues, and opportunities can be shared. Support from the PIU in organizing these events is recommended.

178. The EPC Contractor should hire those on a priority basis who have completed a six-month diploma in various trades under the project vocational training program. The PIU's perusal and facilitation in the matter is recommended.

ANNEXURES

Annexure 1: Minutes of HSE Weekly Progress Review Meeting (April 27, 2025)

S. No	Agenda Item	Action	Responsibility	Time Frame
1.	Accident Analysis: All accidents require a thorough root cause analysis.	The EPC contractor is required to verbally inform all incidents within 24 hours and submit the initial incident report to the PMC within two days and final within three days depend on the availability of the affected person as per instruction of ADB. Review and resubmit all incidents reports with proper immediate and root causes. The EPC contractor has indicated that their department is working to improve the effectiveness of reporting and controlling incidents. Still contractor need time to finalize all past incidents report.	EPC Contractor	Before 30 th , April, 2025 New Date 20 th June, 2025
2.	Medical Invoices: All medical invoices for the injured should be settled promptly.	Mr. Qaisar respond on the issue that no invoice has been pending till to date but if any then PMC and PEDO provide us to resolve. He also informed that CGGC engaged few hospitals on panel to provide treatment to the injured but if somebody go somewhere else than it will be difficult to verify their invoices. PMC and PEDO review this issue with the EPC contractor and verify the complainant criticize.	EPC Contractor	Before 30 th . March, 2025 New Date 20 th June 2025
3.	Confined Space attendant was not present at Adit-1 and diversion tunnel	PMC instructed to depute the confined space attendant at diversion tunnel too. Mr. Qi respond that we will instruct to the site in-charge for it. PMC also instructed to the GRC for the Confined space attendant at Adit-1 but their manager said we already deputed. PMC said Confined Space attendant should sit outside the tunnel not in the office. PEDO instructed to the CGGC to write a letter against the GRC non-conformances and CC to PMC and PEDO. GRC deputed a confined space attendant at the Adit-1 tunnel.	EPC Contractor	25 th . March, 2025 (Issue Closed)

S. No	Agenda Item	Action	Responsibility	Time Frame
4.	SSEMP Training: The SSEMP training will be conducted after April 18th, 2025. The training will include participation from both QA/QC and HSE staff.	PMC will prepare and deliver the training to the labor, staff and HSE professionals. It is also finalized that after Eid-ul-Fitar training will conduct by the PMC and PEDO. It was also decided for new hiring after induction training three days training will be provided by the senior workers to familiar the working environment of the site. Mr. Li Yong agreed to distribute HSE hand book to all workers. It was decided after the training of ADB that the SSEMP Training will be provided to the workers in the month of June 2025	EPC Contractor	18 th Feb, 2025 20 th June, 2025
5.	Third-Party Training on Rigging and Scaffolding: A third-party training session on Rigging and Scaffolding must be conducted.	PMC instructed to the contractor to arrange a third-party training for the proposed workers for rigging and scaffolding. Riggers and scaffolders should have third-party certificate before allow them to performance the said duty. EPC contractor agreed to provide third party trainings to all scaffolders and riggers. Mr. Irshad said that the institute has been selected and working on it.	EPC Contractor	06 th . March, 2025 30 th May 2025
6.	NOC Status Update: Provide an update on the status of NOCs for the Powerhouse Retaining Wall, N-15 Road, and Explosives, EPA and mineral department.	The EPC contractor stated that the matter is currently in process and Mr. Qaisar will be in better positioned to provide a response regarding this issue. PEDO confirmed that they will assist with the NOC-related matters. The EPC contractor expects to receive the Explosive NOC shortly. PEDO will also provide support for the NOC from the EPA and the mineral department. The admin department of the EPC contractor will address the NOC issues related to the NHA. Mr. Qaisar said and gave evidence to PEDO and PMC for the reminder of the NHA. EPC contractor said no need for the NOC of the retaining wall near main access tunnel. But DD PEDO said it is required to take from the concerned departments. Issue still pending. Work has been completed.	EPC Contractor	15 th , March, 2025 New Date 30 th . April 2025 (Issue Closed)

S. No	Agenda Item	Action	Responsibility	Time Frame
7	Wind Sock Installation: Wind sock was purchase but not installed on the site.	PMC has strictly instructed to the EPC contractor for installation of the wind socks tow on each site. Mr. Li Yond said within April it will be installed. Issue still pending.	EPC Contractor	20 th , March, 2025 New Date 30 th . April 2025 30 th May 2025
8.	Salaries of the laborers and HSE staff: It was reported that the salaries of the labor and HSE staff were deviated from one and other and most of the time salaries were decrease rather than increase without any valid reason.	DD PEDO and PMC will check the salary slips or record of the labor and the HSE staff at least last three months. DD PEDO said she will write a letter to the EPC contractor to submit the pay of the workers for resolving their complains. CGGC was not supporting to the PMC on the issue of salary slips.	EPC Contractor	20 th , March, 2025 Before 15 April 2025 30 th May 2025
9.	Performance and competency of the HSE officers: It is decided that the competency of the HSE officers need to verify by the PEDO and PMC.	PMC will arrange a competency test of all the HSE teams of the contractor and consider their field performance and past exposure. After Eid PMC will conduct the assessment exam of all HSE officer of CGGC and GRC. EPC contractor agreed principally for the improvement in the HSE department's performance. HSE assessment exam has been conducted. But some HSE officers intentionally escape by the assessment exam. PMC has decided to take action on the HSE officers who escape by the exam intentionally. It was decided to develop KPI of all HSE officers.	PMC and DEPO	20 th , March, 2025 New Date 30 th . April, 2025 (Issue Closed)
10.	KPI of all HSE officers.	KPI for all HSE officers has been finalized with the Contractor for further improving HSE culture. Following are the minimum KPI of all the HSE officers. 60 safe or unsafe act or condition will be reported by each HSE officer per month. TBT monitoring per Week. Deliver TBT 1/week OHS Training will conduct by each HSE officer 1/ Month OHS Drill conduct by each HSE officers 1/Month etc. Inspection and audit of equipment and operation. Etc. Mr. Haider will prepare KPI of all the HSE officers and submit to PMC for approval.	EPC Contractor	30 th May 2025

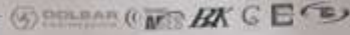
S. No	Agenda Item	Action	Responsibility	Time Frame
11.	NOC of magazine of Main Access tunnel, Adit-3 and dam site.	The EPC contractor responded that the NOC of magazine of the Main access tunnel and the dam is under progress. But Adit-3 is not using to store explosive and Mr. Hussain said this instruction already gave to the blasting team. Mr. Hussain of material department have informed that the Noc of dam and main access tunnel have been received but adit-3 magazine is not in use to store explosive.	EPC Contractor	30 th . April 2025 (Issue Closed)
12.	Sedimentation and Septic tank issue.	Technical department said no need to submit the design for approval to the PMC for any temporary work. PMC said its design must submit to the PMC for approval because it is paid to you. Mr. Asad will visit in next month to finalize the issue with the contractor.	EPC Contractor	30 th . April 2025 30 th May 2025
13.	Water Sprinkling and its record.	PMC instructed to the EPC contractor for the frequent sprinkling in dry season and maintain its record. After every sprinkling contractor should take verification by any PMC staff on site. It is followed said Mr. Irshad.	EPC Contractor	28 th . March 2025 (Issue Closed)
14.	Submission of the summer Contingency plan before summer. Winter contingency plan delay.	Mr. Irshad said I will come to PMC office and jointly finalize the summer plan. Mr. Li Yond said it is difficult to provide blankets and mattresses to the workers due to their complains of stiling. Hence Winter contingency plan is not updated on the instruction of the PMC comments. DD PEDO said if it is mentioned in the contract then the contractor is bond to provide it to the workers.	EPC Contractor PMC and PEDO	15 th . April 2025 (Issue Closed)
15.	Corrective action plan of ADB and EEM.	PMC discussed about the current position of the corrective action plan status. Mr. Li Yong marked and said most of them has been rectified. PMC said we will be verified after Eid.	EPC Contractor	15 th . April 2025
16.	Spoil Area of Dam and powerhouse site.	EPC contractor informed to the PMC and PEDO that the NESPAK is conduction technical evaluation of both spoil areas then after we will submit to the PMC for approval. Mr. Asad will visit in next month to finalize the issue with the contractor	EPC Contractor	30 th . April 2025 30 th May 2025

S. No	Agenda Item	Action	Responsibility	Time Frame
1	PPEs provision for the PMC and PEDO staff.	MD department has requested to the PMC for resubmission of the list of staff and required PPEs to them for providing it. Mr. Qi said I will also pursue it today by the MD department. PMC said today we will update the list and submit to the contractor. Updated list has been submitted to the contractor. PPEs sample has been 2 nd time finalized by the PMC but still pending to provide by material department of the EPC contractor.	EPC Contractor	15 th . April 2025 30 th May 2025
18.	16th. March incident and its investigation.	PMC instructed to the GRC for conducting transparent investigation of the incident and submit it to the PMC as soon as possible. PMC informed to the contractor that we will conduct the parallel investigation of the incident. PEDO and PMC disappointed on the delaying of the incident final investigation report by the GRC. Report has been submitted said Mr. Haider.	EPC Contractor	22 nd March 2025 (Issue Closed)
19.	Hemet for the motorbike riders are mandatory on site.	PMC instructed to the contractor to bond all the bike riders to use helmet on the site otherwise not allow to enter on site without helmet. Instruction has been giving to all workers on site.	EPC Contractor	25 th March 2025 (Issue Closed)
20.	GRC workers were working on site near permanent bridge paras without PPEs. ADB was highlighted issue to the PMC on 25th April 2025.	CGGC will write a letter against the violation of the GRC on urgent basis.	EPC Contractor	Immediately

Enclosed: Attendance sheet and Pictures

BALAKOT HPP CONSULTANTS

A JV of DOLBAR, AGES, BAK, CIV TECH, ELECTRA & TLO Consultants



HSE MEETING: LIST OF PARTICIPANTS

DATE: April 27, 2025

S. No	Name of Participants	Designation	Department	Signature
1	Syed Ali Farid	HSE EXPERT	PMC	[Signature]
2	Muhammad Saeed	Environmental Engineer	CGCL	[Signature]
3	Nasim-Us-Saeib	Environmental Officer	PMC	[Signature]
4	Ali Haider Shah	HSE OFFICER	CGCL	Ali

Annexure 2: Copies of Instrumental Environmental Monitoring

Ambient Air Monitoring Results (First Quarter, 2025)-Particulate Matters



AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Dam Site (Paras Valley)
Monitoring Date:	07-03-2025	Reporting Date:	22-03-2025
Source:	Ambient Air	Monitoring Instrument:	Henan Oceanus AQMS-09
GPS Coordinates:	34.660470, 73.455497		

GPS Coordinates: 34.600470, 73.435487

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		PM _{2.5}	PM ₁₀	PM _{2.5}	PM ₁₀
		Units			
	(µg/m ³)	(µg/m ³)			
1.	09:00 A.M	11.23	40.73	13.17 (µg/m ³)	30.24 (µg/m ³)
2.	10:00 A.M	11.64	21.50		
3.	11:00 A.M	14.75	40.52		
4.	12:00 P.M	11.33	36.21		
5.	01:00 P.M	10.46	24.64		
6.	02:00 P.M	14.63	35.64		
7.	03:00 P.M	14.34	37.15		
8.	04:00 P.M	12.56	44.71		
9.	05:00 P.M	13.28	35.39		
10.	06:00 P.M	16.27	31.42		
11.	07:00 P.M	10.34	33.57		
12.	08:00 P.M	13.34	26.78		
13.	09:00 P.M	14.85	29.83		
14.	10:00 P.M	12.44	17.73		
15.	11:00 P.M	14.63	22.92		
16.	12:00 A.M	11.12	30.82		
17.	01:00 A.M	13.23	23.83		
18.	02:00 A.M	13.91	30.63		
19.	03:00 A.M	09.46	20.62		
20.	04:00 A.M	11.14	25.63		
21.	05:00 A.M	14.34	41.82		
22.	06:00 A.M	16.64	23.59		
23.	07:00 A.M	14.73	20.72		
24.	08:00 A.M	15.43	29.40		
NEQSAA				35(µg/m ³)	150(µg/m ³)
WHO				15 (µg/m ³)	45 (µg/m ³)

NEQSAA: National Environmental Quality Standards for Ambient Air

WHO: World Health Organization

Note:

- Selected measurement units were $\mu\text{g}/\text{m}^3$ otherwise stated.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

Signature of Analyst:

Signature of Chief Chemist

FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

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Environmental Protection Agency (EPA-KPK) Certified



Integrated Environment Laboratory



AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MVV)	Monitoring Location:	Adit-1 (Thobi)
Monitoring Date:	12-03-2025	Reporting Date:	22-03-2025
Source:	Ambient Air	Monitoring Instrument:	Hiwan Oceanus AQMS-09
GPS Coordinates:	34.636125, 73.428597		

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		PM _{2.5}	PM ₁₀	PM _{2.5}	PM ₁₀
	Hours of Monitoring	Units	Units		
		($\mu\text{g}/\text{m}^3$)	($\mu\text{g}/\text{m}^3$)		
1.	09:00 A.M	28.7	73.02	21.38 ($\mu\text{g}/\text{m}^3$)	58.51 ($\mu\text{g}/\text{m}^3$)
2.	10:00 A.M	29.7	74.91		
3.	11:00 A.M	26.01	71.77		
4.	12:00 P.M	27.1	77.99		
5.	01:00 P.M	29.81	73.54		
6.	02:00 P.M	27.23	73.99		
7.	03:00 P.M	27.1	70.55		
8.	04:00 P.M	30.7	69.44		
9.	05:00 P.M	19.81	54.88		
10.	06:00 P.M	18.28	51.87		
11.	07:00 P.M	16.7	52.99		
12.	08:00 P.M	19.16	54.93		
13.	09:00 P.M	16.11	50.49		
14.	10:00 P.M	17.54	53.78		
15.	11:00 P.M	15.2	54.77		
16.	12:00 A.M	17.16	48.97		
17.	01:00 A.M	14.7	45.88		
18.	02:00 A.M	19.08	47.92		
19.	03:00 A.M	22.98	49.32		
20.	04:00 A.M	19.7	49.29		
21.	05:00 A.M	18.81	46.99		
22.	06:00 A.M	16.7	50.8		
23.	07:00 A.M	17.27	50.5		
24.	08:00 A.M	17.55	55.67		
NEQSAA				35($\mu\text{g}/\text{m}^3$)	150($\mu\text{g}/\text{m}^3$)
WHO				15 ($\mu\text{g}/\text{m}^3$)	45 ($\mu\text{g}/\text{m}^3$)

NEQSAA: National Environmental Quality Standards for Ambient Air

WHO: World Health Organization

Note:

- Selected measurement units were $\mu\text{g}/\text{m}^3$ otherwise stated.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

Signature of Analyst:

Signature of Chief Chemist



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Integrated Environment Laboratory



AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Adit-2 (Ghanool)
Monitoring Date:	08-03-2025	Reporting Date:	22-03-2025
Source:	Ambient Air	Monitoring Instrument:	Henan Oceanus AQMS-09
GPS Coordinates:	34.619787, 73.417525		

Sr. No	Time Hours of Monitoring	Parameters		Results (Average 24 Hrs)	
		PM _{2.5}	PM ₁₀	PM _{2.5}	PM ₁₀
		(µg/m ³)	(µg/m ³)		
1.	09:00 A.M	21.63	50.30	18.37 (µg/m ³)	41.17 (µg/m ³)
2.	10:00 A.M	22.73	40.66		
3.	11:00 A.M	24.62	48.51		
4.	12:00 P.M	19.43	47.93		
5.	01:00 P.M	23.83	34.63		
6.	02:00 P.M	14.73	35.78		
7.	03:00 P.M	18.83	33.86		
8.	04:00 P.M	22.78	49.57		
9.	05:00 P.M	17.57	41.12		
10.	06:00 P.M	22.84	33.43		
11.	07:00 P.M	13.62	40.56		
12.	08:00 P.M	18.73	39.55		
13.	09:00 P.M	18.78	32.90		
14.	10:00 P.M	14.76	31.50		
15.	11:00 P.M	15.93	36.59		
16.	12:00 A.M	16.57	37.38		
17.	01:00 A.M	15.83	39.64		
18.	02:00 A.M	12.64	39.57		
19.	03:00 A.M	19.74	57.92		
20.	04:00 A.M	20.37	29.37		
21.	05:00 A.M	12.78	40.18		
22.	06:00 A.M	14.29	40.37		
23.	07:00 A.M	20.65	48.46		
24.	08:00 A.M	17.30	58.39		
NEQSAA				35 (µg/m ³)	150(µg/m ³)
WHO				15 (µg/m ³)	45 (µg/m ³)

NEQSAA: National Environmental Quality Standards for Ambient Air
WHO: World Health Organization

Note:

- Selected measurement units were µg/m³ otherwise stated.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

Signature of Analyst:

Signature of Chief Chemist

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AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Adi-3 (Kholian)
Monitoring Date:	09-03-2025	Reporting Date:	22-03-2025
Source:	Ambient Air	Monitoring Instrument:	Henan Oceanus AQMS-09
GPS Coordinates:	34 610253.73 389367		

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		PM _{2.5}	PM ₁₀	PM _{2.5}	PM ₁₀
	Units				
	Hours of Monitoring	($\mu\text{g}/\text{m}^3$)	($\mu\text{g}/\text{m}^3$)		
1	09:00 A.M	20.52	25.67	15.23 ($\mu\text{g}/\text{m}^3$)	32.86 ($\mu\text{g}/\text{m}^3$)
2	10:00 A.M	18.46	33.67		
3	11:00 A.M	20.76	41.76		
4	12:00 P.M	15.76	45.97		
5	01:00 P.M	14.56	45.83		
6	02:00 P.M	18.56	47.47		
7	03:00 P.M	16.93	25.78		
8	04:00 P.M	14.42	25.76		
9	05:00 P.M	14.55	24.63		
10	06:00 P.M	12.69	36.27		
11	07:00 P.M	17.33	30.78		
12	08:00 P.M	14.64	44.56		
13	09:00 P.M	12.74	44.36		
14	10:00 P.M	17.47	29.78		
15	11:00 P.M	17.38	35.02		
16	12:00 A.M	12.39	23.65		
17	01:00 A.M	11.75	30.67		
18	02:00 A.M	11.78	25.89		
19	03:00 A.M	13.30	28.58		
20	04:00 A.M	13.67	28.23		
21	05:00 A.M	10.72	34.98		
22	06:00 A.M	12.78	24.03		
23	07:00 A.M	13.76	27.68		
24	08:00 A.M	18.68	27.56		
NEQSAA				35 ($\mu\text{g}/\text{m}^3$)	150($\mu\text{g}/\text{m}^3$)
WHO				15 ($\mu\text{g}/\text{m}^3$)	45 ($\mu\text{g}/\text{m}^3$)

NEQSAA: National Environmental Quality Standards for Ambient Air

WHO: World Health Organization

Note:

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Signature of Analyst

Signature of Chief Chemist

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AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Powerhouse (Barkot)
Monitoring Date:	10-03-2025	Reporting Date:	22-03-2025
Source:	Ambient Air	Monitoring Instrument:	Henan Oceanus AQMS-09
GPS Coordinates:	34 601812, 73.377145		

Source: GPS Coordinates: 34 601812, 73.377145

09

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		PM _{2.5}	PM ₁₀	PM _{2.5}	PM ₁₀
		Units			
		(µg/m ³)	(µg/m ³)		
1.	09:00 A.M	35.58	54.64	24.61 (µg/m ³)	49.30 (µg/m ³)
2.	10:00 A.M	23.57	55.81		
3.	11:00 A.M	23.74	45.82		
4.	12:00 P.M	22.64	39.09		
5.	01:00 P.M	20.56	42.01		
6.	02:00 P.M	25.79	49.40		
7.	03:00 P.M	26.45	50.01		
8.	04:00 P.M	22.96	39.58		
9.	05:00 P.M	23.54	50.50		
10.	06:00 P.M	23.50	39.20		
11.	07:00 P.M	25.27	59.40		
12.	08:00 P.M	25.06	56.84		
13.	09:00 P.M	23.26	42.57		
14.	10:00 P.M	23.73	55.70		
15.	11:00 P.M	25.56	55.45		
16.	12:00 A.M	25.45	59.21		
17.	01:00 A.M	23.04	44.48		
18.	02:00 A.M	25.98	42.65		
19.	03:00 A.M	30.19	58.84		
20.	04:00 A.M	19.41	44.22		
21.	05:00 A.M	18.36	49.75		
22.	06:00 A.M	21.10	43.25		
23.	07:00 A.M	31.35	44.71		
24.	08:00 A.M	24.53	60.01		
NEQSAA				35 (µg/m ³)	150(µg/m ³)
WHO				15 (µg/m ³)	45 (µg/m ³)

NEQSAA: National Environmental Quality Standards for Ambient Air
WHO: World Health Organization
Note:

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Signature of Analyst:

Signature of Chief Chemist

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Integrated Environment Laboratory



AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Tailrace Upstream (Barkot)
Monitoring Date:	11-03-2025	Reporting Date:	22-03-2025
Source:	Ambient Air	Monitoring Instrument:	Henan Oceanus AQMS-09
GPS Coordinates:	34.596088, 73.374512		

Sr. No	Time Hours of Monitoring	Parameters		Results (Average 24 Hrs)	
		PM _{2.5}	PM ₁₀	PM _{2.5}	PM ₁₀
		Units ($\mu\text{g}/\text{m}^3$)	Units ($\mu\text{g}/\text{m}^3$)		
1.	09:00 A.M	18.04	54.35	16.90 ($\mu\text{g}/\text{m}^3$)	55.68 ($\mu\text{g}/\text{m}^3$)
2.	10:00 A.M	26.47	64.32		
3.	11:00 A.M	25.09	47.05		
4.	12:00 P.M	16.78	62.34		
5.	01:00 P.M	27.03	50.31		
6.	02:00 P.M	25.22	52.13		
7.	03:00 P.M	14.23	43.95		
8.	04:00 P.M	13.83	52.43		
9.	05:00 P.M	14.23	48.76		
10.	06:00 P.M	13.14	72.27		
11.	07:00 P.M	12.54	55.52		
12.	08:00 P.M	13.74	58.31		
13.	09:00 P.M	14.35	48.45		
14.	10:00 P.M	14.06	51		
15.	11:00 P.M	11.73	61.32		
16.	12:00 A.M	10.23	52.35		
17.	01:00 A.M	11.56	62.04		
18.	02:00 A.M	10.44	50.16		
19.	03:00 A.M	15.04	69.69		
20.	04:00 A.M	21.32	52.95		
21.	05:00 A.M	16.99	59.05		
22.	06:00 A.M	14.64	65.59		
23.	07:00 A.M	22.22	50.43		
24.	08:00 A.M	22.72	51.57		
NEQSAA				35 ($\mu\text{g}/\text{m}^3$)	150($\mu\text{g}/\text{m}^3$)
WHO				15 ($\mu\text{g}/\text{m}^3$)	45 ($\mu\text{g}/\text{m}^3$)

NEQSAA: National Environmental Quality Standards for Ambient Air
WHO: World Health Organization

Note:

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Signature of Analyst:

Signature of Chief Chemist

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AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number:	BHPP/ENV/155-2025	Client Name:	COGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	GRC Camp Office (Sanghar)
Monitoring Date:	13-03-2025	Reporting Date:	22-03-2025
Source:	Ambient Air	Monitoring Instrument:	Henan Oceanus AQMS-09
GPS Coordinates:	34 584562, 73 373878		

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		PM _{2.5}	PM ₁₀	PM _{2.5}	PM ₁₀
	Hours of Monitoring	($\mu\text{g}/\text{m}^3$)	($\mu\text{g}/\text{m}^3$)		
1	09:00 A.M	13.87	43.4	13.78 ($\mu\text{g}/\text{m}^3$)	41.49 ($\mu\text{g}/\text{m}^3$)
2	10:00 A.M	15.71	52.85		
3	11:00 A.M	13.04	49.12		
4	12:00 P.M	10.38	43.65		
5	01:00 P.M	15.33	50.87		
6	02:00 P.M	12.65	43.62		
7	03:00 P.M	17.61	46.39		
8	04:00 P.M	14.94	48.89		
9	05:00 P.M	9.66	37.64		
10	06:00 P.M	6.23	32.41		
11	07:00 P.M	11.55	39.88		
12	08:00 P.M	19.51	41.01		
13	09:00 P.M	9.18	35.66		
14	10:00 P.M	14.13	44.58		
15	11:00 P.M	11.46	30.87		
16	12:00 A.M	16.4	31.49		
17	01:00 A.M	13.74	27.3		
18	02:00 A.M	11.08	29.48		
19	03:00 A.M	16.02	38.92		
20	04:00 A.M	13.36	35.47		
21	05:00 A.M	18.3	33.28		
22	06:00 A.M	15.64	52.39		
23	07:00 A.M	12.97	46.81		
24	08:00 A.M	17.34	59.68		
NEQSAA				35 ($\mu\text{g}/\text{m}^3$)	150 ($\mu\text{g}/\text{m}^3$)
WHO				15 ($\mu\text{g}/\text{m}^3$)	45 ($\mu\text{g}/\text{m}^3$)

NEQSAA: National Environmental Quality Standards for Ambient Air
WHO: World Health Organization

Note:

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Signature of Chief Chemist



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AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number:	BHPP/ENV/155-2025	Client Name:	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Colony Area (Sanghar)
Monitoring Date:	14-03-2025	Reporting Date:	22-03-2025
Source:	Ambient Air	Monitoring Instrument:	Henan Oceanus AQMS-09
GPS Coordinates:	34 587775 73 366225		

Sr. No	Time Hours of Monitoring	Parameters		Results (Average 24 Hrs)	
		PM _{2.5}	PM ₁₀	PM _{2.5}	PM ₁₀
		Units ($\mu\text{g}/\text{m}^3$)	Units ($\mu\text{g}/\text{m}^3$)		
1.	09:00 A.M	23.75	50.21	14.85 ($\mu\text{g}/\text{m}^3$)	37.56 ($\mu\text{g}/\text{m}^3$)
2.	10:00 A.M	14.79	41.89		
3.	11:00 A.M	28.03	28.18		
4.	12:00 P.M	17.05	53.65		
5.	01:00 P.M	14.41	39.92		
6.	02:00 P.M	27.65	65.39		
7.	03:00 P.M	16.67	51.68		
8.	04:00 P.M	14.03	77.1		
9.	05:00 P.M	18.95	63.41		
10.	06:00 P.M	8.32	20.25		
11.	07:00 P.M	5.67	22.57		
12.	08:00 P.M	10.61	16.36		
13.	09:00 P.M	7.95	34.31		
14.	10:00 P.M	12.87	17.45		
15.	11:00 P.M	10.23	46.06		
16.	12:00 A.M	7.57	41.41		
17.	01:00 A.M	12.51	57.8		
18.	02:00 A.M	9.86	14.63		
19.	03:00 A.M	20.49	23.29		
20.	04:00 A.M	12.13	9.86		
21.	05:00 A.M	17.06	12.67		
22.	06:00 A.M	20.1	9.57		
23.	07:00 A.M	9.14	24.44		
24.	08:00 A.M	16.67	79.28		
NEQSAA				35 ($\mu\text{g}/\text{m}^3$)	150 ($\mu\text{g}/\text{m}^3$)
WHO				15 ($\mu\text{g}/\text{m}^3$)	45 ($\mu\text{g}/\text{m}^3$)

NEQSAA: National Environmental Quality Standards for Ambient Air

WHO: World Health Organization

Note:

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Signature of Analyst:

Signature of Chief Chemist:


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Ambient Gaseous Monitoring Results (First Quarter, 2025)



Integrated Environment Laboratory



AMBIENT GASES MONITORING REPORT

Reference Number:	BHP/18 NV/155-2025	Client Name:	COCC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Dam Site (Paras Valley)
Monitoring Date:	07-03-2025	Reporting Date:	22-03-2025
Source:	Ambient Air Gases	Monitoring Instrument:	Henan Oceanus AQMS-09
GPS Coordinates:	34.660470, 73.455497		

Sr. No	Time	Parameters			
		CO	NO	NO ₂	SO ₂
	Hours	(mg/m ³)	(µg/m ³)	(µg/m ³)	(µg/m ³)
1	09:00 A.M	0.20	14.23	11.45	17.53
2	10:00 A.M	0.37	13.03	13.34	15.98
3	11:00 A.M	0.25	10.72	13.53	18.63
4	12:00 P.M	0.26	12.26	14.75	8.67
5	01:00 P.M	0.25	14.50	14.45	13.07
6	02:00 P.M	0.24	10.45	14.25	16.63
7	03:00 P.M	0.28	12.69	10.73	12.95
8	04:00 P.M	0.28	8.62	20.94	10.54
9	05:00 P.M	0.20	13.24	13.34	15.81
10	06:00 P.M	0.23	10.95	12.62	10.67
11	07:00 P.M	0.23	12.33	12.62	14.77
12	08:00 P.M	0.22	13.46	13.72	8.83
13	09:00 P.M	0.27	12.35	17.45	9.73
14	10:00 P.M	0.34	11.73	13.63	9.38
15	11:00 P.M	0.21	10.66	15.63	10.83
16	12:00 A.M	0.23	9.80	15.24	11.16
17	01:00 A.M	0.14	9.82	13.64	12.46
18	02:00 A.M	0.24	11.67	18.34	13.46
19	03:00 A.M	0.34	8.50	14.83	12.88
20	04:00 A.M	0.19	12.44	15.46	17.83
21	05:00 A.M	0.25	14.57	13.61	20.32
22	06:00 A.M	0.33	13.22	16.45	22.63
23	07:00 A.M	0.33	13.73	20.36	15.68
24	08:00 A.M	0.21	14.33	21.92	14.94
Average Concentration		0.26	12.06	15.10	13.97
NEQSAA		05	40	80	120
WHO		04	---	25	40

NEQSAA: National Environmental Quality Standards for Ambient Air
WHO: World Health Organization

Note:

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Signature of Analyst:

Signature of Chief Chemist



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AMBIENT GASES MONITORING REPORT

Reference Number:	BHPP/ENV/155-2025	Client Name:	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Adit-1 (Thobi)
Monitoring Date:	12-03-2025	Reporting Date:	22-03-2025
Source:	Ambient Air Gases	Monitoring Instrument:	Henan Oceanus AQMS-09
GPS Coordinates:	34.636125, 73.428597		

Sr. No	Time	Parameters			
		CO	NO	NO ₂	SO ₂
	Hours	(mg/m ³)	(µg/m ³)	(µg/m ³)	(µg/m ³)
1	09:00 A.M	0.12	10.83	15.17	13.29
2	10:00 A.M	0.40	9.60	15.12	15.20
3	11:00 A.M	0.51	12.83	16.87	18.35
4	12:00 P.M	0.52	10.19	19.42	16.56
5	01:00 P.M	0.31	12.55	15.54	17.29
6	02:00 P.M	0.26	14.25	17.81	13.34
7	03:00 P.M	0.44	12.19	17.89	10.99
8	04:00 P.M	0.13	7.83	14.32	18.02
9	05:00 P.M	0.31	12.38	16.88	14.19
10	06:00 P.M	0.16	12.62	16.75	15.38
11	07:00 P.M	0.63	9.29	17.32	11.20
12	08:00 P.M	0.10	9.95	17.94	18.02
13	09:00 P.M	0.66	9.01	16.08	15.20
14	10:00 P.M	0.67	10.74	16.11	18.00
15	11:00 P.M	0.14	13.42	15.16	13.36
16	12:00 A.M	0.56	7.47	14.31	15.84
17	01:00 A.M	0.31	13.91	19.01	12.16
18	02:00 A.M	0.59	8.49	15.95	19.55
19	03:00 A.M	0.35	7.74	17.05	16.57
20	04:00 A.M	0.11	14.46	15.57	18.41
21	05:00 A.M	0.28	13.82	16.76	11.34
22	06:00 A.M	0.09	14.35	19.27	12.65
23	07:00 A.M	0.39	8.27	13.83	11.94
24	08:00 A.M	0.35	10.80	15.56	15.12
Average Concentration		0.51	11.46	13.06	12.18
NEQSAA		05	40	80	120
WHO		04	---	25	40

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WHO: World Health Organization

Note:

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Signature of Analyst:

Signature of Chief Chemist:



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AMBIENT GASES MONITORING REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Adit-2 (Ghanool)
Monitoring Date:	08-03-2025	Reporting Date:	22-03-2025
Source:	Ambient Air Gases	Monitoring Instrument:	Henan Oceanus AQMS-09
GPS Coordinates:	34.619787, 73.417525		

Sr. No	Time	Parameters			
		CO	NO	NO ₂	SO ₂
	Hours	(mg/m ³)	(µg/m ³)	(µg/m ³)	(µg/m ³)
1	09:00 A.M	0.68	12.40	12.65	10.73
2	10:00 A.M	0.50	12.34	12.48	14.17
3	11:00 A.M	0.54	11.36	12.63	13.46
4	12:00 P.M	0.45	13.97	12.41	17.58
5	01:00 P.M	0.12	11.47	11.72	16.56
6	02:00 P.M	0.34	13.62	12.08	10.32
7	03:00 P.M	0.43	14.34	12.93	14.34
8	04:00 P.M	0.23	10.03	12.64	15.45
9	05:00 P.M	0.33	12.95	14.63	14.74
10	06:00 P.M	0.32	13.11	17.34	13.91
11	07:00 P.M	0.54	10.19	15.45	9.62
12	08:00 P.M	0.31	12.34	11.56	13.63
13	09:00 P.M	0.26	9.65	14.54	11.68
14	10:00 P.M	0.44	10.24	14.55	11.45
15	11:00 P.M	0.23	12.92	12.03	13.74
16	12:00 A.M	0.43	13.14	12.13	12.34
17	01:00 A.M	0.32	13.72	15.64	14.34
18	02:00 A.M	0.23	12.98	15.14	14.45
19	03:00 A.M	0.25	9.84	14.07	9.45
20	04:00 A.M	0.43	12.65	15.36	15.24
21	05:00 A.M	0.28	13.52	17.36	15.57
22	06:00 A.M	0.43	11.65	26.63	11.47
23	07:00 A.M	0.47	11.54	16.63	12.54
24	08:00 A.M	0.83	12.23	14.99	10.98
Average Concentration		0.39	12.18	14.48	13.24
NEQSAA		05	40	80	120
WHO		04	—	25	40

NEQSAA: National Environmental Quality Standards for Ambient Air
WHO: World Health Organization

Note:

- Selected measurement units were µg/m³ & mg/m³ otherwise stated.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

[Signature]
Signature of Analyst

[Signature]
Signature of Chemist



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AMBIENT GASES MONITORING REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Adit-3 (Kholian)
Monitoring Date:	09-03-2025	Reporting Date:	22-03-2025
Source:	Ambient Air Gases	Monitoring Instrument:	Henan Oceanus AQMS-09
GPS Coordinates:	34.610253, 73.389367		

Sr. No	Time	Parameters			
		CO	NO	NO ₂	SO ₂
	Hours	(mg/m ³)	(µg/m ³)	(µg/m ³)	(µg/m ³)
1.	09:00 A.M	0.29	16.34	22.62	22.62
2.	10:00 A.M	0.39	13.45	23.83	20.93
3.	11:00 A.M	0.27	13.34	17.92	22.62
4.	12:00 P.M	0.24	14.34	17.72	19.34
5.	01:00 P.M	0.35	13.64	23.72	19.45
6.	02:00 P.M	0.25	11.34	24.62	18.71
7.	03:00 P.M	0.31	15.74	18.62	18.99
8.	04:00 P.M	0.27	13.63	18.73	23.63
9.	05:00 P.M	0.32	13.97	19.72	18.98
10.	06:00 P.M	0.33	16.45	19.62	23.72
11.	07:00 P.M	0.37	14.35	20.43	21.51
12.	08:00 P.M	0.27	13.09	22.45	21.13
13.	09:00 P.M	0.48	13.83	18.45	17.36
14.	10:00 P.M	0.27	17.62	22.62	19.61
15.	11:00 P.M	0.47	12.34	13.99	22.30
16.	12:00 A.M	0.24	16.56	23.45	18.34
17.	01:00 A.M	0.42	17.45	20.65	22.34
18.	02:00 A.M	0.25	14.38	19.62	22.71
19.	03:00 A.M	0.28	15.23	21.45	24.21
20.	04:00 A.M	0.38	17.74	19.49	18.43
21.	05:00 A.M	0.29	12.35	19.72	19.94
22.	06:00 A.M	0.38	14.48	18.52	18.35
23.	07:00 A.M	0.27	13.24	22.72	22.35
24.	08:00 A.M	0.29	17.72	22.61	22.23
		0.32	14.69	20.55	20.87
Average Concentration		05	40	80	120
NEQSAA		04	---	25	40
WHO		04	---	25	40

NEQSAA: National Environmental Quality Standards for Ambient Air
WHO: World Health Organization

Note:

- Selected measurement units were µg/m³ & mg/m³ otherwise stated.
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Signature of Analyst

Signature of Chief Chemist



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AMBIENT GASES MONITORING REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Powerhouse (Barkot)
Monitoring Date:	10-03-2025	Reporting Date:	22-03-2025
Source:	Ambient Air Gases	Monitoring Instrument:	Henan Oceanus AQMS-09
GPS Coordinates:	34.601812, 73.377145		

Sr. No	Time	Parameters			
		CO	NO	NO ₂	SO ₂
	Hours	(mg/m ³)	(µg/m ³)	(µg/m ³)	(µg/m ³)
1.	09:00 A.M	0.30	12.34	16.81	13.57
2.	10:00 A.M	0.45	13.34	18.71	12.45
3.	11:00 A.M	0.34	11.34	15.91	13.98
4.	12:00 P.M	0.34	14.62	20.81	14.91
5.	01:00 P.M	0.40	14.62	19.81	14.54
6.	02:00 P.M	0.20	12.61	19.77	11.61
7.	03:00 P.M	0.25	12.52	13.71	16.30
8.	04:00 P.M	0.34	14.61	13.71	13.75
9.	05:00 P.M	0.38	13.79	14.72	12.90
10.	06:00 P.M	0.40	13.12	14.91	13.12
11.	07:00 P.M	0.38	12.51	14.81	16.91
12.	08:00 P.M	0.24	14.19	18.87	14.89
13.	09:00 P.M	0.26	14.61	17.81	11.45
14.	10:00 P.M	0.45	14.61	15.63	13.34
15.	11:00 P.M	0.34	15.61	14.71	14.90
16.	12:00 A.M	0.52	13.51	10.65	17.11
17.	01:00 A.M	0.35	15.78	19.72	13.59
18.	02:00 A.M	0.82	14.61	15.55	17.81
19.	03:00 A.M	0.22	10.71	18.01	15.77
20.	04:00 A.M	0.55	13.81	13.91	13.71
21.	05:00 A.M	0.34	12.91	15.71	15.48
22.	06:00 A.M	0.26	10.51	13.81	12.77
23.	07:00 A.M	0.43	14.76	13.73	11.61
24.	08:00 A.M	0.33	15.90	13.09	14.80
Average Concentration		0.37	13.62	16.04	14.23
NEQSAA		05	40	80	120
WHO		04	—	25	40

NEQSAA: National Environmental Quality Standards for Ambient Air
WHO: World Health Organization

Note:

- Selected measurement units were µg/m³ & mg/m³ otherwise stated.
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[Signature]
Signature of Analyst

[Signature]
Signature of Chief Chemist



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AMBIENT GASES MONITORING REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Tailrace Upstream (Barkot)
Monitoring Date:	11-03-2025	Reporting Date:	22-03-2025
Source:	Ambient Air Gases	Monitoring Instrument:	Henan Oceanus AQMS-09
GPS Coordinates:	34.596088, 73.374512		

Sr. No	Time	Parameters			
		CO	NO	NO ₂	SO ₂
		Units			
	Hours	(mg/m ³)	(µg/m ³)	(µg/m ³)	(µg/m ³)
1	09:00 A.M	0.58	11.37	22.46	13.23
2	10:00 A.M	0.41	12.44	25.47	17.38
3	11:00 A.M	0.53	19.45	19.48	14.27
4	12:00 P.M	0.55	17.51	18.77	16.10
5	01:00 P.M	0.34	12.43	23.46	12.45
6	02:00 P.M	0.44	12.49	19.54	13.47
7	03:00 P.M	0.38	14.83	12.30	18.46
8	04:00 P.M	0.38	14.46	18.56	16.75
9	05:00 P.M	0.51	10.34	15.87	16.47
10	06:00 P.M	0.32	13.67	22.23	11.17
11	07:00 P.M	0.25	12.37	26.46	14.68
12	08:00 P.M	0.45	12.12	14.56	14.47
13	09:00 P.M	0.31	14.53	13.57	12.46
14	10:00 P.M	0.43	12.34	11.37	12.25
15	11:00 P.M	0.36	11.74	15.45	12.36
16	12:00 A.M	0.35	13.17	16.96	14.31
17	01:00 A.M	0.46	10.29	19.36	16.98
18	02:00 A.M	0.36	13.20	15.79	15.97
19	03:00 A.M	0.46	13.35	22.56	14.81
20	04:00 A.M	0.46	16.36	14.07	14.51
21	05:00 A.M	0.36	14.59	18.43	15.43
22	06:00 A.M	0.64	13.47	14.26	16.48
23	07:00 A.M	0.68	16.83	17.46	17.47
24	08:00 A.M	0.73	17.47	25.27	19.73
Average Concentration		0.45	13.78	18.49	15.07
NEQSAA		05	40	80	120
WHO		04	—	25	40

NEQSAA: National Environmental Quality Standards for Ambient Air
WHO: World Health Organization

Note:

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Signature of Analyst:

Signature of Chief Chemist



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AMBIENT GASES MONITORING REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	GRC Camp Office (Sanghar)
Monitoring Date:	13-03-2025	Reporting Date:	22-03-2025
Source:	Ambient Air Gases	Monitoring Instrument:	Henan Oceanus AQMS-09
GPS Coordinates:	34.584562, 73.373878		

Sr. No	Time	Parameters			
		CO	NO	NO ₂	SO ₂
		Units			
	Hours	(mg/m ³)	(µg/m ³)	(µg/m ³)	(µg/m ³)
1.	09:00 A.M	0.39	9.69	13.43	11.13
2.	10:00 A.M	0.47	11.7	14.45	11.78
3.	11:00 A.M	0.34	6.72	11.93	10.17
4.	12:00 P.M	0.58	12.73	14.97	12.11
5.	01:00 P.M	0.37	11.51	14.35	11.71
6.	02:00 P.M	0.32	6.55	11.84	10.11
7.	03:00 P.M	0.37	10.55	11.88	10.05
8.	04:00 P.M	0.25	5.59	9.37	8.45
9.	05:00 P.M	0.21	6.96	10.06	8.89
10.	06:00 P.M	0.34	10.37	11.78	9.99
11.	07:00 P.M	0.16	5.41	9.28	6.39
12.	08:00 P.M	0.19	4.2	8.66	8
13.	09:00 P.M	0.14	10.17	11.68	9.93
14.	10:00 P.M	0.15	8.95	11.06	9.53
15.	11:00 P.M	0.09	11.21	12.21	10.26
16.	12:00 A.M	0.07	9.98	11.58	9.86
17.	01:00 A.M	0.1	5.03	9.08	8.27
18.	02:00 A.M	0.12	11.03	12.12	10.2
19.	03:00 A.M	0.25	9.8	11.48	9.79
20.	04:00 A.M	0.18	4.85	8.98	8.2
21.	05:00 A.M	0.22	10.85	12.02	9.74
22.	06:00 A.M	0.24	5.89	9.52	8.54
23.	07:00 A.M	0.39	6.67	11.9	10.14
24.	08:00 A.M	0.42	12.67	14.93	12.09
Average Concentration		0.27	8.71	11.61	9.89
NEQSAA		05	40	80	120
WHO		04	—	25	40

NEQSAA: National Environmental Quality Standards for Ambient Air
WHO: World Health Organization

Note:

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[Signature]
Signature of Analyst:

[Signature]
Signature of Chief Chemist



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AMBIENT GASES MONITORING REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Colony Area (Snaghar)
Monitoring Date:	14-03-2025	Reporting Date:	22-03-2025
Source:	Ambient Air Gases	Monitoring Instrument:	Henan Oceanus AQMS-09
GPS Coordinates:	34 587775, 73 366225		

Sr. No	Time	Parameters			
		CO	NO	NO ₂	SO ₂
		Units			
	Hours	(mg/m ³)	(µg/m ³)	(µg/m ³)	(µg/m ³)
1.	09:00 A.M	0.55	7.09	12.57	11.28
2.	10:00 A.M	0.63	6.36	9.34	9.22
3.	11:00 A.M	0.39	7.29	12.38	11.15
4.	12:00 P.M	0.33	6.84	11.76	10.76
5.	01:00 P.M	0.42	6.19	9.25	9.16
6.	02:00 P.M	0.59	11	11.68	10.71
7.	03:00 P.M	0.42	7.23	9.79	9.5
8.	04:00 P.M	0.40	6.01	9.17	9.1
9.	05:00 P.M	0.58	8.27	10.31	9.84
10.	06:00 P.M	0.39	7.06	9.7	9.45
11.	07:00 P.M	0.51	5.84	9.08	9.05
12.	08:00 P.M	0.49	8.11	10.24	9.6
13.	09:00 P.M	0.51	6.9	9.62	9
14.	10:00 P.M	0.53	9.14	10.76	10.14
15.	11:00 P.M	0.59	7.94	10.15	9.74
16.	12:00 A.M	0.56	6.72	9.53	9.36
17.	01:00 A.M	0.59	8.98	10.69	10.09
18.	02:00 A.M	0.54	7.77	10.07	9.69
19.	03:00 A.M	0.50	6.65	11.2	10.42
20.	04:00 A.M	0.59	8.81	10.6	10.03
21.	05:00 A.M	0.40	6.4	9.37	9.25
22.	06:00 A.M	0.44	9.84	11.12	10.37
23.	07:00 A.M	0.48	8.63	10.51	9.59
24.	08:00 A.M	0.47	10.86	11.63	9.19
Average Concentration		0.50	7.75	10.44	9.83
NEQSAA		05	40	80	120
WHO		04	—	25	40

NEQSAA: National Environmental Quality Standards for Ambient Air
WHO: World Health Organization

Note:

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Signature of Analyst:

Signature of Chief Chemist



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Ambient Noise level Results (First Quarter, 2025)



AMBIENT NOISE MONITORING REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Dam Site (Paras Valley)
Monitoring Date:	07-03-2025	Reporting Date:	22-03-2025
Source:	Ambient Noise	Monitoring Instrument:	Noise Meter-IEC651-Type-2
GPS Coordinates:	34.660470, 73.455497		

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	09:00 A.M	dB(A)	59.7	60.8	60.25
2.	10:00 A.M		59.5	60.7	60.10
3.	11:00 A.M		58.9	60.2	59.55
4.	12:00 P.M		58.7	60.0	59.35
5.	01:00 P.M		57.1	59.2	58.15
6.	02:00 P.M		56.9	58.2	57.55
7.	03:00 P.M		56.8	56.9	56.85
8.	04:00 P.M		56.4	56.7	56.55
9.	05:00 P.M		56.0	55.8	55.90
10.	06:00 P.M		55.1	55.4	55.25
11.	07:00 P.M		53.0	54.9	53.95
12.	08:00 P.M		52.6	54.7	53.65
13.	09:00 P.M		52.2	54.5	53.35
14.	10:00 P.M		51.7	54.3	53.00
15.	11:00 P.M		51.1	53.2	52.15
16.	12:00 A.M		49.1	53.2	51.15
17.	01:00 A.M		48.8	52.3	50.55
18.	02:00 A.M		48.6	51.8	50.20
19.	03:00 A.M		48.4	50.8	49.60
20.	04:00 A.M		47.7	50.8	49.25
21.	05:00 A.M		47.5	50.8	49.15
22.	06:00 A.M		47.3	49.6	48.45
23.	07:00 A.M		46.6	49.5	48.05
24.	08:00 A.M		45.8	49.0	47.40

NEQS limit : 45-55 dB
WHO limit: 70 dB

NEQS: National Environmental Quality Standards WHO: World Health Organization
Leq: Log Equivalent Continuous Sound Level

Note:

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[Signature]
Signature of Analyst

[Signature]
Signature of Chief Chemist



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AMBIENT NOISE MONITORING REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Adit-1 (Thobi)
Monitoring Date:	12-03-2025	Reporting Date:	22-03-2025
Source:	Ambient Noise	Monitoring Instrument:	Noise Meter-IEC651- Type-2
GPS Coordinates:	34 636125, 73 428597		

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	09:00 A.M	dB(A)	64.3	55.7	60.0
2.	10:00 A.M		62.8	54.4	58.6
3.	11:00 A.M		63.9	55.3	59.6
4.	12:00 P.M		64.3	52.4	58.4
5.	01:00 P.M		63.9	55.5	59.7
6.	02:00 P.M		55.8	52.6	54.2
7.	03:00 P.M		56.4	52.5	54.5
8.	04:00 P.M		56.5	52.3	54.4
9.	05:00 P.M		54.3	51.8	53.1
10.	06:00 P.M		56.4	52.4	54.4
11.	07:00 P.M		53.5	56.5	55.0
12.	08:00 P.M		54.5	50.3	52.4
13.	09:00 P.M		53.7	46.5	50.1
14.	10:00 P.M		54.2	48.5	51.4
15.	11:00 P.M		52.1	48.5	50.3
16.	12:00 A.M		52.4	51.4	51.9
17.	01:00 A.M		52.6	47.3	50.0
18.	02:00 A.M		51.4	46.7	49.1
19.	03:00 A.M		50.3	44.5	47.4
20.	04:00 A.M		51.4	45.8	48.6
21.	05:00 A.M		46.4	45.5	46.0
22.	06:00 A.M		49.4	44.5	47.0
23.	07:00 A.M		49.6	47.5	48.6
24.	08:00 A.M		46.8	43.9	45.4

NEQS limit : 45-55 dB

WHO limit: 70 dB

NEQS: National Environmental Quality Standards WHO: World Health Organization
Leq: Log Equivalent Continuous Sound Level

Note:

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Signature of Analyst:

Signature of Chief Chemist



FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

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AMBIENT NOISE MONITORING REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Adit-2 (Ghanool)
Monitoring Date:	08-03-2025	Reporting Date:	22-03-2025
Source:	Ambient Noise	Monitoring Instrument:	Noise Meter-IEC651-Type-2
GPS Coordinates:	34.619787, 73.417525		

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	09:00 A.M	dB(A)	60.1	66.0	63.1
2.	10:00 A.M		59.2	65.3	62.2
3.	11:00 A.M		58.1	64.8	61.5
4.	12:00 P.M		58.9	64.6	60.8
5.	01:00 P.M		58.7	63.4	60.1
6.	02:00 P.M		58.1	63.1	59.6
7.	03:00 P.M		55.7	62.6	59.2
8.	04:00 P.M		54.7	62.4	58.6
9.	05:00 P.M		53.2	60.3	56.8
10.	06:00 P.M		51.3	57.5	54.4
11.	07:00 P.M		50.6	55.7	53.2
12.	08:00 P.M		50.6	55.8	53.1
13.	09:00 P.M		50.2	55.2	52.7
14.	10:00 P.M		49.3	54.5	51.9
15.	11:00 P.M		49.0	52.8	50.9
16.	12:00 A.M		48.7	50.8	49.7
17.	01:00 A.M		45.4	50.1	47.7
18.	02:00 A.M		45.0	49.0	47.0
19.	03:00 A.M		43.1	47.1	45.1
20.	04:00 A.M		42.5	47.0	44.7
21.	05:00 A.M		41.6	46.4	44.0
22.	06:00 A.M		41.0	46.2	43.6
23.	07:00 A.M		40.9	45.8	43.3
24.	08:00 A.M		40.5	44.4	42.5

NEQS limit : 45-55 dB

WHO limit: 70 dB

NEQS: National Environmental Quality Standards WHO: World Health Organization

Leq: Log Equivalent Continuous Sound Level

Note:

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Signature of Analyst

Signature of Chief Chemist

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AMBIENT NOISE MONITORING REPORT

Reference Number:	BHPP/ENV155-2025	Client Name:	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Adit-3 (Kholian)
Monitoring Date:	09-03-2025	Reporting Date:	22-03-2025
Source:	Ambient Noise	Monitoring Instrument:	Noise Meter-IEC651-Type-2
GPS Coordinates:	34 610253.73 389367		

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	09:00 A.M	dB(A)	60.4	67.1	63.7
2.	10:00 A.M		60.2	65.9	63.0
3.	11:00 A.M		59.3	65.4	62.4
4.	12:00 P.M		59.1	64.2	61.7
5.	01:00 P.M		58.9	62.5	60.7
6.	02:00 P.M		58.0	61.2	59.6
7.	03:00 P.M		57.9	59.9	58.9
8.	04:00 P.M		57.8	59.7	58.8
9.	05:00 P.M		56.6	55.8	56.2
10.	06:00 P.M		55.1	55.1	55.1
11.	07:00 P.M		53.5	53.9	53.7
12.	08:00 P.M		50.1	51.9	51.0
13.	09:00 P.M		49.2	51.4	50.3
14.	10:00 P.M		48.6	50.6	49.6
15.	11:00 P.M		45.9	50.2	48.0
16.	12:00 A.M		45.2	50.1	47.7
17.	01:00 A.M		45.0	49.8	47.4
18.	02:00 A.M		44.8	49.5	47.2
19.	03:00 A.M		44.7	48.7	46.7
20.	04:00 A.M		43.0	47.6	45.3
21.	05:00 A.M		42.5	47.2	44.9
22.	06:00 A.M		41.2	46.3	43.7
23.	07:00 A.M		40.8	46.3	43.5
24.	08:00 A.M		40.6	45.2	42.9

NEQS limit : 45-55 dB
WHO limit: 70 dB

NEQS: National Environmental Quality Standards WHO: World Health Organization
Leq: Log Equivalent Continuous Sound Level

Note:

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AMBIENT NOISE MONITORING REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Powerhouse (Barkot)
Monitoring Date:	10-03-2025	Reporting Date:	22-03-2025
Source:	Ambient Noise	Monitoring Instrument:	Noise Meter-IEC651-Type-2
GPS Coordinates:	34.601812, 73.377145		

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leg
1.	09:00 A.M	dB(A)	59.2	65.8	62.5
2.	10:00 A.M		58.8	65.1	61.9
3.	11:00 A.M		58.7	64.8	61.7
4.	12:00 P.M		58.3	64.5	61.4
5.	01:00 P.M		55.9	64.1	60.0
6.	02:00 P.M		53.9	62.8	58.3
7.	03:00 P.M		53.3	61.4	57.4
8.	04:00 P.M		53.1	60.6	56.8
9.	05:00 P.M		52.8	59.1	55.9
10.	06:00 P.M		52.5	58.1	55.3
11.	07:00 P.M		52.0	57.0	54.5
12.	08:00 P.M		51.2	55.6	53.4
13.	09:00 P.M		50.3	54.3	52.3
14.	10:00 P.M		50.0	53.1	51.5
15.	11:00 P.M		48.4	52.7	50.6
16.	12:00 A.M		48.4	51.9	50.1
17.	01:00 A.M		45.8	50.7	48.3
18.	02:00 A.M		45.7	50.3	48.0
19.	03:00 A.M		44.1	50.0	47.0
20.	04:00 A.M		45.2	49.6	46.8
21.	05:00 A.M		43.9	47.9	45.9
22.	06:00 A.M		42.8	46.6	44.7
23.	07:00 A.M		42.7	44.3	43.5
24.	08:00 A.M		40.9	44.2	42.6

NEQS limit : 45-55 dB

WHO limit: 70 dB

NEQS: National Environmental Quality Standards WHO: World Health Organization
Leq: Log Equivalent Continuous Sound Level

Note:

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AMBIENT NOISE MONITORING REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Tailrace Upstream (Barkot)
Monitoring Date:	11-03-2025	Reporting Date:	22-03-2025
Source:	Ambient Noise	Monitoring Instrument:	Noise Meter-IEC651-Type-2
GPS Coordinates:	34.596088, 73.374512		

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	09:00 A.M	dB(A)	47.7	55.1	51.4
2.	10:00 A.M		47.0	54.3	50.6
3.	11:00 A.M		46.7	53.7	50.2
4.	12:00 P.M		46.3	53.3	49.8
5.	01:00 P.M		46.3	53.0	49.6
6.	02:00 P.M		45.9	51.6	48.7
7.	03:00 P.M		45.6	49.6	47.6
8.	04:00 P.M		45.2	48.6	46.9
9.	05:00 P.M		45.2	48.3	46.7
10.	06:00 P.M		45.2	47.9	46.5
11.	07:00 P.M		44.7	46.7	45.7
12.	08:00 P.M		44.5	45.6	45.1
13.	09:00 P.M		43.8	45.5	44.7
14.	10:00 P.M		43.4	45.4	44.4
15.	11:00 P.M		43.1	45.2	44.2
16.	12:00 A.M		42.8	44.4	43.6
17.	01:00 A.M		42.4	44.3	43.3
18.	02:00 A.M		42.2	44.1	43.2
19.	03:00 A.M		40.7	44.0	42.4
20.	04:00 A.M		40.6	43.0	41.8
21.	05:00 A.M		40.4	42.9	41.6
22.	06:00 A.M		40.3	42.7	41.5
23.	07:00 A.M		40.0	42.2	41.1
24.	08:00 A.M		39.5	41.4	40.4
NEQS limit : 45-55 dB					
WHO limit: 70 dB					

NEQS: National Environmental Quality Standards WHO: World Health Organization
Leq: Log Equivalent Continuous Sound Level

Note:

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AMBIENT NOISE MONITORING REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	GRC Camp Office (Sanghar)
Monitoring Date:	13-03-2025	Reporting Date:	22-03-2025
Source:	Ambient Noise	Monitoring Instrument:	Noise Meter-IEC651-Type-2
GPS Coordinates:	34 584562, 73 373878		

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	09:00 A.M	dB(A)	67.5	59.3	63.4
2.	10:00 A.M		66.4	60.0	63.2
3.	11:00 A.M		65.4	56.8	61.1
4.	12:00 P.M		66.5	57.6	62.1
5.	01:00 P.M		67.6	55.4	61.5
6.	02:00 P.M		65.8	58.5	62.2
7.	03:00 P.M		65.9	58.6	62.3
8.	04:00 P.M		64.7	54.0	59.4
9.	05:00 P.M		64.3	57.7	61.0
10.	06:00 P.M		62.8	58.0	60.4
11.	07:00 P.M		62.8	55.7	59.3
12.	08:00 P.M		62.4	57.5	60.0
13.	09:00 P.M		61.4	56.5	59.0
14.	10:00 P.M		61.3	56.4	58.9
15.	11:00 P.M		49.3	52.8	51.1
16.	12:00 A.M		48.7	50.9	49.8
17.	01:00 A.M		45.6	52.1	48.9
18.	02:00 A.M		45.3	48.0	46.7
19.	03:00 A.M		43.9	45.1	44.5
20.	04:00 A.M		44.5	53.0	48.8
21.	05:00 A.M		43.6	45.3	44.5
22.	06:00 A.M		43.0	46.2	44.6
23.	07:00 A.M		43.9	46.9	45.4
24.	08:00 A.M		43.5	45.4	44.5

NEQS limit : 55-65 dB

WHO limit : 70 dB

NEQS: National Environmental Quality Standards WHO: World Health Organization
Leq: Log Equivalent Continuous Sound Level

Note:

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Signature of Analyst:

Signature of Chief Chemist



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AMBIENT NOISE MONITORING REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Colony Area (Sanghar)
Monitoring Date:	14-03-2025	Reporting Date:	22-03-2025
Source:	Ambient Noise	Monitoring Instrument:	Noise Meter-IEC651-Type-2
GPS Coordinates:	34.587775, 73.366225		

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	09:00 A.M	dB(A)	60.4	55.7	58.1
2.	10:00 A.M		59.6	54.3	57.0
3.	11:00 A.M		58.5	55.5	57.0
4.	12:00 P.M		59.5	52.7	56.1
5.	01:00 P.M		59.6	51.5	55.6
6.	02:00 P.M		58.9	51.7	55.3
7.	03:00 P.M		58.6	51.7	55.3
8.	04:00 P.M		58.4	50.6	53.5
9.	05:00 P.M		57.4	55.9	56.7
10.	06:00 P.M		54.3	53.2	53.8
11.	07:00 P.M		57.4	61.2	59.3
12.	08:00 P.M		58.3	61.5	59.9
13.	09:00 P.M		54.4	57.5	56.0
14.	10:00 P.M		61.5	61.5	61.5
15.	11:00 P.M		47.4	50.4	48.9
16.	12:00 A.M		45.6	50.5	48.1
17.	01:00 A.M		45.7	49.8	47.8
18.	02:00 A.M		44.9	49.5	47.2
19.	03:00 A.M		44.6	48.9	46.8
20.	04:00 A.M		46.0	47.7	46.9
21.	05:00 A.M		44.5	47.4	46.0
22.	06:00 A.M		43.2	46.3	44.8
23.	07:00 A.M		43.8	46.3	45.1
24.	08:00 A.M		44.5	45.4	45.0

NEQS limit : 45-55 dB

WHO limit: 70 dB

NEQS: National Environmental Quality Standards WHO: World Health Organization
Leq: Log Equivalent Continuous Sound Level

Note:

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[Signature]
Signature of Analyst

[Signature]
Signature of Chief Chemist



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Drinking Water Monitoring Results (First Quarter, 2025)



DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Dam Site (Paras Valley)
Sampling Date:	15-03-2025	Reporting Date:	22-03-2025
Source:	Spring Water (Source)	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates:	34.653167, 73.445678		

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA-4500H+ B	--	6.5-8.5	6.5-8.5	7.5
2.	Temperature	---	°C	---	---	14
3.	Taste & Odor	In-house	--	Non-Objectionable	Non-Objectionable	Non-Objectionable
4.	Color	APHA-2120 B/C	TCU	≤ 15	<15	3
5.	Turbidity	APHA-2130 B	NTU	<5	<5	1.8
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000	271
7.	Total Hardness as CaCO ₃	APHA-2340 C	mg/L	---	<500	163
8.	Nitrate (NO ₃)	APHA-4500NO3 B	mg/L	50	≤50	2.84
9.	Nitrite (NO ₂)	APHA-4500NO2 B	mg/L	3	≤3	0.22
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D
11.	Nickel (Ni)	ASTM E3047-16	mg/L	0.02	≤0.02	0.004
12.	Antimony (Sb)	APHA-3500Sb B	mg/L	0.005	<0.005	N.D
13.	Chloride (Cl)	APHA-4500Cl- B	mg/L	250	<250	135
14.	Chlorine	APHA-4500 CL	mg/L		0.5-1.5	0.54
15.	Lead (Pb)	APHA-3500 Pb-B	mg/L	0.01	≤0.05	N.D
16.	Fluoride	APHA-4500F- C	mg/L	1.5	≤1.5	0.41
17.	Aluminum	APHA-3500 Al	mg/L	≤ 0.2	≤0.2	N.D
18.	Manganese (Mn)	APHA-3500 MN-B	mg/L	0.5	≤0.5	N.D
19.	Cadmium (Cd)	APHA-3500 Cd-B	mg/L	0.003	0.01	N.D
20.	Barium (Ba)	APHA-3500 Ba B	mg/L	0.3	0.7	0.19
21.	Mercury (Hg)	APHA-3500 Hg-B	mg/L	0.001	≤0.001	N.D
22.	Copper (Cu)	APHA-3500 Cu-B	mg/L	2	2	0.23
23.	Zinc (Zn)	APHA-3500 Zn B	mg/L	3	5	2.42
24.	Boron (B)	APHA 4500 B- C	mg/L	0.3	0.3	N.D
25.	Chromium (Cr)	APHA 3500 cr B	mg/L	0.05	≤0.05	N.D
26.	Selenium (Se)	APHA-3500 Se C	mg/L	0.01	0.01	N.D
27.	Cyanide (CN)	APHA 4500-CN	mg/L	0.07	≤0.05	N.D
28.	E-Coli	APHA-9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29.	Total Coliform	APHA-9222 B	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS
N.D

National Drinking Water Quality Standards WHO

World Health Organization

Signature of Analyst

Signature of Chief Chemist



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Integrated Environment Laboratory



DRINKING WATER ANALYSIS REPORT

Reference Number	BIHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Dam Site (Paras Valley)
Sampling Date:	15-03-2025	Reporting Date:	22-03-2025
Source:	Water Cooler (End User)	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates;	34 660653, 73 455772		

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA-4500H+ B	--	6.5-8.5	6.5-8.5	7.8
2.	Temperature	---	°C	---	---	12
3.	Taste & Odor	In-house	--	Non-Objectionable	Non-Objectionable	Non-Objectionable
4.	Color	APHA-2120 B/C	TCU	≤ 15	<15	5
5.	Turbidity	APHA-2130 B	NTU	<5	<5	4.4
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000	254
7.	Total Hardness as CaCO ₃	APHA-2340 C	mg/L	---	<500	156
8.	Nitrate (NO ₃)	APHA-4500NO3 B	mg/L	50	≤50	3.33
9.	Nitrite (NO ₂)	APHA-4500NO2 B	mg/L	3	≤3	0.44
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D
11.	Nickel (Ni)	ASTM E3047-16	mg/L	0.02	≤0.02	0.002
12.	Antimony (Sb)	APHA-3500Sb B	mg/L	0.005	<0.005	N.D
13.	Chloride (Cl)	APHA-4500Cl- B	mg/L	250	<250	141
14.	Chlorine	APHA-4500 CL	mg/L	---	0.5-1.5	0.38
15.	Lead (Pb)	APHA-3500 Pb-B	mg/L	0.01	≤0.05	N.D
16.	Fluoride	APHA-4500F- C	mg/L	1.5	≤1.5	0.36
17.	Aluminum	APHA-3500 Al	mg/L	≤ 0.2	≤0.2	N.D
18.	Manganese (Mn)	APHA-3500 MN-B	mg/L	0.5	≤0.5	N.D
19.	Cadmium (Cd)	APHA-3500 Cd-B	mg/L	0.003	0.01	N.D
20.	Barium (Ba)	APHA-3500 Ba B	mg/L	0.3	0.7	0.17
21.	Mercury (Hg)	APHA-3500 Hg-B	mg/L	0.001	≤0.001	N.D
22.	Copper (Cu)	APHA- 3500 Cu-B	mg/L	2	2	0.34
23.	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	1.76
24.	Boron (B)	APHA 4500 B- C	mg/L	0.3	0.3	N.D
25.	Chromium (Cr)	APHA 3500 cr B	mg/L	0.05	≤0.05	N.D
26.	Selenium (Se)	APHA- 3500 Se C	mg/L	0.01	0.01	N.D
27.	Cyanide (CN)	APHA 4500-CN	mg/L	0.07	≤0.05	N.D
28.	E-Coli	APHA:9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29.	Total Coliform	APHA:9222 B	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS
N D

National Drinking Water Quality Standards WHO
Not Detected

World Health Organization

Signature of Analyst

Signature of Chief Chemist



FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

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DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Adit-1 (Thobi)
Sampling Date:	15-03-2025	Reporting Date:	22-03-2025
Source:	Spring Water (Source)	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates:	34 636125, 73 428597		

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA-4500H+ B	--	6.5-8.5	6.5-8.5	7.4
2.	Temperature	---	°C	---	---	11
3.	Taste & Odor	In-house	--	Non-Objectable	Non-Objectable	Non-Objectable
4.	Color	APHA-2120 B/C	TCU	≤ 15	<15	8
5.	Turbidity	APHA-2130 B	NTU	<5	<5	4.3
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000	273
7.	Total Hardness as CaCO ₃	APHA-2340 C	mg/L	---	<500	168
8.	Nitrate (NO ₃)	APHA-4500NO3 B	mg/L	50	≤50	2.58
9.	Nitrite (NO ₂)	APHA-4500NO2 B	mg/L	3	≤3	0.33
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D
11.	Nickel (Ni)	ASTM E3047-16	mg/L	0.02	≤0.02	0.007
12.	Antimony (Sb)	APHA-3500Sb B	mg/L	0.005	<0.005	N.D
13.	Chloride (Cl)	APHA-4500Cl- B	mg/L	250	<250	132
14.	Chlorine	APHA-4500 CL	mg/L	---	0.5-1.5	0.57
15.	Lead (Pb)	APHA-3500 Pb-B	mg/L	0.01	≤0.05	N.D
16.	Fluoride	APHA-4500F- C	mg/L	1.5	≤1.5	0.59
17.	Aluminum	APHA-3500 Al	mg/L	≤ 0.2	≤0.2	N.D
18.	Manganese (Mn)	APHA-3500 MN-B	mg/L	0.5	≤0.5	N.D
19.	Cadmium (Cd)	APHA-3500 Cd-B	mg/L	0.003	0.01	N.D
20.	Barium (Ba)	APHA-3500 Ba B	mg/L	0.3	0.7	0.33
21.	Mercury (Hg)	APHA-3500 Hg-B	mg/L	0.001	≤0.001	N.D
22.	Copper (Cu)	APHA- 3500 Cu-B	mg/L	2	2	0.15
23.	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	1.47
24.	Boron (B)	APHA 4500 B- C	mg/L	0.3	0.3	N.D
25.	Chromium (Cr)	APHA 3500 cr B	mg/L	0.05	≤0.05	N.D
26.	Selenium (Se)	APHA- 3500 Se C	mg/L	0.01	0.01	N.D
27.	Cyanide (CN)	APHA 4500-CN	mg/L	0.07	≤0.05	N.D
28.	E-Coli	APHA-9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29.	Total Coliform	APHA-9222 B	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS

N.D

National Drinking Water Quality Standards WHO

Not Detected

World Health Organization

Signature of Analyst:

Signature of Chief Chemist



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DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Adi-1 (Thobi)
Sampling Date:	15-03-2025	Reporting Date:	22-03-2025
Source:	Tap Water (End User)	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates:	34 636125, 73 428597		

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA-4500H+ B	--	6.5-8.5	6.5-8.5	7.7
2.	Temperature	---	°C	---	---	10
3.	Taste & Odor	In-house	--	Non-Objectionable	Non-Objectionable	Non-Objectionable
4.	Color	APHA-2120 B/C	TCU	≤ 15	≤ 15	5
5.	Turbidity	APHA-2130 B	NTU	< 5	< 5	2.6
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	< 1000	245
7.	Total Hardness as CaCO ₃	APHA-2340 C	mg/L	---	< 500	165
8.	Nitrate (NO ₃)	APHA-4500NO3 B	mg/L	50	≤ 50	3.80
9.	Nitrite (NO ₂)	APHA-4500NO2 B	mg/L	3	≤ 3	0.38
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤ 0.05	N.D
11.	Nickel (Ni)	ASTM E3047-16	mg/L	0.02	≤ 0.02	0.004
12.	Antimony (Sb)	APHA-3500Sb B	mg/L	0.005	< 0.005	N.D
13.	Chloride (Cl)	APHA-4500Cl- B	mg/L	250	< 250	125
14.	Chlorine	APHA-4500 CL	mg/L		0.5-1.5	0.48
15.	Lead (Pb)	APHA-3500 Pb-B	mg/L	0.01	≤ 0.05	N.D
16.	Fluoride	APHA-4500F- C	mg/L	1.5	≤ 1.5	0.55
17.	Aluminum	APHA-3500 Al	mg/L	≤ 0.2	≤ 0.2	N.D
18.	Manganese (Mn)	APHA-3500 MN-B	mg/L	0.5	≤ 0.5	N.D
19.	Cadmium (Cd)	APHA-3500 Cd-B	mg/L	0.003	0.01	N.D
20.	Barium (Ba)	APHA-3500 Ba B	mg/L	0.3	0.7	0.38
21.	Mercury (Hg)	APHA-3500 Hg-B	mg/L	0.001	≤ 0.001	N.D
22.	Copper (Cu)	APHA- 3500 Cu-B	mg/L	2	2	0.13
23.	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	2.21
24.	Boron (B)	APHA 4500 B- C	mg/L	0.3	0.3	N.D
25.	Chromium (Cr)	APHA 3500 cr B	mg/L	0.05	≤ 0.05	N.D
26.	Selenium (Se)	APHA- 3500 Se C	mg/L	0.01	0.01	N.D
27.	Cyanide (CN)	APHA 4500-CN	mg/L	0.07	≤ 0.05	N.D
28.	E-Coli	APHA-9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29.	Total Coliform	APHA-9222 B	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS

N.D

National Drinking Water Quality Standards WHO
Not Detected

World Health Organization

Signature of Analyst:

Signature of Chief Chemist



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DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Adit-2 (Ghanol)
Sampling Date:	15-03-2025	Reporting Date:	22-03-2025
Source:	Spring Water	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates:	34.619367, 73.417288		

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1	pH	APHA-4500H+ B	--	6.5-8.5	6.5-8.5	7.9
2	Temperature	---	°C	---	---	11
3	Taste & Odor	In-house	--	Non-Objectionable	Non-Objectionable	Non-Objectionable
4	Color	APHA-2120 B/C	TCU	≤ 15	≤ 15	4
5	Turbidity	APHA-2130 B	NTU	< 5	< 5	4.6
6	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	< 1000	258
7	Total Hardness as CaCO ₃	APHA-2340 C	mg/L	-----	< 500	148
8	Nitrate (NO ₃)	APHA-4500NO3 B	mg/L	50	≤ 50	1.63
9	Nitrite (NO ₂)	APHA-4500NO2 B	mg/L	3	≤ 3	0.26
10	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤ 0.05	N.D
11	Nickel (Ni)	ASTM E3047-16	mg/L	0.02	≤ 0.02	0.002
12	Antimony (Sb)	APHA-3500Sb B	mg/L	0.005	< 0.005	N.D
13	Chloride (Cl)	APHA-4500Cl- B	mg/L	250	< 250	145
14	Chlorine	APHA-4500 CL	mg/L		0.5-1.5	0.44
15	Lead (Pb)	APHA-3500 Pb-B	mg/L	0.01	≤ 0.05	N.D
16	Fluoride	APHA-4500F- C	mg/L	1.5	≤ 1.5	0.62
17	Aluminum	APHA-3500 Al	mg/L	≤ 0.2	≤ 0.2	N.D
18	Manganese (Mn)	APHA-3500 MN-B	mg/L	0.5	≤ 0.5	N.D
19	Cadmium (Cd)	APHA-3500 Cd-B	mg/L	0.003	0.01	N.D
20	Barium (Ba)	APHA-3500 Ba B	mg/L	0.3	0.7	0.28
21	Mercury (Hg)	APHA-3500 Hg-B	mg/L	0.001	≤ 0.001	N.D
22	Copper (Cu)	APHA- 3500 Cu-B	mg/L	2	2	0.39
23	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	1.55
24	Boron (B)	APHA 4500 B- C	mg/L	0.3	0.3	N.D
25	Chromium (Cr)	APHA 3500 cr B	mg/L	0.05	≤ 0.05	N.D
26	Selenium (Se)	APHA- 3500 Se C	mg/L	0.01	0.01	N.D
27	Cyanide (CN)	APHA 4500-CN	mg/L	0.07	≤ 0.05	N.D
28	E-Coli	APHA-9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29	Total Coliform	APHA-9222 B	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS
N.D

National Drinking Water Quality Standards WHO
Not Detected

World Health Organization

Signature of Analyst

Signature of Chief Chemist



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DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Adit-2 (Ghanol)
Sampling Date:	15-03-2025	Reporting Date:	22-03-2025
Source:	Tap Water (End User)	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates:	34.620250, 73.417595		

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA-4500H+ B	--	6.5-8.5	6.5-8.5	7.3
2.	Temperature	---	°C	---	---	9
3.	Taste & Odor	In-house	--	Non-Objectionable	Non-Objectionable	Non-Objectionable
4.	Color	APHA-2120 B/C	TCU	≤ 15	≤ 15	6
5.	Turbidity	APHA-2130 B	NTU	≤ 5	≤ 5	3.1
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	≤ 1000	≤ 1000	279
7.	Total Hardness as CaCO ₃	APHA-2340 C	mg/L	-----	≤ 500	139
8.	Nitrate (NO ₃)	APHA-4500NO3 B	mg/L	50	≤ 50	1.85
9.	Nitrite (NO ₂)	APHA-4500NO2 B	mg/L	3	≤ 3	0.29
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤ 0.05	N.D
11.	Nickel (Ni)	ASTM E3047-16	mg/L	0.02	≤ 0.02	0.004
12.	Antimony (Sb)	APHA-3500Sb B	mg/L	0.005	≤ 0.005	N.D
13.	Chloride (Cl)	APHA-4500Cl- B	mg/L	250	≤ 250	138
14.	Chlorine	APHA-4500 CL	mg/L		0.5-1.5	0.41
15.	Lead (Pb)	APHA-3500 Pb-B	mg/L	0.01	≤ 0.05	N.D
16.	Fluoride	APHA-4500F- C	mg/L	1.5	≤ 1.5	0.59
17.	Aluminum	APHA-3500 Al	mg/L	≤ 0.2	≤ 0.2	N.D
18.	Manganese (Mn)	APHA-3500 MN-B	mg/L	0.5	≤ 0.5	N.D
19.	Cadmium (Cd)	APHA-3500 Cd-B	mg/L	0.003	0.01	N.D
20.	Barium (Ba)	APHA-3500 Ba B	mg/L	0.3	0.7	0.27
21.	Mercury (Hg)	APHA-3500 Hg-B	mg/L	0.001	≤ 0.001	N.D
22.	Copper (Cu)	APHA- 3500 Cu-B	mg/L	2	2	0.27
23.	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	1.58
24.	Boron (B)	APHA 4500 B- C	mg/L	0.3	0.3	N.D
25.	Chromium (Cr)	APHA 3500 cr B	mg/L	0.05	≤ 0.05	N.D
26.	Selenium (Se)	APHA- 3500 Se C	mg/L	0.01	0.01	N.D
27.	Cyanide (CN)	APHA 4500-CN	mg/L	0.07	≤ 0.05	N.D
28.	E-Coli	APHA-9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29.	Total Coliform	APHA-9222 B	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS
N D

National Drinking Water Quality Standards WHO
Not Detected

World Health Organization

Signature of Analyst:

Signature of Chief Chemist



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DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name	Balakot Hydropower Project (300 MW)	Sampling Location	Adit-3 (Kholian)
Sampling Date	15-03-2025	Reporting Date	22-03-2025
Source	Spring Water (Source)	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates	34.605195, 73.394487		

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA-4500H+ B	---	6.5-8.5	6.5-8.5	7.4
2.	Temperature	---	°C	---	---	10
3.	Taste & Odor	In-house	--	Non-Objectionable	Non-Objectionable	Non-Objectionable
4.	Color	APHA-2120 B/C	TCU	≤ 15	≤ 15	3
5.	Turbidity	APHA-2130 B	NTU	≤ 5	≤ 5	2.7
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	≤ 1000	≤ 1000	254
7.	Total Hardness as CaCO ₃	APHA-2340 C	mg/L	---	≤ 500	136
8.	Nitrate (NO ₃)	APHA-4500NO3 B	mg/L	50	≤ 50	8.54
9.	Nitrite (NO ₂)	APHA-4500NO2 B	mg/L	3	≤ 3	1.43
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤ 0.05	N.D
11.	Nickel (Ni)	ASTM E3047-16	mg/L	0.02	≤ 0.02	0.090
12.	Antimony (Sb)	APHA-3500Sb B	mg/L	0.005	≤ 0.005	N.D
13.	Chloride (Cl)	APHA-4500Cl- B	mg/L	250	≤ 250	133
14.	Chlorine	APHA-4500 CL	mg/L	---	0.5-1.5	0.32
15.	Lead (Pb)	APHA-3500 Pb-B	mg/L	0.01	≤ 0.05	N.D
16.	Fluoride	APHA-4500F- C	mg/L	1.5	≤ 1.5	0.51
17.	Aluminum	APHA-3500 Al	mg/L	≤ 0.2	≤ 0.2	N.D
18.	Manganese (Mn)	APHA-3500 MN-B	mg/L	0.5	≤ 0.5	N.D
19.	Cadmium (Cd)	APHA-3500 Cd-B	mg/L	0.003	0.01	N.D
20.	Barium (Ba)	APHA-3500 Ba B	mg/L	0.3	0.7	0.48
21.	Mercury (Hg)	APHA-3500 Hg-B	mg/L	0.001	≤ 0.001	N.D
22.	Copper (Cu)	APHA- 3500 Cu-B	mg/L	2	2	0.35
23.	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	1.19
24.	Boron (B)	APHA 4500 B- C	mg/L	0.3	0.3	N.D
25.	Chromium (Cr)	APHA 3500 cr B	mg/L	0.05	≤ 0.05	N.D
26.	Selenium (Se)	APHA- 3500 Se C	mg/L	0.01	0.01	N.D
27.	Cyanide (CN)	APHA 4500-CN	mg/L	0.07	≤ 0.05	N.D
28.	E-Coli	APHA-9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29.	Total Coliform	APHA-9222 B	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS
N D

National Drinking Water Quality Standards WHO
Not Detected

World Health Organization

Signature of Analyst

Signature of Chief Chemist



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DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Adit-3 (Kholan)
Sampling Date:	15-03-2025	Reporting Date:	22-03-2025
Source:	Pipe Water (End User)	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates:	34 608942, 73 383133		

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA-4500H+ B	--	6.5-8.5	6.5-8.5	7.4
2.	Temperature	---	°C	---	---	9
3.	Taste & Odor	In-house	--	Non-Objectionable	Non-Objectionable	Non-Objectionable
4.	Color	APHA-2120 B/C	TCU	≤ 15	<15	4
5.	Turbidity	APHA-2130 B	NTU	<5	<5	2.3
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000	278
7.	Total Hardness as CaCO ₃	APHA-2340 C	mg/L	---	<500	144
8.	Nitrate (NO ₃)	APHA-4500NO3 B	mg/L	50	≤50	7.70
9.	Nitrite (NO ₂)	APHA-4500NO2 B	mg/L	3	≤3	1.69
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D
11.	Nickel (Ni)	ASTM E3047-16	mg/L	0.02	≤0.02	0.050
12.	Antimony (Sb)	APHA-3500Sb B	mg/L	0.005	<0.005	N.D
13.	Chloride (Cl)	APHA-4500Cl- B	mg/L	250	<250	141
14.	Chlorine	APHA-4500 CL	mg/L	---	0.5-1.5	0.29
15.	Lead (Pb)	APHA-3500 Pb-B	mg/L	0.01	≤0.05	N.D
16.	Fluoride	APHA-4500F- C	mg/L	1.5	≤1.5	0.84
17.	Aluminum	APHA-3500 Al	mg/L	≤ 0.2	≤0.2	N.D
18.	Manganese (Mn)	APHA-3500 MN-B	mg/L	0.5	≤0.5	N.D
19.	Cadmium (Cd)	APHA-3500 Cd-B	mg/L	0.003	0.01	N.D
20.	Barium (Ba)	APHA-3500 Ba B	mg/L	0.3	0.7	0.56
21.	Mercury (Hg)	APHA-3500 Hg-B	mg/L	0.001	≤0.001	N.D
22.	Copper (Cu)	APHA- 3500 Cu-B	mg/L	2	2	0.22
23.	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	1.47
24.	Boron (B)	APHA 4500 B- C	mg/L	0.3	0.3	N.D
25.	Chromium (Cr)	APHA 3500 cr B	mg/L	0.05	≤0.05	N.D
26.	Selenium (Se)	APHA- 3500 Se C	mg/L	0.01	0.01	N.D
27.	Cyanide (CN)	APHA 4500-CN	mg/L	0.07	≤0.05	N.D
28.	E-Coli	APHA-9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29.	Total Coliform	APHA-9222 B	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS
N D

National Drinking Water Quality Standards WHO

World Health Organization

Not Detected

Signature of Analyst

Signature of Chief Chemist



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DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Powerhouse (Barkot)
Sampling Date:	15-03-2025	Reporting Date:	22-03-2025
Source:	Water Cooler	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates:	34 603747, 73 379525		

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1	pH	APHA-4500H+ B	---	6.5-8.5	6.5-8.5	7.6
2	Temperature	---	°C	---	---	10
3	Taste & Odor	In-house	---	Non-Objectionable	Non-Objectionable	Non-Objectionable
4	Color	APHA-2120 B/C	TCU	≤ 15	<15	4
5	Turbidity	APHA-2130 B	NTU	<5	<5	2.6
6	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000	268
7	Total Hardness as CaCO ₃	APHA-2340 C	mg/L	---	<500	133
8	Nitrate (NO ₃)	APHA-4500NO3 B	mg/L	50	≤50	1.64
9	Nitrite (NO ₂)	APHA-4500NO2 B	mg/L	3	≤3	0.42
10	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D
11	Nickel (Ni)	ASTM E3047-16	mg/L	0.02	≤0.02	0.006
12	Antimony (Sb)	APHA-3500Sb B	mg/L	0.005	<0.005	N.D
13	Chloride (Cl)	APHA-4500Cl- B	mg/L	250	<250	141
14	Chlorine	APHA-4500 CL	mg/L	---	0.5-1.5	0.43
15	Lead (Pb)	APHA-3500 Pb-B	mg/L	0.01	≤0.05	N.D
16	Fluoride	APHA-4500F- C	mg/L	1.5	≤1.5	0.46
17	Aluminum	APHA-3500 Al	mg/L	≤ 0.2	≤0.2	N.D
18	Manganese (Mn)	APHA-3500 MN-B	mg/L	0.5	≤0.5	N.D
19	Cadmium (Cd)	APHA-3500 Cd-B	mg/L	0.003	0.01	N.D
20	Barium (Ba)	APHA-3500 Ba B	mg/L	0.3	0.7	0.13
21	Mercury (Hg)	APHA-3500 Hg-B	mg/L	0.001	≤0.001	N.D
22	Copper (Cu)	APHA- 3500 Cu-B	mg/L	2	2	0.06
23	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	1.13
24	Boron (B)	APHA 4500 B- C	mg/L	0.3	0.3	N.D
25	Chromium (Cr)	APHA 3500 cr B	mg/L	0.05	≤0.05	N.D
26	Selenium (Se)	APHA- 3500 Se C	mg/L	0.01	0.01	N.D
27	Cyanide (CN)	APHA 4500-CN	mg/L	0.07	≤0.05	N.D
28	E-Coli	APHA.9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29	Total Coliform	APHA.9222 B	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS
N.D

National Drinking Water Quality Standards WHO

World Health Organization

Signature of Analyst

Signature of Chief Chemist



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DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	GRC Camp Office (Sanghar)
Sampling Date:	15-03-2025	Reporting Date:	22-03-2025
Source:	Spring Water (Source)	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates:	34 584928, 73 376913		

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA-4500H+ B	---	6.5-8.5	6.5-8.5	7.5
2.	Temperature	---	°C	---	---	9
3.	Taste & Odor	In-house	---	Non-Objectionable	Non-Objectionable	Non-Objectionable
4.	Color	APHA-2120 B/C	TCU	≤ 15	<15	3
5.	Turbidity	APHA-2130 B	NTU	<5	<5	1.7
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000	260
7.	Total Hardness as CaCO ₃	APHA-2340 C	mg/L	-----	<500	117
8.	Nitrate (NO ₃)	APHA-4500NO3 B	mg/L	50	≤50	0.94
9.	Nitrite (NO ₂)	APHA-4500NO2 B	mg/L	3	≤3	0.29
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D
11.	Nickel (Ni)	ASTM E3047-16	mg/L	0.02	≤0.02	0.002
12.	Antimony (Sb)	APHA-3500Sb B	mg/L	0.005	<0.005	N.D
13.	Chloride (Cl)	APHA-4500Cl- B	mg/L	250	<250	135
14.	Chlorine	APHA-4500 CL	mg/L		0.5-1.5	0.57
15.	Lead (Pb)	APHA-3500 Pb-B	mg/L	0.01	≤0.05	N.D
16.	Fluoride	APHA-4500F- C	mg/L	1.5	≤1.5	0.53
17.	Aluminum	APHA-3500 Al	mg/L	≤ 0.2	≤0.2	N.D
18.	Manganese (Mn)	APHA-3500 MN-B	mg/L	0.5	≤0.5	N.D
19.	Cadmium (Cd)	APHA-3500 Cd-B	mg/L	0.003	0.01	N.D
20.	Barium (Ba)	APHA-3500 Ba B	mg/L	0.3	0.7	0.09
21.	Mercury (Hg)	APHA-3500 Hg-B	mg/L	0.001	≤0.001	N.D
22.	Copper (Cu)	APHA- 3500 Cu-B	mg/L	2	2	0.03
23.	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	1.02
24.	Boron (B)	APHA 4500 B- C	mg/L	0.3	0.3	N.D
25.	Chromium (Cr)	APHA 3500 cr B	mg/L	0.05	≤0.05	N.D
26.	Selenium (Se)	APHA- 3500 Se C	mg/L	0.01	0.01	N.D
27.	Cyanide (CN)	APHA 4500-CN	mg/L	0.07	≤0.05	N.D
28.	E-Coli	APHA 9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29.	Total Coliform	APHA 9222 B	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS

N D

National Drinking Water Quality Standards WHO

Not Detected

World Health Organization

Signature of Analyst

Signature of Chief Chemist



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DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	GRC Camp Office (Sanghar)
Sampling Date:	15-03-2025	Reporting Date:	22-03-2025
Source:	Tap Water (End User)	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates:	34 584478, 73 373817		

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA-4500H+ B	--	6.5-8.5	6.5-8.5	7.4
2.	Temperature	---	°C	---	---	11
3.	Taste & Odor	In-house	--	Non-Objectionable	Non-Objectionable	Non-Objectionable
4.	Color	APHA-2120 B/C	TCU	≤ 15	≤ 15	5
5.	Turbidity	APHA-2130 B	NTU	< 5	< 5	2.2
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	< 1000	270
7.	Total Hardness as CaCO ₃	APHA-2340 C	mg/L	---	< 500	124
8.	Nitrate (NO ₃)	APHA-4500NO3 B	mg/L	50	≤ 50	1.41
9.	Nitrite (NO ₂)	APHA-4500NO2 B	mg/L	3	≤ 3	0.44
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤ 0.05	N.D
11.	Nickel (Ni)	ASTM E3047-16	mg/L	0.02	≤ 0.02	0.004
12.	Antimony (Sb)	APHA-3500Sb B	mg/L	0.005	< 0.005	N.D
13.	Chloride (Cl)	APHA-4500Cl- B	mg/L	250	< 250	143
14.	Chlorine	APHA-4500 CL	mg/L	---	0.5-1.5	0.49
15.	Lead (Pb)	APHA-3500 Pb-B	mg/L	0.01	≤ 0.05	N.D
16.	Fluoride	APHA-4500F- C	mg/L	1.5	≤ 1.5	0.49
17.	Aluminum	APHA-3500 Al	mg/L	≤ 0.2	≤ 0.2	N.D
18.	Manganese (Mn)	APHA-3500 MN-B	mg/L	0.5	≤ 0.5	N.D
19.	Cadmium (Cd)	APHA-3500 Cd-B	mg/L	0.003	0.01	N.D
20.	Barium (Ba)	APHA-3500 Ba B	mg/L	0.3	0.7	0.17
21.	Mercury (Hg)	APHA-3500 Hg-B	mg/L	0.001	≤ 0.001	N.D
22.	Copper (Cu)	APHA- 3500 Cu-B	mg/L	2	2	0.04
23.	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	1.16
24.	Boron (B)	APHA 4500 B- C	mg/L	0.3	0.3	N.D
25.	Chromium (Cr)	APHA 3500 cr B	mg/L	0.05	≤ 0.05	N.D
26.	Selenium (Se)	APHA- 3500 Se C	mg/L	0.01	0.01	N.D
27.	Cyanide (CN)	APHA 4500-CN	mg/L	0.07	≤ 0.05	N.D
28.	E-Coli	APHA 9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29.	Total Coliform	APHA 9222 B	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS National Drinking Water Quality Standards WHO
N D Not Detected

World Health Organization

Signature of Analyst:

Signature of Chief Chemist



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Surface Water Monitoring Results (First Quarter, 2025)



Integrated Environment Laboratory



SURFACE WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Dam Site (Paras Valley)
Sampling Date:	15-03-2025	Reporting Date:	22-03-2025
Source:	Kunhar River	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates	34 660247, 73 451592		

Sr. No	Parameters	Analysis Method	Units	NEQS	Results
1)	Temperature	----	°C	40	8
2)	pH	APHA-4500H+ B	--	6-9	7.9
3)	Chemical Oxygen Demand (COD)	APHA-5220-D	mg/l	150	48
4)	Biological Oxygen Demand (BOD ₅) at 20 °C	APHA, 5210	mg/l	80	34.2
5)	Total Dissolved Solids (TDS)	APHA-2540 C	mg/l	3500	959
6)	Total Suspended Solids (TSS)	APHA-2540 D	mg/l	200	106
7)	Total Hardness	APHA-2340 C	mg/l	--	97.3
8)	Oil & Grease	Separation Method	mg/l	10	1.2
9)	Chromium (Hexa & Trivalent)	APHA-3500Cr B	mg/l	1.0	0.38
10)	Total Iron	APHA-3500-Fe-B	mg/l	8.0	3.11
11)	Chloride	APHA-4500Cl- B	mg/l	1000	161
12)	Fluoride	APHA-4500F- C	mg/l	10	1.85
13)	Ammonia	ASTM-D1426-15	mg/l	40	3.24
14)	Cadmium	APHA-3500 Cd-B	mg/l	0.1	N.D
15)	Lead	APHA-3500-Pb B	mg/l	0.5	N.D
16)	Arsenic	APHA-3500As B	mg/l	1.0	N.D
17)	Copper	APHA-3500Cu B	mg/l	1.0	N.D
18)	Barium	APHA-3500Ba B	mg/l	1.5	0.06
19)	Selenium	APHA- 3500 Se C	mg/l	0.5	N.D
20)	Silver	APHA-3500Ag-B	mg/l	1.0	N.D
21)	Manganese	APHA-3500-Mn B	mg/l	1.5	0.31
22)	Zinc	APHA-3500-Zn B	mg/l	5.0	0.54
23)	Nickel	ASTM E3047-16	mg/l	1.0	0.02
24)	Boron	APHA-4500B-C	mg/l	6.0	N.D
25)	Mercury	APHA-3500 Hg-B	mg/l	0.01	N.D
26)	Sulphide (S ²⁻)	APHA-4500 S ₂	mg/l	1.0	0.28
27)	Sulphate (SO ₄)	APHA-4500-SO ₄ C	mg/l	600	324
28)	An Ionic Detergent (as MBAS)	---	mg/l	20	1.08
29)	Phenolic Compound (as Phenol)	APHA-5530-D	mg/l	0.1	0.05
30)	Cyanide (as CN) total	APHA 4500-CN	mg/l	1.0	N.D
31)	E-Coli	APHA:9222 D	Number/100 mL	---	Uncountable
32)	Total Coliform	APHA:9222 B	Number/100 mL	---	Uncountable

NEQS: National Environmental Quality Standards for Liquid Effluents N.D: Not Detected

Signature of Analyst

Signature of Chief Chemist



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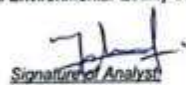
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SURFACE WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Tailrace Upstream (Barkot)
Sampling Date:	15-03-2025	Reporting Date:	22-03-2025
Source:	Kunhar River	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates	34 5971541, 73 3700751		

Sr. No	Parameters	Analysis Method	Units	NEQS	Results
1)	Temperature	-----	°C	40	8
2)	pH	APHA-4500H+ B	--	6-9	7.8
3)	Chemical Oxygen Demand (COD)	APHA-5220-D	mg/l	150	51
4)	Biological Oxygen Demand (BOD5) at 20 °C	APHA, 5210	mg/l	80	36.4
5)	Total Dissolved Solids (TDS)	APHA-2540 C	mg/l	3500	1038
6)	Total Suspended Solids (TSS)	APHA-2540 D	mg/l	200	117
7)	Total Hardness	APHA-2340 C	mg/l	--	142
8)	Oil & Grease	Separation Method	mg/l	10	1.29
9)	Chromium (Hexa & Trivalent)	APHA-3500Cr B	mg/l	1.0	0.56
10)	Total Iron	APHA-3500-Fe-B	mg/l	8.0	3.21
11)	Chloride	APHA-4500Cl- B	mg/l	1000	184
12)	Fluoride	APHA-4500F- C	mg/l	10	1.78
13)	Ammonia	ASTM-D1426-15	mg/l	40	3.53
14)	Cadmium	APHA-3500 Cd-B	mg/l	0.1	N.D
15)	Lead	APHA-3500-Pb B	mg/l	0.5	N.D
16)	Arsenic	APHA-3500As B	mg/l	1.0	N.D
17)	Copper	APHA-3500Cu B	mg/l	1.0	N.D
18)	Barium	APHA-3500Ba B	mg/l	1.5	0.002
19)	Selenium	APHA- 3500 Se C	mg/l	0.5	N.D
20)	Silver	APHA-3500Ag-B	mg/l	1.0	N.D
21)	Manganese	APHA-3500-Mn B	mg/l	1.5	0.34
22)	Zinc	APHA-3500-Zn B	mg/l	5.0	0.57
23)	Nickel	ASTM E3047-16	mg/l	1.0	0.006
24)	Boron	APHA-4500B-C	mg/l	6.0	N.D
25)	Mercury	APHA-3500 Hg-B	mg/l	0.01	N.D
26)	Sulphide (S ²⁻)	APHA-4500 S ₂	mg/l	1.0	0.41
27)	Sulphate (SO ₄)	APHA-4500-SO ₄ C	mg/l	600	325
28)	An Ionic Detergent (as MBAS)	---	mg/l	20	1.01
29)	Phenolic Compound (as Phenol)	APHA-5530-D	mg/l	0.1	0.01
30)	Cyanide (as CN) total	APHA 4500-CN	mg/l	1.0	N.D
31)	E-Coli	APHA-9222 D	Number/100 mL	---	Uncountable
32)	Total Coliform	APHA-9222 B	Number/100 mL	---	Uncountable

NEQS: National Environmental Quality Standards for Liquid Effluents N.D: Not Detected


Signature of Analyst


Signature of Chief Chemist

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SURFACE WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Colony Area (Sanghar)
Sampling Date:	15-03-2025	Reporting Date:	22-03-2025
Source:	Kunhar River	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates	34 586503, 73 363695		

Sr. No	Parameters	Analysis Method	Units	NEQS	Results
1)	Temperature	---	°C	40	9.5
2)	pH	APHA-4500H+ B	---	6-9	7.9
3)	Chemical Oxygen Demand (COD)	APHA-5220-D	mg/l	150	55
4)	Biological Oxygen Demand (BOD ₅) at 20 °C	APHA, 5210	mg/l	80	37.5
5)	Total Dissolved Solids (TDS)	APHA-2540 C	mg/l	3500	924
6)	Total Suspended Solids (TSS)	APHA-2540 D	mg/l	200	112
7)	Total Hardness	APHA-2340 C	mg/l	---	162
8)	Oil & Grease	Separation Method	mg/l	10	1.26
9)	Chromium (Hexa & Trivalent)	APHA-3500Cr B	mg/l	1.0	0.43
10)	Total Iron	APHA-3500-Fe-B	mg/l	8.0	2.61
11)	Chloride	APHA-4500Cl- B	mg/l	1000	188
12)	Fluoride	APHA-4500F- C	mg/l	10	2.06
13)	Ammonia	ASTM-D1426-15	mg/l	40	3.27
14)	Cadmium	APHA-3500 Cd-B	mg/l	0.1	N.D
15)	Lead	APHA-3500-Pb B	mg/l	0.5	N.D
16)	Arsenic	APHA-3500As B	mg/l	1.0	N.D
17)	Copper	APHA-3500Cu B	mg/l	1.0	N.D
18)	Barium	APHA-3500Ba B	mg/l	1.5	0.006
19)	Selenium	APHA- 3500 Se C	mg/l	0.5	N.D
20)	Silver	APHA-3500Ag-B	mg/l	1.0	N.D
21)	Manganese	APHA-3500-Mn B	mg/l	1.5	0.29
22)	Zinc	APHA-3500-Zn B	mg/l	5.0	0.50
23)	Nickel	ASTM E3047-16	mg/l	1.0	0.003
24)	Boron	APHA-4500B-C	mg/l	6.0	N.D
25)	Mercury	APHA-3500 Hg-B	mg/l	0.01	N.D
26)	Sulphide (S ²⁻)	APHA-4500 S ₂	mg/l	1.0	0.42
27)	Sulphate (SO ₄)	APHA-4500-SO ₄ C	mg/l	600	383
28)	An Ionic Detergent (as MBAS)	---	mg/l	20	1.02
29)	Phenolic Compound (as Phenol)	APHA-5530-D	mg/l	0.1	0.01
30)	Cyanide (as CN) total	APHA 4500-CN	mg/l	1.0	N.D
31)	E-Coli	APHA.9222 D	Number/100 mL	---	Uncountable
32)	Total Coliform	APHA.9222 B	Number/100 mL	---	Uncountable

NEQS: National Environmental Quality Standards for Liquid Effluents N.D: Not Detected

Signature of Analyst

Signature of Chief Chemist



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Soil Analysis Results (First Quarter, 2025)



Integrated Environment Laboratory



SOIL ANALYSIS REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location :	Adit-1 (Thobi)
Monitoring Date:	15-03-2025	Reporting Date:	22-03-2025
Source:	Soil Sample		

Sr. No.	Parameters	Results
1	Soil Texture	Sand %
		27
		Silt%
		47
		Clay %
		26
	Texture Class	Silty Clay Loam
2	pH	7.9
3	Electrical Conductivity EC ($\mu\text{S m}^{-1}$)	225
4	Phosphorus (mg kg^{-1})	2.76
5	Sodium Absorption Ratio	3.29

$\mu\text{S m}^{-1}$: Micro siemens/meter
 mg kg^{-1} : milligram per Kilogram

Signature of Analyst

Signature of Chief Chemist



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SOIL ANALYSIS REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location :	Adil-2 (Ghanol)
Monitoring Date:	15-03-2025	Reporting Date:	22-03-2025
Source:	Soil Sample		

Sr. No.	Parameters	Results
1	Soil Texture	Sand %
		25
		Silt%
		46
	Clay %	29
		Texture Class
		Silty Clay Loam
2	pH	7.8
3	Electrical Conductivity EC (μSm^{-1})	245
4	Phosphorus (mgkg^{-1})	2.84
5	Sodium Absorption Ratio	3.18

μSm^{-1} : micro siemens/meter
 mgkg^{-1} : milligram per Kilogram


Signature of Analyst


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SOIL ANALYSIS REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location :	Adit-3 (Kholian)
Monitoring Date:	15-03-2025	Reporting Date:	22-03-2025
Source:	Soil Sample		

Sr. No.	Parameters	Results
1	Soil Texture	Sand %
		35
		Silt%
		49
	Clay %	16
		Texture Class
2	pH	8.4
3	Electrical Conductivity EC (μSm^{-1})	254
4	Phosphorus (mgkg^{-1})	1.41
5	Sodium Absorption Ratio	3.91

μSm^{-1} : micro siemens/meter
 mgkg^{-1} : milligram per Kilogram


Signature of Analyst:


Signature of Entry Chemist



FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

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SOIL ANALYSIS REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location :	Powerhouse (Barkot)
Monitoring Date:	15-03-2025	Reporting Date:	22-03-2025
Source:	Soil Sample		

Sr. No.	Parameters	Results
1	Soil Texture	Sand %
		26
		Silt%
		42
		Clay %
		32
	Texture Class	Silty Clay Loam
2	pH	8.12
3	Electrical Conductivity EC (μSm^{-1})	245
4	Phosphorus (mgkg^{-1})	3.52
5	Sodium Absorption Ratio	3.46

μSm^{-1} : micro siemens/meter
 mgkg^{-1} : milligram per Kilogram


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FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

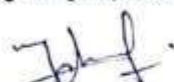
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SOIL ANALYSIS REPORT

Reference Number	BHPP/ENV/155-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location :	GRC Camp Office (Sanghar)
Monitoring Date:	15-03-2025	Reporting Date:	22-03-2025
Source:	Soil Sample		

Sr. No.	Parameters	Results
1	Soil Texture	Sand %
		23
		Silt%
		39
	Texture Class	Clay %
		38
		Silty Clay Loam
2	pH	8.5
3	Electrical Conductivity EC (μSm^{-1})	222
4	Phosphorus (mgkg^{-1})	2.51
5	Sodium Absorption Ratio	4.1

μSm^{-1} : Micro siemens/meter
 mgkg^{-1} : milligram per Kilogram


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Ambient Air Monitoring Results (Second Quarter, 2025) Particulate Matters



IEL
Integrated Environment Laboratory



AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Dam Site (Paras Valley)
Monitoring Date:	19-06-2025	Reporting Date:	04-07-2025
Source:	Ambient Air	Monitoring Instrument:	Aeroqual, AQMS 09
GPS Coordinates:	34.660470, 73.455497		

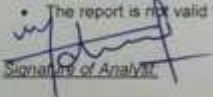
Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		PM _{2.5}	PM ₁₀	PM _{2.5}	PM ₁₀
		Units			
	Hours of Monitoring	($\mu\text{g}/\text{m}^3$)	($\mu\text{g}/\text{m}^3$)		
1.	09:00 A.M	24.18	64.56	26.16 ($\mu\text{g}/\text{m}^3$)	67.48 ($\mu\text{g}/\text{m}^3$)
2.	10:00 A.M	23.99	76.77		
3.	11:00 A.M	35.54	76.55		
4.	12:00 P.M	20.49	70.64		
5.	01:00 P.M	33.39	68.94		
6.	02:00 P.M	32.48	59.01		
7.	03:00 P.M	30.25	61.78		
8.	04:00 P.M	35.83	77.21		
9.	05:00 P.M	21.25	73.30		
10.	06:00 P.M	16.62	55.97		
11.	07:00 P.M	18.37	67.55		
12.	08:00 P.M	26.52	75.02		
13.	09:00 P.M	21.42	54.58		
14.	10:00 P.M	27.34	80.79		
15.	11:00 P.M	31.26	76.25		
16.	12:00 A.M	30.68	63.45		
17.	01:00 A.M	20.79	77.03		
18.	02:00 A.M	26.68	80.81		
19.	03:00 A.M	32.43	80.97		
20.	04:00 A.M	18.51	52.63		
21.	05:00 A.M	22.72	62.59		
22.	06:00 A.M	35.28	52.42		
23.	07:00 A.M	22.95	47.29		
24.	08:00 A.M	18.95	63.46		
NEQSAA				35($\mu\text{g}/\text{m}^3$)	150($\mu\text{g}/\text{m}^3$)
WHO				15 ($\mu\text{g}/\text{m}^3$)	45 ($\mu\text{g}/\text{m}^3$)

NEQSAA: National Environmental Quality Standards for Ambient Air

WHO: World Health Organization

Note:

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- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.



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AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Add-1 (Thobi)
Monitoring Date:	24-06-2025	Reporting Date:	04-07-2025
Source:	Ambient Air	Monitoring Instrument:	Aeroqual, AQMS 09
GPS Coordinates:	34.636125, 73.428597		

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		PM _{2.5}	PM ₁₀	PM _{2.5}	PM ₁₀
		Units	Units		
	Hours of Monitoring	($\mu\text{g}/\text{m}^3$)	($\mu\text{g}/\text{m}^3$)		
1.	09:00 A.M	42.15	94.37	47.81 ($\mu\text{g}/\text{m}^3$)	97.29 ($\mu\text{g}/\text{m}^3$)
2.	10:00 A.M	52.19	106.58		
3.	11:00 A.M	43.66	106.36		
4.	12:00 P.M	48.36	100.45		
5.	01:00 P.M	53.81	98.75		
6.	02:00 P.M	44.13	88.82		
7.	03:00 P.M	54.10	91.57		
8.	04:00 P.M	46.77	107.02		
9.	05:00 P.M	36.06	103.11		
10.	06:00 P.M	53.86	85.78		
11.	07:00 P.M	46.12	97.36		
12.	08:00 P.M	55.95	104.83		
13.	09:00 P.M	40.69	84.39		
14.	10:00 P.M	39.20	110.60		
15.	11:00 P.M	36.32	106.06		
16.	12:00 A.M	51.19	93.26		
17.	01:00 A.M	49.09	106.84		
18.	02:00 A.M	56.09	110.62		
19.	03:00 A.M	55.12	110.78		
20.	04:00 A.M	42.64	82.44		
21.	05:00 A.M	56.42	92.40		
22.	06:00 A.M	47.86	82.23		
23.	07:00 A.M	41.40	77.10		
24.	08:00 A.M	54.31	93.27		
NEQSAA				35($\mu\text{g}/\text{m}^3$)	150($\mu\text{g}/\text{m}^3$)
WHO				15 ($\mu\text{g}/\text{m}^3$)	45 ($\mu\text{g}/\text{m}^3$)

NEQSAA: National Environmental Quality Standards for Ambient Air
WHO: World Health Organization
Note:

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AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Adit-2 (Ghanool)
Monitoring Date:	20-06-2025	Reporting Date:	04-07-2025
Source:	Ambient Air	Monitoring Instrument:	Aeroqual, AQMS 09
GPS Coordinates:	34.619787, 73.417525		

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		PM _{2.5}	PM ₁₀	PM _{2.5}	PM ₁₀
		Units			
		Hours of Monitoring	(µg/m ³)		
1.	09:00 A.M	21.03	60.19	17.14 (µg/m ³)	48.11 (µg/m ³)
2.	10:00 A.M	11.55	44.68		
3.	11:00 A.M	10.57	48.91		
4.	12:00 P.M	24.77	47.44		
5.	01:00 P.M	17.27	48.34		
6.	02:00 P.M	16.75	55.04		
7.	03:00 P.M	18.35	52.19		
8.	04:00 P.M	13.78	53.61		
9.	05:00 P.M	23.97	59.37		
10.	06:00 P.M	7.95	36.85		
11.	07:00 P.M	27.24	40.43		
12.	08:00 P.M	12.48	49.05		
13.	09:00 P.M	17.36	57.20		
14.	10:00 P.M	11.62	36.83		
15.	11:00 P.M	13.83	37.94		
16.	12:00 A.M	16.04	45.22		
17.	01:00 A.M	16.47	49.99		
18.	02:00 A.M	12.71	69.42		
19.	03:00 A.M	18.55	36.71		
20.	04:00 A.M	20.28	59.54		
21.	05:00 A.M	19.94	51.86		
22.	06:00 A.M	17.92	40.22		
23.	07:00 A.M	19.28	34.75		
24.	08:00 A.M	21.70	38.87		
NEQSAA				35 (µg/m ³)	150(µg/m ³)
WHO				15 (µg/m ³)	45 (µg/m ³)

NEQSAA: National Environmental Quality Standards for Ambient Air
WHO: World Health Organization

Note:

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Signature of Analyst:

Signature of Chief Chemist



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AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Adit-3 (Kholian)
Monitoring Date:	21-06-2025	Reporting Date:	04-07-2025
Source:	Ambient Air	Monitoring Instrument:	Aeroqual, AQMS 09
GPS Coordinates:	34.610253, 73.389367		

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		PM _{2.5}	PM ₁₀	PM _{2.5}	PM ₁₀
		Units			
		(µg/m ³)	(µg/m ³)		
1.	09:00 A.M	11.66	37.95	22.34 (µg/m ³)	52.00 (µg/m ³)
2.	10:00 A.M	23.64	45.73		
3.	11:00 A.M	28.01	51.75		
4.	12:00 P.M	27.08	71.49		
5.	01:00 P.M	15.83	43.86		
6.	02:00 P.M	15.30	60.29		
7.	03:00 P.M	24.22	62.97		
8.	04:00 P.M	15.51	45.31		
9.	05:00 P.M	19.66	65.79		
10.	06:00 P.M	21.07	37.09		
11.	07:00 P.M	25.66	55.71		
12.	08:00 P.M	25.71	47.47		
13.	09:00 P.M	30.54	68.51		
14.	10:00 P.M	15.60	36.90		
15.	11:00 P.M	21.64	43.16		
16.	12:00 A.M	24.73	53.22		
17.	01:00 A.M	19.64	37.11		
18.	02:00 A.M	21.59	64.23		
19.	03:00 A.M	28.44	58.86		
20.	04:00 A.M	27.71	58.11		
21.	05:00 A.M	27.28	53.57		
22.	06:00 A.M	25.51	67.40		
23.	07:00 A.M	26.10	41.86		
24.	08:00 A.M	13.56	39.77		
NEQSAA				35 (µg/m ³)	150(µg/m ³)
WHO				15 (µg/m ³)	45 (µg/m ³)

NEQSAA: National Environmental Quality Standards for Ambient Air
WHO: World Health Organization

Note:

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AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Powerhouse (Barkot)
Monitoring Date:	22-06-2025	Reporting Date:	04-07-2025
Source:	Ambient Air	Monitoring instrument:	Aeroqual, AQMS 09
GPS Coordinates:	34.601812, 73.377145		

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		PM _{2.5}	PM ₁₀	PM _{2.5}	PM ₁₀
	Hours of Monitoring	Units	Units		
1.	09:00 A.M	(µg/m ³)	(µg/m ³)	15.07 (µg/m ³)	41.1 (µg/m ³)
2.	10:00 A.M	13.68	41.73		
3.	11:00 A.M	22.35	60.61		
4.	12:00 P.M	12.95	51.13		
5.	12:00 P.M	17.23	34.52		
6.	01:00 P.M	10.55	36.99		
7.	02:00 P.M	6.12	52.83		
8.	03:00 P.M	14.92	31.39		
9.	04:00 P.M	18.80	41.08		
10.	05:00 P.M	19.90	36.29		
11.	06:00 P.M	19.06	31.00		
12.	07:00 P.M	7.32	28.32		
13.	08:00 P.M	12.74	50.55		
14.	09:00 P.M	12.92	40.08		
15.	10:00 P.M	8.16	52.09		
16.	11:00 P.M	23.56	50.15		
17.	12:00 A.M	18.81	32.00		
18.	01:00 A.M	22.04	26.10		
19.	02:00 A.M	23.80	35.51		
20.	03:00 A.M	10.79	44.11		
21.	04:00 A.M	12.66	46.59		
22.	05:00 A.M	14.52	25.89		
23.	06:00 A.M	9.03	31.07		
24.	07:00 A.M	19.58	49.55		
25.	08:00 A.M	10.10	56.21		
NEQSAA				35 (µg/m ³)	150 (µg/m ³)
WHO				15 (µg/m ³)	45 (µg/m ³)

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WHO: World Health Organization

Note:

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AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Tailrace Upstream (Barkot)
Monitoring Date:	23-06-2025	Reporting Date:	04-07-2025
Source:	Ambient Air	Monitoring Instrument:	Aeroqual, AQMS 09
GPS Coordinates:	34.596088, 73.374512		

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		PM _{2.5}	PM ₁₀	PM _{2.5}	PM ₁₀
	Hours of Monitoring	Units	Units		
1.	09:00 A.M	29.44	75.97	26.49 ($\mu\text{g}/\text{m}^3$)	84.14 ($\mu\text{g}/\text{m}^3$)
2.	10:00 A.M	27.81	76.32		
3.	11:00 A.M	36.85	76.19		
4.	12:00 P.M	30.98	76.64		
5.	01:00 P.M	30.26	87.66		
6.	02:00 P.M	21.40	85.87		
7.	03:00 P.M	18.46	91.83		
8.	04:00 P.M	31.32	99.00		
9.	05:00 P.M	26.23	84.03		
10.	06:00 P.M	26.02	98.49		
11.	07:00 P.M	33.77	97.31		
12.	08:00 P.M	32.90	78.29		
13.	09:00 P.M	21.50	73.30		
14.	10:00 P.M	17.67	67.66		
15.	11:00 P.M	35.89	77.49		
16.	12:00 A.M	34.46	78.63		
17.	01:00 A.M	23.53	93.53		
18.	02:00 A.M	17.80	91.57		
19.	03:00 A.M	23.40	85.42		
20.	04:00 A.M	16.96	79.20		
21.	05:00 A.M	22.00	97.93		
22.	06:00 A.M	30.08	68.69		
23.	07:00 A.M	19.22	89.23		
24.	08:00 A.M	27.84	89.10		
NEQSAA				35 ($\mu\text{g}/\text{m}^3$)	150 ($\mu\text{g}/\text{m}^3$)
WHO				15 ($\mu\text{g}/\text{m}^3$)	45 ($\mu\text{g}/\text{m}^3$)

NEQSAA: National Environmental Quality Standards for Ambient Air

WHO: World Health Organization

Note:

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AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	GRC Camp Office (Sanghar)
Monitoring Date:	25-06-2025	Reporting Date:	04-07-2025
Source:	Ambient Air	Monitoring Instrument:	Aeroqual, AQMS 09
GPS Coordinates:	34.584562, 73.373878		

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		PM _{2.5}	PM ₁₀	PM _{2.5}	PM ₁₀
	Hours of Monitoring	Units	Units		
1.	09:00 A.M	19.83	34.89	19.63 ($\mu\text{g}/\text{m}^3$)	45.85 ($\mu\text{g}/\text{m}^3$)
2.	10:00 A.M	24.96	36.76		
3.	11:00 A.M	16.06	56.80		
4.	12:00 P.M	20.54	44.72		
5.	01:00 P.M	26.41	51.00		
6.	02:00 P.M	29.49	37.69		
7.	03:00 P.M	19.95	31.19		
8.	04:00 P.M	13.68	67.45		
9.	05:00 P.M	23.08	46.15		
10.	06:00 P.M	9.40	29.87		
11.	07:00 P.M	27.34	31.38		
12.	08:00 P.M	14.14	54.40		
13.	09:00 P.M	23.68	43.58		
14.	10:00 P.M	20.83	49.62		
15.	11:00 P.M	15.55	35.76		
16.	12:00 A.M	9.93	52.45		
17.	01:00 A.M	11.11	53.40		
18.	02:00 A.M	25.80	41.57		
19.	03:00 A.M	15.23	47.86		
20.	04:00 A.M	21.32	57.05		
21.	05:00 A.M	21.62	34.28		
22.	06:00 A.M	18.56	52.00		
23.	07:00 A.M	26.05	58.05		
24.	08:00 A.M	16.57	50.48		
NEQSAA				35 ($\mu\text{g}/\text{m}^3$)	150 ($\mu\text{g}/\text{m}^3$)
WHO				15 ($\mu\text{g}/\text{m}^3$)	45 ($\mu\text{g}/\text{m}^3$)

NEQSAA: National Environmental Quality Standards for Ambient Air

WHO: World Health Organization

Note:

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AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Colony Area (Sanghar)
Monitoring Date:	26-06-2025	Reporting Date:	04-07-2025
Source:	Ambient Air	Monitoring Instrument:	Aeroqual, AQMS 09
GPS Coordinates:	34 587775, 73 386225		

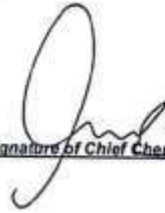
Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		PM _{2.5}	PM ₁₀	PM _{2.5}	PM ₁₀
	Hours of Monitoring	($\mu\text{g}/\text{m}^3$)	($\mu\text{g}/\text{m}^3$)		
1.	09:00 A.M	10.68	42.80	9.73 ($\mu\text{g}/\text{m}^3$)	37.46 ($\mu\text{g}/\text{m}^3$)
2.	10:00 A.M	1.23	24.08		
3.	11:00 A.M	14.19	44.53		
4.	12:00 P.M	9.90	53.98		
5.	01:00 P.M	6.25	54.21		
6.	02:00 P.M	0.42	24.11		
7.	03:00 P.M	9.15	41.27		
8.	04:00 P.M	16.78	25.53		
9.	05:00 P.M	20.75	23.26		
10.	06:00 P.M	6.04	36.97		
11.	07:00 P.M	17.01	51.29		
12.	08:00 P.M	10.63	25.27		
13.	09:00 P.M	17.90	42.62		
14.	10:00 P.M	2.38	45.83		
15.	11:00 P.M	5.75	34.15		
16.	12:00 A.M	11.62	36.93		
17.	01:00 A.M	12.11	53.30		
18.	02:00 A.M	3.35	35.02		
19.	03:00 A.M	15.13	27.11		
20.	04:00 A.M	6.33	45.48		
21.	05:00 A.M	5.28	35.76		
22.	06:00 A.M	10.35	28.36		
23.	07:00 A.M	9.18	30.37		
24.	08:00 A.M	11.00	37.05		
NEQSAA				35 ($\mu\text{g}/\text{m}^3$)	150($\mu\text{g}/\text{m}^3$)
WHO				15 ($\mu\text{g}/\text{m}^3$)	45 ($\mu\text{g}/\text{m}^3$)

NEQSAA: National Environmental Quality Standards for Ambient Air
WHO: World Health Organization

Note:

- Selected measurement units were $\mu\text{g}/\text{m}^3$ otherwise stated.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.


Signature of Analyst


Signature of Chief Chemist



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Ambient Gaseous Monitoring Results (Second Quarter, 2025)



AMBIENT GASES MONITORING REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Dam Site (Paras Valley)
Monitoring Date:	19-06-2025	Reporting Date:	04-07-2025
Source:	Ambient Air Gases	Monitoring Instrument:	Aeroqual, AQMS 09
GPS Coordinates:	34.660470, 73.455497		

Sr. No	Time	Parameters			
		CO	NO	NO ₂	SO ₂
		Units			
	Hours	(mg/m ³)	(µg/m ³)	(µg/m ³)	(µg/m ³)
1.	09:00 A.M	0.47	18.53	21.00	18.47
2.	10:00 A.M	0.60	12.04	18.04	18.00
3.	11:00 A.M	0.56	16.02	17.81	19.85
4.	12:00 P.M	0.95	12.27	19.23	19.13
5.	01:00 P.M	0.90	16.83	18.35	18.59
6.	02:00 P.M	0.48	12.04	17.01	18.62
7.	03:00 P.M	0.68	13.90	17.06	17.50
8.	04:00 P.M	0.83	15.05	17.68	20.32
9.	05:00 P.M	0.73	18.00	18.81	17.32
10.	06:00 P.M	0.79	14.80	18.84	19.26
11.	07:00 P.M	0.50	14.28	20.07	18.30
12.	08:00 P.M	0.67	14.04	21.21	20.59
13.	09:00 P.M	0.51	11.85	20.33	17.89
14.	10:00 P.M	0.49	17.34	17.86	17.96
15.	11:00 P.M	0.84	14.23	20.15	21.40
16.	12:00 A.M	0.65	18.87	20.96	17.17
17.	01:00 A.M	0.74	17.44	21.14	18.90
18.	02:00 A.M	0.75	16.27	20.23	17.60
19.	03:00 A.M	0.44	13.78	19.58	19.68
20.	04:00 A.M	0.87	17.22	17.08	19.67
21.	05:00 A.M	0.94	19.24	17.84	19.67
22.	06:00 A.M	0.56	18.01	21.88	17.51
23.	07:00 A.M	0.63	17.21	19.48	21.03
24.	08:00 A.M	0.52	14.60	21.47	17.30
Average Concentration		0.67	15.58	19.30	18.82
NEQSAA		05	40	80	120
WHO		04	—	25	40

NEQSAA: National Environmental Quality Standards for Ambient Air
WHO: World Health Organization

Note:

- Selected measurement units were µg/m³ & mg/m³ otherwise stated.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

Signature of Analyst

Signature of Chief Chemist



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AMBIENT GASES MONITORING REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Adit-1 (Thobi)
Monitoring Date:	26-06-2025	Reporting Date:	04-07-2025
Source:	Ambient Air Gases	Monitoring Instrument:	Aeroqual, AQMS 09
GPS Coordinates:	34.636125, 73.428597		

Sr. No	Time	Parameters			
		CO	NO	NO ₂	SO ₂
	Hours	(mg/m ³)	(µg/m ³)	(µg/m ³)	(µg/m ³)
1.	09:00 A.M	0.39	10.42	18.39	12.83
2.	10:00 A.M	0.37	12.21	15.75	17.00
3.	11:00 A.M	0.41	12.51	15.93	14.20
4.	12:00 P.M	0.31	11.97	16.20	12.82
5.	01:00 P.M	0.35	13.62	16.73	19.10
6.	02:00 P.M	0.45	17.54	15.15	17.65
7.	03:00 P.M	0.31	13.33	16.77	18.17
8.	04:00 P.M	0.27	10.85	15.22	11.70
9.	05:00 P.M	0.32	12.38	18.93	10.90
10.	06:00 P.M	0.47	12.15	17.06	14.80
11.	07:00 P.M	0.30	11.78	14.86	11.95
12.	08:00 P.M	0.29	16.71	18.24	11.51
13.	09:00 P.M	0.29	16.46	16.11	18.05
14.	10:00 P.M	0.38	14.14	18.69	16.94
15.	11:00 P.M	0.28	10.80	19.21	17.40
16.	12:00 A.M	0.25	16.25	17.48	13.03
17.	01:00 A.M	0.40	9.68	19.17	12.22
18.	02:00 A.M	0.32	16.05	15.40	14.29
19.	03:00 A.M	0.41	9.49	16.94	15.70
20.	04:00 A.M	0.49	12.68	13.72	17.71
21.	05:00 A.M	0.51	9.52	15.14	16.54
22.	06:00 A.M	0.33	10.56	14.44	19.03
23.	07:00 A.M	0.27	12.68	17.76	13.95
24.	08:00 A.M	0.30	14.22	13.89	10.89
Average Concentration		0.35	12.83	16.55	14.93
NEQSAA		05	40	80	120
WHO		04	---	25	40

NEQSAA: National Environmental Quality Standards for Ambient Air
WHO: World Health Organization

Note:

- Selected measurement units were µg/m³ & mg/m³ otherwise stated.
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Signature of Analyst:


Signature of Chief Chemist



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AMBIENT GASES MONITORING REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Adit-2 (Ghanoal)
Monitoring Date:	20-06-2025	Reporting Date:	04-07-2025
Source:	Ambient Air Gases	Monitoring Instrument:	Aeroqual, AQMS 09
GPS Coordinates:	34.619787, 73.417525		

Sr. No	Time	Parameters			
		CO	NO	NO ₂	SO ₂
		Units			
	Hours	(mg/m ³)	(µg/m ³)	(µg/m ³)	(µg/m ³)
1.	09:00 A.M	0.31	9.72	12.58	10.88
2.	10:00 A.M	0.22	10.86	14.75	12.96
3.	11:00 A.M	0.37	10.47	16.02	16.01
4.	12:00 P.M	0.38	14.52	16.66	11.78
5.	01:00 P.M	0.42	14.24	15.84	13.63
6.	02:00 P.M	0.35	14.34	16.20	16.47
7.	03:00 P.M	0.20	14.82	14.90	10.20
8.	04:00 P.M	0.35	11.95	12.36	9.43
9.	05:00 P.M	0.36	12.12	16.11	14.92
10.	06:00 P.M	0.25	12.07	12.13	12.74
11.	07:00 P.M	0.30	8.94	12.50	15.21
12.	08:00 P.M	0.24	10.57	12.28	13.76
13.	09:00 P.M	0.30	11.92	13.81	14.81
14.	10:00 P.M	0.41	10.15	16.61	14.70
15.	11:00 P.M	0.24	8.79	12.37	14.26
16.	12:00 A.M	0.31	9.22	13.58	13.20
17.	01:00 A.M	0.42	13.48	14.95	9.17
18.	02:00 A.M	0.39	10.14	16.51	16.53
19.	03:00 A.M	0.24	9.79	12.80	10.09
20.	04:00 A.M	0.33	11.38	11.58	14.96
21.	05:00 A.M	0.26	13.74	12.44	15.71
22.	06:00 A.M	0.30	9.09	16.25	14.51
23.	07:00 A.M	0.30	14.10	12.27	16.56
24.	08:00 A.M	0.36	14.13	13.92	14.21
Average Concentration		0.32	11.69	14.14	13.61
NEQSAA		05	40	80	120
WHO		04	---	25	40

NEQSAA: National Environmental Quality Standards for Ambient Air
WHO: World Health Organization

Note:

- Selected measurement units were µg/m³ & mg/m³ otherwise stated.
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Signature of Analyst


Signature of Chief Chemist



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AMBIENT GASES MONITORING REPORT

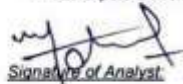
Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Adit-3 (Kholian)
Monitoring Date:	21-06-2025	Reporting Date:	04-07-2025
Source:	Ambient Air Gases	Monitoring Instrument:	Aeroqual, AQMS 09
GPS Coordinates:	34.610253, 73.389367		

Sr. No	Time	Parameters			
		CO	NO	NO ₂	SO ₂
	Hours	(mg/m ³)	(µg/m ³)	(µg/m ³)	(µg/m ³)
1.	09:00 A.M	0.52	15.74	24.80	18.72
2.	10:00 A.M	0.46	14.95	19.45	20.50
3.	11:00 A.M	0.46	17.62	24.17	24.02
4.	12:00 P.M	0.38	14.84	23.29	18.87
5.	01:00 P.M	0.38	16.27	19.26	17.40
6.	02:00 P.M	0.28	17.95	19.49	24.66
7.	03:00 P.M	0.47	19.81	24.17	24.58
8.	04:00 P.M	0.29	15.79	23.48	18.89
9.	05:00 P.M	0.34	14.47	23.06	16.95
10.	06:00 P.M	0.63	18.96	18.99	22.15
11.	07:00 P.M	0.42	18.48	24.17	22.38
12.	08:00 P.M	0.31	18.31	24.61	18.56
13.	09:00 P.M	0.38	15.90	19.71	19.84
14.	10:00 P.M	0.46	20.46	24.91	18.97
15.	11:00 P.M	0.48	14.35	24.43	18.32
16.	12:00 A.M	0.42	15.15	23.87	17.57
17.	01:00 A.M	0.56	14.96	20.65	24.48
18.	02:00 A.M	0.48	16.95	22.92	22.81
19.	03:00 A.M	0.62	17.33	24.02	21.34
20.	04:00 A.M	0.57	15.57	23.64	24.67
21.	05:00 A.M	0.59	17.70	23.20	20.38
22.	06:00 A.M	0.55	16.37	23.84	22.48
23.	07:00 A.M	0.51	14.28	24.16	25.03
24.	08:00 A.M	0.63	15.38	19.06	20.18
Average Concentration		0.47	16.57	22.64	20.99
NEQSAA		05	40	80	120
WHO		04	—	25	40

NEQSAA: National Environmental Quality Standards for Ambient Air
WHO: World Health Organization

Note:

- Selected measurement units were µg/m³ & mg/m³ otherwise stated.
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AMBIENT GASES MONITORING REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Powerhouse (Barkot)
Monitoring Date:	22-06-2025	Reporting Date:	04-07-2025
Source:	Ambient Air Gases	Monitoring Instrument:	Aeroqual, AQMS 09
GPS Coordinates:	34.601812, 73.377145		

Sr. No	Time	Parameters			
		CO	NO	NO ₂	SO ₂
	Hours	(mg/m ³)	(µg/m ³)	(µg/m ³)	(µg/m ³)
1.	09:00 A.M	0.17	7.25	13.57	11.55
2.	10:00 A.M	0.29	7.59	11.52	11.23
3.	11:00 A.M	0.14	6.60	10.81	6.69
4.	12:00 P.M	0.21	6.75	10.79	6.92
5.	01:00 P.M	0.11	9.99	13.74	7.79
6.	02:00 P.M	0.27	11.09	10.27	11.25
7.	03:00 P.M	0.26	10.56	13.58	8.67
8.	04:00 P.M	0.11	9.44	14.93	12.12
9.	05:00 P.M	0.24	6.62	10.34	7.84
10.	06:00 P.M	0.14	6.68	11.20	11.25
11.	07:00 P.M	0.18	6.54	12.57	6.91
12.	08:00 P.M	0.30	7.22	8.82	11.10
13.	09:00 P.M	0.22	10.92	13.18	10.05
14.	10:00 P.M	0.29	7.01	14.20	11.67
15.	11:00 P.M	0.27	9.36	12.28	9.63
16.	12:00 A.M	0.24	6.88	10.58	8.80
17.	01:00 A.M	0.16	6.60	12.62	8.17
18.	02:00 A.M	0.13	10.05	11.93	9.60
19.	03:00 A.M	0.08	9.66	8.78	8.99
20.	04:00 A.M	0.10	7.77	11.07	12.42
21.	05:00 A.M	0.19	6.78	14.22	10.08
22.	06:00 A.M	0.31	7.52	12.44	13.45
23.	07:00 A.M	0.24	8.82	14.61	11.82
24.	08:00 A.M	0.18	11.49	9.12	10.18
Average Concentration		0.20	8.30	11.97	9.92
NEQSAA		05	40	80	120
WHO		04	—	25	40

NEQSAA: National Environmental Quality Standards for Ambient Air
WHO: World Health Organization

Note:

- Selected measurement units were µg/m³ & mg/m³ otherwise stated.
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AMBIENT GASES MONITORING REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGQC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Tailrace (Barkot) Upstream
Monitoring Date:	23-06-2025	Reporting Date:	04-07-2025
Source:	Ambient Air Gases	Monitoring Instrument:	Aeroqual, AQMS 09
GPS Coordinates:	34 596088, 73 374512		

Sr. No	Time	Parameters			
		CO	NO	NO ₂	SO ₂
	Hours	Units			
		(mg/m ³)	(µg/m ³)	(µg/m ³)	(µg/m ³)
1.	09:00 A.M	0.14	11.00	16.68	18.14
2.	10:00 A.M	0.26	13.85	19.01	17.40
3.	11:00 A.M	0.29	14.89	18.44	19.30
4.	12:00 P.M	0.23	13.08	18.85	15.28
5.	01:00 P.M	0.33	14.40	14.68	17.38
6.	02:00 P.M	0.22	15.16	14.91	17.87
7.	03:00 P.M	0.19	13.41	17.40	15.60
8.	04:00 P.M	0.16	13.87	15.54	15.73
9.	05:00 P.M	0.20	11.92	16.98	18.70
10.	06:00 P.M	0.28	12.34	17.45	17.70
11.	07:00 P.M	0.31	13.44	16.28	16.11
12.	08:00 P.M	0.28	14.95	16.83	15.16
13.	09:00 P.M	0.30	12.10	16.79	20.59
14.	10:00 P.M	0.15	13.63	14.45	19.81
15.	11:00 P.M	0.32	11.36	18.99	19.91
16.	12:00 A.M	0.20	15.79	17.46	19.00
17.	01:00 A.M	0.34	15.11	18.67	19.21
18.	02:00 A.M	0.26	14.64	16.47	18.75
19.	03:00 A.M	0.34	12.91	16.36	15.36
20.	04:00 A.M	0.19	13.10	19.04	14.83
21.	05:00 A.M	0.34	13.57	15.65	15.65
22.	06:00 A.M	0.26	15.59	18.30	17.75
23.	07:00 A.M	0.24	15.12	16.37	17.11
24.	08:00 A.M	0.20	14.79	17.69	16.93
Average Concentration		0.25	13.75	17.06	17.47
NEQSAA		05	40	80	120
WHO		04	—	25	40

NEQSAA: National Environmental Quality Standards for Ambient Air
WHO: World Health Organization

Note:

- Selected measurement units were µg/m³ & mg/m³ otherwise stated.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.


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AMBIENT GASES MONITORING REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	GRC Camp Office (Sanghar)
Monitoring Date:	25-06-2025	Reporting Date:	04-07-2025
Source:	Ambient Air Gases	Monitoring Instrument:	Aeroqual, AQMS 09
GPS Coordinates:	34 584562, 73 373878		

Sr. No	Time	Parameters			
		CO	NO	NO ₂	SO ₂
		Units	Units	Units	Units
	Hours	(mg/m ³)	(µg/m ³)	(µg/m ³)	(µg/m ³)
1	09:00 A.M	0.39	15.05	16.74	19.75
2	10:00 A.M	0.48	17.07	20.75	15.56
3	11:00 A.M	0.33	15.61	18.51	19.21
4	12:00 P.M	0.35	17.36	21.01	21.06
5	01:00 P.M	0.27	11.86	18.06	14.91
6	02:00 P.M	0.33	13.56	19.99	16.54
7	03:00 P.M	0.42	15.74	18.26	15.07
8	04:00 P.M	0.42	14.95	22.40	22.72
9	05:00 P.M	0.35	15.77	18.61	19.51
10	06:00 P.M	0.23	18.25	19.43	17.34
11	07:00 P.M	0.30	13.25	20.38	19.84
12	08:00 P.M	0.41	16.51	17.79	14.92
13	09:00 P.M	0.45	14.97	18.29	21.50
14	10:00 P.M	0.28	13.84	19.09	15.29
15	11:00 P.M	0.33	17.75	22.16	22.30
16	12:00 A.M	0.25	14.66	19.40	19.17
17	01:00 A.M	0.42	14.91	20.76	21.76
18	02:00 A.M	0.38	15.88	17.67	21.43
19	03:00 A.M	0.33	14.48	22.03	18.26
20	04:00 A.M	0.33	12.39	22.32	14.70
21	05:00 A.M	0.28	17.33	17.24	21.75
22	06:00 A.M	0.41	12.57	17.14	20.40
23	07:00 A.M	0.40	18.55	16.42	16.61
24	08:00 A.M	0.44	14.57	17.57	16.39
Average Concentration		0.36	15.29	19.26	18.58
NEQSAA		05	40	80	120
WHO		04	---	25	40

NEQSAA: National Environmental Quality Standards for Ambient Air
WHO: World Health Organization

Note:

- Selected measurement units were µg/m³ & mg/m³ otherwise stated.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.


Signature of Analyst:


Signature of Chief Executive Officer


FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

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AMBIENT GASES MONITORING REPORT

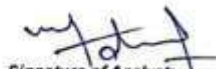
Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Colony Area (Snaghar)
Monitoring Date:	26-06-2025	Reporting Date:	04-07-2025
Source:	Ambient Air Gases	Monitoring Instrument:	Aeroqual, AQMS 09
GPS Coordinates:	34 587775, 73.366225		

Sr. No	Time	Parameters			
		CO	NO	NO ₂	SO ₂
		Units			
	Hours	(mg/m ³)	(µg/m ³)	(µg/m ³)	(µg/m ³)
1	09:00 A.M	0.17	6.28	10.89	7.46
2	10:00 A.M	0.21	7.34	11.36	8.62
3	11:00 A.M	0.22	5.79	6.98	6.85
4	12:00 P.M	0.18	6.42	10.74	6.37
5	01:00 P.M	0.12	6.03	8.56	10.93
6	02:00 P.M	0.10	5.75	13.16	7.82
7	03:00 P.M	0.24	9.65	10.12	6.92
8	04:00 P.M	0.17	5.52	10.86	11.60
9	05:00 P.M	0.16	10.47	7.91	9.64
10	06:00 P.M	0.17	6.38	8.60	6.40
11	07:00 P.M	0.13	8.03	9.24	10.74
12	08:00 P.M	0.14	9.18	11.56	11.42
13	09:00 P.M	0.18	9.48	7.56	11.15
14	10:00 P.M	0.24	7.20	9.55	11.04
15	11:00 P.M	0.06	7.05	12.46	10.80
16	12:00 A.M	0.27	6.82	8.81	7.13
17	01:00 A.M	0.23	8.98	11.49	7.40
18	02:00 A.M	0.06	7.65	10.74	9.82
19	03:00 A.M	0.24	6.69	11.93	11.60
20	04:00 A.M	0.25	6.21	8.87	10.75
21	05:00 A.M	0.21	6.92	7.00	12.14
22	06:00 A.M	0.05	10.45	7.56	10.05
23	07:00 A.M	0.26	6.42	12.55	11.12
24	08:00 A.M	0.24	9.55	13.51	10.81
Average Concentration		0.18	7.51	10.88	9.52
NEQSAA		05	40	80	120
WHO		04	---	25	40

NEQSAA: National Environmental Quality Standards for Ambient Air
WHO: World Health Organization

Note:

- Selected measurement units were µg/m³ & mg/m³ otherwise stated.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.


Signature of Analyst:


Signature of Chief Chemist


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Ambient Noise Level Monitoring Results (Second Quarter, 2025)



AMBIENT NOISE MONITORING REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Dam Site (Paras Valley)
Monitoring Date:	19-06-2025	Reporting Date:	04-07-2025
Source:	Ambient Noise	Monitoring Instrument:	Noise Meter-IEC651-Type-2
GPS Coordinates:	34.660470, 73.455497		

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	09:00 A.M	dB(A)	64.9	66.5	65.7
2.	10:00 A.M		66.7	68.5	67.6
3.	11:00 A.M		66.4	69.5	67.95
4.	12:00 P.M		62.9	65.3	64.1
5.	01:00 P.M		69.1	69.8	69.45
6.	02:00 P.M		69.5	69.9	69.7
7.	03:00 P.M		68.3	70.6	69.45
8.	04:00 P.M		66.4	67	66.7
9.	05:00 P.M		57.1	59.1	58.1
10.	06:00 P.M		61.5	63.2	62.35
11.	07:00 P.M		59.9	61.7	60.8
12.	08:00 P.M		59.5	62.9	61.2
13.	09:00 P.M		59.6	67.3	63.45
14.	10:00 P.M		63.9	64.4	64.15
15.	11:00 P.M		61.6	66	63.8
16.	12:00 A.M		63.9	68.6	66.25
17.	01:00 A.M		59.8	61.3	60.55
18.	02:00 A.M		60	66.6	63.3
19.	03:00 A.M		63.5	65.8	64.65
20.	04:00 A.M		61.8	63.2	62.5
21.	05:00 A.M		60.6	62.6	61.6
22.	06:00 A.M		60.1	66.6	63.35
23.	07:00 A.M		61.6	63.3	62.45
24.	08:00 A.M		63.9	65.2	64.55
NEQS limit : 45-55 dB					
WHO limit: 70 dB					

NEQS: National Environmental Quality Standards WHO: World Health Organization
 Leq: Log Equivalent Continuous Sound Level

Note:

- Selected measurement units were dB (A) otherwise stated.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

Signature of Analyst

Signature of Chief Chemist



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AMBIENT NOISE MONITORING REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Adit-1 (Thobi)
Monitoring Date:	24-05-2025	Reporting Date:	04-07-2025
Source:	Ambient Noise	Monitoring Instrument:	Noise Meter-IEC651-Type-2
GPS Coordinates:	34 636125, 73 428597		

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	09:00 A.M	dB(A)	68.7	71.9	70.3
2.	10:00 A.M		68.5	71.7	70.1
3.	11:00 A.M		68.3	71.5	69.9
4.	12:00 P.M		68.1	71.3	69.7
5.	01:00 P.M		67.8	71	69.4
6.	02:00 P.M		67.6	70.8	69.2
7.	03:00 P.M		67.4	70.6	69
8.	04:00 P.M		67.2	70.4	68.8
9.	05:00 P.M		67	70.2	68.6
10.	06:00 P.M		53.8	57	55.4
11.	07:00 P.M		53.5	56.7	55.1
12.	08:00 P.M		53.3	56.5	54.9
13.	09:00 P.M		53.1	56.3	54.7
14.	10:00 P.M		52.9	56.1	54.5
15.	11:00 P.M		52.7	55.9	54.3
16.	12:00 A.M		52.4	55.6	54
17.	01:00 A.M		52.2	55.4	53.8
18.	02:00 A.M		52	55.2	53.6
19.	03:00 A.M		51.8	55	53.4
20.	04:00 A.M		51.6	54.7	53.15
21.	05:00 A.M		51.3	54.5	52.9
22.	06:00 A.M		51.1	54.3	52.7
23.	07:00 A.M		49.2	53.1	51.15
24.	08:00 A.M		55.4	59.5	57.45
NEQS limit : 45-55 dB					
WHO limit: 70 dB					

NEQS: National Environmental Quality Standards WHO: World Health Organization
Leq: Log Equivalent Continuous Sound Level

Note:

- Selected measurement units were dB (A) otherwise stated.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

Signature of Analyst:

Signature of Chief Chemist



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AMBIENT NOISE MONITORING REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Adit-2 (Ghanool)
Monitoring Date:	20-06-2025	Reporting Date:	04-07-2025
Source:	Ambient Noise	Monitoring Instrument:	Noise Meter-IEC851-Type-2
GPS Coordinates:	34.619787, 73.417525		

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	09:00 A.M	dB(A)	68	69.4	68.7
2.	10:00 A.M		69.8	71.4	70.6
3.	11:00 A.M		69.5	72.4	70.95
4.	12:00 P.M		66	68.2	67.1
5.	01:00 P.M		72.2	72.7	72.45
6.	02:00 P.M		72.6	72.8	72.7
7.	03:00 P.M		71.4	73.5	72.45
8.	04:00 P.M		69.5	69.9	69.7
9.	05:00 P.M		65	67.3	66.15
10.	06:00 P.M		47.5	49.4	48.45
11.	07:00 P.M		45.9	47.9	46.9
12.	08:00 P.M		45.5	49.1	47.3
13.	09:00 P.M		45.6	53.5	49.55
14.	10:00 P.M		49.9	50.6	50.25
15.	11:00 P.M		47.6	52.2	49.9
16.	12:00 A.M		49.9	54.8	52.35
17.	01:00 A.M		45.8	47.5	46.65
18.	02:00 A.M		46	52.8	49.4
19.	03:00 A.M		49.5	52	50.75
20.	04:00 A.M		47.8	49.4	48.6
21.	05:00 A.M		46.6	48.8	47.7
22.	06:00 A.M		46.1	52.8	49.45
23.	07:00 A.M		47.7	50.6	49.15
24.	08:00 A.M		49.9	51.4	50.65

NEQS limit : 45-55 dB

WHO limit: 70 dB

NEQS: National Environmental Quality Standards WHO: World Health Organization
Leq: Log Equivalent Continuous Sound Level

Note:

- Selected measurement units were dB (A) otherwise stated.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

Signature of Analyst

Signature of Chief Chemist



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AMBIENT NOISE MONITORING REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Adit-3 (Kholian)
Monitoring Date:	21-06-2025	Reporting Date:	04-07-2025
Source:	Ambient Noise	Monitoring Instrument:	Noise Meter-IEC651-Type-2
GPS Coordinates:	34.610253, 73.389367		

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leg
1.	09:00 A.M	dB(A)	70.4	73.3	71.85
2.	10:00 A.M		70.2	73	71.6
3.	11:00 A.M		69.9	72.8	71.35
4.	12:00 P.M		69.7	72.6	71.15
5.	01:00 P.M		69.5	72.4	70.95
6.	02:00 P.M		69.3	72.2	70.75
7.	03:00 P.M		69.1	72	70.55
8.	04:00 P.M		68.9	71.7	70.3
9.	05:00 P.M		67.6	70.5	69.05
10.	06:00 P.M		67.4	70.3	68.85
11.	07:00 P.M		67.2	70.1	68.65
12.	08:00 P.M		67	69.9	68.45
13.	09:00 P.M		66.8	69.7	68.25
14.	10:00 P.M		66.6	69.4	68
15.	11:00 P.M		56.5	59.4	57.95
16.	12:00 A.M		56.2	59.1	57.65
17.	01:00 A.M		56	58.9	57.45
18.	02:00 A.M		55.8	58.7	57.25
19.	03:00 A.M		55.6	58.5	57.05
20.	04:00 A.M		55.4	58.2	56.8
21.	05:00 A.M		55.1	58	56.55
22.	06:00 A.M		54.9	57.8	56.35
23.	07:00 A.M		54.7	57.6	56.15
24.	08:00 A.M		58.5	60.2	59.35

NEQS limit : 45-55 dB
WHO limit: 70 dB

NEQS: National Environmental Quality Standards WHO: World Health Organization
Leq: Log Equivalent Continuous Sound Level

Note:

- Selected measurement units were dB (A) otherwise stated.
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- The report is not valid for court.

Signature of Analyst

Signature of Chief Chemist



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AMBIENT NOISE MONITORING REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Powerhouse (Barkot)
Monitoring Date:	22-06-2025	Reporting Date:	04-07-2025
Source:	Ambient Noise	Monitoring Instrument:	Noise Meter-IEC651-Type-2
GPS Coordinates:	34.601812, 73.377145		

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	09:00 A.M	dB(A)	65.8	68.4	67.1
2.	10:00 A.M		65.6	68.1	66.85
3.	11:00 A.M		65.3	67.9	66.6
4.	12:00 P.M		65.1	67.7	66.4
5.	01:00 P.M		64.9	67.5	66.2
6.	02:00 P.M		64.7	67.3	66
7.	03:00 P.M		64.5	67.1	65.8
8.	04:00 P.M		64.3	66.8	65.55
9.	05:00 P.M		64	66.6	65.3
10.	06:00 P.M		63.8	66.4	65.1
11.	07:00 P.M		63.6	66.2	64.9
12.	08:00 P.M		63.4	66	64.7
13.	09:00 P.M		63.2	65.8	64.5
14.	10:00 P.M		63	65.5	64.25
15.	11:00 P.M		62.7	65.3	64
16.	12:00 A.M		62.5	65.1	63.8
17.	01:00 A.M		62.3	64.9	63.6
18.	02:00 A.M		62.1	64.7	63.4
19.	03:00 A.M		61.9	64.5	63.2
20.	04:00 A.M		61.7	64.2	62.95
21.	05:00 A.M		61.4	64	62.7
22.	06:00 A.M		61.2	63.8	62.5
23.	07:00 A.M		61	63.6	62.3
24.	08:00 A.M		60.8	63.4	62.1

NEQS limit : 45-55 dB
WHO limit: 70 dB

NEQS: National Environmental Quality Standards WHO: World Health Organization
Leq: Log Equivalent Continuous Sound Level

Note:

- Selected measurement units were dB (A) otherwise stated.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

[Signature]
Signature of Analyst

[Signature]
Signature of Chief Chemist



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AMBIENT NOISE MONITORING REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Tailrace (Barkot) Upstream
Monitoring Date:	23-06-2025	Reporting Date:	04-07-2025
Source:	Ambient Noise	Monitoring Instrument:	Noise Meter-IEC651-Type-2
GPS Coordinates:	34.596088, 73.374512		

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	09:00 A.M	dB(A)	62.9	66.3	64.6
2.	10:00 A.M		64	67.3	65.65
3.	11:00 A.M		62	63.9	62.95
4.	12:00 P.M		61.9	65.6	63.75
5.	01:00 P.M		65.4	69.4	67.4
6.	02:00 P.M		65.4	67.2	66.3
7.	03:00 P.M		61.8	64.1	62.95
8.	04:00 P.M		64.5	66	65.25
9.	05:00 P.M		66.8	70.1	68.45
10.	06:00 P.M		54.4	56.4	55.4
11.	07:00 P.M		56.9	60.4	58.65
12.	08:00 P.M		50.9	53.9	52.4
13.	09:00 P.M		48.9	51.5	50.2
14.	10:00 P.M		53.2	56.1	54.65
15.	11:00 P.M		50.9	53.2	52.05
16.	12:00 A.M		53.2	54.8	54
17.	01:00 A.M		54.9	57.4	56.15
18.	02:00 A.M		50.4	52.9	51.65
19.	03:00 A.M		52.8	55.4	54.1
20.	04:00 A.M		51.1	54.6	52.85
21.	05:00 A.M		49.9	52	50.95
22.	06:00 A.M		49.2	52.4	50.8
23.	07:00 A.M		61.6	65.3	63.45
24.	08:00 A.M		65.8	69.4	67.6
NEQS limit : 45-55 dB					
WHO limit: 70 dB					

NEQS: National Environmental Quality Standards WHO: World Health Organization
Leq: Log Equivalent Continuous Sound Level

Note:

- Selected measurement units were dB (A) otherwise stated.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.

Signature of Analyst

Signature of Chief Engineer



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AMBIENT NOISE MONITORING REPORT

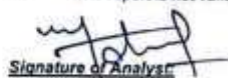
Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	GRC Camp Office (Sanghar)
Monitoring Date:	25-06-2025	Reporting Date:	04-07-2025
Source:	Ambient Noise	Monitoring Instrument:	Noise Meter-IEC651-Type-2
GPS Coordinates:	34 584562, 73 373878		

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1	09 00 A.M	dB(A)	64.1	67	65.55
2	10 00 A.M		63.9	66.8	65.35
3	11 00 A.M		63.7	66.6	65.15
4	12 00 P.M		63.5	66.4	64.95
5	01 00 P.M		63.3	66.1	64.7
6	02 00 P.M		63	65.9	64.45
7	03 00 P.M		62.8	65.7	64.25
8	04 00 P.M		62.6	65.5	64.05
9	05 00 P.M		56.1	59	57.55
10	06 00 P.M		55.9	58.8	57.35
11	07 00 P.M		55.7	58.5	57.1
12	08 00 P.M		55.4	58.3	56.85
13	09 00 P.M		55.2	58.1	56.65
14	10 00 P.M		55	57.9	56.45
15	11 00 P.M		54.8	57.7	56.25
16	12 00 A.M		54.6	57.5	56.05
17	01 00 A.M		54.4	57.3	55.85
18	02 00 A.M		54.2	57.1	55.65
19	03 00 A.M		54	56.9	55.45
20	04 00 A.M		53.8	56.6	55.2
21	05 00 A.M		53.5	56.4	54.95
22	06 00 A.M		53.3	56.2	54.75
23	07 00 A.M		54.2	56.6	55.4
24	08 00 A.M		51.5	55	53.25
NEQS limit : 55-65 dB					
WHO limit: 70 dB					

NEQS: National Environmental Quality Standards WHO: World Health Organization
Leq: Log Equivalent Continuous Sound Level

Note:

- Selected measurement units were dB (A) otherwise stated.
- The client is responsible lawful usage of reported data in future.
- The report is not valid for court.


Signature of Analyst


Signature of Chief Chemist



FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

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AMBIENT NOISE MONITORING REPORT

Reference Number:	BHPP/ENV/161-2025	Client Name:	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Colony Area (Sanghar)
Monitoring Date:	26-06-2025	Reporting Date:	04-07-2025
Source:	Ambient Noise	Monitoring Instrument:	Noise Meter-IEC651-Type-2
GPS Coordinates:	34 587775, 73.366225		

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	09:00 A.M	dB(A)	59.7	62.1	60.9
2.	10:00 A.M		61.5	64.1	62.8
3.	11:00 A.M		61.2	65.1	63.15
4.	12:00 P.M		57.7	60.9	59.3
5.	01:00 P.M		63.9	65.4	64.65
6.	02:00 P.M		64.3	65.5	64.9
7.	03:00 P.M		63.1	66.2	64.65
8.	04:00 P.M		61.2	62.6	61.9
9.	05:00 P.M		57.2	60	58.6
10.	06:00 P.M		61.6	64.1	62.85
11.	07:00 P.M		60	62.6	61.3
12.	08:00 P.M		53.8	57.8	55.7
13.	09:00 P.M		53.7	62.2	57.95
14.	10:00 P.M		58	59.3	58.65
15.	11:00 P.M		55.7	60.9	58.3
16.	12:00 A.M		58	63.5	60.75
17.	01:00 A.M		53.9	56.2	55.05
18.	02:00 A.M		54.1	61.5	57.8
19.	03:00 A.M		57.6	60.7	59.15
20.	04:00 A.M		55.9	58.1	57
21.	05:00 A.M		54.7	57.5	56.1
22.	06:00 A.M		54.2	61.5	57.85
23.	07:00 A.M		59.7	65.3	62.5
24.	08:00 A.M		58	60.1	59.05

NEQS limit: 45-55 dB

WHO limit: 70 dB

NEQS: National Environmental Quality Standards WHO: World Health Organization
Leq: Log Equivalent Continuous Sound Level

Note:

- Selected measurement units were dB (A) otherwise stated.
- The client is responsible lawful usage of reported data in future.
- The reports not valid for court.

Signature of Analyst:

Signature of Chief Chemist



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Drinking Water Monitoring Results (Second Quarter, 2024)

DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Dam Site (Paras Valley)
Sampling Date:	26-06-2025	Reporting Date:	04-07-2025
Source:	Spring Water (Source)	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates:	34 653167, 73.445678		

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA-4500H+ B	—	6.5-8.5	6.5-8.5	7.3
2.	Temperature	—	°C	—	—	11
3.	Taste & Odor	In-house	—	Non-Objectionable	Non-Objectionable	Non-Objectionable
4.	Color	APHA-2120 B/C	TCU	≤ 15	<15	2.4
5.	Turbidity	APHA-2130 B	NTU	<5	<5	3.1
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000	269
7.	Total Hardness as CaCO ₃	APHA-2340 C	mg/L	—	<500	183
8.	Nitrate (NO ₃)	APHA-4500NO3 B	mg/L	50	≤50	0.86
9.	Nitrite (NO ₂)	APHA-4500NO2 B	mg/L	3	≤3	0.006
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D.
11.	Nickel (Ni)	ASTM E3047-16	mg/L	0.02	≤0.02	N.D.
12.	Antimony (Sb)	APHA-3500Sb B	mg/L	0.005	<0.005	N.D.
13.	Chloride (Cl)	APHA-4500Cl- B	mg/L	250	<250	86.4
14.	Chlorine	APHA-4500 CL	mg/L	—	0.5-1.5	0.52
15.	Lead (Pb)	APHA-3500 Pb-B	mg/L	0.01	≤0.05	N.D.
16.	Fluoride	APHA-4500F- C	mg/L	1.5	≤1.5	0.42
17.	Aluminum	APHA-3500 Al	mg/L	≤ 0.2	≤0.2	N.D.
18.	Manganese (Mn)	APHA-3500 MN-B	mg/L	0.5	≤0.5	N.D.
19.	Cadmium (Cd)	APHA-3500 Cd-B	mg/L	0.003	0.01	N.D.
20.	Barium (Ba)	APHA-3500 Ba B	mg/L	0.3	0.7	0.049
21.	Mercury (Hg)	APHA-3500 Hg-B	mg/L	0.001	≤0.001	N.D.
22.	Copper (Cu)	APHA- 3500 Cu-B	mg/L	2	2	0.06
23.	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	1.14
24.	Boron (B)	APHA 4500 B- C	mg/L	0.3	0.3	N.D.
25.	Chromium (Cr)	APHA 3500 cr B	mg/L	0.05	≤0.05	N.D.
26.	Selenium (Se)	APHA- 3500 Se C	mg/L	0.01	0.01	N.D.
27.	Cyanide (CN)	APHA 4500-CN	mg/L	0.07	≤0.05	N.D.
28.	E-Coli	APHA-9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29.	Total Coliform	APHA-9222 B	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS
N D

National Drinking Water Quality Standards WHO
Not Detected

World Health Organization

Signature of Analyst

Signature of Chief Chemist



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DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Dam Site (Paras Valley)
Sampling Date:	26-06-2025	Reporting Date:	04-07-2025
Source:	Tap Water (End User)	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates:	34.860653, 73.455772		

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA-4500H+ B	—	6.5-8.5	6.5-8.5	7.6
2.	Temperature	—	°C	—	—	13
3.	Taste & Odor	In-house	—	Non-Objectable	Non-Objectable	Non-Objectable
4.	Color	APHA-2120 B/C	TCU	≤ 15	≤ 15	4
5.	Turbidity	APHA-2130 B	NTU	< 5	< 5	3.8
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	< 1000	313
7.	Total Hardness as CaCO ₃	APHA-2340 C	mg/L	—	< 500	199
8.	Nitrate (NO ₃)	APHA-4500NO3 B	mg/L	50	≤ 50	1.04
9.	Nitrite (NO ₂)	APHA-4500NO2 B	mg/L	3	≤ 3	0.003
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤ 0.05	N.D.
11.	Nickel (Ni)	ASTM E3047-16	mg/L	0.02	≤ 0.02	N.D.
12.	Antimony (Sb)	APHA-3500Sb B	mg/L	0.005	< 0.005	N.D.
13.	Chloride (Cl)	APHA-4500Cl- B	mg/L	250	< 250	83.9
14.	Chlorine	APHA-4500 CL	mg/L	—	0.5-1.5	0.47
15.	Lead (Pb)	APHA-3500 Pb-B	mg/L	0.01	≤ 0.05	N.D.
16.	Fluoride	APHA-4500F- C	mg/L	1.5	≤ 1.5	0.47
17.	Aluminum	APHA-3500 Al	mg/L	≤ 0.2	≤ 0.2	N.D.
18.	Manganese (Mn)	APHA-3500 MN-B	mg/L	0.5	≤ 0.5	N.D.
19.	Cadmium (Cd)	APHA-3500 Cd-B	mg/L	0.003	0.01	N.D.
20.	Barium (Ba)	APHA-3500 Ba B	mg/L	0.3	0.7	0.27
21.	Mercury (Hg)	APHA-3500 Hg-B	mg/L	0.001	≤ 0.001	N.D.
22.	Copper (Cu)	APHA- 3500 Cu-B	mg/L	2	2	0.19
23.	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	1.25
24.	Boron (B)	APHA 4500 B- C	mg/L	0.3	0.3	N.D.
25.	Chromium (Cr)	APHA 3500 cr B	mg/L	0.05	≤ 0.05	N.D.
26.	Selenium (Se)	APHA- 3500 Se C	mg/L	0.01	0.01	N.D.
27.	Cyanide (CN)	APHA 4500-CN	mg/L	0.07	≤ 0.05	N.D.
28.	E-Coli	APHA-9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29.	Total Coliform	APHA-9222 B	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS National Drinking Water Quality Standards WHO
N D Not Detected

World Health Organization

Signature of Analyst:

Signature of Chief Chemist



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DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Adit-1 (Thobi)
Sampling Date:	26-06-2025	Reporting Date:	04-07-2025
Source:	Spring Water (Source)	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates:	34.636125, 73.428597		

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1	pH	APHA-4500H+ B	--	6.5-8.5	6.5-8.5	7.6
2	Temperature	---	°C	---	---	14
3	Taste & Odor	In-house	--	Non-Objectionable	Non-Objectionable	Non-Objectionable
4	Color	APHA-2120 B/C	TCU	≤ 15	<15	5
5	Turbidity	APHA-2130 B	NTU	<5	<5	3.2
6	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000	351
7	Total Hardness as CaCO ₃	APHA-2340 C	mg/L	---	<500	187
8	Nitrate (NO ₃)	APHA-4500NO3 B	mg/L	50	≤50	1.84
9	Nitrite (NO ₂)	APHA-4500NO2 B	mg/L	3	≤3	0.008
10	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D.
11	Nickel (Ni)	ASTM E3047-16	mg/L	0.02	≤0.02	0.003
12	Antimony (Sb)	APHA-3500Sb B	mg/L	0.005	<0.005	N.D.
13	Chloride (Cl)	APHA-4500Cl- B	mg/L	250	<250	129
14	Chlorine	APHA-4500 CL	mg/L		0.5-1.5	0.38
15	Lead (Pb)	APHA-3500 Pb-B	mg/L	0.01	≤0.05	N.D.
16	Fluoride	APHA-4500F- C	mg/L	1.5	≤1.5	0.49
17	Aluminum	APHA-3500 Al	mg/L	≤ 0.2	≤0.2	N.D.
18	Manganese (Mn)	APHA-3500 MN-B	mg/L	0.5	≤0.5	N.D.
19	Cadmium (Cd)	APHA-3500 Cd-B	mg/L	0.003	0.01	N.D.
20	Barium (Ba)	APHA-3500 Ba B	mg/L	0.3	0.7	0.2
21	Mercury (Hg)	APHA-3500 Hg-B	mg/L	0.001	≤0.001	N.D.
22	Copper (Cu)	APHA- 3500 Cu-B	mg/L	2	2	0.058
23	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	1.08
24	Boron (B)	APHA 4500 B- C	mg/L	0.3	0.3	N.D.
25	Chromium (Cr)	APHA 3500 cr B	mg/L	0.05	≤0.05	N.D.
26	Selenium (Se)	APHA- 3500 Se C	mg/L	0.01	0.01	N.D.
27	Cyanide (CN)	APHA 4500-CN	mg/L	0.07	≤0.05	N.D.
28	E-Coli	APHA 9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29	Total Coliform	APHA 9222 B	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS
N D

National Drinking Water Quality Standards WHO
Not Detected

World Health Organization

Signature of Analyst:

Signature of Chief Chemist



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DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Adit-1 (Thobi)
Sampling Date:	26-06-2025	Reporting Date:	04-07-2025
Source:	Tap Water (End User)	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates:	34 636125, 73 428597		

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1	pH	APHA-4500H+ B	--	6.5-8.5	6.5-8.5	7.9
2	Temperature	---	°C	---	---	15
3	Taste & Odor	In-house	--	Non-Objectionable	Non-Objectionable	Non-Objectionable
4	Color	APHA-2120 B/C	TCU	≤ 15	<15	6
5	Turbidity	APHA-2130 B	NTU	<5	<5	4.4
6	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000	364
7	Total Hardness as CaCO ₃	APHA-2340 C	mg/L	---	<500	209
8	Nitrate (NO ₃)	APHA-4500NO3 B	mg/L	50	≤50	1.72
9	Nitrite (NO ₂)	APHA-4500NO2 B	mg/L	3	≤3	0.19
10	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D.
11	Nickel (Ni)	ASTM E3047-16	mg/L	0.02	≤0.02	0.007
12	Antimony (Sb)	APHA-3500Sb B	mg/L	0.005	<0.005	N.D.
13	Chloride (Cl)	APHA-4500Cl- B	mg/L	250	<250	105
14	Chlorine	APHA-4500 CL	mg/L	---	0.5-1.5	0.42
15	Lead (Pb)	APHA-3500 Pb-B	mg/L	0.01	≤0.05	N.D.
16	Fluoride	APHA-4500F- C	mg/L	1.5	≤1.5	0.65
17	Aluminum	APHA-3500 Al	mg/L	≤ 0.2	≤ 0.2	N.D.
18	Manganese (Mn)	APHA-3500 MN-B	mg/L	0.5	≤0.5	N.D.
19	Cadmium (Cd)	APHA-3500 Cd-B	mg/L	0.003	0.01	N.D.
20	Barium (Ba)	APHA-3500 Ba B	mg/L	0.3	0.7	0.18
21	Mercury (Hg)	APHA-3500 Hg-B	mg/L	0.001	≤0.001	N.D.
22	Copper (Cu)	APHA- 3500 Cu-B	mg/L	2	2	0.066
23	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	0.93
24	Boron (B)	APHA 4500 B- C	mg/L	0.3	0.3	N.D.
25	Chromium (Cr)	APHA 3500 cr B	mg/L	0.05	≤0.05	N.D.
26	Selenium (Se)	APHA- 3500 Se C	mg/L	0.01	0.01	N.D.
27	Cyanide (CN)	APHA 4500-CN	mg/L	0.07	≤0.05	N.D.
28	E-Coli	APHA 9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29	Total Coliform	APHA 9222 B	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS National Drinking Water Quality Standards WHO

N D

Not Detected

Signature of Analyst:

World Health Organization

Signature of Chief Chemist



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DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Adit-2 (Ghand)
Sampling Date:	26-06-2025	Reporting Date:	04-07-2025
Source:	Spring Water	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates:	34.619367, 73.417288		

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA-4500H+ B	—	6.5-8.5	6.5-8.5	7.9
2.	Temperature	—	°C	—	—	10
3.	Taste & Odor	In-house	—	Non-Objectionable	Non-Objectionable	Non-Objectionable
4.	Color	APHA-2120 B/C	TCU	≤ 15	<15	6.4
5.	Turbidity	APHA-2130 B	NTU	<5	<5	4.6
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000	366
7.	Total Hardness as CaCO ₃	APHA-2340 C	mg/L	—	<500	291
8.	Nitrate (NO ₃)	APHA-4500NO3 B	mg/L	50	≤50	5.72
9.	Nitrite (NO ₂)	APHA-4500NO2 B	mg/L	3	≤3	0.39
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D.
11.	Nickel (Ni)	ASTM E3047-16	mg/L	0.02	≤0.02	N.D.
12.	Antimony (Sb)	APHA-3500Sb B	mg/L	0.005	<0.005	N.D.
13.	Chloride (Cl)	APHA-4500Cl- B	mg/L	250	<250	144
14.	Chlorine	APHA-4500 CL	mg/L	—	0.5-1.5	0.37
15.	Lead (Pb)	APHA-3500 Pb-B	mg/L	0.01	≤0.05	N.D.
16.	Fluoride	APHA-4500F- C	mg/L	1.5	≤1.5	0.62
17.	Aluminum	APHA-3500 Al	mg/L	≤ 0.2	≤0.2	N.D.
18.	Manganese (Mn)	APHA-3500 MN-B	mg/L	0.5	≤0.5	N.D.
19.	Cadmium (Cd)	APHA-3500 Cd-B	mg/L	0.003	0.01	N.D.
20.	Barium (Ba)	APHA-3500 Ba B	mg/L	0.3	0.7	0.04
21.	Mercury (Hg)	APHA-3500 Hg-B	mg/L	0.001	≤0.001	N.D.
22.	Copper (Cu)	APHA- 3500 Cu-B	mg/L	2	2	0.091
23.	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	1.02
24.	Boron (B)	APHA 4500 B- C	mg/L	0.3	0.3	N.D.
25.	Chromium (Cr)	APHA 3500 cr B	mg/L	0.05	≤0.05	N.D.
26.	Selenium (Se)	APHA- 3500 Se C	mg/L	0.01	0.01	N.D.
27.	Cyanide (CN)	APHA 4500-CN	mg/L	0.07	≤0.05	N.D.
28.	E-Coli	APHA:9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29.	Total Coliform	APHA:9222 B	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS
N D

National Drinking Water Quality Standards WHO
Not Detected

World Health Organiza

Signature of Analyst

Signature of Chief Chemist



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DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Adit-2 (Ghanol)
Sampling Date:	26-06-2025	Reporting Date:	04-07-2025
Source:	Tap Water (End User)	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates:	34.620250, 73.417595		

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA-4500H+ B	—	6.5-8.5	6.5-8.5	7.6
2.	Temperature	—	°C	—	—	13
3.	Taste & Odor	In-house	—	Non-Objectionable	Non-Objectionable	Non-Objectionable
4.	Color	APHA-2120 B/C	TCU	≤ 15	<15	5.9
5.	Turbidity	APHA-2130 B	NTU	<5	<5	4.1
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000	352
7.	Total Hardness as CaCO ₃	APHA-2340 C	mg/L	—	<500	269
8.	Nitrate (NO ₃)	APHA-4500NO3 B	mg/L	50	≤50	5.68
9.	Nitrite (NO ₂)	APHA-4500NO2 B	mg/L	3	≤3	0.37
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D.
11.	Nickel (Ni)	ASTM E3047-16	mg/L	0.02	≤0.02	N.D.
12.	Antimony (Sb)	APHA-3500Sb B	mg/L	0.005	<0.005	N.D.
13.	Chloride (Cl)	APHA-4500Cl- B	mg/L	250	<250	139
14.	Chlorine	APHA-4500 CL	mg/L	—	0.5-1.5	0.3
15.	Lead (Pb)	APHA-3500 Pb-B	mg/L	0.01	≤0.05	N.D.
16.	Fluoride	APHA-4500F- C	mg/L	1.5	≤1.5	0.59
17.	Aluminum	APHA-3500 Al	mg/L	≤ 0.2	≤0.2	N.D.
18.	Manganese (Mn)	APHA-3500 MN-B	mg/L	0.5	≤0.5	N.D.
19.	Cadmium (Cd)	APHA-3500 Cd-B	mg/L	0.003	0.01	N.D.
20.	Barium (Ba)	APHA-3500 Ba B	mg/L	0.3	0.7	0.06
21.	Mercury (Hg)	APHA-3500 Hg-B	mg/L	0.001	≤0.001	N.D.
22.	Copper (Cu)	APHA- 3500 Cu-B	mg/L	2	2	0.093
23.	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	1
24.	Boron (B)	APHA 4500 B- C	mg/L	0.3	0.3	N.D.
25.	Chromium (Cr)	APHA 3500 cr B	mg/L	0.05	≤0.05	N.D.
26.	Selenium (Se)	APHA- 3500 Se C	mg/L	0.01	0.01	N.D.
27.	Cyanide (CN)	APHA 4500-CN	mg/L	0.07	≤0.05	N.D.
28.	E-Coli	APHA:9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29.	Total Coliform	APHA:9222 B	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS
N D

National Drinking Water Quality Standards WHO
Not Detected

World Health Organization

Signature of Analyst

Signature of Chemist



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DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	COGG JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Adi-3 (Kholian)
Sampling Date:	26-06-2025	Reporting Date:	04-07-2025
Source:	Spring Water (Source)	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates:	34 605195, 73 394487		

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA-4500H+ B	—	6.5-8.5	6.5-8.5	7.6
2.	Temperature	—	°C	—	—	10
3.	Taste & Odor	In-house	—	Non-Objectionable	Non-Objectionable	Non-Objectionable
4.	Color	APHA-2120 B/C	TCU	≤ 15	≤ 15	6
5.	Turbidity	APHA-2130 B	NTU	< 5	< 5	4
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	< 1000	308
7.	Total Hardness as CaCO ₃	APHA-2340 C	mg/L	—	< 500	234
8.	Nitrate (NO ₃)	APHA-4500NO3 B	mg/L	50	≤ 50	4.09
9.	Nitrite (NO ₂)	APHA-4500NO2 B	mg/L	3	≤ 3	0.67
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤ 0.05	N.D.
11.	Nickel (Ni)	ASTM E3047-16	mg/L	0.02	≤ 0.02	N.D.
12.	Antimony (Sb)	APHA-3500Sb B	mg/L	0.005	< 0.005	N.D.
13.	Chloride (Cl)	APHA-4500Cl- B	mg/L	250	< 250	124
14.	Chlorine	APHA-4500 CL	mg/L	—	0.5-1.5	0.48
15.	Lead (Pb)	APHA-3500 Pb-B	mg/L	0.01	≤ 0.05	N.D.
16.	Fluoride	APHA-4500F- C	mg/L	1.5	≤ 1.5	0.6
17.	Aluminum	APHA-3500 Al	mg/L	≤ 0.2	≤ 0.2	N.D.
18.	Manganese (Mn)	APHA-3500 MN-B	mg/L	0.5	≤ 0.5	N.D.
19.	Cadmium (Cd)	APHA-3500 Cd-B	mg/L	0.003	0.01	N.D.
20.	Barium (Ba)	APHA-3500 Ba B	mg/L	0.3	0.7	0.19
21.	Mercury (Hg)	APHA-3500 Hg-B	mg/L	0.001	≤ 0.001	N.D.
22.	Copper (Cu)	APHA- 3500 Cu-B	mg/L	2	2	N.D.
23.	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	1.09
24.	Boron (B)	APHA 4500 B- C	mg/L	0.3	0.3	N.D.
25.	Chromium (Cr)	APHA 3500 cr B	mg/L	0.05	≤ 0.05	N.D.
26.	Selenium (Se)	APHA- 3500 Se C	mg/L	0.01	0.01	N.D.
27.	Cyanide (CN)	APHA 4500-CN	mg/L	0.07	≤ 0.05	N.D.
28.	E-Coli	APHA-9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29.	Total Coliform	APHA-9222 B	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS
N D

National Drinking Water Quality Standards WHO

Not Detected

Signature of Analyst

World Health Organization

Signature of Chief Chemist



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DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Adit-3 (Kholian)
Sampling Date:	26-06-2025	Reporting Date:	04-07-2025
Source:	Pipe Water (End User)	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates:	34.608942, 73.383133		

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA-4500H+ B	—	6.5-8.5	6.5-8.5	7.8
2.	Temperature	—	°C	—	—	11
3.	Taste & Odor	In-house	—	Non-Objectionable	Non-Objectionable	Non-Objectionable
4.	Color	APHA-2120 B/C	TCU	≤ 15	<15	6.3
5.	Turbidity	APHA-2130 B	NTU	<5	<5	4.8
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000	389
7.	Total Hardness as CaCO ₃	APHA-2340 C	mg/L	—	<500	277
8.	Nitrate (NO ₃)	APHA-4500NO3 B	mg/L	50	≤50	4.13
9.	Nitrite (NO ₂)	APHA-4500NO2 B	mg/L	3	≤3	0.73
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D.
11.	Nickel (Ni)	ASTM E3047-16	mg/L	0.02	≤0.02	N.D.
12.	Antimony (Sb)	APHA-3500Sb B	mg/L	0.005	<0.005	N.D.
13.	Chloride (Cl)	APHA-4500Cl- B	mg/L	250	<250	116
14.	Chlorine	APHA-4500 CL	mg/L	—	0.5-1.5	0.37
15.	Lead (Pb)	APHA-3500 Pb-B	mg/L	0.01	≤0.05	N.D.
16.	Fluoride	APHA-4500F- C	mg/L	1.5	≤1.5	0.59
17.	Aluminum	APHA-3500 Al	mg/L	≤ 0.2	≤0.2	N.D.
18.	Manganese (Mn)	APHA-3500 MN-B	mg/L	0.5	≤0.5	N.D.
19.	Cadmium (Cd)	APHA-3500 Cd-B	mg/L	0.003	0.01	N.D.
20.	Barium (Ba)	APHA-3500 Ba B	mg/L	0.3	0.7	0.26
21.	Mercury (Hg)	APHA-3500 Hg-B	mg/L	0.001	≤0.001	N.D.
22.	Copper (Cu)	APHA- 3500 Cu-B	mg/L	2	2	N.D.
23.	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	0.94
24.	Boron (B)	APHA 4500 B- C	mg/L	0.3	0.3	N.D.
25.	Chromium (Cr)	APHA 3500 cr B	mg/L	0.05	≤0.05	N.D.
26.	Selenium (Se)	APHA- 3500 Se C	mg/L	0.01	0.01	N.D.
27.	Cyanide (CN)	APHA 4500-CN	mg/L	0.07	≤0.05	N.D.
28.	E-Coli	APHA:9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29.	Total Coliform	APHA:9222 B	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS National Drinking Water Quality Standards WHO
N D Not Detected

[Signature]
Signature of Analyst

World Health Organization
[Signature]
Signature of Chief Chemist

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DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Powerhouse (Barkot)
Sampling Date:	26-06-2025	Reporting Date:	04-07-2025
Source:	Spring Water (Sanduri)	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates:	34.603747, 73.379525		

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA-4500H+ B	—	6.5-8.5	6.5-8.5	7.3
2.	Temperature	—	°C	—	—	9
3.	Taste & Odor	In-house	—	Non-Objectionable	Non-Objectionable	Non-Objectionable
4.	Color	APHA-2120 B/C	TCU	≤ 15	<15	4
5.	Turbidity	APHA-2130 B	NTU	<5	<5	2
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000	243
7.	Total Hardness as CaCO ₃	APHA-2340 C	mg/L	—	<500	167
8.	Nitrate (NO ₃)	APHA-4500NO3 B	mg/L	50	≤50	1.39
9.	Nitrite (NO ₂)	APHA-4500NO2 B	mg/L	3	≤3	0.42
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D.
11.	Nickel (Ni)	ASTM E3047-16	mg/L	0.02	≤0.02	N.D.
12.	Antimony (Sb)	APHA-3500Sb B	mg/L	0.005	<0.005	N.D.
13.	Chloride (Cl)	APHA-4500Cl- B	mg/L	250	<250	131
14.	Chlorine	APHA-4500 CL	mg/L	—	0.5-1.5	0.42
15.	Lead (Pb)	APHA-3500 Pb-B	mg/L	0.01	≤0.05	0.006
16.	Fluoride	APHA-4500F- C	mg/L	1.5	≤1.5	0.24
17.	Aluminum	APHA-3500 Al	mg/L	≤ 0.2	≤0.2	N.D.
18.	Manganese (Mn)	APHA-3500 MN-B	mg/L	0.5	≤0.5	N.D.
19.	Cadmium (Cd)	APHA-3500 Cd-B	mg/L	0.003	0.01	N.D.
20.	Barium (Ba)	APHA-3500 Ba B	mg/L	0.3	0.7	0.06
21.	Mercury (Hg)	APHA-3500 Hg-B	mg/L	0.001	≤0.001	N.D.
22.	Copper (Cu)	APHA- 3500 Cu-B	mg/L	2	2	N.D.
23.	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	1.13
24.	Boron (B)	APHA 4500 B- C	mg/L	0.3	0.3	N.D.
25.	Chromium (Cr)	APHA 3500 cr B	mg/L	0.05	≤0.05	N.D.
26.	Selenium (Se)	APHA- 3500 Se C	mg/L	0.01	0.01	N.D.
27.	Cyanide (CN)	APHA 4500-CN	mg/L	0.07	≤0.05	N.D.
28.	E-Coli	APHA:9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29.	Total Coliform	APHA:9222 B	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS National Drinking Water Quality Standards WHO
N D Not Detected

Signature of Analyst

World Health Organization

Signature of Chief Chemist



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DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Chinese Camp Paras Valley
Sampling Date:	26-06-2025	Reporting Date:	04-07-2025
Source:	Water Storage Tank	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates:	34.664338, 73.460997		

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA-4500H+ B	—	6.5-8.5	6.5-8.5	7.4
2.	Temperature	—	°C	—	—	11
3.	Taste & Odor	In-house	—	Non-Objectionable	Non-Objectionable	Non-Objectionable
4.	Color	APHA-2120 B/C	TCU	≤ 15	<15	6
5.	Turbidity	APHA-2130 B	NTU	<5	<5	4
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000	591
7.	Total Hardness as CaCO ₃	APHA-2340 C	mg/L	—	<500	302
8.	Nitrate (NO ₃)	APHA-4500NO3 B	mg/L	50	≤50	2.34
9.	Nitrite (NO ₂)	APHA-4500NO2 B	mg/L	3	≤3	0.68
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D.
11.	Nickel (Ni)	ASTM E3047-16	mg/L	0.02	≤0.02	0.0039
12.	Antimony (Sb)	APHA-3500Sb B	mg/L	0.005	<0.005	N.D.
13.	Chloride (Cl)	APHA-4500Cl- B	mg/L	250	<250	91
14.	Chlorine	APHA-4500 CL	mg/L	—	0.5-1.5	0.42
15.	Lead (Pb)	APHA-3500 Pb-B	mg/L	0.01	≤0.05	N.D.
16.	Fluoride	APHA-4500F- C	mg/L	1.5	≤1.5	0.73
17.	Aluminum	APHA-3500 Al	mg/L	≤ 0.2	≤0.2	N.D.
18.	Manganese (Mn)	APHA-3500 MN-B	mg/L	0.5	≤0.5	N.D.
19.	Cadmium (Cd)	APHA-3500 Cd-B	mg/L	0.003	0.01	N.D.
20.	Barium (Ba)	APHA-3500 Ba B	mg/L	0.3	0.7	0.16
21.	Mercury (Hg)	APHA-3500 Hg-B	mg/L	0.001	≤0.001	N.D.
22.	Copper (Cu)	APHA- 3500 Cu-B	mg/L	2	2	0.04
23.	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	0.75
24.	Boron (B)	APHA 4500 B- C	mg/L	0.3	0.3	N.D.
25.	Chromium (Cr)	APHA 3500 cr B	mg/L	0.05	≤0.05	N.D.
26.	Selenium (Se)	APHA- 3500 Se C	mg/L	0.01	0.01	N.D.
27.	Cyanide (CN)	APHA 4500-CN	mg/L	0.07	≤0.05	N.D.
28.	E-Coli	APHA:9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	9
29.	Total Coliform	APHA:9222 B	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	17

NDWQS
N D

National Drinking Water Quality Standards WHO

World Health Organization

Signature of Analyst:

Signature of Chief Chemist

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DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Chinese Camp (Power House)
Sampling Date:	26-06-2025	Reporting Date:	04-07-2025
Source:	Water Bottle	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates:	34.593091, 73.365897		

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA-4500H+ B	--	6.5-8.5	6.5-8.5	7.5
2.	Temperature	---	°C	---	---	12
3.	Taste & Odor	In-house	--	Non-Objectionable	Non-Objectionable	Non-Objectionable
4.	Color	APHA-2120 B/C	TCU	≤ 15	<15	4
5.	Turbidity	APHA-2130 B	NTU	<5	<5	2.01
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000	119
7.	Total Hardness as CaCO ₃	APHA-2340 C	mg/L	---	<500	64.2
8.	Nitrate (NO ₃)	APHA-4500NO3 B	mg/L	50	≤50	2.33
9.	Nitrite (NO ₂)	APHA-4500NO2 B	mg/L	3	≤3	0.51
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D
11.	Nickel (Ni)	ASTM E3047-16	mg/L	0.02	≤0.02	0.05
12.	Antimony (Sb)	APHA-3500Sb B	mg/L	0.005	<0.005	N.D
13.	Chloride (Cl)	APHA-4500Cl- B	mg/L	250	<250	115.7
14.	Chlorine	APHA-4500 CL	mg/L	---	0.5-1.5	0.33
15.	Lead (Pb)	APHA-3500 Pb-B	mg/L	0.01	≤0.05	N.D
16.	Fluoride	APHA-4500F- C	mg/L	1.5	≤1.5	0.84
17.	Aluminum	APHA-3500 Al	mg/L	≤ 0.2	≤0.2	N.D
18.	Manganese (Mn)	APHA-3500 MN-B	mg/L	0.5	≤0.5	N.D
19.	Cadmium (Cd)	APHA-3500 Cd-B	mg/L	0.003	0.01	N.D
20.	Barium (Ba)	APHA-3500 Ba B	mg/L	0.3	0.7	0.27
21.	Mercury (Hg)	APHA-3500 Hg-B	mg/L	0.001	≤0.001	N.D
22.	Copper (Cu)	APHA- 3500 Cu-B	mg/L	2	2	0
23.	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	1.47
24.	Boron (B)	APHA 4500 B- C	mg/L	0.3	0.3	N.D
25.	Chromium (Cr)	APHA 3500 cr B	mg/L	0.05	≤0.05	N.D
26.	Selenium (Se)	APHA- 3500 Se C	mg/L	0.01	0.01	N.D
27.	Cyanide (CN)	APHA 4500-CN	mg/L	0.07	≤0.05	N.D
28.	E-Coli	APHA-9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29.	Total Coliform	APHA-9222 B	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS
N D

National Drinking Water Quality Standards WHO
Not Detected

World Health Organization

Signature of Analyst

Signature of Chief Chemist



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DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/181-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Chinese Camp (Power House)
Sampling Date:	26-06-2025	Reporting Date:	04-07-2025
Source:	Tap Water (End User)	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates:	34.592870, 73.365676		

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA-4500H+ B	—	6.5-8.5	6.5-8.5	7.6
2.	Temperature	—	°C	—	—	12
3.	Taste & Odor	In-house	—	Non-Objectionable	Non-Objectionable	Non-Objectionable
4.	Color	APHA-2120 B/C	TCU	≤ 15	<15	4
5.	Turbidity	APHA-2130 B	NTU	<5	<5	2
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000	372
7.	Total Hardness as CaCO ₃	APHA-2340 C	mg/L	—	<500	246
8.	Nitrate (NO ₃)	APHA-4500NO3 B	mg/L	50	≤50	1.16
9.	Nitrite (NO ₂)	APHA-4500NO2 B	mg/L	3	≤3	0.45
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D.
11.	Nickel (Ni)	ASTM E3047-16	mg/L	0.02	≤0.02	0.08
12.	Antimony (Sb)	APHA-3500Sb B	mg/L	0.005	<0.005	N.D.
13.	Chloride (Cl)	APHA-4500Cl- B	mg/L	250	<250	127
14.	Chlorine	APHA-4500 CL	mg/L	—	0.5-1.5	0.61
15.	Lead (Pb)	APHA-3500 Pb-B	mg/L	0.01	≤0.05	N.D.
16.	Fluoride	APHA-4500F- C	mg/L	1.5	≤1.5	0.72
17.	Aluminum	APHA-3500 Al	mg/L	≤ 0.2	≤0.2	N.D.
18.	Manganese (Mn)	APHA-3500 MN-B	mg/L	0.5	≤0.5	N.D.
19.	Cadmium (Cd)	APHA-3500 Cd-B	mg/L	0.003	0.01	N.D.
20.	Barium (Ba)	APHA-3500 Ba B	mg/L	0.3	0.7	0.18
21.	Mercury (Hg)	APHA-3500 Hg-B	mg/L	0.001	≤0.001	N.D.
22.	Copper (Cu)	APHA- 3500 Cu-B	mg/L	2	2	0.06
23.	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	0.91
24.	Boron (B)	APHA 4500 B- C	mg/L	0.3	0.3	N.D.
25.	Chromium (Cr)	APHA 3500 cr B	mg/L	0.05	≤0.05	N.D.
26.	Selenium (Se)	APHA- 3500 Se C	mg/L	0.01	0.01	N.D.
27.	Cyanide (CN)	APHA 4500-CN	mg/L	0.07	≤0.05	N.D.
28.	E-Coli	APHA.9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29.	Total Coliform	APHA.9222 B	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS
N D

National Drinking Water Quality Standards WHO
Not Detected

World Health Organization

Signature of Analyst

Signature of Chief Chemist

FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

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DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/151-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	GRC Camp Office (Sanghar)
Sampling Date:	26-06-2025	Reporting Date:	04-07-2025
Source:	Spring Water (Source)	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates:	34 584928, 73 376913		

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1	pH	APHA-4500H+ B	—	6.5-8.5	6.5-8.5	7.8
2	Temperature	—	°C	—	—	8
3	Taste & Odor	In-house	—	Non-Objectionable	Non-Objectionable	Non-Objectionable
4	Color	APHA-2120 B/C	TCU	≤ 15	<15	4
5	Turbidity	APHA-2130 B	NTU	<5	<5	2
6	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000	368
7	Total Hardness as CaCO ₃	APHA-2340 C	mg/L	—	<500	238
8	Nitrate (NO ₃)	APHA-4500NO3 B	mg/L	50	≤50	1.13
9	Nitrite (NO ₂)	APHA-4500NO2 B	mg/L	3	≤3	0.42
10	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D.
11	Nickel (Ni)	ASTM E3047-16	mg/L	0.02	≤0.02	0.006
12	Antimony (Sb)	APHA-3500Sb B	mg/L	0.005	<0.005	N.D.
13	Chloride (Cl)	APHA-4500Cl- B	mg/L	250	<250	125
14	Chlorine	APHA-4500 CL	mg/L	—	0.5-1.5	0.59
15	Lead (Pb)	APHA-3500 Pb-B	mg/L	0.01	≤0.05	N.D.
16	Fluoride	APHA-4500F- C	mg/L	1.5	≤1.5	0.76
17	Aluminum	APHA-3500 Al	mg/L	≤ 0.2	≤0.2	N.D.
18	Manganese (Mn)	APHA-3500 MN-B	mg/L	0.5	≤0.5	N.D.
19	Cadmium (Cd)	APHA-3500 Cd-B	mg/L	0.003	0.01	N.D.
20	Barium (Ba)	APHA-3500 Ba B	mg/L	0.3	0.7	0.18
21	Mercury (Hg)	APHA-3500 Hg-B	mg/L	0.001	≤0.001	N.D.
22	Copper (Cu)	APHA- 3500 Cu-B	mg/L	2	2	0.03
23	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	0.98
24	Boron (B)	APHA 4500 B- C	mg/L	0.3	0.3	N.D.
25	Chromium (Cr)	APHA 3500 cr B	mg/L	0.05	≤0.05	N.D.
26	Selenium (Se)	APHA- 3500 Se C	mg/L	0.01	0.01	N.D.
27	Cyanide (CN)	APHA 4500-CN	mg/L	0.07	≤0.05	N.D.
28	E-Coli	APHA 9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29	Total Coliform	APHA 9222 B	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS N D National Drinking Water Quality Standards WHO Not Detected

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DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/181-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	GRC Camp Office (Sanghar)
Sampling Date:	26-06-2025	Reporting Date:	04-07-2025
Source:	Tap Water (End User)	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates:	34 584478, 73 373817		

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1	pH	APHA-4500H+ B	---	6.5-8.5	6.5-8.5	7.5
2	Temperature	---	°C	---	---	10
3	Taste & Odor	In-house	---	Non-Objectionable	Non-Objectionable	Non-Objectionable
4	Color	APHA-2120 B/C	TCU	≤ 15	≤ 15	6
5	Turbidity	APHA-2130 B	NTU	< 5	< 5	3.4
6	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	< 1000	384
7	Total Hardness as CaCO ₃	APHA-2340 C	mg/L	---	< 500	361
8	Nitrate (NO ₃)	APHA-4500NO3 B	mg/L	50	≤ 50	1.57
9	Nitrite (NO ₂)	APHA-4500NO2 B	mg/L	3	≤ 3	0.68
10	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤ 0.05	N.D.
11	Nickel (Ni)	ASTM E3047-16	mg/L	0.02	≤ 0.02	0.009
12	Antimony (Sb)	APHA-3500Sb B	mg/L	0.005	< 0.005	N.D.
13	Chloride (Cl)	APHA-4500Cl- B	mg/L	250	< 250	159
14	Chlorine	APHA-4500 CL	mg/L	---	0.5-1.5	0.47
15	Lead (Pb)	APHA-3500 Pb-B	mg/L	0.01	≤ 0.05	N.D.
16	Fluoride	APHA-4500F- C	mg/L	1.5	≤ 1.5	0.53
17	Aluminum	APHA-3500 Al	mg/L	≤ 0.2	≤ 0.2	N.D.
18	Manganese (Mn)	APHA-3500 MN-B	mg/L	0.5	≤ 0.5	N.D.
19	Cadmium (Cd)	APHA-3500 Cd-B	mg/L	0.003	0.01	N.D.
20	Barium (Ba)	APHA-3500 Ba B	mg/L	0.3	0.7	0.22
21	Mercury (Hg)	APHA-3500 Hg-B	mg/L	0.001	≤ 0.001	N.D.
22	Copper (Cu)	APHA- 3500 Cu-B	mg/L	2	2	0.06
23	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	1.2
24	Boron (B)	APHA 4500 B- C	mg/L	0.3	0.3	N.D.
25	Chromium (Cr)	APHA 3500 cr B	mg/L	0.05	≤ 0.05	N.D.
26	Selenium (Se)	APHA- 3500 Se C	mg/L	0.01	0.01	N.D.
27	Cyanide (CN)	APHA 4500-CN	mg/L	0.07	≤ 0.05	N.D.
28	E-Coli	APHA 9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29	Total Coliform	APHA 9222 B	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS
N.D. National Drinking Water Quality Standards WHO
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AMBIENT NOISE MONITORING REPORT

Reference Number:	BHPP/ENV/161-2025	Client Name:	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Colony Area (Sanghar)
Monitoring Date:	26-06-2025	Reporting Date:	04-07-2025
Source:	Ambient Noise	Monitoring Instrument:	Noise Meter-IEC651-Type-2
GPS Coordinates:	34 587775, 73.366225		

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	09:00 A.M	dB(A)	59.7	62.1	60.9
2.	10:00 A.M		61.5	64.1	62.8
3.	11:00 A.M		61.2	65.1	63.15
4.	12:00 P.M		57.7	60.9	59.3
5.	01:00 P.M		63.9	65.4	64.65
6.	02:00 P.M		64.3	65.5	64.9
7.	03:00 P.M		63.1	66.2	64.65
8.	04:00 P.M		61.2	62.6	61.9
9.	05:00 P.M		57.2	60	58.6
10.	06:00 P.M		61.6	64.1	62.85
11.	07:00 P.M		60	62.6	61.3
12.	08:00 P.M		53.8	57.8	55.7
13.	09:00 P.M		53.7	62.2	57.95
14.	10:00 P.M		58	59.3	58.65
15.	11:00 P.M		55.7	60.9	58.3
16.	12:00 A.M		58	63.5	60.75
17.	01:00 A.M		53.9	56.2	55.05
18.	02:00 A.M		54.1	61.5	57.8
19.	03:00 A.M		57.6	60.7	59.15
20.	04:00 A.M		55.9	58.1	57
21.	05:00 A.M		54.7	57.5	56.1
22.	06:00 A.M		54.2	61.5	57.85
23.	07:00 A.M		59.7	65.3	62.5
24.	08:00 A.M		58	60.1	59.05

NEQS limit: 45-55 dB

WHO limit: 70 dB

NEQS: National Environmental Quality Standards WHO: World Health Organization
Leq: Log Equivalent Continuous Sound Level

Note:

- Selected measurement units were dB (A) otherwise stated.
- The client is responsible lawful usage of reported data in future.
- The reports not valid for court.

Signature of Analyst:

Signature of Chief Chemist



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Surface Water Monitoring Results (Second Quarter, 2025)



SURFACE WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Dam Site (Paras Valley)
Sampling Date:	26-06-2025	Reporting Date:	04-07-2025
Source:	Kunhar River	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates	34.660247, 73.451592		

Sr. No	Parameters	Analysis Method	Units	NEQS	Results
1)	Temperature	—	°C	40	8
2)	pH	APHA-4500H+ B	—	6-9	7.9
3)	Chemical Oxygen Demand (COD)	APHA-5220-D	mg/l	150	59
4)	Biological Oxygen Demand (BOD5) at 20 °C	APHA, 5210	mg/l	80	42.1
5)	Total Dissolved Solids (TDS)	APHA-2540 C	mg/l	3500	1094
6)	Total Suspended Solids (TSS)	APHA-2540 D	mg/l	200	104
7)	Total Hardness	APHA-2340 C	mg/l	—	99
8)	Oil & Grease	Separation Method	mg/l	10	1.9
9)	Chromium (Hexa & Trivalent)	APHA-3500Cr B	mg/l	1.0	0.28
10)	Total Iron	APHA-3500-Fe-B	mg/l	8.0	3.1
11)	Chloride	APHA-4500Cl- B	mg/l	1000	143
12)	Fluoride	APHA-4500F- C	mg/l	10	3.02
13)	Ammonia	ASTM-D1426-15	mg/l	40	3.5
14)	Cadmium	APHA-3500 Cd-B	mg/l	0.1	N.D
15)	Lead	APHA-3500-Pb B	mg/l	0.5	N.D
16)	Arsenic	APHA-3500As B	mg/l	1.0	N.D
17)	Copper	APHA-3500Cu B	mg/l	1.0	0.24
18)	Barium	APHA-3500Ba B	mg/l	1.5	0.06
19)	Selenium	APHA- 3500 Se C	mg/l	0.5	N.D
20)	Silver	APHA-3500Ag-B	mg/l	1.0	N.D
21)	Manganese	APHA-3500-Mn B	mg/l	1.5	0.29
22)	Zinc	APHA-3500-Zn B	mg/l	5.0	0.46
23)	Nickel	ASTM E3047-16	mg/l	1.0	0.09
24)	Boron	APHA-4500B-C	mg/l	6.0	N.D
25)	Mercury	APHA-3500 Hg-B	mg/l	0.01	N.D
26)	Sulphide (S ²⁻)	APHA-4500 S ₂	mg/l	1.0	0.33
27)	Sulphate (SO ₄)	APHA-4500-SO ₄ C	mg/l	600	291
28)	An Ionic Detergent (as MBAS)	—	mg/l	20	0.63
29)	Phenolic Compound (as Phenol)	APHA-5530-D	mg/l	0.1	0.005
30)	Cyanide (as CN) total	APHA 4500-CN	mg/l	1.0	N.D
31)	E-Coli	APHA-9222 D	Number/100 mL	—	Uncountable
32)	Total Coliform	APHA-9222 B	Number/100 mL	—	Uncountable

NEQS: National Environmental Quality Standards for Liquid Effluents N.D: Not Detected

[Signature]
Signature of Analyst

[Signature]
Signature of Chief Chemist



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SURFACE WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Tailrace (Barkot) Upstream
Sampling Date:	26-06-2025	Reporting Date:	04-07-2025
Source:	Kunhar River	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates	34 5971541, 73 3700751		

Sr. No	Parameters	Analysis Method	Units	NEQS	Results
1)	Temperature	---	°C	40	8
2)	pH	APHA-4500H+ B	---	6-9	8
3)	Chemical Oxygen Demand (COD)	APHA-5220-D	mg/l	150	61.7
4)	Biological Oxygen Demand (BOD5) at 20 °C	APHA, 5210	mg/l	80	44.02
5)	Total Dissolved Solids (TDS)	APHA-2540 C	mg/l	3500	1341
6)	Total Suspended Solids (TSS)	APHA-2540 D	mg/l	200	116
7)	Total Hardness	APHA-2340 C	mg/l	---	134
8)	Oil & Grease	Separation Method	mg/l	10	1.34
9)	Chromium (Hexa & Trivalent)	APHA-3500Cr B	mg/l	1.0	0.37
10)	Total Iron	APHA-3500-Fe-B	mg/l	8.0	3.37
11)	Chloride	APHA-4500Cl- B	mg/l	1000	154
12)	Fluoride	APHA-4500F- C	mg/l	10	3.17
13)	Ammonia	ASTM-D1426-15	mg/l	40	3.92
14)	Cadmium	APHA-3500 Cd-B	mg/l	0.1	N.D
15)	Lead	APHA-3500-Pb B	mg/l	0.5	N.D
16)	Arsenic	APHA-3500As B	mg/l	1.0	N.D
17)	Copper	APHA-3500Cu B	mg/l	1.0	N.D
18)	Barium	APHA-3500Ba B	mg/l	1.5	0.12
19)	Selenium	APHA- 3500 Se C	mg/l	0.5	N.D
20)	Silver	APHA-3500Ag-B	mg/l	1.0	N.D
21)	Manganese	APHA-3500-Mn B	mg/l	1.5	0.35
22)	Zinc	APHA-3500-Zn B	mg/l	5.0	0.57
23)	Nickel	ASTM E3047-16	mg/l	1.0	0.1
24)	Boron	APHA-4500B-C	mg/l	6.0	N.D
25)	Mercury	APHA-3500 Hg-B	mg/l	0.01	N.D
26)	Sulphide (S ²⁻)	APHA-4500 S ₂	mg/l	1.0	0.46
27)	Sulphate (SO ₄)	APHA-4500-SO ₄ C	mg/l	600	322
28)	An ionic Detergent (as MBAS)	---	mg/l	20	0.71
29)	Phenolic Compound (as Phenol)	APHA-5530-D	mg/l	0.1	0.02
30)	Cyanide (as CN) total	APHA 4500-CN	mg/l	1.0	N.D
31)	E-Coli	APHA:9222 D	Number/100 mL	---	Uncountable
32)	Total Coliform	APHA:9222 B	Number/100 mL	---	Uncountable

NEQS: National Environmental Quality Standards for Liquid Effluents N.D: Not Detected


Signature of Analyst


Signature of Senior Chemist

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SURFACE WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Colony Area (Sanghar)
Sampling Date:	26-06-2025	Reporting Date:	04-07-2025
Source:	Kunhar River	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates	34.596503, 73.363695		

Sr. No	Parameters	Analysis Method	Units	NEQS	Results
1)	Temperature	-----	°C	40	8
2)	pH	APHA-4500H+ B	--	6-9	8.1
3)	Chemical Oxygen Demand (COD)	APHA-5220-D	mg/l	150	63.9
4)	Biological Oxygen Demand (BOD5) at 20 °C	APHA, 5210	mg/l	80	45.6
5)	Total Dissolved Solids (TDS)	APHA-2540 C	mg/l	3500	1359
6)	Total Suspended Solids (TSS)	APHA-2540 D	mg/l	200	119
7)	Total Hardness	APHA-2340 C	mg/l	--	137
8)	Oil & Grease	Separation Method	mg/l	10	1.39
9)	Chromium (Hexa & Trivalent)	APHA-3500Cr B	mg/l	1.0	0.4
10)	Total Iron	APHA-3500-Fe-B	mg/l	8.0	3.4
11)	Chloride	APHA-4500Cl- B	mg/l	100 0	158
12)	Fluoride	APHA-4500F- C	mg/l	10	3.2
13)	Ammonia	ASTM-D1426-15	mg/l	40	4.01
14)	Cadmium	APHA-3500 Cd-B	mg/l	0.1	N.D
15)	Lead	APHA-3500-Pb B	mg/l	0.5	N.D
16)	Arsenic	APHA-3500As B	mg/l	1.0	N.D
17)	Copper	APHA-3500Cu B	mg/l	1.0	N.D
18)	Barium	APHA-3500Ba B	mg/l	1.5	0.14
19)	Selenium	APHA- 3500 Se C	mg/l	0.5	N.D
20)	Silver	APHA-3500Ag-B	mg/l	1.0	N.D
21)	Manganese	APHA-3500-Mn B	mg/l	1.5	0.39
22)	Zinc	APHA-3500-Zn B	mg/l	5.0	0.6
23)	Nickel	ASTM E3047-16	mg/l	1.0	0.1
24)	Boron	APHA-4500B-C	mg/l	6.0	N.D
25)	Mercury	APHA-3500 Hg-B	mg/l	0.01	N.D
26)	Sulphide (S ²⁻)	APHA-4500 S ₂	mg/l	1.0	0.49
27)	Sulphate (SO ₄)	APHA-4500-SO ₄ C	mg/l	600	329
28)	An Ionic Detergent (as MBAS)	---	mg/l	20	0.78
29)	Phenolic Compound (as Phenol)	APHA-5530-D	mg/l	0.1	0.02
30)	Cyanide (as CN) total	APHA 4500-CN	mg/l	1.0	N.D
31)	E-Coli	APHA-9222 D	Number/100 ml	--	Uncountable
32)	Total Coliform	APHA-9222 B	Number/100 ml	--	Uncountable

NEQS: National Environmental Quality Standards for Liquid Effluents N.D: Not Detected

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Soil Analysis Results (Second Quarter, 2025)

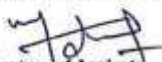


SOIL ANALYSIS REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location :	Adit-1 (Thobi)
Monitoring Date:	26-06-2025	Reporting Date:	04-07-2025
Source:	Soil Sample		

Sr. No.	Parameters	Results
1	Soil Texture	Sand %
		26
		Silt%
		51
	Clay %	23
		Texture Class
		Silty Clay Loam
2	pH	8.1
3	Electrical Conductivity EC (μSm^{-1})	236
4	Phosphorus (mgkg^{-1})	3.81
5	Sodium Absorption Ratio	3.64

μSm^{-1} : Micro siemens/meter
 mgkg^{-1} : milligram per Kilogram


Signature of Analyst:


Signature of Chief Chemist



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SOIL ANALYSIS REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location :	Adit-2 (Ghanol)
Monitoring Date:	26-06-2025	Reporting Date:	04-07-2025
Source:	Soil Sample		

Sr. No.	Parameters	Results
1	Soil Texture	Sand %
		21
		Silt%
		46
	Clay %	33
		Texture Class
		Silty Clay Loam
2	pH	7.8
3	Electrical Conductivity EC (μSm^{-1})	259
4	Phosphorus (mgkg^{-1})	2.42
5	Sodium Absorption Ratio	3.97

μSm^{-1} : micro siemens/meter
 mgkg^{-1} : milligram per Kilogram

Signature of Analyst:

Signature of Chief Chemist



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SOIL ANALYSIS REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location :	Adit-3 (Kholian)
Monitoring Date:	26-06-2025	Reporting Date:	04-07-2025
Source:	Soil Sample		

Sr. No.	Parameters	Results
1	Soil Texture	Sand %
		34
		Silt%
		46
	Clay %	20
		Texture Class
		Silty Clay Loam
2	pH	8.4
3	Electrical Conductivity EC (μSm^{-1})	273
4	Phosphorus (mgkg^{-1})	2.34
5	Sodium Absorption Ratio	9.07

μSm^{-1} : micro siemens/meter
 mgkg^{-1} : milligram per Kilogram

Signature of Analyst

Signature of Chief Chemist



FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

Street No. 09, Main Canal Road, Abshaar Colony Warsak Road, Peshawar, Pakistan
Toll: +92 91 5202323 Cell: +92 3000391053 Email: inenvconsultants@yahoo.com www.iec-consultants.com

Environmental Protection Agency (EPA-KPK) Certified

SOIL ANALYSIS REPORT

Reference Number	BHPP/ENV/161-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location :	Powerhouse (Barkot)
Monitoring Date:	26-06-2025	Reporting Date:	04-07-2025
Source:	Soil Sample		

Sr. No.	Parameters	Results
1	Soil Texture	Sand %
		29
		Silt%
		42
	Clay %	29
		Texture Class
2	pH	Silty Clay Loam
3	Electrical Conductivity EC (μSm^{-1})	8.0
4	Phosphorus (mgkg^{-1})	262
5	Sodium Absorption Ratio	3.06
		3.48

μSm^{-1} : micro siemens/meter
 mgkg^{-1} : milligram per Kilogram

Signature of Analyst:

Signature of Chief Chemist



FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

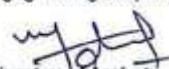
Street No. 09, Main Canal Road, Abshaar Colony Warsak Road, Peshawar, Pakistan
Toll: +92 91 5202323 Cell: +92 3000391053 Email: inenvconsultants@yahoo.com www. iec-consultants.com
Environmental Protection Agency (EPA-KPK) Certified

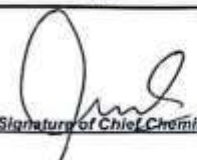
SOIL ANALYSIS REPORT

Reference Number	BHPP/ENV/181-2025	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location :	GRC Camp Office (Sanghar)
Monitoring Date:	26-06-2025	Reporting Date:	04-07-2025
Source:	Soil Sample		

Sr. No.	Parameters	Results
1	Soil Texture	Sand %
		21
		Silt%
		53
	Clay %	26
		Texture Class
2	pH	7.9
3	Electrical Conductivity EC (μSm^{-1})	245
4	Phosphorus (mgkg^{-1})	1.98
5	Sodium Absorption Ratio	3.96

μSm^{-1} : Micro siemens/meter
 mgkg^{-1} : milligram per Kilogram


Signature of Analyst:


Signature of Chief Chemist



FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

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Environmental Protection Agency (EPA-KPK) Certified

Annexure 3: Incidents Record of the EPC Contractor (January to June 2025)

S/No	Accident/Incident No	Accident/Incident Date	Location	Accident/Incident Details	Injury Detail	Injured Person Name	Current Status
1	IANR-32	03/01/2025	N-15 Dam Site	During the shifting of lattice girders, a worker accidentally stepped on an exposed, sharp, thin, vertically positioned connecting steel bar. As a result, he sustained an injury to his foot.	Laceration below the right foot	Sultan Shah	Resumed duty
2	IANR-33	04/01/2025	A-3 Headrace Tunnel	During pneumatic hammer drilling operations, a drilling rod that had been placed unsecured nearby fell and landed on a worker foot, resulting in an injury.	A minor foot injury	M. Shakeel	Resumed duty
3	IANR-34	05/01/2025	Dam Site Diversion Tunnel	While performing duty, the worker suddenly experienced severe abdominal pain followed by vomiting. The symptoms appeared without warning and required immediate medical attention	Abdominal pain and vomiting	Imran Ahmad	Resumed duty
4	IANR-35	09/01/2025	A-2 Tunnel Portal	During the unloading of an air pressure pipe, a steel pipe accidentally slipped from the worker hand and struck his finger, causing injury	Laceration to the ring finger of right hand	M. Sajjad	Resumed duty
5	IANR-36	14/01/2025	Dam Site	A local contractor mobile crane was descending from the N-15 access road to the Dam Site when its brakes failed. As a result of the brake failure, the crane collided with a company dumper and subsequently overturned	Ribs pain	M. Khalid	Resumed duty
6	IANR-37	23/01/2025	Dam Site	While operating the excavator, a large stone accidentally fell from the excavator bucket. The stone rolled downhill and struck the scaffolding structure. As a result of the impact, a metal tube became dislodged from the scaffolding and struck a worker on his left arm	A minor abrasion on left arm	Jabbar Ahmad	Rest at home
7	IANR-38	27/01/2025	Dam Site	While working at the steel workshop, the worker was cutting steel using a cutter. During the process, his thumb accidentally came into contact with the edge of the cutter, resulting in an injury	Severe laceration at the thumb	M Zulqarnain	Resumed duty
8	IANR-39	04/02/2025	Dam Site	During working at the cofferdam downstream, a passing excavator disturbed a stone on the slope. The stone rolled down and struck the worker knee	Minor scratches on the knee.	Abdul Latif	Resumed duty
9	IANR-40	10/02/2025	Dam Site	While working at the Dam Site steel workshop, some workers suddenly brought a lattice girder and placed it near him. The lattice girder dropped and struck the worker on the right leg.	A linear fracture	Abdul Wahid	Hospitalized

S/No	Accident/Incident No	Accident/Incident Date	Location	Accident/Incident Details	Injury Detail	Injured Person Name	Current Status
10	IANR-41	11/02/2025	Dam Site	While working at a cofferdam during the dismantling of formwork, a steel pipe accidentally detached from the shuttering and struck him near the right eye	Minor laceration	M. Kamran	Resumed duty
11	IANR-42	16/02/2025	Powerhouse Steel Workshop	During working at the powerhouse steel workshop, the worker was inserting steel pipes into the steel straightening machine when his left hand accidentally became caught between the rolling parts, causing an injury.	Hand rush injury	M. Amir	Hospitalized
12	IANR-43	19/02/2025	Dam Site	During shotcreting, a concrete pipe broke due to high air pressure, causing concrete to enter the worker eye	Minor abrasion	Syed Mazhar Shah	Resumed duty
13	IANR-44	27/02/2025	Dam Site	While working at the diversion tunnel outlet, the worker was shifting wire mesh and rock bolts from a location close to the tunnel face. Unfortunately, a stone rolled down from above and struck him on the left side of his forehead, causing an injury.	Skull Fracture	Rehan Shaheen	Hospitalized
14	IANR-45	03/03/2025	Dam Site	A private truck transporting wire mesh to the Dam site overturned near the batching plant due to loss of balance.	-----	-----	-----
15	IANR-46	05/03/2025	R3 Road Powerhouse	While on duty, a worker who was riding a bike in a hurry lost control and accidentally hit him from behind	Minor Injury	Adil Shahzad	Resumed duty
16	IANR-47	08/03/2025	Dam Site	While working at the edge of the barriers during the formwork process, a stone shifted and struck his right foot as he was dismantling the shuttering	Open wound on the right foot	Khursheed Ahmad	Hospitalized
17	IANR-48	10/03/2025	Main Access Tunnel	While working at the main access tunnel powerhouse, a connecting bar detached from a plate and struck Jameel's helmet. He sustained no physical injury.	No injury sustained	M. Jame el	Resumed duty
18	IANR-49	16/03/2025	Dam Site	While working, one of the scaffolding tubes struck him. When he tried to free the metal tube by pulling it forcefully, it dislodged abruptly and struck him on the nose	Nasal fracture	Fawad Shah	Resumed duty
19	IANR-50	22/03/2025	D/S Surge Shaft Tunnel	During grouting operations at the surge shaft tunnel (downstream), a temporary platform became detached and fell. As a result, the falling platform struck two workers positioned below—one sustained an injury to the foot, and the other was hit on the back	Minor injury to his back	Usama	Resumed duty

S/No	Accident/Incident No	Accident/Incident Date	Location	Accident/Incident Details	Injury Detail	Injured Person Name	Current Status
20	IANR-51	19/04/2025	Dam Site Batching Plant	During the handling process, while lifting a steel bar to chest height, the individual accidentally lost grip of the bar. As a result, the steel bar slipped from his hands and struck his left arm.	A deep laceration on left arm	Fawad Hussain shah	Resumed duty
21	IANR-52	20/04/2025	Dam Site N-15 Road	During the shifting of micro steel pile pipes from one location to another, one of the pipe accidentally slipped from the worker hand, resulting in an injury to the big toe of the left foot.	laceration on the big toe of the left foot	Muhammad Adil	Hospitalized
22	IANR-53	26/04/2025	Main Access Tunnel	During a drilling operation, a pneumatic hammer air drill machine slipped from his hand, resulting in a laceration to his right arm	Arm Laceration	Ameer Akbar	Sick Leave
23	IANR-54	26/04/2025	Adit-2	A fire incident occurred in the vehicle parking area near the A2 spoil area. A driver, Mr. Atif, observed that a dumper truck had caught fire, reportedly due to a short circuit in its electrical wiring. The fire was promptly and successfully extinguished	No injuries were reported	No injuries were reported	No injuries were reported
24	IANR-55	29/04/2025	Dam Site Batching Plant	While unloading concrete blocks from the bucket of a loader, the loader moved unexpectedly. As a result, the bucket struck Mr. Hanif right foot, causing an injury.	Minor abrasion on the right foot	M. Hanif	Resumed duty
25	IANR-56	02/05/2025	A-2 Steel Workshop	While operating the steel bending machine, a steel bar accidentally struck his right thumb with force, penetrated it, and caused a laceration	Abrasion on right thumb	M. Shaukat	Resumed duty
26	IANR-57	11/05/2025	Dam Site Right Slope	While working, the movement of cattle caused some stones and rocks to dislodge and fall from the slope on the right bank. Upon noticing this, Mr. Shoaib attempted to move away quickly. Meanwhile, one stone struck him on the back, resulting in internal injuries.	Blunt chest trauma	M. Shoaib Khan	Resumed duty
27	IANR-58	20/05/2025	Dam Site Left Slope	Unfortunately, a stone fell from an elevation and struck him on the head, resulting in an injury	Minor abrasion on head	Mazhar Shah	Resumed duty
28	IANR-59	21/05/2025	Dam Site	While inspecting the electric poles, Mr. Khalid lost his footing due to a steep slope in the area and fell approximately 8 meters downhill. As a result of the fall, he sustained a fracture in his leg	left leg bone fracture.	M. Khalid	Resumed duty
29	IANR-60	28/05/2025	Dam Site Right abutment	While using a nearby water tap, Mr. Shafaqat unexpectedly received a severe electric shock upon making contact with the tap. The electrical discharge was intense enough to	A minor laceration on the right knee	M. Shafaqat	Resumed duty

S/No	Accident/Incident No	Accident/Incident Date	Location	Accident/Incident Details	Injury Detail	Injured Person Name	Current Status
				physically throw him back from the tap. As a result, he sustained minor lacerations to his knee and foot			
30	IANR-61	30/05/2025	Dam Site Diversion Tunnel Inlet	While performing work at the diversion tunnel inlet, a worker was using a hammer to bend a steel bar. Meanwhile, the hammer accidentally slipped from his hands and struck his right foot, resulting in a minor injury	Minor laceration on right foot	Faisal Ghafoor	Resumed duty
31	IANR-62	01/06/2025	Dam Site Diversion Tunnel Inlet	While driving, the vehicle brakes reportedly failed, causing the vehicle to lose control and collide with a mixer stationed at the portal of the inlet. As a result, the driver sustained injuries, with suspected fractures in the right leg	Knee trauma with suspected fracture or ligamentous injury	M. Younas	Resumed duty
32	IANR-63	02/06/2025	Dam Site Diversion Tunnel Outlet	A worker was tightening a rock bolt nut at the diversion tunnel outlet. Unfortunately, during the process, the wrench slipped from his hand and struck his forehead, resulting in an injury	Minor abrasion on forehead	Ziaullah	Resumed duty
33	IANR-64	14/06/2025	Upstream Surge Shaft	During drilling operations at the upstream surge shaft tunnel, increased water seepage caused a small stone to dislodge from the crown area. The stone initially fell onto the working platform, then bounced and struck Mr. Kareem Shah.	laceration near the right elbow.	Kareem Shah	Resumed duty
34	IANR-65	14/06/2025	Main Access Tunnel	While performing wire mesh installation work on the right side of the platform, small stones became dislodged from the top arch and fell onto a worker. The stones struck the worker helmet with significant force, causing the helmet to break	An open wound laceration on the head	M. Umer	Resumed duty
35	IANR-66	20/06/2025	A-2 Mechanical Workshop	During unloading activities at the A2 store area, a worker was manually handling heavy compressor components when a loss of grip occurred. As a result, one of the components fell and struck the worker helmet.	An open wound laceration on the head	Saddam Noor	Resumed Duty
36	IANR-67	21/06/2025	Dam Site Diversion Tunnel Inlet	After completing tasks inside the tunnel, the worker was exiting the area when he tripped over a water pipe lying on the ground near a concrete pump. As a result, he fell forward and struck his head against the edge of a nearby concrete structure, sustaining a head injury	A laceration over the upper occipital region	Rustam Ali	Resumed Duty

S/No	Accident/Incident No	Accident/Incident Date	Location	Accident/Incident Details	Injury Detail	Injured Person Name	Current Status
37	IANR-68	21/06/2025	Main Access Tunnel	While drilling rock bolts in the main access tunnel, a minor rock collapse occurred, leading to the dislodgement and fall of small stones. Some of the falling debris struck a worker on the shoulder and lower back.	Minor injury to the shoulder and backbone	Kamran khan	Resumed Duty
38	IANR-69	24/06/2025	Dam Site Diversion Tunnel	While changing clothes, the worker' left foot accidentally came into contact with a sharp steel object lying on the floor, resulting in a small laceration to the middle toe of the left foot	Minor laceration on the middle toe of the left foot	Muhammad Arif	Resumed Duty

Annexure 4: Incident Reports



Incident/Accident Report

Classification

LTI- Lost Time Injury, RWC- Restricted work case, MTC- Medical Treatment Case, OHI, Occupational Health Illness- First Aid Case, RTA- Road Traffic Accident

Fatality ☐	LTI ☐	RWC ☐	Environmental ☐	MTC ☒	
OHI ☐	Near miss ☐	FAC ☐	Asset Damage ☐	RTA ☐	
Date	June,20-2025	Time	11:08 AM	Location	A-2 Mechanical Workshop

Caused by:

Contractor ☒	Sub-contractor ☐	Third party ☐
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Victim's Detail:

Name	Saddam Noor	Age	-	Designation	Mechanic
CNIC Number	42301-9612668-3	Company Name	-		

Direct Supervisor's Detail:

Name	-	Designation	-	Mobile Number	-
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Witness Detail:

Name	Zaheer Ahmed	Designation	Foreman	Mobile Number	0349-2648621
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Incident Summary (What and How)

" At around 11:08 am, a mechanic Muhammad Saddam Noor was performing unloading activities involving a dumper compressor in the designated store area of the A2 site. While handling the heavy compressor components, a loss of grip occurred, causing parts of the compressor to fall. One of the falling components struck his helmet, causing it to break and resulting in a minor head injury. The injured mechanic was promptly escorted to the camp's first aid station, where he was provided necessary medical treatment.

Injury Detail:

Open wound laceration on head

Present Status of the Victim (Sick leave/Hospitalized/Resumed duty etc.)

Resumed duty

Reported by:

Ali Haider Shah

Signature with Date:

20th June ,2025

Ali

Incident/Accident Report

Classification

LTI- Lost Time Injury, RWC- Restricted work case, MTC- Medical Treatment Case, OHI, Occupational Health Illness,
FAC- First Aid Case, RTA- Road Traffic Accident

Fatality ☐		LTI ☐		RWC ☐		Environmental ☐		MTC ☐	
OHI ☐		Near miss ☐		FAC ☐		Asset Damage ☒		RTA ☐	
Date	March,03-2025		Time	10:35 AM		Location		Dam site Batching plant	

Caused by:

Contractor ☐	Sub-contractor ☐	Third party ☒
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Victim's Detail:

Name	Muhammad Qasir	Age	27	Designation	Driver
CNIC Number	13503-7774772-3	Company Name	Private		

Direct Supervisor's Detail:

Name		Designation		Mobile Number	
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Witness Detail:

Name	Shahbaz Riaz	Designation	HSE Officer	Mobile Number	03478388535
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Incident Summary (What and How)

On 3rd Of March 2025, around 10:35 A.M, an accident happened at the dam access road near batching plant. When a private truck (Registration No. JT 3592), was ascending from TR2 road toward the batching plant of dam site. This private truck was carrying wire mesh to the damsite. While passing through the corner of the road, accidentally, the left back tire of the truck passed through the edge of the road containing loose soil thus skidded through the soil. The whole frame of the truck became out of balance and bent on the left side of the road and ultimately overturned. Fortunately, the driver of the private truck was safe, although the truck got significant damage.

Injury Detail:

Not Applicable

Present Status of the Victim (Sick leave/Hospitalized/Resumed duty etc.)

Not Applicable

Reported by:

Naeem Yusef Chughtai



Signature with Date:

3rd March ,2025

Annexure 5: Copy of the GRM Register Exhibiting Environmental and Social Complaints Status During Reporting Period (January-June 2025)

Copies of the Environmental Complaint Received during the Reporting Period

ENVIRONMENT, GENDER HEALTH & SAFETY GRIEVANCES REGISTER OF BHP PROJECT 2025						
S. No	Date of Lodging Grievance	Name, Address and Contact Number of the Complainer	Nature of Complaint	Mode of Complaint Verbally, Telephonically or in writing	Action Taken	Remarks
1.	17-01-25	citizen Postal	N-15 Land & Environment issues	Written	Detail reply is given to citizen postal	Resolved
2.	22-01-25	Main Nifae	House damage due to blasting	Written	The complaint is Forwarded to GRC Committee for detail investigation.	
3.	27-01-25	Divisional Forest office	Plant damage in the require land of PCCO	Written	Meeting was Under process with DFO/EDC	
4.	28-01-25	Sangan Locals	About dust	Verbal	Contactor is advised	
					Submit the daily browser register to find out the timing & quantity of water to use for dust at Sangan site.	
	02.17.2025	M. Gadiya s/o Alf Bani	Dumping on Private land	Written	Complaint is Forwarded to GRC to find out the issue on 19.2.2025	

Copy of GRM Register Exhibiting Details of Complaints Received by the Social Section of the PIU

GRIEVANCES REGISTER OF BHP PROJECT						
S. No	Date of Lodging Grievance	Name, Address and Contact Number of the Complainant	Nature of Complaint	Mode of Complaint Verbally, Telephonically or in writing	Action Taken	Remarks
01	17/01/25	Talwar Shah, Paros	Unauthorized one roof of floor	Written	Letter to be taken up with LAC to seek his guidance for early installation	Closed/Resolved
02	17/01/25	Muhammad Mubarak, Paros	Unauthorized one roof of a structure	Written	"	Closed/Resolved
03	17/01/25	GAC committee, Gung, Paros	Group application for LARP Displacement Allowance	Written	Project Secret Meeting is finding to be held soon	
04	22/01/25	Community members from Nihau, Paros	Group application to know B.O.P. of 2nd of structures	Written (15/01/25)	1st Printings already Dislosed to GAC & Community in 18 May 2024 online Meeting	Closed
05	22/01/25	Talwar Shah and his family, Paros	Application for 1st Business Loss Allowance	Written	Letter issued for submission of relevant business documents as per the approved criterion. No relevant documents submitted till today.	Closed/Resolved

Annexure 6: The EPC Contractor's Intimation of Hazardous Waste Collection Firm

The EPC Contractor's Intimation Letter



Date: February 24, 2025

Total Page: 01

Our Ref: CGGC-GRC-JV-2025-PMC-111

Your Ref:

Team Leader
Project Management Consultants

DELIVERY BY : EMAIL

Attention: Mr. Zafer DEMIRSELÇUK

**SUBJECT: NOMINATION OF 3R-GREEN SERVICE VENDOR FOR WASTE MANAGEMENT-
HAZARDOUS AND NON-HAZARDOUS WASTE AT BALAKOT HYDROPOWER
PROJECT (300MW).**

Dear Sir,

This reference to the subject mentioned above, we would like to inform you that, in accordance with the approved Site-Specific Environmental Management Plan (SSEMP), the EPC Contractor has nominated **3R-Green Service** as the designated vendor for the collection, storage, transportation, recycling, and disposal of both hazardous and non-hazardous waste for the Balakot Hydropower Project. 3R-Green Service is a trusted provider of comprehensive waste management solutions. The company concentrates in the responsible handling of both hazardous and non-hazardous waste, with a strong commitment to sustainable practices and environmental responsibility. Their services ensure strict compliance with all local, state, and federal regulations, ensuring the safe and eco-friendly management of waste. Additionally, 3R-Green Service will be responsible for the treatment of hazardous and non-hazardous waste for the Balakot Hydropower Project at the Hattar Industrial Estate, located in the Haripur District of Khyber Pakhtunkhwa. Enclosed below is the 3R-Green Service EPA Certificate for your reference. This for your information and records only.

Yours truly,

Qin Meng

Acting Authorized Representative
For CGGC-GRC JV for Balakot Hydropower Project

Encl.: 1- 3R-Green Service-EPA Certificate.

CC.: 1. Project Director / PD- PEDO
2. Deputy Team Leader of Consultants

Add: Dam Camp Near N-15 Road Paras Village Tehsil Balakot District Mansehra
Tel.: +92 83451397777 Email: cggcgrcjvbk@gmail.com

The M/S 3R Green Services (Waste Collector) Environmental Approval Renewal

**Environmental Protection Agency**
Government of Sindh, Regional Office Sukkur
Opposite Govt. College of Physical Education Sukkur, Near New Bus Terminal, Post office Arain, Sukkur
Reference No. EPA (ROS)/Tech/EMP/2024/181 Dated: 27/03/2024

To,
The Owner/ CEO
M/s 3R Green Services (Waste Contractor)
Plot. No: 09, Township Sector 5, Sukkur

Only valid for m/s 3R Green Services for

SUBJECT: RENEWAL OF ENVIRONMENTAL APPROVAL FOR COLLECTION, STORAGE, TRANSPORTATION, RECYCLING AND DISPOSAL OF HAZARDOUS AND NON-HAZARDOUS WASTE.

This is reference to your request vide letter No: Nil dated Nil on subjected matter, Sindh EPA considered your request with compliance of following conditions:

- That the proponent shall ensure the compliance of National Environmental Quality Standards (NEQS) Sindh Environmental Quality Standards (SEQS).
- A comprehensive waste management plan will be developed, Qualitative & quantitative data shall be maintained. The waste shall be disposed off in environment friendly manner.
- That the proponent is bound to comply with Rules and Regulations of Federal as well as Provincial Government.
- The Proponent shall ensure that no unfortunate incident(s) are caused due to proposed activity/ project. The cost of damage to the environment, property and life of the people/ workers shall lie on the proponent.
- That the proponent shall be liable for compliance of Section 11, 13, 14, 17 & 20 of Sindh Environmental Protection Act-2014
- This Approval is not valid for any Court Matters/ land dispute.
- That the proponent shall be exclusively responsible for information provided through report. In case of any misrepresentation/ concealment of facts then this approval shall stand cancelled without any notice.

Sindh EPA reserves the right to stipulate additional conditions at any stage.

That the proponent is bound to comply with SEP Act-2014 and its Rules & Regulations made there under.

- That the proponent is bound to comply with conditions mentioned in original approval.

H. B. Lakhan

3R GREEN SERVICES
Call No 0332-90028511

- This renewal is valid for ONE year;
- This approval shall be treated null and void if the conditions, mentioned above, are not complied with

This is issued with the approval of Director General, Sindh EPA


Director General

C.c. to:-

1. The Director General, Sindh EPA Karachi
2. Office Copy


GREEN
SERVICES
Cell No. 0332-9002854


Assistant Director (Tech.)
For Director General

Annexure 7: EPC Contractor's Daily Dispensary Record (May 2025)

Daily Medicine Consumption Record BHPP								
Date		14-15-16-17	Month	05	Year	2025	2024	
Sr#	Name of patient	CNIC #	Contact #	Department	Cause	Medicines Name	QTY	Signature
1	Ran Shao	1		Chinese	Cough	Syp. Acetof.	1	2025-5-15
2	A. Rashad	13501-2435441	0345-9627406	Laborer	Head burning Acidity	Susp. D/Lin.	1	2025-5-15
3	Fouzan Akhtar	13503-0179891	0346-9477477	Servant	Less motion Nausea	Tab. Flupyr. Tab. Imodium	4 1	4/4
4	Munir Ahmad	82203-8189534	0342-4624170	Driller	Back Pain	Tab. Naloxone Crem. Voltrol	5 1	2025-5-15
5	Ali				Flu - Fever	Tab. Paracet. Tab. Ativan	5 5	
6	M. Shafique	13501-7322339	0348-5626417	Laborer	Kidney Pain	inj. Tramadol	1ms	
7	Shafiqul Zaman	13501-8237694	0346-7652566	Welder	Hand Injured	ALS Dressing Surg. Plaster	4 6	Shafiqul Zaman
8		21-20-19-05-	2025					
9	Tariq Hussain	13501-1825231	0343-8120448	Short Crane Laborer	Injured the Right Arm	ALS Dressing inj. Tramadol	1 6	Tariq Hussain
10	Hanifa Sharif	13501-8652256	0334-0016313	Laborer	Less motion Vomiting	Tab. Flupyr. Tab. Imodium Tab. Ondanset.	6 4 3+1	2025-5-15
11	M. Tariq	82203-4255243	0342-2450170	Driller	Burn of L. Leg	Tab. Diclofenac Crem. Voltrol	1ms 6	
12	Azhar Ali	13501-3408893	0317-3149139	Laborer	Stomach Pain	Tab. Ketorolac Tab. Paracet.	6 6	Azhar Ali