Environmental Monitoring Report

PUBLIC

Semestral Report (January-June 2024)
August 2024

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
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 sixth Semi-Annual Environmental Monitoring Report (SAEMR) for the Balakot Hydropower Project (HPP,300 megawatt [MW]) covering the reporting period from January to June 2024.

1.2 Headline Information

2. During the reporting period, the detailed engineering design, review of the engineering, procurement and construction (EPC) Contractor's method statements/technical reports, and construction works at the Project residential colony, access roads including access roads at the dam site, excavation at adit tunnels, protection works, and establishment of camp at adit tunnel A3 remained in progress.

3. On February 29, 2024, the External Environmental Monitor (EEM) visited the construction sites whereby the non-provision of sufficient signage at the dam site; dumping of muck materials along the Ganhool Nullah; and non-provision of properly designed sedimentation tank(s) at adit tunnels were some of the major observations recorded. The gaps identified by the EEM were subsequently shared with the EPC Contractor in the form of a corrective action plan (CAP) for swift rectification.

4. During March and June 2024, two meetings were held among the Divisional Forest Officer (DFO) office Kunhar Watershed Division, the Project Implementation Unit (PIU) of Balakot HPP, Project Management Consultants (PMC), and the EPC Contractor to sort out the issue of claimed damages to the plants at access road R3. As a result of these meetings, in the last week of June 2024, the EPC Contractor undertook site demarcation to segregate permanently acquired land from part of the land where claimed damages have been done due to the execution of works. Once physically demarcated (which remained in progress till the end of the reporting period), stakeholders will resolve the issue promptly.

5. On April 18, 2024, the Environment Consultant of ADB, visited the Site and held a joint meeting with the PIU, PMC, and the EPC Contractor wherein the CAP issues were discussed in detail. During the Site visit, except accumulation of the isolated landslide materials at the Kunhar River left bank, just upstream of the Baily bridge, there was no other major observation of the visiting Consultant.

6. From May 10 to 16, 2024, as part of the Project environmental impact assessment (EIA) report updating, the biodiversity and fisheries experts hired by the PMC, undertook field surveys wherein the latest information/data was collected from the Project area. The biodiversity and aquatic surveys were conducted in the Kunhar valley, from upstream of the Sukki Kinari HPP reservoir up to the Patrind HPP reservoir area. While updating the floral and faunal profile of the area, some additional species were identified by both experts. Compilation of survey findings and preparation of the management plan(s) for critical species remained in progress during the reporting month.

7. Under the provisions of the environmental management plan contained in the EPC Contract, during May 2024, the EPC Contractor initiated six-month vocational training for eligible candidates from the Project-affected community. Initially, 18 students (7 male and 11 female) will be trained in tailoring, beautician, computer operation, and electrician at Government Skill Development Center Hassa Balakot. A total of 10 such training courses are planned during the currency of the contract i.e. till December 2027.

8. In compliance with the EEM directions and to cross-check the results of the drinking water analyzed by the Integrated Environment Laboratory (IEL), samples were collected from source and consumer endpoints by an independent laboratory, namely Water Environment

Laboratory and Consultancy Service (WELCO). The laboratory analysis undertaken by WELCO showed consistency with the analysis carried out by IEL for the same sampled points

9. During the reporting period, the EPC Contractor held regular health safety and environment (HSE) champion program, whereby awards were distributed among the Contractor's staff who adhered to the HSE provisions, followed safety protocols, and trained other workers while discharging their assigned duties.

2 PROJECT DESCRIPTION AND CURRENT ACTIVITIES

2.1 Project Description

10. 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.

11. The Project dam site is located in Paras village, around 2 km downstream of the Sukki Kinari HPP (870 MW) tailrace, while the powerhouse site is proposed at Ganhool village of Balakot. The 9.1 km-long headrace tunnel of 8-meter (m) diameter will divert 154 m^3/second design flow of the Kunhar River water to the powerhouse to generate 300 (MW of electricity. The Project residential colony is identified in Sangar village.

12. 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.

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

- Project basic and detailed design
- Temporary works
- Diversion works
- Construction of dam
- Intake structures
- Adit tunnels (adits-01,02 and 03)
- Headrace tunnel
- Surge shaft
- Powerhouse
- Access roads (temporary and permanent)
- Residential colony
- Switchyard
- Transmission line

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

Table 2.1: Brief Salient Features

Hydrology and Design Flows	
River	Kunhar
Catchment area at dam site (km^2)	1939
Design Discharge (m^3/s)	154
Design Flood (m^3/s) T= 10 000 years	3500
Probable Maximum Flood (m^3/s)	5000
Reservoir	
Normal Operation Level (NOL)	1288.0
Minimum Operation Level (MOL)	1283.0
Surface area (at MOL) (km^2)	0.28
Length of Reservoir (at NOL) (km)	2.20
Gross storage capacity (at NOL) ($x10^6\ m^3$)	3.56
Live storage (at NOL) ($x10^6\ m^3$)	1.20
Dam Structure	
Type	Concrete Gravity Arch
Dam crest elevation (masl)	1292.0
Maximum height above riverbed (m)	35.0
Maximum height above foundation (m)	58.0
Crest length (m)	130.0
Spillways and Low-Level Outlets / Flushing Sluices	
Spillway type	Upper Gated Ogee Crest Spillway + low level Gated Spillway
Upper spillway crest elevation (masl)	1278.0
Upper spillway gates No. and type	3 (radial gates)
Upper spillway gates size (W x H) (m)	11 x 10
Low-level spillway invert elevation (masl)	1258.0
Low-level spillway gates no. and type	2 (sluice gates)
Low-level spillway size (WxH) (m)	6 x 8
Sediment Management	
Sediment Bypass Tunnel type	Gated Intake followed by Archway Tunnel
Intake size (WxH)(m)	7.5 x 4.5
Inlet invert elevation (masl)	1261.0
Tunnel cross section (W x H) (m)	archway (7.5 x 8.0)
Tunnel length (m)	650
Tunnel slope (%)	1.5
Outlet invert elevation (masl)	1248.0
Submerged guiding structure crest elevation (masl)	1272.0
Submerged weir/guiding structure height (m)	21 (estimated maximum above foundation)
River Diversion	
Construction Flood (T= 20 years) (m^3/s)	900
Diversion type	Openings left in the dam body for the low-level spillway and a left bank diversion tunnel.
Upstream Coffer dam type	Concrete gravity solution (which will be further converted to guiding structure)
Upstream Coffer dam crest elevation (masl)	1272.0
Downstream Coffer dam type	Concrete gravity solution
Downstream Coffer dam crest elevation (masl)	1252.5
Diversion tunnel type	Archway (concrete lined)
Diversion tunnel no. (-)	1
Diversion tunnel size (WxH) (m)	Archway (7.5 x 8.0)
Diversion tunnel length (m)	650
Diversion tunnel slope (%)	1.5
Diversion tunnel inlet invert El. (masl)	1261.0
Diversion tunnel outlet invert El. (masl)	1248.0
Power Intake Structure	
Intake type	Horizontal intake
Trash rack No.	4
Trash rack size (W x H) (m)	8 x 10

Service gates No.	2
Service gates size (W x H) (m)	4 x 8
Intake crest elevation (masl).	1271
Headrace Tunnel	
Tunnel section	Circular concrete lined (8.0 m inner diameter)
Length up to surge tank (m)	9137
Tunnel slope (%)	0.56%
Upstream Surge Shaft	
Type	Concrete lined circular surge shaft
Internal diameter (m)	14.5
Surge shaft height (m)	122
Surge shaft bottom elevation (masl)	1220.0
Pressure Tunnel/Shaft and Penstock	
Pressure tunnel/shaft main section type and size	Steel lined circular cross section (5.6 m internal diameter)
Pressure tunnel/shaft length (m)	152
Penstock length (m)	88
Branch Section Type	Manifold (3 branches)
Size of each branch (m)	3.2 m internal diameter conduits
Max. Length of branch (m)	~30
Powerhouse and Substation	
Powerhouse type	Conventional underground cavern
Main cavern general dimensions (LxWxH) (m)	71 x 20 x 34
Turbine type	Francis
No. of units	3
Turbine axis elevation (masl)	1054.0
No. of generators	3
Transformer / Substation type	Underground cavern (adjacent to the main powerhouse cavern)
Transformer cavern general dimensions (LxWxH) (m)	88 x 14 x 20
Downstream Surge Shaft	
Type	Concrete-lined circular surge shaft
Internal diameter (m)	3
Surge shaft height (m)	244
Surge shaft bottom elevation (masl)	1055.0
Tailrace	
Type	Circular tunnel with transition to an archway section at the final length and Outlet portal
Tunnel section	Circular concrete lined (8.0 m diameter)
Length up to the final transition section (m)	1515
Tunnel slope up to the final transition section (%)	0.23% (ascending slope)
Tunnel final section	Archway concrete lined section (8.0 W x 8.0 H)
Length from transition to outlet (m)	50
Tunnel slope up to the outlet portal (%)	15% (ascending slope)
Power and Energy	
Gross Head (m)	229.0
Design Net Head (m)	217.6
Installed plant capacity (MW)	300 (at the generator)
Mean annual energy (GWh)	1143 (average of 55 years)
Project Access Facilities	
Access road to dam and related structures (length)	550 m (Off-taking from National Highway N-15 at the left side of Kunhar River, near Paras village)
Access road to the by-pass tunnel (length)	440 m

Figure 2.1: Project Location in Pakistan

Figure 2.2: Project Location in District Mansehra

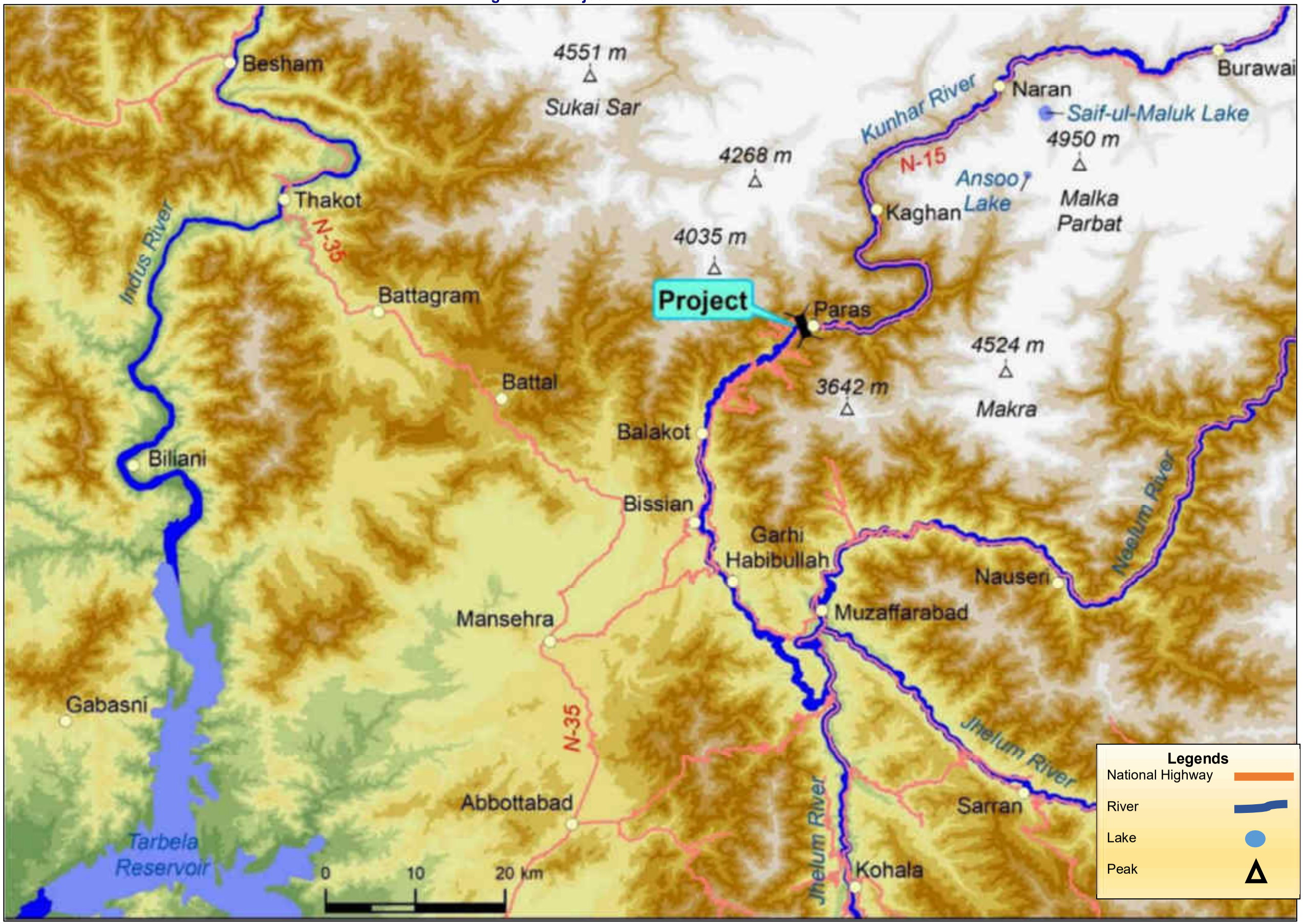


Figure 2.3: Project Layout Map

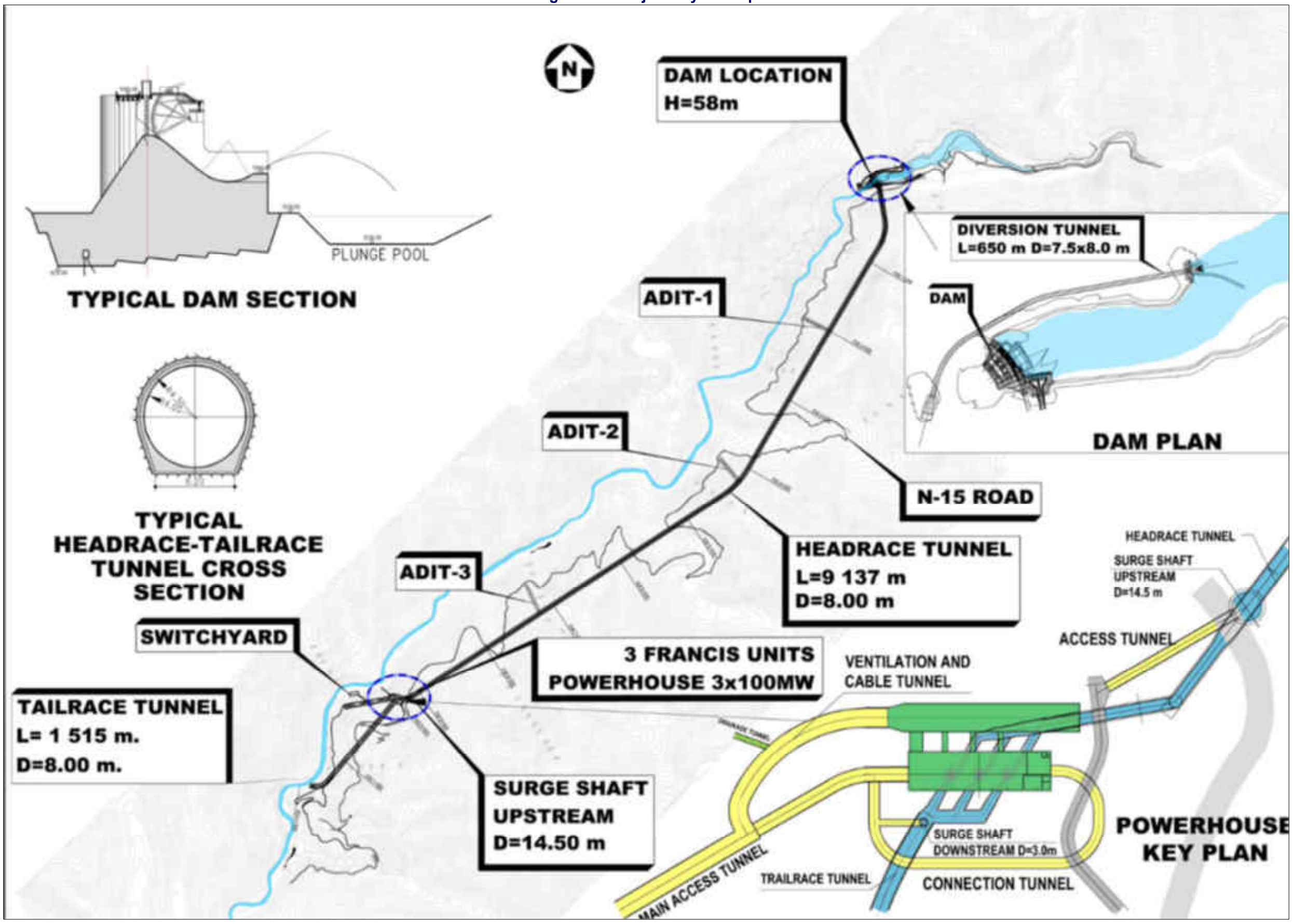


Figure 2.4: Project Setting-Dam site

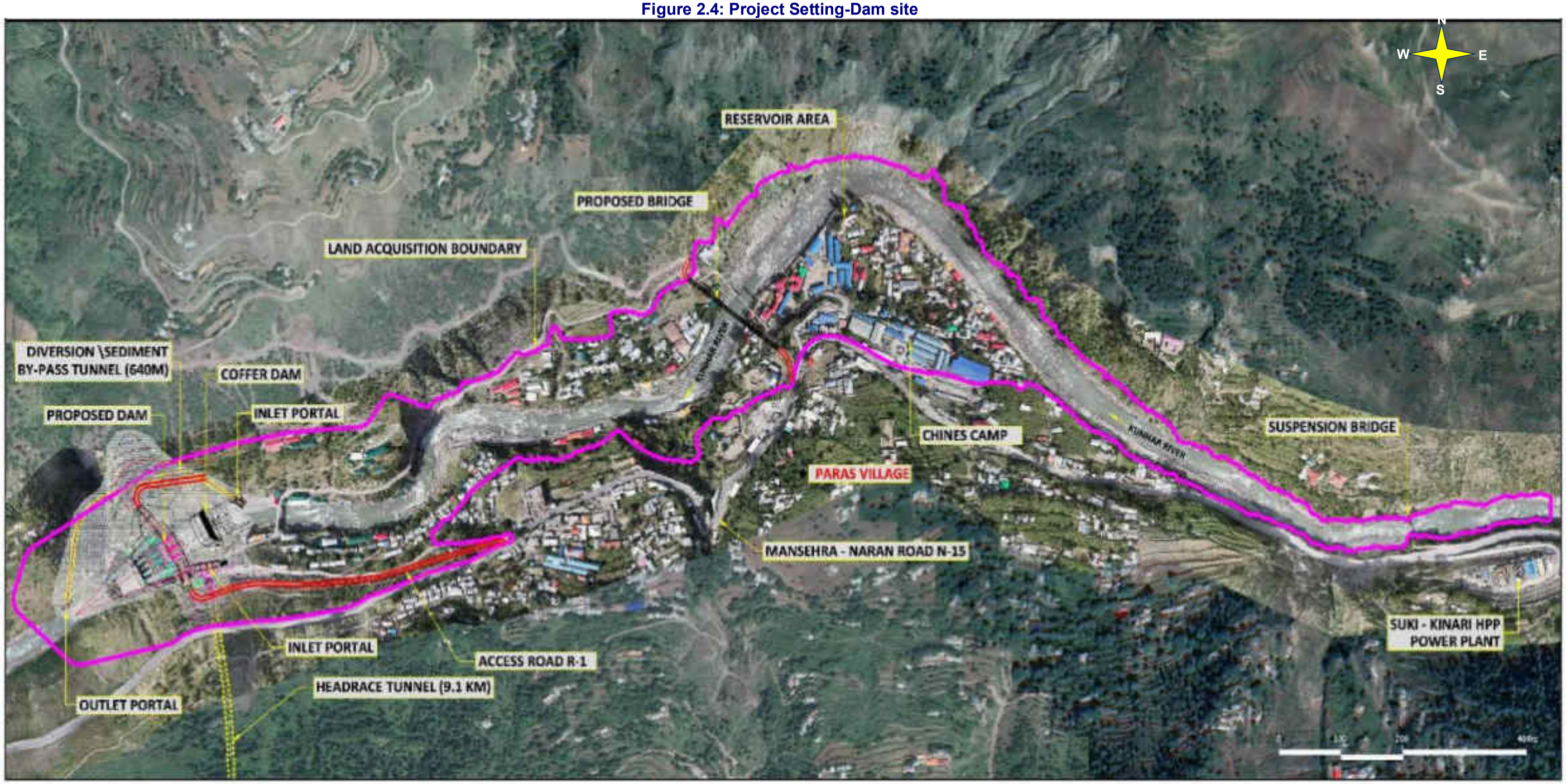
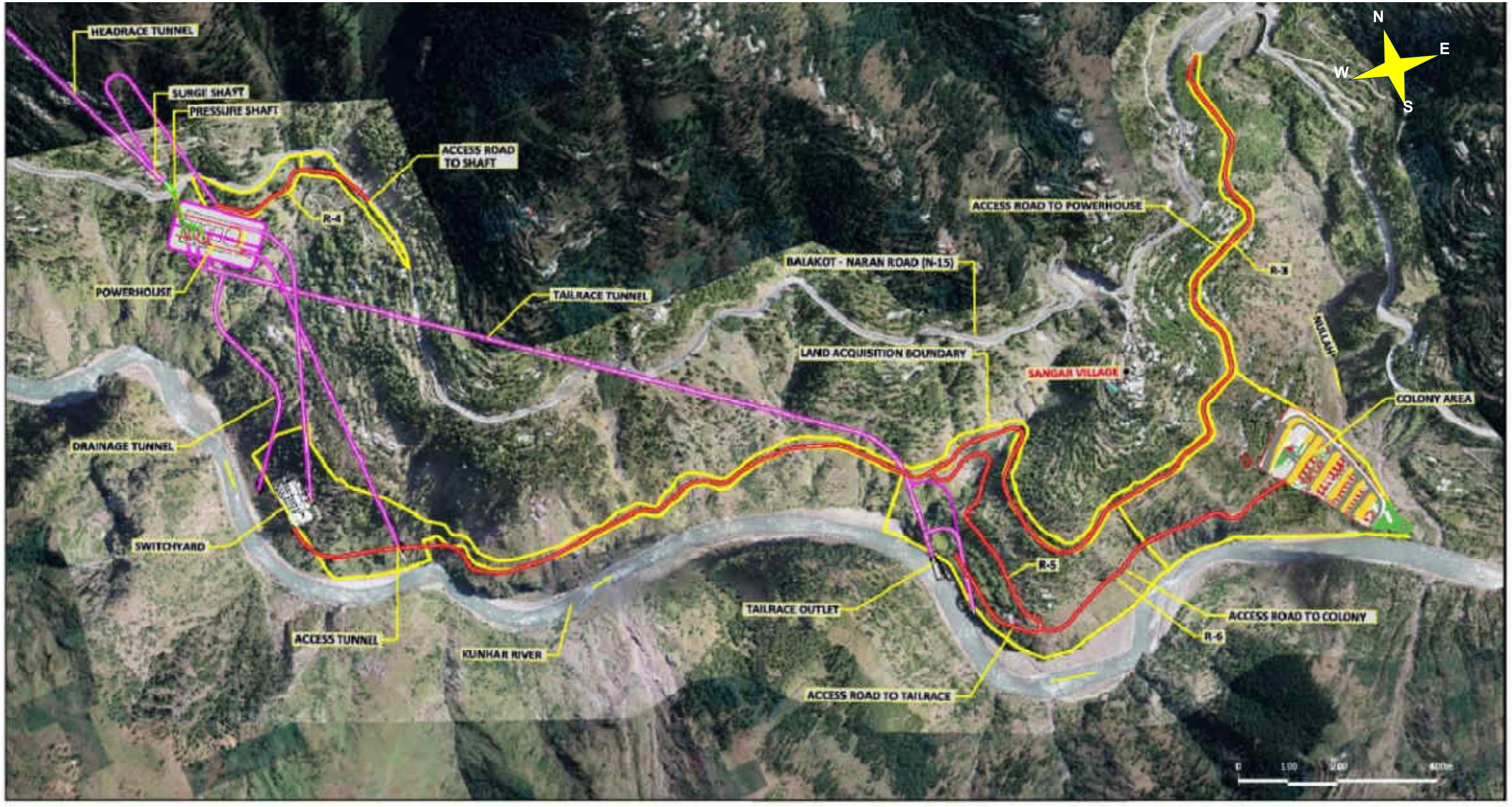


Figure 2.5: Project Setting-Powerhouse and Colony sites



2.2 Project Contracts and Management

2.2.1 Project Implementation Arrangements

15. 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

16. 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.

17. 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)

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

19. **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).

20. **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 need arise.

Figure 2.6: PIU Organogram

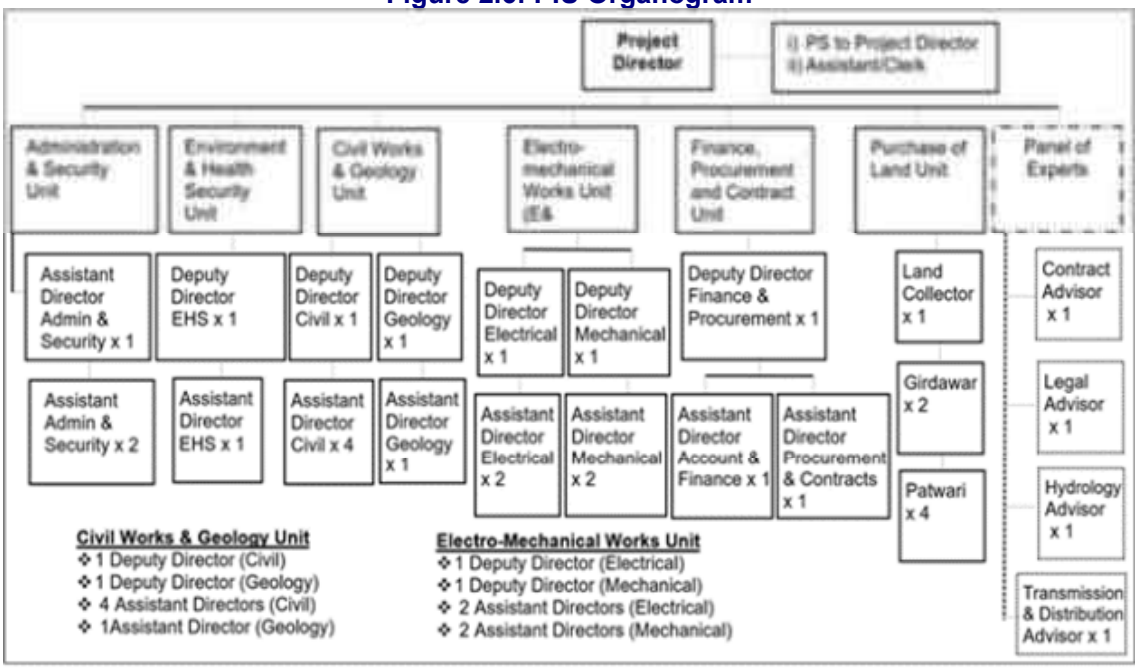


Table 2.3: PIU Staff Deployed During the Reporting Period

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

21. 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) aspect of the Project. In this regard, Ms. Ibtesaam 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: ibtesaamz@gmail.com

22. 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.

23. Under the provisions of the EPC Contract, the PIU project office was established at the Site 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

24. **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).

25. 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".

26. **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

27. **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
Expatriate Key Staff		
1	Project Manager - Team Leader	Intermittent
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
Local Experts		
1	Deputy Team Leader/Resident Engineer	Full Time
2	Chief Engineer (Dam & Surface Works)	Full Time
3	Chief Engineer (Underground Works)	Full Time
4	Electricity Tariff and PPA Expert	Intermittent
5	Quality Assurance Engineer (Dam & Surface Works)	Full Time

S/No	Designation	Inputs
6	Civil Engineer (Tunnel)	Full Time
7	Quality Assurance Engineer (Underground Works)	Full Time
8	Transmission Line Engineer	Intermittent
9	Contract Specialist	Full Time
10	Health and Safety Monitor	Full Time
11	Resettlement Expert	Intermittent
12	Gender/Community Mobilization Expert	Intermittent
13	Environment Expert	Intermittent
14	Document Controller (Monitoring)	Full Time
15	Geologist A	Full Time
16	Geologist B	Full Time
17	Structures Engineer	Intermittent
18	Site Inspector (Dam and Surface Works)	Full Time
19	Site Inspector (Dam and Surface Works)	Full Time
20	Site Inspector (Dam and Surface Works)	Full Time
21	Site Inspector (Underground Works)	Full Time
22	Site Inspector (Underground Works)	Full Time
23	Site Inspector (Underground Works)	Full Time
24	Site Inspector (Underground Works)	Full Time
25	Site Inspector (Underground Works)	Full Time
26	Planning Engineer	Full Time
27	Laboratory Technician	Full Time
28	Laboratory Technician	Full Time
29	Laboratory Technician	Full Time
30	Laboratory Technician	Full Time
31	Cost / Time Controller	Full Time
32	Architect	Full Time
33	Pool of Junior Engineer	Full Time
34	Pool of Junior Engineer	Full Time
35	Pool of Junior Engineer	Full Time
36	Pool of Junior Engineer	Full Time
37	Pool of Junior Engineer	Full Time
38	CAD Operator	Full Time
39	Resettlement Assistant	Full Time
40	Junior Geologist	Full Time
41	Junior Geologist	Full Time
42	Junior Geologist	Full Time
43	Office Manager	Full Time
44	Accountant	Full Time
45	Office Assistant	Full Time
46	Office Assistant	Full Time
47	Accounts Assistant	Full Time
48	Computer Operator	Full Time
49	Computer Operator	Full Time
50	Patwari	Full Time

28. 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

29. 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

30. 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

31. **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.

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

33. 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

34. 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.

35. Under the provisions of the conditions of the contract, preparation of the SSEMP is one of the EPC Contractor's contractual obligations. Accordingly, the EPC Contractor prepared SSEMP 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.

36. During all three phases of the Project, i.e. pre-construction, construction, and defects liability period, the EPC Contractor will take care of the HSE portfolio through implementing measures outlined in the SSEMP, good practices, and instructions issued, or filling gaps identified in the monitoring reports during the contract.

37. **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' HSE Team Organogram

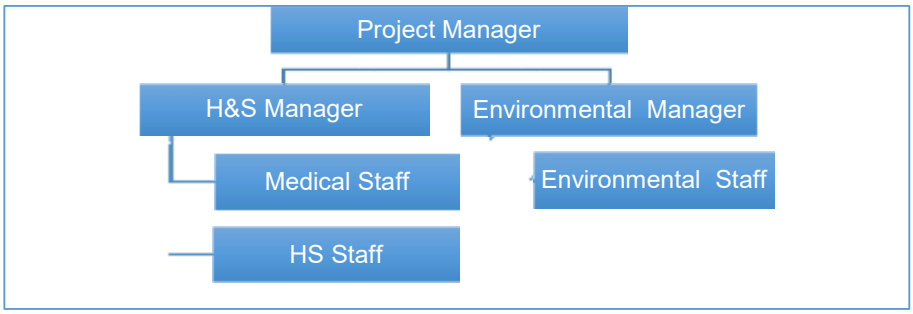


Table 2.7: EPC Contractor's HSE Team

S/NO	Name	Designation	Duty Station	Contact Number
1	Qi Xiu Feng	H & S Manager	Site and Office	+92-3455386888
2	Li Yong	QHSE Director	Site and Office	+92-3441789770
3	Irshad Saeed	Environmental Manager	Site and Office	+92-3059028481
4	Zul Qarnain	HSE Manager	Site and Office	+92-3319025035
5	Wang He	QHSE Officer	Site and Office	+92-3075552090
6	Wang Chaowei	QHSE Officer	Site and Office	+92-3441783042
7	Syed Babar Ali	HSE Officer	Site and Office	+92-3449661669
8	Zaigham Shah	HSE Officer	Adit-1 Kiwai	+92-3249191434
9	Saeedul Haq	HSE Officer	Dam Site- Paras	+92-3468292024
10	Momin Khan	HSE Officer	Adit 3-Kholian	+92-3151855378
11	Syed Hassan Shah	HSE Officer	Dam Site -Paras	+92-3432152402
12	Rashid Hussain	HSE Officer	Adit 3-Kholian	+92-3419304247
13	Muhammad Ajmal	HSE Officer	Adit 2 -Ganhool	+92-3013381622
14	Syed Ahsan Ali	HSE Officer	Adit 2 -Ganhool	+92-3414351519
15	Syed Ubaidullah	HSE Officer	Powerhouse-Sangar	+92-3425870825

2.2.2 Project HSE Safeguard Team

38. From the details given above, the HSE personnel responsible for the HSE safeguards are 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
	Environmental Specialist – regional technical assistance consultant	Abdul Hadi	ahadi.consultant@adb.org
PIU	Deputy Director HSE and Gender	Ibtesaam Zaima	ibtesaamz@gmail.com
PMC	Environmental Expert	Assad Ali Khan	dtlbalakothpp@yahoo.com
	Health and Safety Monitor	Fawad Ali Shah	

Organization	Job Title	Name	Contact Details
EPC Contractor	Qi Xiu Feng	H & S Manager	cggcgrcjvbk@gmail.com
	Li Yong	QHSE Director	
	Irshad Saeed	Environmental Manager	
	Zul Qarnain	HSE Manager	
	Wang He	QHSE Officer	
	Wang Chaowei	QHSE Officer	
	Syed Babar Ali	HSE Officer	
	Zaigham Shah	HSE Officer	
	Saeedul Haq	HSE Officer	
	Momin Khan	HSE Officer	
	Syed Hassan Shah	HSE Officer	
	Rashid Hussain	HSE Officer	
	Muhammad Ajmal	HSE Officer	
	Syed Ahsan Ali	HSE Officer	
	Syed Ubaidullah	HSE Officer	

2.3 Project Activities during the Current Reporting Period

39. During the reporting period, construction works at the Project residential colony, access roads including access roads at the dam site, excavation at adit tunnels, protection works, and establishment of camp at A3 remained in progress.

40. **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, 2023	June 31, 2024
March 9, 2020	December 30, 2022	Irshad Saeed	Qi Xiu Feng	September 28, 2022	January 1, 2027	8.60%	10.87%

[1] The SSEMP, approved by the Employer, contained requisite plans.
[2] The start and end dates of the civil works are those contained in the last approved Program of Work (Work Schedule).

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

Description	Planned Start	Planned Finish	Planned %age	% Progress
Preparatory works	28-Aug-21	27-Feb-23	100%	72.3% 27.7%
Basic Design	21-Sep-21	27-Sep-22	100%	99.0% 1.0
Detail Design	29-May-22	28 Dec-27	19%	12.6% 87.4%
Procurement & Production & Test & transportation	29-Jul-22	30-May-26	23%	0.0% 100.0%
River Diversion	1-Oct-22	27-Nov-23	62%	0.0% 100.0%
Concrete Dam	19-Jun-23	27-Jan-27	8%	0.0% 100.0%
Power Intake Works	28-Jan-23	28-Jul-24	26%	0.0% 100.0%
Headrace Tunnel	13-Oct-22	27-Jun-26	19%	8.5% 91.5%
Upstream Surge Tank, Pressure Shaft & Penstocks	23-Apr-23	25-Jul-25	9%	0.0% 100.0%
Main Access Tunnel & Ventilation and Cable Tunnel	16-Nov-22	18-Oct-26	15%	2.0% 98.0%
Powerhouse Works	4-Jun-23	20-Dec-25	2%	0.0% 100.0%
Tailrace Tunnel Downstream Surge Shaft	29-Jul-23	27-Feb-26	0%	0.0% 100.0%
Switchyard	16-Apr-23	15-Jan-24	24%	0.0% 100.0%
Transmission Line Works	28-Sep-22	27-Aug-25	25%	0.0% 100.0%
Main transformers and other equipment installation	1-Mar-25	30-Nov-26	0%	0.0% 100.0%
Road and Bridge	1-Oct-22	3-Oct-26	18%	45.2% 54.8%
Permanent Staff Residential Colony	28-Jun-23	28-Dec-25	0%	31.4% 68.6%
Erection of Unit1,2,3	29-Apr-26	28-May-27	0%	0.0% 100.0%
Completion &Taking-over	29-Sep-27	28-Dec-27	0%	0.0% 100.0%

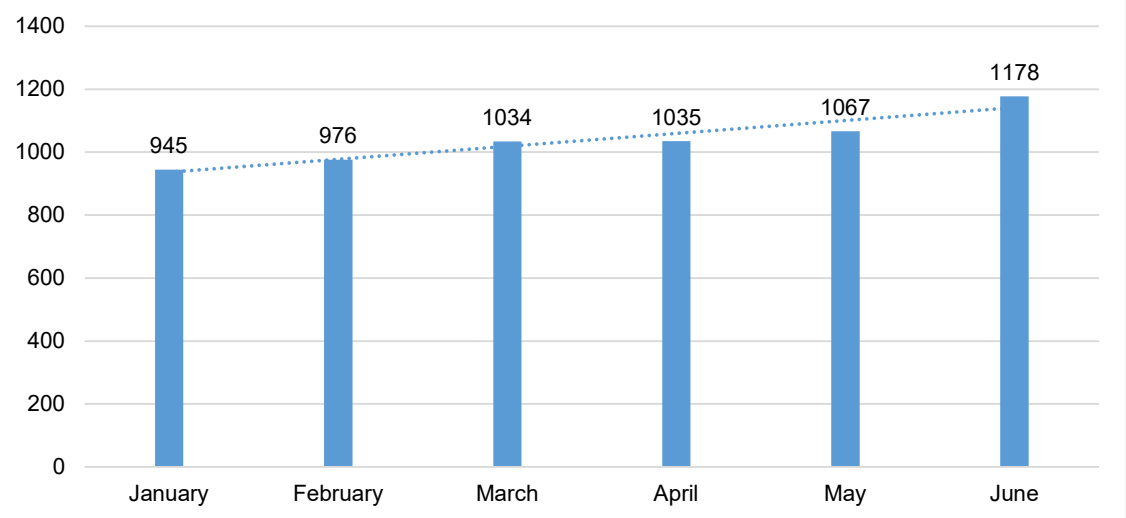
41. The manpower deployed at the Site during the reporting period is in **Table 2.11**, followed by the staff deployment trend in **Figure 2.8.** The total workforce deployment since the commencement of work is exhibited in **Figure 2.9**.

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 &Planning	1	1	1	1	1	1
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	10	10	10	10	10	10
11	Planning, Engineering, &Technical Management Department	14	18	18	18	18	18
12	QHSE Management Department	14	16	20	20	19	19
13	Equipment and Materials Department	15	15	17	17	17	17
14	Financial Management Department	4	4	4	4	4	4
15	Administration & Human Resources Department	41	41	42	42	42	42
16	Mechanical Operators &Driver Team	91	109	118	118	132	166
17	Survey Team	10	10	10	10	10	10
18	Laboratory Team	9	9	9	9	9	9

S/No	Staff	Reporting Month					
		Jan	Feb	Mar	Apr	May	Jun
19	General Team Electricity, water supply, A2&A3	46	47	50	50	50	50
20	A3 Camp & Retaining wall Skilled &unskilled Labors	48	48	48	48	48	48
21	Batching Plant team A2	15	16	16	16	16	16
22	Steel factory team A2	21	21	21	21	21	21
23	Design &Geological Management	5	5	5	5	5	5
24	Adit#2 team Skilled &unskilled Labors	102	103	103	103	103	113
25	Adit #3 team skilled &unskilled labors	98	98	113	113	113	131
26	Batching Plant team A3	22	22	24	24	24	24
27	Main Access Tunnel & Sanghar Camp	22	22	22	22	22	31
28	Dam Site	29	31	53	53	68	72
29	Site Manager	1	1	1	1	1	1
30	Planning Engineer	3	3	3	3	3	3
31	Construction Manager	1	1	1	1	1	1
32	Admin Manager	2	2	2	2	2	2
33	Quantity Surveyor	1	1	1	1	1	1
34	Site Engineer	2	2	2	2	2	2
35	Site Engineer	3	3	3	3	4	4
36	Chief Surveyor	2	2	2	2	2	2
37	Land Surveyor	4	4	4	4	4	4
38	Assistant Surveyor	1	1	1	1	1	1
39	Material Engineer	1	1	1	1	1	1
40	Senior Engineer Technical	1	1	1	1	1	1
41	Structure Engineer	1	1	1	1	1	1
42	Senior Planning Engineer	3	3	3	3	3	3
43	Senior Accountant	1	1	1	1	1	1
44	Lab technician	2	2	2	2	2	2
45	Electrical Engineer	1	1	1	1	1	1
46	Health &Safety	1	1	1	2	1	1
47	Geologist	3	3	3	3	4	4
48	Store Keepers	2	2	2	2	2	2
49	Quantity Surveyor	1	1	1	1	1	1
50	Mechanical Purchaser	1	1	1	1	1	1
51	Senior Engineer	1	1	1	1	1	1
52	Skilled Labor	141	143	143	143	146	152
53	Unskilled Labor	139	139	139	139	139	169
Total (No)		**945**	**976**	**1034**	**1035**	**1067**	**1178**
Out of Total, Local Employed Workforce (No)		**555**	**604**	**618**	**620**	**692**	**707**

Figure 2.8: Staff Deployment during the Reporting Period

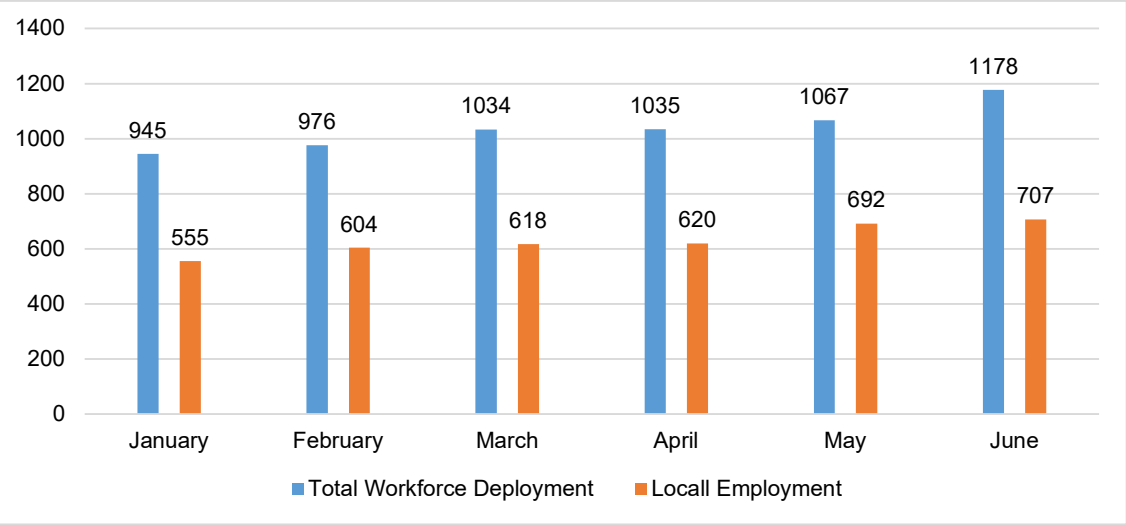


42. As evident from the above figures, there is a gradual increase in the EPC Contractor's workforce which shows an increase in the existing construction activities and initiation of new activities at different sites. Also, the graph shows that the EPC Contractor deployed more workforce in the summer as compared to the winter months.

43. Statistics of locals employed by the EPC Contractor during the reporting period are in **Figure 2.9**.

44. As evident from the presentation, although there occurred a vivid increase in the EPC Contractor's overall workforce in June 2024, however, there was no such increase in local employment. The EPC Contractor reported that as locals are mainly employed by subcontractors, therefore, the fluctuation in their work affects the workforce size as well.

Figure 2.9: Local People Employed during the Reporting Period



45. **Table 2.12** exhibits the EPC Contractor machinery and important equipment deployed to the Site. The heavy machinery was mainly deployed for 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 Reporting Period

S/No	Machine	Model	Total No. Deployed	Deployment Month					
				Jan	Feb	Mar	Apr	May	Jun
1	Excavator	HITACHI 200	1	1	1	1	1	1	1
2	Excavator	Hyundai	1	1	1	1	1	0	0
3	Excavator	Hitachi 220	1	0	0	0	0	1	1
4	Dumper	Schuman	1	0	0	0	0	1	1
5	Concrete Mixer Machine		3	0	0	0	0	3	3
6	Road Roller	XS183JPD	1	1	1	1	1	1	1
7	Crawler Hydraulic Drilling Rig	T35	1	0	0	0	0	1	1
8	Loader	LW500N	1	0	0	0	0	1	1
9	Diesel Generator	V550C2	1	1	1	1	1	1	1
10	Air Compressors		2	2	2	2	2	2	2
11	Compressor generator	XAHS206C	1	0	0	0	0	1	1
12	Diesel tanker		1	0	0	0	0	1	1
13	Concrete Pump	HBTSD 80.13.112	1	0	0	0	0	1	1
14	Crawler Bulldozer		1	0	0	0	1	1	1
15	Power Transformer	V550C2	1	1	1	1	1	1	1
16	Power Transformer	ET0800/11	1	0	0	0	0	1	1
17	Binding Machine		1	1	1	1	1	1	1
18	Welding Machine		1	1	1	1	1	1	1

S/No	Machine	Model	Total No. Deployed	Deployment Month					
				Jan	Feb	Mar	Apr	May	Jun
19	Crawler Single Bucket Excavator	PC200-8	1	0	0	0	1	1	1
20	Excavator	Hyundai 210	1	0	0	0	0	1	1
21	Excavator	CAT 320	1	0	0	0	0	1	1
22	Excavator	Komatsu 200	1	1	1	1	1	1	1
23	Excavator	Komastu 100	1	1	1	1	1	1	1
24	Loader	500FN	1	1	1	1	1	1	1
25	Loader	XCMG300	2	1	1	1	1	2	2
26	Water tank	SCS5160GSS	2	1	1	1	1	2	2
27	Jeep		1	0	0	0	0	1	1
28	Mixture Machine		2	2	2	2	2	2	2
29	Dump Trucks	SCHUMAN	4	4	4	4	4	4	4
30	Crawl Bulldozer	SD22	1	2	2	2	2	1	1
31	Concrete Pumps	HBT 80.13.112RSD	1	0	0	0	0	1	1
32	Mobile Crane	25 Ton	1	0	0	0	0	1	1
33	Single Arm Rock Drilling Rig	Boomer K111	1	0	0	0	0	1	1
34	Tele belt Concrete machine	TB130	1	0	0	0	0	1	1
35	Prado	V8	2	0	0	0	2	2	2
36	Prado	TZ	1	0	0	0	1	1	1
37	Car	MJ	1	1	1	1	1	1	1
38	Pick up Double Cabin	Toyota	3	0	0	0	3	3	3
39	Diesel generator sets	1106A-70TG1/UCI274F	1	1	1	1	1	1	1
40	Diesel generator sets	Perkins121KW,GEII500	2	0	0	0	2	2	2
41	vibrating mill	XS203J	1	0	0	0	1	1	1
42	Side dump loader	WA380-6	1	1	1	1	1	1	1
43	Submersible drilling rig	KSZ100B	4	0	0	0	4	4	4
44	flatbed truck	FG1JKPB	1	1	1	1	1	1	1
45	jib crane	QY8F/1	1	0	0	0	1	1	1
46	jib crane	BZD-2	1	1	1	1	1	1	1
47	Digital Underground Scale	SCS-60	1	1	1	1	1	1	1
48	low voltage switch box	380V 1600A	1	1	1	1	1	1	1
49	low voltage switch box	380V 2000A	1	1	1	1	1	1	1
50	low voltage switch box	UAN111-354-111	1	1	1	1	1	1	1
51	Ordinary lathe	C6160C	1	1	1	1	1	1	1
52	Vertical lifting table milling machine	ZX7045	1	1	1	1	1	1	1
53	Shaper	BC6063	1	1	1	1	1	1	1
54	sewage pump	TS200-125-365	1	1	1	1	1	1	1
55	oil storage tank	5170 Gallon 19500L	1	1	1	1	1	1	1
56	lathe	CY6166B-3000	1	1	1	1	1	1	1
57	Shaper	B6065	1	1	1	1	1	1	1
58	Vertical lifting table milling machine	XQ6232W-B	1	1	1	1	1	1	1
59	Radial drilling machine	Z5140A	1	1	1	1	1	1	1
60	Single column press	YX41-100T	1	1	1	1	1	1	1
61	Hydraulic presses (pipe crimping machines)	XM91-C1	1	1	1	1	1	1	1
62	Vehicle-mounted concrete pump	ZHJ5120THB	1	1	1	1	1	1	1
63	Excavator	Cat 210	1	1	1	1	1	1	1
64	Dumper	Volvo	1	1	1	1	1	1	1
65	Excavator	323-336-310	3	0	0	0	3	3	3
66	Pick up Double Cabin		1	0	0	0	1	1	1
67	Mazda	XA185	1	1	1	1	1	1	1
68	Jeep		1	1	1	1	1	1	1
69	Batching plant	1.0 m3	1	1	1	1	1	1	1
70	Ventilation Fan		1	1	1	1	1	1	1
71	Electric Air Compressor	XAMS850E	4	3	3	3	3	4	4

S/No	Machine	Model	Total No. Deployed	Deployment Month					
				Jan	Feb	Mar	Apr	May	Jun
72	Concrete Mixer truck	ZZ1257N3641W,ZZ1257 N364	4	1	1	2	4	4	4
73	Wheel Excavator	Doosan DX210W	1	1	1	1	1	1	1
74	Wet Spray Trolley	TSR 2010	1	1	1	1	1	1	1
75	Loader (robot arm)	LW300FN	1	1	1	1	1	1	1
76	Robotic Arm Wet Spray Machine	Sika aliva272+Aliva302.2	1	0	0	0	0	1	1
77	Screw Air Compressor	XAS 186	1	1	1	1	1	1	1
78	Large Axcel Flow Fan	AVH140.90.4	1	1	1	1	1	1	1
79	Dynamo	V550C2	1	1	1	1	1	1	1
80	Dynamo	J110 kva	1	1	1	1	1	1	1
81	Wet spray trolley	TSR2010	1	1	1	1	1	1	1
82	Robotic arm wet spray concrete pump	Sika aliva702+Aliva302.1	2	1	1	1	2	2	2
83	dump truck	SX3255DR384R	2	2	2	2	2	2	2
84	Diesel generators	1106A-70TG1/UCI274F	1	1	1	1	1	1	1
85	Diesel generators	SDMO MODEL J110KVA	1	1	1	1	1	1	1
86	dynamo	CUPP640(S)	2	2	2	2	2	2	2
87	Electric air compressor	XAMS850E	5	2	2	2	3	5	5
88	screw compressor	XAS186	1	1	1	1	1	1	1
89	Axial Fan	2*AVH125.90.4.8	1	1	1	1	1	1	1
90	Three arm Trolley	BOOMER XL3D	1	1	1	1	1	1	1
91	geological drilling rig	XY-2	2	1	1	1	1	2	2
92	Concrete Mixer truck	8M3	1	1	1	1	1	1	1
93	Van Type Transformer	500 KVA	1	1	1	1	1	1	1
94	Electric Air Compressor	20m3	1	1	1	1	1	1	1
95	Punching Machine	CCHJ70/50C	2	1	1	1	2	2	2
96	Concrete Mixer Truck	FYG5253GJBC	1	1	1	1	1	1	1
97	Concrete Mixer Truck	LZZ5BLNB3KD575216	1	1	1	1	1	1	1
98	Truck Crane	XCT8L4	1	0	1	1	1	1	1
99	Carter Excavator	CAT320	1	1	1	1	1	1	1
100	Concrete Mixer Truck	ZZ5257GJBM3247C/LB2	1	1	1	1	1	1	1
101	Wheeled Excavator	DX210W-9C	2	1	1	1	2	2	2
102	Loader	LW300FN	2	1	1	1	2	2	2
103	Robotic Arm wet Spray Machine	Sika aliva702+Aliva302.1	2	1	1	1	2	2	2
104	mini truck	VIGO CHAMP GX TRD	2	0	0	1	2	2	2
105	power transformer	ETO800/11	1	0	0	1	1	1	1
106	Mobile homes (containers)		1	1	1	1	1	1	1
107	Crawler single bucket excavator	PC-200	1	0	0	0	1	1	1
108	Tank type special vehicle	Foton Daimler,M600	1	0	0	1	1	1	1
109	Cantilever jib crane	SQ8SK3Q	1	0	0	1	1	1	1
110	Ordinary lathe	C6140C	1	0	0	1	1	1	1
111	forklift	CPSCD50	1	1	1	1	1	1	1
112	Land Cruiser V8		1	0	0	1	1	1	1
113	Excavator 210	328	3	0	0	0	3	3	3
114	Excavator 210	339	1	0	0	0	1	1	1
115	Excavator 320		1	0	0	0	1	1	1
116	Small crane	KLT.SI.5.3	1	0	0	0	1	1	1
117	Mazda	KLT.SI.3.5	1	0	0	0	1	1	1
118	Loader	G-950	2	0	0	0	2	2	2
119	Transit mixer	NISSAN, HINO	1	2	2	2	1	1	1
120	Excavator	HITCHI 200	1	0	0	0	1	1	1
121	Excavator	Hyundai 160	1	0	0	0	1	1	1
122	Excavator	Doosan 210,	2	0	0	0	2	2	2

S/No	Machine	Model	Total No. Deployed	Deployment Month					
				Jan	Feb	Mar	Apr	May	Jun
123	Dump truck	FAW 280	3	5	5	5	3	3	3
124	Generator	200kV, 100KV, 65kV	1	0	0	0	1	1	1
125	Tractor trolley	385 Budot	1	0	0	0	1	1	1
126	batching plant	B-O.5	1	0	0	0	1	1	1
127	Crush plant		1	0	0	0	1	1	1
128	Double cabin	Tiger 2002	1	2	2	2	1	1	1
129	Double cabin	2017	1	0	0	0	1	1	1
130	Toyota Corolla	2016	2	0	0	0	2	2	2
131	Compressor/2 Bar		2	0	0	0	2	2	2
132	Jeep		1	2	2	2	1	1	1
133	Trolley Crane		2	1	1	1	2	2	2
134	Drilling Equipment		1	0	0	0	1	1	1
135	Excavator		1	0	0	0	1	1	1
136	Shotcrete Machine		1	0	0	0	1	1	1
137	Ventilator		1	1	1	1	1	1	1
138	Peter Engine		4	2	2	2	4	4	4
139	Excavator	HITACHI 200	3	2	2	3	3	3	3
140	Excavator	Doosan 210	1	1	1	1	1	1	1
141	Power Generator		4	2	2	2	4	4	4
142	Excavator	HITACHI 200	1	1	1	1	1	1	1
143	Excavator Crawler	CDM6225	1	1	1	1	1	1	1
144	Excavator	Mobile Sunny/SAY155UU	3	1	1	1	3	3	3
145	Dump truck	FAW 280 & Howo	2	0	0	0	2	2	2
146	Generator	15KV	1	0	0	0	1	1	1
147	Power Generator	375KVA/Volvo	1	0	0	0	1	1	1
148	Bull Dozer	7G	4	0	0	0	3	4	4
149	Excavator	Hitachi EX 200	2	0	0	0	2	2	2
150	Excavator	Doosan DX 225	1	1	1	1	1	1	1
151	Excavator	Hyundai EX 210	1	1	1	1	1	1	1
152	Excavator	Hyundai Chain 2007	1	1	1	1	1	1	1
153	Excavator	Hitachi chain EX 200	1	1	1	1	1	1	1
154	Bull Dozer	Cat	1	0	0	0	1	1	1
155	Double cabin	Toyota	1	0	0	0	1	1	1
156	Skid Dumper		1	0	0	0	1	1	1
157	Water Bozer		1	1	1	1	1	1	1
158	Jeep		1	1	1	1	1	1	1
159	Dumper		1	1	1	1	1	1	1
160	Generator	250	1	1	1	1	1	1	1
161	Shotcrete Pump		1	1	1	1	1	1	1
162	Mobile Shotcrete Pump		1	1	1	1	1	1	1
163	Hilux Vigo		1	1	1	1	1	1	1
164	Dumper Skid Fiori		1	1	1	1	1	1	1
165	Power Generator (200KVA)		1	1	1	1	1	1	1
166	Dumper Mini Hino		1	1	1	1	1	1	1
167	Transit Mixer		1	1	1	1	1	1	1
168	Generator 500KVA	Cat	1	1	1	1	1	1	1
169	Tractor		1	1	1	1	1	1	1

S/No	Machine	Model	Total No. Deployed	Deployment Month					
				Jan	Feb	Mar	Apr	May	Jun
170	Transit mixer		1	1	1	1	1	1	1
171	Batching plant	1 CUM	1	1	1	1	1	1	1
172	Weighing Bridge	1 CUM	1	1	1	1	1	1	1
173	Dumper	Howo 405077	1	1	1	1	1	1	1
174	Loader	420	1	1	1	1	1	1	1
175	Ventilator Fan		1	1	1	1	1	1	1
176	Shotcrete Pump		1	1	1	1	1	1	1
177	Hand mixing machine		1	1	1	1	1	1	1
178	Air Compressor		1	1	1	1	1	1	1
179	Excavator	CAT, HYUNDAI	4	4	4	4	4	0	0
180	Excavator	Volvo 145, Sunny	5	5	5	5	5	0	0
181	Crawl Excavator	HITACHI 200	4	4	4	4	4	0	0
182	Loader		2	2	2	2	2	0	0
183	Mini Dumper		2	2	2	2	2	0	0
184	Roller		1	1	1	1	1	0	0
185	Generator	200, 200, 65 kV 15 kV,250	6	6	6	6	6	6	6
186	Batching plant	$0.5m^3$	1	1	1	1	1	1	1
187	Car Corolla	Toyota	1	1	1	1	1	1	1
188	Compressor /12Bar		2	2	2	2	2	1	1
189	Drilling Equipment		14	14	14	14	14	14	14
190	Shotcrete Pump		2	2	2	2	2	2	2
191	Ventilation Fan			1	1	1	1	1	1
192	Power Generator	375kVA	1	1	1	1	1	1	1
193	Peter Engine	25HP	2	2	2	2	2	2	2
194	Bulldozer		2	2	2	2	2	2	2
195	Skid Dumper		1	1	1	1	1	1	1
196	Concrete Silo		1	1	1	1	1	1	1
197	Vigo Hilux		1	1	1	1	1	1	1
198	Power Generator 200 KVA		1	1	1	1	1	0	0
199	Dumper	Mini Hino	1	1	1	1	1	0	0
200	Generator	Cat	1	1	1	1	1	0	0
201	Air Compressor		1	1	1	1	1	0	0
202	Tractor		1	1	1	1	1	0	0
203	Dumper		1	1	1	1	0	0	0
204	Shotcrete Pump		1	1	1	1	0	0	0
205	Air Compressor		1	1	1	1	0	0	0
206	Frequency Inverter		1	1	1	1	0	0	0
207	Crawl Excavators	PC200-8	1	1	1	1	1	0	0
208	Dump Trucks	SCHMAN	7	7	7	7	0	0	0
209	Dump Truck		4	0	0	4	0	0	0
210	Grader		1	0	0	1	0	0	0
211	Water Bozer		1	0	0	1	0	0	0
212	Excavator	Hitachi 200, Hitachi 220	2	2	2	2	2	0	0
213	Excavator	CATN320D, Hyundai 210	2	2	2	2	0	0	0
214	Excavator	Komatsu 200,Komatsu 100	2	2	2	2	0	0	0

S/No	Machine	Model	Total No. Deployed	Deployment Month					
				Jan	Feb	Mar	Apr	May	Jun
215	Loader	LW500	1	1	1	1	0	0	0
216	Diesel generators	Perkins 121hp,1106A-70TG1	2	2	2	2	0	0	0
217	Water tank	SCS5160GSS	2	2	2	2	0	0	0
218	Diesel tank	Foton Daimler,M600	1	1	1	1	0	0	0
219	Water truck	DLQ5161GSSZ4	1	1	1	1	0	0	0
220	Concrete Mixture Machine		3	3	3	3	0	0	0
221	GPS-RTK Survey System Brand	Nan fang S82	4	4	4	4	0	0	0
222	Total station Brand	GPT-4002LN	1	1	1	1	0	0	0
223	Digital Levelling Instruments	Trimble DINI03	1	1	1	1	0	0	0
224	Crawler Drilling machine	T35	1	1	1	1	0	0	0
225	Mobile truck crane 25ton	QY25K5-I	1	1	1	1	0	0	0
226	Single Arm Rock Drilling Rig	D7	1	1	1	1	0	0	0
227	Dump truck Volvo		1	1	1	1	0	0	0
228	Pickup double cabin		1	1	1	1	0	0	0
229	Robotic arm wet spray concrete pump	Sika aliva702+Aliva302.1	1	1	1	1	0	0	0
230	Loader	LW300FN	2	0	2	2	0	0	0
231	low voltage switch box	380V 1000A	1	0	0	1	0	0	0

2.4 Material Resource Utilization

46. During the reporting period, several major construction materials were utilized in constructing permanent 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 and Duracem
iv. Reinforced steel: FF Steel, Amreli , Siraj, SJ and Pak steel

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

48. **Tables 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	100.93	27380	47481	43961
2	February	55.34	20293	48812	61032
3	March	29.16	12960	19618	20700
4	April	114.765	13011	35577	14236
5	May	79.97	7478	64111	72738
6	June	240.56	23697	71702	96900
Total for Reporting Period (January-June 2024)		620.725	104819	287301	309567

S/No	Month	Steel (Ton)	Cement (Bag)	Sand (cft)	Aggregates (cft)
Total for Previous Reporting Period (July-December 2023)		324.97	45974	137298	98638.4
Cumulative for the Project		1238.695	152849	442234.1	432634.4

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

S/No	Month	Diesel	Petrol	Water
1	January	154550.4	1493.09	1275750
2	February	102345	3984.7	1522560
3	March	58432	1681.56	1613040
4	April	120531	1336.34	1499300
5	May	173594	935.61	1387100
6	June	189783	1182	1387900
Total for Reporting Period (January-June 2024)		799235.4	10613.3	8685650
Total for Previous Reporting Period (July-December 2023)		586033	4582.99	5207250
Cumulative for the Project since Commencement of Works		1750293.4	18038.79	16940300

Overview of the dam site construction activities

Construction of a permanent access road at the dam site

Shotcreting at slopes for stability at the dam site

Adit 2 invert concreting

Excavation and support work at Adit 1

Excavation and support work at Adit 3

Overview of the Employer's colony

EPC Contractor's camp construction at the A3 site

Construction site barricading at N-15 (dam site)

Water sprinkling at the A3 access road

2.5 Description of Any Changes to the Project Design

49. There were no design changes in the reporting period. The Employer has however approved the design changes reported in the SAEMR for the period from January to June 2023.

2.6 Description of Any Changes to the Agreed Construction Methods

50. 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

51. During the reporting period, construction works at the Project residential colony, access roads including access roads at the dam site, excavation at adit tunnels, protection works, and establishment of camp at A3 remained in progress. 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.

52. During the reporting period, PMC undertook site visits in connection with the due diligence survey of the muck disposal sites (A2 and A3 sites) identified by the EPC Contractor. Review comments, covering environmental aspects of the sites, were traded with the Contractor for incorporation in the revised submission(s).

53. As part of the Project EIA updating, the biodiversity and fisheries experts of the PMC undertook field surveys wherein the latest information/data was collected from the Project area. While updating the floral and faunal profile of the area, some additional species were identified during the survey. Compilation of survey findings and preparation of the management plan(s) for critical species remained in progress during the reporting period.

54. Regular weekly 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-complied 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**.

55. During February and April of the reporting period, the External Environmental Monitor (EEM) and safeguard specialist from ADB conducted site audits. Observations of the auditing teams were transmitted to the EPC Contractor in the form of a corrective action plan (CAP) for necessary rectification at the earliest. The EPC Contractor accordingly rectified most of the observations and submitted the report to the PMC for record.

56. Quarterly instrumental monitoring, covering air, noise, drinking and surface water, and soil analysis, was undertaken by the Khyber Pakhtunkhwa Environmental Protection Agency (KPEPA) certified laboratory. As directed by the EEM, to cross-check the results of the drinking water samples collected from source and consumer endpoints, the same were analyzed by an independent laboratory.

57. Under the provisions of the environmental management plan contained in the EPC Contract, during May 2024, the EPC Contractor initiated six-month vocational training for eligible candidates from the Project-affected community. Initially, 18 students (7 male and 11 female) will be trained in tailoring, beautician, computer operation, and electrician at Government Skill Development Center Hassa Balakot. A total of 10 such trainings are planned during the currency of the contract i.e. till December 2027

58. Toolbox talks, training on induction, capacity building training on explosive handling and usage, and champion programs were regularly held during the reporting period.

59. During the reporting period, the EPC Contractor reported one accident at the site involving injury to the labor, and damage to the vehicles, and other construction machinery.

60. The following is a brief description of the major safeguard activities undertaken during the reporting period.

3.1.1 HSE Meetings

HSE progress review meetings. As apprised in the preceding paras, to ensure consistent implementation of the HSE provisions at the Site and construction camp(s), and to resolve non-complied issues, regular tripartite meetings among PIU, PMC, and EPC Contractor are being held since the commencement of Works at the Site. The agenda items for such meetings usually remained the same, i.e. item-wise review of the HSE progress; review of targets set in the previous meeting(s); furnishing weekly plan for pending issues; and identifying impediments in implementation of measures proposed in the EMP/SSEMP.

61. So far, these meetings have been proved effective in resolving HSE-related issues and pushing the EPC Contractor to swiftly resolve pending non-compliances. These weekly meetings also enable the supervisory staff to quickly fill the gaps identified and decide on matters requiring PMC/PIU's decision.

62. **First Virtual meeting with the ADB safeguard team on updated EIA report.** On February 27, 2024, a virtual meeting of the PMC and PIU was held with the safeguard team of the ADB wherein gaps identified in the biodiversity section of the updated EIA report were discussed. In the meeting, it was agreed that PMC will hire fisheries and biodiversity experts to review and update the biodiversity section of the EIA report with emphasis on critically endangered species of Kashmir Hillstream loach. The experts will conduct field surveys for the updating of the floral and faunal profile of the Project area and will prepare management/mitigation plan(s) for the critically endangered species of Kashmir Hillstream loach.

63. **Second virtual meeting with ADB safeguard team on updated EIA report.** After the decision made in the first virtual meeting on the updated EIA report, PMC hired biodiversity and fisheries experts under short-term consultancy services agreements. Both experts were introduced to the ADB safeguard team on the occasion of the second virtual meeting held on April 26, 2024. Also, PMC apprised that field surveys will be commenced in the first week of May 2024 while the assigned task of EIA updating will be completed within two months.

64. **Meeting with the Fisheries department of the Govt. of KP.** On March 20, 2024, the PIU and PMC environmental safeguard team held a meeting with the Research Officer (RO) of the Fisheries department Mansehra office intending to obtain information regarding the status of the Kashmir Hillstream Loach in the Kunhar River and to seek the department support for the upcoming survey. The Fisheries department vouched for the providence of their full support and technical assistance in field surveys.

65. **Meeting with the Kunhar Watershed Division.** On March 20, 2024, the PIU and PMC environmental safeguard team held a meeting with the Divisional Forest Officer (DFO) Kunhar Watershed Division to resolve the issue of the claimed damage done to the plants at the R3 access road site. After thorough discussion, it was agreed that a field survey will be undertaken to demarcate the affected site enabling the stakeholders to establish whether the damages have been done within the right of way (RoW) or outside of the RoW.

66. In this regard, PIU, PMC, and the EPC Contractor held a follow-up meeting on June 12, 2024, wherein it was decided that till June 29, 2024, the latter will complete physical demarcation of the site in the presence of the department and PIU relevant staff. Thereafter, the department will deal the matter with the PIU and EPC Contractor independently. As committed, the survey was accordingly completed within the stipulated time while findings and other proceedings that fall beyond the current reporting period will be detailed in other periodic reports including SAEMR.

HSE weekly progress review meeting -May 28, 2024

Meeting with the DFO Kunhar Watershed Division at the PIU

3.1.2 Field Surveys in Connection with the EIA Updating

67. From May 10 to 16, 2024, as part of the Project EIA report updating, the biodiversity and fisheries experts undertook field surveys wherein the latest information/data was collected from the Project area. The biodiversity and aquatic surveys were conducted from upstream of the Sukki Kinari HPP reservoir up to the Patrind HPP reservoir area. While updating the floral and faunal profile of the area, some additional species were identified by both experts. Compilation of survey findings and preparation of the management plan(s) for critical species remained in progress till the end of the reporting period.

68. The biodiversity section of the EIA report will be updated in light of the field survey findings and recommendations of the experts and will subsequently be submitted to the ADB for review on or before August 20, 2024.

Collection and inspection of fish sample-Kunhar River

3.1.3 Due Diligence of Muck Disposal Sites.

69. On May 2 and 16, 2024, the EE of PMC undertook due diligence on the proposed muck disposal sites identified as A2 and A3 disposal sites. Findings and observations recorded as a result of the site's due diligence were accordingly shared with the EPC Contractor on May 21, 2024, for his appropriate response/clarification. From an environmental perspective, major observations were recorded at the A2 site as a significant number of fruit and shade trees are feared to be affected due to muck disposal operation. Protection of the Ganhool Nullah and the Kunhar River from erosion of the disposed materials and construction of the access road to the muck disposal site were also observed among the challenging tasks at the A2 site. With the adoption of some precautionary measures, the A3 site was largely found feasible for muck disposal.

Consultation with one of the landowners at the A2 site

Overview of the A3 muck disposal site

3.1.4 Establishment of Fish Hatchery

70. Under condition “hh” of the “Environmental Approval” to the EIA report, PEDO will finance the construction/establishment of a fish hatchery for the provincial government to offset impacts on the fish resources of the Kunhar River. In compliance with this condition, and as agreed in a meeting held with the Director General (DG) Fisheries of the Govt. of KP, on December 6, 2023, PIU requested in writing for a follow-up meeting and site at the date as deemed appropriate to the Fisheries department. The request submitted on April 23, 2024, was subsequently reminded on May 16, 2024. However, by the end of the reporting period, neither task had been completed. Now, as appraised by the Fisheries department, the visit for hatchery site identification will be conducted in the last week of July 2024.

3.1.5 Instrumental Environmental Monitoring

71. The KPEPA certified laboratory, namely Integrated Environment Laboratory (IEL) conducted quarterly instrumental environmental monitoring for air quality, noise level, water quality, and soil analysis at the locations pinned in the SSEMP where baseline instrumental monitoring was done in December 2022.

72. Under the EEM directions and to cross-check the results of the drinking water analyzed by the IEL, samples were collected from source and consumer endpoints by an independent laboratory, namely the Water Environment Laboratory and Consultancy Service (WELCO). The laboratory analysis undertaken by WELCO shows consistency with the analysis carried out by the IEL for the same sampled points.

73. Details of the instrumental environmental monitoring and results have been given under a dedicated subhead while signed copies are in **Annexure 2.**

3.2 Site Audit

74. **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 Health and Safety Monitor visits the Site on an almost daily basis, hence, his routine inspection/supervision visits are not reflected herein.

75. During these visits, HSE aspects of the construction activities such as permanent access roads, Employer’s residential colony, camp facilities, batching plants, adit tunnels, and dam sites were audited.

76. The EEM’s observations recorded during his visit on February 29, 2024, and the EPC Contractor’s action thereon are given in the corrective action plan (CAP) in **Table 3.1**.

Table 3.1: Site Audit Conducted during the Reporting Period

Visit Date	Auditor		Purpose of Audit	Summary of Findings
	Title	Name		
February 29, 2024	**PIU:** Deputy Director HSE and Gender	Ibtesaam Zaima	HSE compliance audit of Site and identification of gaps in measures proposed in SSEMP/EMP	Although detailed observations have been given in a separate table however, insufficient signboards at the dam and colony sites, delay in the design of sedimentation tanks, non-availability of NOC for medical waste disposal, non-providence of hydro census report, and non-availability of waste containers at sites were some of the major observations recorded during the visit.
	PMC: i. Environmental Expert ii. Health and Safety Monitor	i. Assad Ali Khan ii. Fawad Ali Shah		
	EEM	Dr. Abdul Qayyum		
	EPC Contractor: i. Environmental Manager ii. H & S Manager iii. HSE officer	i. Irshad Saeed ii. Qi Ziu Feng iii. Syed Babar Ali		
April 18, 2024	**ADB:** i. Environmental Specialist (regional technical assistance consultant)	Abdul Hadi	HSE compliance audit of construction works at the Site	No major non-compliance was observed, neither at the Site nor at camp except accumulation of the isolated landslide materials at the Kunhar River left bank, just upstream of the Bailey bridge.
	PIU: i. Deputy Director HSE and Gender	Ibtesam Zaima		
	PMC: i. Environmental Expert ii. Health and Safety Monitor	i. Assad Ali Khan ii. Syed Ali Fawad Shah		
	EPC Contractor: i. Environmental Manager ii. H&S Manager	i. Irshad Saeed ii. Qi Ziu Feng		
May 2 and 16, 2024	**PMC:** i. Deputy Team Leader ii. Environmental Expert	i. Muhammad Hussain ii. Asad Ali Khan	Due diligence of muck disposal sites identified at A2 and A3	i. From an environmental perspective, major observations were recorded at the A2 site as significant number of fruit and shade trees are feared to be affected due to muck disposal operation. ii. Protection of Ganhool Nullah and the Kunhar River from erosion of the disposed materials and construction of the access road to the muck disposal site were also observed among the challenging tasks at the A2 site. iii. The A3 site was largely found feasible for muck disposal.
	EPC Contractor: i. Environmental Manager ii. Planning Officer	i. Irshad Saeed ii. Awais Khan		

EEM visit to the Employer's colony site

ADB Auditing team visit to the Adit tunnel A2.

Table 3.2: EEM's Observations and their Rectification/Accomplishment Status

S/No	Observation/Issue	Required Action	Rectification Timing	Status as of June 30, 2024
1	Air, noise, and vibration monitoring inside adit tunnels	Installation/providence of the followingmonitoring equipment (i) Lux meter (ii) dBA meter (iii) Gas testing meter (iv) Vibrometer	March 20, 2024	The EPC Contractor utilizes SK (Suki Kinari) digital portable monitoring devices for air, noise, and vibration monitoring inside adit tunnels.
2	Provision of standard medical bed with all accessories at the dispensary and hiring of PMDC registered doctor. Also, NOC for medical waste disposal.	i. Provision of standard medical bed with all essentials at the Camp dispensary ii. The hiring of a full-time PMDC registered doctor. iii. Obtain NOC from relevant quarters for medical waste disposal.	March 15, 2024	i. Hired PMDC Registered Doctor. Mr. Hamid Yaseen ii. Provided standard medical bed with all essentials iii. Signed contract with the Govt. of KP registered firm "ARAR" for disposal of medical waste.
3	Removal of waste material/excavated stuff from the Ganhool Nullah	The waste dumped in Ganhool Nullah in frontof the batching plant and the vicinity of Adit 2 shall be removed and disposed of at the approved disposal site.	Immediate	The waste will be relocated to the approved spoil area, once the area is approved for dumping.
4	Design and thereafter construction of sedimentation tank(s) at all adit tunnels.	i. The EPC Contractor shall submit the sedimentation tank design to the PMC for review and approval. ii. Once approved, construction of the same shall immediately be started.	March 18, 2024	The sedimentation design has been completed and will be shared with the PMC till July 5, 2024.
5	Essential signage exhibiting sufficient information regarding the Project, cautions/warnings/emergency contact numbers/GRM, etc. at all construction sites, particularly at colony and dam sites.	The EPC Contractor shall provide Project related signage in the same manner, as exhibited at Audit 2, at all construction sites.	March 25, 2024	• Safety signages at the dam have been installed, and work on some signage is in progress at the Employer's residential colony. • Complaint boxes for A2 and A3 have been installed.

S/No	Observation/Issue	Required Action	Rectification Timing	Status as of June 30, 2024
6	Provision of waste containers and drinking water and sanitation facilities at all active sites	i. The EPC Contractor shall ensure the provision of waste collection containers and clean drinking water at all active sites. ii. Sanitation facilities like latrines shall also be provided at all sites, particularly at the dam site where no such facilitiesexist. iii. The drinking water at all sites shall instrumentally be monitored to examine whether the quality of the drinking water aligns with the NEQS/WHO requirements or not.	March 25, 2024	i. The EPC Contractor has provided waste at some sites, however, failed to fully rectify the observation. ii. Sanitation facilities like latrines have been provided at all sites. iii. Through IEL and WELCOS laboratories have undertaken the drinking water quality tests as per SSEMP requirements and under the directions of EEM.
7	Third-party certification of heavy construction machinery/equipment. Securing the PMC approval of PTW	The EPC Contractor shall certify the heavy machinery/ equipment through government-approved labs/institutions to ensure safe and efficient usage of such machinery.	March 30, 2024	Although the EPC Contractor has complied with the observation however such compliance is not regular.
8	Separate HSE record for dam, colony, and adit tunnel sites.	The EPC Contractor shall maintain separate documentary records about HSE activities (toolbox talks, training, non-compliances, etc.) to enable auditors to get a quick insight into the activities, workforce involved, and outcome.	Immediate	As directed, the EPC Contractor maintains separate documentary records about HSE activities (toolbox talks, training, non-compliance, etc.)
9	Providence of support to the Environmental Manager of the EPC Contractor in supervision of field activities and reporting.	It was observed that the EPC Contractor's Environmental Manager spent most of his time at the camp in preparation of various periodic reports and maintenance of documentary records. To effectively supervise and strengthen the Project environmental portfolio, the EPC Contractor shall provide support to the Environmental Manager through hiring/deployment of eligible personnel at the Site who will directly work under the supervision of the Environmental Manager. The same has already been done by the EPC Contractor in the health and safety portfolio where several health and safety inspectors have been deployed at the Site.	Immediate	An adequate number of HSE officers have been recruited to oversee the health, safety, and environmental aspects of the Project.

S/No	Observation/Issue	Required Action	Rectification Timing	Status as of June 30, 2024
10	Submission of Spring census report, and muck disposal Site identification reports	The PMC comments on the earlier Spring census and muck disposal sites reports shall be incorporated and be submitted for further review and approval thereof.	Immediate	Muck disposal reports and the PMC comments thereon have been traded with the PMC while the hydro-census report will be submitted on or before July 5,2024. The delay in submission of hydro-census report is primarily attributed to the inputs of geologists as required by the PMC.

77. Following are some of the glimpses showing the EPC Contractor's rectification of gaps identified in the CAP.

Signage installed at the dam site

Complaint box installed at the A3 site


Provision of bed at the Camp dispensary


Provision of a latrine facility at the dam site

3.3 Issues Tracking Based on Non-conformance Notices

78. As reported in the previous SAEMR for the period from July to Dec 2023, out of 63 minor non-compliances, 5 remained open at the end of that reporting period. However, during the current reporting period, among those 5 open issues, 3 were resolved, including the discharge of kitchen effluent into the Ganhool Nullah and the hiring of a PMDC registered medical doctor for the camp dispensary. Out of the two unresolved issues, the sedimentation tank design by the EPC Contractor remained in progress and is scheduled to be submitted to the PMC on or before July 5, 2024, while, as committed by the EPC Contractor in a weekly meeting held in the last week of the reporting period, providence of PPE to all skilled and unskilled labor of the sub-contractors will be ensured till July 10, 2024. The PMC's Health and Safety Monitor is regularly monitoring progress and compliance on the PPE issue.

79. The minor non-compliances recorded during the current reporting period include; delay in the updating of the safety scoreboard; the disappearance of the walkway yellow marking on the floor of the warehouse; improper stacking of material at work sites; miss-handling of gas cylinders; insufficient signage at colony and dam sites; motorbikes parking in the camp corridor; cooking in the living room by some of the camp occupants; sludge in the tunnel; unavailability of confined space attendant at the access of adit tunnels A1 and A3; insufficient sprinkling on access roads for dust suppression; ineffective implementation of permit to work (PTW); delay in incident reporting; no designated banksmen at dam site; delay in inspection regime of the fire extinguisher; and unavailability of PPE with workers of some of the sub-contractors.

80. The status of non-compliance is in **Table 3.3**.

Table 3.3: Tracking of Non-Compliances for the Current and Previous Reporting Periods

Issue	Reporting Period	
	July-December 2023	January- June 2024
Number of open issues	5	2
Number of closed issues	58	45
Total number of non-compliances	63	47
Percentage of issues closed	92%	96%

81. **Table 3.3** shows that out of 47 minor non-compliances observed, 45 (96%) 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 an effective incident investigation process; improvement in the permit to work certificate; development of more inspection checklists; capacity building of the HSE officers; hiring of a medical practitioner to support the PMDC registered doctor; and arrangement of the third-party training for riggers, scaffolders, first aiders, etc.

82. Also, the number of non-compliances recorded during the current reporting period is less than the previous reporting period. This reduction is primarily attributed to the hiring of additional HSE officers by the EPC Contractor and the holding of regular weekly HSE meetings to ascertain progress on gaps identified in the implementation of HSE provisions and strategize the resolution of new issues. It is expected that with continuous hammering, increased training frequency, safety flyers, holding of regular safety champion awards ceremonies, penalization of the violators, and toolbox talks, the level of non-compliance events involving the EPC Contractor's workforce will significantly be reduced in the future.

3.4 Trends

83. As evident from **Table 3.3**, there is a downward trend in the number of non-compliances recorded during the current reporting period. Although with the propagation of construction activities at the Site and deployment of additional staff by the EPC Contractor, the number of non-compliances may increase in the future, however, PMC is planning to strengthen its HSE team by engaging additional HSE staff. It is expected that with vigorous monitoring and regular capacity-building training of the EPC Contractor's workforce, the downward trend in HSE non-compliance will be maintained in the future as well.

3.5 Unanticipated Environmental Impacts or Risks

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

4 STATUS OF COMPLIANCE WITH COVENANTS

85. **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 Covenants[3]

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. (c)The EIA report was updated to reflect changes in the Project-specific BAP implementation arrangements and composition of BAP Management Committee. On August 11, 2023, the updated EIA report was submitted to the PIU for their review and onward transmission to ADB. The ADB review comments pertain to the updating of the biodiversity section of the EIA report remained in progress in the current reporting period. Submission of the updated EIA report is scheduled on August 20, 2024.
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. For BAP implementation, budgetary provision exists in Project PC-1, whereas for the EMP implementation, the EPC Contractor has allocated a lump sum amount in his bid which is also reflected in the EPC Contract.
Safeguards – Related Provisions in Bidding Documents and Works Contracts. PEDO shall ensure that all bidding documents and contracts for Works	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)

[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
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.		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; (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;	Para. 11, pages 10 and 11	**Compliance in progress.** (a) This is the sixth SAEMR furnished in compliance with the mentioned loan covenant. The previous five 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 was approved and disclosed by the ADB. (d) External experts specified in the PAM are on board in compliance with the covenant provisions. (e) No breach of compliance has occurred so far.

Covenant	Reference in Project Agreement	Compliance Status
(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.		
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 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;	Para. 15, page 11	**Compliance in progress.** Provisions from 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
(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

86. 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.

87. 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.

88. Compliance with the specifications and implementation of the mitigation measures proposed in EMP/SSEMP were regularly supervised by the PMC while effect monitoring, covering monitoring of air pollution, noise level, water, and soil analysis, was undertaken by the EPC Contractor through the hiring of the third-party services. It shall be noted that PMC not only supervises field activities of the third-party laboratory but also regularly reviews their instrumental environmental monitoring reports.

89. The instrumental environmental monitoring carried out during the reporting period is detailed in the succeeding paras.

5.2 Instrumental Environmental Monitoring

90. As highlighted under sub-head 3.1.5, quarterly instrumental environmental monitoring under the Balakot HPP (300 MW) was carried out by the KPEPA certified laboratory, namely the Integrated Environment Laboratory at the locations pinned in the SSEMP. The first quarter monitoring was conducted in March 2024, while the second quarter monitoring was undertaken in June 2024.

91. 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

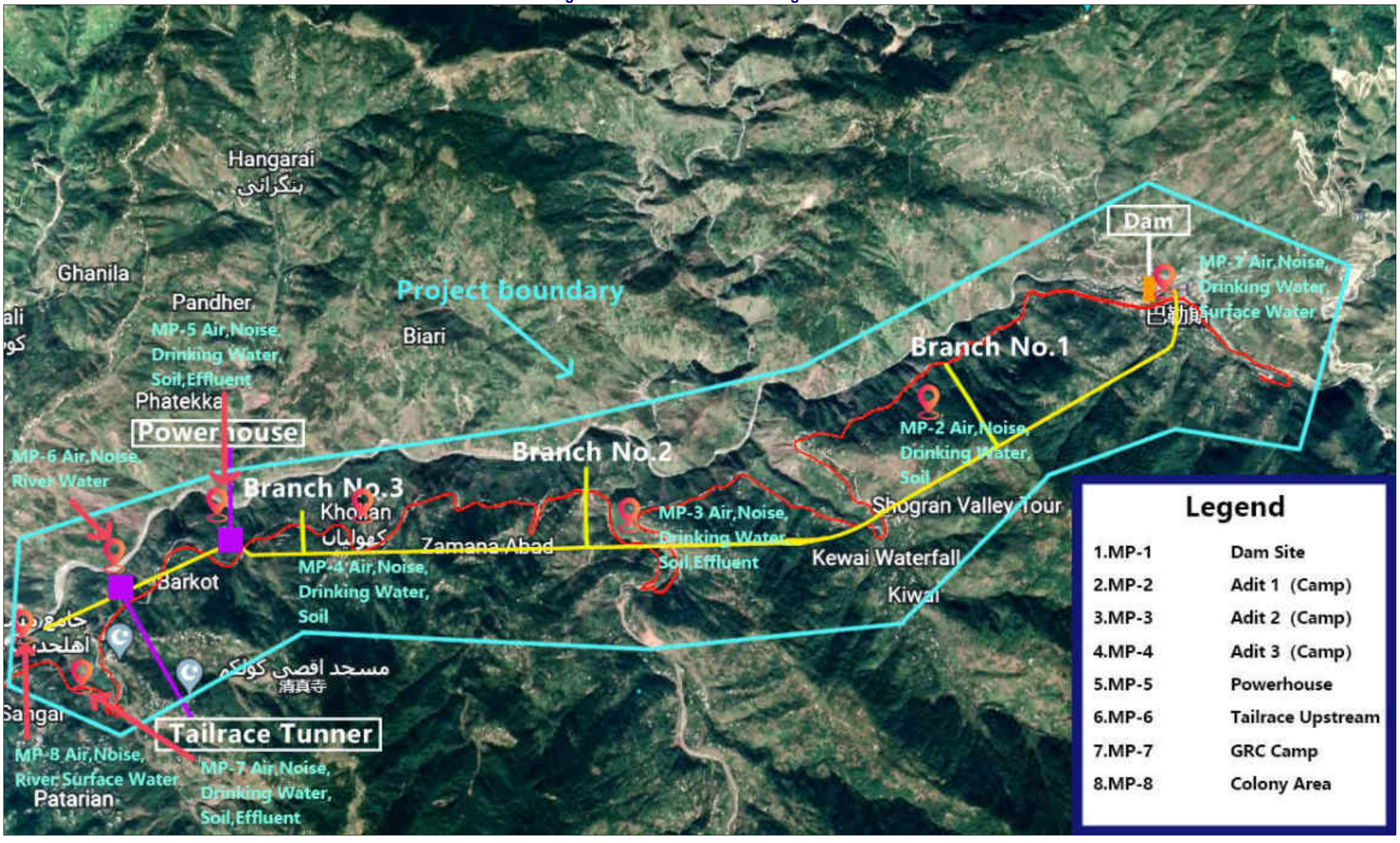


Table 5.1: Instrumental Environmental Monitoring Plan

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, NOx, 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 *coil form*, *fecal coliform* and *e. coli*	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

92. Comparison of the two quarters of instrumental environmental monitoring results with the baseline results, and NEQS, World Health Organization (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

93. **Methodology and instruments used.** Ambient particulate matter (PM) monitoring was carried out to assess PM_{10} and $PM_{2.5}$ concentrations at the pre-identified locations within the Project reach. The Air Quality Monitoring System (AQMS-65) employed for PM_{10} 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.

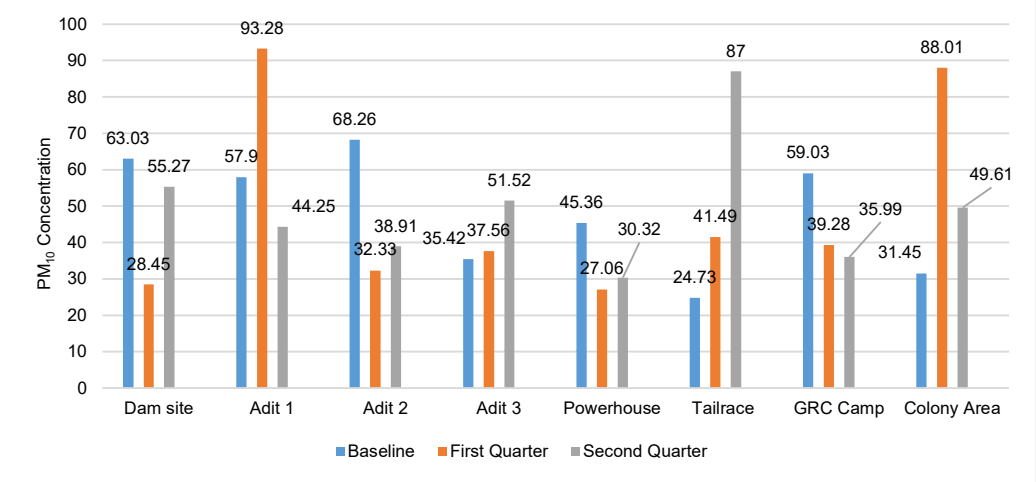
94. **Comparison of results.** Ambient PM_{10} and $PM_{2.5}$ were monitored for 24 hours at the pre-identified locations as in **Figure 5.1**. **Figure 5.2** exhibits the intended comparison.

95. As evident from the results, the PM_{10} concentration at most of the sampling points exceeded the WHO guideline values but fell below the NEQS. In fact, due to vehicular movement on the unpaved roads leading to Adit 3, powerhouse, and tailrace, the generation of dust caused an increase in particulate matters in the second half of the reporting period. Similarly, the increase in particulate matter concentration at the dam site is mainly due to the earthwork activities carried out for the construction of access roads and the cutting of left-side slopes. However, during the same period, as there were no major earthwork activities at Adit 1 and the Project residential colony thus, a vivid reduction in PM_{10} construction was recorded.

96. Except at the tailrace monitoring point, the results obtained for $PM_{2.5}$ show compliance with the NEQS however, exceeded the WHO guideline values at almost all monitoring points. As evident from **Figure 5.3**, even baseline results recorded at some locations exceeded the WHO guideline values.

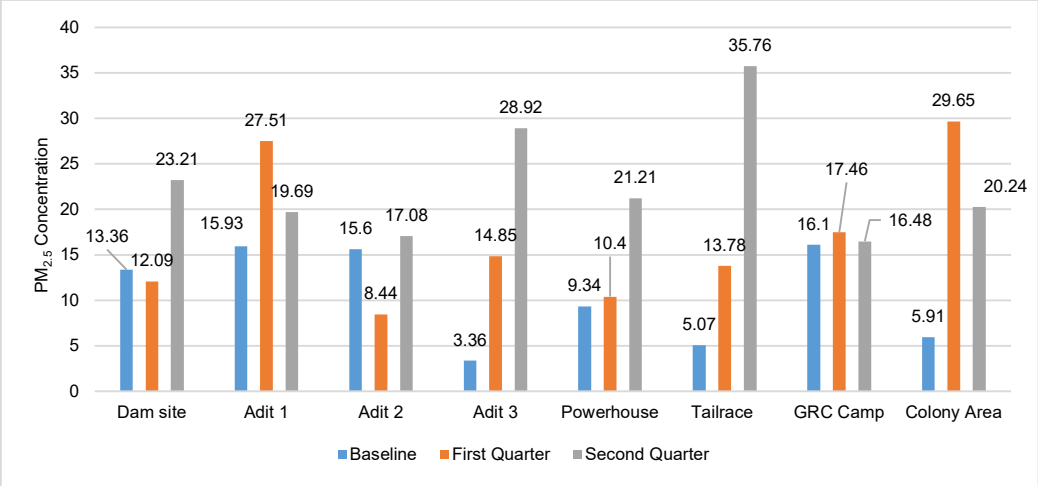
97. The increase in $PM_{2.5}$ concentration at Adit 3, tailrace, and powerhouse is again attributed to the construction machinery movement on the unpaved access roads leading to these sites.

Figure 5.2: Particulate Matter (PM_{10}) µg/m³ Concentrations in Quarter 1 and Quarter 2, 2024



NEQS: 150 µg/m³, WHO: 45 µg/m³

Figure 5.3: Particulate Matter ($PM_{2.5}$) µg/m³ Concentrations in Quarter 1 and Quarter 2, 2024



NEQS: 35 µg/m³, WHO: 15 µg/m³

98. To curtail excessive particulate matter concentration i.e. to reduce dust generation, the EPC Contractor was instructed to ensure regular sprinkling of water on the unpaved access roads. In this regard, in support of each Interim Payment Certificate (IPC), the EPC Contractor will provide documentary evidence duly signed by the PMC and EPC Contractor's HSE staff, exhibiting regular sprinkling on all unpaved access roads.

b. Gas Monitoring

99. **Methodology and instruments used.** The ambient gas monitoring was carried out by assessing carbon monoxide (CO), sulfur dioxide (SO_2), and nitrogen oxide (NO_x) at the pre-determined locations. AQMS-65 was also employed for monitoring.

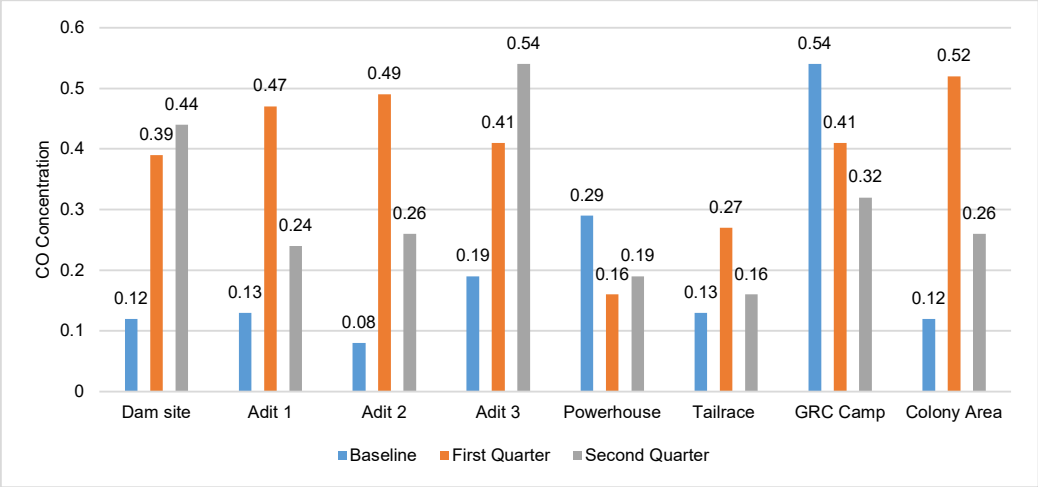
100. **Comparison of results.** The 24-hour ambient gas monitoring for the foregoing gases was carried out during the first and second quarters of 2024 at the pre-identified locations in the Project area. A comparison of the results obtained is exhibited in **Figure 5.4 to Figure 5.7**.

101. The results recorded in both quarters generally show an increase in CO, NOx, and SO_2 concentration as compared to baseline concentration. The increase is primarily attributed to the concentration of construction machinery and vehicles at these sites as construction activities remained in full swing during the monitoring period.

102. The sharp increase in CO, NOx, and SO_2 concentration at the adit tunnel A3 is mainly due to the operation of the diesel generator at this site. As evident from the picture given below, the insufficient height of the generator exhaust stack, wrong alignment, and poor tunning are the main reasons for such an increase.

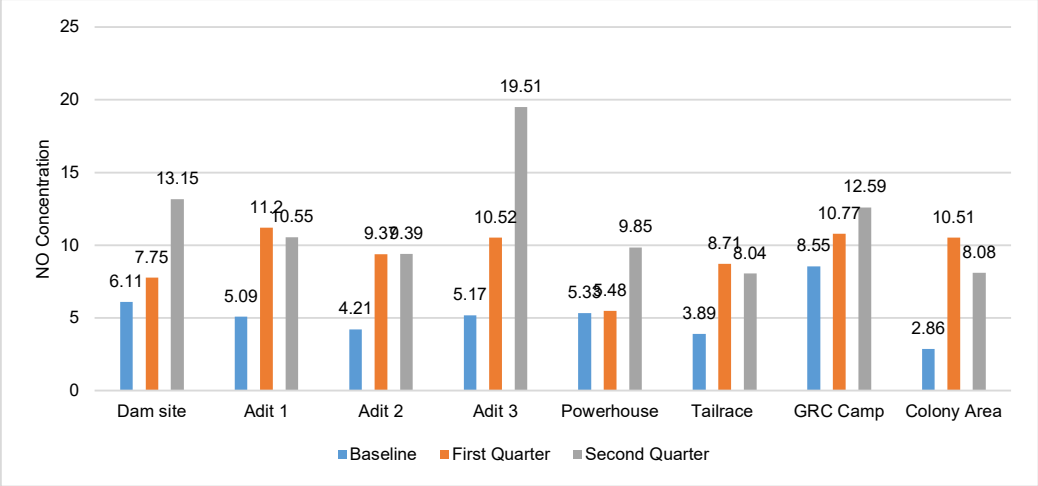
103. Generally, the CO, NOx, and SO_2 concentrations fall within the NEQS and WHO guiding values however, as evident from **Figure 5.6**, the NO_2 concentration of 26.88 (mg/m³) at the adit tunnel A3, exceeds the WHO guiding value of 25 µg/m³, which is mainly due to the reasons stated above. As a corrective measure, the EPC Contractor was instructed to increase the height of the exhaust stack; tune the generator, and replace the damaged part(s) if any.

Figure 5.4: Carbon Monoxide (CO) (mg/m^3) Concentrations in Quarter 1 and Quarter 2, 2024



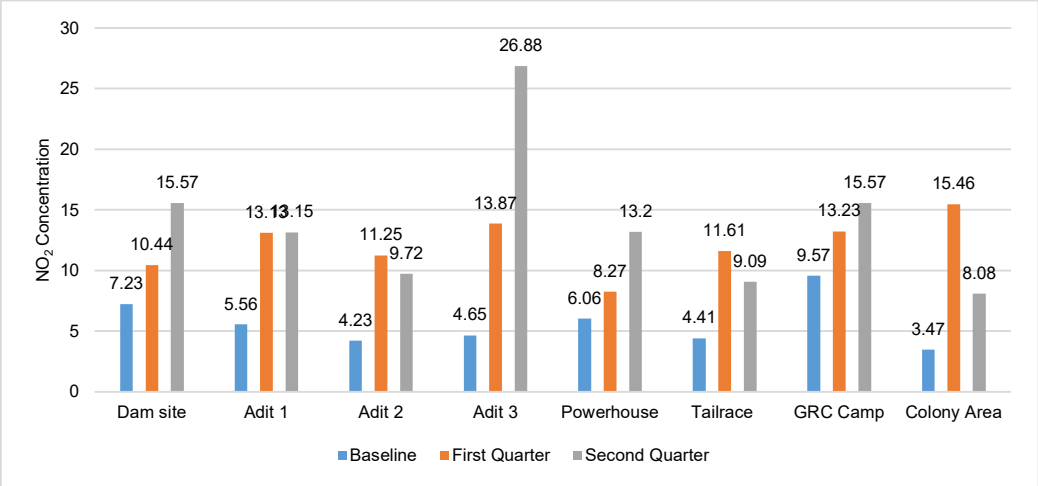
NEQS: 5 mg/m^3, WHO: 4 mg/m^3

Figure 5.5: Nitrogen Oxide (NO) (mg/m^3) Concentrations in Quarter 1 and Quarter 2, 2024



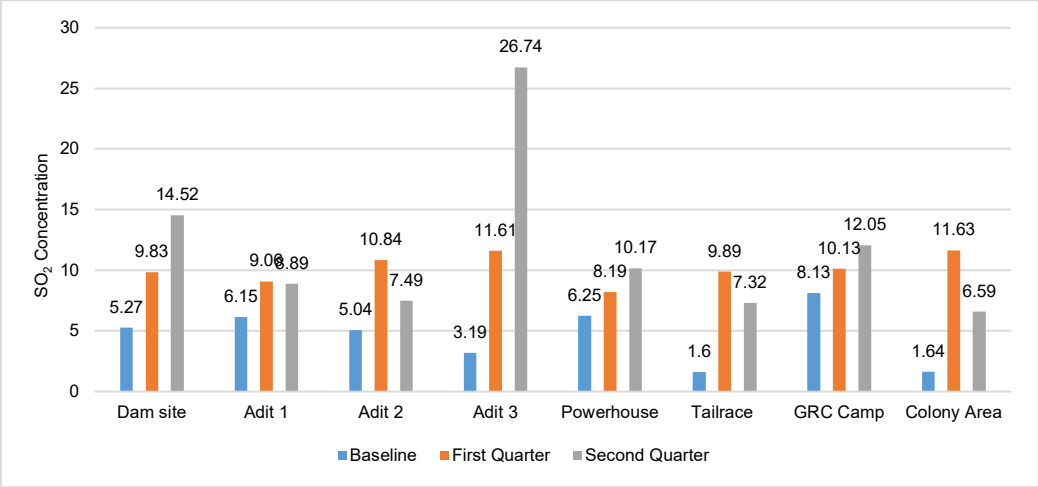
NEQS: 40 mg/m^3, WHO: 40 mg/m^3

Figure 5.6: Nitrogen Dioxide (NO_2) (µg/m^3) Concentrations in Quarter 1 and Quarter 2, 2024



NEQS: 80 µg/m^3, WHO: 25 µg/m^3

Figure 5.7: Sulfur Dioxide (SO_2) (µg/m^3) Concentrations in Quarter 1 and Quarter 2, 2024



NEQS: 120 µg/m^3, WHO: 40 µg/m^3

Emission from diesel generator at the Adit tunnel A3.

5.3.2 Noise Monitoring

104. **Methodology.** The 24-hour noise level monitoring was carried out at the pre-identified locations as shown in **Figure 5.1**.

105. 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

106. **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. **Table 5.2** also exhibits a comparison of the two-quarter results with the baseline monitoring results.

107. The 24-hour results for ambient noise level monitoring show that the recorded noise levels at almost all active construction sites exceed the NEQS guideline value of 55 decibels (dB) for residential areas. This increase is attributed to the deployment and operation of heavy construction machinery at sites.

108. Generally, the hourly results indicate that noise levels are higher during working hours, while during off-working hours, noise levels at the monitored sites fall within the NEQS guideline value of 55 dB. Also, due to the ongoing night shift works at adit tunnels, the noise levels recorded at these sites show exceedance to the NEQS guiding value of 45 dB.

109. At work sites, particularly at adit tunnels, where diesel generators and heavy excavation machinery operate round the clock, it is not possible to reduce the noise level to 55 dB as recommended for residential areas under NEQS. Nevertheless, consistent efforts have been made to keep the noise levels within the WHO guiding value of 70 dB. Also, safety equipment has been given to all workers to guard them against the negative effects of the prolonged excessive noise.

Table 5.2: Ambient Noise Monitoring Results in Quarter 1 and Quarter 2, 2024

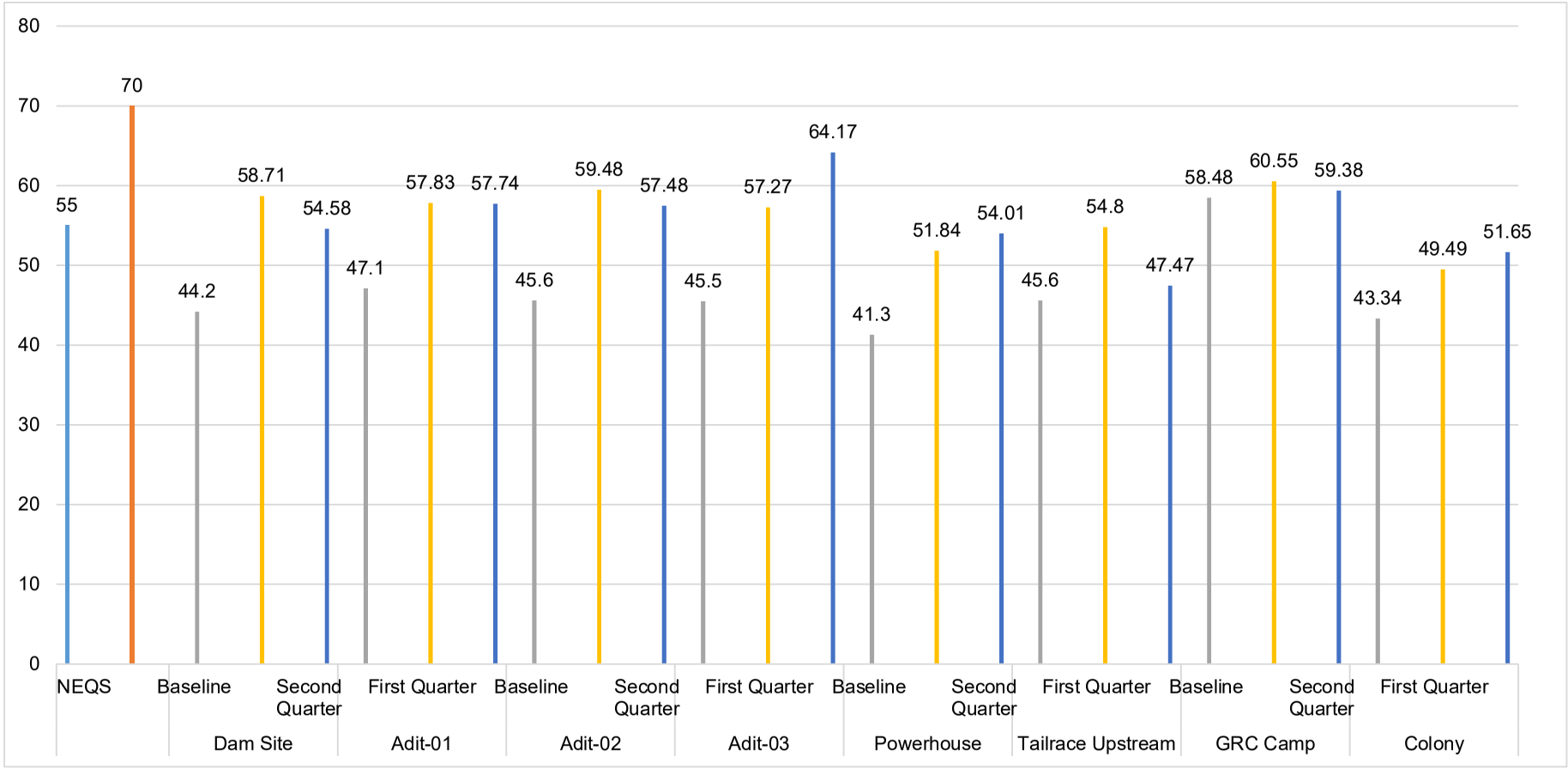
S/No	Monitoring Time	Unit	Sampling Points																					
			Dam Site			Adit -01			Adit-02			Adit-03			Powerhouse			Tailrace Upstream			GRC Camp			Colony Area		
			Results (Leq)																							
			Baseline	First Quarter	Second Quarter	Baseline	First Quarter	Second Quarter	Baseline	First Quarter	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	62.90	62.10	49.60	61.00	60.20	48.10	67.00	63.10	48.00	66.20	64.90	43.80	54.30	59.80	48.10	57.60	56.40	61.00	63.80	62.90	42.50	60.70	54.90
2.	10.00AM		46.50	62.70	61.90	49.40	60.70	60.00	47.90	66.80	62.80	47.80	66.00	66.80	43.60	54.10	60.80	47.90	57.30	56.20	60.80	63.50	62.60	43.60	60.50	54.60
3.	11.00 AM		46.30	62.50	61.60	49.20	60.50	59.80	47.70	66.50	62.60	47.60	65.70	67.10	43.40	53.90	58.10	47.70	57.10	55.90	60.50	63.30	62.40	40.90	60.20	54.40
4.	12.00AM		46.10	62.30	61.40	49.00	60.30	59.60	47.50	66.30	62.40	47.40	65.50	63.30	43.20	53.70	58.90	47.50	56.90	55.70	60.30	63.10	62.20	41.70	60.00	54.20
5.	1:00 PM		45.80	62.00	61.20	48.70	60.10	59.30	47.20	66.10	62.20	47.10	65.30	68.60	42.90	53.40	62.60	47.20	56.70	55.50	60.10	62.90	62.00	45.30	59.80	54.00
6.	2:00 PM		45.60	61.80	56.50	48.50	59.90	59.10	47.00	61.40	62.00	46.90	65.10	68.90	42.70	53.20	61.50	47.00	56.50	55.30	59.90	62.70	61.80	44.20	59.60	53.80
7.	3:00 PM		45.40	57.30	54.30	48.30	57.70	58.90	46.80	59.20	61.80	46.70	64.90	68.60	42.50	53.00	58.10	46.80	56.30	55.10	59.70	62.50	59.60	40.90	50.10	53.60
8.	4:00 PM		45.20	57.10	54.10	48.10	57.40	58.70	46.60	59.00	61.50	46.50	53.70	65.90	42.30	52.80	60.40	46.60	56.00	43.90	59.50	62.20	59.30	43.20	49.90	53.30
9.	5:00 PM		45.00	56.90	53.80	47.90	57.20	58.50	46.40	58.70	61.30	46.30	53.40	62.60	42.10	52.60	63.60	46.40	55.80	43.60	59.20	62.00	59.10	46.40	49.60	53.10
10.	6:00 PM		44.80	56.70	53.60	47.70	57.00	58.30	46.20	58.50	61.10	46.10	53.20	66.80	41.90	52.40	50.60	46.20	55.60	43.40	59.00	61.80	58.90	45.40	49.40	52.90
11.	7:00 PM		44.50	56.40	53.40	47.40	56.80	58.00	45.90	58.30	60.90	45.80	53.00	65.30	41.60	52.10	53.80	45.90	53.40	43.20	58.80	61.60	58.70	48.70	49.20	52.70
12.	8:00 PM		44.30	56.20	53.20	47.20	56.60	57.80	45.70	58.10	60.70	45.60	52.80	59.70	41.40	51.90	47.60	45.70	53.20	43.00	58.60	61.40	58.50	42.40	49.00	52.50
13.	9:00 PM		44.10	56.00	53.00	47.00	56.40	57.60	45.50	57.90	60.50	45.40	52.60	63.30	41.20	51.70	45.40	45.50	53.00	42.80	58.40	61.20	58.30	40.20	48.80	52.30
14.	10.00 PM		43.90	55.80	52.80	46.80	56.10	57.40	45.30	57.70	56.60	45.20	52.40	62.60	41.00	51.50	49.80	45.30	52.70	42.60	58.20	60.90	58.00	44.70	48.60	52.00
15.	11.00 PM		43.70	55.60	51.10	46.60	55.90	57.20	45.10	56.00	52.90	45.00	52.10	62.30	40.80	51.30	47.20	45.10	54.00	42.30	57.90	55.90	57.80	42.10	38.50	47.00
16.	12.00 PM		43.40	55.30	50.80	46.30	55.70	57.00	44.80	55.70	51.00	44.70	51.90	64.70	40.50	51.10	49.20	44.80	53.70	42.10	57.70	55.60	57.60	44.00	38.20	46.70
17.	1:00 AM		43.20	55.10	50.60	46.10	55.50	56.80	44.60	55.50	49.70	44.50	51.70	63.30	40.30	50.90	51.30	44.60	53.50	41.90	57.50	55.40	57.40	46.20	38.00	46.50
18.	2:00 AM		43.00	54.90	50.40	45.90	55.30	56.60	44.40	55.30	50.70	44.30	51.50	59.90	40.10	50.70	46.80	44.40	53.30	41.70	57.30	55.20	57.20	41.70	43.60	46.30
19.	3:00 AM		42.80	57.70	50.20	45.70	55.10	56.40	44.20	55.10	49.30	44.10	51.30	63.10	39.90	50.50	49.30	44.20	53.10	41.50	57.10	55.00	57.00	44.10	43.40	46.10
20.	4:00 AM		42.60	57.40	50.00	45.40	54.80	56.10	44.00	54.90	49.50	43.80	51.10	61.00	39.70	50.20	48.00	44.00	52.80	41.30	56.90	54.70	56.70	42.90	43.20	45.80
21.	5:00 AM		42.30	61.50	49.70	45.20	54.60	55.90	43.70	54.60	48.80	43.60	50.80	60.10	39.40	50.00	46.10	43.70	52.60	41.00	56.60	58.50	56.50	41.00	42.90	49.60
22.	6:00 AM		42.10	61.30	51.50	45.00	56.40	55.70	43.50	56.40	52.10	43.40	61.60	61.80	39.20	49.80	46.00	43.50	52.40	51.80	56.40	63.20	58.30	40.40	42.70	54.30
23.	7:00 AM		41.90	61.10	54.40	44.80	62.50	55.50	43.30	59.30	55.80	43.20	61.40	66.50	39.00	49.60	58.60	43.30	53.50	51.60	56.20	65.40	63.20	44.30	46.00	56.50
24.	8:00 AM		41.70	62.60	58.30	44.60	64.50	55.30	43.10	63.20	60.30	43.00	61.20	63.00	38.80	49.40	62.80	43.10	58.10	51.40	56.00	61.40	59.10	43.30	55.90	52.50
Average for 24 hrs			**44.20**	**58.71**	**54.58**	**47.10**	**57.83**	**57.74**	**45.60**	**59.48**	**57.48**	**45.50**	**57.27**	**64.17**	**41.30**	**51.84**	**54.01**	**45.60**	**54.80**	**47.47**	**58.48**	**60.55**	**59.38**	**43.34**	**49.49**	**51.65**

NEQS Guideline Values: 45-55 dB[4], WHO Guideline Value: 70 dB

Leq: Log Equivalent Continuous Sound Level

[4] 45 dB for Night time and 55 dB for Day time.

Figure 5.8: 24-hour (average) of Ambient Noise Monitoring Results (dB) in Quarter 1 and Quarter 2, 2024



5.3.3 Water Monitoring

a. Drinking Water

110. **Methodology.** During the reporting period, the drinking water quality tests were conducted at the sample points identified in the map in **Figure 5.1**.

111. 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.

112. **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**.

113. Under the EEM directions and to cross-check the results of the drinking water analyzed by the IEL, samples were collected from source and consumer endpoints by an independent laboratory, namely the Water Environment Laboratory and Consultancy Service (WELCO). The laboratory analysis undertaken by WELCO shows consistency with the analysis carried out by IEL for the same sampled points.

114. As evident from the results of the drinking water analysis in the Project area, almost all of the monitored parameters fall within the permissible limits 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.

b. Surface Water Results of the Kunhar River

115. 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 Sukki 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.

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

117. The results obtained from the instrumental environmental monitoring carried out in the first and second quarters of the reporting period are presented in **Table 5.4**.

118. As evident from **Table 5.4,** the total suspended solids (TSS) results, obtained at the dam site during the first and second quarters, are much lower than the baseline results at this location. This appears to be due to a fall in underground construction activities at the upstream Sukki Kinari hydropower project. For the rest of the monitored parameters, there is no vivid variation in the recorded results.

Table 5.3: Drinking Water Monitoring Results in Quarter 1 and Quarter 2, 2024

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	7.50	7.7	7.6	7.32	7.3	7.6	7.22	7.7	7.9	7.07	7.5	7.5	7.21	7.7	7.8	7.32
2.	Temperature	---	°C	---	----	7	16	17	6	14	21	8	14	19	8	15	17	7	11	16	7	13	18
3.	Taste & Odor	In-house	--	Non-Objectionable	Non-Objectionable	Non-Objectionable	Non Objectionable	Non Objectionable	Non Objectionable	Non Objectionable	Non Objectionable	Non Objectionable	Non Objectionable	Non Objectionable	Non Objectionable	Non Objectionable	Non Objectionable	Non Objectionable	Non Objectionable	Non Objectionable	Non Objectionable	Non Objectionable	Non Objectionable	Non Objectionable
4.	Color	APHA-2120 B/C	TCU	≤ 15	<15	4	6.2	3.86	6	5	5.04	5	4.5	5.14	6	6.3	3.40	10	6	3.38	6	5	4.71
5.	Turbidity	APHA-2130 B	NTU	<5	<5	3	3.4	3.8	4	4.1	4.5	4	3.7	4.1	4	4.9	5.3	4	3.4	3.8	3	3.7	4.1
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/l	< 1000	<1000	359	374	368	381	382	371	363	369	358	377	427	416	402	375	364	384	382	371
7.	Total Hardness as $CaCO_3$	APHA-2340 C	mg/l	-------	<500	294	279	259	217	301	287	261	254	240	258	395	381	316	283	269	347	372	358
8.	Nitrate (NO_3)	APHA-4500NO3 B	mg/l	50	≤50	2.2	0.91	0.93	1.9	1.66	1.68	1.03	0.79	0.81	1.06	2.5	2.52	1.2	0.61	0.63	1.46	1.34	1.36
9.	Nitrite (NO_2)	APHA-4500NO2 B	mg/l	3	≤3	0.04	0.005	0.008	0.06	0.12	0.12	0.07	0.07	0.071	0.08	0.58	0.62	0.37	0.25	0.28	0.58	0.61	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.
11.	Nickel (Ni)	ASTM E3047-16	mg/l	0.02	≤0.02	0.001	N.D.	N.D.	0.003	0.006	N.D.	0.005	N.D.	N.D.	0.008	N.D.	N.D.	0.009	0.005	N.D.	0.006	0.0048	N.D.
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	103.1	122.5	131	122	141.9	138	159	176.3	129	172	177.6	105	131	192.3	117	164	183
14.	Chlorine	APHA-4500 CL	mg/l		0.5-1.5	0.2	0.59	0.59	0.09	0.49	0.43	0.1	0.5	0.4	0.03	0.47	0.52	0.1	0.52	0.61	0.05	0.44	0.58
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.	N.D.	N.D	N.D.	N.D.
16.	Fluoride	APHA-4500F- C	mg/l	1.5	≤1.5	0.73	0.44	0.41	0.58	0.59	0.62	0.86	0.79	0.72	0.75	0.61	0.61	0.91	1.5	1.28	0.64	0.58	0.61
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.	Manganese (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.
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	0.22	0.25	0.08	0.22	0.21	0.12	0.07	0.062	0.16	0.22	0.29	0.11	0.06	0.052	0.2	0.24	0.22

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
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	0.15	N.D	0.07	0.061	N.D	0.04	0.058	N.D	N.D.	N.D.	N.D	0.06	N.D.	N.D	0.05	0.04	N.D
23.	Zinc (Zn)	APHA-3500 Zn B	mg/l	3	5	1.01	1.13	1.04	1.06	0.99	0.9	1.1	1.1	1.01	1.3	1.04	0.95	1.08	1.1	1.01	1.06	1.08	0.99
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:9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	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:9222 B	Number/100 ml	Must not be detectable in any 100 ml sample	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, 2024

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	11	16	6	13	17	4	13	16
2.	pH	APHA-4500H+ B	--	6.5-8.5	8.3	7.8	7.6	7.9	7.9	7.7	8.1	7.7	7.5
3.	Chemical Oxygen Demand (COD)	APHA-5220-D	mg/l	150	113	42	39	108	56	44	86	51	43
4.	Biological Oxygen Demand (BOD5) at 20 °C	APHA, 5210	mg/l	80	62.8	29.6	27.8	54.7	41.4	35.4	42	36.9	33.2
5.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/l	3500	2637	1495	1251	2492	1864	1392	1864	1743	1367
6.	Total Suspended Solids (TSS)	APHA-2540 D	mg/l	200	129	43	38	108	106	74	117	92	69
7.	Total Hardness	APHA-2340 C	mg/l	--	164	137	109	157	144	127	161	132	121
8.	Oil & Grease	Separation Method	mg/l	10	2.8	0.4	0.2	2	1.22	0.88	1.3	0.74	0.84
9.	Chromium (Hexa & Trivalent)	APHA-3500Cr B	mg/l	1	0.61	0.22	0.19	0.55	0.39	0.3	0.41	0.16	0.27
10.	Total Iron	APHA-3500-Fe-B	mg/l	8	3.8	2.5	2.24	3.2	2.88	2.49	2.6	2.25	2.36
11.	Chloride	APHA-4500Cl- B	mg/l	1000	256	186	152	234	171	182	209	162	189
12.	Fluoride	APHA-4500F- C	mg/l	10	2.4	2.76	2.59	1.8	1.94	2.06	1.1	1.65	2.12
13.	Ammonia	ASTM-D1426-15	mg/l	40	4.9	2.8	1.4	3.7	3.43	2.58	2.9	3.18	2.51
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	N.D	N D	N.D	N.D	N D	N.D	N.D
18.	Barium	APHA-3500Ba B	mg/l	1.5	0.07	0.04	0.023	0.04	0.08	0.065	0.03	0.046	0.051
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	0.26	0.14	0.28	0.3	0.24	0.26	0.12	0.19
22.	Zinc	APHA-3500-Zn B	mg/l	5	0.58	0.41	0.44	0.37	0.52	0.58	0.31	0.43	0.6
23.	Nickel	ASTM E3047-16	mg/l	1	0.15	0.13	N.D	0.11	0.038	N.D	0.08	0.01	N.D
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.	Sulphide (S^{-2})	APHA-4500 S_2	mg/l	1	0.35	0.29	0.23	0.31	0.25	0.17	0.29	0.23	0.2
27.	Sulphate (SO_4)	APHA-4500-SO_4 C	mg/l	600	429	351	309	354	367	325	349	338	317
28.	An Ionic Detergent (as MBAS)	----	mg/l	20	1.1	0.7	0.52	0.9	1.06	0.88	0.4	0.67	0.71
29.	Phenolic Compound (as Phenol)	APHA-5530-D	mg/l	0.1	0.06	0.01	N.D	0.02	0.06	0.052	0.01	0.025	0.046
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

119. 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 obligate 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).

120. A comparison of the soil analysis results obtained during the reporting period is in **Table 5.5**. As evident from the results, there is a vivid increase in sand content in the soil composition at all the monitored sites. Apparently, due to sand transportation and its utilization in construction activities, some sand might have been added to the soil resulting in an increase in sand content. Such a trend was also recorded in the previous monitoring results.

Table 5.5: Soil Analysis Results in Quarter 1 and Quarter 2, 2024

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	35	8	34	29	17	26	36	16	20	26	12	29	33
		Silt%	57	49	46	58	38	38	49	43	41	43	48	44	61	31	38
		Clay %	29	24	19	34	28	33	34	31	`23	41	32	30	37	40	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	7.7	7.6	8.1	7.6	7.6	8.1	7.9	8.02	8.0	7.9	7.8	8.1	8	7.8
3	Electrical Conductivity EC (μSm^{-1})		238	252	269	238	288	257	238	261	281	231	234	251	229	277	269
4	Phosphorus ($mgkg^{-1}$)		2.01	1.83	1.95	2.01	2.61	2.38	2.01	2.43	2.38	3.2	3.83	3.88	2.9	3	3.07
5	Sodium Absorption Ratio		4.07	3.47	3.32	4.07	3.04	2.96	4.07	3.08	3.23	3.54	3.61	3.54	3.37	3.97	3.56

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

5.3.5 Trends

121. Due to the propagation of construction activities, and deployment of heavy construction machinery at the Site, an increase in noise levels and particulate matter concentration was recorded at most of the monitored points. Although the noise levels recorded during the two-quarters of the current reporting period remained consistent with the previous quarters, however, during the second quarter of 2024, there was a sharp increase in particulate matter at some locations. 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 significantly decrease.

122. Except for gaseous emission at the adit tunnel A3, a flattened trend in air quality, noise level, water quality, and soil analysis were observed during the current reporting period.

Ambient air and noise monitoring at the A3 site (March 2024)

Kunhar River water sampling (March 2024)

Drinking water sampling at the consumer endpoint (June 2024)

Soil sampling at the A2 camp (June 2024)

5.3.6 Summary of Monitoring Outcomes

123. The instrumental environmental monitoring results show that the ongoing construction activities and deployment of heavy machinery collectively affected the baseline air quality and noise 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.

124. To counter-check the drinking water analysis undertaken by the IEL laboratory, samples from the same locations were collected at the same point in time and were subsequently analyzed for the same parameters by an independent laboratory namely

WELCO. The results of both laboratories showed consistency with each other establishing the accuracy of the IEL laboratory.

125. As stated above, except for gaseous emissions recorded at the adit tunnel A3, all other monitored parameters fall within the NEQS/WHO guiding values.

126. 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.

5.4 Waste Management

127. In pursuance of 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.

128. For the safe disposal of medical waste, the EPC Contractor signed a contract with a certified firm namely ARAR (Assisting Remarkable Accomplishment Results). Under obligations of the contract, the EPC Contractor transports medical waste to the Kohat Tehsil office from where ARAR collects the waste and transports it to Peshawar for final disposal at the government of KP approved disposal site. A copy of the contract is in **Annexure 3.**

129. For lubricant and other hazardous waste disposal, the EPC Contractor identified a vendor from Sindh province, however, the contract with the vendor couldn't mature during the reporting period because the vendor failed to provide verifiable certificates enabling the EPC Contractor to ensure execution of the contract with the certified vendor.

130. Although the EPC Contractor has engaged the govt. of KP approved firm for medical waste disposal however, no such firm or vendor could be engaged for the collection and safe disposal of hazardous waste generated at camps, stores, workshops, and construction sites. Since the start of the construction activities, the EPC Contractor once sold out hazardous waste to AH Enterprise, a material supplier registered in Punjab province, however, the firm neither had any license for hazardous waste collection and disposal thereof nor had any experience in such operations hence, the EPC Contractor was directed to stop further supply to AH Enterprise, instead search out for an approved certified vendor

131. As evident from **Table 5.6**, compared to the previous reporting period, there is a vivid decrease in used engine oil and tires while there is a sharp increase in the generation of used plastic waste. Due to the deployment of new vehicles at sites, particularly on access roads, the number of used waste tires has significantly decreased. The increase in plastic waste is due to the increase of plastic waste generated in kitchens and drinking water bottles.

132. During the reporting period, the EPC Contractor hired services of the Pakistan Medical and Dental Council (PMDC) registered medical doctor which encouraged the Contractor staff to use the medical facility without hesitation as witnessed in the previous reporting periods. This increase in availing the medical services at the dispensary caused an increase in the generation of medical waste as exhibited in **Table 5.7.**

133. For the primary treatment of the camp sewage, the EPC Contractor constructed a septic tank wherein sewage was being treated under anaerobic conditions. Also, provision exists for drainage in the camp.

134. The EPC Contractor has constructed a small platform intended for use as a vehicle washing yard however, usage of the facility was not observed during the reporting period. Although the grease trap has not been constructed yet, however, as confirmed by the Contractor, the same will be constructed before the washing yard operation.

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

136. Despite the above, during the monitoring period, some shortcomings were also observed in the EPC Contractor's waste management operation. For example, some construction sites had no solid waste containers, and the solid waste bins available at camps were not color-coded. Also, gaps were observed in the EPC Contractor's site waste storage.

137. **Tables 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/No	Type of Waste	Quantity			Disposal
		This Reporting Period	Previous Reporting Period (Jul-Dec. 2023)	Cumulative for the Project	
1	Plastic waste	92.5 kg	17.5 kg	132 kg	Collected in the KDA-supplied waste container and then transported to the approved waste disposal site.
2	Used tyres	22	55 Nos	87 Nos	Stored in junkyard (to be auctioned)
3	Used wooden sheets	0	0 kg	0 kg	Not produced yet.
4	Used engine oil	400	1243 ltr	1673 ltr	Stored in barrels.
5	Biodegradable waste (vegetables, food etc)	372	460 kg	822 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	0.50	0.20
2	February	0.40	0
3	March	0.72	0.10
4	April	0.31	0
5	May	0.82	0.50
6	June	1.00	0.70
Total for Reporting Period (January- June 2024)		3.75	1.5
Total for Previous Reporting Period (July-Dec. 2023)		2.40	0
Cumulative for the Project		7.15	1.5

KDA-supplied waste containers at the Site and waste bins at the A2 camp.

5.5 Health and Safety

5.5.1 Community Health and Safety

138. 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 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).

139. The unpaved road leading to A3 has been concreted to the batching plant to eliminate dust generation issues and protect the community, residing along Kholia Nullah, from dust-related negative impacts.

140. Furthermore, the sections of unpaved tracks exposed to excess particulate matter concentration were particularly sprinkled more frequently. For example, the entire access road R3 to colony and powerhouse, and kacha sections of access road to the adit tunnel A3 were regularly sprinkled to suppress dust emanating from the heavy machinery movement.

141. As previously done at the start of new construction activity, the EPC Contractor usually consults the nearby community before undertaking critical construction activity like surface/underground blasting or closure of the site, etc. Information dissemination regarding the project activities, associated risks, and safety arrangements are the prime objectives of such consultations.

142. Similarly, while identifying new sites for the construction of temporary facilities or muck disposal, consultation with the community is mandatory wherein the scope of work, impacts, and benefits are discussed in the local language and a conducive environment. For example, during the reporting period, the PMC HSE staff consulted owners of the land identified for muck disposal at A2 and A3 sites wherein various aspects of muck disposal operation, associated risks, and future benefits were discussed while their apprehensions/recommendations were recorded for consideration in demarcation and design of such sites.

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

144. 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.

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

146. 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.

147. The SSU maintains an in-and-out record of the community residing within the valley where the EPC Contractor's construction activities are in progress. Although this is primarily done to ensure the security of the EPC Contractor's staff, however, as reported by some members of the community, such an arrangement has created a sense of enhanced safety and security among the community of the valley. For example, SSU maintains daily an in-and-

out record of the community residing in Kholia Nullah Valley where the EPC Contractor's batching plant and access road to the adit tunnel A3 are located.

Consultation with one of the owners of the proposed muck disposal site A2.

5.5.2 Workers Health and Safety

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

149. To effectively implement HSE provisions contained in the SSEMP, management plans, and works-related method statements, EPC Contractor has deputed nine 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 training was provided to these officers from time to time.

150. To encourage workers to regularly follow safety protocols and implement safety measures at the works sites, champion programs were regularly held whereby cash awards were distributed among HSE champions of the month. Usually, three skilled/unskilled labor/staff from the EPC Contractor's workforce, who regularly followed safety protocols and encouraged other staff to do so, were selected as HSE champions of the month.

Prize distribution under the HSE champion program at the A2 camp (June 11, 2024)

151. For the construction workers, the EPC Contractor conducted periodic training and held regular toolbox talks on safety issues with practical demonstrations of response to any emergency. Also, on February 6, 2024, the EPC Contractor arranged one-day training on explosive material transportation, storage, and utilization.

152. 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.

153. During the reporting period, under the PMC instructions and regular follow-up, the EPC Contractor provided sanitation facilities at all 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 camps were equipped with all necessities, like accommodation, dining halls, sanitation, and games.

154. 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 A2 camp dispensary round the clock. The record maintained at the dispensary covers medicines received and used, the name of the patient treated, and type of disease, etc. **Table 5.8** exhibits month-wise patient records and types of common diseases treated at the dispensary.

155. 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	Number of patients treated at Camp Medical Facility	178	249	108	144	243	194
2	Number of patients referred to DHQ Hospital, THQ Balakot	0	0	0	1	2	0
3	Type of illness	Flu. Cough	Flu. cough, Sinusitis	pain abdomen	Kidney pain. Left flank pain	Generalized body pains, Weakness	Hypertension, GBA
		Toothache	Kidney Pain	Burning micturition	Cough and constipation	Arm Pain	Sore throat
		Body aches	Leg pain	Stomach acidity	Diarrhea	Flue and fever	Headache. Hypertension
		Headache	Generalized body aches	Lethargy and body pain	minor injuries. Muscle sprains	Diarrhea. Pain abdomen. Stomach acidity	Diarrhea. Vomiting

156. During the previous reporting period, a total of 1065 patients were treated for various minor diseases/injuries at the A2 camp dispensary while during the current reporting period, 1116 patients were treated for the aforementioned diseases exhibiting a 4.78% increase in the number of patients. This increase is mainly attributed to the overall increase in the EPC Contractor's workforce which jumped from 868 to 1178 (35%) at the end of the previous and current reporting period respectively.

5.6 Implementation Status of Environmental Management Plan

157. **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	EMP Requirements		Compliance Attained		Comment on Reasons for Partial or Non-Compliance	Required Action and Target Dates to Achieve Compliance
	Impact	Mitigation Measures				
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 a 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 top soil 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 be 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		Partial	EPC Contractor updated the Hydro-census report in light of the PMC review comments while the same will be submitted in the first week of July 2024.	Final Hydro-census Report submission by **July 5, 2024**.
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[5]			

[5] 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			
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	In April 2024, the EPC Contractor submitted design reports for the two potential muck disposal sites namely A2 and A3 muck disposal sites. During May and June 2024, the PMC design team review comments, and the Environmental Expert's due	The EPC Contractor will address the PMC observations and will re-submit design reports for both sites in the last week of July 2024. The PMC concurrence to the suitability of the identified

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				
					diligence reports remained in correspondence with the EPC Contractor. A joint visit of the PMC and EPC Contractor to the identified sites is scheduled on July 10 and 11, 2024, to address review comments and finalize the sites.	sites is expected till **August 5, 2024.**
		Preparation of spoil management plan	Yes			
8	Permanent 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	Improved accessibility due to construction of Project internal roads	Consult communities during final design and location of site access roads	Yes			
10	Increase 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	Loss of assets and livelihood as a result of land acquired for the Project	LARP implementation		Partial	LARP implementation is in progress.	
12	Submergence of the graveyard	Plaster the graves with mud or cement.		No	LARP implementation is in progress. The affected community and the district administration have not yet decided whether to	

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				
					shift the graves or not or when to shift the graves. In this regard, as reported in the previous SAEMR for the period from July to December 2023, a committee has been notified comprising of community representatives, representatives from district administration and the Balakot HPP (300 MW), with the mandate to resolve the matter align with religious and local acceptable.	
		If relocation of the graveyard cannot be avoided, it shall be managed through the local religious authorities.		No	Same as above.	Same as above
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	SSEMP 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 Loss of riverine ecosystem due to inundation by Project Reservoir	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 is awaited	The signing of the contract and field activities will be initiated after the Bank's concurrence to the updated EIA report[6].

[6] See Corrective Action Plan

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				
	Degradation of the river ecosystem in the low flow segment downstream of the Project dam				till approval of the updated EIA report by the Project financiers.	
	Degradation of the River Ecosystem Downstream of the Tailrace					
	Terrestrial habitat loss caused by construction related activities.					
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			
		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			

[7] The first annual OHS training was held on August 8 and 9, 2023, while the second such training is scheduled in the month of September 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				
		Minimize disturbance to, or movement of, soil and vegetation	Yes			
		Prevent soil damage and erosion				
		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			
		Train and raise awareness regarding AIS among Project staff and contractors				
		Retain as much natural vegetation as possible				
		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	Decline 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	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				
		(such as venomous snakes); and what to do if dangerous animals are encountered.				
		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			
		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	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				
		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				
		Equipment emitting excessive noise in comparison with other similar equipment will not be allowed to operate	Yes			
		Equipment under use will be regularly maintained, tuned, and provided with mufflers to minimize noise levels.		Partial	At the adit tunnel A3, the diesel generator was creating excessive noise and causing air pollution.	The EPC Contractor's Environmental Manager was instructed to increase the height of the diesel generator exhaust stack and tune it properly to reduce air and noise pollution. As committed by the EPC Contractor, compliance will be ensured till **July 24, 2024.**
		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 EPC Contractor's Tree Plantation Plan (TPP) has been approved while the plantation of trees will be initiated once sites (access roads, muck disposal	Under provisions of the approved TPP, tree plantation was scheduled to initiate at the onset of the monsoon season of 2024, however, due to 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				
					sites, slopes, etc.) are made available for plantation.	non-availability of the identified sites, such plantation will be undertaken in the first plantation period of 2025 subject to availability of the sites identified for plantation.
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	Yes[8]			
		Prepare a SSEMP (see **Section 9.5.3**) 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	Yes			
		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 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.		Partial	During the reporting period, instances of dust generation due to insufficient water sprinkling on access roads and excessive emissions from diesel generators were observed at sites hence, the aspect was termed as partially complied.	To suppress dust, water sprinkling frequency was increased while sections of the temporary access roads causing excessive dust generation were concreted. The EPC Contractor's Environmental Manager was instructed to increase the height of the diesel generator exhaust stacks where needed and tune them properly to reduce air pollution. As committed by the EPC Contractor, compliance

[8] 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				
		• 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 harmful pollutants to less harmful pollutants e.g. it converts the nitrogen oxides back into nitrogen and oxygen. • Appropriate maintenance of vehicles and machinery				will be ensured till **July 24, 2024.**
		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.	Yes[9]			

[9] The Headrace tunnel blasting operation has not yet been started however, the site-specific mitigation measures are included in the SSEMP. Need based sprinkling done to prevent fugitive dust emission.

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				
		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.	Yes[10]			
		Fugitive dust emissions from concrete batching plants • 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.	Yes			

[10] 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				
		• 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 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.	Yes			
		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.	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				
		• 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. • Retain as much natural vegetation as possible	Yes			
6	Vibration from blasting during the construction phase may disturb local communities.	Develop a Blasting and Explosives Management Plan and Vibration Monitoring Plan.	Yes			
		• 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	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				
		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 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.				
		♦ 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	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				
		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.				
		♦ Meaningful contact with the community shall be maintained and their grievance shall be attended to in a timely manner. In this regard: o 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 notice period to be giving to the community for various blasting related generating activities. o The GRM will be used to record, investigate, and respond to any complaints. Investigation of the complaints will be undertaken by the Supervision Consultant.	Yes			
		♦ 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: o ensure that vibration levels in the communities are within the adopted criteria levels;	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				
		○ 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	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			
		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.	Yes			
		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.	Yes			
		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	Yes			
		Where fly rock possesses a serious problem, the stemming length should not be less than the whole burden. Also, an effective stemming material like crushed angular rock should be used to prevent premature venting of explosion gases through the stemming column.	Yes			
		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.	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				
		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.	Yes			
		Blasts designed on a face length to width ratio in the range of 3 to 4 produces minimum fly rock.	Yes			
8	Alterations 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.		Partial	EPC Contractor updated the Hydro-census Report in light of the PMC review comments while the same will be submitted in the first week of July 2024.	Final Hydro-census Report submission by **July 5, 2024**.
		Monitor flow for located springs and maintain records.		Partial	Same as above	Same as above
		Support the community in development of alternate water supply schemes through local NGOs		Partial	Same as above	Same as above
		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.	Yes			
9	Use of local water resources for construction activities may reduce the water availability for the local communities.	Develop a Water Sourcing and Abstraction Plan	Yes			
		Source water for construction from authorized abstraction sources agreed between the local communities, local government and EPC contractor.	Yes			
		Water conservation techniques will be developed and implemented by the EPC contractor.	Yes			
		Access of community to water sources shall be kept clear so that the community's ability to meet its water requirements are not compromised.	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				
		Exercise care while moving heavy machinery to avoid damage or blockage of natural waterways and channels.	Yes			
		Maintain records of water usage in all Project activities.	Yes			
		Incorporate the above measures in the Construction SSEMP	Yes			
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	Yes			
		Prepare and implement a Spill Prevention and Response Plan and inducted to the staff for any incident of spill.		Partial	There were some incidents of spillages which, however, were rectified after the PMC instructions.	
		Provide and use spill prevention trays at refueling locations.	Yes			
		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.		No	i. The Grease trap is part of the EPC Contractor 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.	Yes			
		Keep all fuel storage tanks and lubricating oil drums in secondary containment impervious pits with impervious shed walls.	Yes			
		Avoid on-site maintenance of construction vehicles and equipment, as far as possible.	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				
		Regularly inspect construction vehicles and equipment to detect leakages.	Yes			
		Store fuels and lubricants in covered and dyked areas, underlain with impervious lining.	Yes			
		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.	Yes			
		Remove contaminated soil from the site and dispose in a manner to ensure protection of water sources.	Yes			
		Construct the bottom of any soak pit or septic tank at least 100 meters away from springs and water bores.	Yes			
		Maintain records of spills and volume of removed contaminated soil.	Yes			
		Maintain record of remedial measures taken.	Yes			
		Use silt traps to prevent contamination of river and streams.		Partial	Due to the non-submission of the sedimentation tank design (already prepared by the EPC Contractor), the aspect is termed partial.	The sedimentation tank design submission for the PMC review is due on **July 5, 2024.**
		Incorporate the above measures in the Construction SSEMP	Yes			
11	Increase in ambient noise levels due to operation of construction equipment, movement of construction traffic and blasting may create	Develop a Noise and Vibration Control Plan	Yes[11]			
		Noise generated from construction sites from construction activities. • Select the quietest available plant and equipment that can economically undertake the work required.	Yes[12]			

[11] Noise and Vibration plans are part of the approved SSEMP.
[12] 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				
	nuisance for nearby communities and visiting tourists.	• 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 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.	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				
		• 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. • Combine noisy operations to occur in the same time period. The total noise level produced will not be significantly greater	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				
		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. • Conveyor belts and crushing/screening equipment can be housed to provide acoustic screening.	Yes[13]			

[13] 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				
		• 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	Yes			
12	Contamination of soil as a result of accidental release of solvents, oils and lubricants can degrades soil fertility and agricultural productivity.	Prepare a Spill Prevention and Response Plan and induct to the staff for any incident of spill.	Yes[14]			
		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.	Yes			
		Install grease traps on the site, wherever needed, to prevent flow of oily water.		No	The grease trap is not available	A grease trap will be constructed as part of the washing yard. EPC Contractor has not scheduled construction of the washing yard yet.

[14] 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				
		Spill cleaning kit (shovels, plastic bags and absorbent materials) will be available near fuel and oil storage areas.	Yes			
		Carry cleanup kits in all fuel trucks.	Yes			
		Fueling should only take place over impermeable surfaces, other hazmat should be stored and used over impermeable surfaces.	Yes			
		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.	Yes			
13	Land 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.	Yes			
		Limit vegetation loss to demarcated construction area.	Yes			
		Cover areas such as muck disposal area, batching plant, labor camp and quarry sites after the closure shall with grass and shrubs.		No[15]		
		Adopt slope stabilization measures such as adequate vertical and horizontal drains, drainage along roadsides, cross drainage and retaining walls.	Yes			
		Monitor slope movements around excavation work areas.	Yes			
		Salvage, store, and reuse all topsoil at all construction sites.	Yes[16]			
		The height of the stockpile will be minimized to the extent possible by increasing the size of the land for the stockpile.	Yes			

[15] The closure phase has not been reached yet.

[16] 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 have indirectly been complied.

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				
		Topsoil will be carefully stripped to ensure that it is not mixed with subsoil.	Yes			
		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.	Yes			
		Topsoil stockpiles will be clearly signposted for easy identification and to avoid any inadvertent losses.	Yes			
		The establishment of declared plants on the stockpiles will also be monitored and control programs implemented as required.	Yes			
		The topsoil will be treated with temporary soil stabilization and erosion control measures.	Yes			
		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.	Yes			
		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.	Yes			
		Select local species for plantation to restore the biodiversity of the area in consultation with Forest Department after completion of respective activities.	Yes			
14	Failure of spoil dumping sites resulting in	Dumping sites should have a flood prevention design for a 20-year flood.	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				
	increased erosion and sediment load entering river	The water drainage works consist of the masonry structures, and shall be designed to drain a 5-year rainfall every 10 minutes.	Yes			
		Where constructed tailing hold structure will be of galvanized woven wire mesh gabions	Yes			
		All dumping sites will undergo vegetation restoration works comprising of surface leveling, covering and forest/grass planting or agricultural land rehabilitation	Yes[17]			
		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). • Reinstate 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. Place this material in long-term, upland storage sites, as it cannot be used for fill.	Yes[18]			

[17] All dumping sites will be rehabilitated under the terms of lease agreements while, where applicable, plantation will be undertaken on the dumping sites.
[18] Spoil disposal 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				
		• 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 control fabric on slopes greater than 1:2 if site is erosive.				

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				
		• 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. • Continually assess the effectiveness of sediment control measures and make necessary improvements.				

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				
		• 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.	Yes			
		Back fill to original levels.		No	Mitigation measures will be applied upon completion of activities at site(s).	
		Reshaping to match in with surrounding topography.	Yes			
		Reinstate vegetation around construction sites.		No	Implementation of the tree plantation plan has not been started yet.	Under provisions of the approved TPP, tree plantation was scheduled to initiate at the onset of the monsoon season of 2024, however, due to the non-availability of the identified sites, such plantation will be undertaken in the first plantation period of 2025 subject to availability of the sites identified for plantation.
16		Develop and implement a Site Rehabilitation and Landscaping Plan.	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				
	Permanent impact in aesthetics due to proposed developments.	Use colors that better integrate with the landscape.	Yes			
		Disguise elements with vegetation where possible.	Yes			
		Retain as much natural vegetation as possible.	Yes			
17	Increase in congestion, due to increased traffic volume will cause delays.	Develop and implement a Traffic Management Plan.	Yes			
		Make roundabouts for the congestion points.	Yes			
		Retain as much natural vegetation as possible to reduce the impact of smoke due to vehicles.	Yes			
		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 were observed without cover hence, the aspect is termed partially complied.	EPC Contractor has been instructed to immediately cover materials loaded on vehicles.
		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.	Yes			
		Sprinkle water on unsealed roads that are used for construction traffic.	Yes			
		Retain as much natural vegetation as possible to reduce the impact of smoke due to vehicles.	Yes			
		The vehicles going on the spoil routes and passing through the communities must be completely covered to avoid dust emissions.		Partial	Same as above.	
		Strictly implement speed limits and defensive driving policies.	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				
		Promptly and properly repair and maintain roads that are subject to damage by Project activities.	Yes			
19	Increased risk to community safety due to increased traffic volume during the construction phase near communities.	Develop and implement a Traffic Management Plan.	Yes			
		Identify suitable times to transport equipment.	Yes[19]			
		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	Yes			
		Keep speeds slow (30 km/hr) where there is traffic exchange between roads.	Yes			
		Make roundabouts for the congestion points.	Yes			
		Designate traffic wardens at roads on the transport route to manage traffic during school hours.	Yes			
		Construction traffic will not travel during school starting and ending hours on designated road segments in front of schools on the transport route.	Yes			
		Strictly implement speed limits and defensive driving policies.	Yes			
		Maintain vehicles especially brakes.	Yes			
20	Degradation 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.		Partial	The N-15 road damaged for the second time near Kholia Nullah has not been fully restored so far.	PMC has strictly instructed through various letters to the EPC Contractor to re-construct the damaged section of the road at the earliest.

[19] 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				
21	Direct, 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.	Yes			
		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.	Yes			
22	Increase in the stock of skilled human capital due to transfer of knowledge and skill under the Project resulting in enhanced productivity of the local labor.	Support a 'Vocational Training Program' to assist local people to qualify for semi-skilled positions focusing on issues such as procurement, involvement of vulnerable groups in Project opportunities and continual professional development of staff.	Yes			
		Assist local people having practical skills but lacking qualifications to obtain their certificates and thus increase their employment opportunities.	Yes			
		Support initiatives promoting a culture of learning in local communities.	Yes			
		Plan and implement training program for vulnerable groups to encourage their participation in economic opportunities created by the Project.	Yes			
		Assist employees and local communities to improve basic personal financial life skills				

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				
		through training and awareness campaigns, respectively.				
		Consider further training programs to prepare retrenched workers to seek employment in sectors not related to dam construction.	Yes			
23	Increase 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 is awaited till approval of the updated EIA report by the Project financiers.	The signing of the contract and field activities will be initiated after the Bank's concurrence to the updated EIA report.
24	Loss of income from sand and gravel mining due to change in pattern of sediment deposition following construction of the dam.	Sediment Mining and Management Guidelines are prepared and will be implemented as a 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.	Yes			
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	Yes			
		Encourage local communities to use the grievance procedure for concerns related to deterioration of local services.	Yes			
		Support local government in the implementation of infrastructure projects.	Yes			
		Support NGOs specializing in development of infrastructure to assist local government.	Yes			
26	Disputes over distribution of Project employment within and between Study Area	Implement PEDO Stakeholder Engagement Plan including: • maintaining regular communication with local communities and other stakeholders	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				
	inhabitants and the in-migrants resulting in social unrest.	to minimize tensions arising from Project activities; ♦ maintaining a grievance procedure, and encourage and facilitate stakeholders to use the mechanism to express concerns; and ♦ 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 inhabitants and in-migrants.	Plaster the graves with mud or cement.		No	The affected community and the district administration have not yet decided whether to shift the graves or not or when to shift the graves. In this regard, as reported in the previous SAEMR for the period from July to December 2023, a committee has been notified comprising of community representatives, representatives from district administration, and the Balakot HPP (300 MW), with the mandate to resolve the matter align with religious and local norms.	
		If relocation of the graveyard cannot be avoided, it shall be managed through the local religious authorities.	Yes			

5.7 Trainings

158. **Explosive material transportation, storage, and utilization training.** On February 6, 2024, the EPC Contractor arranged one-day training on explosive material transportation, storage, and utilization. In Balakot HPP (300 MW), the explosive materials are commonly being used for underground and surface blasting at adit, headrace tunnels, and surface works at roads and dam sites.

159. The training, imparted by an expert from Kashmir Polytechnic Institute Muzaffarabad, was attended by the EPC Contractor's blasting staff, HSE personnel, and H&S Monitor of the PMC. During the training, the expert demonstrated how to label, store, transport, and use explosive material with an emphasis on mandatory safety precautions while handling such materials. He also highlighted risks associated with the blasting operation; major causes of injuries to staff handling the operation; and possible damages to the assigned equipment and infrastructure in the vicinity of the blasting site.

Presentation on explosive transportation, storage, and utilization

160. **Vocational training.** In pursuance of the EMP/SSEMP requirements and under the vocational training program, on May 2, 2024, the EPC Contractor got admission of 18 students (7 male and 11 female) for the first training at the Government Skill Development Center Hassa Balakot. These students- selected from the project-affected communities- will be trained in tailoring, beautician, computer operation, and electrician trades. 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. **Annexure 4** exhibits details of students enrolled for training.

161. Upon completion of the six-month training, the EPC Contractor will be encouraged to employ these trained youngsters as per the Project requirements.


Computer and tailoring classes in progress


Practical work under electrician trade

Pick and drop facility

5.8 Complaints

162. During the reporting period, no complaint was received falling in the HSE portfolio of the Project. Social complaints, received during the current reporting period, which have separately been reported in the social safeguard periodic report are synopsized in **Table 5.10** below.

Table 5.10: Summary of the Complaints Registered with the PIU

S/No	Detail of Grievances	Category of Grievances		Resolved Applications/ Complaints	Outcome/Status of the complaints/applications
		Applications / Concern Submitted to PIU	Complaints Registered to ADB's OSPF/ CRP		
1	Applications regarding pending labor wages with the contractor.	2	-	2	The field staff of the PIU and the EPC Contractor resolved the issues at the Site.
2	Partial assessment of affected built-up properties.	1	-	1	After the consultation meeting with the IVS, the complainant withdrew his complaint.
3	Applications/concerns for additional/ missing monetary allowances.	26	-	26	All complaints were resolved after the incorporation of the admissible allowances in the LARP.

S/No	Detail of Grievances	Category of Grievances		Resolved Applications/ Complaints	Outcome/Status of the complaints/applications
		Applications / Concern Submitted to PIU	Complaints Registered to ADB's OSPF/ CRP		
4	Internal family dispute over LARP allowances.	10	-	10	All issues were resolved through the interventions of PIU's relevant staff and GRC members.
5	Applications/objections against GRC member of village Paras.	3	-	1	One applicant withdrew his application while, during the reporting period, the remaining two applicants were not available for the GRC meeting. The issue has not been completely resolved.
6	Applications/complaints for missing Business allowances	2	2	4	The PIU, with the support of the PMC, held detailed discussions with the complaints and resolved the issue amicably. Additionally, the applicants/ complainants also provided a written statement of satisfaction to the PIU establishing the complaints as resolved.
7	Damage of construction materials Mixture Machine	1	-	1	After thorough verification by the GRC members, and the PIU staff at the site, no evidence of any damage to the mixture machine was observed.
8	Complaint regarding land acquisition, valuation, and compensation amount.	-	1	1	The matter has been resolved as the complainant has shown written satisfaction with the IVS study outcome.
Status at the end of the reporting period.		**45**	**3**	**46**	

6 FUNCTIONING OF THE SSEMP

6.1 SSEMP Review

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

164. Various plans contained in the SSEMP, like the Erosion and Sediment Control Plan, Pollution Prevention Plan, Waste Management Plan, Instrumental Environmental Monitoring Plan, and Health and Safety Plan were satisfactorily implemented by the EPC Contractor.

165. During the reporting period, the Blasting Management and Tree Plantation plans in the SSEMP were updated, made more Site-specific, and furnished as standalone documents. Both the plans were subsequently cleared by the ADB.

166. Although there were instances of minor non-compliance at active construction sites, however, by and large, the EPC Contractor complied with the SSEMP provisions regarding the health and safety aspects of the Project. The minor non-compliances recorded during the current reporting period include; delay in updating the safety scoreboard; the disappearance of the walkway yellow marking on the floor of the warehouse; improper stacking of material at work sites; miss handling of gas cylinders; insufficient signage at colony and dam sites; motorbikes parking in the camp corridor; cooking in the living room by some of the camp occupants; sludge in the tunnel; unavailability of confined space attendant at the access of adit tunnels A1 and A3; insufficient sprinkling on access roads for dust suppression; ineffective implementation of permit to work (PTW); delay in incident reporting; no designated banksmen at dam site; delay in inspection regime of the fire extinguisher, and unavailability of PPE with workers of some of the sub-contractors. These non-compliances are constantly being rectified through regular weekly HSE meetings and regular follow-up by the HSE staff of the PMC.

167. Although there was no need to revise or amend the approved SSEMP, as the SSEMP is construed to be a live document hence, when the need arises, the same will be updated as per site conditions, and will accordingly be intimated to ADB/AIIB.

7 GOOD PRACTICE AND OPPORTUNITY FOR IMPROVEMENT

7.1 Good Practices

168. The EPC Contractor's consultation with the local area community and provision of jobs for them has created a good working environment at the Site. Also, the EPC Contractor's drive to engage the community even at the planning stage is a good initiative enabling the community to conceive the proposed intervention(s) and contribute their say at the very beginning. For example, while identifying and proposing muck disposal sites for A2 and A3, the owners of the land in particular, and the local community, in general, remained on board throughout the entire process.

169. The initiation of vocational training for the eligible youngsters in the Project area is yet another good initiative aimed at the betterment of the affected community. Upon successful completion of six months of training, the EPC Contractor will be encouraged to employ these trained electricians, plumbers, and computer operators instead of hiring from outside of the Project area. In the long run, such training will help the trained youngsters earn their livelihood outside of the Project area and abroad, particularly in Middle Eastern countries where a large number of Pakistanis are engaged in these professions.

170. 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.

171. The EPC Contractor regularly held monthly HSE champion events whereby prizes were distributed among laborers (skilled/unskilled) who demonstrated proven adherence to the worksite safety protocols. 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.

172. Although limited open spaces are available in the camps, the EPC Contractor arranged sports and other recreational activities. For example, at the A2 camp, the EPC Contractor has provided a basketball facility where basketball matches are regularly held in the evening time. Such an activity is beneficial for a healthy life, and utilization of spare time.

7.2 Opportunities for Improvement

173. Although the EPC Contractor 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, the EPC Contractor needs to immediately address community complaints about potential damages to their property caused by construction activities at the sites.

174. The EPC Contractor also needs to hold informal social meetings with the Project area communities to apprise 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.

8 SUMMARY AND RECOMMENDATIONS

8.1 Summary

175. During the reporting period, construction works at the Project residential colony, access roads, including access roads at the dam site, excavation at adit tunnels, protection works, and the establishment of camp at A3 remained in progress. 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.

176. During the current reporting period, EPC Contractor addressed most of the major non-compliances reported during the previous reporting period. Those include the hiring of the PMDC registered medical doctor; identification of muck disposal sites; obtaining NOC for medical waste disposal; initiation of vocational training for the eligible youngsters from the affected community and finalization of the hydro-census report.

177. During the current reporting period, a total of 47 minor non-compliance events were recorded as compared to 58 events recorded in the previous reporting period exhibiting a 19% drop in occurrence of the non-compliance events. This drop is mainly attributed to the consistent efforts of the Project HSE team; regular meetings and capacity building/orientation trainings; incentives given under the HSE champion program; and fines imposed on HSE provisions violators.

178. The EPC Contractor's failure to identify and engage a certified firm/vendor for safe collection, transportation, and disposal of hazardous waste is perhaps the major non-complied activity pending since the start of construction works.

179. Due to changes in the PEDO top management, the larger consultation meeting with stakeholders, prospective BAP financiers, ADB, and the Private Power Investment Board (PPIB) could not be held as earlier proposed in the virtual meeting held on November 14, 2023.

180. Under the Project specific BAP in the Area of Management, contracts with the Fisheries and Wildlife departments of the KP province will be signed upon the ADB/AIIB concurrence to the updated EIA report which is scheduled to be submitted on or before August 20, 2024.

181. As part of the EIA update, the biodiversity and fisheries experts undertook field surveys wherein the latest information/data was collected from the Project area. The biodiversity and aquatic surveys were conducted from upstream of the Sukki Kinari HPP reservoir up to the Patrind HPP reservoir area. Compilation of survey findings and preparation of the management plan(s) for critical species remained in progress till the end of the reporting period.

182. An addendum to the consultancy contract could not materialize till the end of the reporting period; hence, PMC could not install a full-time environmental officer at the Site to assist the Environmental Expert in supervising environmental activities.

183. Instrumental environmental monitoring was held at the Site promptly, at the points pinned in the SSEMP. Except for a few exceedances in particulate matters and noise levels mainly associated with the operation of construction machinery and insufficient water sprinkling on unpaved access roads, the results obtained were generally consistent with the baseline results.

184. **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[20]	Responsibility	Timing (Target Date)	Description of Resolution and Timing (Actual)	Reason(s) of delay/non-achievement and further Action Required with Time frame
1	Pending signing of Project specific BAP contracts with Fisheries and Wildlife departments of the KP province	i. Submit the updated EIA report to ADB/AIIB reflecting changes in the Project-specific BAP and design (Dam site). ii. Finalize various modalities, e.g. offices, human resources, and payment modalities, in consultation with the Fisheries and Wildlife departments of the KP province.	PIU- Balakot HPP (300 MW)	April 30, 2024	The target could not be achieved within the stipulated time.	**Reasons for Delay:** i. Due to changes that occurred in the IUCN status of the Kashmir loach (from not assessed to critically endangered), additional field surveys were undertaken in May 2024 by fisheries and biodiversity experts. Revised submission of the updated EIA is scheduled on or before August 20, 2024. ii. As the signing of contracts with the Fisheries and Wildlife departments of the KP province was tied up with the approval of the updated EIA report; hence, its delay affected the contract signing schedule. iii. Owing to the above, except identification of field offices, no vivid progress could be made on the Project specific BAP interventions. **Further Action Required:** i. Submission of updated EIA on or before August 20, 2024. ii. Preparation of draft contracts and their finalization with the consent of Fisheries and Wildlife departments.
2	Pending establishment of a fully equipped dispensary under the full-time charge of the PMDC registered medical doctor	Hiring full-time services of the PMDC registered medical doctor	EPC Contractor	January 30, 2024	EPC Contractor hired full-time services of the PMDC registered medical doctor on March 21, 2024.	
3	Pending vocational training for community	i. Finalize list containing eligible candidates from	EPC Contractor	January 30, 2024	EPC Contractor got admission of 18 eligible	

[20] Actions proposed in the previous SAEMR

S/No	Issue	Required Action[20]	Responsibility	Timing (Target Date)	Description of Resolution and Timing (Actual)	Reason(s) of delay/non-achievement and further Action Required with Time frame
		the affected community. ii. Secure admission to the identified government-approved institute.			youngsters at the Government Skill Development Center Hassa Balakot on May 2, 2024.	
4	Pending NOCs for medical waste	Follow up on the applications submitted for NOC.	EPC Contractor with the assistance of PIU	January 30, 2024	On April 30, 2024, the EPC Contractor signed an agreement signed with ARAR (Assisting Remarkable Accomplishment Results) for medical waste disposal.	
5	Disposal of A2 camp kitchen effluent	Construct filter/treatment facility	EPC Contractor	February 15, 2024	February 14, 2024	
6	Pending submission of i. Updated EIA report ii. Tree Plantation Plan iii. Blasting Management Plan	Submit plans to ADB for review and concurrence	PIU	January 15, 2024.	i. Updated EIA submitted to ADB on January 18, 2024. ii. Tree Plantation Plan submitted on January 17, 2024. iii. Blasting Management Plan submitted	

S/No	Issue	Required Action[20]	Responsibility	Timing (Target Date)	Description of Resolution and Timing (Actual)	Reason(s) of delay/non-achievement and further Action Required with Time frame
					on January 17, 2024.	
7	Pending second Basin-wide BAP Consultation Report	Prepare the 2nd Basin-wide BAP Consultation Report containing details of the consultation(s) carried out with the stakeholders, and recommended course of action(s).	PIU and PMC	January 30, 2024	The target couldn't be achieved within the due date.	**Reason for Delay:** Due to changes in the PEDO top management, the larger consultation meeting with stakeholders, prospective BAP financiers, ADB, and PPIB could not be held as earlier proposed in the virtual meeting held on November 14, 2024. As larger consultation meeting couldn't be held; hence, the 2nd Basin-wide BAP consultation report could not be prepared.[21]

[21] For further actions, refer to the recommendation section of the report.

185. 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 hydro-census report	Submission of final hydro-census report	EPC Contractor	July 5, 2024
	Noise and excessive emissions from diesel generators	Installation of proper exhaust stack to the diesel generators and their tunning including other construction equipment/machinery.	EPC Contractor	July 24, 2024
2	Lack of air, noise, and vibration monitoring equipment inside adit tunnels	Installation/providence of the following monitoring equipment permanently. (v) Lux meter (vi) dBA meter (vii) Gas testing meter (viii) Vibrometer	EPC Contractor	August 10, 2024
3	The non-availability of the Third-Party certification of heavy construction machinery/equipment.	The EPC Contractor shall certify the heavy machinery/ equipment through government-approved labs/institutions to ensure safe and efficient usage of such machinery.	EPC Contractor	August 13, 2024
4	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	August 30, 2024
5	Re-submission of the updated EIA report with particular emphasis on the updating of the biodiversity sections of the report.	Re-submission of the EIA report containing the updated biodiversity section in track changes mode.	PMC/PIU	August 20, 2024
6	BAP contract signing with the Fisheries and Wildlife departments of the KP province	Preparation of draft contracts and their finalization with the Fisheries and Wildlife departments.	PIU/PMC	September 15, 2024
7	PIU recommendations on the future course of actions on Basin-wide BAP.	Submission of the PIU recommendations to the ADB and AIIB, setting out the future course of actions on Basin-wide BAP.	PIU	August 30, 2024
8	Establishment of a Fish hatchery for the Fisheries department of the KP province	With the consent of the Fisheries department, finalization of the site for the construction of a fish hatchery in the Project area.	PIU	August 30, 2024

8.2 Recommendations

186. Instead of waiting for approval of the updated EIA report by the Project financiers, the PIU should sign Project specific BAP contract(s) with the Fisheries and Wildlife department of the KP province enabling both the departments to establish field offices and start protection activities.

187. A meeting is scheduled to be held in the first week of August 2024 with the management of Patrind and Suki Kinari HPPs to discuss the Watershed Management Organization (WMO) envisaged for the Kunhar River basin under the Basin-wide BAP to streamline its materialization independent of Institute for Research on River Ecology (IRRE). However, as construed from the previous consultation meetings held with the aforementioned HPPs, they may not contribute any financing towards the establishment and operation of WMO as there is either no compensation in their respective tariffs or they are not sure of such compensations. Also, the PEDO owned other two projects, namely Bata Kundi and Naran hydropower projects, identified on the Kunhar River, are still in the planning stages. Hence, it is recommended to maintain the original provisions of WMO as part of the Basin-wide BAP instead of bringing it under the ambit of the Project specific BAP as advised by the ADB.

188. Furthermore, in the absence of policy guidelines, collective efforts, and the leading role of the federal or the provincial government relevant ministry, materialization of the Basin-wide BAP appears an uphill task for an individual project/developer. Also, there are operational projects in the Jhelum Basin where no BAP obligations exist. Neelum Jhelum and Patrind HPPs are the two projects in the instant case. Unless IRRE and WMO establishment and associated recurring costs compensation are not guaranteed in the COD tariff, monetary contributions by the Jhelum Basin hydropower developers appear obscure. Hence, under the circumstances, and keeping in view the foreseeable delay in the development of several projects identified in the Jhelum Basin including those proposed on the Kunhar River, the PIU environmental team inputs at this juncture of time may be of no significant avail; thus, the team should concentrate on the Project specific BAP to initiate implementation of the protection measures in the Area of Management.

ANNEXURES

Annexure 1: Minutes of HSE Weekly Progress Review Meeting (April 26, 2024)

Balakot Hydropower Project (300 MW)
District Mansehra
Minutes of Weekly HSE Progress Review Meeting
Dated April 26, 2024

S.No	Agenda Item	Action	Responsibility	Time Frame
1.	i. Discussed major non-conformances and their effective resolution. ii. Pakistani mess waste effluent was not connected with the main sewer line.	i. Contractor accepted the time line to resolve the non-conformance within the prescribed date. ii. Mr. Qaisar said that they will resolve the issue of Pakistani mess kitchen effluent disposal.	EPC Contractor	I. Target date 15th, May,24. II. Effluent of Pakistani mess. 15th. April 2024 New Date 15th, May, 2024
2.	Site orientation video translation in Urdu and English.	EPC contractor informed to PMC that 70 % video is already completed and rest will be finalized in couple of days.	EPC Contractor	15th. April,2024 (New Date) 15th. May, 2024
3.	Current status of vocational, and HSE trainings.	I. Mr. Qaisar informed PMC that first 22 nominees were finalized but again PEDO reviewed the list and nominated 29 people. II. Due to delay in starting the training session few nominees were withdraw their nomination and currently 18 nominees are ready for attending the vocation training. III. He further added that we will try to accommodate the nominees in the current session and request to the principal of the institute to grant the admission.	EPC Contractor with the assistance of PIU/PMC social team	Training matric till 24th, November, 2023. (Issue Pending). Vocational training will be in the month of November as per institute's schedule. (Issue Pending). Meeting: 28th.Feb, 2024 15th April, 2024 (New Date) 15th, May, 2024

S.No	Agenda Item	Action	Responsibility	Time Frame
4.	Mucking operation: Clearly mention the disposal site for muck disposal.	I. EPC contractor informed to PMC that dumping has been stopped near water body. II. Design of Muck disposal areas soon finalized. III. Discussed on the new submitted proposal of muck IV. Mr. Aasad will visit the site after the meeting and assess the proposal submitted by the NESPAK designers.	EPC	Design of Adit-2 will be submitted on 15 April,2024 dam and Adit-3 muck disposal area design will be submitted after one month. Design meeting conducted on: 24th, April, 2024
5.	Establish the emergency protocol.	EPC contractor request for a week to arrange the wind sock. CGGC manager respond that wind sock is already ordered but soon it will reach in Pakistan from China.	EPC Contractor	Wind sock: October, 2023. (Issue Pending) 29th.Feb, 2024 25th April, 2024 15th. May, 2024
6.	GRC mostly absent in the HSE progress review meetings.	HSE Manager has attended the HSE meeting and committed for continuity. Again, GRC was not present in the meeting. Again, GRC representative is absent in the meeting. CGGC will write a letter against the GRC casual attitude in the HSE meetings.	PMC	CGGC letter will issue before. 25th. Feb, 2024 (Issue Pending) 15th, May, 2024

S.No	Agenda Item	Action	Responsibility	Time Frame
7.	GRC workers were found improper PPEs and lose clothing.	HSE Manager has informed that PPEs has been provided to the workers and PMC can verify it. After several site visits PPEs' violations were recorded. PMC will again write the letter against the violation of the GRC. CGGC was also agreed to take necessary action against GRC.	EPC Contractor	(Issue Pending) 15th, May, 2024
8.	Washroom condition in Adit-3	PMC instructed to the Contractor for the maintenance of washrooms in the Adit-3 and provide more Geiser. Mr. Tahir is attended the meeting to discuss the camp issues at Adit-3. He committed to resolve the issue as soon as possible.	EPC Contractor	31st, Jan, 2024 (Issue Pending) 30th April, 2024 15th, May, 2024
9.	Lack of HSE coverage by GRC.	HSE coverage still negligible at site. PMC has instructed, to hire at-least three more safety officers. HSE Manager informed PMC that he already raised the issue to their Project Manager and soon it will rectify. No information about the hiring of the HSE officers due to the unavailability of the HSE manager in the meeting.	EPC Contractor	15th, March, 2024 30th April, 2024 15th, May, 2024

S.No	Agenda Item	Action	Responsibility	Time Frame
10.	A single guard was deputed in night shift at batching plant.	PMC has instructed to the contractor for adopting buddy system on all its remote working and night shift activities. Contractor responds that they will discuss the issue to the concerned. Contractor responds that they will instruct to the concerned for follow the buddy system.	EPC Contractor	10th March, 2024 New Date: 30th April, 2024 15th, May, 2024
11.	Corrective Action Plan	EPC contractor said that most of the point mentioned in the CAP have been rectified by PMC continuous hammering in the minutes of meeting. PMC has intimated to the contractor that PMC will thoroughly review the corrective action plan implementation after Eid holidays. Mr. Irshad will send the achievement.	EPC Contractor	17th April, 2024 15th, May, 2024
12.	Repair of the sedimentation tank.	PMC instructed to repair the damaged sedimentation tank and remove the debris around it.	EPC Contractor	26th April, 2024 (New Date) 15th, May 2024
13.	Vent pipe installation on the septic tank.	Admin Manager took the responsibility.	EPC Contractor	26th April, 2024 15th, May, 2024
14.	Previous incident reports and its data review and analyzation session.	PMC instructed to the HSE department of the CGGC to compile the previous incidents reports and its data to analyze. PMC showed it reservation against the contractor hiding or delay reporting process. Hence it is decided that statistical data of all incident will be reviewed in separate meeting.	PMC, PEDO and EPC Contractor	30th, April, 2024 31th, May, 2024

S.No	Agenda Item	Action	Responsibility	Time Frame
15.	OHS inhouse training and its status.	EPC contractor informed the PMC about the total OHS training conducted in the month of April.	EPC Contractor	(Issue Closed)
16.	OHS inhouse training record.	PMC will review the training record of the contractor in the month of May 2024.	EPC Contractor	15th, May, 2024
17.	Mock evacuation drill in the months of March and April.	Mock Drill should conduct quarterly to check the effectiveness of the system and understand of the employees. Mock evacuation drill will be schedule in the month of May, 2024.	EPC Contractor	Month of May
18.	I. Availability of banksman, flagman, confined space attendant, and fire watchers. II. List of the above-mentioned personals should submit to the PMC.	PMC instructed for the training of the banksman, flag man and confined space attendant to some workers. Issue the ID cards to the trained workers. Submit the list of all banksman, flagman, confined Space attendant and fire watchers to the PMC.	EPC Contractor	15th. May, 2024
19.	Summer and its effect control plan.	Mr. Irshad will submit the summer effect control plan.	EPC Contractor	15th. May, 2024
20.	List of First Aiders on the site.	Contractor provides the list of the first aider on site.	EPC Contractor	15th. May, 2024
21.	Safety Score board was not update on daily basis.	PMC strictly assigned the task to Mr. Babar HSE officer to maintain the safety score board	EPC Contractor	27th, May, 2024

BALAKOT HPP CONSULTANTS

A JV of DOLSAR, AGES, BAK, CIV TECH, ELECTRA & TLC Consultants

DOLSAR AGES BAK CIV TECH ELECTRA TLC

LIST OF PARTICIPANTS

WEEKLY HSE PROGRESS REVIEW MEETING AT ADIT-2, BALAKOT HYDRO POWER PROJECT HELD ON (APRIL-26-2024)

Chaired by: Syed Ali Fawad Shah

Sr.#	Name of Participants	Designation	Department/ Organization	Signature
1.	SYED ALI FAWAD	HSE EXPERT	CGGC	
2.	Waqar Saeed	Environmental Monitor	CGGC/QHSE	
3.	SYED BABAR ALI SHAH	HSE	QHSE/CGGC	
4.	Li Tong	QHSE	CGGC	
5.	Qaisar	AD	CGGC	
6.	Amir Ali	HSE Officer	CGGC	
7.	Talib Abbas	AD	CGGC	
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Annexure 2: Copies of Instrumental Environmental Monitoring

Ambient Air Monitoring Results (First Quarter, 2024)-Particulate Matters

Integrated Environment Laboratory

AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number:	[illegible]	Client Name:	CSGC JV (PK)
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Dam Site (Paras Valley)
Monitoring Date:	28-03-2024	Reporting Date:	15-04-2024
Source:	Ambient Air	Monitoring Instrument:	AQMS 60, Serial # 1510
GPS Coordinates:	34.6924°N, 73.455497		

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}
		Units			
	Hours of Monitoring	($\mu g/m^3$)	($\mu g/m^3$)		
1.	09:00 A.M	17.03	36.39	12.08 ($\mu g/m^3$)	28.48 ($\mu g/m^3$)
2.	10:00 A.M	16.15	37.26		
3.	11:00 A.M	14.22	35.71		
4.	12:00 P.M	13.48	39		
5.	01:00 P.M	13.51	37.45		
6.	02:00 P.M	13.87	36.14		
7.	03:00 P.M	13.61	34.21		
8.	04:00 P.M	13.41	32.86		
9.	05:00 P.M	12.31	29.17		
10.	06:00 P.M	11.08	28.26		
11.	07:00 P.M	10.21	29.92		
12.	08:00 P.M	10.71	28		
13.	09:00 P.M	11.21	25.28		
14.	10:00 P.M	11.08	24.55		
15.	11:00 P.M	9.33	24.03		
16.	12:00 A.M	11.2	21.3		
17.	01:00 A.M	10.34	23.77		
18.	02:00 A.M	11.91	22.06		
19.	03:00 A.M	11.21	22.46		
20.	04:00 A.M	10.79	20.5		
21.	05:00 A.M	10.38	21.66		
22.	06:00 A.M	9.51	23.93		
23.	07:00 A.M	11.13	24.84		
24.	08:00 A.M	11.71	25.83		
NEQSAA				35($\mu g/m^3$)	150($\mu g/m^3$)
WHO				15 ($\mu g/m^3$)	45 ($\mu g/m^3$)

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

- Selected measurement units were $\mu g/m^3$ otherwise stated.
- The client is responsible lawful usage of reported data in future.
- This 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:	EHPF/ENV/TS-2024	**Client Name:**	DGGC JV GRC
Project Name:	Balakot Hydropower Project (302 MW)	**Monitoring Location:**	Adit-1 (Thob)
Monitoring Date:	02-04-2024	**Reporting Date:**	15-04-2024
Source:	Ambient Air	**Monitoring Instrument:**	AQMS 65, Serial # 1310
GPS Coordinates:	34.836125, 73.428597		

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}
		Units			
	Hours of Monitoring	(µg/m³)	(µg/m³)		
1.	09:00 A.M	28.12	94.37	27.61 (µg/m³)	89.28 (µg/m³)
2.	10:00 A.M	26.57	91.8		
3.	11:00 A.M	31.91	88.00		
4.	12:00 P.M	28.26	76.26		
5.	01:00 P.M	26.57	79.84		
6.	02:00 P.M	31.03	86.12		
7.	03:00 P.M	26.86	91.6		
8.	04:00 P.M	33.81	77.67		
9.	05:00 P.M	31.13	91.49		
10.	06:00 P.M	30.18	89.63		
11.	07:00 P.M	39.20	85.74		
12.	08:00 P.M	32.66	91.55		
13.	09:00 P.M	21.7	87.49		
14.	10:00 P.M	34.83	109.82		
15.	11:00 P.M	23.96	92.22		
16.	12:00 A.M	21.20	117.66		
17.	01:00 A.M	31.55	91.37		
18.	02:00 A.M	33.59	80.25		
19.	03:00 A.M	20.84	115.68		
20.	04:00 A.M	25.86	101.96		
21.	05:00 A.M	23.21	109.39		
22.	06:00 A.M	39.15	130.71		
23.	07:00 A.M	29.48	117		
24.	08:00 A.M	22.83	124.26		
NEQSAA				36(µg/m³)	160(µg/m³)
WHO				15 (µg/m³)	45 (µg/m³)

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.

Signatory of Analyst

Signatory of Chief Chemist

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Environmental Protection Agency (EPA-KPK) Certified

Integrated Environment Laboratory

AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number	BHPP/ENV/18-2024	**Client Name**	CGGC-JV-DEC
Project Name:	Balakot Hydropower Project (300 MW)	**Monitoring Location:**	Adit 2 (Dharnali)
Monitoring Date:	29-03-2024	**Reporting Date:**	15-04-2024
Source:	Ambient Air	**Monitoring Instrument:**	AQMS 05, Serial # 1210
GPS Coordinates:	34.619787, 73.417525		

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		$PM_{2.5}$	PM_{10}		
		Units		$PM_{2.5}$	PM_{10}
	Hours of Monitoring	($\mu g/m^3$)	($\mu g/m^3$)		
1.	09:00 A.M	14.31	39.12	8.44 ($\mu g/m^3$)	32.33 ($\mu g/m^3$)
2.	10:00 A.M	8.55	41.57		
3.	11:00 A.M	10.49	43.23		
4.	12:00 P.M	7.83	32.64		
5.	01:00 P.M	12.77	46.07		
6.	02:00 P.M	10.1	32.59		
7.	03:00 P.M	8.05	28.91		
8.	04:00 P.M	5.56	18.19		
9.	05:00 P.M	8.14	40.67		
10.	06:00 P.M	7.66	26.96		
11.	07:00 P.M	4.85	29.28		
12.	08:00 P.M	8.93	15.55		
13.	09:00 P.M	7.21	19.87		
14.	10:00 P.M	4.55	27.3		
15.	11:00 P.M	0.65	29.46		
16.	12:00 A.M	9.69	39.04		
17.	01:00 A.M	8.31	26.32		
18.	02:00 A.M	8.62	11.81		
19.	03:00 A.M	8.18	37.08		
20.	04:00 A.M	5.84	23.38		
21.	05:00 A.M	8.62	48.62		
22.	06:00 A.M	7.9	35.11		
23.	07:00 A.M	9.06	43.87		
24.	08:00 A.M	11.73	46.84		
NEQSAA				35 ($\mu g/m^3$)	150($\mu g/m^3$)
WHO				15 ($\mu g/m^3$)	45 ($\mu g/m^3$)

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

- Selected measurement units were $\mu g/m^3$ otherwise stated.
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- The report is not valid for court.

Signature of Analyst

Signature of Chief Chemist

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Environmental Protection Agency (EPA-KPK) Certified

Integrated Environment Laboratory

AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number:	BHPP/ENV/16-2024	Client Name:	CGGC JV GMC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Adit-3 (Khoban)
Monitoring Date:	30-03-2024	Reporting Date:	18-04-2024
Source:	Ambient Air	Monitoring Instrument:	AQMS-05, Serial # 1310
GPS Coordinates:	34.610293,73.569367		

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}
		Units			
	Hours of Monitoring	($\mu g/m^3$)	($\mu g/m^3$)		
1.	09:00 A.M	23.75	50.21	14.85 ($\mu g/m^3$)	37.50 ($\mu g/m^3$)
2.	10:00 A.M	14.79	41.89		
3.	11:00 A.M	28.03	28.18		
4.	12:00 P.M	17.55	53.65		
5.	01:00 P.M	14.41	39.62		
6.	02:00 P.M	27.65	65.39		
7.	03:00 P.M	16.07	31.68		
8.	04:00 P.M	14.03	77.1		
9.	05:00 P.M	18.93	63.41		
10.	06:00 P.M	8.32	20.25		
11.	07:00 P.M	5.67	22.52		
12.	08:00 P.M	10.61	16.26		
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	46.08		
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	20.45	23.29		
20.	04:00 A.M	12.12	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	28.84		
24.	08:00 A.M	16.87	70.25		
NEQSAA				35 ($\mu g/m^3$)	150($\mu g/m^3$)
WHO				15 ($\mu g/m^3$)	45 ($\mu g/m^3$)

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

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- 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:	IEL/ENV/16-2024	Client Name:	CSGC (A JSC)
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Powerhouse (Sangot)
Monitoring Date:	21-03-2024	Reporting Date:	10-04-2024
Source: GPS Coordinates:	Ambient Air 34.60°.812, 73.377145	Monitoring Instrument:	AQMS 50, Serial # 1310

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}
		Units			
	Hours of Monitoring	(ug/m3)	(ug/m3)		
1.	09:00 A.M	13.13	47.74	10.40 (ug/m³)	27.06 (ug/m³)
2.	10:00 A.M	14.57	18.00		
3.	11:00 A.M	12.3	25.11		
4.	12:00 P.M	10.26	29.78		
5.	01:00 P.M	7.59	20.79		
6.	02:00 P.M	8.54	39.24		
7.	03:00 P.M	5.87	27.79		
8.	04:00 P.M	13.81	28.75		
9.	05:00 P.M	8.10	39.53		
10.	06:00 P.M	6.49	30.99		
11.	07:00 P.M	12.43	34.88		
12.	08:00 P.M	7.77	29.3		
13.	09:00 P.M	13.71	22.04		
14.	10:00 P.M	10.05	29.56		
15.	11:00 P.M	7.39	21.73		
16.	12:00 A.M	12.33	20.9		
17.	01:00 A.M	9.88	19.58		
18.	02:00 A.M	14.59	18.85		
19.	03:00 A.M	9.72	21.94		
20.	04:00 A.M	10.55	27.40		
21.	05:00 A.M	9.23	25.10		
22.	06:00 A.M	11.56	20.20		
23.	07:00 A.M	12.79	28.51		
24.	08:00 A.M	13.83	26.21		
NEQSAA				35 (ug/m³)	150(ug/m³)
WHO				15 (ug/m³)	45 (ug/m³)

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

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

Technical Analyst

Authorized Chief Chemist

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Integrated Environment Laboratory

AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number:	B-PP/ENV/16-2024	**Client Name:**	CGGC JV CRC
Project Name:	Balakot Hydropower Project (300 MW)	**Monitoring Location:**	Terrace Updream (Darkot)
Monitoring Date:	01.04.2024	**Reporting Date:**	10-04-2024
Source: **GPS Coordinates:**	Ambient Air 34.580068, 73.574512	**Monitoring Instrument:**	ADMS 65, Serial # 1315

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}
		Units			
	Hours of Monitoring	($\mu g/m^3$)	($\mu g/m^3$)		
1.	09:00 A.M	13.87	43.4	13.78 ($\mu g/m^3$)	41.49 ($\mu g/m^3$)
2.	10:00 A.M	15.71	52.93		
3.	11:00 A.M	13.04	49.12		
4.	12:00 P.M	16.38	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	17.01	46.29		
8.	04:00 P.M	14.94	48.85		
9.	05:00 P.M	9.66	37.64		
10.	06:00 P.M	6.29	32.41		
11.	07:00 P.M	11.55	39.66		
12.	08:00 P.M	19.51	41.01		
13.	09:00 P.M	9.16	35.65		
14.	10:00 P.M	14.13	44.56		
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	29.49		
19.	03:00 A.M	16.02	38.92		
20.	04:00 A.M	13.38	35.47		
21.	05:00 A.M	18.3	33.28		
22.	06:00 A.M	15.84	52.30		
23.	07:00 A.M	12.97	46.51		
24.	08:00 A.M	17.34	59.68		
NEQSAA				35 ($\mu g/m^3$)	150($\mu g/m^3$)
WHO				15 ($\mu g/m^3$)	45 ($\mu g/m^3$)

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.

Signature of Analyst

Authorized Signatory

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Integrated Environment Laboratory

AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number:	IEL/PHEN/2/10-2024	Client Name:	CDGC JV GIIC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	GIIC Camp Office (Sangher)
Monitoring Date:	03-04-2024	Reporting Date:	10-04-2024
Source: GPS Coordinates:	Ambient Air 34.588802, 73.373819	Monitoring Instrument:	AQM3 65, Serial # 1212

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}
	Hours of Monitoring	Units (µg/m³)	Units (µg/m³)		
1.	09:00 A.M	23.73	47.22	17.46 (µg/m³)	39.28 (µg/m³)
2.	10:00 A.M	21.46	48.09		
3.	11:00 A.M	19.54	46.54		
4.	12:00 P.M	18.79	49.83		
5.	01:00 P.M	18.82	48.28		
6.	02:00 P.M	15.16	47.87		
7.	03:00 P.M	19.12	45.04		
8.	04:00 P.M	16.72	43.82		
9.	05:00 P.M	17.63	40.8		
10.	06:00 P.M	16.39	39.88		
11.	07:00 P.M	15.82	37.35		
12.	08:00 P.M	16.02	38.65		
13.	09:00 P.M	16.02	36.11		
14.	10:00 P.M	16.89	35.38		
15.	11:00 P.M	14.85	34.95		
16.	12:00 A.M	16.51	32.13		
17.	01:00 A.M	16.05	31.0		
18.	02:00 A.M	17.22	32.89		
19.	03:00 A.M	16.52	33.32		
20.	04:00 A.M	16.1	31.63		
21.	05:00 A.M	16.69	32.48		
22.	06:00 A.M	14.82	34.76		
23.	07:00 A.M	15.1	35.87		
24.	08:00 A.M	17.02	39.66		
NEQSAA				35 (µg/m³)	150 (µg/m³)
WHO				15 (µg/m³)	45 (µg/m³)

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

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Supervised & Checked by: Approved & Chief Chemist

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Integrated Environment Laboratory

AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number:	IEL/PR/EN/15-2024	Client Name:	DSSC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Colony Area (Sanghar)
Monitoring Date:	04-04-2024	Reporting Date:	15-04-2024
Source: GPS Coordinates:	Ambient Air 34.587775, 73.566235	Monitoring Instrument:	AQMS 6A, Serial # 1210

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		$PM_{2.5}$	PM_{10}		
		Units		$PM_{2.5}$	PM_{10}
	Hours of Monitoring	($\mu g/m^3$)	($\mu g/m^3$)		
1.	09:00 A.M	31.05	103.87	29.85 ($\mu g/m^3$)	88.01 ($\mu g/m^3$)
2.	10:00 A.M	28.39	98.62		
3.	11:00 A.M	25.71	77.83		
4.	12:00 P.M	30.67	94.11		
5.	01:00 P.M	28	89.59		
6.	02:00 P.M	32.95	79.85		
7.	03:00 P.M	35.27	101.55		
8.	04:00 P.M	19.32	87.62		
9.	05:00 P.M	34.49	83.73		
10.	06:00 P.M	31.8	109.18		
11.	07:00 P.M	22.94	95.49		
12.	08:00 P.M	29.18	90.44		
13.	09:00 P.M	33.11	79.71		
14.	10:00 P.M	30.45	83		
15.	11:00 P.M	27.78	88.48		
16.	12:00 A.M	32.72	74.76		
17.	01:00 A.M	30.06	109.23		
18.	02:00 A.M	19.11	80.01		
19.	03:00 A.M	33.34	73.78		
20.	04:00 A.M	29.67	98.26		
21.	05:00 A.M	34.02	94.83		
22.	06:00 A.M	34.49	83.73		
23.	07:00 A.M	31.8	109.18		
24.	08:00 A.M	33.73	95.49		
NEQSAA				35 ($\mu g/m^3$)	150 ($\mu g/m^3$)
WHO				15 ($\mu g/m^3$)	45 ($\mu g/m^3$)

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

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- The report is not valid for court.

Prepared by Analyst: Signature of Client Director

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Ambient Gaseous Monitoring Results (First Quarter, 2024)

Integrated Environment Laboratory

AMBIENT GASES MONITORING REPORT

Reference Number:	IEL/PPESW/10-2024	Client Name:	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Dam Site (Paras Valley)
Monitoring Date:	28-03-2024	Reporting Date:	15-04-2024
Source: GPS Coordinates:	Ambient Air Cases 34.660470, 73.495497	Monitoring Instrument:	AQMS 95, Serial # 1310

Sr. No	Time	Parameters			
		CO	NO	NO_2	SO_2
		Units			
	Hours	(mg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
1	08:00 A.M	0.4	7.05	12.57	11.28
2	10:00 A.M	0.48	8.36	9.34	9.22
3	11:00 A.M	0.5	7.29	12.38	11.75
4	12:00 P.M	0.36	6.94	11.76	10.79
5	01:00 P.M	0.37	8.19	9.29	9.19
6	02:00 P.M	0.45	11	11.68	10.71
7	03:00 P.M	0.51	7.23	9.79	9.6
8	04:00 P.M	0.35	8.01	9.17	9.1
9	05:00 P.M	0.65	9.27	10.21	9.84
10	06:00 P.M	0.5	7.95	9.7	9.45
11	07:00 P.M	0.33	5.84	9.08	9.05
12	08:00 P.M	0.64	8.11	10.24	9.8
13	09:00 P.M	0.48	8.9	9.82	9
14	10:00 P.M	0.44	8.14	10.16	10.14
15	11:00 P.M	0.31	7.94	10.18	9.74
16	12:00 A.M	0.28	6.72	9.53	9.36
17	01:00 A.M	0.33	8.38	10.85	10.09
18	02:00 A.M	0.3	7.77	10.01	9.68
19	03:00 A.M	0.25	8.55	11.2	10.42
20	04:00 A.M	0.05	8.81	10.5	10.02
21	05:00 A.M	0.37	9.4	9.37	9.25
22	06:00 A.M	0.21	9.84	11.12	10.57
23	07:00 A.M	0.41	8.63	10.51	9.59
24	08:00 A.M	0.33	10.89	11.83	9.79
Average Concentration		0.39	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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- 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 GASES MONITORING REPORT

Reference Number:	IEL/PT/ENV/10-2024	Client Name:	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Adit-1 (Theli)
Monitoring Date:	02-04-2024	Reporting Date:	10-04-2024
Source: GPS Coordinates:	Ambient Air Gases 34.826129, 73.429997	Monitoring Instrument:	AQMS 55, Serial # 1310

Sr. No	Time	Parameters			
		CO	NO	NO_x	SO_2
		Units			
	Hours	[mg/m³]	[µg/m³]	[µg/m³]	[µg/m³]
1	09:00 A.M	0.71	14.11	15.46	10.41
2	10:00 A.M	0.64	12	13.89	9.41
3	11:00 A.M	0.8	16.01	16.93	11.39
4	12:00 P.M	0.59	11.04	14.41	8.74
5	01:00 P.M	0.67	9.82	13.8	9.35
6	02:00 P.M	0.63	14.09	16.24	13.81
7	03:00 P.M	0.58	10.67	14.93	9.68
8	04:00 P.M	0.66	9.65	13.71	9.09
9	05:00 P.M	0.29	8.91	10.87	8.65
10	06:00 P.M	0.13	7.7	10.26	7.64
11	07:00 P.M	0.2	10.81	11.92	8.04
12	08:00 P.M	0.38	9.6	11.21	8.23
13	09:00 P.M	0.23	9.4	10.81	7.88
14	10:00 P.M	0.19	10.04	11.74	8.39
15	11:00 P.M	0.24	9.43	11.13	7.83
16	12:00 A.M	0.28	11.68	12.27	8.94
17	01:00 A.M	0.36	9.28	11.06	9.15
18	02:00 A.M	0.35	13.66	12.77	9.23
19	03:00 A.M	0.4	11.48	13.16	7.39
20	04:00 A.M	0.32	10.28	11.56	8.46
21	05:00 A.M	0.62	10.9	12.08	7.71
22	06:00 A.M	0.56	12.84	16.07	10.61
23	07:00 A.M	0.61	13.72	15.66	9.19
24	08:00 A.M	0.72	16.54	16.59	9.65
Average Concentration		0.47	11.20	13.13	9.00
NEQSAA		09	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

Integrated Environment Laboratory

AMBIENT GASES MONITORING REPORT

Reference Number	BHPP/ENV/16-2024	Client Name	CGGC-JV-GRC
Project Name	Balakot Hydropower Project (300 MW)	Monitoring Location	Adit-2 (Chanali)
Monitoring Date	28-10-2024	Reporting Date	16-04-2024
Source	Ambient Air Gases	Monitoring Instrument	AQMS 93, Serial # 1310
GPS Coordinates	34.616787, 73.417826		

Sr. No	Time	Parameters			
		CO	NO	NO_2	SO_2
		Units			
	Hours	(mg/m³)	(ug/m³)	(ug/m³)	(ug/m³)
1	09:00 A.M	0.46	11.82	12.49	11.94
2	10:00 A.M	0.17	12.66	13.31	11.81
3	11:00 A.M	0.5	11.43	12.28	11.41
4	12:00 P.M	0.64	6.47	9.78	9.81
5	01:00 P.M	0.74	12.47	12.81	11.75
6	02:00 P.M	0.58	7.5	10.3	10.15
7	03:00 P.M	0.23	6.3	9.59	9.76
8	04:00 P.M	0.43	9.54	10.83	10.49
9	05:00 P.M	0.37	7.34	10.22	10.1
10	06:00 P.M	0.4	12.12	12.86	11.65
11	07:00 P.M	0.48	8.37	10.76	10.43
12	08:00 P.M	0.32	7.19	10.13	10.24
13	09:00 P.M	0.62	9.41	11.28	11.59
14	10:00 P.M	0.46	8.2	10.68	10.26
15	11:00 P.M	0.26	6.89	10.04	9.98
16	12:00 A.M	0.73	9.21	11.2	10.73
17	01:00 A.M	0.44	8.04	10.55	10.33
18	02:00 A.M	0.19	10.28	11.72	11.59
19	03:00 A.M	0.53	9.08	11.11	10.67
20	04:00 A.M	0.31	11.29	12.02	11.39
21	05:00 A.M	0.16	10.1	11.63	11.81
22	06:00 A.M	0.81	8.9	11.02	10.61
23	07:00 A.M	0.88	11.12	12.14	11.29
24	08:00 A.M	0.74	9.93	11.94	10.56
Average Concentration		0.49	9.37	11.25	10.84
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 µgm³/& mgm³ 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 Quality Control

FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

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Integrated Environment Laboratory

AMBIENT GASES MONITORING REPORT

Reference Number:	0/EPP/ENV/10-2024	Client Name:	CGGC (V.GRC)
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Adit-3 (Chotian)
Monitoring Date:	30-03-2024	Reporting Date:	15-04-2024
Source: GPS Coordinates:	Ambient Air Gases 34.610203,73.389367	Monitoring Instrument:	AQM3 kit, Serial # 1310

Sr. No	Time	Parameters			
		CO	NO	NO_2	SO_2
		Units			
	Hours	(mg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
1	09:00 A.M	0.74	14.81	15.2	14.28
2	10:00 A.M	0.57	13.6	16.58	13.69
3	11:00 A.M	0.67	13.84	16.72	13.45
4	12:00 P.M	0.71	14.04	16.51	14.22
5	01:00 P.M	0.99	18.65	17.22	14.91
6	02:00 P.M	0.24	15.06	16.03	10.38
7	03:00 P.M	0.29	8.9	12.02	9.16
8	04:00 P.M	0.36	8.36	13.14	9.84
9	05:00 P.M	0.22	8.25	12.54	9.11
10	06:00 P.M	0.28	7.69	13.47	10.16
11	07:00 P.M	0.34	8.84	12.05	8.32
12	08:00 P.M	0.19	8.75	11.85	9.06
13	09:00 P.M	0.16	9.66	13.58	8.89
14	10:00 P.M	0.2	8.53	12.37	9.47
15	11:00 P.M	0.24	9.02	14.1	9
16	12:00 A.M	0.23	7.79	11.12	8.6
17	01:00 A.M	0.28	8.82	10.95	9.17
18	02:00 A.M	0.34	8.89	11.67	8.94
19	03:00 A.M	0.29	7.62	13.4	8.67
20	04:00 A.M	0.22	8.49	10.87	9.31
21	05:00 A.M	0.38	8.67	13.04	14.98
22	06:00 A.M	0.43	10.84	14.73	10.81
23	07:00 A.M	0.59	11.05	16.61	14.24
24	08:00 A.M	0.84	12.46	15.84	10.66
Average Concentration		0.41	10.62	13.87	11.01
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 Quality Control

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AMBIENT GASES MONITORING REPORT

Reference Number:	BHPP/EMV/05-2024	Client Name:	[illegible]
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Powerhouse (Berth)
Monitoring Date:	31-03-2024	Reporting Date:	10-04-2024
Source:	Ambient Air Gases	Monitoring Instrument:	AQMS BS, Serial # 1310
GPS Coordinates:	34.601812, 73.377145		

Sr. No.	Time	Parameters			
		CO	NO	NO_2	SO_2
		Units			
	Hours	mg/m³	µg/m³	µg/m³	µg/m³
1	09:00 A.M	0.21	4.19	6.75	7.22
2	10:00 A.M	0.22	5.65	9.52	8.59
3	11:00 A.M	0.15	4.44	8.8	8.59
4	12:00 P.M	0.15	2.06	7.7	7.62
5	01:00 P.M	0.19	5.41	9.42	8.63
6	02:00 P.M	0.12	4.26	8.8	8.63
7	03:00 P.M	0.11	5.51	9.65	9.25
8	04:00 P.M	0.09	5.28	9.32	9.69
9	05:00 P.M	0.07	5.33	9.82	7.27
10	06:00 P.M	0.13	5.33	9.85	9.2
11	07:00 P.M	0.1	5.1	9.22	8.79
12	08:00 P.M	0.08	5.15	9.12	7.2
13	09:00 P.M	0.17	5.84	9.76	8.74
14	10:00 P.M	0.18	5.28	7.28	7.54
15	11:00 P.M	0.12	5.79	8.64	7.14
16	12:00 A.M	0.18	6.04	9.67	9.09
17	01:00 A.M	0.14	5.42	7.16	7.49
18	02:00 A.M	0.2	5.9	9.66	7.09
19	03:00 A.M	0.19	5.61	8.97	8.53
20	04:00 A.M	0.13	4.86	7.3	7.45
21	05:00 A.M	0.22	7.07	9.3	8.66
22	06:00 A.M	0.25	5.88	7.61	7.79
23	07:00 A.M	0.2	4.68	7.01	6.99
24	08:00 A.M	0.27	5.51	8.13	8.51
Average Concentration		0.16	5.48	8.27	8.19
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 Scientist

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AMBIENT GASES MONITORING REPORT

Reference Number:	[illegible]/IEL/2024	**Client Name:**	CSCEC JV GSC
Project Name:	Balakot Hydropower Project (300 MW)	**Monitoring Location:**	Terrace Upstream (Balkot)
Monitoring Date:	01-04-2024	**Reporting Date:**	10-04-2024
Source: **GPS Coordinates:**	Ambient Air Gases 34.596589, 73.274512	**Monitoring Instrument:**	AQMS 65, Serial # 101C

Sr. No	Time	Parameters			
		CO	NO	NO_2	SO_2
		Units			
	Hours	(mg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
1	09:00 A.M	0.29	9.69	13.43	11.32
2	10:00 A.M	0.47	11.7	14.45	11.78
3	11:00 A.M	0.24	8.72	11.93	10.17
4	12:00 P.M	0.18	12.73	14.97	12.11
5	01:00 P.M	0.27	11.51	14.35	11.71
6	02:00 P.M	0.33	8.56	11.84	10.11
7	03:00 P.M	0.37	10.89	11.88	10.05
8	04:00 P.M	0.25	8.56	9.37	8.45
9	05:00 P.M	0.21	9.96	10.06	8.88
10	06:00 P.M	0.24	10.37	11.76	9.99
11	07:00 P.M	0.16	5.41	9.29	8.39
12	08:00 P.M	0.19	4.2	8.66	8
13	09:00 P.M	0.14	10.37	11.09	9.93
14	10:00 P.M	0.13	8.96	11.06	9.53
15	11:00 P.M	0.09	11.21	12.21	10.26
16	12:00 A.M	0.07	9.69	11.58	9.86
17	01:00 A.M	0.1	5.03	9.08	8.27
18	02:00 A.M	0.12	11.05	12.12	10.2
19	03:00 A.M	0.15	9.8	11.46	9.79
20	04:00 A.M	0.18	4.83	8.98	8.2
21	05:00 A.M	0.22	10.85	12.02	9.74
22	06:00 A.M	0.24	9.89	9.92	8.54
23	07:00 A.M	0.39	9.67	11.9	10.14
24	08:00 A.M	0.42	12.57	14.05	12.09
Average Concentration		0.27	9.71	11.81	9.88
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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Integrated Environment Laboratory

AMBIENT GASES MONITORING REPORT

Reference Number:	IEL/ENV/15-2024	**Client Name:**	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	**Monitoring Location:**	GRC Camp Office (Sangrar)
Monitoring Date:	03-04-2024	**Reporting Date:**	15-04-2024
Source:	Ambient Air Gases	**Monitoring Instrument:**	AQMS 65, Serial # 1310
GPS Coordinates:	34.594682, 73.373978		

Sr. No	Time	Parameters			
		CO	NO	NO_2	SO_2
		Units			
	(Hours)	(mg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
1	09:00 A.M	0.49	14.13	16.97	12.82
2	10:00 A.M	0.53	14.68	17.05	13.7
3	11:00 A.M	0.49	15.05	17.32	12.97
4	12:00 P.M	0.56	15.8	16.23	13.1
5	01:00 P.M	0.68	15.2	16.1	12.25
6	02:00 P.M	0.49	15.38	16.21	12.33
7	03:00 P.M	0.46	15.92	16.57	12.95
8	04:00 P.M	0.41	15.09	16.72	14.14
9	05:00 P.M	0.37	10.22	16.24	11.07
10	06:00 P.M	0.43	9.99	10.59	9.17
11	07:00 P.M	0.29	7.77	11.27	8.2
12	08:00 P.M	0.33	8.1	10.36	7.87
13	09:00 P.M	0.31	8.91	10.91	7.44
14	10:00 P.M	0.36	7.19	10.86	7.1
15	11:00 P.M	0.29	8.78	11.49	7.95
16	12:00 A.M	0.41	7.94	10.74	8.23
17	01:00 A.M	0.39	9.01	10.58	7.18
18	02:00 A.M	0.25	7.39	10.44	6.97
19	03:00 A.M	0.37	9.05	10.32	8.15
20	04:00 A.M	0.38	8.29	9.93	7.06
21	05:00 A.M	0.43	8.02	9.38	7.43
22	06:00 A.M	0.41	10.55	13.24	11.09
23	07:00 A.M	0.43	11.5	13.03	11.68
24	08:00 A.M	0.52	10.54	14.81	12.46
Average Concentration		0.41	10.77	13.23	10.13
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
- This report is not valid for court

Signature of Analyst

Signature of Chief Chemist

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Integrated Environment Laboratory

AMBIENT GASES MONITORING REPORT

Reference Number	BHPPENV/15-2024	**Client Name**	CGGC JV CRC
Project Name:	Balakot Hydropower Project (300 MW)	**Monitoring Location:**	Colony Area (Shaghai)
Monitoring Date:	04-04-2024	**Reporting Date:**	15-04-2024
Source:	Ambient Air Gases	**Monitoring Instrument:**	AQMS 05, Serial # 1310
GPS Coordinates:	34.667775, 73.366229		

Sr. No	Time	Parameters			
		CO	NO	NO_2	SO_2
		Units			
	Hours	(mg/m^3)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
1	09:00 A.M	1.13	14.25	21.02	14.75
2	10:00 A.M	1.04	13.28	18.5	13.14
3	11:00 A.M	1.09	11.06	17.89	12.78
4	12:00 P.M	0.95	15.09	20.55	14.31
5	01:00 P.M	1.1	12.11	18.42	13.09
6	02:00 P.M	0.98	10.69	17.8	12.69
7	03:00 P.M	0.93	13.15	18.98	14.25
8	04:00 P.M	0.88	8.94	13.24	10.04
9	05:00 P.M	0.91	10.03	13.91	11.04
10	06:00 P.M	0.97	8.94	13.3	10.45
11	07:00 P.M	0.92	8.04	12.7	10.28
12	08:00 P.M	0.14	9.18	12.46	10.11
13	09:00 P.M	0.2	7.96	11.84	9.71
14	10:00 P.M	0.28	10.22	12.38	10.43
15	11:00 P.M	0.13	9.01	12.27	10.08
16	12:00 A.M	0.17	7.79	11.16	9.66
17	01:00 A.M	0.24	10.06	13.91	10.41
18	02:00 A.M	0.11	8.85	13.29	9.91
19	03:00 A.M	0.22	11.09	13.43	10.75
20	04:00 A.M	0.25	9.89	12.82	10.39
21	05:00 A.M	0.08	8.67	15.2	9.97
22	06:00 A.M	0.89	12.05	19.91	14.04
23	07:00 A.M	0.71	10.94	19.3	13.65
24	08:00 A.M	0.76	9.54	18.7	13.28
Average Concentration		**0.82**	**10.61**	**15.46**	**11.63**
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 $\mu g/m^3$ & mg/m^3 otherwise stated.
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- This report is not valid for court.

Signature of Analyst

Signature of Chief Chemist

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Ambient Noise Level Monitoring Results (First Quarter, 2024)

Integrated Environment Laboratory

AMBIENT NOISE MONITORING REPORT

Reference Number:	IEL/ENV/19-2024	Client Name:	CSGC JV GBC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Dam Site (Yarak Valley)
Monitoring Date:	28-03-2024	Reporting Date:	15-04-2024
Source: GPS Coordinates:	Ambient Noise 34.600470, 73.455497	Monitoring Instrument:	Noise Meter IEC651 Type-2

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	09:00 A.M	dB(A)	91.2	94.6	92.9
2.	10:00 A.M		91	94.3	92.7
3.	11:00 A.M		90.8	94.1	92.5
4.	12:00 P.M		90.8	93.6	92.2
5.	01:00 P.M		90.3	93.6	92.0
6.	02:00 P.M		90.1	93.4	91.8
7.	03:00 P.M		55.66	58.94	57.3
8.	04:00 P.M		55.44	58.74	57.1
9.	05:00 P.M		54.24	58.54	56.9
10.	06:00 P.M		55.04	58.34	56.7
11.	07:00 P.M		54.14	58.04	56.4
12.	08:00 P.M		54.54	57.84	56.2
13.	09:00 P.M		54.34	57.64	56.0
14.	10:00 P.M		54.14	57.44	55.8
15.	11:00 P.M		53.94	57.24	55.6
16.	12:00 A.M		53.04	56.84	55.3
17.	01:00 A.M		53.44	56.74	55.1
18.	02:00 A.M		53.24	56.54	54.9
19.	03:00 A.M		56.04	59.34	57.7
20.	04:00 A.M		55.84	59.24	57.4
21.	05:00 A.M		59.8	63.1	61.5
22.	06:00 A.M		59.6	62.9	61.3
23.	07:00 A.M		59.4	62.7	61.1
24.	08:00 A.M		60.9	64.3	62.6

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

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Integrated Environment Laboratory

AMBIENT NOISE MONITORING REPORT

Reference Number:	[illegible]	Client Name:	CSDC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Adit-1 (Tholo)
Monitoring Date:	02-04-2024	Reporting Date:	16-04-2024
Source: GPS Coordinates:	Ambient Noise 34.636125, 73.429997	Monitoring Instrument:	Noise Meter (IEC651 Type-2

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	09:00 A.M	dB(A)	58.9	63	61.2
2.	10:00 A.M		58.7	62.7	60.7
3.	11:00 A.M		58.4	63.5	60.5
4.	12:00 P.M		58.2	62.3	60.3
5.	01:00 P.M		56	62.1	59.1
6.	02:00 P.M		57.9	61.6	59.9
7.	03:00 P.M		55.6	59.7	57.7
8.	04:00 P.M		55.4	59.4	57.4
9.	05:00 P.M		55.1	59.2	57.2
10.	06:00 P.M		54.9	59	57.0
11.	07:00 P.M		54.7	58.8	56.8
12.	08:00 P.M		54.5	58.6	56.6
13.	09:00 P.M		54.3	58.4	56.4
14.	10:00 P.M		54.1	58.1	56.1
15.	11:00 P.M		53.8	57.9	55.9
16.	12:00 A.M		53.6	57.7	55.7
17.	01:00 A.M		53.4	57.5	55.5
18.	02:00 A.M		53.2	57.3	55.3
19.	03:00 A.M		53	57.1	55.1
20.	04:00 A.M		52.8	56.8	54.8
21.	05:00 A.M		52.5	56.6	54.6
22.	06:00 A.M		54.3	58.4	56.4
23.	07:00 A.M		60.4	64.5	62.5
24.	08:00 A.M		62.2	66.8	64.6
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 Chemist

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Integrated Environment Laboratory

AMBIENT NOISE MONITORING REPORT

Reference Number	BHPP/ENV/16-2024	**Client Name**	[illegible]
Project Name:	Balakot Hydropower Project (300 MW)	**Monitoring Location:**	Adit-2 (Diversion)
Monitoring Date:	29-03-2024	**Reporting Date:**	15-04-2024
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)	69.4	68.8	67.0
2.	10:00 A.M		66.2	68.3	66.8
3.	11:00 A.M		64.9	68.1	66.5
4.	12:00 P.M		64.7	67.8	66.3
5.	01:00 P.M		64.5	67.7	66.1
6.	02:00 P.M		59.8	53	61.4
7.	03:00 P.M		57.6	66.8	64.2
8.	04:00 P.M		57.4	60.3	59.0
9.	05:00 P.M		57.1	60.3	58.7
10.	06:00 P.M		56.9	60.1	58.5
11.	07:00 P.M		56.7	59.9	58.3
12.	08:00 P.M		56.5	59.7	58.1
13.	09:00 P.M		56.3	59.5	57.9
14.	10:00 P.M		56.1	59.2	57.7
15.	11:00 P.M		54.4	57.8	56.0
16.	12:00 A.M		54.1	57.3	55.7
17.	01:00 A.M		53.9	57.1	55.5
18.	02:00 A.M		53.7	56.8	55.3
19.	03:00 A.M		53.5	56.7	55.1
20.	04:00 A.M		53.3	56.4	54.9
21.	05:00 A.M		53	56.2	54.6
22.	06:00 A.M		54.8	58	56.4
23.	07:00 A.M		57.3	61.2	58.5
24.	08:00 A.M		61.7	64.1	63.2

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

NEQS: National Environmental Quality Standards **WHO:** World Health Organization
Leq: Leq 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.

Supervising Chief Chemist

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AMBIENT NOISE MONITORING REPORT

Reference Number	0197/ENV/10-2024	Client Name	GSPDC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Adit-3 (Khoter)
Monitoring Date:	30-03-2024	Reporting Date:	15-04-2024
Source:	Ambient Noise	Monitoring Instrument:	Noise Meter-(ECO51-Type-2
GPS Coordinates:	34.810263,73.380087		

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1	09:00 A M	dB(A)	64.5	67.9	66.2
2	10:00 A M		64.5	67.5	66.0
3	11:00 A M		64	67.4	65.7
4	12:00 P M		63.9	67.2	65.5
5	01:00 P M		63.6	67	65.3
6	02:00 P M		63.4	66.8	65.1
7	03:00 P M		63.2	66.6	64.9
8	04:00 P M		62	65.3	63.7
9	05:00 P M		61.7	65.1	63.4
10	06:00 P M		61.5	64.9	63.2
11	07:00 P M		61.3	64.7	63.0
12	08:00 P M		61.1	64.5	62.8
13	09:00 P M		60.9	64.3	62.6
14	10:00 P M		60.7	64	62.4
15	11:00 P M		60.4	63.8	62.1
16	12:00 A M		60.2	63.6	61.9
17	01:00 A M		60	63.4	61.7
18	02:00 A M		59.8	63.2	61.5
19	03:00 A M		59.6	63	61.3
20	04:00 A M		59.4	62.7	61.1
21	05:00 A M		59.1	62.5	60.8
22	06:00 A M		58.9	62.3	61.6
23	07:00 A M		58.7	62.1	61.4
24	08:00 A M		58.5	62.9	61.2

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.
- This report is not valid for court.

Signature of Analyst

Signature of Technical Director

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AMBIENT NOISE MONITORING REPORT

Reference Number	DHPP/IEN/19-2024	Client Name	CGGC JV GBC
Project Name	Balakot Hydropower Project (300 MW)	Monitoring Location	Powerhouse (Barkot)
Monitoring Date	21-03-2024	Reporting Date	13-04-2024
Source	Ambient Noise	Monitoring Instrument	Noise Meter (8 OBS-Type 2
GPS Coordinates	34.601812, 73.377149		

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1	09:00 A M	dB(A)	50.6	55.9	54.3
2	10:00 A M		52.4	55.7	54.1
3	11:00 A M		52.2	55.5	53.9
4	12:00 P M		52	55.3	53.7
5	01:00 P M		51.8	55	53.4
6	02:00 P M		51.6	54.8	53.2
7	03:00 P M		51.3	54.5	53.0
8	04:00 P M		51.1	54.4	52.8
9	05:00 P M		50.9	54.2	52.6
10	06:00 P M		50.7	54	52.4
11	07:00 P M		50.5	53.7	52.1
12	08:00 P M		50.2	53.5	51.9
13	09:00 P M		50	53.3	51.7
14	10:00 P M		49.8	53.1	51.5
15	11:00 P M		49.6	52.9	51.3
16	12:00 A M		49.4	52.7	51.1
17	01:00 A M		49.2	52.6	50.9
18	02:00 A M		49	52.3	50.7
19	03:00 A M		48.8	52.1	50.5
20	04:00 A M		48.6	51.9	50.3
21	05:00 A M		48.3	51.6	50.0
22	06:00 A M		48.1	51.4	49.8
23	07:00 A M		47.9	51.2	49.6
24	08:00 A M		47.7	51	49.4

NEQS limit: 45-60 dB
WHO limit: 70 dB

NEQS: National Environmental Quality Standards WHO: World Health Organization
Leq: Leq 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 Client Agency

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AMBIENT NOISE MONITORING REPORT

Reference Number	EHP/IEL/NV/10-2024	**Client Name**	OGDC JV (HPC)
Project Name:	Balakot Hydropower Project (300 MW)	**Monitoring Location:**	Terrace Upstream (Barkot)
Monitoring Date:	01-04-2024	**Reporting Date:**	15-04-2024
Source:	Ambient Noise	**Monitoring Instrument:**	Noise Meter-BENETECH Type-2
GPS Coordinates:	34.590089, 73.574012		

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	09:00 A.M	dB(A)	56.1	59	57.6
2.	10:00 A.M		56.9	58.7	57.9
3.	11:00 A.M		55.6	58.5	57.1
4.	12:00 P.M		55.4	58.3	56.9
5.	01:00 P.M		55.2	58.1	56.7
6.	02:00 P.M		55	57.9	56.5
7.	03:00 P.M		54.8	57.7	56.3
8.	04:00 P.M		54.5	57.4	56.0
9.	05:00 P.M		54.3	57.2	55.8
10.	06:00 P.M		54.1	57	55.6
11.	07:00 P.M		51.9	54.8	53.4
12.	08:00 P.M		51.7	54.6	53.2
13.	09:00 P.M		51.5	54.4	53.0
14.	10:00 P.M		51.3	54.1	52.7
15.	11:00 P.M		47.1	50.4	49.0
16.	12:00 A.M		52.2	55.1	53.7
17.	01:00 A.M		52	54.9	53.5
18.	02:00 A.M		51.8	54.7	53.3
19.	03:00 A.M		51.6	54.5	53.1
20.	04:00 A.M		51.4	54.2	52.8
21.	05:00 A.M		51.1	54	52.6
22.	06:00 A.M		50.9	53.8	52.4
23.	07:00 A.M		51.8	55.2	53.5
24.	08:00 A.M		56.5	59.7	58.1
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 useful usage of reported data in future
- This report is not valid for court

Signature of Analyst

Signature of Chief Chemist

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AMBIENT NOISE MONITORING REPORT

Reference Number:	IEL/PPER/NT/6-2024	Client Name:	DGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	GRC Camp Office (Sangrar)
Monitoring Date:	03-04-2024	Reporting Date:	10-04-2024
Source: GPS Coordinates:	Ambient Noise 34.594502, 73.373878	Monitoring Instrument:	Noise Meter (EC65) Type 2

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	09:00 A.M	dB(A)	62.3	66.2	63.6
2.	10:00 A.M		62.1	64.9	63.5
3.	11:00 A.M		61.8	64.7	63.3
4.	12:00 P.M		61.6	64.5	63.1
5.	01:00 P.M		61.4	64.3	62.9
6.	02:00 P.M		61.2	64.1	62.7
7.	03:00 P.M		61	63.9	62.5
8.	04:00 P.M		60.8	63.6	62.2
9.	05:00 P.M		60.5	63.4	62.0
10.	06:00 P.M		60.3	63.2	61.8
11.	07:00 P.M		60.1	63	61.6
12.	08:00 P.M		59.9	62.9	61.4
13.	09:00 P.M		59.7	62.6	61.2
14.	10:00 P.M		59.5	62.3	60.9
15.	11:00 P.M		54.4	57.3	55.9
16.	12:00 A.M		54.1	57	55.6
17.	01:00 A.M		53.9	56.8	55.4
18.	02:00 A.M		53.7	56.6	55.2
19.	03:00 A.M		53.5	56.4	55.0
20.	04:00 A.M		53.3	56.1	54.7
21.	05:00 A.M		57	59.9	58.5
22.	06:00 A.M		61.8	64.5	63.2
23.	07:00 A.M		63.2	67.8	66.4
24.	08:00 A.M		60	62.7	61.4

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 CEO/ Chemist

Integrated Environment Laboratory

AMBIENT NOISE MONITORING REPORT

Reference Number:	IEL/PR/ENV/16-2024	Client Name:	CGGC JV GPC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Colony Area (Sangha)
Monitoring Date:	04-04-2024	Reporting Date:	15-04-2024
Source: GPS Coordinates:	Ambient Noise 34.587775, 73.368225	Monitoring Instrument:	Noise Meter (ECM) Type-2

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	09:00 A.M	dB(A)	60.7	64.3	60.7
2.	10:00 A.M		60.5	64	60.9
3.	11:00 A.M		60.2	63.6	60.3
4.	12:00 P.M		60	63.5	60
5.	01:00 P.M		59.9	63.4	59.9
6.	02:00 P.M		59.8	63.2	59.8
7.	03:00 P.M		60.1	63.3	60.1
8.	04:00 P.M		49.9	53	49.9
9.	05:00 P.M		49.6	52.8	49.6
10.	06:00 P.M		49.4	52.6	49.4
11.	07:00 P.M		49.2	52.4	49.2
12.	08:00 P.M		49	52.2	49
13.	09:00 P.M		48.8	52	48.8
14.	10:00 P.M		48.6	51.7	48.6
15.	11:00 P.M		38.5	41.7	38.3
16.	12:00 A.M		38.2	41.4	38.2
17.	01:00 A.M		38	41.2	38
18.	02:00 A.M		43.8	46.8	43.8
19.	03:00 A.M		43.4	46.6	43.4
20.	04:00 A.M		43.2	46.3	43.2
21.	05:00 A.M		42.9	46.1	42.9
22.	06:00 A.M		42.7	45.9	42.7
23.	07:00 A.M		40	45.6	40
24.	08:00 A.M		55.9	58.3	55.9

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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- The report is not valid for court.

Signature of Analyst: Signature of Chief Chemist

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Drinking Water Monitoring Results (First Quarter, 2024)

Integrated Environment Laboratory

DRINKING WATER ANALYSIS REPORT

Reference Number:	BHPP/ENV/15-2024	Client Name	[illegible]
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Dam Site (Paras Valley)
Sampling Date:	24-04-2024	Reporting Date:	15-04-2024
Source:	Spring Water (Source)	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates:	34.653167, 73.446875		

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	—	—	13
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	2.9
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000	304
7.	Total Hardness as $CaCO_3$	APHA-2340 C	mg/L	———	<500	361
8.	Nitrate (NO_3)	APHA-4500NO3 B	mg/L	50	≤50	0.72
9.	Nitrite (NO_2)	APHA-4500NO2 B	mg/L	3	≤3	0.004
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D
11.	Nickel (Ni)	ASTM E394T-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	92.7
14.	Chrome	APHA-4500 CL	mg/L		0.3-1.5	0.8
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	0.28
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	0.042
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	0.57
24.	Boron (B)	APHA 4500 B- C	mg/L	2.5	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 World Health Organization

N.D Not Detected

[illegible] of Analyst

[illegible]

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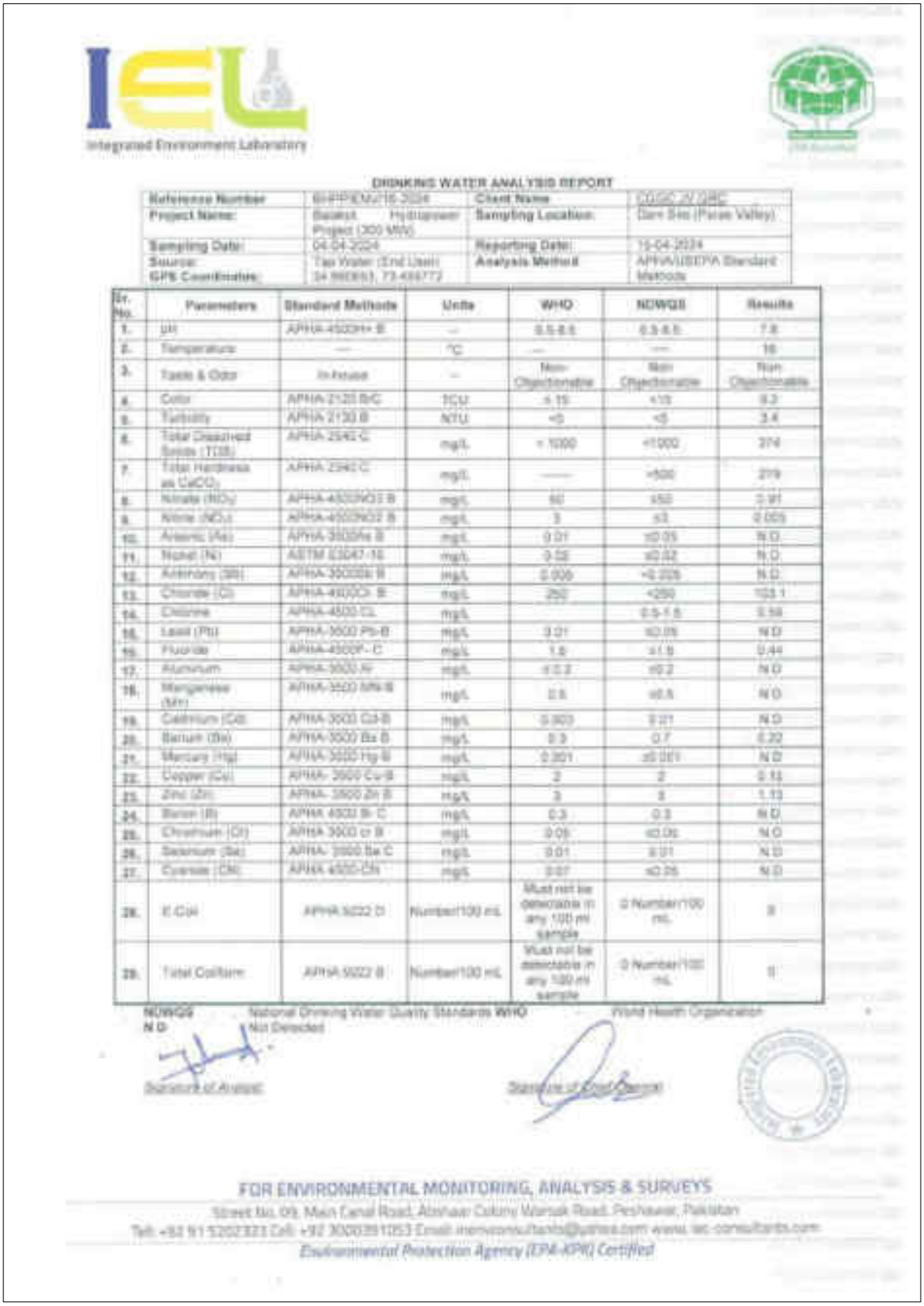

Integrated Environment Laboratory

DRINKING WATER ANALYSIS REPORT

Reference Number	IEL/PP/ENV/16-2024	**Client Name**	CGGC JV GHC
Project Name:	Balakot Hydropower Project (300 MW)	**Sampling Location:**	Dam Site (Paras Valley)
Sampling Date:	04-04-2024	**Reporting Date:**	16-04-2024
Source:	Tap Water (End User)	**Analysis Method**	APHA/USEPA Standard Methods
GPS Coordinates:	34.990863, 73.439772		

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	---	---	16
3.	Taste & Odor	In-House	--	Non-Objectionable	Non-Objectionable	Non-Objectionable
4.	Color	APHA 2120 B/C	TCU	≤ 15	≤15	0.3
5.	Turbidity	APHA 2130 B	NTU	<5	<5	3.4
6.	Total Dissolved Solids (TDS)	APHA 2540 C	mg/L	< 1000	<1000	374
7.	Total Hardness as $CaCO_3$	APHA 2340 C	mg/L	------	<500	219
8.	Nitrate (NO_3)	APHA-4500NO3 B	mg/L	50	≤50	0.91
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 D3847-16	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	103.1
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	0.44
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	0.15
23.	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	3	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 World Health Organization
N.D Not Detected

Signature of Analyst Signature of Chief Chemist

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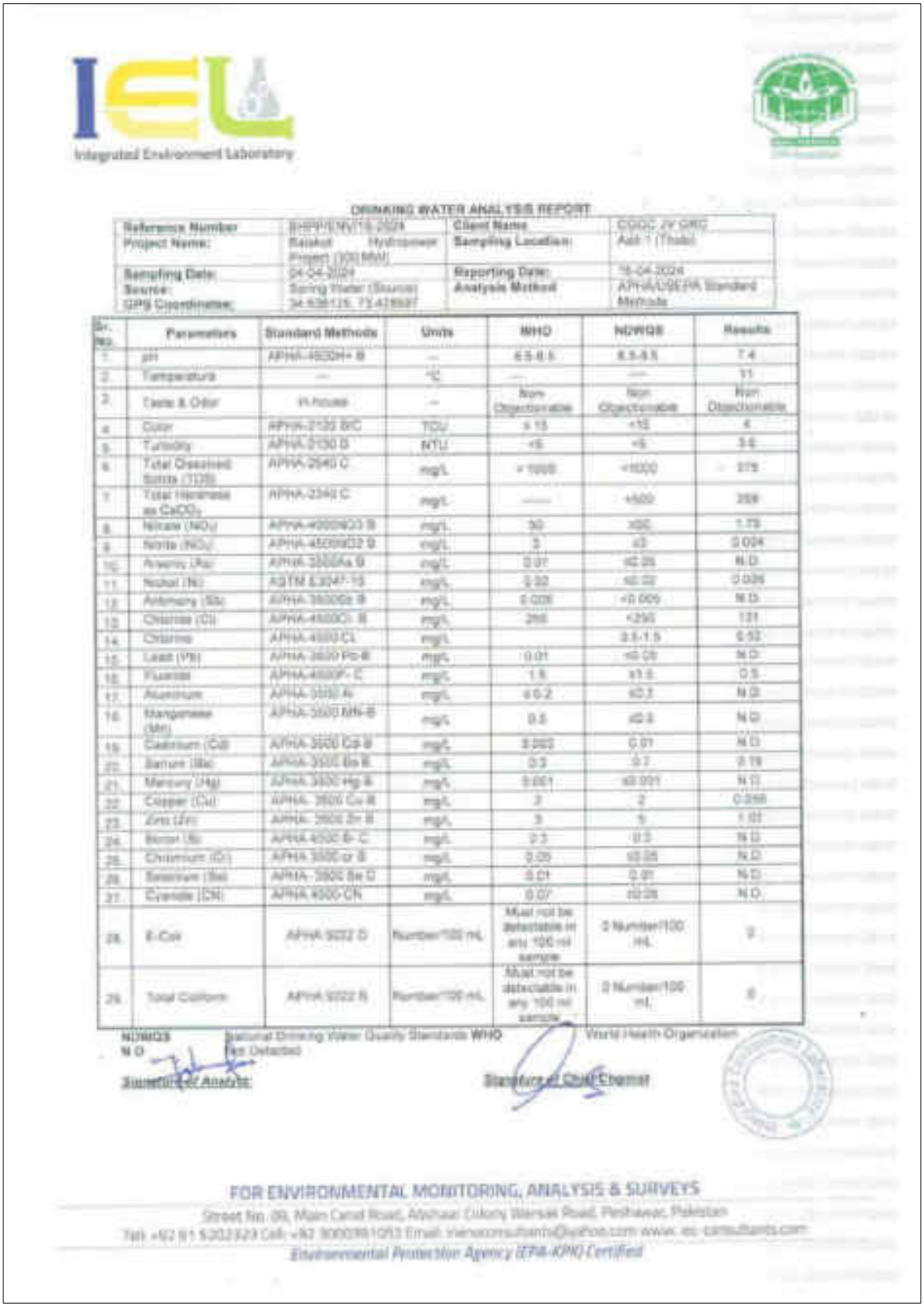

Integrated Environment Laboratory

DRINKING WATER ANALYSIS REPORT

Reference Number:	BHPP/ENV/15-2024	Client Name:	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Adit 1 (Thale)
Sampling Date:	04-04-2024	Reporting Date:	15-04-2024
Source:	Spring Water (Source)	Analysis Method	APHA/USEPA Standard Methods
GPS Coordinates:	34.438125, 73.418697		

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	4
5.	Turbidity	APHA-2130 B	NTU	<5	<5	3.6
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000	378
7.	Total Hardness as $CaCO_3$	APHA-2340 C	mg/L	------	<500	209
8.	Nitrate (NO_3)	APHA-4500NO3 B	mg/L	50	≤50	1.79
9.	Nitrite (NO_2)	APHA-4500NO2 B	mg/L	3	≤3	0.004
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D
11.	Nickel (Ni)	ASTM D 3347-15	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	131
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	0.5
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	0.068
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 D	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 World Health Organization
N D Not Detected

Signature of Analyst

Signature of Chief Chemist

FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

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DRINKING WATER ANALYSIS REPORT

Reference Number	IEL/PES/INV/19-2024	**Client Name**	CGGC JV GPC
Project Name:	Balakot Hydropower Project (300 MW)	**Sampling Location**	Adit-1 (Thobi)
Sampling Date:	04-04-2024	**Reporting Date:**	15-04-2024
Source:	Tap Water (End User)	**Analysis Method**	APHA/USEPA Standard Methods
GPS Coordinates:	34.839128, 73.428587		

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	--	--	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	4.1
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000	382
7.	Total Hardness as $CaCO_3$	APHA-2340 C	mg/L	------	<500	301
8.	Nitrate (NO_3)	APHA-4500NO3 B	mg/L	50	650	1.66
9.	Nitrite (NO_2)	APHA-4500NO2 B	mg/L	3	≤3	0.12
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D.
11.	Nickel (Ni)	ASTM D3847-16	mg/L	0.02	≤0.02	0.008
12.	Antimony (Sb)	APHA-3500Sb B	mg/L	0.005	<0.005	N.D.
13.	Chloride (Cl)	APHA-4500C- B	mg/L	250	<250	102
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	0.58
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	0.061
23.	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	3	0.38
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 9221 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: World Health Organization
N.D.: Not Detected

Signature of Analyst

Signature of Chief Chemist

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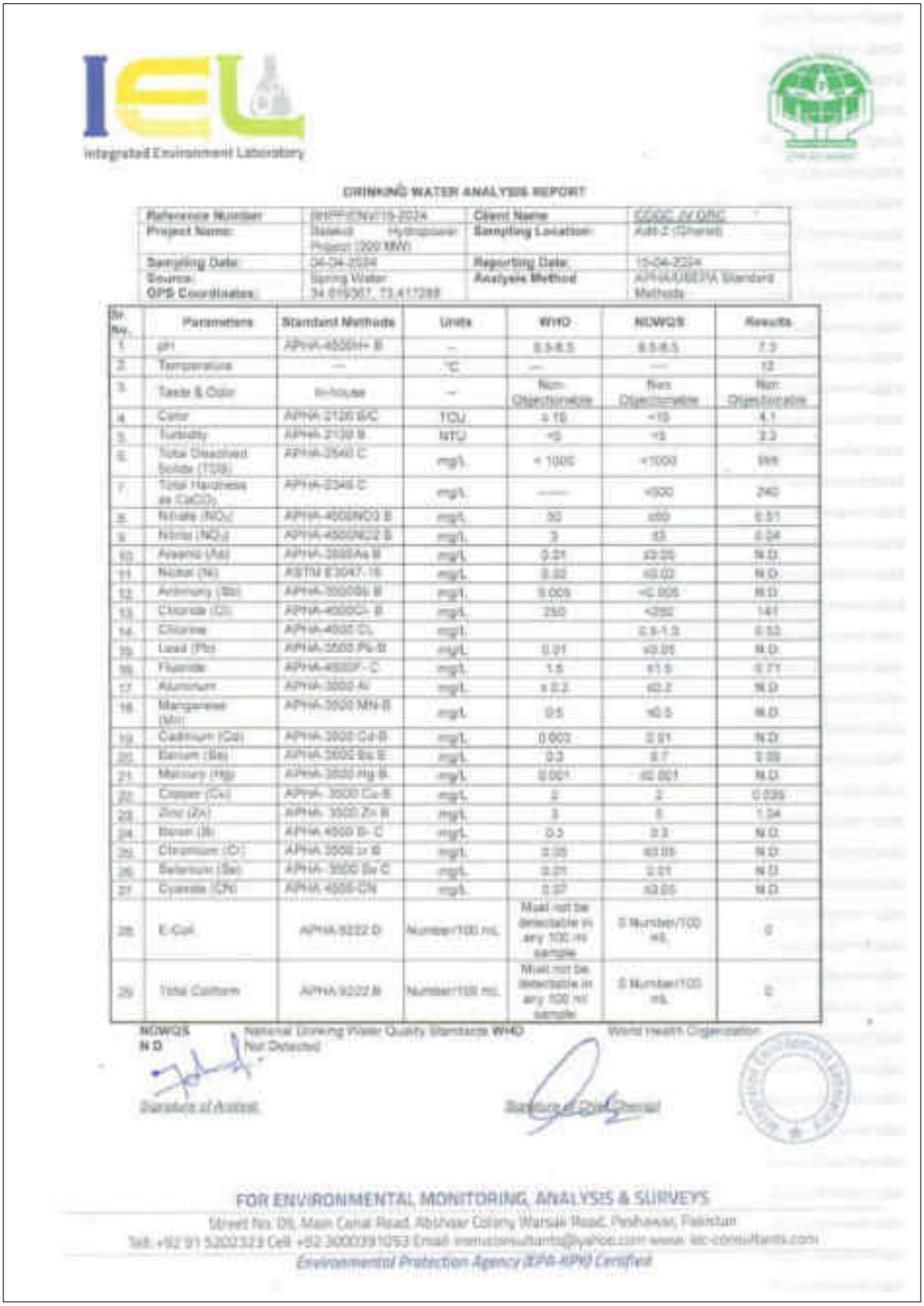

Integrated Environment Laboratory

DRINKING WATER ANALYSIS REPORT

Reference Number:	IEL/DW/19-2024	**Client Name:**	[illegible]
Project Name:	Balakot Hydropower Project (300 MW)	**Sampling Location:**	Kath-2 (Dharian)
Sampling Date:	04-04-2024	**Reporting Date:**	15-04-2024
Source:	Spring Water	**Analysis Method**	APHA/USEPA Standard Methods
GPS Coordinates:	34.615067, 73.417289		

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	---	---	12
3	Taste & Odor	In-house	--	Non-Objectionable	Non-Objectionable	Non-Objectionable
4	Color	APHA 2120 B/C	TCU	≤ 15	<15	4.1
5	Turbidity	APHA 2130 B	NTU	<5	<5	2.3
6	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000	356
7	Total Hardness as $CaCO_3$	APHA-2340 C	mg/L	------	<500	240
8	Nitrate (NO_3)	APHA-4500NO3 B	mg/L	50	≤50	0.51
9	Nitrite (NO_2)	APHA-4500NO2 B	mg/L	3	≤3	0.24
10	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D.
11	Nickel (Ni)	ASTM E3047-15	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	141
14	Chlorine	APHA-4500 CL	mg/L		0.5-1.5	0.53
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	0.71
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	≤ 01	N.D.
20	Barium (Ba)	APHA-3500 Ba E	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	0.035
23	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	1.24
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	≤ 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** World Health Organization
N.D Not Detected

Signature of Analyst

Signature of Director General

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DRINKING WATER ANALYSIS REPORT

Reference Number	[illegible]	**Client Name**	[illegible]
Project Name:	Balakot Hydropower Project (300 MW)	**Sampling Location:**	ASH 2 (Shared)
Sampling Date:	04-04-2024	**Reporting Date:**	10-04-2024
Source: **GPS Coordinates:**	Tap Water (First User) 34.620200, 73.417508	**Analysis Method**	APHA/USEPA Standard Methods

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	4.5
5.	Turbidity	APHA-2130 B	NTU	<5	<5	3.7
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	264
8.	Nitrate (NO_3)	APHA-4500NO3 B	mg/L	50	≤50	0.78
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 D3867-18	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-4500C- B	mg/L	250	<250	188
14.	Chlorine	APHA-4500 CL	mg/L		0.5-1.5	0.5
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	0.79
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	0.07
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	0.358
23.	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	1.1
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 National Drinking Water Quality Standards **WHO** World Health Organization
N.D. Not Detected

Signature of Analyst

Signature of Chief Chemist

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DRINKING WATER ANALYSIS REPORT

Reference Number:	[illegible]	**Client Name:**	[illegible]
Project Name:	Balakot Hydropower Project (300 MW)	**Sampling Location:**	Ash-3 (Khalian)
Sampling Date:	04-09-2024	**Reporting Date:**	10-09-2024
Source: **GPS Coordinates:**	Spring Water (Source) 34.617600, 73.408869	**Analysis Method:**	APHA/USEPA Standard Methods

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	--	---	12
3.	Taste & Odor	In-house	--	Non-Objectionable	Non-Objectionable	Non-Objectionable
4.	Color	APHA-2120 B/C	TCU	≤ 15	<15	5.8
5.	Turbidity	APHA-2130 B	NTU	<5	<5	4.2
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000	409
7.	Total Hardness as $CaCO_3$	APHA-2340 C	mg/L	------	<500	361
8.	Nitrate (NO_3)	APHA-4500NO3 B	mg/L	50	≤50	1.9
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 D3867-16	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	159
14.	Chlorine	APHA-4500 CL	mg/L		0.5-1.5	0.22
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	0.68
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	0.24
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	1.3
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: World Health Organization
N.D: Not Detected

Signature of Analyst

Signature & Seal of Chemist

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DRINKING WATER ANALYSIS REPORT

Reference Number	BHPT/ENV/10-2024	**Client Name**	COSCO JV GBC
Project Name:	Balakot Hydropower Project (300 MW)	**Sampling Location:**	Adit 3 (Rhodari)
Sampling Date	04-04-2024	**Reporting Date:**	13-04-2024
Source: **GPS Coordinates;**	Pipe Water (End User) 34.628942, 73.283133	**Analysis Method**	APHA/USEPA Standard Methods

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	0.18	<15	6.3
5	Turbidity	APHA-2130 B	NTU	<5	<5	4.9
6	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000	427
7	Total Hardness as $CaCO_3$	APHA-2340 C	mg/L	——	<500	289
8	Nitrate (NO_3)	APHA-4500NO3 B	mg/L	50	≤50	2.5
9	Nitrite (NO_2)	APHA-4500NO2 B	mg/L	3	≤3	0.58
10	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D
11	Nickel (Ni)	ASTM E3047-19	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-4500C- B	mg/L	250	<250	172
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	0.61
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	0.5	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	N.D.
23	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	1.04
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** World Health Organization
N D Not Detected

Signature of Analyst

Signature of Chief Chemist

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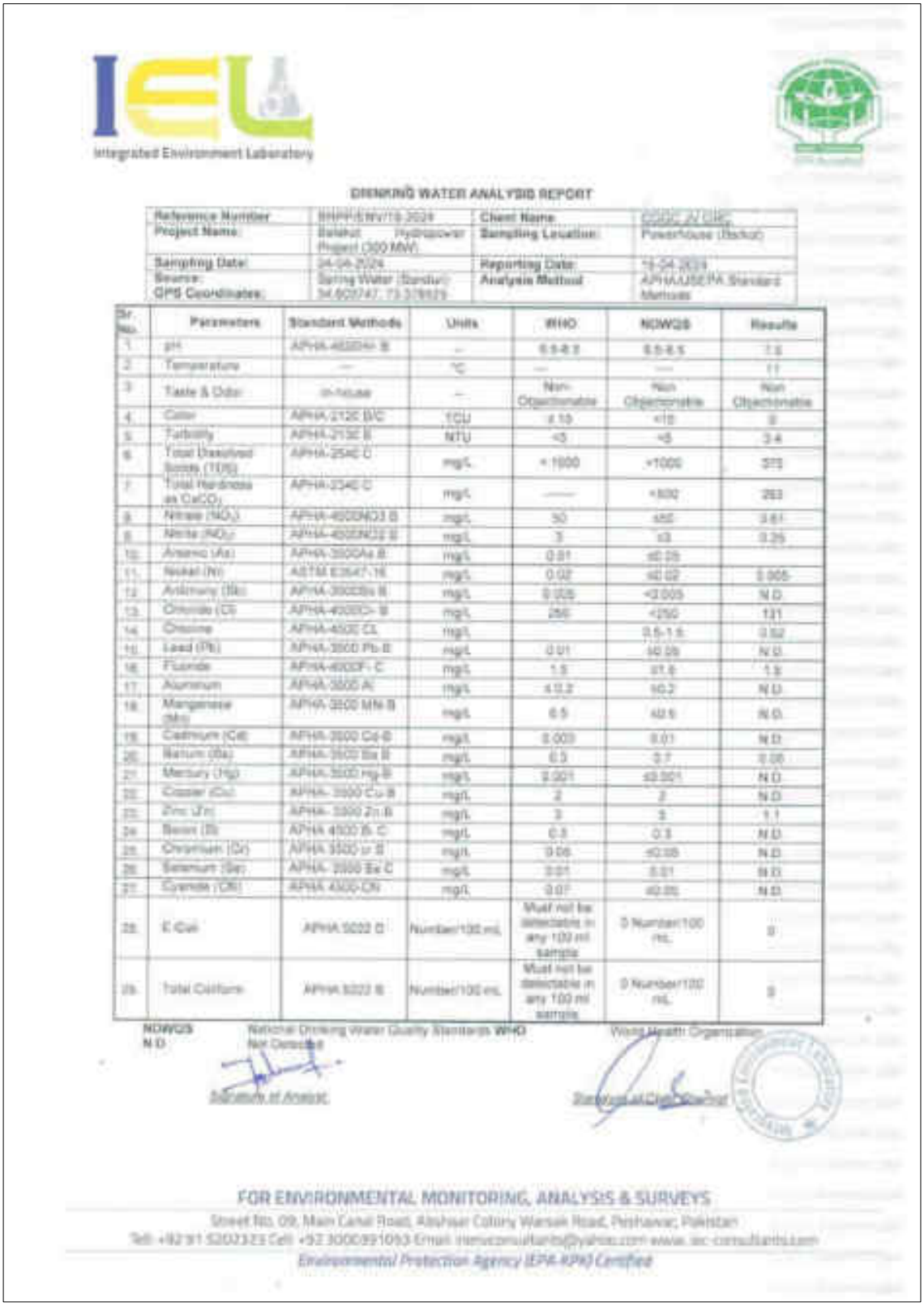

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DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/19-2024	**Client Name**	[illegible]
Project Name:	Balakot Hydropower Project (300 MW)	**Sampling Location:**	Powerhouse (Backup)
Sampling Date:	24-04-2024	**Reporting Date:**	19-04-2024
Source: **GPS Coordinates:**	Spring Water (Sandur) 34.603747, 73.378929	**Analysis Method**	APHA/USEPA Standard Methods

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	—	—	11
3.	Taste & Odor	In-house	–	Non-Objectionable	Non Objectionable	Non Objectionable
4.	Color	APHA 2120 B/C	TCU	≤ 15	<15	0
5.	Turbidity	APHA 2130 B	NTU	<5	<5	3.4
6.	Total Dissolved Solids (TDS)	APHA 2540 C	mg/L	< 1000	<1000	370
7.	Total Hardness as $CaCO_3$	APHA 2340 C	mg/L	——	<500	263
8.	Nitrate (NO_3)	APHA 4500NO3 B	mg/L	50	≤50	3.61
9.	Nitrite (NO_2)	APHA 4500NO2 B	mg/L	3	≤3	0.25
10.	Arsenic (As)	APHA 3500As B	mg/L	0.01	≤0.05	
11.	Nickel (Ni)	ASTM E3647-16	mg/L	0.02	≤0.02	0.005
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	0.52
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	1.3
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	0.5	0.7	0.08
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	3	1.1
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 National Drinking Water Quality Standards **WHO** World Health Organization
N.D Not Detected

Signature of Analyst

Signature of Chief Chemist

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DRINKING WATER ANALYSIS REPORT

Reference Number:	BHPP/1392/16-2024	**Client Name:**	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	**Sampling Location:**	GRC Camp Office (Sangher)
Sampling Date:	04-04-2024	**Reporting Date:**	15-04-2024
Source:	Spring Water (Source)	**Analysis Method**	APHA/USEPA Standard Methods
GPS Coordinates:	34.584626, 73.276913		

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	3
5.	Turbidity	APHA-2130 B	NTU	<5	<5	3.1
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000	206
7.	Total Hardness as $CaCO_3$	APHA-2340 C	mg/L	------	<500	331
8.	Nitrate (NO_3)	APHA-4500NO3 B	mg/L	50	50	0.06
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	0.003
12.	Antimony (Sb)	APHA-3500Sb B	mg/L	0.005	<0.005	N.D.
13.	Chloride (Cl)	APHA-4500Cl- B	mg/L	250	<250	139
14.	Chlorine	APHA-4500 CL	mg/L		0.5-1.5	0.68
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	0.2
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	0.01
23.	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	3	0.53
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 9223 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: World Health Organization
N.D: Not Detected

Supervising Analyst: Supervising Chief Chemist

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DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/76-2024	**Client Name**	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	**Sampling Location:**	GRC Camp Office (Kanghan)
Sampling Date:	04-04-2024	**Reporting Date:**	13-04-2024
Source: GPS Coordinates:	Tap Water (End User) 34.584478, 73.372871	**Analysis Method**	APHA/USEPA Standard Methods

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	---	---	13
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	3.1
6	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000	382
7	Total Hardness as $CaCO_3$	APHA-2340 C	mg/L	------	<500	372
8	Nitrate (NO_3)	APHA-4500NO3 B	mg/L	50	≤50	1.34
9	Nitrite (NO_2)	APHA-4500NO2 B	mg/L	3	≤3	0.01
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	0.0048
12	Antimony (Sb)	APHA-3500Sb B	mg/L	0.005	=0.005	N.D
13	Chloride (Cl)	APHA-4500Cl- B	mg/L	250	<250	184
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	0.08
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	0.24
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	1.08
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 National Drinking Water Quality Standards WHO World Health Organization
N.D Not Detected

Signature of Analyst Signature of Chief Chemist

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Surface Water Monitoring Results (First Quarter, 2024)

Integrated Environment Laboratory

SURFACE WATER ANALYSIS REPORT

Reference Number	0997/ENV/16-2024	**Client Name**	CGGC JV SBC
Project Name	Balakot Hydropower Project (300 MW)	**Sampling Location:**	Dam Site (Pehar Valley)
Sampling Date	04-04-2024	**Reporting Date**	16-04-2024
Source/ GPS Coordinates	Kunhar River 34.992047, 73.401092	**Analysis Method**	APHA/USEPA Standard Methods

Sr. No	Parameters	Analysis Method	Units	NEQS	Results
1)	Temperature	----	°C	40	11
2)	pH	APHA-4500H+ B	--	6-9	7.8
3)	Chemical Oxygen Demand (COD)	APHA-5220-D	mg/l	150	42
4)	Biological Oxygen Demand (BOD5) at 20 °C	APHA- 5210	mg/l	80	29.5
5)	Total Dissolved Solids (TDS)	APHA-2540 C	mg/l	3500	1489
6)	Total Suspended Solids (TSS)	APHA-2540 D	mg/l	200	43
7)	Total Hardness	APHA-2340 C	mg/l	--	137
8)	Oil & Grease	Separation Method	mg/l	10	0.4
9)	Chromium (Hexa & Trivalent)	APHA-3500Cr B	mg/l	1.0	0.02
10)	Total Iron	APHA-3500-Fe-B	mg/l	8.0	2.5
11)	Chloride	APHA-4500Cl- B	mg/l	1000	189
12)	Flouride	APHA-4032F- C	mg/l	10	2.76
13)	Ammonia	ASTM D1426-15	mg/l	40	2.5
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	N.D
18)	Barium	APHA-3500Ba B	mg/l	1.5	0.24
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	0.28
22)	Zinc	APHA-3500-Zn B	mg/l	5.0	0.41
23)	Nickel	ASTM D3947-18	mg/l	1.0	0.13
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	0.29
27)	Sulphate (SO_4)	APHA-4500-SO_4 C	mg/l	600	391
28)	An ionic Detergent (as MBAS)	----	mg/l	20	0.7
29)	Phenolic Compound (as Phenol)	APHA-5530-D	mg/l	0.1	0.21
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	[illegible]	**Client Name**	[illegible]
Project Name	Balakot Hydropower Project (300 MW)	**Sampling Location:**	Tarbela Upstream (Barrier)
Sampling Date	04-04-2024	**Reporting Date**	15-04-2024
Source/ GPS Coordinates	Kunhar River 34.5971541, 73.3700781	**Analysis Method**	APHA/USEPA Standard Methods

Sr. No	Parameters	Analysis Method	Units	NEQS	Results
1)	Temperature	----	°C	40	19
2)	pH	APHA-4500H+ B	---	6-9	7.9
3)	Chemical Oxygen Demand (COD)	APHA-5220-D	mg/l	150	56
4)	Biological Oxygen Demand (BOD5) at 20 °C	APHA, 5210	mg/l	80	41.4
5)	Total Dissolved Solids (TDS)	APHA-2540 C	mg/l	3500	1884
6)	Total Suspended Solids (TSS)	APHA-2540 D	mg/l	200	106
7)	Total Hardness	APHA-2340 C	mg/l	--	144
8)	Oil & Grease	Separation Method	mg/l	10	1.22
9)	Chromium (Hexa & Trivalent)	APHA-3500Cr B	mg/l	1.0	0.39
10)	Total Iron	APHA-3500-Fe B	mg/l	8.0	2.88
11)	Chloride	APHA-4500Cl- B	mg/l	1000	121
12)	Flouride	APHA-4500F- C	mg/l	10	1.04
13)	Ammonia	ASTM-D1426-15	mg/l	40	3.43
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	0.08
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	0.3
22)	Zinc	APHA-3500-Zn B	mg/l	5.0	0.52
23)	Nickel	ASTM D3557-16	mg/l	1.0	0.038
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^{-})	APHA-4500 S_c	mg/l	1.0	0.29
27)	Sulphate (SO_4)	APHA-4500 SO_4 C	mg/l	600	367
28)	An ionic Detergent (as MBAS)	----	mg/l	20	1.09
29)	Phenolic Compound (as Phenol)	APHA-5530 D	mg/l	0.1	0.09
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 Scientist

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SURFACE WATER ANALYSIS REPORT

Reference Number	IEHPP/SW/19-2024	**Client Name**	CGGC JV GRC
Project Name	Environt. Hydropower Project (300 MW)	**Sampling Location**	Colony Area (Sanghar)
Sampling Date:	04-04-2024	**Reporting Date:**	15-04-2024
Source: GPS Coordinates	Kunhar River 34.886503, 73.383899	**Analysis Method**	APHA/USEPA Standard Methods

Sr. No	Parameters	Analysis Method	Units	NEQS	Results
1)	Temperature	----	°C	40	13
2)	pH	APHA-4500H+ B	--	5-9	7.7
3)	Chemical Oxygen Demand (COD)	APHA-5220-D	mg/l	150	31
4)	Biological Oxygen Demand (BOD5) at 20 °C	APHA, 5210	mg/l	80	35.9
5)	Total Dissolved Solids (TDS)	APHA-2540 C	mg/l	3500	1743
6)	Total Suspended Solids (TSS)	APHA-2540 D	mg/l	200	82
7)	Total Hardness	APHA-2340 C	mg/l	--	132
8)	Oil & Grease	Separation Method	mg/l	10	0.74
9)	Chromium (Hexa & Trivalent)	APHA-3500Cr- B	mg/l	1.0	0.16
10)	Total Iron	APHA-3500-Fe-B	mg/l	8.0	2.29
11)	Chloride	APHA-4500Cl- B	mg/l	1000	162
12)	Flourde	APHA-4500F- C	mg/l	10	1.88
13)	Ammonia	ASTM-D1426-15	mg/l	40	3.19
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	0.045
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	0.12
22)	Zinc	APHA-3500-Zn B	mg/l	5.0	0.43
23)	Nickel	ASTM E3061-16	mg/l	1.0	0.01
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	0.03
27)	Sulphate (SO_4)	APHA-4500 SO_4 C	mg/l	600	338
28)	An Ionic Detergent (as MBAS)	----	mg/l	20	0.07
29)	Phenolic Compound (as Phenol)	APHA-5530-D	mg/l	0.1	0.029
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 Lab Chemist

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Soil Analysis Results (First Quarter, 2024)

Integrated Environment Laboratory

SOIL ANALYSIS REPORT

Reference Number	BHPP/ENV/16-2024	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location :	Adit-1 (Tiete)
Monitoring Date:	04-04-2024	Reporting Date:	15-04-2024
Source:	Soil Sample		

Sr. No.	Parameters		Results
1	Soil Texture	Sand %	27
		Silt%	49
		Clay %	24
		Texture Class	Silty Clay Loam
2	pH		7.7
3	Electrical Conductivity EC (µSm^{-1})		202
4	Phosphorus (mgkg^{-1})		1.63
5	Sodium Absorption Ratio		3.47

µSm^{-1}: Micro siemens/meter

mgkg^{-1}: milligram per Kilogram

Signature of Analyst

Signature of Chief Scientist

FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

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SOIL ANALYSIS REPORT

Reference Number	EHPP/EML/15-2024	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Adit 2 (Gharial)
Monitoring Date:	04-04-2024	Reporting Date:	15-04-2024
Source:	Soil Sample		

Sr. No.	Parameters		Results
1	Soil Texture	Sand %	34
		Silt%	38
		Clay %	28
		Texture Class	Silty Clay Loam
2	pH		7.6
3	Electrical Conductivity EC. (μSm^{-1})		268
4	Phosphorus ($mgkg^{-1}$)		2.81
5	Sodium Absorption Ratio		3.04

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

Completed By

Signature of Chief Chemist

FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

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SOIL ANALYSIS REPORT

Reference Number:	IEL/ENV/16-2024	Client Name:	CGGC (V) GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Adit-3 (Khohan)
Monitoring Date:	04-04-2024	Reporting Date:	15-04-2024
Source:	Soil Samples		

Sr. No.	Parameters		Results
1	Soil Texture	Sand %	26
		Silt%	43
		Clay %	31
		Texture Class	Silty Clay Loam
2	pH		7.9
3	Electrical Conductivity EC (μSm^{-1})		201
4	Phosphorus ($mgkg^{-1}$)		2.43
5	Sodium Absorption Ratio		3.08

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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Integrated Environment Laboratory

SOIL ANALYSIS REPORT

Reference Number	IEL/ENVTS/2024	Client Name	CGGC-AT GRC
Project Name	Balakot Hydropower Project (300 MW)	Sampling Location	Powerhouse (Balkot)
Monitoring Date	04-04-2024	Reporting Date	15-04-2024
Source	Soil Sample		

Sr. No.	Parameters		Results
1	Soil Texture	Sand %	29
		Silt%	31
		Clay %	40
		Texture Class	Silty Clay Loam
2	pH		8
3	Electrical Conductivity EC (μSm^{-1})		277
4	Phosphorus ($mgkg^{-1}$)		3
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/15-2024	Client Name:	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	GRC Camp Office (Sangher)
Monitoring Date:	04-04-2024	Reporting Date:	15-04-2024
Source:	Soil Sample		

Sr. No.	Parameters		Results
1	Soil Texture	Sand %	20
		Silt%	48
		Clay %	32
		Texture Class	Silty Clay Loam
2	pH		7.9
3	Electrical Conductivity EC (μSm^{-1})		234
4	Phosphorus ($mgkg^{-1}$)		3.83
5	Sodium Absorption Ratio		3.61

μSm^{-1}: Micro siemens/meter

$mgkg^{-1}$: milligram per Kilogram

Signature of Analyst

Signature of Chief Chemist

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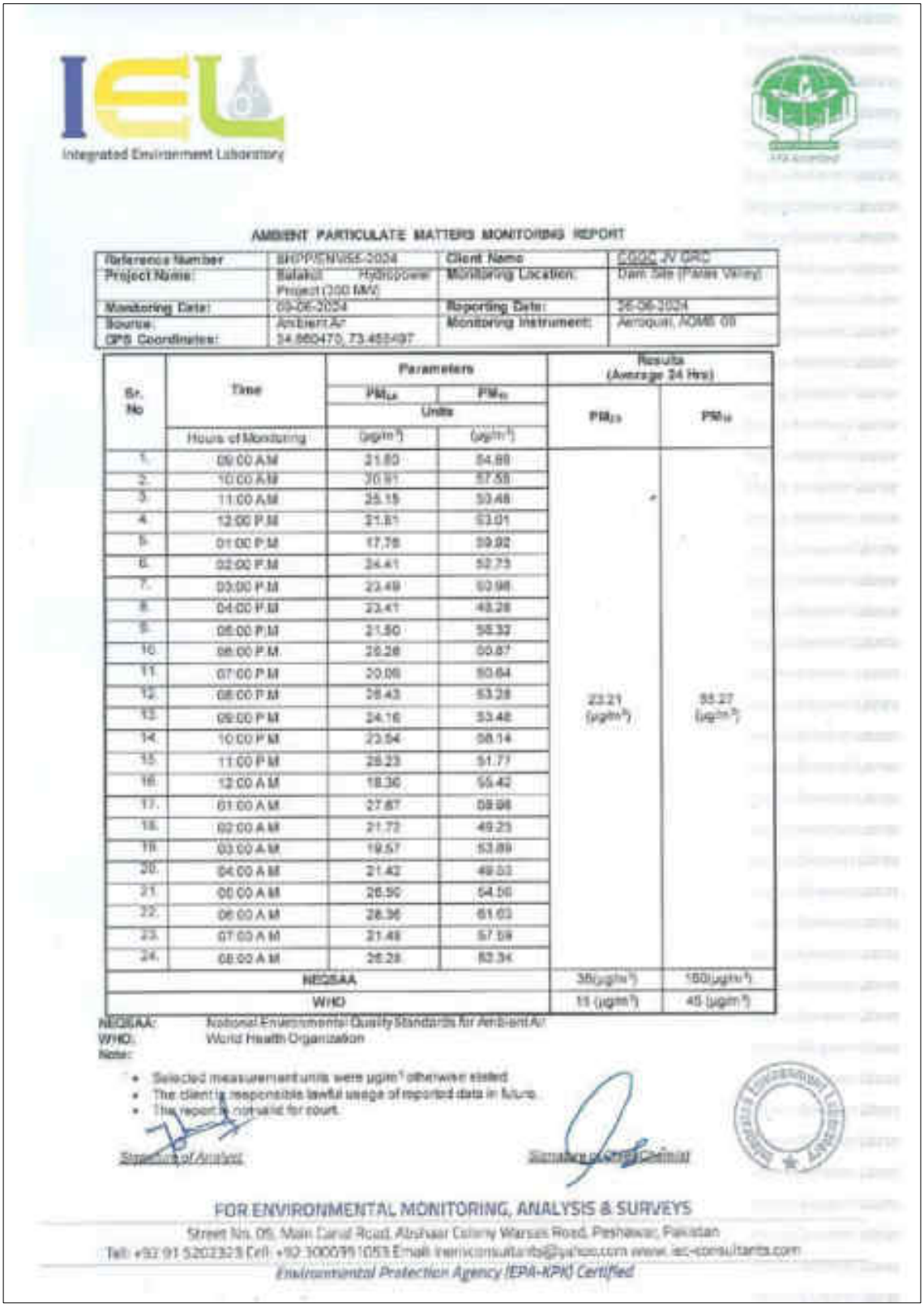
Ambient Air Monitoring Results (Second Quarter, 2024) Particulate Matters



Integrated Environment Laboratory

AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number	BHPP/ENV/05-2024	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Dam Site (Palas Valley)
Monitoring Date:	09-06-2024	Reporting Date:	26-06-2024
Source: GPS Coordinates:	Ambient Air 34.660470, 73.455497	Monitoring Instrument:	Aeroqual, AQMS 60

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}
	Hours of Monitoring	Units (µg/m³)	(µg/m³)		
1.	09:00 A.M	21.80	54.88	23.21 (µg/m³)	55.27 (µg/m³)
2.	10:00 A.M	20.91	57.58		
3.	11:00 A.M	25.15	53.48		
4.	12:00 P.M	21.81	53.01		
5.	01:00 P.M	17.78	59.92		
6.	02:00 P.M	24.41	52.73		
7.	03:00 P.M	23.49	50.98		
8.	04:00 P.M	23.41	48.28		
9.	05:00 P.M	21.50	58.32		
10.	06:00 P.M	26.26	55.87		
11.	07:00 P.M	20.06	50.64		
12.	08:00 P.M	28.43	53.28		
13.	09:00 P.M	24.16	53.48		
14.	10:00 P.M	23.54	58.14		
15.	11:00 P.M	28.23	51.77		
16.	12:00 A.M	18.36	55.42		
17.	01:00 A.M	27.87	58.98		
18.	02:00 A.M	21.72	49.23		
19.	03:00 A.M	19.57	53.89		
20.	04:00 A.M	21.42	49.03		
21.	05:00 A.M	26.50	54.58		
22.	06:00 A.M	28.36	61.03		
23.	07:00 A.M	21.48	57.59		
24.	08:00 A.M	26.28	52.34		
NEQSAA				35(µg/m³)	150(µg/m³)
WHO				15 (µg/m³)	45 (µg/m³)

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

- Selected measurement units were µgm⁻³ otherwise stated
- The client is responsible lawful usage of reported data in future
- This 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/ENVSS-2024	Client Name:	CGGC JV CRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	AQ-1 (Tinoo)
Monitoring Date:	13-06-2024	Reporting Date:	26-06-2024
Source: GPS Coordinates:	Ambient Air 34.630123, 73.428097	Monitoring Instrument:	AQM 65, Serial # 1310

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		$PM_{2.5}$	PM_{10}		
		Units			
	Hours of Monitoring	($\mu g/m^3$)	($\mu g/m^3$)	$PM_{2.5}$	PM_{10}
1.	09:00 A.M	20.88	47.29	19.59 ($\mu g/m^3$)	44.25 ($\mu g/m^3$)
2.	10:00 A.M	22.72	39.97		
3.	11:00 A.M	20.92	43.53		
4.	12:00 P.M	17.87	42.11		
5.	01:00 P.M	19.45	38.52		
6.	02:00 P.M	17.75	39.68		
7.	03:00 P.M	21.23	52.40		
8.	04:00 P.M	20.45	48.05		
9.	05:00 P.M	18.72	38.13		
10.	06:00 P.M	19.02	43.28		
11.	07:00 P.M	20.37	38.21		
12.	08:00 P.M	20.22	44.64		
13.	09:00 P.M	18.41	38.23		
14.	10:00 P.M	17.53	49.74		
15.	11:00 P.M	18.02	43.03		
16.	12:00 A.M	22.42	45.42		
17.	01:00 A.M	20.98	44.79		
18.	02:00 A.M	16.97	51.62		
19.	03:00 A.M	18.86	38.73		
20.	04:00 A.M	20.06	45.93		
21.	05:00 A.M	18.92	47.18		
22.	06:00 A.M	19.51	44.39		
23.	07:00 A.M	20.90	49.55		
24.	08:00 A.M	20.48	50.37		
NEQSAA				35($\mu g/m^3$)	150($\mu g/m^3$)
WHO				15 ($\mu g/m^3$)	45 ($\mu g/m^3$)

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

- Selected measurement units were $\mu g/m^3$ 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 Office Incharge

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AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number:	BHPP/ENV/05-2024	Client Name:	CSDC JV (PVT) LTD
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Ashkot (Dhanool)
Monitoring Date:	10-06-2024	Reporting Date:	25-06-2024
Source:	Ambient Air	Monitoring Instrument:	Aerosol, AQMS 09
GPS Coordinates:	34.619767, 73.417525		

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		$PM_{2.5}$	PM_{10}		
		Units		$PM_{2.5}$	PM_{10}
	Hours of Monitoring	(µg/m³)	(µg/m³)		
1.	09:00 A.M	14.59	32.89	17.08 (µg/m³)	39.91 (µg/m³)
2.	10:00 A.M	16.34	46.19		
3.	11:00 A.M	17.70	30.51		
4.	12:00 P.M	17.79	48.00		
5.	01:00 P.M	14.29	44.02		
6.	02:00 P.M	18.46	47.59		
7.	03:00 P.M	15.02	36.29		
8.	04:00 P.M	19.31	40.65		
9.	05:00 P.M	19.86	30.90		
10.	06:00 P.M	18.78	44.12		
11.	07:00 P.M	17.93	39.18		
12.	08:00 P.M	16.93	47.54		
13.	09:00 P.M	19.85	30.82		
14.	10:00 P.M	18.48	36.70		
15.	11:00 P.M	14.51	32.16		
16.	12:00 A.M	17.80	41.96		
17.	01:00 A.M	13.80	32.47		
18.	02:00 A.M	21.09	28.18		
19.	03:00 A.M	17.22	48.18		
20.	04:00 A.M	16.06	42.01		
21.	05:00 A.M	16.54	38.99		
22.	06:00 A.M	20.50	36.92		
23.	07:00 A.M	17.29	42.00		
24.	08:00 A.M	16.18	34.87		
NEQSAA				35 (µg/m³)	150(µg/m³)
WHO				15 (µg/m³)	45 (µg/m³)

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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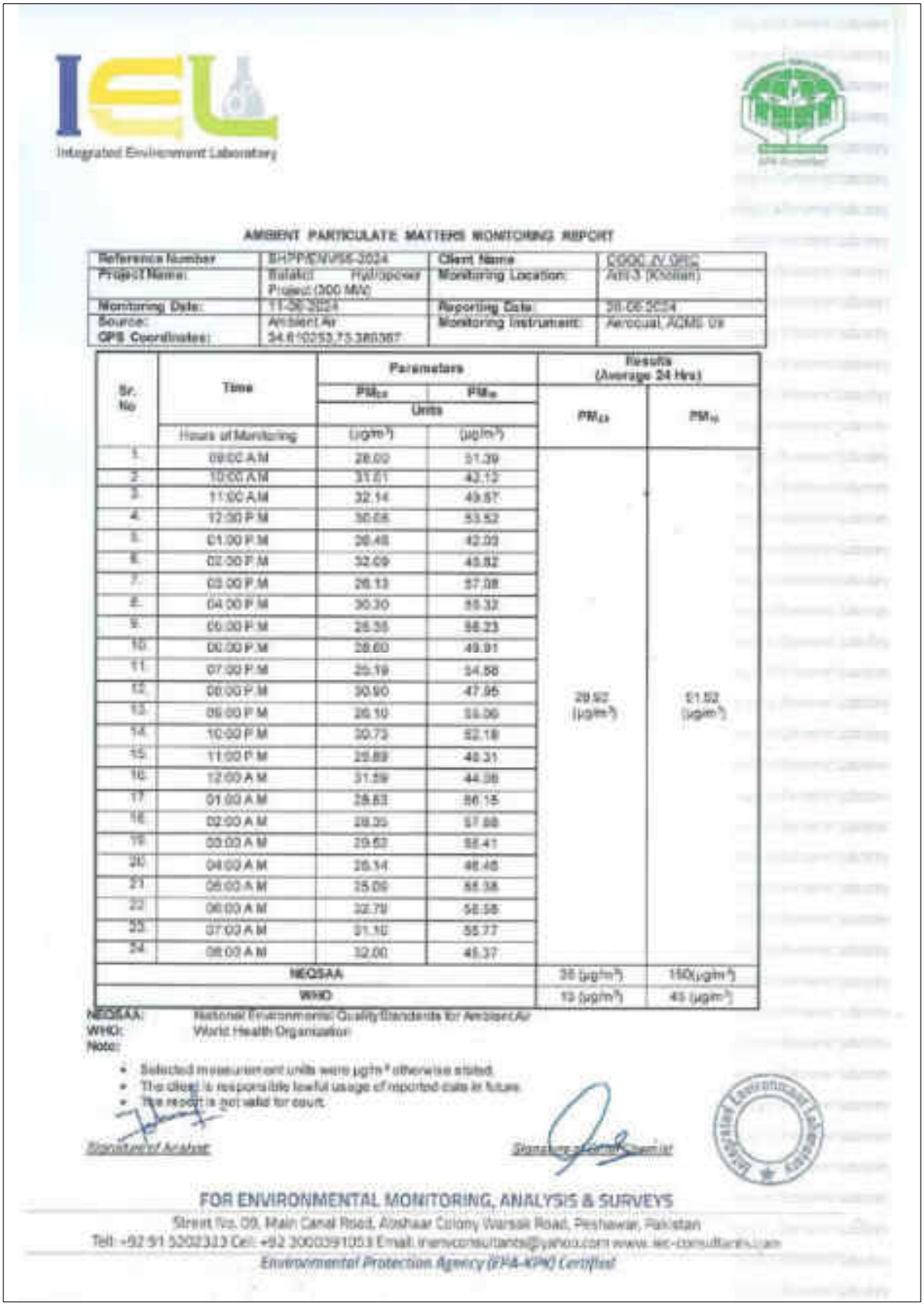

Integrated Environment Laboratory

AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number	IEL/PPE/ENV/55-2024	Client Name	CGGC JV GPC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	AMS-3 (Khoian)
Monitoring Date:	11-06-2024	Reporting Date	20-06-2024
Source:	Ambient Air	Monitoring Instrument:	Aerocual ADMS 02
GPS Coordinates:	34.610253,73.380367		

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		$PM_{2.5}$	PM_{10}		
		Units		$PM_{2.5}$	PM_{10}
	Hours of Monitoring	($\mu g/m^3$)	($\mu g/m^3$)		
1.	09:00 A.M	28.09	51.39	29.92 ($\mu g/m^3$)	51.92 ($\mu g/m^3$)
2.	10:00 A.M	31.01	42.13		
3.	11:00 A.M	32.14	49.67		
4.	12:00 P.M	30.08	53.52		
5.	01:00 P.M	28.48	42.09		
6.	02:00 P.M	32.09	49.82		
7.	03:00 P.M	26.13	57.08		
8.	04:00 P.M	30.30	55.32		
9.	05:00 P.M	28.35	56.23		
10.	06:00 P.M	28.60	49.91		
11.	07:00 P.M	25.19	54.56		
12.	08:00 P.M	30.90	47.95		
13.	09:00 P.M	26.10	55.06		
14.	10:00 P.M	30.73	52.18		
15.	11:00 P.M	25.89	48.31		
16.	12:00 A.M	31.59	44.08		
17.	01:00 A.M	28.83	56.15		
18.	02:00 A.M	28.35	57.68		
19.	03:00 A.M	29.52	58.41		
20.	04:00 A.M	26.14	48.48		
21.	05:00 A.M	25.06	55.38		
22.	06:00 A.M	32.79	58.58		
23.	07:00 A.M	31.10	55.77		
24.	08:00 A.M	32.00	46.37		
NEQSAA				35 ($\mu g/m^3$)	150($\mu g/m^3$)
WHO				15 ($\mu g/m^3$)	45 ($\mu g/m^3$)

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 Technical Manager

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Integrated Environment Laboratory

AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number	SIPPENV55-2024	Client Name	CGGC JV CRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Powerhouse (Bankot)
Monitoring Date:	12-06-2024	Reporting Date:	18-06-2024
Source: GPS Coordinates:	Ambient Air 34.601812, 73.377145	Monitoring Instrument:	Aeroqual AQM5 09

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		$PM_{2.5}$	PM_{10}		
		Units		$PM_{2.5}$	PM_{10}
	Hours of Monitoring	(µg/m3)	(µg/m3)		
1.	09:00 A.M	20.53	30.39		
2.	10:00 A.M	22.26	35.03		
3.	11:00 A.M	20.37	30.55		
4.	12:00 P.M	20.70	29.81		
5.	01:00 P.M	17.70	25.46		
6.	02:00 P.M	21.34	36.08		
7.	03:00 P.M	18.52	30.56		
8.	04:00 P.M	24.14	28.12		
9.	05:00 P.M	24.35	29.79		
10.	06:00 P.M	19.88	28.16		
11.	07:00 P.M	23.15	30.16		
12.	08:00 P.M	24.04	31.30	21.2 (µg/m³)	30.68 (µg/m³)
13.	09:00 P.M	21.81	30.39		
14.	10:00 P.M	21.81	26.85		
15.	11:00 P.M	21.06	32.70		
16.	12:00 A.M	18.84	27.69		
17.	01:00 A.M	19.22	29.66		
18.	02:00 A.M	17.79	36.69		
19.	03:00 A.M	22.74	36.83		
20.	04:00 A.M	18.02	31.49		
21.	05:00 A.M	22.88	31.99		
22.	06:00 A.M	22.83	25.09		
23.	07:00 A.M	23.49	25.60		
24.	08:00 A.M	21.94	28.78		
NEQSAA				35 (µg/m³)	150(µg/m³)
WHO				15 (µg/m³)	45 (µg/m³)

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

- Selected measurement units were µg/m³ otherwise stated.
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- The report is not valid for court.

Signature of Analyst

Signature of Authority

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AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number:	EHP-ENV/05-2024	Client Name:	Qatar JV GHC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Terrace Opposite (Balkot)
Monitoring Date:	13-05-2024	Reporting Date:	25-05-2024
Source: GPS Coordinates:	Ambient Air 34.536088, 73.374512	Monitoring Instrument:	Aeroqual, AQM2 09

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}
	Hours of Monitoring	Units ($\mu g/m^3$)	($\mu g/m^3$)		
1.	09:00 A.M	31.10	94.06		
2.	10:00 A.M	32.00	95.11		
3.	11:00 A.M	30.02	85.67		
4.	12:00 P.M	32.00	72.48		
5.	01:00 P.M	32.71	97.94		
6.	02:00 P.M	39.12	91.27		
7.	03:00 P.M	39.46	78.10		
8.	04:00 P.M	39.00	71.51		
9.	05:00 P.M	38.37	101.88		
10.	06:00 P.M	34.16	71.14		
11.	07:00 P.M	35.34	88.16		
12.	08:00 P.M	39.26	72.55		
13.	09:00 P.M	37.79	93.12	39.78 ($\mu g/m^3$)	87.00 ($\mu g/m^3$)
14.	10:00 P.M	39.01	78.51		
15.	11:00 P.M	36.27	76.53		
16.	12:00 A.M	37.06	83.51		
17.	01:00 A.M	32.32	102.02		
18.	02:00 A.M	37.14	93.07		
19.	03:00 A.M	35.40	98.00		
20.	04:00 A.M	35.56	92.74		
21.	05:00 A.M	33.27	71.35		
22.	06:00 A.M	31.70	90.94		
23.	07:00 A.M	38.48	97.84		
24.	08:00 A.M	34.21	82.66		
NEQSAA				35 ($\mu g/m^3$)	180($\mu g/m^3$)
WHO				15 ($\mu g/m^3$)	45 ($\mu g/m^3$)

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

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

Sign/Stamp of Analyst

Signature of Client/Agent

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Integrated Environment Laboratory

AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number	BHPP/ENVSS-2024	Client Name	COGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	GRC Camp Office (Sanghar)
Monitoring Date:	19-05-2024	Reporting Date:	28-06-2024
Source:	Ambient Air	Monitoring Instrument:	AQMS 00, Serial # 1310
GPS Coordinates:	34.584562, 73.373878		

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		$PM_{2.5}$	PM_{10}		
		Units		$PM_{2.5}$	PM_{10}
	Hours of Monitoring	($\mu g/m^3$)	($\mu g/m^3$)		
1.	09:00 A.M	16.81	37.89	16.48 ($\mu g/m^3$)	35.89 ($\mu g/m^3$)
2.	10:00 A.M	14.56	38.28		
3.	11:00 A.M	19.49	32.38		
4.	12:00 P.M	15.74	38.90		
5.	01:00 P.M	14.65	29.83		
6.	02:00 P.M	19.18	41.12		
7.	03:00 P.M	19.10	31.27		
8.	04:00 P.M	15.73	37.21		
9.	05:00 P.M	17.06	28.83		
10.	06:00 P.M	19.20	33.40		
11.	07:00 P.M	14.24	33.34		
12.	08:00 P.M	15.79	37.46		
13.	09:00 P.M	15.39	41.82		
14.	10:00 P.M	15.77	36.69		
15.	11:00 P.M	13.96	39.42		
16.	12:00 A.M	16.18	35.07		
17.	01:00 A.M	14.04	34.65		
18.	02:00 A.M	19.00	34.22		
19.	03:00 A.M	15.79	38.70		
20.	04:00 A.M	17.82	28.97		
21.	05:00 A.M	17.03	42.67		
22.	06:00 A.M	19.27	38.39		
23.	07:00 A.M	16.26	39.21		
24.	08:00 A.M	16.89	31.41		
NEQSAA				35 ($\mu g/m^3$)	150($\mu g/m^3$)
WHO				15 ($\mu g/m^3$)	45 ($\mu g/m^3$)

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

- Selected measurement units were $\mu g/m^3$ 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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AMBIENT PARTICULATE MATTERS MONITORING REPORT

Reference Number:	EIP/ENV/SC-2024	Client Name:	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Colony Area (Sangrar)
Monitoring Date:	18-06-2024	Reporting Date:	26-06-2024
Source: GPS Coordinates:	Ambient Air 34.587773, 73.393225	Monitoring Instrument:	AQMS 66, Serial # 1310

Sr. No	Time	Parameters		Results (Average 24 Hrs)	
		$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}
	Hours of Monitoring	Units: (µg/m³)	(µg/m³)		
1.	09:00 A.M	23.27	48.14	20.24 (µg/m³)	49.61 (µg/m³)
2.	10:00 A.M	19.06	46.15		
3.	11:00 A.M	18.03	52.19		
4.	12:00 P.M	17.42	48.72		
5.	01:00 P.M	14.84	56.22		
6.	02:00 P.M	20.48	48.34		
7.	03:00 P.M	20.35	44.39		
8.	04:00 P.M	22.02	45.73		
9.	05:00 P.M	21.70	51.88		
10.	06:00 P.M	31.00	48.50		
11.	07:00 P.M	22.82	54.78		
12.	08:00 P.M	14.63	49.30		
13.	09:00 P.M	24.65	49.55		
14.	10:00 P.M	14.48	51.90		
15.	11:00 P.M	20.68	49.08		
16.	12:00 A.M	17.28	54.74		
17.	01:00 A.M	24.26	50.49		
18.	02:00 A.M	24.24	49.00		
19.	03:00 A.M	16.71	44.71		
20.	04:00 A.M	20.97	54.35		
21.	05:00 A.M	21.80	48.78		
22.	06:00 A.M	19.54	55.76		
23.	07:00 A.M	26.00	49.37		
24.	08:00 A.M	30.03	48.87		
NEQSAA				35 (µg/m³)	150(µg/m³)
WHO				15 (µg/m³)	45 (µg/m³)

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.
- This report is not valid for court.

Manager Analyst

Technical Director

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Environmental Protection Agency (EPA-KPK) Certified

Ambient Gaseous Monitoring Results (Second Quarter, 2024)

Integrated Environment Laboratory

AMBIENT GASES MONITORING REPORT

Reference Number	SHP/ENV/05-2024	**Client Name**	CSCEC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	**Monitoring Location:**	Dam site (Paras Valley)
Monitoring Date:	09-06-2024	**Reporting Date:**	08-06-2024
Source:	Ambient Air Gases	**Monitoring Instrument:**	Aeroqual AQM 60
GPS Coordinates:	34.550470, 73.455407		

Sr. No	Time	Parameters			
		CO	NO	NO_2	SO_2
		Units			
	Hours	(mg/m^3)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
1.	09:00 AM	0.48	15.70	18.51	16.85
2.	10:00 AM	0.41	16.11	17.58	15.09
3.	11:00 AM	0.37	13.65	19.79	17.91
4.	12:00 P.M	0.42	12.88	13.45	16.39
5.	01:00 P.M	0.35	16.54	15.13	12.95
6.	02:00 P.M	0.40	13.54	14.78	16.91
7.	03:00 P.M	0.25	12.81	14.44	12.04
8.	04:00 P.M	0.38	11.07	19.04	17.60
9.	05:00 P.M	0.41	11.63	17.07	14.72
10.	06:00 P.M	0.83	11.49	15.74	14.34
11.	07:00 P.M	0.54	13.97	14.36	10.62
12.	08:00 P.M	0.50	13.61	15.00	13.03
13.	09:00 P.M	0.24	12.31	12.04	13.71
14.	10:00 P.M	0.49	12.70	15.30	16.19
15.	11:00 P.M	0.56	9.66	13.53	14.07
16.	12:00 A.M	0.51	14.77	14.91	13.04
17.	01:00 A.M	0.46	0.82	11.75	16.47
18.	02:00 A.M	0.64	15.59	13.30	13.00
19.	03:00 A.M	0.60	11.00	12.81	14.07
20.	04:00 A.M	0.36	14.77	14.57	16.88
21.	05:00 A.M	0.20	13.58	16.00	14.23
22.	06:00 A.M	0.26	13.53	14.88	14.34
23.	07:00 A.M	0.58	16.37	18.09	12.93
24.	08:00 A.M	0.59	14.93	16.81	13.00
Average Concentration		**0.44**	**13.18**	**15.57**	**14.52**
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 $\mu g/m^3$ & mg/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 Lab In-Charge

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Integrated Environment Laboratory

AMBIENT GASES MONITORING REPORT

Reference Number:	IEL/PR/ENV/05-2024	Client Name:	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	ADIT (Tbc01)
Monitoring Date:	14-06-2024	Reporting Date:	26-06-2024
Source: GPS Coordinates:	Ambient Air Gases 34.630125, 73.428567	Monitoring Instrument:	AQMS GS, Serial # 1510

Sr. No	Time	Parameters			
		CO	NO	NO_2	SO_2
		Units			
	Hours	(mg/m^3)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
1.	09:00 A.M	0.18	13.34	11.24	11.42
2.	10:00 A.M	0.33	12.60	12.98	9.28
3.	11:00 A.M	0.29	9.33	13.97	11.01
4.	12:00 P.M	0.09	11.64	12.89	9.80
5.	01:00 P.M	0.32	9.07	14.21	10.47
6.	02:00 P.M	0.29	12.64	10.97	10.68
7.	03:00 P.M	0.11	12.76	9.71	11.92
8.	04:00 P.M	0.27	10.33	16.35	7.75
9.	05:00 P.M	0.18	11.22	13.07	9.92
10.	06:00 P.M	0.16	9.99	15.17	8.26
11.	07:00 P.M	0.23	7.93	14.41	9.33
12.	08:00 P.M	0.28	9.78	9.86	11.65
13.	09:00 P.M	0.09	11.90	12.59	7.15
14.	10:00 P.M	0.23	9.87	14.04	10.73
15.	11:00 P.M	0.37	13.58	9.35	8.73
16.	12:00 A.M	0.16	10.54	16.56	8.42
17.	01:00 A.M	0.16	11.04	13.77	7.54
18.	02:00 A.M	0.19	8.39	10.01	11.99
19.	03:00 A.M	0.26	11.77	11.55	5.39
20.	04:00 A.M	0.17	8.87	15.71	8.42
21.	05:00 A.M	0.32	11.56	11.90	7.47
22.	06:00 A.M	0.17	7.05	15.71	12.18
23.	07:00 A.M	0.36	12.74	13.20	5.78
24.	08:00 A.M	0.33	7.03	9.83	7.65
Average Concentration		0.24	10.55	13.15	8.89
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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Integrated Environment Laboratory

AMBIENT GASES MONITORING REPORT

Reference Number:	SHPP/EMN/55-2024	Client Name:	CGGC JV GRX
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Adit 2 (Dhandot)
Monitoring Date:	10-06-2024	Reporting Date:	26-06-2024
Source: GPS Coordinates:	Ambient Air Gases 34.619787, 73.417625	Monitoring Instrument:	Aeroqual, AQMS 09

Sr. No	Time	Parameters			
		CO	NO	NO_2	SO_2
		Units			
	Hours	(mg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
1.	09:00 A.M	0.21	6.94	7.48	8.21
2.	10:00 A.M	0.26	10.39	13.18	6.83
3.	11:00 A.M	0.31	11.42	10.38	0.91
4.	12:00 P.M	0.27	12.10	10.84	0.20
5.	01:00 P.M	0.30	8.82	7.23	13.39
6.	02:00 P.M	0.35	12.07	7.59	13.02
7.	03:00 P.M	0.18	8.49	10.71	6.18
8.	04:00 P.M	0.18	6.25	9.59	8.09
9.	05:00 P.M	0.22	13.39	14.18	6.37
10.	06:00 P.M	0.29	8.11	10.83	9.18
11.	07:00 P.M	0.27	7.00	9.42	7.37
12.	08:00 P.M	0.22	10.05	9.78	9.64
13.	09:00 P.M	0.25	9.67	8.82	7.01
14.	10:00 P.M	0.19	10.37	10.23	8.83
15.	11:00 P.M	0.27	9.16	9.68	6.37
16.	12:00 A.M	0.22	8.10	8.96	7.75
17.	01:00 A.M	0.28	12.35	8.85	8.21
18.	02:00 A.M	0.12	12.58	9.81	4.92
19.	03:00 A.M	0.36	6.93	10.26	5.25
20.	04:00 A.M	0.28	12.55	7.75	10.22
21.	05:00 A.M	0.23	9.02	13.21	6.01
22.	06:00 A.M	0.21	6.55	7.29	8.45
23.	07:00 A.M	0.30	7.16	9.88	9.62
24.	08:00 A.M	0.15	10.80	13.06	8.31
Average Concentration		0.26	9.39	9.72	7.49
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 useage of reported data in future
- This report is not valid for court

Signature of Analyst

Signature of Lab In-Charge

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AMBIENT GASES MONITORING REPORT

Reference Number:	BHPP/ENVIS-2024	Client Name:	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	ABS 3 (Khoian)
Monitoring Date:	11-05-2024	Reporting Date:	25-05-2024
Source: GPS Coordinates:	Ambient Air Gases 34.610263,73.389387	Monitoring Instrument:	Aeroqual, AQMS 09

Sr. No	Time	Parameters			
		CO	NO	NO_2	SO_2
		Units			
	Hours	(µg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
1.	09:00 A.M	0.76	20.09	27.19	26.66
2.	10:00 A.M	0.56	26.13	22.87	18.91
3.	11:00 A.M	0.44	16.39	35.83	28.76
4.	12:00 P.M	0.46	14.03	30.21	26.07
5.	01:00 P.M	0.71	14.20	32.23	31.03
6.	02:00 P.M	0.61	13.87	20.40	34.52
7.	03:00 P.M	0.46	16.93	27.86	24.93
8.	04:00 P.M	0.79	25.66	21.14	27.66
9.	05:00 P.M	0.42	22.19	18.43	21.26
10.	06:00 P.M	0.61	21.64	27.96	19.09
11.	07:00 P.M	0.66	23.11	29.33	31.45
12.	08:00 P.M	0.68	21.64	34.03	31.36
13.	09:00 P.M	0.53	17.24	32.13	17.83
14.	10:00 P.M	0.90	23.42	32.95	30.34
15.	11:00 P.M	0.69	18.16	19.78	23.06
16.	12:00 A.M	0.58	21.67	15.92	26.37
17.	01:00 A.M	0.43	14.36	28.70	27.27
18.	02:00 A.M	0.42	17.27	18.89	24.30
19.	03:00 A.M	0.56	23.61	33.11	35.02
20.	04:00 A.M	0.53	23.13	19.64	16.35
21.	05:00 A.M	0.47	22.36	33.36	32.83
22.	06:00 A.M	0.65	17.28	36.43	34.15
23.	07:00 A.M	0.42	18.87	38.22	33.43
24.	08:00 A.M	0.47	16.04	23.31	26.09
Average Concentration		0.54	19.51	26.69	26.74
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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Integrated Environment Laboratory

AMBIENT GASES MONITORING REPORT

Reference Number:	SHPP/EMS/Gas-2024	Client Name:	CGGC JV GBC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Powerhouse (Balkot)
Monitoring Date:	12-06-2024	Reporting Date:	20-06-2024
Source: GPS Coordinates:	Ambient Air Gases 34.601912, 73.377145	Monitoring Instrument:	Aeroqual AQ88 09

Sr. No	Time	Parameters			
		CO	NO	NO_2	SO_2
		Units			
	Hours	(mg/m^3)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
1.	09:00 A.M	0.12	10.04	16.42	11.60
2	10:00 A.M	0.18	11.34	11.92	9.41
3.	11:00 A.M	0.24	8.50	10.73	12.07
4.	12:00 P.M	0.31	10.81	10.83	11.70
5.	01:00 P.M	0.14	11.44	11.04	12.18
6.	02:00 P.M	0.23	9.32	8.94	9.39
7.	03:00 P.M	0.17	8.90	10.09	7.88
8.	04:00 P.M	0.30	8.48	11.29	9.72
9.	05:00 P.M	0.24	8.97	14.21	9.69
10.	06:00 P.M	0.18	10.69	14.72	11.23
11	07:00 P.M	0.09	10.91	16.37	11.34
12.	08:00 P.M	0.24	11.27	10.09	13.28
13.	09:00 P.M	0.30	9.68	10.13	8.96
14.	10:00 P.M	0.20	10.16	16.50	10.09
15.	11:00 P.M	0.25	9.87	13.51	13.41
16.	12:00 A.M	0.08	9.49	10.81	12.01
17.	01:00 A.M	0.25	9.59	16.54	9.36
18.	02:00 A.M	0.23	9.73	15.82	11.84
19.	03:00 A.M	0.20	11.17	16.54	7.46
20.	04:00 A.M	0.19	8.82	11.71	7.42
21.	05:00 A.M	0.26	9.06	17.72	8.06
22.	06:00 A.M	0.13	9.19	12.23	8.66
23.	07:00 A.M	0.12	11.30	14.43	8.04
24.	08:00 A.M	0.09	8.83	13.32	9.37
Average Concentration		0.19	9.85	13.29	10.17
NEQSAA		08	40	80	120
WHO		04	—	25	40

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

Note:

- Selected measurement units were µgm⁻³& mgm⁻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 Quality Analyst

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AMBIENT GASES MONITORING REPORT

Reference Number:	IMPP/ENV/66-2024	**Client Name:**	CSDC JV GBC
Project Name:	Balakot Hydropower Project (300 MW)	**Monitoring Location:**	Terrace Contractor (Balkot)
Monitoring Date:	13.06.2024	**Reporting Date:**	26.06.2024
Source:	Ambient Air Gases	**Monitoring Instrument:**	Aeroqual, AQMS 09
GPS Coordinates:	34.600088, 73.374512		

Sr. No	Time	Parameters			
		CO	NO	NO_2	SO_2
		Units			
	Hours	(mg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
1.	09:30 A.M	0.15	7.21	10.13	5.89
2.	10:00 A.M	0.13	9.12	9.69	5.37
3.	11:00 A.M	0.23	8.40	7.21	5.56
4.	12:00 P.M	0.23	9.48	10.29	6.09
5.	01:00 P.M	0.10	7.00	8.78	7.53
6.	02:00 P.M	0.15	9.65	7.93	8.33
7.	03:00 P.M	0.17	9.23	7.29	7.29
8.	04:00 P.M	0.20	5.81	8.90	7.06
9.	05:00 P.M	0.15	7.42	10.21	6.53
10.	06:00 P.M	0.21	7.93	6.34	7.17
11.	07:00 P.M	0.07	8.75	10.51	5.91
12.	08:00 P.M	0.20	8.22	9.49	6.51
13.	09:00 P.M	0.15	8.09	10.41	7.26
14.	10:00 P.M	0.14	7.63	7.65	7.27
15.	11:00 P.M	0.19	6.89	7.75	9.02
16.	12:00 A.M	0.11	6.87	8.85	9.16
17.	01:00 A.M	0.16	9.01	10.24	5.41
18.	02:00 A.M	0.21	8.23	10.18	8.30
19.	03:00 A.M	0.12	8.79	7.75	5.89
20.	04:00 A.M	0.23	6.18	7.40	8.24
21.	05:00 A.M	0.24	9.04	10.45	9.32
22.	06:30 A.M	0.08	8.04	8.92	7.34
23.	07:00 A.M	0.18	8.18	8.77	8.57
24.	08:30 A.M	0.07	7.89	10.12	5.72
Average Concentration		**0.15**	**8.04**	**9.09**	**7.32**
NEQSAA		**35**	**40**	**80**	**120**
WHO		**34**	---	**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/05-2024	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	GRC Camp Office (Banghar)
Monitoring Date:	15-06-2024	Reporting Date:	26-06-2024
Source: GPS Coordinates:	Ambient Air Gases 34.594552, 73.373978	Monitoring Instrument:	AQM2 GS, Serial # 1310

Sr. No	Time	Parameters			
		CO	NO	NO_2	SO_2
		Units			
	Hours	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)	($\mu g/m^3$)
1.	09:00 AM	0.21	0.65	12.04	16.55
2.	10:00 AM	0.35	10.72	18.63	15.92
3.	11:00 AM	0.32	11.27	17.23	13.54
4.	12:00 P.M.	0.17	12.74	12.38	9.86
5.	01:00 P.M.	0.32	12.80	11.35	14.61
6.	02:00 P.M.	0.33	16.19	16.92	9.40
7.	03:00 P.M.	0.16	14.25	13.99	12.21
8.	04:00 P.M.	0.42	8.72	13.54	16.98
9.	05:00 P.M.	0.20	14.58	14.63	13.40
10.	06:00 P.M.	0.42	16.07	16.63	9.86
11.	07:00 P.M.	0.22	11.03	19.42	14.95
12.	08:00 P.M.	0.38	15.78	17.24	16.27
13.	09:00 P.M.	0.39	13.77	16.61	17.18
14.	10:00 P.M.	0.21	16.54	13.37	16.01
15.	11:00 P.M.	0.39	12.72	19.36	8.35
16.	12:00 A.M.	0.19	8.44	13.61	8.45
17.	01:00 A.M.	0.18	11.73	15.37	14.65
18.	02:00 A.M.	0.29	9.65	11.08	8.97
19.	03:00 A.M.	0.50	8.54	17.02	8.57
20.	04:00 A.M.	0.39	16.54	18.20	8.65
21.	05:00 A.M.	0.47	0.00	11.50	13.28
22.	06:00 A.M.	0.23	14.52	16.54	16.18
23.	07:00 A.M.	0.36	13.20	15.91	16.24
24.	08:00 A.M.	0.54	12.72	16.42	8.59
Average Concentration		0.32	12.59	15.57	12.05
NEQSAA		08	40	80	120
WHO		04	---	25	40

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

Note:

- Selected measurement units were $\mu g/m^3$ & mg/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 Quality Manager

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Integrated Environment Laboratory

AMBIENT GASES MONITORING REPORT

Reference Number:	IEL/PR/NW/05-2024	Client Name:	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Colony Area (Shaghai)
Monitoring Date:	18-05-2024	Reporting Date:	28-05-2024
Source: GPS Coordinates:	Ambient Air Gases 34.587775, 73.386225	Monitoring Instrument:	ACMS 00, Serial # 1210

Sr. No	Time	Parameters			
		CO	NO	NO_2	SO_2
		Units			
	Hours	(mg/m³)	(µg/m³)	(µg/m³)	(µg/m³)
1.	09:00 A.M	0.23	9.83	5.44	8.61
2.	10:00 A.M	0.29	5.55	7.99	9.45
3.	11:00 A.M	0.26	9.07	6.39	8.83
4.	12:00 P.M	0.21	8.09	8.20	3.09
5.	01:00 P.M	0.20	7.11	5.81	8.79
6.	02:00 P.M	0.27	8.53	10.88	6.09
7.	03:00 P.M	0.31	10.77	7.44	0.27
8.	04:00 P.M	0.22	9.66	8.75	7.03
9.	05:00 P.M	0.31	4.79	11.08	5.80
10.	06:00 P.M	0.21	9.15	8.09	4.09
11.	07:00 P.M	0.22	10.23	9.95	2.83
12.	08:00 P.M	0.28	4.58	7.14	9.46
13.	09:00 P.M	0.29	5.63	6.68	8.41
14.	10:00 P.M	0.33	6.67	8.57	0.51
15.	11:00 P.M	0.26	11.57	5.69	9.33
16.	12:00 A.M	0.20	8.43	8.33	8.64
17.	01:00 A.M	0.24	9.78	7.85	3.65
18.	02:00 A.M	0.21	9.38	7.89	9.92
19.	03:00 A.M	0.27	8.61	10.15	2.74
20.	04:00 A.M	0.20	8.49	5.77	9.46
21.	05:00 A.M	0.22	9.73	8.35	5.11
22.	06:00 A.M	0.27	8.98	9.29	9.70
23.	07:00 A.M	0.25	7.00	10.37	4.40
24.	08:00 A.M	0.23	9.29	9.61	5.36
Average Concentration		**0.25**	**8.08**	**8.00**	**6.89**
NEQSAA		**08**	**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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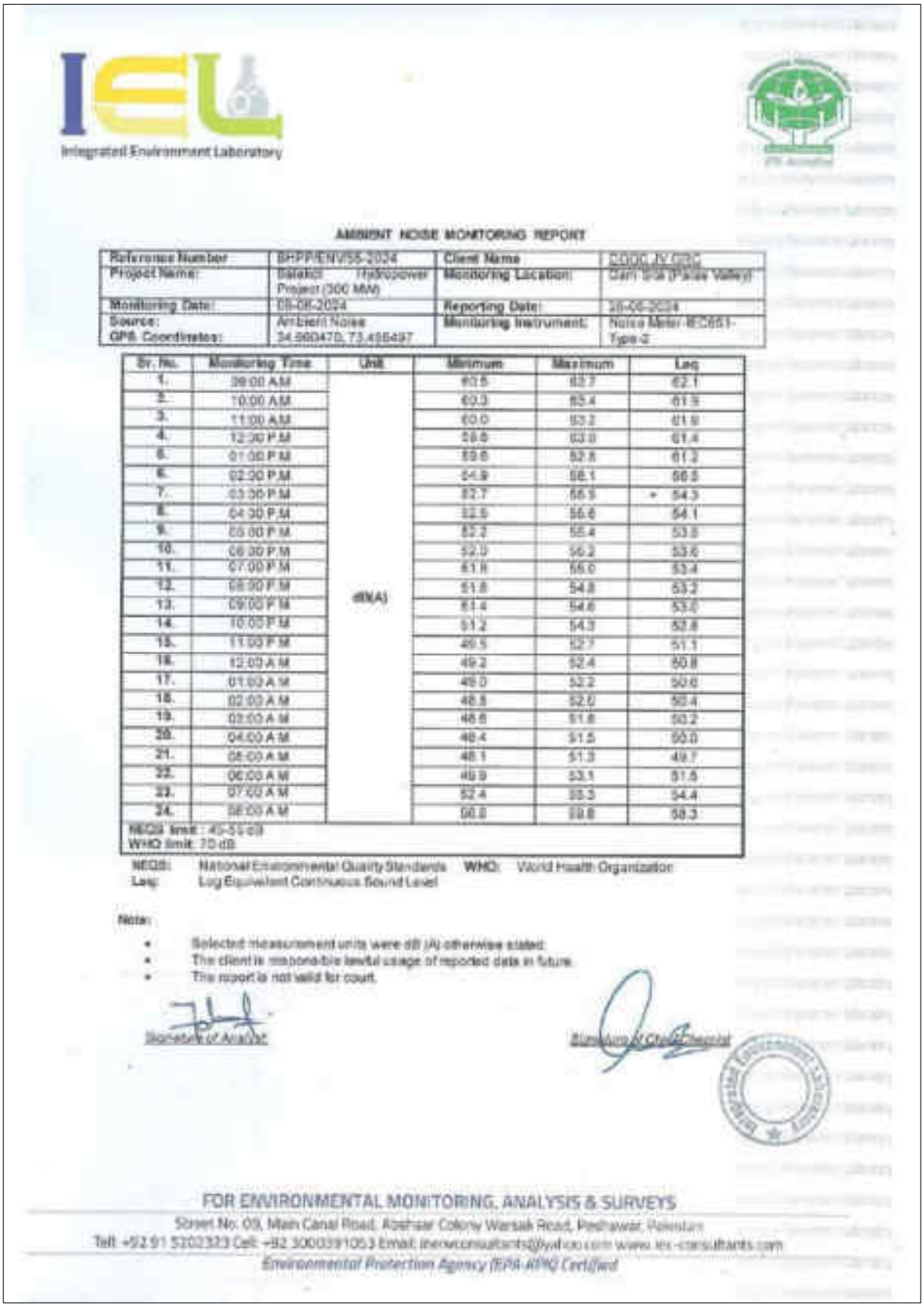
Ambient Noise Level Monitoring Results (Second Quarter, 2024)



Integrated Environment Laboratory

AMBIENT NOISE MONITORING REPORT

Reference Number:	BHPP/ENVSS-2024	Client Name:	CDOC JV (PEC)
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Dam Site (Palas Valley)
Monitoring Date:	05-06-2024	Reporting Date:	10-06-2024
Source: GPS Coordinates:	Ambient Noise 34.960470, 73.455497	Monitoring Instrument:	Noise Meter IEC651-Type-2

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	09:00 A.M	dB(A)	60.5	63.7	62.1
2.	10:00 A.M		60.3	63.4	61.9
3.	11:00 A.M		60.0	63.2	61.6
4.	12:00 P.M		59.8	63.0	61.4
5.	01:00 P.M		59.6	62.8	61.2
6.	02:00 P.M		54.9	56.1	56.5
7.	03:00 P.M		52.7	55.5	54.3
8.	04:00 P.M		52.5	55.6	54.1
9.	05:00 P.M		52.2	55.4	53.8
10.	06:00 P.M		52.0	55.2	53.6
11.	07:00 P.M		51.8	55.0	53.4
12.	08:00 P.M		51.6	54.8	53.2
13.	09:00 P.M		51.4	54.6	53.0
14.	10:00 P.M		51.2	54.3	52.8
15.	11:00 P.M		49.5	52.7	51.1
16.	12:00 A.M		49.2	52.4	50.8
17.	01:00 A.M		49.0	52.2	50.6
18.	02:00 A.M		48.8	52.0	50.4
19.	03:00 A.M		48.6	51.8	50.2
20.	04:00 A.M		48.4	51.5	50.0
21.	05:00 A.M		48.1	51.3	49.7
22.	06:00 A.M		49.9	53.1	51.5
23.	07:00 A.M		52.4	55.3	54.4
24.	08:00 A.M		56.0	59.8	58.3

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.
- This report is not valid for court.

Signature of Analyst

Signature of Chief Chemist

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AMBIENT NOISE MONITORING REPORT

Reference Number:	BHPP/ENVSS/2024	Client Name:	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	ASF1 (TP05)
Monitoring Date:	14-06-2024	Reporting Date:	25-06-2024
Source: GPS Coordinates:	Ambient Noise 34.630125, 73.428597	Monitoring Instrument:	Noise Meter-IEC651-Type 2

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	09:00 A.M	dB(A)	56.5	61.8	60.3
2.	10:00 A.M		56.3	61.0	60.0
3.	11:00 A.M		56.1	61.4	59.9
4.	12:00 P.M		57.9	61.2	59.6
5.	01:00 P.M		57.7	60.9	59.3
6.	02:00 P.M		57.4	60.7	59.1
7.	03:00 P.M		57.3	60.5	58.9
8.	04:00 P.M		57.0	60.3	58.7
9.	05:00 P.M		56.8	60.1	58.5
10.	06:00 P.M		56.6	59.9	58.3
11.	07:00 P.M		56.4	59.6	58.0
12.	08:00 P.M		56.1	59.4	57.8
13.	09:00 P.M		55.9	59.2	57.6
14.	10:00 P.M		55.7	59.0	57.4
15.	11:00 P.M		55.5	58.8	57.2
16.	12:00 A.M		55.3	58.6	57.0
17.	01:00 A.M		55.1	58.4	56.8
18.	02:00 A.M		54.9	58.2	56.6
19.	03:00 A.M		54.7	58.0	56.4
20.	04:00 A.M		54.5	57.7	56.1
21.	05:00 A.M		54.3	57.5	55.9
22.	06:00 A.M		54.0	57.3	55.7
23.	07:00 A.M		53.8	57.1	55.5
24.	08:00 A.M		53.6	56.9	55.3

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:	IEL/PEPA/055-2024	Client Name:	CGGC-JV GPC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	ADIT-2 (Left bank)
Monitoring Date:	10-06-2024	Reporting Date:	26-06-2024
Source: GPS Coordinates:	Ambient Noise 34.610787, 73.417525	Monitoring Instrument:	Noise Meter BENETECH Type-2

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	09:00 A.M	dB(A)	61.6	64.5	63.1
2.	10:00 A.M		61.4	64.5	62.9
3.	11:00 A.M		61.1	64.0	62.6
4.	12:00 P.M		60.9	63.8	62.4
5.	01:00 P.M		60.7	63.6	62.2
6.	02:00 P.M		60.5	63.4	62.0
7.	03:00 P.M		60.3	63.2	61.8
8.	04:00 P.M		60.1	62.9	61.6
9.	05:00 P.M		59.8	62.7	61.3
10.	06:00 P.M		59.6	62.5	61.1
11.	07:00 P.M		59.4	62.3	60.9
12.	08:00 P.M		59.2	62.1	60.7
13.	09:00 P.M		59.0	61.9	60.5
14.	10:00 P.M		58.8	61.4	60.0
15.	11:00 P.M		51.9	53.8	52.5
16.	12:00 A.M		49.3	52.7	51.0
17.	01:00 A.M		48.2	51.1	49.7
18.	02:00 A.M		50.0	51.3	50.7
19.	03:00 A.M		47.8	50.7	49.3
20.	04:00 A.M		48.5	50.4	49.5
21.	05:00 A.M		47.3	50.2	48.8
22.	06:00 A.M		50.8	53.4	52.1
23.	07:00 A.M		54.5	57.0	55.8
24.	08:00 A.M		58.1	61.5	60.3
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.

Supervising Analyst

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Integrated Environment Laboratory

AMBIENT NOISE MONITORING REPORT

Reference Number:	BHPP/ENV/55-2024	Client Name:	CDGC-ZV-SPEC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	AEP-3 (Khoitian)
Monitoring Date:	11-06-2024	Reporting Date:	26-06-2024
Source: GPS Coordinates:	Ambient Noise 34.610233,73.389367	Monitoring Instrument:	Noise Meter-IEC651-Type-2

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	09:00 A.M	dB(A)	64.2	66.6	64.9
2.	10:00 A.M		66.0	67.6	66.5
3.	11:00 A.M		66.7	68.6	67.1
4.	12:00 P.M		62.2	64.4	63.3
5.	01:00 P.M		66.4	68.9	66.8
6.	02:00 P.M		66.8	69.0	66.9
7.	03:00 P.M		67.6	69.7	68.6
8.	04:00 P.M		66.7	66.1	66.9
9.	05:00 P.M		61.7	63.5	62.6
10.	06:00 P.M		66.1	67.6	66.8
11.	07:00 P.M		64.5	66.1	65.3
12.	08:00 P.M		58.1	61.3	59.7
13.	09:00 P.M		61.0	65.7	63.3
14.	10:00 P.M		62.5	62.8	62.6
15.	11:00 P.M		60.2	64.4	62.3
16.	12:00 A.M		62.3	67.0	64.7
17.	01:00 A.M		62.1	64.5	63.3
18.	02:00 A.M		58.6	61.2	59.9
19.	03:00 A.M		62.1	64.2	63.1
20.	04:00 A.M		60.4	61.6	61.0
21.	05:00 A.M		59.2	61.0	60.1
22.	06:00 A.M		58.7	65.0	61.8
23.	07:00 A.M		64.2	66.8	65.5
24.	08:00 A.M		62.5	63.6	63.0

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:

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

Signature of Analyst

Signature of Chief Chemist

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AMBIENT NOISE MONITORING REPORT

Reference Number	BHPP/ENVSS-2024	Client Name	[illegible]
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Powerhouse (Barrio)
Monitoring Date:	12-06-2024	Reporting Date:	26-06-2024
Source: GPS Coordinates:	Ambient Noise 34.601612, 73.377148	Monitoring Instrument:	Noise Meter-BC651-Type-2

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	09:00 AM	dB(A)	58.6	60.9	59.8
2.	10:00 AM		59.7	61.9	60.8
3.	11:00 AM		57.7	58.5	58.1
4.	12:00 PM		57.6	60.2	58.9
5.	01:00 PM		61.1	64.0	62.6
6.	02:00 PM		61.1	61.9	61.5
7.	03:00 PM		57.6	58.7	58.1
8.	04:00 PM		60.2	60.8	60.4
9.	05:00 PM		62.5	64.7	63.6
10.	06:00 PM		60.1	61.0	60.6
11.	07:00 PM		52.6	55.3	53.9
12.	08:00 PM		46.6	48.5	47.6
13.	09:00 PM		44.6	46.1	45.4
14.	10:00 PM		48.9	50.7	49.8
15.	11:00 PM		46.6	47.8	47.2
16.	12:00 AM		48.9	49.4	49.2
17.	01:00 AM		50.6	52.5	51.5
18.	02:00 AM		46.1	47.3	46.8
19.	03:00 AM		48.5	50.0	49.3
20.	04:00 AM		45.8	49.2	48.0
21.	05:00 AM		45.6	46.8	46.1
22.	06:00 AM		44.9	47.0	46.0
23.	07:00 AM		57.3	60.9	58.6
24.	08:30 AM		61.5	64.6	63.0

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

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

Note:

- Related 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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Integrated Environment Laboratory

AMBIENT NOISE MONITORING REPORT

Reference Number	BHPP/ENV/65-2024	Client Name	CGGC JV WBC
Project Name	Balakot Hydropower Project (300 MW)	Monitoring Location:	Tehsil& District (Barkot)
Monitoring Date:	13-06-2024	Reporting Date:	20-06-2024
Source: GPS Coordinates:	Ambient Noise 34.699068, 73.274512	Monitoring Instrument:	Noise Meter-IEC651-Type-2

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	09:00 A.M	dB(A)	54.7	58.1	56.4
2.	10:00 A.M		54.5	57.8	56.2
3.	11:00 A.M		54.2	57.8	55.9
4.	12:00 P.M		54.0	57.4	55.7
5.	01:00 P.M		53.8	57.2	55.5
6.	02:00 P.M		53.6	57.0	55.3
7.	03:00 P.M		53.4	56.8	55.1
8.	04:00 P.M		42.2	46.5	43.9
9.	05:00 P.M		41.9	46.3	43.6
10.	06:00 P.M		41.7	46.1	43.4
11.	07:00 P.M		41.5	44.9	43.2
12.	08:00 P.M		41.3	44.7	43.0
13.	09:00 P.M		41.1	44.5	42.8
14.	10:00 P.M		40.9	44.2	42.6
15.	11:00 P.M		40.8	44.0	42.5
16.	12:00 A.M		40.4	43.8	42.1
17.	01:00 A.M		40.2	43.6	41.9
18.	02:00 A.M		40.0	43.4	41.7
19.	03:00 A.M		39.8	43.2	41.5
20.	04:00 A.M		39.6	42.9	41.3
21.	05:00 A.M		39.3	42.7	41.0
22.	06:00 A.M		50.1	53.5	51.8
23.	07:00 A.M		49.9	53.3	51.6
24.	08:00 A.M		49.7	53.1	51.4
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:

- 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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Integrated Environment Laboratory

AMBIENT NOISE MONITORING REPORT

Reference Number:	IEL/PREVIEW/2024	Client Name:	CGGC JV DRC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	DRC Camp Office (Sanghar)
Monitoring Date:	15-06-2024	Reporting Date:	26-06-2024
Source: GPS Coordinates:	Ambient Noise 34.884562, 73.373978	Monitoring Instrument:	Noise Meter-IEDE1-Type-2

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	09:00 A.M	dB(A)	60.6	64.9	62.9
2.	10:00 A.M		60.6	64.6	62.6
3.	11:00 A.M		60.3	64.4	62.4
4.	12:00 P.M		60.1	64.2	62.2
5.	01:00 P.M		59.9	64.0	62.0
6.	02:00 P.M		59.7	63.8	61.8
7.	03:00 P.M		57.8	61.6	59.6
8.	04:00 P.M		57.3	61.3	59.3
9.	05:00 P.M		57.0	61.1	59.1
10.	06:00 P.M		56.8	60.9	58.9
11.	07:00 P.M		56.6	60.7	58.7
12.	08:00 P.M		56.4	60.5	58.5
13.	09:00 P.M		56.2	60.3	58.3
14.	10:00 P.M		56.0	60.0	58.0
15.	11:00 P.M		55.7	59.8	57.8
16.	12:00 A.M		55.5	59.6	57.6
17.	01:00 A.M		55.3	59.4	57.4
18.	02:00 A.M		55.1	59.2	57.2
19.	03:00 A.M		54.9	59.0	57.0
20.	04:00 A.M		54.7	58.7	56.7
21.	05:00 A.M		54.4	58.5	56.5
22.	06:00 A.M		58.2	60.3	58.3
23.	07:00 A.M		61.8	64.8	63.2
24.	08:00 A.M		58.1	60.0	59.1

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 Scientist

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Integrated Environment Laboratory

AMBIENT NOISE MONITORING REPORT

Reference Number:	BHPP/ENV/55-2024	Client Name:	CGGC JV GHC
Project Name:	Balakot Hydropower Project (300 MW)	Monitoring Location:	Colony Area (Sangilar)
Monitoring Date:	18-06-2024	Reporting Date:	26-06-2024
Source: GPS Coordinates:	Ambient Noise 34.567775, 73.386226	Monitoring Instrument:	Noise Meter IEC651-Type-2

Sr. No.	Monitoring Time	Unit	Minimum	Maximum	Leq
1.	09:00 A.M	dB(A)	53.4	56.3	54.9
2.	10:00 A.M		53.2	56.0	54.6
3.	11:00 A.M		52.9	55.8	54.4
4.	12:00 P.M		52.7	55.6	54.2
5.	01:00 P.M		52.6	55.4	54.0
6.	02:00 P.M		52.3	55.2	53.8
7.	03:00 P.M		52.1	55.0	53.6
8.	04:00 P.M		51.9	54.7	53.3
9.	05:00 P.M		51.6	54.5	53.1
10.	06:00 P.M		51.4	54.3	52.9
11.	07:00 P.M		51.2	54.1	52.7
12.	08:00 P.M		51.0	53.9	52.5
13.	09:00 P.M		50.9	53.7	52.3
14.	10:00 P.M		50.6	53.4	52.0
15.	11:00 P.M		49.5	48.4	47.0
16.	12:00 A.M		48.2	48.1	46.7
17.	01:00 A.M		48.0	47.9	46.5
18.	02:00 A.M		44.9	47.7	46.3
19.	03:00 A.M		44.6	47.5	46.1
20.	04:00 A.M		44.4	47.2	45.8
21.	05:00 A.M		48.1	51.0	49.6
22.	06:00 A.M		52.9	55.8	54.3
23.	07:00 A.M		54.3	56.7	55.5
24.	08:00 A.M		51.1	53.9	52.5

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

NEQS: National Environmental Quality Standards **WHO:** World Health Organization
Leq: Leq 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 Analyst

Signature of Chief Chemist

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Drinking Water Monitoring Results (Second Quarter, 2024)

Integrated Environment Laboratory

DRINKING WATER ANALYSIS REPORT

Reference Number:	EHPP/DW/05-2024	Client Name:	Client W.Q#1
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Dam Site (Paras Valley)
Sampling Date:	16-05-2024	Reporting Date:	25-05-2024
Source: GPS Coordinates:	Spring Water (Source) 34.653167, 73.445678	Analysis Method	APHA/USEPA Standard Methods

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA-4500H+ B	--	6.5-8.5	6.5-8.5	7.43
2.	Temperature	---	°C	---	---	15
3.	Taste & Odor	In-house	--	Non-Objectionable	Non Objectionable	Non Objectionable
4.	Color	APHA-2120 B/C	TCU	≤ 15	<15	4.05
5.	Turbidity	APHA-2130 B	NTU	<5	<5	3.3
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000	343
7.	Total Hardness as $CaCO_3$	APHA-2340 C	mg/L	----	<500	247
8.	Nitrate (NO_3)	APHA-4500NO3 B	mg/L	50	≤50	0.74
9.	Nitrite (NO_2)	APHA-4500NO2 B	mg/L	3	≤3	0.0049
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D
11.	Nickel (Ni)	ASTM D5047-16	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	112.1
14.	Chlorine	APHA-4500 Cl	mg/L		0.5-1.5	0.64
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	0.034
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	0.68
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	APHA9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29.	Total Coliform	APHA9222 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 World Health Organization
N D Not Detected

Signature of Analyst Signature of Quality Checklist

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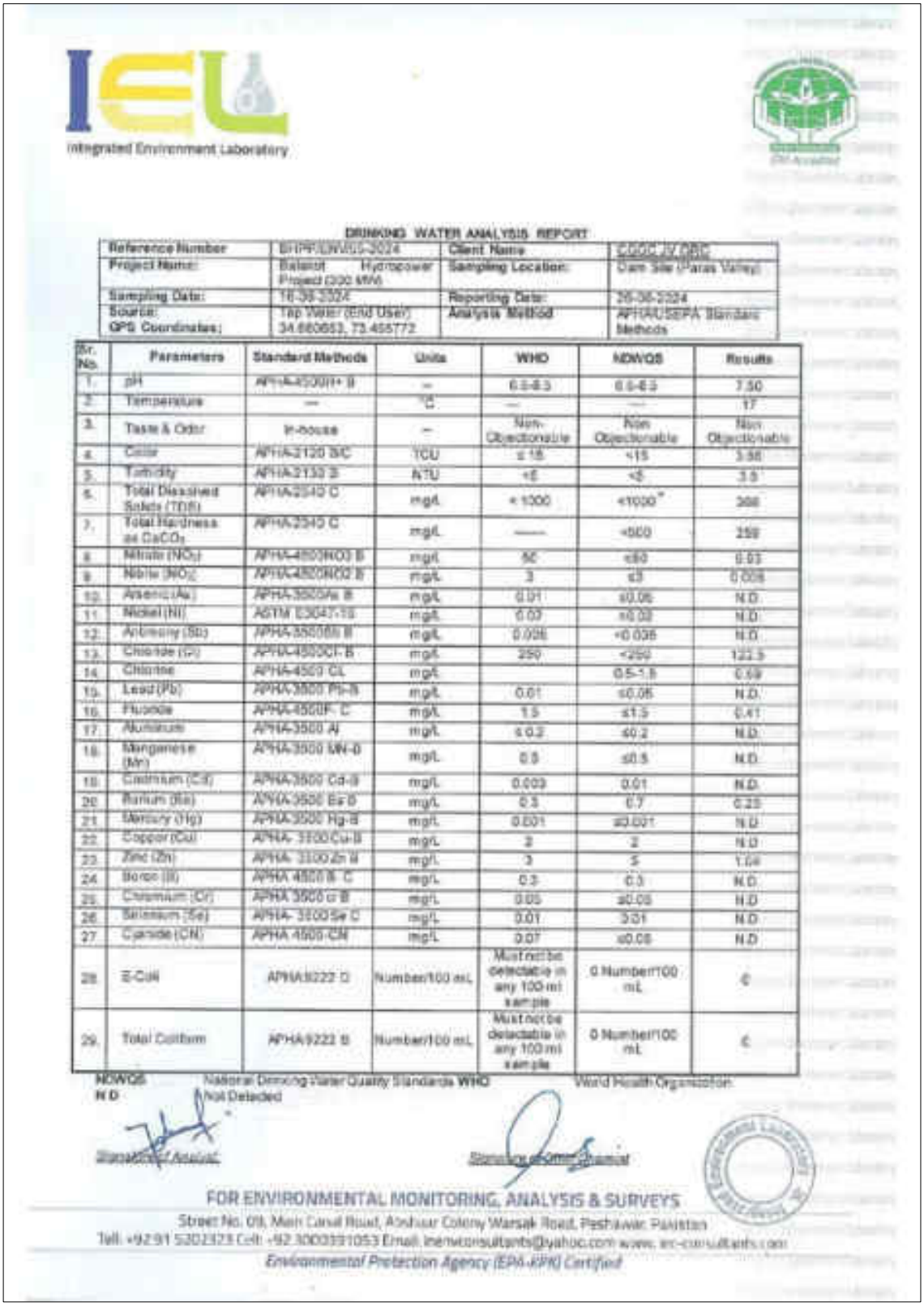

(Integrated Environment Laboratory)

DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/DW/05-2024	Client Name	CSCEC JV PBC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Dam Site (Paras Valley)
Sampling Date:	16-05-2024	Reporting Date:	25-06-2024
Source: GPS Coordinates:	Tap Water (End User) 34.660653, 73.455772	Analysis Method	APHA/USEPA Standard Methods

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA-4500H+ B	–	6.5-8.5	6.5-8.5	7.50
2.	Temperature	—	°C	—	—	17
3.	Taste & Odor	In-house	–	Non-Objectionable	Non Objectionable	Non Objectionable
4.	Color	APHA-2120 B/C	TCU	≤ 15	<15	3.56
5.	Turbidity	APHA-2130 B	NTU	<5	<5	3.5
6.	Total Dissolved Solids (TDS)	APHA2540 C	mg/L	< 1000	<1000*	368
7.	Total Hardness as $CaCO_3$	APHA2340 C	mg/L	------	<500	259
8.	Nitrate (NO_3)	APHA-4500NO3 B	mg/L	50	≤50	0.03
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 D3647-13	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	122.5
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	0.41
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	0.25
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	1.04
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- 3500Se 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	APHA9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29.	Total Coliform	APHA9222 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 World Health Organization

N D Not Detected

Signature of Analyst Signature of Technical Manager

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DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/ENV/65-2024	**Client Name**	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	**Sampling Location:**	Adit-1 [Thobi]
Sampling Date:	18-06-2024	**Reporting Date:**	26-06-2024
Source:	Spring Water (Source)	**Analysis Method**	APHA/USEPA Standard Methods
GPS Coordinates:	34.636128, 73.426507		

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA-4500H+ B	—	6.5-8.5	6.5-8.5	7.33
2.	Temperature	—	°C	—	—	18
3.	Taste & Odor	In-house	—	Non-Objectionable	Non Objectionable	Non Objectionable
4.	Color	APHA-2120 B/C	TCU	≤ 15	<15	3.33
5.	Turbidity	APHA-2130 B	NTU	<5	<5	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	235
8.	Nitrate (NO_3)	APHA-4500NO3 B	mg/L	50	≤50	1.81
9.	Nitrite (NO_2)	APHA-4500NO2 B	mg/L	3	≤3	0.005
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D.
11.	Nickel (Ni)	ASTM D3867-16	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	182.2
14.	Chlorine	APHA-4500 CL	mg/L		0.5-1.5	0.69
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	0.16
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	N.D.
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 World Health Organization
N D Not Detected

Signature of Analyst Signature of Chief Chemist

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DRINKING WATER ANALYSIS REPORT

Reference Number:	BHPP/EMR/5-2024	Client Name:	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Adit-1 (Tholi)
Sampling Date:	15-05-2024	Reporting Date:	30-05-2024
Source: GPS Coordinates:	Tap Water (Well Used) 34.636125, 73.426567	Analysis Method:	APHA/USEPA Standard Methods

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA-4500H+ B	–	6.5-8.5	6.5-8.5	7.32
2.	Temperature	—	°C	—	—	21
3.	Taste & Odor	In-house	–	Non-Objectionable	Non Objectionable	Non Objectionable
4.	Color	APHA-2120 B/C	TCU	≤ 15	<15	5.04
5.	Turbidity	APHA-2130 B	NTU	<5	<5	4.9
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000*	371
7.	Total Hardness as $CaCO_3$	APHA-2340 C	mg/L	——	<500	287
8.	Nitrate (NO_3)	APHA-4500NO3 B	mg/L	50	≤50	1.68
9.	Nitrite (NO_2)	APHA-4500NO2 B	mg/L	3	≤3	0.12
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D.
11.	Nickel (Ni)	ASTM D3047-16	mg/L	0.02	≤0.02	N.D.
12.	Antimony (Sb)	APHA-3500Sb B	mg/L	0.006	<0.006	N.D.
13.	Chlorides (Cl)	APHA-4500Cl- B	mg/L	250	<250	141.9
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	0.62
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	0.21
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	0.9
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	5

NDWQS National Drinking Water Quality Standards WHO World Health Organization
N D Not Detected

Director (Chief Chemist)

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DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/EIA/WS-2024	Client Name	COMC JV (HEC)
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Abbe (Umaid)
Sampling Date:	10-06-2024	Reporting Date:	26-06-2024
Source: GPS Coordinates:	Spring Water 34.619367, 73.417288	Analysis Method	APHA/USEPA Standard Methods

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA-4500H+ B	–	6.5-8.5	6.5-8.5	7.40
2.	Temperature	—	°C	—	—	18
3.	Taste & Odor	In-house	–	Non-Objectionable	Non Objectionable	Non Objectionable
4.	Color	APHA-2120 B/C	TCU	≤ 15	<15	3.57
5.	Turbidity	APHA-2130 B	NTU	<5	<5	3.7
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000	344
7.	Total Hardness as $CaCO_3$	APHA-2340 C	mg/L	——	<500	225
8.	Nitrate (NO_3)	APHA-4500NO3 B	mg/L	50	≤50	0.53
9.	Nitrite (NO_2)	APHA-4500NO2 B	mg/L	3	≤3	0.041
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D.
11.	Nickel (Ni)	ASTM D3867-16	mg/L	0.02	≤0.02	N.D.
12.	Antimony (Sb)	APHA-3500Sb B	mg/L	0.006	<0.005	N.D.
13.	Chloride (Cl)	APHA-4500Cl- B	mg/L	250	<250	160
14.	Chlorine	APHA-4500 CL	mg/L		0.5-1.3	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 Se B	mg/L	0.3	0.7	0.042
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	0.90
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 World Health Organization
N.D Not Detected

Signature of Analyst Signature of Chief Chemist

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DRINKING WATER ANALYSIS REPORT

Reference Number	BHPP/ENVS/2024	Client Name	CQGC JV QHC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	ADIT-2 (Drinking)
Sampling Date:	16-05-2024	Reporting Date:	30-05-2024
Source: GPS Coordinates:	Tap Water (End User) 34.620050, 73.417696	Analysis Method	APHA/USEPA Standard Methods

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA 4500H+ B	—	6.5-8.5	6.5-8.5	7.22
2.	Temperature	—	°C	—	—	19
3.	Taste & Odor	In-house	—	Non Objectionable	Non Objectionable	Non Objectionable
4.	Color	APHA 2120 B/C	TCU	≤ 15	≤15	≤ 14
5.	Turbidity	APHA 2130 B	NTU	<5	<5	≤ 1
6.	Total Dissolved Solids (TDS)	APHA 2540 C	mg/L	< 1000	<1000	358
7.	Total Hardness as $CaCO_3$	APHA 2340 C	mg/L	———	<500	240
8.	Nitrate (NO_3)	APHA 4500NO3 B	mg/L	50	≤50	0.81
9.	Nitrite (NO_2)	APHA 4500NO2 B	mg/L	3	≤3	0.071
10.	Arsenic (As)	APHA 3500As B	mg/L	0.01	≤0.05	N.D.
11.	Nickel (Ni)	ASTM D1687-16	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	179.3
14.	Chlorine	APHA 4500 CL	mg/L		0.5-1.5	0.4
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 A	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	0.093
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	3	1.01
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	5

NDWQS: National Drinking Water Quality Standards WHO: World Health Organization
N D: Not Detected

Signature of Analyst

Signature of Chief Chemist

FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

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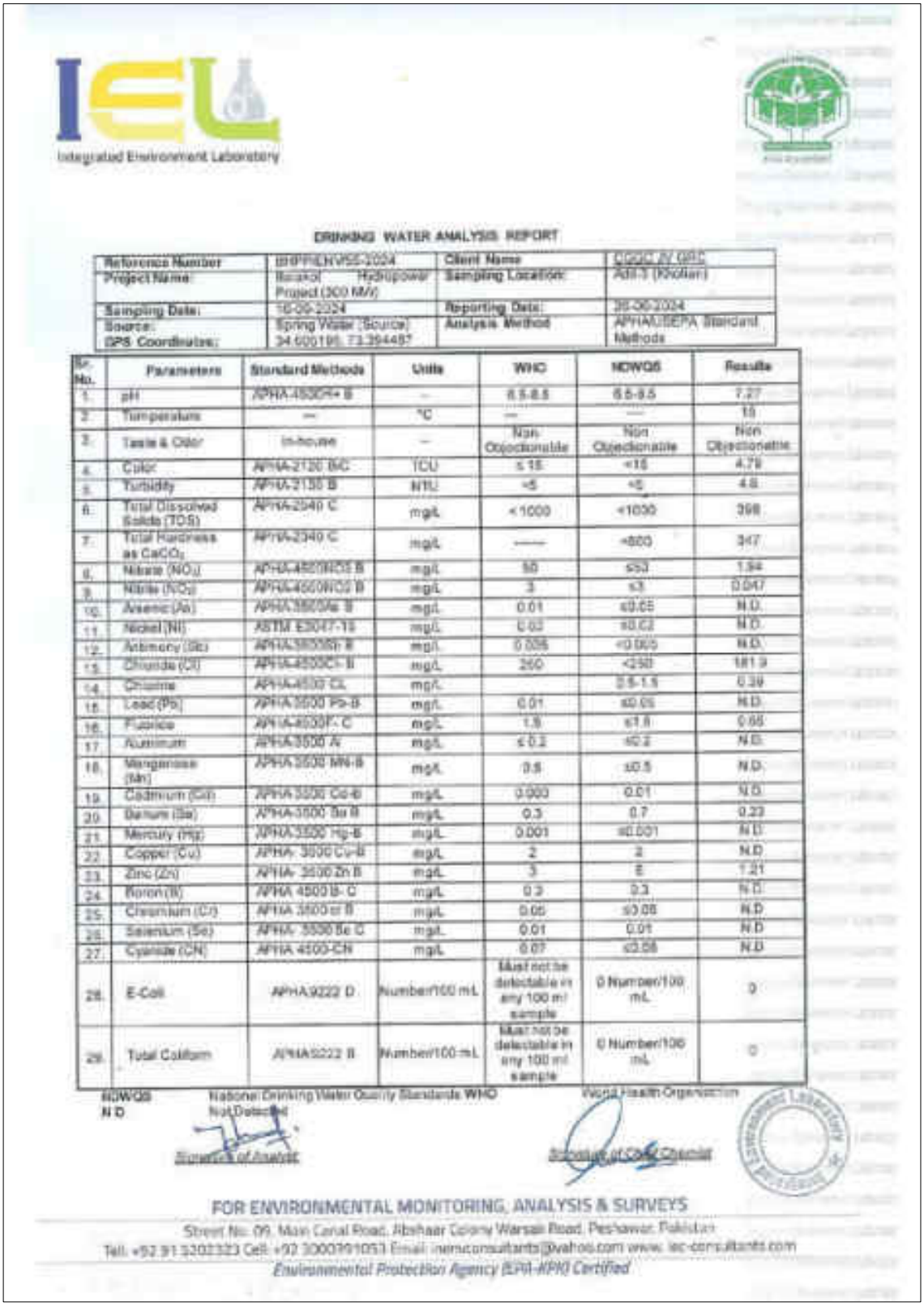

Integrated Environment Laboratory

DRINKING WATER ANALYSIS REPORT

Reference Number	IEL/PHENVSS-2024	Client Name	CGGC JV GHC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Adit-3 (Khoiian)
Sampling Date:	16-06-2024	Reporting Date:	26-06-2024
Source: GPS Coordinates:	Spring Water (Source) 34.600190, 73.394487	Analysis Method	APHA/USEPA Standard Methods

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA 4500H+ B	--	6.5-8.5	6.5-8.5	7.27
2.	Temperature	---	°C	---	---	18
3.	Taste & Odor	In-house	--	Non Objectionable	Non Objectionable	Non Objectionable
4.	Color	APHA-2120 BC	TCU	≤ 15	<15	4.79
5.	Turbidity	APHA-2130 B	NTU	<5	<5	4.8
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	<1000	<1000	398
7.	Total Hardness as $CaCO_3$	APHA-2340 C	mg/L	------	<600	347
8.	Nitrate (NO_3)	APHA-4500NO3 B	mg/L	50	≤50	1.94
9.	Nitrite (NO_2)	APHA4500NO2 B	mg/L	3	≤3	0.047
10.	Arsenic (As)	APHA 3500As B	mg/L	0.01	≤0.05	N.D.
11.	Nickel (Ni)	ASTM E3047-19	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	181.9
14.	Chlorine	APHA4500 CL	mg/L		0.5-1.5	0.39
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	0.23
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	5	5	1.21
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	APHA9222 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 World Health Organization
N.D Not Detected

Signature of Analyst Signature of Quality Checklist

FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

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DRINKING WATER ANALYSIS REPORT

Reference Number:	IEL/PENV/55-2024	Client Name:	CGGC JV DRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	ADS-2 (Khilkari)
Sampling Date:	10-06-2024	Reporting Date:	26-06-2024
Source: GPS Coordinates:	Pipe Water (End User) 34.808942, 73.383133	Analysis Method	APHA/USEPA Standard Methods

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA-4500H+ B	–	6.5-8.5	6.5-8.5	7.07
2.	Temperature	---	°C	---	---	17
3.	Taste & Odor	In-house	–	Non-Objectionable	Non Objectionable	Non Objectionable
4.	Color	APHA-2120 B/C	TCU	≤ 15	<15	3.40
5.	Turbidity	APHA-2130 B	NTU	<5	<5	5.3
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000	416
7.	Total Hardness as $CaCO_3$	APHA-2340 C	mg/L	------	<500	381
8.	Nitrate (NO_3)	APHA-4500NO3 B	mg/L	50	≤50	2.52
9.	Nitrite (NO_2)	APHA-4500NO2 B	mg/L	3	≤3	0.62
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D.
11.	Nickel (Ni)	ASTM E3047-15	mg/L	0.02	≤0.02	N.D.
12.	Antimony (Sb)	APHA-3500Sb B	mg/L	0.006	<0.006	N.D.
13.	Chloride (Cl)	APHA-4500Cl- E	mg/L	250	<250	177.6
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	0.61
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	N.D.
23.	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	0.05
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	APHA9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29.	Total Coliform	APHA9222 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 World Health Organization
N D Not Detected

Signature of Analyst

Signature of Chief Chemist

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DRINKING WATER ANALYSIS REPORT

Reference Number:	BHPPEN255-2024	Client Name:	Consult AI (Pvt)
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Powerhouse (Balkot)
Sampling Date:	16-05-2024	Reporting Date:	20-05-2024
Source: GPS Coordinates:	Spring Water (Sandun) 34.602747, 73.379523	Analysis Method:	APHA/USEPA Standard Methods

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA-4500H+ B	–	6.5-8.5	6.5-8.5	7.21
2.	Temperature	—	°C	—	—	19
3.	Taste & Odor	In-house	–	Non-Objectionable	Non Objectionable	Non Objectionable
4.	Color	APHA-2120 B/C	TCU	≤ 15	<15	3.38
5.	Turbidity	APHA-2130 B	NTU	<5	<5	3.8
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	289
8.	Nitrate (NO_3)	APHA-4500NO3 B	mg/L	50	≤50	0.63
9.	Nitrite (NO_2)	APHA-4500NO2 B	mg/L	3	≤3	0.28
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D.
11.	Nickel (Ni)	ASTM D3867-16	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	192.3
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	1.29
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	0.062
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	1.01
24.	Boron (B)	APHA 4500 B- C	mg/L	0.3	0.5	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	APHA9222 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 World Health Organization
N.D Not Detected

Signature of Analyst Signature of Lab In-Charge

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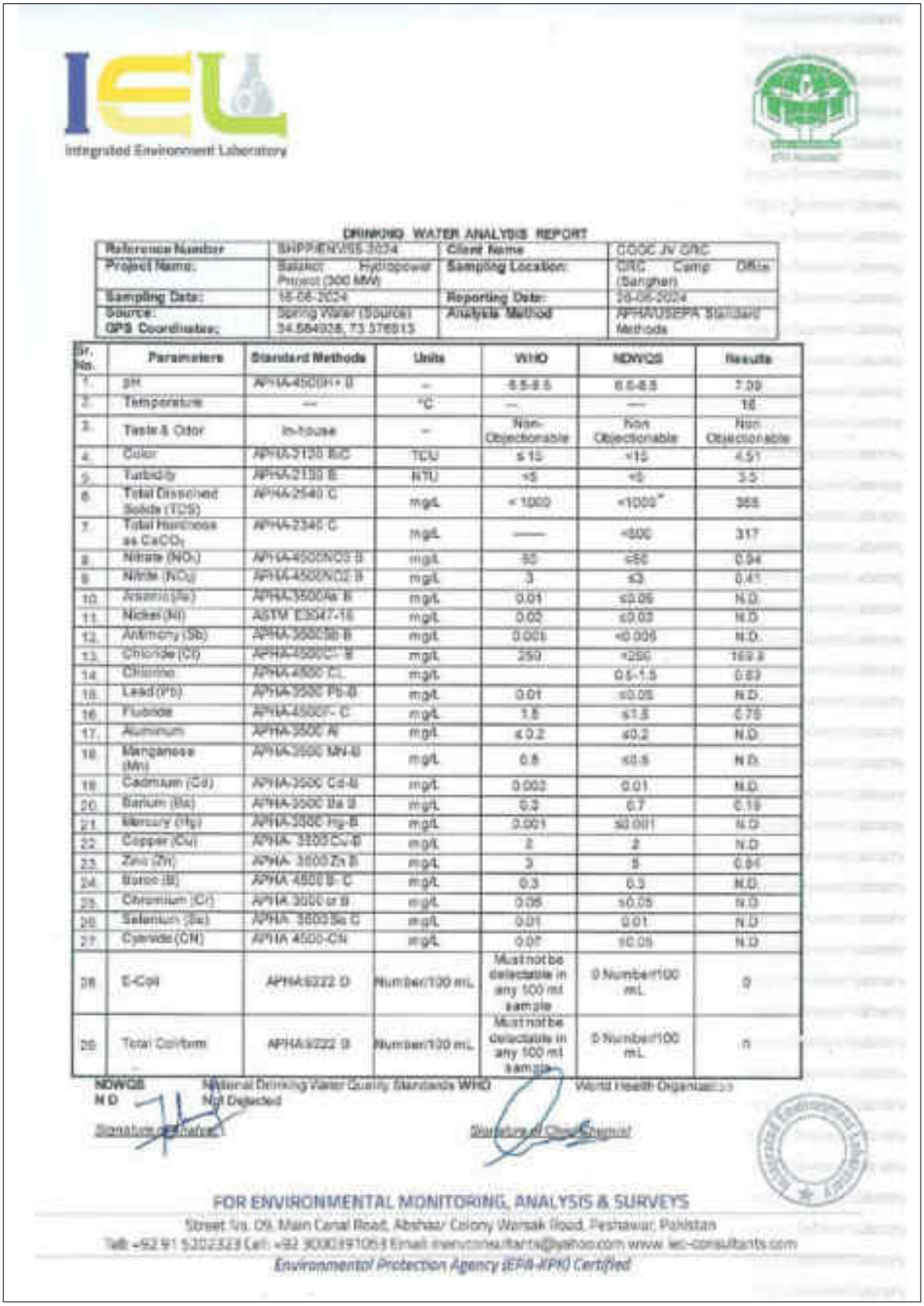

Integrated Environment Laboratory

DRINKING WATER ANALYSIS REPORT

Reference Number	SHPP/ENV/05-2024	**Client Name**	COOC JV CRC
Project Name:	Balakot Hydropower Project (300 MW)	**Sampling Location:**	CRC Camp Office (Sanghar)
Sampling Date:	16-05-2024	**Reporting Date:**	20-05-2024
Source: **GPS Coordinates:**	Spring Water (Source) 34.584938, 73.376915	**Analysis Method**	APHA/USEPA Standard Methods

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA-4500H+ B	–	6.5-8.5	6.5-8.5	7.09
2.	Temperature	—	°C	—	—	16
3.	Taste & Odor	In-house	–	Non-Objectionable	Non Objectionable	Non Objectionable
4.	Color	APHA-2120 B/C	TCU	≤ 15	<15	4.51
5.	Turbidity	APHA-2130 B	NTU	<5	<5	3.5
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000*	365
7.	Total Hardness as $CaCO_3$	APHA-2340 C	mg/L	——	<500	317
8.	Nitrate (NO_3)	APHA-4500NO3 B	mg/L	50	≤50	0.94
9.	Nitrite (NO_2)	APHA-4500NO2 B	mg/L	3	≤3	0.41
10.	Arsenic(As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D.
11.	Nickel (Ni)	ASTM D3867-16	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	169.8
14.	Chlorine	APHA-4500 Cl.	mg/L		0.5-1.5	0.83
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	0.75
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	0.84
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	APHA9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29.	Total Coliform	APHA9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0

NDWQS National Drinking Water Quality Standards **WHO** World Health Organization
N D Not Detected

Signature of Analyst Signature of Chief Chemist

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DRINKING WATER ANALYSIS REPORT

Reference Number:	BHPP/ENVSS-2024	Client Name:	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	GRC Camp Office (Sangher)
Sampling Date:	16-06-2024	Reporting Date:	20-06-2024
Source: GPS Coordinates:	Tap Water (End User) 34.584478, 73.373817	Analysis Method	APHA/USEPA Standard Methods

Sr. No.	Parameters	Standard Methods	Units	WHO	NDWQS	Results
1.	pH	APHA-4500H+ B	–	6.5-8.5	6.5-8.5	7.32
2.	Temperature	—	°C	—	—	18
3.	Taste & Odor	In-house	–	Non-Objectionable	Non Objectionable	Non Objectionable
4.	Color	APHA-2120 B/C	TCU	≤ 15	<15	4.71
5.	Turbidity	APHA-2130 B	NTU	<5	<5	4.1
6.	Total Dissolved Solids (TDS)	APHA-2540 C	mg/L	< 1000	<1000*	371
7.	Total Hardness as $CaCO_3$	APHA 2340 C	mg/L	——	<500	358
8.	Nitrate (NO_3)	APHA-4500NO3 B	mg/L	50	≤50	1.35
9.	Nitrite (NO_2)	APHA-4500NO2 B	mg/L	3	≤3	0.09
10.	Arsenic (As)	APHA-3500As B	mg/L	0.01	≤0.05	N.D.
11.	Nickel (Ni)	ASTM D3867-16	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	185
14.	Chlorine	APHA-4500 Cl	mg/L		0.5-1.5	0.58
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	0.61
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	N.D.
23.	Zinc (Zn)	APHA- 3500 Zn B	mg/L	3	5	0.99
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	APHA9222 D	Number/100 mL	Must not be detectable in any 100 ml sample	0 Number/100 mL	0
29.	Total Coliform	APHA9222 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 World Health Organization
N.D Not Detected

Signature of Analyst

Signature of Chemist

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Surface Water Monitoring Results (Second Quarter, 2024)

Integrated Environment Laboratory

SURFACE WATER ANALYSIS REPORT

Reference Number	DHP/ENVSS-2024	Client Name	Cooper AV (pvt) Limited
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Dam Site (Palas Valley)
Sampling Date:	16-06-2024	Reporting Date:	28-06-2024
Source: GPS Coordinates	Kunhar River 34.660247, 73.451593	Analysis Method	APHA/USEPA Standard Methods

Sr. No	Parameters	Analysis Method	Units	NEQS	Results
1)	Temperature	---	°C	40	16
2)	pH	APHA-4500H+ B	--	6-9	7.6
3)	Chemical Oxygen Demand (COD)	APHA-5220-D	mg/l	150	39
4)	Biological Oxygen Demand (BOD5) at 20 °C	APHA, 5210	mg/l	80	27.8
5)	Total Dissolved Solids (TDS)	APHA-2540 C	mg/l	3500	1251
6)	Total Suspended Solids (TSS)	APHA-2540 D	mg/l	*200	38
7)	Total Hardness	APHA-2340 C	mg/l	--	109
8)	Oil & Grease	Separation Method	mg/l	10	0.2
9)	Chromium (Hexa & Trivalent)	APHA-3500Cr B	mg/l	1.0	0.10
10)	Total Iron	APHA-3500-Fe-B	mg/l	8.0	2.24
11)	Chloride	APHA-4500Cl- B	mg/l	1000	152
12)	Flouride	APHA-4500F- C	mg/l	10	2.09
13)	Ammonia	ASTM D1426-15	mg/l	40	1.4
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	0.323
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	0.14
22)	Zinc	APHA-3500-Zn B	mg/l	5.0	0.44
23)	Nickel	ASTM D3047-15	mg/l	1.0	N.D
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	0.23
27)	Sulphate (SO_4)	APHA-4500-SO_4 C	mg/l	600	309
28)	An Ionic Detergent (as MBAS)	---	mg/l	20	0.52
29)	Phenolic Compound (as Phenol)	APHA-5530-D	mg/l	0.1	N.D
30)	Cyanide (as CN) total	APHA 4500-CN	mg/l	1.0	N.D
31)	E-Coli	APHA9222 D	Number/100 mL	---	Uncountable
32)	Total Coliform	APHA9222 B	Number/100 mL	---	Uncountable

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

Signature of Analyst

Signature of Chief Chemist

FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

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Integrated Environment Laboratory

SURFACE WATER ANALYSIS REPORT

Reference Number	IEL/PR/NWS-2024	Client Name	CSDC JV (PVT)
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Tailrace Upstream (Balakot)
Sampling Date:	10-06-2024	Reporting Date:	26-06-2024
Source: GPS Coordinates	Kunhar River 34.5671541, 73.3700751	Analysis Method	APHA/USEPA Standard Methods

Sr. No	Parameters	Analysis Method	Units	NEQS	Results
1)	Temperature	----	°C	40	17
2)	pH	APHA-4500H+ B	---	6-9	7.7
3)	Chemical Oxygen Demand (COD)	APHA-5220-D	mg/l	150	44
4)	Biological Oxygen Demand (BOD5) at 20 °C	APHA, 5310	mg/l	80	20.4
5)	Total Dissolved Solids (TDS)	APHA-2540 C	mg/l	3500	1292
6)	Total Suspended Solids (TSS)	APHA-2540 D	mg/l	*200	74
7)	Total Hardness	APHA-2340 C	mg/l	---	127
8)	Oil & Grease	Separation Method	mg/l	10	0.88
9)	Chromium (Hexa & Trivalent)	APHA-3500Cr B	mg/l	1.0	0.3
10)	Total Iron	APHA-3500-Fe- B	mg/l	8.0	2.48
11)	Chloride	APHA-4500Cl- B	mg/l	1000	182
12)	Flouride	APHA-4500F- C	mg/l	10	2.06
13)	Ammonia	ASTM-D1426-15	mg/l	40	2.58
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	0.060
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	0.24
22)	Zinc	APHA-3500-Zn B	mg/l	5.0	0.58
23)	Nickel	ASTM E3047-19	mg/l	1.0	N.D
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	0.17
27)	Sulphate (SO_4)	APHA-4500-SO_4 C	mg/l	600	323
28)	An Ionic Detergent (as MBAS)	----	mg/l	20	0.89
29)	Phenolic Compound (as Phenol)	APHA-5530-D	mg/l	0.1	0.052
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	APHA9222 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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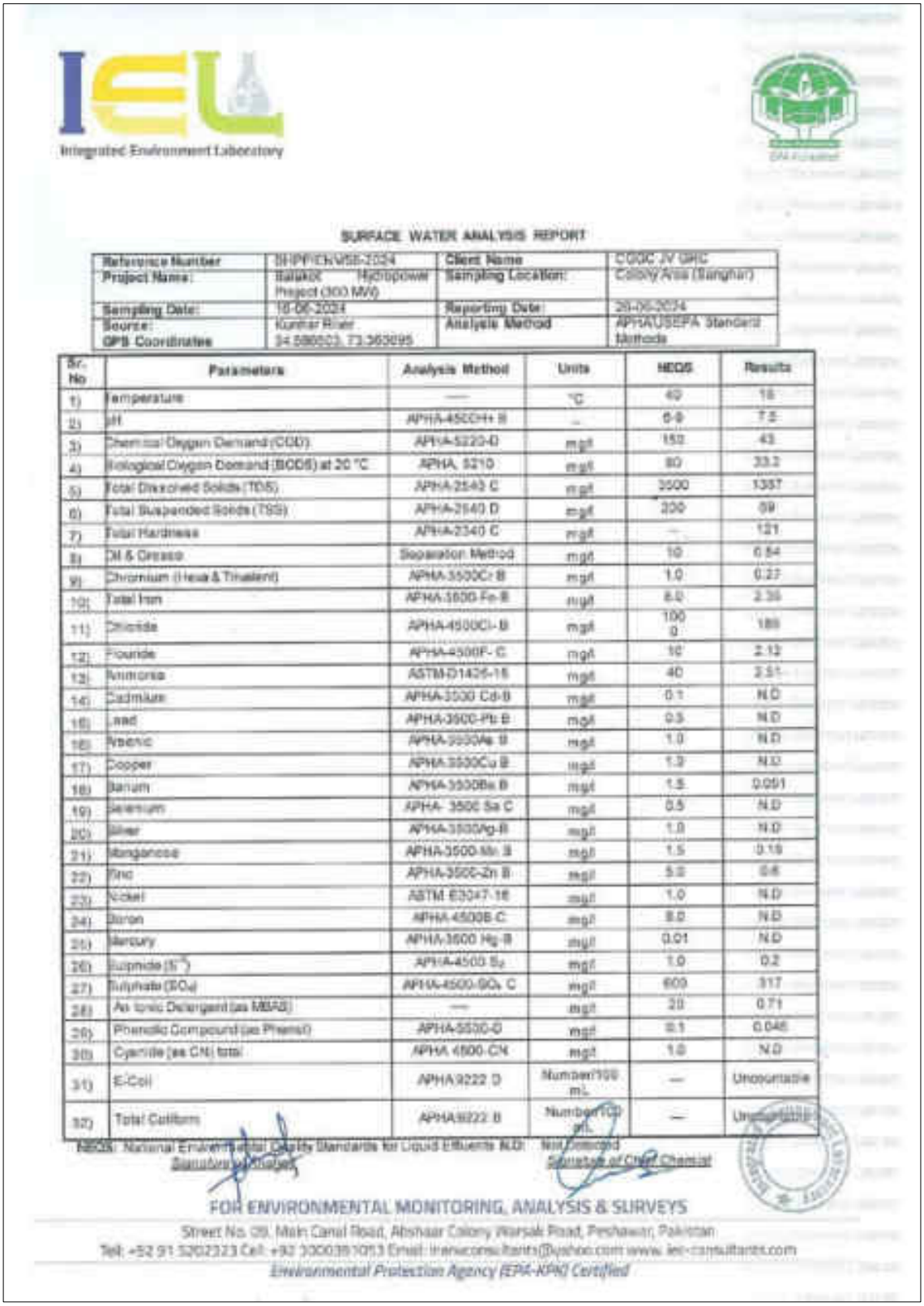

Integrated Environment Laboratory

SURFACE WATER ANALYSIS REPORT

Reference Number	IEL/PHE/Ch/WSR-2024	Client Name	CGGC JV GHC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Colony Area (Sanghar)
Sampling Date:	18-06-2024	Reporting Date	26-06-2024
Source: GPS Coordinates	Kunhar River 34.586503, 73.363695	Analysis Method	APHA/USEPA Standard Methods

Sr. No	Parameters	Analysis Method	Units	NEQS	Results
1)	Temperature	—	°C	40	18
2)	pH	APHA-4500H+ B	-	6-9	7.5
3)	Chemical Oxygen Demand (COD)	APHA-5220-D	mg/l	150	43
4)	Biological Oxygen Demand (BOD5) at 20 °C	APHA, 5210	mg/l	80	33.3
5)	Total Dissolved Solids (TDS)	APHA-2540 C	mg/l	3500	1357
6)	Total Suspended Solids (TSS)	APHA-2540 D	mg/l	200	69
7)	Total Hardness	APHA-2340 C	mg/l	—	121
8)	Oil & Grease	Separation Method	mg/l	10	0.54
9)	Chromium (Hexa & Trivalent)	APHA-3500Cr-B	mg/l	1.0	0.27
10)	Total Iron	APHA-3500-Fe-B	mg/l	8.0	2.35
11)	Chloride	APHA-4500Cl- B	mg/l	1000	189
12)	Flouride	APHA-4500F- C	mg/l	10	2.12
13)	Ammonia	ASTM-D1426-15	mg/l	40	3.51
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	0.091
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	0.19
22)	Zinc	APHA-3500-Zn B	mg/l	5.0	0.6
23)	Nickel	ASTM-D3947-16	mg/l	1.0	N.D
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	0.2
27)	Sulphate (SO_4)	APHA-4500-SO_4 C	mg/l	600	317
28)	An ionic Detergent (as MBAS)	—	mg/l	20	0.71
29)	Phenolic Compound (as Phenol)	APHA-5530-D	mg/l	0.1	0.046
30)	Cyanide [as CN] total	APHA 4500-CN	mg/l	1.0	N.D
31)	E-Coli	APHA 9222 D	Number/100 mL	—	Unsatisfactory
32)	Total Coliform	APHA 9222 B	Number/100 mL	—	Unsatisfactory

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

Signature of Analyst

Signature of Chief Chemist

FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

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Soil Analysis Results (Second Quarter, 2024)

Integrated Environment Laboratory

SOIL ANALYSIS REPORT

Reference Number	BHPP/ENV/SS-2024	Client Name	CGGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location :	Adit (Tribal)
Monitoring Date:	18-06-2024	Reporting Date:	26-06-2024
Source:	Soil Sample		

Sr. No.	Parameters		Results
1	Soil Texture	Sand %	35
		Silt%	46
		Clay %	19
		Texture Class	Silty Clay Loam
2	pH		7.6
3	Electrical Conductivity EC (μSm^{-1})		239
4	Phosphorus ($mgkg^{-1}$)		1.26
5	Sodium Absorption Ratio		3.33

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

Environmental Analyst

Signature of Lab In-charge

FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

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Integrated Environment Laboratory

SOIL ANALYSIS REPORT

Reference Number:	EHPP/ER/SS-2024	Client Name:	CGGC JV SHPC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Adit-2 (Drilling)
Monitoring Date:	18-05-2024	Reporting Date:	29-05-2024
Source:	Soil Sample		

Sr. No.	Parameters		Results
1	Soil Texture	Sand %	28
		Silt%	39
		Clay %	33
		Texture Class	Silty Clay Loam
2	pH		7.6
3	Electrical Conductivity EC (μSm^{-1})		257
4	Phosphorus ($mgkg^{-1}$)		2.38
5	Sodium Absorption Ratio		3.96

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

Signature Analyst

Signature of Chief Scientist

FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

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Integrated Environment Laboratory

SOIL ANALYSIS REPORT

Reference Number:	IEL/PE/EN/010-2024	Client Name:	[illegible]
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	ADF3 (Middle)
Monitoring Date:	18-06-2024	Reporting Date:	28-06-2024
Source:	Soil Sample		

Sr. No.	Parameters		Results
1	Soil Texture	Sand %	36
		Silt%	41
		Clay %	23
		Texture Class	Silty Clay Loam
2	pH		8.02
3	Electrical Conductivity EC (μSm^{-1})		381
4	Phosphorus ($mgkg^{-1}$)		2.38
5	Sodium Absorption Ratio		3.23

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

Environmental Analyst

Environmental Engineer

FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS
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SOIL ANALYSIS REPORT

Reference Number:	IHPP/ENVSS/2024	Client Name:	[illegible]
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location:	Powerhouse (Barko)
Monitoring Date:	10-06-2024	Reporting Date:	28-06-2024
Source:	Soil Sample		

Sr. No.	Parameters		Results
1	Soil Texture	Sand %	33
		Silt%	38
		Clay %	29
		Texture Class	Silty Clay Loam
2	pH		7.8
3	Electrical Conductivity EC (μSm^{-1})		366
4	Phosphorus (mgkg^{-1})		3.07
5	Sodium Absorption Ratio		3.55

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

Signature of Analyst

Signature of Lab In-charge

FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

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Integrated Environment Laboratory

SOIL ANALYSIS REPORT

Reference Number	BHPP/ENV/05-2024	Client Name	CDGC JV GRC
Project Name:	Balakot Hydropower Project (300 MW)	Sampling Location :	GRC Camp Office (Banghar)
Monitoring Date:	10-06-2024	Reporting Date:	25-06-2024
Source:	Soil Sample		

Sr. No.	Parameters		Results
1	Soil Texture	Sand %	20
		Silt%	44
		Clay %	30
		Texture Class	Silty Clay Loam
2	pH		7.8
3	Electrical Conductivity EC (μSm^{-1})		251
4	Phosphorus ($mgkg^{-1}$)		3.88
5	Sodium Absorption Ratio		3.64

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

Signature of Analyst

Signature of Lab In-charge

FOR ENVIRONMENTAL MONITORING, ANALYSIS & SURVEYS

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Tel: +92 91 5202323 Cell: +92 3005391053 Email: ieqconsultants@yahoo.com www.iec-consultants.com

Environmental Protection Agency (EPA-KPK) Certified

Annexure 3: Copy of the Contract Signed Between the EPC Contractor and ARAR for Medical Waste Disposal

Copy of Contract with ARAR for Medical Waste Disposal

CONTRACT AGREEMENT

HAZARDOUS WASTE COLLECTION & INCINERATION SERVICES

Dated: 30 Day of April 2024

Between

ARAR Services (Pvt) Ltd

And

China Gezhouba Group Corporation (CGGC) – Mansehra

This Service Contract "Hazardous Waste Collection & Incineration Services" (hereinafter called the "Contract") is made at Peshawar for which the services will be initiated on 30 day of April, 2024

Between

China Gezhouba Group Corporation (CGGC) , Balakot Hydropower Project A2 Camp (Ghanool), Mansehra KP (hereinafter called the "First Party") which expression shall include successors, legal representatives and permitted assigns) of the first party

And

M/S Arar Services (Pvt) Ltd., having its head office at 140-A Shadman-II Lahore, and branch office at, Plot # W-35-A, Road B-1 Hayatabad Industrial Estate - Peshawar, (hereinafter called the "Second Party"). This Service includes scope of services/terms of reference, general conditions of contract, special conditions of contract, and appendices.

WHEREAS;

(a) The First Party has requested the second party to provide certain services as defined in the contract (hereinafter called the "Hazardous Waste Collection & Incineration Services");

(b) The Second Party having the required professional skills, expertise and technical resources, has agreed to provide the collection & incineration services to the First Party on the terms and conditions set forth in this contract;

NOTARY PUBLIC

(Page 1 0f 3)

This Contract consists of the terms and conditions set forth in the sections captioned by numbered and article designations "**Articles**" which are incorporated and made part this Contract.

Article 1 - Scope of Services
Article 2 - Obligations of the First Party
Article 3- Obligations of the Second Party
Article 4 - Mechanism
Article 5 - Duration of the Contract
Article 6 - Confidentiality
Article 7 - Payment Terms
Article 8 - Communication
Article 9 - Law & Jurisdiction
Article 10- Force Majeure
Article 11- Dispute Resolution
Article 12- Termination of Services

ARTICLE 1: SCOPE OF SERVICES

The Second Party shall perform the services of transportation and incineration of Hazardous Waste, collected from the designated area of First Party. The segregation and interim storage of the Hazardous Waste is the responsibility of First Party.

ARTICLE 2: OBLIGATIONS OF THE FIRST PARTY

2.1 The First Party is highly recommended to ensure, having the availability of all goods, consumables and allied items to ensure the effective and in-time collection in HDPE / LDPE bags, tagging and interim storage of waste at designated area.

2.2 The First Party shall be responsible to ensure the proper segregation of waste as per Hospital Waste Management Rules 2005 – EPA, KPK. The First party shall ensure to put the Infectious waste (used drips, gauze piece, cotton swabs, used bandages, IV Lines etc.) in YELLOW Bag. The First Party shall also ensure to put the Glass/Sharps Waste in separate Yellow Bag and syringes/blades in a YELLOW SHARP CONTAINER. The first party shall be responsible to get its staff properly trained for the segregation of Waste as per protocols set forth by Hospital Waste Management Rules 2005, by EPA-KPK Department.

2.3 The First Party is also highly recommended to ensure that every bag is being collected within 24 hours times of its placement or once got filled, and store in controlled temperature till the arrival of vehicle from second party, for collecting those bags.

2.4 In case, the First Party does not follow the above-mentioned protocols, or any protocol set forth by Hospital Waste Management Rules 2005, by EPA-KPK Department, the second party shall not be responsible for any kind of Hospital Waste Management Rules 2005, by EPA-KPK Department violation on the part of first party.

ARTICLE 3: OBLIGATIONS OF THE SECOND PARTY

3.1 The Second Party shall

(a) collect the properly segregated Hazardous Waste by the staff of FIRST Party, from the designated place of the First Party in its own purpose-built yellow vehicle.
(b) Transport the Hazardous Waste to the Incineration site through safe and environmentally controlled mechanism.
(c) Incineration of Hazardous Waste in incinerator according to Hospital Waste Management Rules 2005 EPA – KPK
(d) Disinfection and Shredding of glass waste.

3.2 The Second Party shall provide all the relevant data of the collection and disposal of Waste.

3.3 The Second Party shall provide the access of HWM Software to the First Party for online viewing of waste collected and incinerated, if required by the first party against the monthly subscription charges.

ARTICLE 4: MECHANISM

4.1 The vehicle of the Second Party shall visit the First Party designated area as per agreed schedule between the parties.

(Page 2 0f 3)

ARTICLE 11: DISPUTE RESOLUTION

Any dispute arising in connection with this Agreement shall be settled by the Parties amicably within a period of 10 days from the service of notice, failing which the same shall be referred to Arbitration under the Arbitration Act, 1940, and a single Arbitrator shall be appointed with mutual consent of both parties. The venue of arbitration shall be Lahore or Peshawar. The decision of the Arbitrator shall be final and binding upon the Parties. The Arbitration proceedings shall be concluded within one month of such reference and the cost/fee etc. shall be borne by the party seeking arbitration.

ARTICLE 12: TERMINATION OF SERVICES

This Contract may be terminated by either Party as per provisions setup below.

Second Party shall be liable to proceed for the termination of contract, if any of the given below situation arises.

1. The payment is not being made on agreed payment schedule / within stipulated time period.
2. If the payment is being delayed by the First Party on regular basis.
3. If the first party concerned staff will not be cooperative and create hindrances in the execution of duties by second party.
4. If the first party shall not perform its duties as per defined scope of work.

First party shall be liable to proceed for the termination of contract, if any of the given below situation arises.

1. The services are not being performed by second party as per their defined scope of work in contract.

   Both parties shall be responsible to give a fifteen days prior notice before the termination of services.

IN WITNESS WHEREOF, the parties hereto have caused the contract to be executed on the day, month and year indicated above.

Signed on behalf of ARAR Services (PVT) Ltd.
Place:
Date:
Asif Aziz

Signed on behalf of China Gezhouba Group Corporation (CGGC):
Place:
Date:

Witnesses:

1.
2.

1.
2.

(Page 3 0f 3)

Annexure 4: Details of Students Enrolled for Vocational Training

Details of Students Enrolled for Vocational Training

S. No	Name	Father Name	Gender	Contact Number	Total	Field	Affectees Status	Verified by GRC member
1	Aliya Ishfaq	M. Ishfaq	Female	03485667392/ 03489850351	Tailoring 08	Tailoring	House Affectee/Sangar	Muhammad Tariq
2	Salma Bibi	Salman	Female	03423104225		Tailoring	House Affectee/Sangar	Muhammad Tariq
3	Anum Bibi	Mir Zaman	Female	03488864800		Tailoring	House Affectee/Sangar	Muhammad Tariq
4	Soniya Bibi	Manzoor Hussain	Female	03453761506		Tailoring	House Affectee/Sangar	Muhammad Tariq
5	Shanza Bibi	Abdur Rehman	Female	03465379396		Tailoring	Land Affectee/Sangar	Muhammad Tariq
6	Kalsoom Bibi	Wali ur Rehman	Female	03438939492		Tailoring	House Affectee/Sangar	Muhammad Tariq
7	Summiya Bibi	Muhammad Bashir	Female	03463993862		Tailoring	Land Affectee/Sangar	Muhammad Tariq
8	Uzma Bibi	Maqbool Rehman	Female			Tailoring	Land Affectee/Sangar	Muhammad Tariq
9	Nazish Bibi	Annaullah	Female	03485667392	Beautician 03	Beautician	House Affectee/Sangar	Muhammad Tariq
10	Jamila Bano	Annaullah	Female	03485667392		Beautician	House Affectee/Sangar	Muhammad Tariq
11	Maryam Bibi	Habib ur Rehman	Female	03467204361		Beautician	House Affectee/Sangar	Muhammad Tariq
12	Muhammad Bilal	Aurangzeb	Male	03471961896	Computer Operator 06	Computer Operator	Land Affectee/ Sangar	Muhammad Tariq
13	Muneeb	Ghulam Qadir	Male	0325-6090736		Computer Operator	Land Affectee/ Sangar	Muhammad Tariq
14	Uzair Habib	Habib ur Rehman	Male	03467204362		Computer Operator	Land Affectee/ Sangar	Muhammad Tariq
15	Main Bilal Ahmed	Fida Hussain	Male	03470121938		Computer Operator	Land Affectee/ Sangar	Muhammad Tariq
16	Hammad Saleem	Muhammad Saleem	Mala	03448709856		Computer Operator	Land Affectee/ Sangar	Muhammad Tariq
17	Mian Muhammad Jamal	Muhammad Shabir	Male	03450528743	Electrician 02	Electrician	Land Affectee/ Sangar	Muhammad Tariq
18	Hamza Salahudeen	Salah ud Din	Male	03419557308		Electrician	Land Affectee/Sangar	Muhammad Tariq