Environmental Monitoring Report

PUBLIC

6 Semestral Report
July 2024

Pakistan: Balochistan Water Resources Development Sector Project

Prepared by Balochistan Irrigation Department and the Agriculture and Cooperatives Department for the Islamic Republic of Pakistan and the Asian Development Bank (ADB).

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Abbreviations

ACD	Agriculture and Cooperatives Department
ADB	Asian Development Bank
BWRDSP	Balochistan Water Resources Development Sector Project
BEPA	Balochistan Environmental Protection Agency
BEQS	Balochistan Environmental Quality Standards
BID	Balochistan Irrigation Department
CSC	Construction Supervision Consultants
EMP	Environmental Management Plan
ES	Environment Specialist
GoB	Government of Balochistan
GRC's	Grievance Redressal Committee's
GRM	Grievance Redressal Mechanism
ha	Hectare
H&S	Health and safety
HSE	Health Safety and Environment
IA	Implementation Agency
IEE	Initial Environmental Examination
MRB	Mula River Basin
PMO	Project Management Office
PIS	Perennial Irrigation Scheme
PIO	Project Implementation Office
PPE's	Personal protective equipment's
SAEMR	Semi-annual Environmental Monitoring Report
SC	Supervision Consultant
SFA	Social Framework Agreement
SPDIS	Solar Powered Drip Irrigation System
SOPs	Standard Operating Procedures
SSEMP	Site Specific Environmental Management Plan
SSHSEMP	Site Specific Health Safety Environmental Management Plan
TBT	Toolbox Talk
WRB	Water Resources Building
ZRB	Zhob River Basin

BRIEF SUMMARY

1. The Asian Development Bank (ADB) is partnering with the Government of Balochistan Province (GoBP), to undertake the Balochistan Water Resources Development Sector Project (BWRDSP) in Zhob and Khuzdar Districts.

2. The BWRDSP will support the implementation of the integrated water resources management policy of the Government of Balochistan (GoB). This policy provides a comprehensive framework for the province to address the issues of water management and development in the context of basin approach, with water harvesting, and groundwater recharging as an integral part of watershed management. About 11 potential sub-projects out of over 300 longlists in the Zhob and Mula river basins were selected for potential ADB financing based on a set of criteria such as water and land availability, economic viability, and a balanced approach to extending development support to different tribal groups. The project was approved by ADB on 31 August 2018 for a concessional loan of $100 million from ADB's ordinary capital resources (L3700-PAK), a grant of $3 million from the Japan Fund for Poverty Reduction (JFPR, G9197-PAK), and a grant of $2 million from the High-Level Technology Fund (HLTF, G0597-PAK). The loan, grants, and project agreements were signed on 5 January 2019. The loan and grants became effective on 7 March 2019. The physical completion of the project will be on 31 July 2026.

3. The project is focused on achieving two significant outcomes in Balochistan: enhancing farm income and improving water resources management. By effectively implementing this project, we aim to witness a remarkable increase in agricultural production in the project areas.

4. Outputs: The project has three outputs:

   (i) Irrigation infrastructure constructed and/ improved;

   (ii) Command area and watershed protection expanded and improved; and

   (iii) Institutional capacity strengthened.

5. Details of Sub-projects

   - **Ahmedzai Perennial Irrigation Scheme NCB 08:** This sub-project named Ahmedzai Irrigation Scheme NCB 08 is located in District Zhob at a distance of about 51 km South-East of Zhob City. This sub-project will rehabilitate and improve damaged weir, canals and appurtenant structures to serve an area of 612 ha. Main components of the sub-project include; (i) a weir structure on the Saward Rud (river) with an irrigation outlet for Perennial channel on the right side and a head regulator for Flood channel on the left side;(ii) a 3.5 km long

Perennial Irrigation channel to irrigate 208 ha of command area on right bank (iii) a 7.5km long Flood Irrigation Channel to irrigate 404 ha of land by Sailaba irrigation on the left bank of the river. The proposed project is awarded to Noor ul Haq & Brothers Contractors.

- **Karakh valley development sub-project NCB 01:** This sub-project is comprised of 2250 ha of culturable land, which will be brought under irrigated agriculture. It is estimated that around 20 MCM of water is available annually for developing agriculture in the command area on the both right and left banks of the river. Currently, cropping intensity in the core sub-project area is 89% and it will be increased to 120 percent after the completion of the core sub-project. There will be an appreciable socio-economic development as a result of the project. The proposed Karkh valley development sub-project consists of three parts: (a) general works – which relate to the Karkh Valley as a whole, (b) weir construction at Jhalaro, and (c) weir rehabilitation at Chutta. The design interventions for the sub-project include; (a) guide bund / flood protection works, (b) construction of new Jhalaro weir, (c) weir rehabilitation at Chutta, (d) Rehabilitation of Chutta lift irrigation (pump house), and (e) lining of unlined existing channels. The proposed project is awarded to M/S Zahir Khan Brothers VS Agha Construction Company.
- **Water Resources Building NCB 05:** The proposed civil works Water Resources Building Quetta (NCB 05) is located on an existing building compound of Irrigation Department, Balochistan which is on government-owned land. Construction Contract has been awarded to M/S Abdul Hameed Bangulzai JV M/S Muhammad Akram Shawani.
- **Kharzan Hatachi Infiltration Gallery NCB 02:** The Kharzan-Hatachi Infiltration Gallery sub-project NCB 02 is located in District Khuzdar in Mula River Basin on Mula River. The proposed intervention for the sub-project include; (a) Construction of two infiltration galleries, (b) Construction and rehabilitation of water conveyance system and associated structures, (c) flood protection works for irrigation canals and command area. The sub-project is aimed to rehabilitate and improve damaged infrastructure to enhance size of command area having irrigation facility. Construction contract of this project has been awarded to M/s Agha Brothers Construction Company, M/s Agha Construction Company and M/s Sadaat Enterprises.
- **Siri Toi Dam ICB 01:** The Siri Toi Dam sub-project (ICB 01) is located in Union Council Sambaza, Tehsil and District Zhob. The main dam will be 72 m high Earth fill Dam about 304 m long. More than 28,243 m of main and distributary

channels have been designed for CCA of 3948 ha. irrigation channel and about 50 km of secondary channel. Construction contract of this project has been awarded to M/s Noor ul Haq & Brothers.

- **Kili Sardar Akhtar NCB 06:** The Killi Sardar Akhtar sub-project comprises (i) infiltration gallery across the stream Sawar Rud-a tributary of Zhob River and (ii) perennial irrigation scheme along right bank. The proposed sub-project will use sub-surface flow for irrigation. The Perennial Irrigation Scheme (PIS) supplies water round the year. The sub-project will improve 106 ha of existing command area of Killi Akhtarzai and Killi Ghundai whereas 124 ha new area of Bazkhel will be brought under cultivation. After construction of sub-project, it will significantly improve the agricultural production and rural livelihood. Construction contract of this project has been awarded to M/s Noor ul Haq & Brothers.
- **Pashta Khan and Garambowad (PIS) NCB 04:** The project is located north – east of Khuzdar in Pashta Khan area at a distance of about 64 km, that is 28 km north via N – 25 Highway (RCD Highway) to Baghbana area and 36 km east on unpaved road and hilly track to location. Pashta Khan and Garambowad (PIS) sub – projects are located at a distance of 7 km from each other and situated on Anjira River which drains into Mula River near Pashta Khan. It is located in tehsil Mula, district Khuzdar, Baluchistan. Both schemes are taken as on sub – project due to closeness and smaller in size.
- **Manyalo, Raiko and Rind Ali (PIS) NCB 07:** Manyalo, Raiko and Rind Ali (PIS) sub – project is located on Mula River Basin in district Khuzdar, about 50 km north – east of Khuzdar. The proposed Manyalo, Raiko and Rind Ali weir lies in UTM Zone 42N at 3096496.83 North and 293914.18 East and average altitude of sub – project's command area is 850 m above mean sea level. Manyalo, Raiko are located on right bank of river, while Rind Ali is located on left bank of river. Access to sub – project site from Khuzdar is through M – 8 motorway which connect to a dirt road crossing Mula river basin boundary on north – east side of M – 8.

6. Status of EIA and IEE Reports of subprojects is as follows

Sr No.	Date	Type of report - final To TL/DTL	Final submitted to PMO	Remarks
IEE/EIA Reports				
1.	25-03-2021	Final EIA of Siri Toi Dam ICB 01	Final submitted	Cleared by ADB
2.	25-05-2021	IEE of Ahmedzai NCB 08	Final submitted	Cleared by ADB

3.	25-05-2021	IEE of Karakh valley Development Sub-Project NCB 01	Final submitted	Cleared by ADB
4.	25-05-2021	IEE Kharzan Hitachi Infiltration Gallery NCB 02	Final submitted	Cleared by ADB
5.	3-07-2021	IEE of Water Resources Building NCB 05	Final submitted	Cleared by ADB
6.	4-08-2021	IEE of Killi Sardar Akhtar NCB 06	Revised as per ADB Comments	Cleared by ADB
7.	19-08-2021	IEE Report of Pashta Khan and Garambowad PIS Subproject NCB- 04	Submitted to PMO	Under ADB Review
8	19-08-2021	IEE Report of Manyalo, Raiko and Rind Ali Perennial Irrigation Subproject – MRB NCB- 07	Submitted to PMO	Under ADB Review

7. In last SAEMR, the construction works on NCB 08, NCB 05, NCB 01, NCB 02, ICB 01 and NCB 06 were reported in detail. The commencement of construction works on NCB 04 and NCB 07 have not been started during the reporting period.

8. Site Specific Environmental Management Plan of all sub-projects have been approved as detailed below,

Sr,No.	**Date**	**Type of report - final To TL/DTL**	**Final submitted On (date) to PMO**	**Remarks**	**Project Category**
1.	20-09-2021	Final SSEMP of Ahmedzai NCB 08	Final version submitted	Cleared by ADB	**B**
2.	3-12-2021	Final SSEMP of Water Resources Building NCB 05	Final version submitted	Cleared by ADB	**B**
3.	9-12-2022	Final SSEMP of Siri Toi Dam ICB 01	Final version submitted	Cleared by ADB	**A**
4.	4-04-2023	Updated SSEMP of Karakh valley Development Sub-Project NCB 01	Updated as per ADB Comments and submitted to PMO	Cleared by CSC	**B**
5.	16 -05-2022	SSEMP of Kharzan Hitachi Infiltration Gallery NCB 02	Final version submitted to PMO after consultants review	Approved by CSC	**B**
6.	6-06-2023	SSEMP of Killi Sardar Akhtar NCB 06	Final version submitted to PMO	Approved by CSC	**B**
7.	12-12-2023	SSEMP of Pashta Khan and Grambowad Perennial Irrigation Subproject – MRB NCB- 04	Final version submitted to PMO	Approved by CSC	**B**

8.	12-12-2023	SSEMP of Manyalo, Raiko and Rind Ali Perennial Irrigation Subproject - MRB NCB- 07	Final version submitted to PMO	Approved by CSC	**B**

9. For the entire project, the civil works contract packages are divided into sub-projects. The contractors' names, along with the sub-project names and contract numbers, commencement details, and updated progress, are as follows:

Sr. No.	Contract No.	Contract Description	Contractor	Commencement Date
1	NCB-01	Construction of Karkh Valley Development Subproject - MRB	M/s Zahir Khan & Brothers - Agha Construction Company (Joint Venture)	28 December 2020
2	NCB-02	Construction of Kharzan Hatachi Infiltartion Gallery Subproject - MRB	M/s Agha Brothers Construction Company - Agha Construction Company - Sadaat Enetrprises (JV)	22 June 2021
3	NCB-05	Construction of Water Resources Building Subproject - Quetta	M/s Haji Abdul Hameed Bangulzai- M/s Muhammad Akbar Shahwani & Brothers (JV)	7 April 2021
4	NCB-08	Construction of Ahmedzai Perennial+Flood Irrigation Subproject - ZRB	M/s Noor ul Haq & Brothers	22 December 2020
5	ICB-01	Construction of Siri Toi Dam Subproject - ZRB	M/s Noor ul Haq & Brothers	22 April 2022
6	NCB-06	Construction of Killi Sardar Akhtar Perennial Irrigation Subproject - ZRB	M/s Noor ul Haq & Brothers	21 December 2022
7	NCB-04	Pashta Khan and Grambowad Perennial Irrigation Subproject – MRB (NCB-04)	M/s Agha Brothers Construction Company & M/s Ramzan & Sons (Pvt.) Ltd. (JV)	03 May 2023
8	NCB-07	Construction of Manyalo, Raiko and Rind Ali Perennial Irrigation Subproject – MRB (NCB-07)	M/s Agha Brothers Construction Company & M/s Ramzan & Sons (Pvt.) Ltd. (JV)	03 May 2023

10. This report refers to the 6th Semi-Annual Environmental Monitoring Report for the Balochistan Water Resources Development Sector Project (BWRDSP) from July to December 2023, which is prepared to analyze the effectiveness of the implementation of environmental safeguards on project sites and compliance with applicable national and international laws and regulations. For this purpose, environmental audits, various site

visits, and meetings with project staff have been conducted during the reporting period to ensure the implementation of environmental safeguards.

11. Details of project activities during Current Reporting Period is given below:

Exhibit 01: Details of ongoing construction activities.

S.No.	Details of Activities	Current Status	Length Covered
Siri Toi Dam ICB 01			
1.	Camp establishment	Masonary	
2.	Earth work (Spillway)	Excavation	
3.	Dyke	Key Trench Excavation	
4.	Access Road	Excavation	
Karakh valley development sub-project NCB 01			
1.	Jhalaro Weir	RCC concrete 2nd step retaining wall	26.5 meters in length
2.	Jhalaro Weir	Excavation of wing wall cut of wall	44 meters in length
3.	Jhalaro Weir	RCC concrete wing wall cut of wall	44 meters in length
4.	Jhalaro Weir	Excavation of D/S wing wall bed	44 meters in length
5.	Jhalaro Weir	Bitchumen coating D/S wing wall bed and wing wall	44 meters in length
6.	Jhalaro Weir	Plum concrete D/S wing wall bed	44 meters in length
7.	Chutta Weir	Excavation U/S cut of wall	24 meters in length
8.	Chutta Weir	RCC concrete U/S Cut of wall	24 meters in length
9.	Sinjori Channel	Copping	RD 1+200 to 1+700
10.	Nurwah Channel	Stone masonry	RD 0+500 to 1+500
11.	Bund 1	Stone pitching	RD 0+270 to 0+500
12.	Bund 1	Slope cutting and spawl	RD 0+500 to 0+651
13.	Bund 1	Stone pitching	RD 0+500 to 0+651
Water Resources Building sub-project NCB 05			
1.	WRB Quetta	Trench for rain water	
2.		Guard room construction	
3.		Union office electric work and the floor tiling in progress	
4.		Aluminium for windows is in progress	
5.		Door frames installation	
	Kharzan-Hatachi sub-project NCB-02		
1.	Bund # 1	In progress	
2.	Bund # 3 & 4		
3.	Bund 3 & 3 A		
	Kili Sardar Akhtar sub-project NCB 06		
1.	Stone Masnory	R.D 4+300	
2.	Excavation	R.D 4+500	

12. A project-level Grievance Redress Mechanism (GRM) has been established to address grievances arising from environmental and social impacts. The GRM is prepared in English and Urdu and cleared by ADB. The GRM is fully implemented in the camp areas and construction sites. The GRM record is being checked on a monthly basis.

13. A good working relationship is being maintained among the PMO, Contractor, and the Consultant's environmental staff. Trainings on a regular basis are performed by the Contractor's HSE Officers on sites for the capacity building of the relevant workers/staff. They are briefed on updating the environmental monitoring checklists and strictly follow the EMP, which they submit on a weekly/monthly basis to adhere to Environmental Management and Monitoring activities.

14. The Corrective Action Plan (CAP) devised by PMO and PIC is communicated to the contractors for effective implementation. SC has advised the contractor to address noncompliance as per the agreed CAP. The corrective actions included better housekeeping on camp and active sites, the provision of proper PPE's to the workers, on-the-job trainings, avoiding littering activities, etc. On-site sanitation at subproject sites utilizes septic tanks for sewage waste disposal, positioned near construction camps before discharging into nearby drainage areas.

15. In accordance with the project's EMP, the Contractors of NCB 01, NCB 02, NCB 05, NCB 06, and ICB 01 have conducted quarterly environmental monitoring through a third-party environmental testing laboratory certified by the Balochistan EPA during December 2023. Sampling and analysis were conducted in the presence of the SC Environmental Specialist in December 2023. Sampling and lab testing have been carried out for ambient air quality, gaseous emissions, drinking/groundwater, surface water, wastewater, and noise.

16. Additional field staff was nominated by Contractors and trainings on housekeeping including waste management and good practices measure was provided to all labors and staff, which decreased minor non-conformance levels months from July to December 2023.

1 INTRODUCTION

1.1 General

17. This report represents the 6th Semi-Annual Environmental Monitoring Review for the Balochistan Water Resources Development Sector Project (BWRDSP), covering the period from July to December 2023. It contains findings of Environmental Compliance monitoring activities at the following sub-project sites: Ahmedzai Perennial subproject NCB 08, Water Resources Building NCB 05, Karakh Valley Development subproject on Mula River NCB 01, NCB 02 Kharzan Hatachi Infiltration Gallery, NCB 06 Kili Sardar Akhtar and ICB 01 Siri Toi Dam. This SAEMR for the project consists of the following subprojects:

Ahmedzai Perennial and Flood Irrigation Sub-Project NCB 08

- Weir
- Flood Protection Channel
- Perennial Channel

Water Resources Building, Quetta NCB 05

- Multi-storey Building

Karakh Valley Development Sub-Project on Mula River Basin NCB 01

- Rehabilitation of weirs including raising of protection and guide bund
- Construction of flood protection Bunds.
- Solar pumping system at one place
- Construction of the new channel and crossing structure

Kharzan Hitachi Infiltration Gallery Sub-Project NCB 02

- Construction of two infiltration gallery.
- Construction and rehabilitation of water conveyance system and associated structures.
- Flood Protection works for irrigation canals and command area.

Siri Toi Dam Sub Project ICB 01

- Construction of Siri Toi Dam Sub Project

Kili Sardar Akhtar Subproject 06

- Construction of infiltration gallery.

- Construction and rehabilitation of water conveyance system and associated structures.

Location of sub-project sites

18. The subproject locations of Mula River Basin and Zhob River Basin are shown in Figures 1 and 2, respectively.

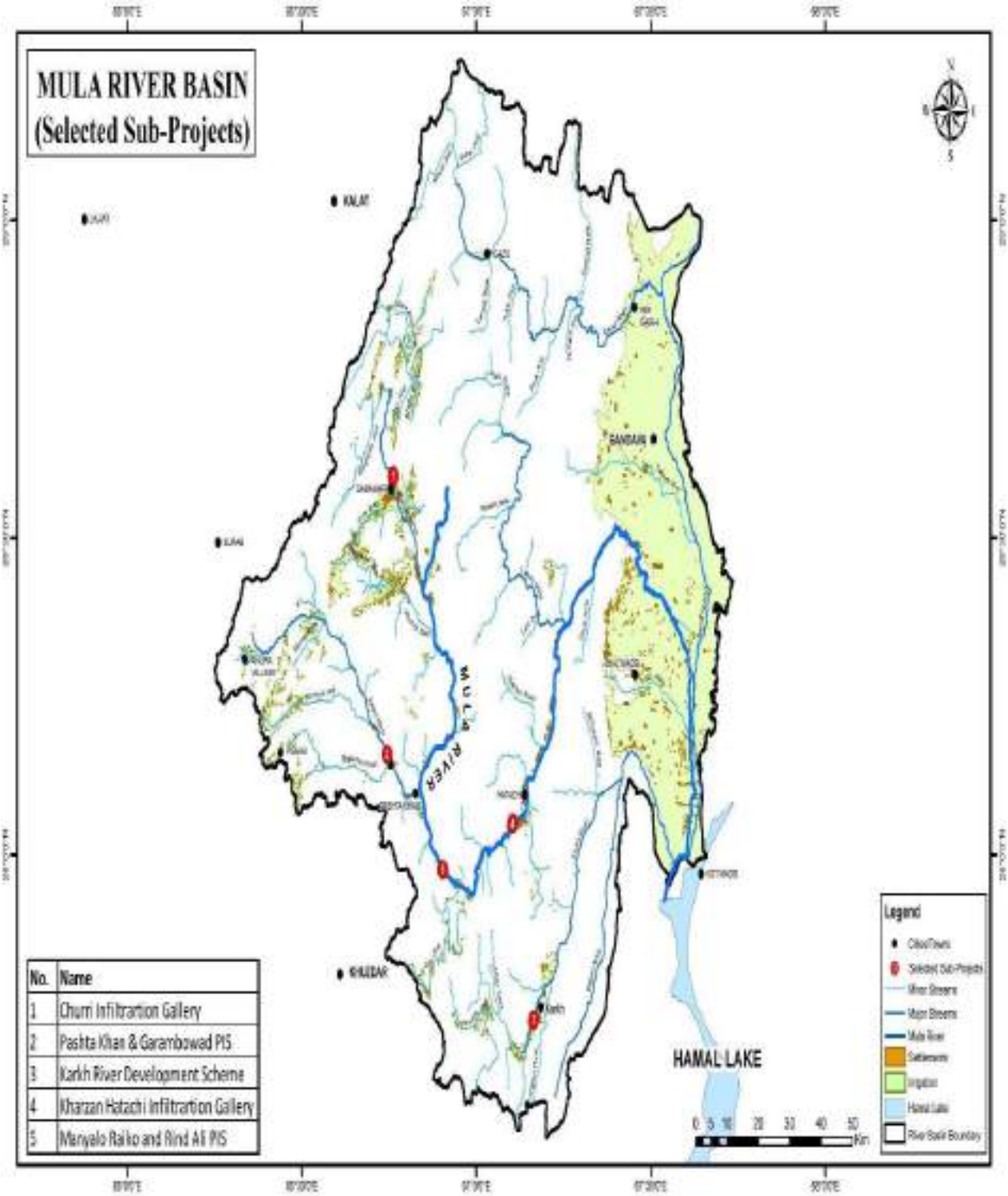


Figure 1: Location map of Mula River Basin

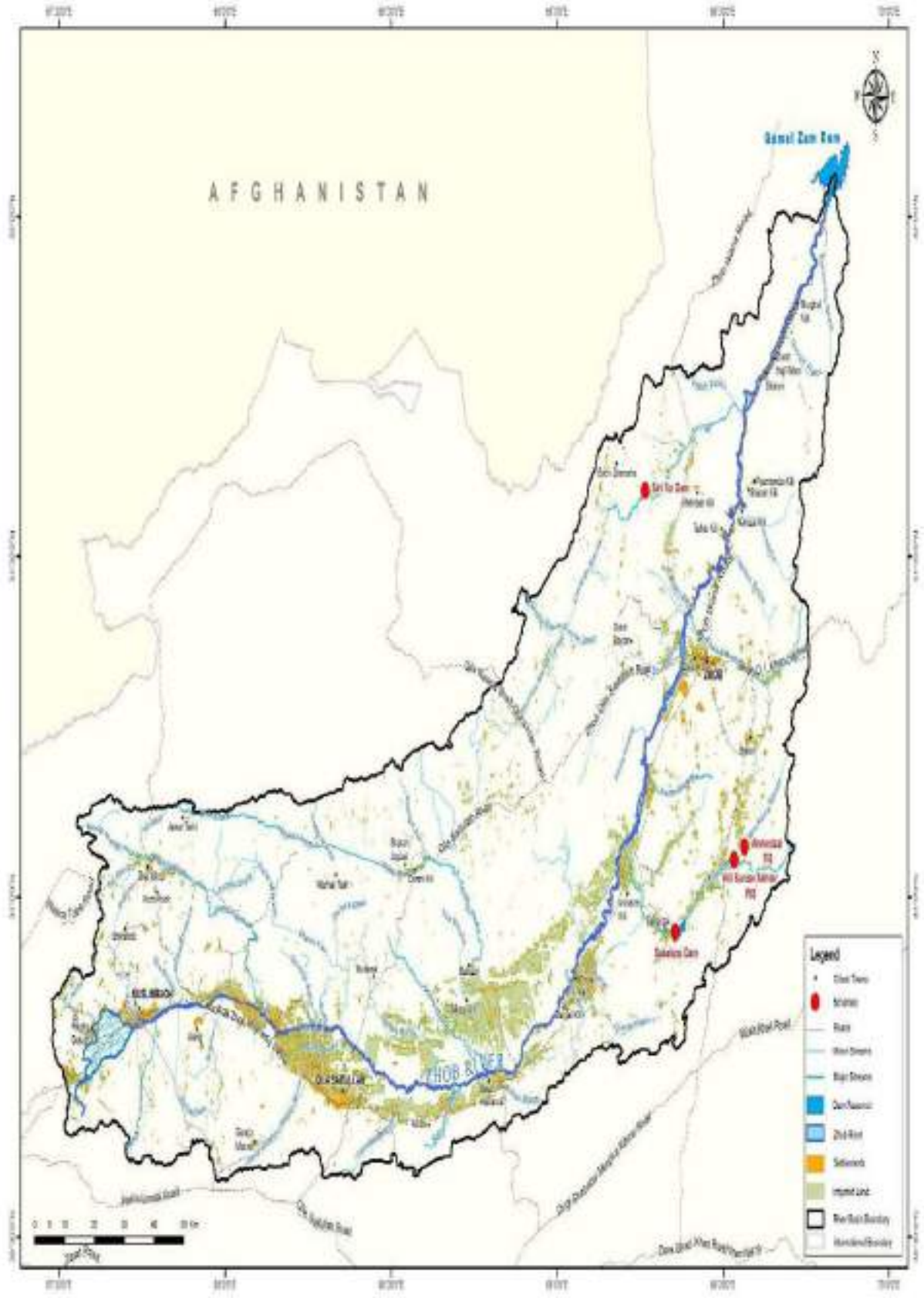


Figure 2: Location map of Zhob River Basin

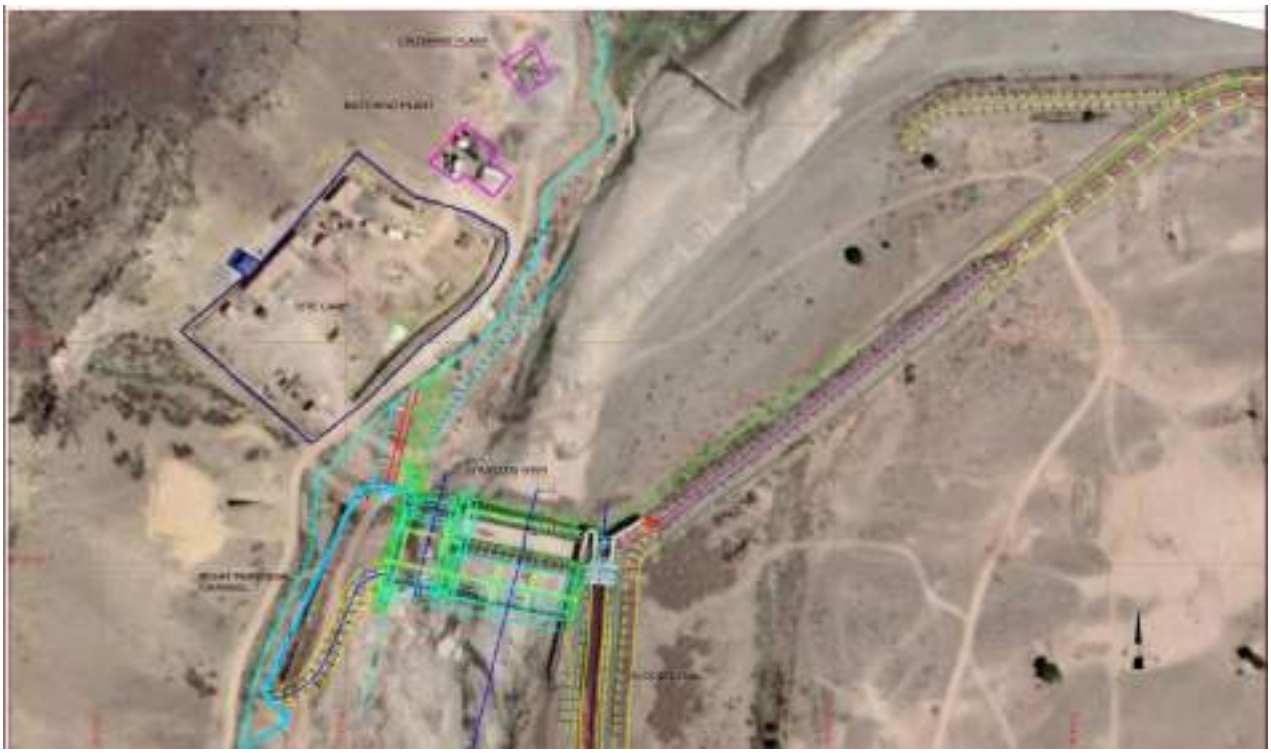


Figure 3: Ahmedzai Sub-project NCB 08 camp location

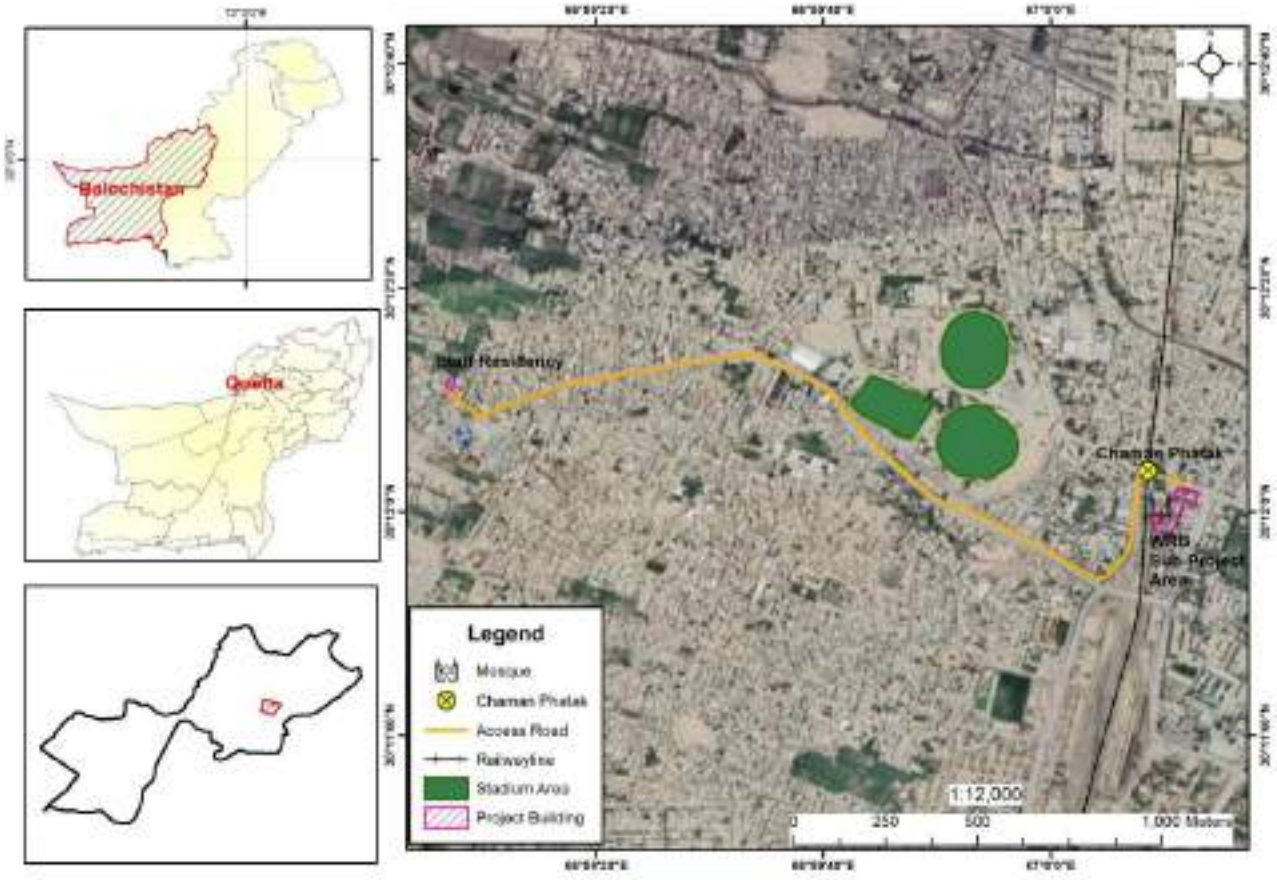


Figure 4: Water Resources Building sub- project NCB 05 Contractor staff Residency

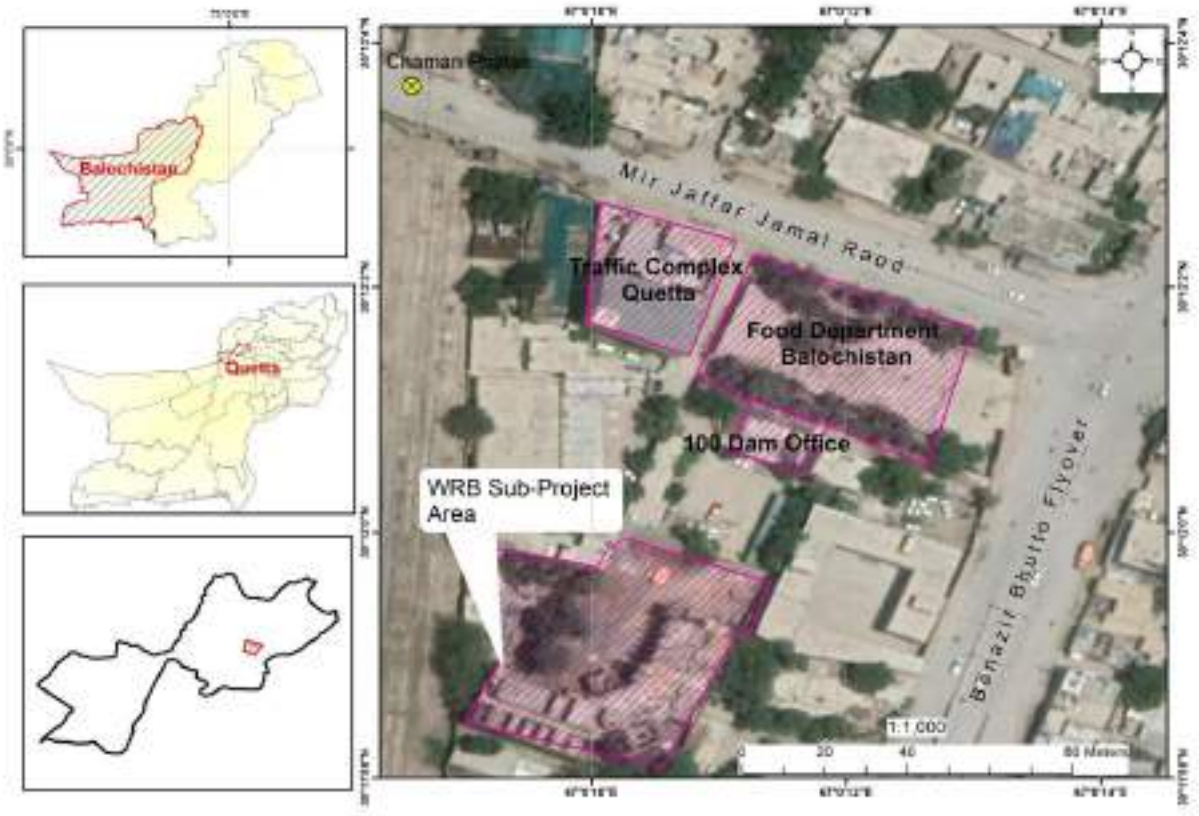


Figure 5: Proposed project location WRB sub-project NCB 05 Quetta

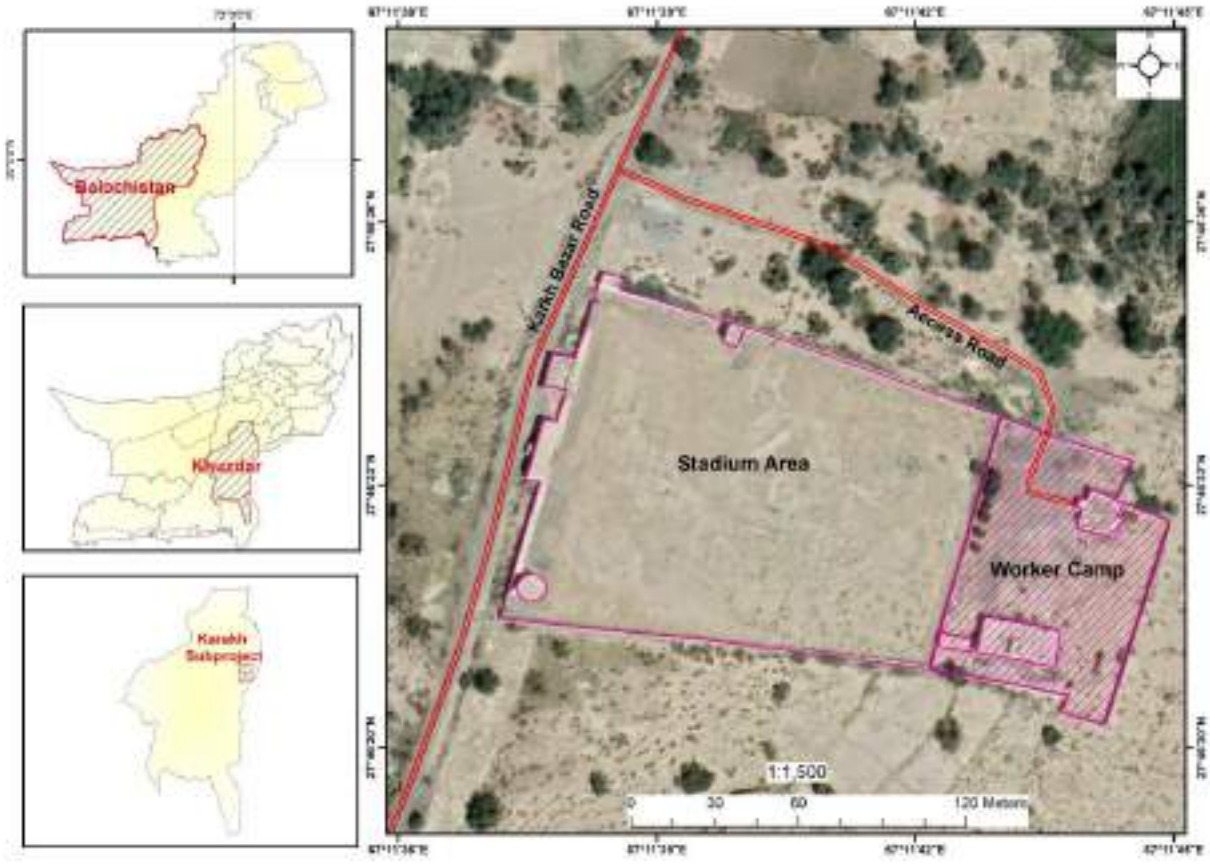


Figure 6: Karakh valley development sub-project NCB 01 location

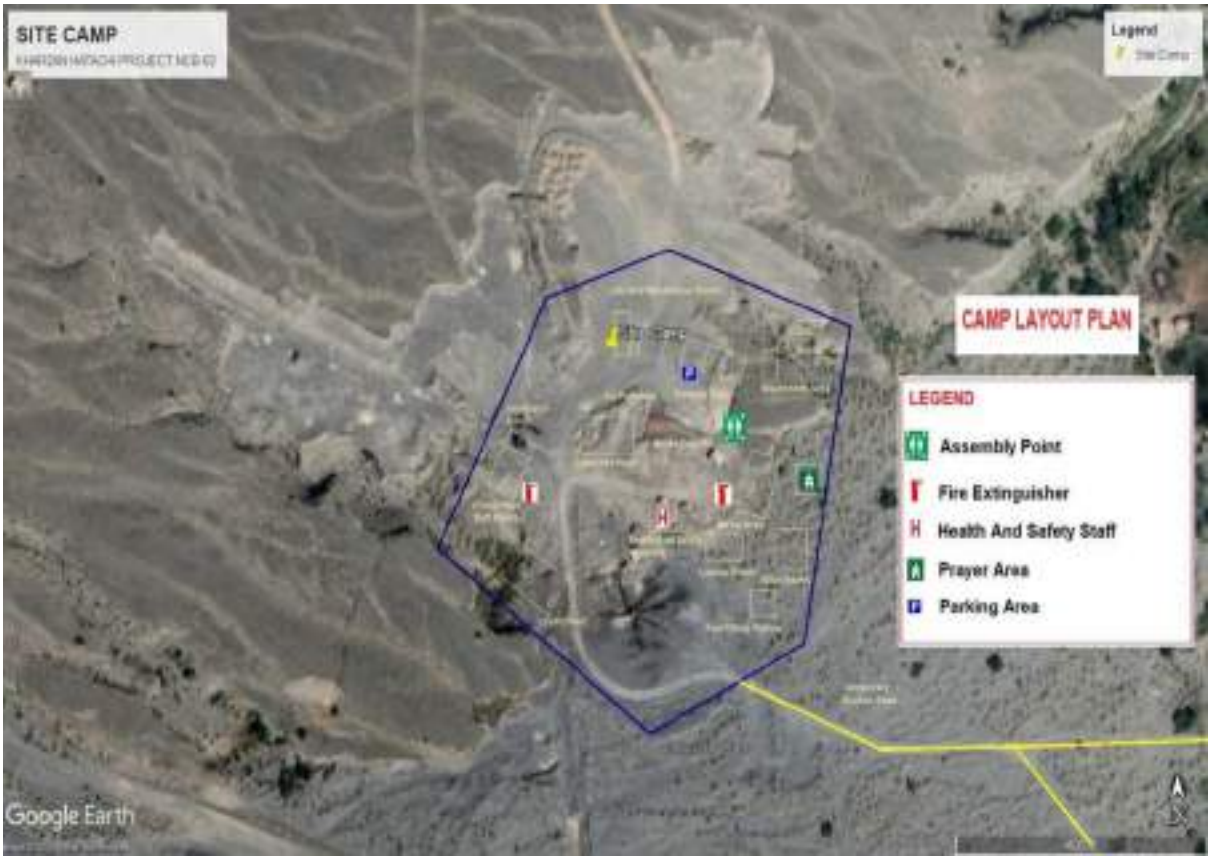


Figure 7: Kharzan Hatachi Infiltration Gallery sub-project NCB 02 location

Figure 8: Siri Toi Dam camp site sub-project ICB 01 location

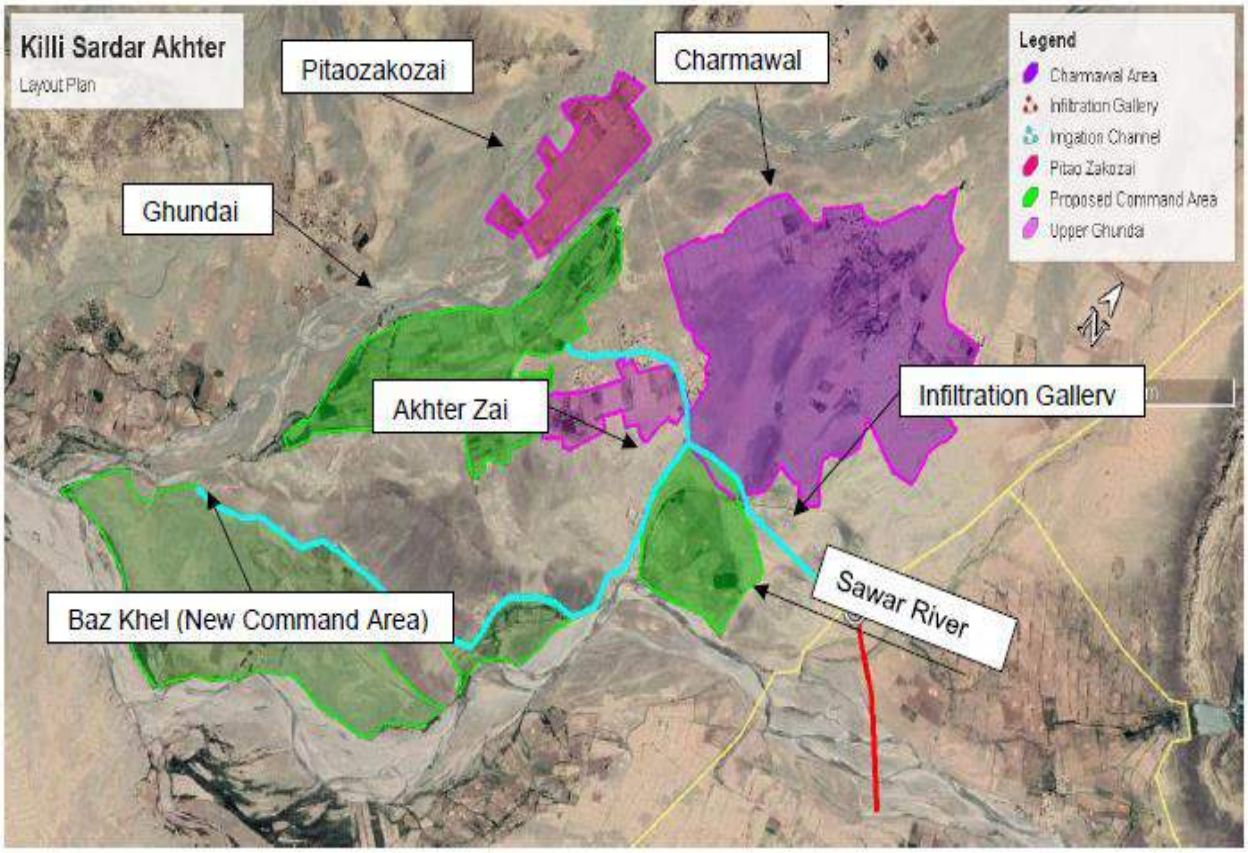


Figure 9: Location map of Kili Sardar Akhtar NCB 06

2 PROJECT DESCRIPTION AND CURRENT ACTIVITIES

2.1 Project Description

19. The Asian Development Bank (ADB) is partnering with the Government of Balochistan Province (GoBP), to undertake the Balochistan Water Resources Development Sector Project (BWRDSP) Zhob and Khuzdar Districts.

20. The BWRDSP will support the implementation of the integrated water resources management policy of the Government of Balochistan (GOB). The policy provides a comprehensive framework for the province to address the issues of water management and development in the context of basin approach, with water harvesting, and groundwater recharging as an integral part of watershed management. About 11 potential sub-projects out of over 300 longlists in the Zhob and Mula river basins were selected for potential ADB financing based on a set of criteria such as water and land availability, economic viability, and a balanced approach to extending development support to different tribal groups. The project was approved by ADB on 31 August 2018 for a concessional loan of $100 million from ADB's ordinary capital resources (L3700-PAK), a grant of $3 million from the Japan Fund for Poverty Reduction (JFPR, G9197-PAK), and a grant of $2 million from the High-Level Technology Fund (HLTF, G0597-PAK). The loan, grants, and project agreements were signed on 5 January 2019. The loan and grants became effective on 7 March 2019. The physical completion of the project will be on 31 July 2026.

21. The project is aligned with the following impacts: Increased farm income in Balochistan and improved water resources management in Balochistan. The project is focused on achieving two significant outcomes in Balochistan: enhancing farm income and improving water resources management. By effectively implementing this project, we aim to witness a remarkable increase in agricultural production in the project areas.

22. The project has three outputs:

I. **Output 1: Irrigation Infrastructure and watershed protection constructed and/or rehabilitated:** The output will consist of the construction, upgrade, or rehabilitation of the following: (i) Siri Toi Dam with a storage capacity of 30 million cubic meters, which will include a spillway and a water intake. (ii) Weirs and infiltration galleries. (iii) Approximately 276 kilometers of irrigation network, which will include headworks, off-takes, aqueducts, culverts, sluice gates, guide bunds, drop/fall facilities, washing structures, transition chambers, and livestock drinking facilities. (iv) Flood protection works aimed at reducing flood risks to irrigation canals and the command area.

II. **Output 2: Command Area established and/or Improved:** This output will support Command Area Development, which includes the improvement of approximately 11,603

hectares of land to maximize the benefits from the irrigation investments. The improvements will be achieved through the following activities: (a) Construction and rehabilitation of secondary and tertiary canals in schemes identified for improvement under Output 1. (b) Construction of lined watercourses. (c) Improvement of on-farm water management and agronomic techniques, such as land leveling and irrigation scheduling. (d) Construction of Kacha track/access roads. (e) Implementation of rainwater harvesting and storage facilities. (f) Provision of farm machinery. (g) Providing farming training for sustainable farming practices. The expected targets for this output are as follows: i) Approximately 11,603 hectares of land will be improved and served by rehabilitated irrigation and Khushkaba infrastructure. About 5,989 hectares of land will be developed under new irrigation infrastructure. About 130 hectares of high-value agriculture will be piloted with a drip irrigation system through the JFPR grant. At least 22 women-led small-scale income-generating agri-businesses will be launched. The implementation of these targets aims to enhance agricultural productivity, improve water management, and promote sustainable farming practices in the region.

III. **Output 3: Institutional capacity strengthened:** The Water Resources Information System (WRIS) has been established and is now operational with the help of technical assistance. This output aims to achieve the following targets: Utilization of high-level technology hydro-meteorological equipment for field validation of satellite-based WRIS data to monitor water resources in 3 river basins under the Grant Project. Capacity building for project management and implementation skills of at least 40 trained staff from the Irrigation Department (ID), Agriculture and Cooperative Department (ACD), and Project Management Office/Project Implementation Office (PMO/PIO). At least 30% of these trained staff should be women. Training of at least 750 farmers to enhance their knowledge and skills in the efficient use of water and value-added farming practices. Training of at least 250 women for income-generating high-value agri-businesses. Pilot implementation of high-value agriculture on approximately 130 hectares of land in the project area. This includes the installation of about 160 cost-effective solar-powered drip irrigation systems, construction of two olive oil extraction plants and two processing plants for fruits and vegetables. Additionally, at least 22 women-led small-scale income-generating agri-businesses for livestock will be established to strengthen high-value farming technology and contribute to increasing agricultural production. Strengthening of high-value farming technology through technology demonstrations on at least 130 hectares in 160 farms. Guidelines on efficient water usage and agriculture inputs will be provided to further support agricultural production. Enhancement of community capacity in high-value agriculture, including training for efficient water use and value-added farming practices.

2.2 Project Contracts and Management

23. The Government of Balochistan (GOB), through its Irrigation Department, serves as the executing agency, while the Agriculture and Cooperatives Department (ACD) acts as the implementing agency, being wholly responsible for the Project implementation. This arrangement was jointly agreed upon between the borrower and ADB and is in accordance with the policies and procedures of both the government and ADB. To oversee the overall project implementation and coordination, the Project Management Office has been established in Quetta.

24. Table 1 provides the environmental management teams for this project along with their respective roles.

Table 1: Key Project stakeholders and their contacts

Organization	Discipline/ Designation	Deployed Team	Location	Email Id
PMO	Project Director	Muhammad Sufyan Durrani	Quetta	pd.bwrdsp@gmail.com
	Deputy Project Director (MRB)	Mr. Nadeem	Khuzdar	
	Deputy Project Director (ZRB)	Mr. Abu Bakar	Zhob	
PIO	Deputy Project Director	Asif Mastooi	Quetta	pio.bwrdsp@gmail.com
ADB	Environment Specialist	Syed Asim Ali Sabzwari	Islamabad	asabzwari@adb.org
ADB	Environment Specialist (Consultant)	Abdul Hadi	Islamabad	ahadi.consultant@adb.org
External Consultant	Environment Specialist	Shabir Ahmad Khan	Lahore	sakhanswati56@gmail.com
NESPAK/ RHC	Team Leader	Habib Ullah Bhutto	Quetta	bwrdsp@gmail.com
NESPAK/ RHC	Environment Specialist	Dr Akhtar Iqbal	Lahore	enviro@rehmanhabib.com
	Environment Specialist	Sibghat Ullah Khan	Quetta	sibghat.envir86@gmail.com
Siri Toi Dam (ICB 01)	(Environment Specialist)	Muhammad Nawaz	Project site	nawazhasni50@gmail.com
Contractor (WRB)	HSE	Mubasir Ahmed Khan	Quetta	mubasirk649@gmail.com
Contractor (Karakh)	HSE Supervisor	Shah Meer Ahmed	Karakh (Khuzdar)	shahmeerahmed1960@gmail.com
Contractor (Kharzan Hatachi)	(Environment Specialist)	Arif Hameed	Kharzan Hatachi	arifhameed710@gmail.com
Contractor	HSE Supervisor	Ehsan	Kharzan Hatachi	ahsan.latifsoomro@hotmail.com

(Kharzan Hatachi)				

25. The Government of Balochistan (GoB), through the Irrigation Department, serves as the executing agency for the project, while the Agriculture and Cooperatives Department (ACD), with active support from relevant departments such as Forestry and Wildlife, and Livestock and Dairy, acts as the implementing agency. To ensure effective project implementation and coordination, a Project Management Office (PMO) has been established in Quetta. The PMO, led by a Project Director, is directly responsible for Output 1 and Output 3. Additionally, a Project Implementation Office (PIO) has been established within the ACD to handle the implementation of Output 2. For Output 1, the PMO receives support from the Deputy Director of Irrigation in Zhob and Khuzdar districts, as well as the District Forest Officers and their staff in Zhob and Khuzdar districts for the implementation of watershed protection measures. Regarding Output 2, the PIO is assisted by Deputy Directors responsible for on-farm water management in Zhob and Khuzdar districts. Output 3 will be implemented by the PMO, with support from the PIO.

26. The BWRDSP Consultants have been assigned the specific responsibility of assisting the PMO in ensuring safeguard compliance of civil works, with particular emphasis on monitoring the implementation of Environmental Management Plans (EMPs) through the Contractors' Site-Specific Environmental Management Plans (SSEMPs) and other related aspects of the project.

2.3 Project Activities during reporting period

27. This report represents the 6th Semi-Annual Environmental Monitoring Report for the Balochistan Water Resources Development Sector Project, covering the period from July to December 2023. The report contains findings from Environmental Compliance monitoring activities conducted at the following sub-project sites:

    1. Siri Toi Dam ICB 01,
    2. Ahmedzai Perennial sub-project NCB 08,
    3. Water Resources Building NCB 05,
    4. Karakh Valley Development Sub-Project on Mula River NCB 01,
    5. Kharzan Hatachi Infiltration Gallery NCB 02.
    6. Kili Sardar Akhtar NCB 06.

2.3.1 Siri Toi Dam Sub Project ICB 01

28. The Siri Toi Dam sub-project (ICB 01) is situated in Union Council Sambaza, Tehsil, and District Zhob. The primary dam structure will be an Earth fill Dam with a height of 72 meters and a length of approximately 304 meters. For a Command Area of 3,948 hectares, more than 28,243 meters of main and distributary channels have been designed, along with

about 50 kilometers of secondary channels. The construction contract for this project has been awarded to M/s Noor ul Haq & Brothers.

29. The Siri Toi Dam camp is located at a considerable distance from the local community/settlement. The total area of the leased land for the camp is estimated to be 20 acres. The camp includes various facilities, such as consultant and contractor offices, consultant and contractor staff residences, accommodations for laborers, a mess for staff and labor, a residency for FC, and a Mosque. The contractor staff will be accommodated in the camp, which also features worksite facilities capable of housing between 100 and 200 workers, with an average permanent staffing and workers on-site.

Table 2: Siri Toi Dam Subproject ICB-01 works progress

Sr. No	Activity	Status %
1.	Camp Establishment	95%
2.	Dyke [Trench Excavation]	16%
3.	Slope Protection	58.41%
4.	Curtain and consolidation grouting	3.65%
5.	Spillway [Excavation]	86.17%
6.	Access Road	35.51%

Table 3: Details of ongoing construction activities.

S. No.	Siri Toi Dam ICB 01	
1.	Camp establishment	Masonary
2.	Earth work (Spillway)	Excavation
3.	Dyke	Key Trench Excavation
4.	Access Road	Excavation

Table 4- Detail of material and sources of Siri Toi Dam sub-project ICB 01 are as under

Sr. No.	Name of Material	Source of Material	Quantities Used
1	Cement	D.G Lucky, Lucky cement, Fauji cement, Mapple leaf cement	50,700 bags
2	Steel	Agha steel, Faizan steel, Naveena steel	179,990 Kg
3	Earth work and excavation	Borrow Material areas	3,200,000 cu.m
4	Crush aggregates	As per approved sources nearby site	56,640 Tons
5	Sand		93,360 Tons

30. The campsite has facilities for offices, residential accommodation for staff, as well as workers/labors. Kitchen, dining, and washroom areas have been properly developed to ensure hygienic requirements.
31. A material testing laboratory has been constructed inside the camp.
32. A dispensary has been provided near the offices, which has facilities with qualified medical staff along with all necessary medicines. A full-time ambulance facility is provided for any serious emergencies.
33. In accordance with SSEMP (Site Specific Environmental Management Plan), Traffic Management Plan, Solid Waste Management Plan, HSE plan etc have been developed and being implemented by contractot. A waste collection area has been provided in the camp with proper signs .
34. A diesel-powered generator is also stationed in the camp.
35. Security rooms and a mosque have also been provided in the camp, which are close to the main entrance of the camp.
36. The following table presents the number of workers during the period January to June 2023. The number of workers has increased manifold in each month, which is attributed to the increase in the volume of work.

Table 5- Manpower Technical/skilled/ unskilled staff details

Designation	**Numbers**
Project Manager	1
Chief Surveyor/Quantity Surveyor	1
Surveyor	3
Surveyor Helper	3
General Forman	2
Material Engineer	1
Lab Technician	1
Lab Helper	1
AutoCAD Operator	2
Accountant	1
Storekeeper	1
Procurement Officer	1
Supervisor	1
Mechanic	2
Auto Electrician	1
Batching Plant Operator	1
Batching Plant Helper	1
Crush Plant Operator	1
Crush Plant Helper	2
Heavy Machinery Operator	40

Heavy Machinery Helper	24
Diesel Store	3
Security Guard	3
Cook	2
Cook Helper	2
Labor	44
Mason	14
Steel fixer	2
Total	161

37. Details of machinery/equipment's of sites has been given in Exhibit 5.

Table 6: List of Machinery/Equipment's

Name of Machine	Numbers
Excavator	12
Roller	3
Grader	3
Loader	3
Dozer	2
Transit Mixer	2
Dumper	9
Tractor 240	3
Tractor 385	3
Tractor Trolly	1
Pickup	3
Generator	5
Water Bowser	4
Batching Plant	1
Crush Plant	1
Diesel Tank	5
Tractor with Blade	-
Mechanical Hand Mixture Machine	-
Water Pump for dewatering	-
Jack Hammer	-
Light Travelling Vehicle	-
Welding Plants	-
Motor Cycle	2
Low Bed	-
Steel Machine	7
Toyota Car (Surf)	2
Total	69

2.3.2 Ahmedzai Sub Project NCB 08

38. The sub-project Ahmedzai Irrigation Scheme (NCB 08) is situated in District Zhob, approximately 51 km South-East of Zhob City. The construction of this sub-project was completed on 21 December 2022. Following the completion, the Defect Liability Period (DLP) commenced on 22 December 2022, as indicated in the letter provided in Annexure I.

Table 7: Ahmedzai Subproject NCB-08 Contractor works progress

Sr. No	Activity	Status
A. Weir		
1.	Weir Structure	100% completed
B. Perennial Channel		
1.	Stone masonry side wall	100 % completed
C. Flood Channel		
1.	Earth work (excavation, filling)	100% completed
2.	Stone masonry side wall	100 % completed

2.3.3 Karakh Valley Development Sub Project NCB 01

39. The Karkh Valley Development sub-project (NCB 01) encompasses 2,250 hectares of culturable land, which will be brought under irrigated agriculture. An estimated 20 million cubic meters (MCM) of water is available annually for agricultural development in the command area on both the right and left banks of the river. Currently, the cropping intensity in the core sub-project area is 89%, and it is expected to increase to 120% after the completion of the core sub-project. This development is anticipated to lead to significant socio-economic improvements in the region. The proposed Karakh Valley Development sub-project consists of three parts: (a) General works - which pertain to the Karakh Valley as a whole, (b) Weir construction at Jhalaro, and (c) Weir rehabilitation at Chutta. The design interventions for the sub-project include: (a) Guide bund/flood protection works, (b) Construction of a new Jhalaro weir, (c) Weir rehabilitation at Chutta, (d) Rehabilitation of Chutta lift irrigation (pump house), and (e) Lining of unlined existing channels. The contract for the proposed project has been awarded to M/S Zahir Khan Brothers VS Agha Construction Company.

40. The primary campsite for the Karakh sub-project is located on Khuzdar road, while a temporary campsite is situated nearby the sub-project site on Karakh village road. The camp facilities can accommodate between 100 and 200 workers, with an average permanent staffing of 35 workers on-site. This includes professional and technical personnel, workers, drivers, and operators involved in various tasks, including those related to the canteen.

Table 8: Karakh Valley Development sub-project NCB-01 Contractor works progress

Sr. No	Sub-project Name	Earthwork/excavation status
1.	Wanderi	90% completed
2.	Chutta	90% completed
3.	Kadri	90% completed
4.	Jhalaro	80% completed
5.	Acherwand	75% completed
6.	Sinjori	60% completed
7.	Norwah	30% completed
8.	Bund 2	80% completed
9.	Bund 3	50% completed
10.	Bund 6	100% completed
11.	Bund 7	100% completed
12.	Bund 8	100% completed

Table 9- Detail of material and sources of Karakh Valley Development sub-project NCB 01 are as under

Sr. No.	Name of Material	Source of Material	Quantities Used
1	Cement	Power D.G Lucky	820,010 bags
2	Steel	Faizan Amberley	245,560 Kg
3	Earth work	Borrow Material from site	Record awaited
4	Crush	Karakh	
5	Sand	Wadh	
6	Aggregate	Karakh River	

41. The campsite has facilities for offices, residential accommodation for staff as well as workers/labors. The kitchen, dining, and washrooms have been properly developed to ensure hygienic requirements.

42. A material testing laboratory has been constructed inside the camp.

43. A register is placed for record maintenance of first aid provided to workers.

44. A diesel-powered generator is also stationed in the camp area.

45. The following table presents the number of workers during the period January to June 2023. The number of workers has increased manifold each month, which is attributed to the increase in the volume of work.

Table 10: Details of ongoing construction activities.

Karakh valley development sub-project NCB 01			
1.	Jhalaro Weir	D/S RCC of cut of wall	12 meters length

		completed	
2.	Jhalaro Weir	U/S RCC cut of wall completed	8 meters length
3.	Jhalaro Weir	D/S RCC bed	D3, D6, D7 and D8
4.	Jhalaro Conduit	RCC bed, wall and top slab	RD 0+00 to 0+017
5.	Jhalaro Weir	Excavation layout cut of wall	12 meters length
6.	Jhalaro Weir	D/S plum concrete bed	D8, D9 and D10
7.	Jhalaro Weir	Bitchumen coating of RCC beds	D3, D4, D6, D7 and D8
8.	Bund 3	Stone masonary wall	RD 0+370 to 0+410
9.	Bund 3	10 layers done	RD 0+500 to 0+675
10.	Bund 3	6layers done	RD 0+750 to 0+900
11.	Bund 3	14 layers done	RD 0+500 to 0+675
12.	Bund 3	Top layers done	RD 0+410 to 0+500
13.	Bund 2	Stone pitching work in progress	RD 0+00 to 0+650
14.	Khadri channel	Nakkas completed	
15.	Jhalaro Weir	U/P and D/S slope crest plum concrete	Panel 3, 4, 6, 7, 9 and 10

Table 11- Manpower Technical/skilled/ unskilled staff details

Designation	**Number**
Project Manager	1
Chief Surveyor/Quantity Surveyor	1
Surveyor	2
Surveyor Helper	2
General Forman	4
Material Engineer	1
Lab Technician	1
Lab Helper	1
AutoCAD Operator	1
Accountant	1
Storekeeper	1
Procurement Officer	1
Supervisor	4
Mechanic	1
Auto Electrician	1
Batching Plant Operator	2
Batching Plant Helper	1
Crush Plant Operator	2

Crush Plant Helper	1
Heavy Machinery Operator	27
Heavy Machinery Helper	18
Diesel Store	1
Security Guard	11
Cook	3
Cook Helper	1
Labor	22
Mason	4
Total	116

Table 12- List of Machinery/Equipment's

Name of Machine	**Number**
Excavator	5
Roller	2
Grader	2
Loader	3
Transit Mixer	3
Dumper	5
Tractor Trolly	7
Pickup	3
Generator	3 (Heavy)
Water Bowser	3
Batching Plant	1
Diesel Tank	1
Tractor with Blade	1
Mechanical Hand Mixture Machine	1
Water Pump for dewatering	4
Jack Hammer	1
Welding Plants	1
Motor Cycle	2
Steel Machine	1
Total	**49**

2.3.4 Water Resources Building Sub Project NCB 05

46. The proposed civil works for the Water Resources Building in Quetta (NCB 05) are situated on an existing building compound owned by the Irrigation Department, Balochistan, which is located on government-owned land. The construction contract for this project has been awarded to M/S Abdul Hameed Bangulzai JV M/S Muhammad Akram Shawani.

47. The Water Resources Building site in Quetta is situated in a highly congested area within the city. Despite the limited space, the contractor has managed to arrange three rooms on-site to accommodate laborers. Additionally, a water dispenser is available to provide safe drinking water, and toilet facilities are also present at the site to cater to the needs of the workers.

Table 13- Detail of material and sources of WRB NCB 05 are as under

Sr. No.	Name of Material	Source of Material	Quantities Used
1	Cement	Fauji Cement Ltd, Mapple leaf	30000 Bags
2	Steel	Agha Steel Pvt Ltd Karachi	180 Tons
3	Earth work/back filling	Yarro Sand	35000 cu.m

Table 14: NCB-05 Water Resources Building Contractors works Progress

Sr. No	Activity	Status
1.	Excavation	100% completed
2.	Anti-termite	100% completed
3.	Lean concrete	100% completed
4.	Raft foundation	100% completed
5.	Backfilling	100% completed
6.	Plinth steel	100% completed
7.	Plinth concrete	100% completed

48. First and second conference halls are completed; only finishing items are remaining, and the work is in progress.

Table 15: Details of ongoing construction activities.

Water Resources Building sub-project NCB 05		
1.	Conference Hall walls brick masonry	WRB Quetta
2.	Conference Hall roof concrete	
3.	Lift walls RC concrete	
4.	Ground Floor flooring conduit	
5.	Door frames installation at ground floor	

Table 16- Manpower Technical/skilled/ unskilled staff details

Designation	Numbers
Project Manager	1
Chief Surveyor/Quantity Surveyor	1
Surveyor	1
Surveyor Helper	1
General Forman	1
Material Engineer	1

Lab Technician	1
Lab Helper	1
AutoCAD Operator	2
Accountant	1
Storekeeper	1
Procurement Officer	1
Supervisor	1
Mechanic	1
Auto Electrician	1
Heavy Machinery Operator	2
Heavy Machinery Helper	2
Diesel Store	1
Security Guard	1
Cook	1
Cook Helper	1
Labour	10
Mason	5
Steel fixer	2
Total	**40**

Table 17- List of Machinery/Equipment's

Name of Machine	**Numbers**
Excavator	2
Roller	1
Grader	1
Loader	1
Dozer	-
Transit Mixer	2
Dumper	2
Tractor 240	1
Tractor 385	-
Tractor Trolly	1
Pickup	1
Generator	1
Water Bowser	1
Diesel Tank	1
Tractor with Blade	-
Mechanical Hand Mixture Machine	-
Water Pump for dewatering	-
Low Bed	-
Steel Machine	1
Toyota Car (Surf)	-
Total	16

2.3.5 Kharzan Hatachi Infiltration Gallery Sub Project NCB 02

49. The Kharzan-Hatachi Infiltration Gallery sub-project (NCB 02) is situated in District Khuzdar in the Mula River Basin, specifically along the Mula River. The proposed interventions for the sub-project include: (a) Construction of two infiltration galleries. (b) Construction and rehabilitation of the water conveyance system and associated structures. (c) Implementation of flood protection works for irrigation canals and the command area. The primary aim of this sub-project is to rehabilitate and improve the damaged infrastructure, thereby enhancing the size of the command area with improved irrigation facilities. The construction contract for this project has been awarded to M/s Agha Brothers Construction Company, M/s Agha Construction Company, and M/s Sadaat Enterprises.

50. The Contractor campsite for the Kharzan Hatachi sub-project is located in Union Council Abad, Tehsil Mula, District Khuzdar. The contractor has set up two separate camps—one for the residence of staff and another for labor residence. The contractor is providing basic facilities at these camp sites, and staff members have been hired to oversee all activities as required. The camp incharge ensures proper maintenance of good housekeeping at the campsite.

Table 18- Detail of material and sources are as under

Sr. No.	Name of Material	Source of Material	Quantities Used
1	Cement	Power D.G Lucky	12000 bags
2	Steel	Agha Steel Pvt Ltd Karachi	51.4 tons
3	Earth work	Borrow Material from site	55142
4	Crush	Asif crush plant	414100 ft
5	Sand	Jahn Jal	26694 ft

Table 19: Kharzan-Hatachi NCB-02 Contractors works Progress

Sr. No	Sub-project Name	Earthwork/excavation status
1	Stone spawl	57% completed
2	Stone pitching on slop	45% completed
3	Stone pitching on level	71% completed
4	Excavation in Conduit	50% completed
5	Earthwork of FP Bund	35% completed
6	Excavation in channels	25% completed

7	Construction joint in lining	6% completed
8	Expansion joint in lining	4% completed
9	Water stopper	20% completed
10	Concrete class B(PCC)	14% completed
11	Steel	14% completed
12	Bund # 2	75% completed
13	Bund # 3 B	100% completed
14	Bund 3 C & 3 A	70% completed
15	Bund # 1	0%
16	Bund # 4 A	0%
17	Bund # 4 B	0%

Table 20: Details of ongoing construction activities.

Kharzan Hatachi Infiltration Gallery sub-project NCB 02		
1.	Bund # 2	Total earth Excavation 91325 cu.m
2.	Bund # 3 B	
3.	Bund 3 C & 3 A	In progress

Table 21- Manpower Technical/skilled/ unskilled staff details

Designation	Number
Project Manager	1
Construction Manager	1
Chief Surveyor	1
Surveyor	5
Survey Helper	13
Material Engineer	1
Environmental Specialist	1
Health & Safety Specialist	1
Lab Technician	1
Lab Helper	1
Admin Manager	1
Accountant	1
Cashier	1
Purchaser	2

Supervisor	3
Mechanic	2
Electricians	2
Plant Operator	3
Plant Helper	6
Mechanic & Helper	2
Heavy Machinery Operator	23
Heavy Machinery Helper	23
LT Driver	25
LT Helper	25
Skilled & Non-Skilled Labor	88
Chokidar	13
Messing Staff	15
Total	**264**

Table 22:List of Machinery/Equipment's

Name of Machine	Number
Grader	2
Dumper	8
Transit Mixture	3
Roller	3
Water Tanker	2
Dozer	1
Loader	2
Excavator	9
Batching Plant	1
Crush Plant	1
Mobil Crush Plan	1
Generator	6
Low bed	1
Pickup	4
Dewatering Pump	6
Tractor Trolley	11
Tractor	4
Bar bending Machine	2
Compactor	3
Total	**66**

2.3.6 Kili Sardar Akhtar Sub Project NCB 06

51. The Killi Sardar Akhtar (PIS) sub-project is situated in the Union Council of Laka Bund, Tehsil, and District Zhob, approximately 49 km south-east of Zhob city in Gosa Kibzai. Access to the site is through a metaled road, starting from Zhob to D.I. Khan road, covering a distance of 17 km. The proposed interventions for the sub-project include: (a) Construction of infiltration galleries. (b) Construction and rehabilitation of the water conveyance system and associated structures. The main objective of this sub-project is to rehabilitate and improve the damaged infrastructure, thereby enhancing the size of the command area and improving irrigation facilities. The construction contract for this project has been awarded to M/s Noor ul Haq & Brothers.

52. As of now, the campsite for the Killi Sardar Akhtar sub-project is under construction and is located nearby the proposed channel. The camp is equipped with worksite facilities and has the capacity to accommodate between 50 and 100 workers. On average, the camp will have a permanent staffing of 55 workers on-site, including professional and technical personnel, workers, drivers, and operators associated with canteen tasks. The camp is being set up to support the project's construction activities and cater to the needs of the workers during the project implementation.

53. The construction camp have the following facilities for the labours working on site:"

- Constant supply and accessibility of safe drinking water.
- Living Accommodations/Shelter.
- Sanitary and toilet facilities.
- Washing facilities.
- Kitchen/mess
- Laboratory for material testing
- Contractor offices
- Consultant offices
- Mosque etc

54. For the construction activities, borrow areas have been selected for the extraction of materials, which have already been approved by the Engineers. The contractor has prepared a Borrow Area Management Plan that pertains to the measures incorporated during the identification of borrow area locations, material extraction, and rehabilitation.

Table 23- Detail of material and sources are as under

Sr. No.	Name of Material	Source of Material	Quantities Used
1	Cement	Fauji Cement Ltd, Mapple Leaf	30,000 bags
2	Steel	Agha Steel Pvt Ltd Karachi	180 tonne

3	Earth work/fill	Borrow Material from site	35,000 cu.m

Table 24: Kili Sardar Akhtar NCB-06 Contractors works Progress

Sr. No	Activity	Status
D. Infiltration Gallery		
1.	Excavation	0% completed
E. Main Channel		
2.	Excavation	55% completed
3.	Back Filling	70% completed
F. Ghundai Channel		
3.	Earth work (excavation, filling)	0% completed

Table 25: Details of ongoing construction activities.

Kili Sardar Akhtar NCB-06		
1.	Stone Masonry	R.D 4+300
2.	Excavation	R.D 4+500

Table 26- Manpower Technical/skilled/ unskilled staff details

Designation	Number
Project Manager	1
Chief Surveyor/Quantity Surveyor	1
Surveyor	1
Surveyor Helper	2
General Forman	2
Material Engineer	1
Lab Technician	1
Lab Helper	2
AutoCAD Operator	1
Accountant	1
Storekeeper	2
Procurement Officer	1
Supervisor	2
Mechanic	1
Auto Electrician	1
Environmental Specialist	1
HSE Officer	-
Batching Plant Operator	-
Batching Plant Helper	-
Crush Plant Operator	1

Crush Plant Helper	2
Heavy Machinery Operator	5
Heavy Machinery Helper	2
Diesel Store	1
Security Guard	2
Cook	1
Cook Helper	1
Labor	15
Mason	4
Total	55

Table 27- List of Machinery/Equipment's

Name of Machine	Number
Excavator	2
Roller	1
Grader	1
Loader	1
Dozer	-
Transit Mixer	2
Dumper	3
Tractor 240	-
Pickup	1
Generator	2
Water Bowser	1
Batching Plant	-
Crush Plant	1
Diesel Tank	2
Motor Cycle	-
Low Bed	-
Steel Machine	1
Toyota Car (Surf)	1
Total	19

2.4 Description of any Changes to Project Design

55. No changes to the project design have taken place during the reporting period of this report.

2.5 Description of any Changes to Agreed Construction methods

56. No changes in the construction methodology have taken place during the reporting period of this report, with the initially developed method statements still applicable.

3 ENVIRONMENTAL SAFEGUARD ACTIVITIES

3.1 General Description of Environmental Safeguard Activities

57. During the reporting period, the ADB mission along with PIC/PMO staff visited the Siri Toi Dam sub-project site on 21-26 November 2023. The mission assessed the implementation of safeguard activities and identified certain gaps.

58. The BWRDSP consultants conducted environmental compliance monitoring of sub-project ICB-01. The field visits were conducted by the Supervision Consultant (SC) Environmental Specialist, along with the contractor's Environmental Engineer/HSE advisor. The Contractor's environmental team was responsible for conducting day-to-day inspections on the construction site and ensuring the implementation of measures as specified in the Environmental Management Plan (EMP).

3.2 Site Inspection

59. Site inspections of the sub-project are being performed to comply with the EMP/SSEMP provisions' requirements, and the Contractor is immediately directed to resolve any non-compliance identified during these inspections.

3.3 Issues Tracking (Based on Non-Conformance Notices)

60. The BWRDSP Consultants noted that the contractor working on sub-project ICB 01 has been making efforts to improve environmental compliance based on the issues identified during the site visits.

61. During the monitoring process, non-compliances were identified, such as not wearing the full set of Personal Protective Equipment’s (PPE’s), inadequate site cleaning, improper installation of warning and information signs boards, and other related issues. In response, the BWRDSP Contractor was requested to implement appropriate corrective measures to address these non-compliances.

62. The Subproject Environmental Staff implements daily, weekly, and monthly environmental monitoring checklists to assess various environmental parameters, enabling them to take corrective action for any observed non-conformance (sample checklists can be found in **Annexure II, III, and IV**). These checklists offer a comprehensive overview of various environmental aspects, including but not limited to: Soil conditions and contamination/Fuel and oil usage and spills/Generation and disposal of waste materials/Traffic management/Management of borrow areas/Drainage systems/Operations of diesel generators/Emergency response protocols/Camp management practices/Proper use of Personal Protective Equipment (PPE)/ Maintenance of septic tanks/ Vehicle movement guidelines/ Worker's training and safety protocols/ Placement of safety signs/ Preservation of vegetation and tree-cutting procedures/Labor hiring procedures. The checklists are

thoughtfully designed to address all relevant environmental parameters, and monitoring is carried out at regular intervals. In case of any non-compliance, the Environmental Staff takes appropriate corrective actions promptly. The Contractor's staff utilizes the data gathered through these checklists to develop reports assessing the level of compliance with the measures specified in the Environmental Management Plan (EMP). This monitoring process ensures that the project maintains adherence to environmental standards and complies with the required environmental safeguards.

63. The BWRDSP Consultants' environmental team discussed the revealed findings with the Contractor's team during their physical presence on the site or over-the-phone conversations to identify the best corrective measures.

Table 28: Environmental Safeguards Activities Carried out During Reporting Period (January - June 2023)

Environmental Safeguard Activities	Dates
▪ Review of Cost Estimates for EMP implementation;	December 2023 Quarterly
▪ Meetings with ADB TA Review Mission regarding progress on environmental safeguards and site visits to Siri Toi Dam, Kili Sardar Akhtar, and Ahmedzai schemes.	(21-26 November 2023)
▪ Attended ADB online Session on "Preparation of SSEMP" and "Health & Safety".	22-23 Nov 2023
▪ Attended ADB TA-10110-Online Sessions on ADB's Environmental Safeguards Monitoring and Reporting	29-30 Nov 2023
▪ Supervised and assisted the contractor Environmental Specialist for SSEMP preparation;	Daily
▪ Regular coordination with the contractor Environmental Specialist for implementation of environmental mitigation measures taken in SSEMP and EMP.	Regularly
▪ Regularly coordinated with engineers regarding updates on the project design and works;	Daily
▪ Site inspections and guiding Contractor’s personnel to constantly use PPE’s and improving hygienic conditions at camp.	Daily/Weekly
▪ Assistance & guidance to the Contractor HSE staff regarding preparation of Contractor’s Environmental Monthly Report;	Monthly
▪ Preparation of Semi Annual EMR	December 2023

3.4 Trends

64. With a review of compliance to non-conformances and the Corrective Action Plan (CAP) provided in the previous SAEMR, it has been observed that the sub-projects of BWRDSP

are progressing and improving their compliance with environmental requirements in accordance with their respective Environmental Management Plans (EMPs). Sub-projects have made significant investments in environmental compliance by allocating staff and providing facilities for effective environmental management.

65. Based on the previous CAP record, it was noted that fire extinguishers were not available on sites, and quarterly instrumental monitoring was not being performed, as previously reported. However, the Contractor has taken appropriate action to address these issues. Fire extinguishers have now been provided at the camp sites, and instrumental monitoring is being conducted regularly at each site. This indicates the Contractor's commitment to addressing non-compliance and implementing corrective measures to enhance environmental compliance on the project sites. The efforts made by the sub-projects are contributing to the overall improvement in environmental performance, aligning with the prescribed EMPs and ensuring the project's adherence to environmental safeguards.

3.5 Unanticipated Environmental Impacts or Risks

66. No new environmental impact or risk identified during this reporting period.

3.6 Grievance Redressal Mechanism (GRM)

67. The Grievance Redressal Committee has been formed. No grievances have been received up until the reporting period at any of the project sites.

4 ENVIRONMENTAL MANAGEMENT

4.1 General

68. The Environmental Management Plan (EMP) is an integral part of the BWRDSP sub-project bidding documents and is being broadly followed by the Contractor. The Environmental Specialist/HSE Advisor of the contractor's staff is regularly and strictly monitoring the overall compliance related to environmental and safety issues."

69. The overall Environmental and Social Performance is observed to be good/satisfactory, while efforts for continuous improvements are being carried out.

4.2 Site Specific Environmental Management Plan (SSEMP)

70. A Site-Specific Environmental Management Plan (SSEMP) minimizes adverse or negative impacts of construction activities on local communities and the natural environment. It aims to reduce the induced impacts of construction activities and prevent pollution, ensuring that construction activities are carefully planned to eliminate any risk to the environment. The SSEMP is clearly defined as a tool to mitigate negative impacts, reduce induced impacts, and ensure environmental safety during construction activities.

71. Site-Specific Environmental Management Plans of awarded subprojects have been approved as details given below

Sr,No.	Date	Type of report - final To TL/DTL	Final submitted On (date) to PMO	Remarks	Project Category
1.	20-09-2021	Final SSEMP of Ahmedzai NCB 08	Final version submitted	Cleared by ADB	**B**
2.	3-12-2021	Final SSEMP of Water Resources Building NCB 05	Final version submitted	Cleared by ADB	**B**
3.	9-12-2022	Final SSEMP of Siri Toi Dam ICB 01	Final version submitted	Cleared by ADB	**A**
4.	4-04-2023	Updated SSEMP of Karakh valley Development Sub-Project NCB 01	Updated as per ADB Comments and submitted to PMO	Approved by CSC	**B**
5.	16 -05-2022	SSEMP of Kharzan Hitachi Infiltration Gallery NCB 02	Final version submitted to PMO after consultants review	Approved by CSC	**B**
6.	6-06-2023	SSEMP of Killi Sardar Akhtar NCB 06	Final version submitted to PMO	Approved by CSC	**B**

7.	12-12-2023	SSEMP of Pashta Khan and Grambowad Perennial Irrigation Subproject – MRB NCB- 04	Final version submitted to PMO	Approved by CSC	**B**
8.	12-12-2023	SSEMP of Manyalo, Raiko and Rind Ali Perennial Irrigation Subproject - MRB NCB- 07	Final version submitted to PMO	Approved by CSC	**B**

4.3 Emergency Response Arrangements:

72. Emergency response plans are comprised of the following mandatory work plans as per the requirements of the approved EMP/SSEMP and are being implemented

- Health, Safety and Environment Plan
- Risk Assessment Plan
- Construction Safety Plan
- Emergency Preparedness Response Plan

73. Emergency response procedures and contact details were displayed at the sub-project sites, indicating whom to contact in the event of a fire as elaborated here

- Site Supervisor
- Environmental Engineer
- Fire Brigade
- Nearby Doctor
- Nearby Hospital

74. The Emergency Response Plan (ERP) has been elaborated in plain language, and subsequently, all prone areas and dangerous spots will be monitored on a daily basis. Monitoring safety observation cards will be produced for inspection, and if any unsafe act or unsafe condition is observed in the project, it will be promptly mitigated. With these revisions, the sentence reads more smoothly and clearly describes the elaboration of the Emergency Response Plan (ERP) and the daily monitoring of prone areas and dangerous spots. Additionally, the use of safety observation cards for inspection and prompt mitigation of any unsafe acts or conditions are highlighted effectively.

4.4 Waste Management Plan

75. The Waste Management Plan (WMP) includes the collection, storage, transportation, and disposal of the generated waste in an environmentally safe manner. The WMP is designed for the active construction sites and camp sites. The workers are trained to implement the WMP at the camp(s) and construction sites. The following are the important features:

- Waste segregation at source.

- Reusable and recycled material (cardboard, packing material, bottles, cans, empty bags, drums) is re-used whereas rest is sold in the market.
- Transportation of solid waste as per SOPs.

76. The following section provides the details of major types of waste materials that have been produced from project activities, mainly kitchen/domestic waste and construction waste, and how they are being managed.

4.4.1. Current Period

I. Siri Toi Dam Sub-project Zhob River Basin

77. The construction activities began after obtaining approval for the Site-Specific Environmental Management Plan (SSEMP) on 9th December 2022. The camp establishment is currently 95% complete. Contractor staff has received assistance in marking the designated area for solid waste management. Signboards were observed during the reporting period, and photographic evidence is provided below.

Inspection of waste bins in Siri Toi Dam Camp site

Presence of signboards for adequate disposal of waste at Camp site

Figure 10: Signage and waste segregation

78. The Contractor has provided waste collection bins at various points in the camp, as well as at work sites. Consequently, wastes are being collected in these waste bins throughout the camp. Construction wastes, such as plastics and paper, are collected and transported to the designated waste receiving area within the camp.

79. All the excavated materials are used for filling the cut and low areas. Hence, no soil heaps have been observed due to excavation activities.

80. Local communities are usually asked to take away domestic/kitchen waste. Small quantities of waste are left for final disposal. Therefore, wastes are managed at the camp in designated ditches made for a specific purpose.

81. As discussed in the previous section, small quantities of waste, including plastics, cloth pieces, and cartons, have been observed at a few locations due to a windstorm. Such waste can be managed through the provision of improved waste storage areas designated in the campsite.

82. At the waste collection area of the camp, wastes of economic value are segregated and sold to recyclers, while the remaining waste, mostly degradable in nature, is then dumped in a pit near the camp with the approval of the Project Consultant.

Table 29- Solid Waste generated at sub-project sites are as under

Sr. #	Name of Sub-Project	Solid Waste generated in Kilograms/day	Types of Waste	Remarks
1	Siri Toi Dam ICB 01	1.2 Kg/day	Plastic, polythene bags	Solid waste is preferable reused, recycled and disposed of at designated dumping site.
		2 Kg/day	Solid waste/ cans etc	
		1 Kg/day	Kitchen waste/ Organic waste	

II. Ahmedzai Sub-project

83. Site activities have been closed since December 2022.

III. Water Resources Building

84. There is no workshop area, washing yard, or batching plant at the project site. Therefore, no bulk waste is produced from this site. The burning of solid waste at the workplace is strictly prohibited. Waste material is disposed of in the waste yard in a safe condition, ensuring that it does not block access for other users and people.

a. Kitchen and General/Domestic Waste

85. This type of waste has been generated from the construction site and offices of the project. The solid waste produced at the site is being collected into waste bins and transported to a nearby municipal collection point.

b. Hazardous Waste – Medical Waste and Oily Waste

86. Medical waste is generated from the site's first aid facilities, while oily empty drums are generated from construction activities. The medical waste generated from the project site is collected at one designated location and sent to an incinerator for safe disposal. Other hazardous waste is transported to disposal sites using a vehicle. Additionally, hazardous waste such as oily drums is kept at the project site until they become completely dry. Subsequently, these dry drums are sold to third-party junk dealers.

Table 30- Solid Waste generated at sub-project sites are as under

Sr. #	Name of Sub-Project	Solid Waste generated in Kilograms/day	Types of Waste	Remarks
1	Water Resources Building WRB NCB 05	1 Kg/day	Plastic waste/polythene bags	Solid waste is preferable reused, recycled and disposed of at designated dumping site.
		10 Kg/day	Solid waste (Steel wastes, bottle, cans, cement bags)	
		2 Kg/day	Kitchen waste/organic waste	

IV. Karakh Valley Development Sub-project Mula River Basin

87. The Contractor has selected a designated area for waste disposal, approximately 2 kilometers away from Karakh city. The selected area naturally has a ditch shape where waste is dumped for disposal.

a. Kitchen and General/Domestic Waste

88. Kitchen/domestic waste has been generated from all the camp sites, offices, and construction sites of the project. Dustbins are provided in offices and camp residences, which are regularly monitored and emptied by the contractor staff or a sweeper, and the waste is disposed of in a nearby area. The empty cement bags and associated items generated from construction activity have been sold to a local vendor accordingly.

b. Hazardous Waste – Medical Waste and Oily Waste

89. Medical waste is generated from the first aid facilities on the construction sites, whereas oily empty drums are generated from the construction activities of the project. The medical waste generated from all the construction sites is collected and disposed of in a designated ditch or landfill located away from the project site. Hazardous waste collected in drums is being transported to disposal sites using a vehicle. Additionally, hazardous waste like oily

drums is kept at the campsite until it becomes completely dry. Subsequently, these dry drums will be sold to third-party junk dealers accordingly.

Figure 11: Waste Segregation at Camp site

Waste bins on Karakh Camp site

Table 31- Solid Waste generated at sub-project sites are as under

Sr. #	Name of Sub-Project	Solid Waste generated in Kilograms/day	Types of Waste	Remarks
1	Karakh Valley Development NCB 01	3 Kg/day	Plastic, polythene bags	Solid waste is preferable reused, recycled and disposed off at designated dumping site.
		10 Kg/day	Kitchen waste/organic waste	
		8 Kg/day	Solid waste including cement bags	

V. Kharzan Hatachi Infiltration Gallery Sub-project Mula River Basin

a. Solid Waste Management:

90. Workers' actions pertaining to waste management are found to be responsible and careful. The priority has always been to reduce the waste generated; therefore, the 3Rs (reduce, reuse, and recycle) are observed as the 2nd step of effective waste management, following the 1st priority of preventing waste at the point source on the site. Most of the waste produced is biodegradable. Dust bins are provided for site use and are conveniently located. Due to the limited duty time and the low number of staff, the waste is produced in such low quantities that it can be easily transported to its designated area. This activity is done on a regular basis to ensure that the small waste does not accumulate into large amounts, making waste management and its impacts following remedial actions more expensive and time-consuming, thus diverting resources from useful work.

b. Housekeeping and Material Storage

91. Proper storage and stacking are promoted at work sites, as good housekeeping and properly stored material have the potential to reduce safety incidents by roughly 70%. For this reason, housekeeping and material storage are done in a responsible way to protect workers from untoward safety events or any damage to the environment.

92. The following measures regarding housekeeping are taken:

- All materials, spoils, debris, etc., are cleaned up to avoid accumulation at the end of each work shift.
- Accumulation of trash and debris is prevented by proper covering with polythene sheets and water sprinkles to suppress the mud/dust.
- Access walkways and roadways are kept clear to avoid trips and falls.
- Good housekeeping is maintained at the camp as well as on the working site.
- Dustbins are placed at appropriate locations.

c. Hazardous waste

93. Waste with the characteristics of flammability, toxicity, reactivity, and corrosivity is regarded as hazardous. At the moment, no hazardous waste is being generated. However, a designated area has been prepared for the storage of any hazardous waste. During field visits, it is ensured that hazardous waste generation will be prevented through responsible storage and handling practices. In the event that hazardous waste is generated, its storage is carefully considered, ensuring a safe distance of nearly 100 m (as practically applicable) from the surface water for its handling and storage. (Photographic evidence is provided as follows).


Inspection of waste bins on camp site.

Figure 12: Waste Segregation at camps

Table 32- Solid Waste generated at sub-project sites are as under

Sr. #	Name of Sub-Project	Solid Waste generated in Kilograms/day	Types of Waste	Remarks
1	Kharzan Hatachi Infilteration Gallery NCB 02	2 Kg/day	Plastic waste	Solid waste is preferable reused, recycled and disposed off at designated dumping site.
		6 Kg/day	Solid waste including wood ply	
		4 Kg/day	Kitchen waste	

VI. Kili Sardar Akhtar Sub-project Zhob River Basin

a. Solid Waste Management:

94. Construction of the camp has been completed, and the Contractor workers' actions pertaining to waste management are found to be responsible and careful. The priority has always been to reduce the waste generated; therefore, the 3Rs (reduce, reuse, and recycle) will be observed as the 2nd step of effective waste management, following the 1st priority of preventing waste at the point source on the site. This activity will be done on a regular basis to ensure that the small waste does not accumulate into large amounts, thus preventing management and impact issues that may lead to expensive and time-consuming remedial actions, potentially diverting resources from useful work. Waste generated on-site during camp construction is reported as Exhibit 33.

b. Housekeeping and Material Storage

95. Proper storage and stacking are promoted at work sites. Good housekeeping and properly stored materials have the potential to reduce safety incidents by roughly 70%. Due to this reason, housekeeping and material storage will be done in a responsible way to protect workers from untoward safety events or any damage to the environment.

96. The following measures regarding housekeeping will be taken:

- All materials, spoils, debris, etc. will be cleaned up to avoid accumulation at the end of each work shift.
- Accumulation of trash and debris will be prevented by proper covering with polythene sheets and water sprinkles to suppress the mud.
- Access walkways and roadways will be kept clear to avoid trips and falls.
- Dustbins will be placed at appropriate locations.
- Good housekeeping will be maintained at the camp as well as on the working site.

c. Hazardous waste

97. The waste with characteristics of flammability, toxicity, reactivity, and corrosivity is regarded as hazardous. At the moment, no hazardous waste is being generated. However, a designated area will be selected for the storage of hazardous waste. It will be ensured that in case hazardous waste is generated, soil or water contamination is prevented through its responsible storage and handling. In the event that hazardous waste is generated, its storage will be carefully considered, ensuring a safe distance of nearly 100m (as practically applicable) from the surface water for its handling and storage.

Table 33- Solid Waste generated at sub-project sites are as under

Sr. #	Name of Sub-Project	Solid Waste generated in Kilograms/day	Types of Waste	Remarks
1	Kili Sardar Akhtar NCB 06	2 Kg/day	Plastic, Polythene bags	Solid waste is preferable reused, recycled and disposed off at designated dumping site.
		4 Kg/day	Kitchen waste/Organic waste	
		1 Kg/day	Solid Waste	

4.5 Traffic Management & Diversion Plan (TMP)

98. Pursuant to the EMP and SSEMP, all sub-project sites are located in remote areas. To ensure smooth traffic flow during the execution of construction works and in cases of partial or full closure of roads for the safety of transporters, road users, assets, and the general public, the Contractor is committed to delivering the following during the reporting period:

- Ensure that vehicular movement does not cause any adverse impacts.
- Ensure that vehicular movement does not result in disturbances for the local community residing in the vicinity of the project as far as possible.
- Ensure that site activities adhere to the guidelines of TMP and all regulatory requirements.
- Flagmen/signboards were observed near diversions.

4.6 Training's

4.6.1. Training Imparted by the Contractors

99. A good working relationship is being maintained between the Contractor and the Consultants' environmental staff. Training's and awareness campaigns are being conducted at the Contractor's Camp and Work Sites at regular intervals to raise awareness about worker's safety. The basic purpose of these sessions is to keep workers well informed about the different risks and hazards associated with site-specific construction activities and to make them well-prepared to respond to any kind of emergency situation. (**Annuxure VIII**).

Table 34- Training details on sub-project sites are as under

Sr. #	Name of Sub-Project	Training Details	Date
1	Siri Toi Dam ICB 01	First aid and safety	20-12-2023
2	Water Resources Building WRB NCB 05	Importance of Safety Gadgets/ PPE's	17-12-2023
3	Karakh Valley Development NCB 01	Importance of Safety Gadgets	9-12-2023
4	Kharzan Hatachi Infilteration Gallery NCB 02	Use of fire extinguishers during explosion	3-11-2023
5	Kili Sardar Akhtar	Importance of PPE's	25-12-2023

100. Toolbox talks are conducted by the HSE Supervisor/Officer on a daily basis for site-specific scopes of work. Additionally, toolbox talks are also conducted when there is a change in season to make workers well aware of various infectious and viral diseases. The toolbox talk topics will be repeated periodically in response to changes in the workforce or scope of work at the site.

Daily TBT sessions to the workers

Onsite training sessions

	
Training attendance in November	Training attendance in December

5 RESULTS OF ENVIRONMENTAL MONITORING

5.1 Overview of Monitoring Conducted during the Current Period

101. The primary goal/ objective of environmental monitoring is to:

i. Monitor project impacts on physical, biologicl and socio-economic indicators and to assess adequancy of the EMP/SSEMP in identifying and mitigating the project adverse effects;

ii. Recommend mitigation measures for any unforeseen impact or where the impact level exceeds from those anticipated in EMP/SSEMP; and

iii. Ensure legal compliance including safety of workforce and community.

102. Following two types of Environmental monitoring were ensured during the execution of works.

i. **Compliance Monitoring**: To ensure that 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 and soil etc.

103. To assess the effect of construction activities on various components of the environment on sub-project sites, as shown in Table 5.1, a comprehensive Environmental Monitoring Plan was made part of the construction contract with budgetary provisions thereof. During the reporting period, the given plan was accordingly implemented at the points specified in the Instrumental Monitoring Layout Plan given in the sub-project SSEMP's.

Table 5.1: Instrumental Environmental Monitoring Plan

Environmental Quality	Parameters	Standards/ Guidelines	Location	Monitoring Period/Frequency/Sampling/ No/ year	Responsibility	
					Implementation	Monitoring
Construction Stage						
Air Quality	NO, NO_2, SO_2, CO, O_3, SPM, PM_{10}, $PM_{2.5}$, Humidity, Wind direction, Wind velocity, Pressure etc.	Air quality standard by BEQS, Pakistan	Throughout the project areas particularly at: ▪ Camp and Batching plant site. ▪ Sensitive receptors at active construction site	Quarterly (24 Hours Duration)	Contractor	Supervision Consultant (SC)
Dust	Dust control	Air quality standard by BEQS, Pakistan	Throughout the project areas, particularly near sensitive receptors	Quarterly (24 Hours Duration)	Contractor	Supervision Consultant (SC)
Noise Level	dB(A)	Noise pollution Control BEQS, Pakistan	Camp site and Batching Plant site project areas, particularly near sensitive receptors	Quarterly (24 Hours Duration)	Contractor	Supervision Consultant (SC)
Water Quality	Bore water: Total Bacteria Count, Total Coliform, E. Coli, Faecal Coliform, Turbidity, Taste, Odour, Colour, Phenolic compounds,	BEQS, NEQS, WHO Limits,	Water near project corridor and camp site	Quarterly	Contractor	Supervision Consultant (SC)

	Residual Clorine, pH @25°C, TDS, Total Hardness, Fluoride, Cloride, Cyanide, Nitrate, Nitrite, Antimony, Aluminum, Arsenic, Boron, Barium, Chromium Total, Copper, Cadmium, Lead, Manganese, Mercury, Nickel, Selenium, Zinc, BOD, COD, Temperature, Oil & Grease, Iron, Mercury, Ammonia, Sulphate, Silver.					

5.2 Instrumental Monitoring Laboratory

104. To implement the instrumental monitoring plan at Siri Toi Dam, Water Resources Building and Kili Sardar Akhtar the Contractor, hired services of an external laboratory "Sustainable Environmental Services (SES)". On Karakh Valley and Kharzan Hatachi the Contractor hired the services of "ENVI TECH AL" Laboratory. Balochistan Environmental Protection Agency (BEPA) certified labs, having Head offices at Karachi.

105. The environmental monitoring was carried out by CSC to assess actual nature and extent of key impacts and the effectiveness of mitigation and enhancement measures outlined in the Initial Environmental Examination (IEEs) and Environmental Management Plans (EMPs). The labs conducted instrumental monitoring for ambient air quality, meteriological data, Noise and drinking water during the second quarter of the reporting period i.e., during the month of December 2023, and provided reports. SAEMR contains comparison of the monitoring results obtained during the reporting period. Signed copies of the results are attached as Annexure-VII.

5.3 Monitoring Methodology and Calibration

106. Standard methods were employed for the analysis of environmental parameters. The detail of each method has duly been described in the respective section.

107. Environmental Monitoring equipment were calibrated using the approved prescribed methods. Also, during monitoring hours, the calibration was rechecked to ensure quality of the results.

5.4 Monitoring of Air, Noise and Water at Siri Toi Dam site

5.4.1. Ambient Air Monitoring

i. Methodology and Instrument Used

108. Ambient air quality monitoring was carried out for the assessment of Parameters (NO, NO2, SO2, CO, O3, SPM, PM10, PM2.5, Humidity, Wind direction, Wind velocity, Pressure etc). The Air Quality Monitoring Station (AQMS-09), employed for PM_{10} & $PM_{2.5}$, is a fully integrated air monitoring station that delivers 'near reference levels' of performance parameters. With a size of large suitcase, it can measure up to 20 different gaseous and particulate pollutants and environmental parameters simultaneously. The AQMS 09 offers optimal balance between performance and measuring criteria pollutants.

ii Test Results and Discussion

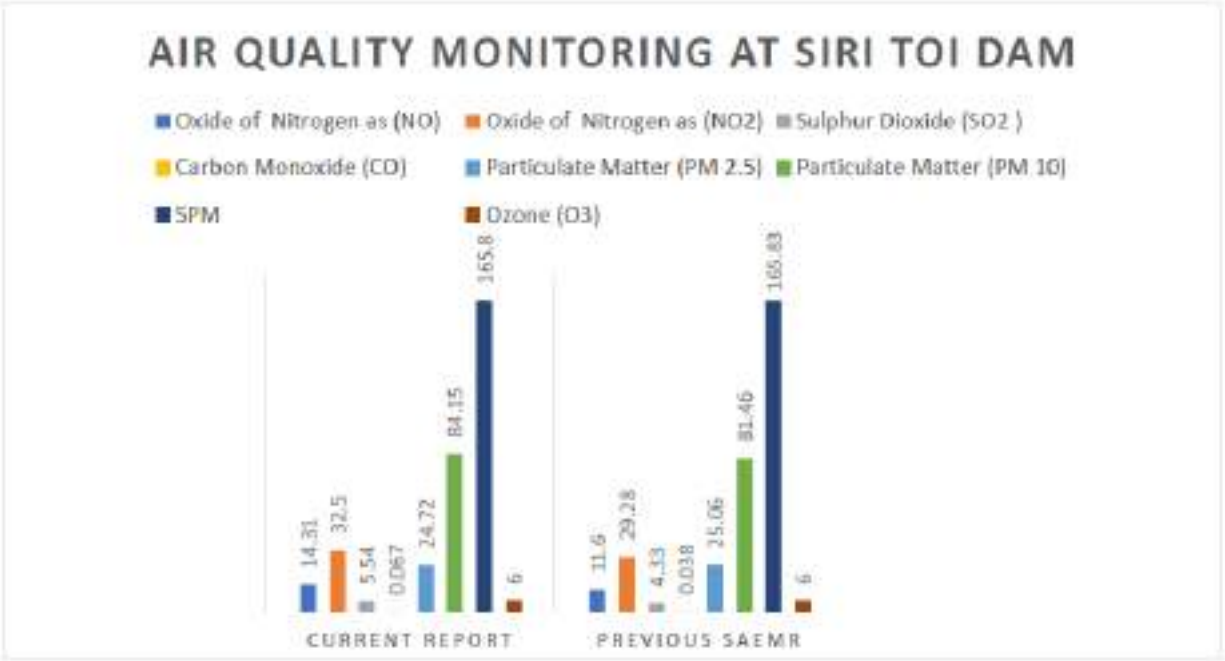


Figure 13: Air Quality Monitoring at Siri Toi Dam Camp site

109. Ambient air quality (NO, NO_2, SO_2, CO, O_3, SPM, PM_{10}, $PM_{2.5}$, Humidity, Wind direction, Wind velocity, Pressure etc) were monitored for twenty-four (24) hours at the locations identified by the SC and results obtained are shown in graphical representation.

110. All the results are within the permissible limits and compliant with the BEQS, NEQS. NO_2, PM_{10}, $PM_{2.5}$ levels exceeded stringent WHO standards, primarily due to high vehicle movement and dust accumulation near the monitoring points. The contractor has been instructed to strictly follow SSEMP recommendations, particularly regarding water sprinkling in dust-prone areas, and to regularly monitor vehicle emissions to ensure compliance with emission standards through effective enforcement measures. However, it is worth noting that during the first quarter, the contractor has not performed quarterly monitoring at the sub-project site and the comparision was made with previously approved SAEMR instrumental results as shown in Figure 5.1 & Table 5.2.

111. Considering the compliance with BEQS, NEQS, and WHO standards, there is no immediate need for additional mitigation measures to control dust, apart from the measures proposed in the SSEMP. These measures may include regular sprinkling of water to suppress dust and timely transportation or disposal of excess materials temporarily stored at the site.

112. It is important to regularly monitor and assess the dust levels and compliance with environmental standards throughout the project's implementation to ensure continued adherence to regulations and to address any potential concerns that may arise.

Table 5.2: Air Quality Monitoring Test Results

	Measuring Parameters	Location	Unit	Current Report	Previous SAEMR	WHO Limit	NEQS & BEQS Limits	Remarks
1.	Oxide of Nitrogen as (NO)	Camp	µg/m³	14.31	11.60	-	40 (24 hrs.)	WL
2.	Oxide of Nitrogen as (NO_2)	Camp	µg/m³	32.5	29.28	25(24 hrs.)	80 (24 hrs.)	WL
3.	Sulphur Dioxide (SO_2)	Camp	µg/m³	5.54	4.33	40(24 hrs.)	120 (24 hrs.)	WL
4.	Carbon Monoxide (CO)	Camp	mg/m³	0.067	0.038	4(24 hrs.)	5 (08 hrs.)	WL
5.	Particulate Matter (PM 2.5)	Camp	µg/m³	24.72	25.06	15(24 hrs.)	35 (24 hrs.)	WL
6.	Particulate Matter (PM 10)	Camp	µg/m³	84.15	81.46	45(24 hrs.)	150 (24 hrs.)	WL
7.	SPM	Camp	µg/m³	165.80	165.83	-	500 (24 hrs.)	WL
8.	Ozone (O_3)	CAmp	µg/m³	06	06	60(Peek Season)	130 (01 hr.)	WL

5.4.2. Noise Monitoring

113. The twenty-four (24) hours noise level monitoring was carried out at Siri Toi Dam camp site using Digital Noise level meter.

i. **Test Results and Discussion**

114. The comparison of noise level monitoring results obtained during the monitoring period is shown in Figure 5.2 and Table 5.3.

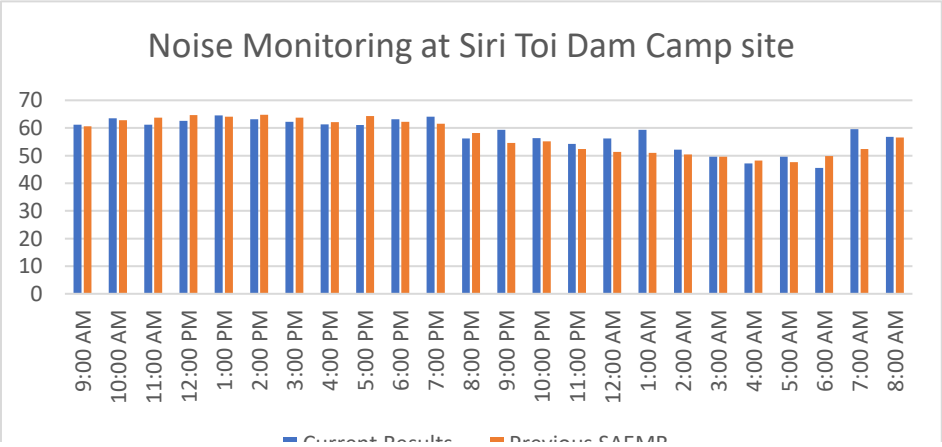


Figure 14: Noise Monitoring at Siri Toi Dam Camp site

115. The noise level monitoring at sites was carried out during day and night with the objective to assess the off working noise levels as well.

Table 5.3: Noise Level Test Results

S. No	Time	Unit	Current Results	Previous SAEMR	WHO Limit	NEQS & BEQS Limits
01	09:00 AM	dB(A)	61.2	60.6	65 dB(A) (Day time)	75 dB(A) (Day time)
02	10:00 AM		63.5	62.8		
03	11:00 AM		61.2	63.7		
04	12:00 PM		62.6	64.6		
05	01:00 PM		64.5	64.1		
06	02:00 PM		63.1	64.8		
07	03:00 PM		62.2	63.7		
08	04:00 PM		61.3	62.1		
09	05:00 PM		61.1	64.3		
10	06:00 PM		63.2	62.2		
11	07:00 PM		64.1	61.5		
12	08:00 PM		56.2	58.2		
13	09:00 PM		59.3	54.6		
14	10:00 PM		56.3	55.2		
15	11:00 PM		54.2	52.4	55 dB(A) (Night time)	65 dB(A) (Night time)
16	12:00 AM		56.2	51.3		
17	01:00 AM		59.3	51.0		
18	02:00 AM		52.2	50.4		
19	03:00 AM		49.6	49.6		
20	04:00 AM		47.2	48.2		
21	05:00 AM		49.6	47.6		
22	06:00 AM		45.5	49.8		
23	07:00 AM		59.6	52.4	65 dB(A) (Day time)	75 dB(A) (Day time)
24	08:00 AM		56.8	56.6		

116. As evident from the results obtained, the average noise level at all intervals falls within the WHO, BEQS and NEQS limits of 65 and 75 dB(A) set for areas.

5.4.3. Monitoring of Drinking Water Quality

i. Methodology

117. During the reporting period, drinking water quality of the Contractor's camp was monitored for the agreed parameters given in the SSEMP. High density sterilized polyethylene bottles were used for the sampling. The collected samples were preserved, sealed and chilled at 40°C as recommended. Grab method is used for sampling and preservation of water whereas.

i. Drinking Water Test Results and Discussion

118. The drinking water demand is being met from bore hole dug out at the camp. At the first instance, water is pumped to elevated storage tank from where it is supplied to the consumer points through a pipe network.

119. Following is the comparison of the results obtained for drinking water parameters shown in Table 5.4.

120. As evident from the above table, almost all parameters of the drinking water, at the Contractor's camp, fall within the permissible limits set under BEQS, NEQS and WHO limits.

Table 5.4: Drinking Water Quality (Bore Water) Report

S.No	Parameters	Unit	Testing Method	BEQS Limits	NEQS Limits	WHO Limits	Current Results	Previous SAEMR	Remarks
1.	Total Bacteria Count	TBC (count/ml)	Total Viable Count	----------	----------	----------	18	09	-
2.	Total Coliform	TC (count/ml)	APHA 922 B	0/100 ml	0/100 ml	0/100 ml	ND	ND	WL
3.	E-Coli	EC (count/ml)	Total Viable Count	0/100 ml	0/100 ml	0/100 ml	ND	ND	WL
4.	Facial Coli	FC (count/ml)	APHA 922 B	0/100 ml	0/100 ml	0/100 ml	ND	ND	WL
5.	Turbidity	NTU	HACH Turbidity meter	<15	<5	<15	<0.06	<0.02	WL
6.	Taste	Taste	Sensory Evolution	Obj/Non Obj	Obj/Non Obj	Obj/Non Obj	Non-Obj	Non-Obj	WL
7.	Odour	Odor	Sensory Evolution	Obj/Non Obj	Obj/Non Obj	Obj/Non Obj	Non-Obj	Non-Obj	WL
8.	Colour	TCU	Pt-Co method	≤ 15 TCU	≤ 15 TCU	≤ 15 TCU	< 2	< 1	WL
9.	Phenolic Compounds	As Phenol (mg/L)	ASTM D-1783	-	-	-	ND	ND	WL
10.	Residual chlorine	Cl_2 (mg/L)	HACH Method 8167	0.2-0.5	0.2-0.5	-	0.6	0.5	WL
11.	Ph@25° C	PH	ASTM D-1293	6.5 to 8.5	6.5 to 8.5	6.5 to 8.5	8.06	7.3	WL
12.	Total Dissolved Solid	TDS (mg/L)	APHA 2540-C	< 1000	< 1000	< 1000	399	279	WL
13.	Total Hardness	As $COCO_3$ (mg/L)	APHA 2340-C	< 500	< 500	-	76	75	WL
14.	Fluoride	F^{-1} (mg/L)	APHA 4500- F^{-1}	≤ 1.5	≤ 1.5	1.5	0.57	0.51	WL
15.	Chloride	CL^{-1}(mg/L)	APHA 4500- Cl^{-1}	< 250	< 250	250	195	162	WL
16.	Cyanide	CN^{-1}(mg/L)	HACH Method 8027	≤ 0.05	≤ 0.05	0.05	ND	ND	WL
17.	Nitrate	NO_3^{-1}(mg/L)	HACH Method 8192	≤ 50	≤ 50	50	0.17	0.16	WL
18.	Nitrite	NO_2^{-1}(mg/L)	APHA 4500- NO_2^{-1}-B	≤3.0 (P)	≤3.0 (P)	3	0.06	0.04	WL
19.	Antimony	Sb (mg/L)	ASTM D-3697	≤0.005	≤0.005	0.02	ND	ND	WL
20.	Aluminum	Al (mg/L)	ASTM D-857	≤0.2	≤0.2	0.2	0.02	0.01	WL
21.	Arsenic	As (mg/L)	ASTM D-2972	≤0.05	≤0.05	0.01	ND	ND	WL
22.	Boron	B (mg/L)	ASTM D-3082	0.3	0.3	0.3	ND	ND	WL
23.	Barium	Ba(mg/L)	ASTM D-4382	0.7	0.7	0.7	0.004	0.006	WL
24.	Chromium Total	Cr(mg/L)	ASTM D-1687	≤0.05	≤0.05	0.05	ND	ND	WL
25.	Copper	Cu(mg/L)	ASTM D-1688	2	2	2	<0.06	<0.04	WL

26.	Cadmium	Cd(mg/L)	ASTM D-3557	0.01	0.01	0.03	ND	ND	WL
27.	Lead	Pb(mg/L)	ASTM D-3559	≤0.05	≤0.05	0.01	ND	ND	WL
28.	Manganese	Mn(mg/L)	ASTM D-858	≤0.5	≤0.5	0.5	ND	ND	WL
29.	Mercury	Hg (mg/L)	ASTM D-3223	≤0.001	≤0.001	0.001	ND	ND	WL
30.	Nickel	Ni(mg/L)	ASTM D-3866	≤0.05	≤0.02	0.02	ND	ND	WL
31.	Selenium	Se(mg/L)	ASTM D-3858	0.01	0.01	0.01	ND	ND	WL
32.	Zinc	Zn (mg/L)	ASTM D-1691	5	5	3	0.07	0.04	WL

Note:

BEQS= Baluchistan Environmental Quality Standards

NEQS= National Environmental Quality Standards

WHO= World Health Organization Limits

WL= Within Limit

5.5 Monitoring of Air, Noise and Water at Karakh Valley

5.5.1. Ambient Air Monitoring

i. Methodology and Instrument Used

121. Ambient air quality monitoring was carried out at batching plant and camp siite for the assessment of Parameters (Temperature, Humidity, $PM_{2.5}$, PM_{10}, CO, SO_2, NO_2, O_2, Formaldehyde, Total Volatile Organic Compounds (TVOC), O_3 etc). The Air Quality Monitoring Station (AQMS-09), employed for PM_{10} & $PM_{2.5}$, is a fully integrated air monitoring station that delivers 'near reference levels' of performance parameters. With a size of large suitcase, it can measure up to 20 different gaseous and particulate pollutants and environmental parameters simultaneously. The AQMS 09 offers optimal balance between performance and measuring criteria pollutants.

ii Test Results and Discussion

122. Ambient air quality (Temperature, Humidity, $PM_{1.0}$, $PM_{2.5}$, PM_{10}, CO, SO_2, NO_2, O_2, Formaldehyde, Total Volatile Organic Compounds (TVOC), O_3) were monitored for twenty-four (24) hours at the locations identified by the SC and results obtained are shown in Table 5.5. $PM_{2.5}$, PM_{10} were within NEQs but levels exceeded stringent WHO standards, primarily due to dust accumulation near the monitoring points. The contractor has been instructed to strictly follow SSEMP recommendations, particularly regarding water sprinkling in dust-prone areas.

Table 5.5: Ambient Air Quality at Batching Plant

	Measuring Parameters	Unit	Current Report	NEQS Limits	WHO Limits
1.	Temperature	°C	28		
2.	Humidity	%	51		
4.	Particulate Matter (PM 2.5)	µg/m^3	28.5	35 (24 hrs.)	15(24 hrs.)
5.	Particulate Matter (PM 10)	µg/m^3	62.8	150 (24 hrs.)	45(24 hrs.)
6.	Carbon Monoxide (CO)	mg/m^3	ND	10 (08 hrs.)	4(24 hrs.)
7.	Sulphur Dioxide (SO_2)	µg/m^3	ND	120 (24 hrs.)	40(24 hrs.)
8.	Oxide of Nitrogen as (NO_2)	µg/m^3	ND	80 (24 hrs.)	25(24 hrs.)
9.	Oxygen O_2	%	20.1	-	
10.	Formaldehyde	µg/m^3	0.172	-	
11.	Total Volatile Organic Compounds (TVOC)	µg/m^3	0.208	-	
12.	Ozone (O_3)	µg/m^3	ND	130 (01 hr.)	60(Peek Season)

123. All the results are within the permissible limits and compliance with the BEQS and NEQS. However, it is worth noting that during the first quarter, the contractor has not performed quarterly monitoring at the sub-project sites.

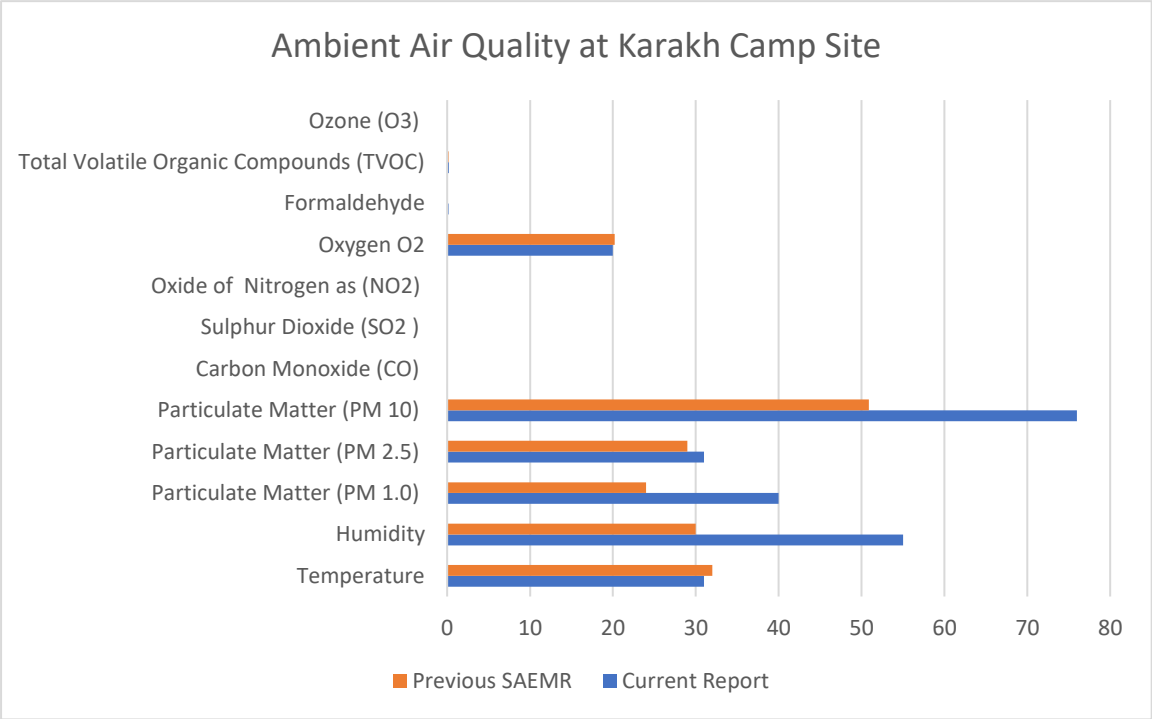


Figure 15: Ambient Air Quality at Karakh Camp Site

124. Considering the compliance with NEQS there is no immediate need for additional mitigation measures to control dust, apart from the measures proposed in the SSEMP. These measures may include regular sprinkling of water to suppress dust and timely transportation or disposal of excess materials temporarily stored at the site.

125. It is important to regularly monitor and assess the dust levels and compliance with environmental standards throughout the project's implementation to ensure continued adherence to regulations and to address any potential concerns that may arise.

Table 5.6: Ambient Air Quality at Camp site

	Measuring Parameters	Unit	Current Report	Previous SAEMR	NEQS Limits	Remarks
1.	Temperature	°C	31	32		
2.	Humidity	%	55	30		
3.	Particulate Matter (PM 1.0)	µg/m^3	40	24	500	WL
4.	Particulate Matter (PM 2.5)	µg/m^3	31	29	35 (24 hrs.)	WL
5.	Particulate Matter (PM 10)	µg/m^3	76	50.9	150 (24 hrs.)	WL
6.	Carbon Monoxide (CO)	mg/m^3	ND	ND	10 (08 hrs.)	WL
7.	Sulphur Dioxide (SO_2)	µg/m^3	ND	ND	120 (24 hrs.)	WL
8.	Oxide of Nitrogen as (NO_2)	µg/m^3	ND	ND	80 (24 hrs.)	WL

9.	Oxygen O_2	%	20	20.2	-	
10.	Formaldehyde	µg/m^3	0.175	0.074	-	
11.	Total Volatile Organic Compounds (TVOC)	µg/m^3	0.221	0.170	-	
12.	Ozone (O_3)	µg/m^3	ND	ND	130 (01 hr.)	WL

5.5.2. Noise Monitoring

126. The twenty-four (24) hours noise level monitoring was carried out at camp site and batching plant of Karakh Valley Development sub-project NCB-01 by using Digital Noise level meter.

i. Test Results and Discussion

127. Following table's shows comparison of noise level monitoring results obtained during the instrumental monitoring.

Table 5.7: Noise Monitoring Test Results

Sr. No	Location	Unit	Method	Current Result	Previous SAEMR	NEQS Limits
1.	Camp Site	dB	ASTM E1686-16	59.4	68.7	75
2.	Batching Plant	dB	ASTM E1686-16	64.5	ND	75

128. The noise level monitoring at sites was carried out during day and night with the objective to assess the off working noise levels as well. As evident from the results obtained, the average noise level at all intervals falls within the NEQS limits of 65 and 75 dB set for areas.

5.5.3. Monitoring of Drinking/Tap Water Quality and Waste Water

i. Methodology

129. During the reporting period, drinking/Tap water quality and waste water quality of the Contractor's camp was monitored for the agreed parameters given in the SSEMP. High density sterilized polyethylene bottles were used for the sampling. The collected samples were preserved, sealed and chilled at 40°C as recommended. APHA-1060 B & C method is used for sampling and preservation of water whereas.

ii. Drinking Water Test Results and Discussion

130. The drinking water demand is being met from Tubewell located near the contractor camp. At the first instance, water is pumped to elevated storage tank from where it is supplied to the consumer points through a pipe network.

Table 5.8: Drinking Water Monitoring at Source

S.No	Parameters	Unit	WHO Limits	NEQS Limits	Current Results	Previous SAEMR
1.	Total Coliform	TC (count/ml)	Must not be detectable in any 100 ml sample	0/100 ml	ND	ND
2.	E-Coli	EC (count/ml)	Must not be detectable in any 100 ml sample	0/100 ml	ND	ND
3.	Fecal Coliform	FC (count/ml)	Must not be detectable in any 100 ml sample	0/100 ml	ND	ND
4.	Turbidity	NTU	< 5	<5	<1	<1
5.	Taste	Taste	Non-Objectionable / Acceptable	Obj/Non Obj	Non-Obj	Non-Obj
6.	Odour	Odor	Non-Objectionable / Acceptable	Obj/Non Obj	Non-Obj	Non-Obj
7.	Colour	TCU	≤ 15	≤ 15 TCU	ND	< 03
8.	Phenolic Compounds	As Phenol (mg/L)	-	-	ND	ND
9.	Residual chlorine	Cl_2 (mg/L)	-	0.2-0.5	0.2	ND
10.	ph@25° C	PH	6.5-8.5	6.5 to 8.5	7.78	8.10
11.	Total Dissolved Solid	TDS (mg/L)	< 1000	< 1000	326	457
12.	Total Hardness	As $COCO_3$ (mg/L)	-	< 500	304	240
13.	Fluoride	F^{-1} (mg/L)	1.5	≤ 1.5	0.16	0.22
14.	Chloride	CL^{-1}(mg/L)	250	< 250	19.99	207.93
15.	Cyanide	CN^{-1}(mg/L)		≤ 0.05	ND	ND
16.	Nitrate	NO_3^{-1}(mg/L)	50	≤ 50	0.3	0.22
17.	Nitrite	NO_2^{-1}(mg/L)	3	≤3.0 (P)	0.004	0.03
18.	Antimony	Sb (mg/L)	0.02	≤0.005	ND	ND
19.	Aluminum	Al (mg/L)	0.2	≤0.2	ND	ND
20.	Arsenic	As (mg/L)	0.01	≤0.05	ND	ND
21.	Boron	B (mg/L)	0.3	0.3	ND	ND
22.	Barium	Ba(mg/L)	0.7	0.7	ND	0.006
23.	Chromium	Cr(mg/L)	0.05	≤0.05	ND	ND
24.	Copper	Cu(mg/L)	2	2	<0.06	<0.04
25.	Cadmium	Cd(mg/L)	0.003	0.01	ND	ND
26.	Lead	Pb(mg/L)	0.01	≤0.05	ND	ND
27.	Manganese	Mn(mg/L)	0.5	≤0.5	ND	ND
28.	Mercury	Hg (mg/L)	0.001	≤0.001	ND	ND
29.	Nickel	Ni(mg/L)	0.02	≤0.02	ND	ND
30.	Selenium	Se(mg/L)	0.01	0.01	ND	ND
31.	Zinc	Zn (mg/L)	3	5	ND	0.0100

Table 5.9: Drinking/Tap Water Monitoring at Consumer End

S.No	Parameters	Unit	WHO Standards	NEQS	Current Results	Previous SAEMR
1.	Total Bacteria Count	TBC (count/ml)	-	0/100 ml	02	ND
2.	Total Coliform	TC (count/ml)	Must not be detectable in any 100 ml sample	0/100 ml	ND	ND
3.	E-Coli	EC (count/ml)	Must not be detectable in any 100 ml sample	0/100 ml	ND	ND
4.	Fecal Coliform	FC (count/ml)	Must not be detectable in any 100 ml sample	0/100 ml	ND	ND
5.	Turbidity	NTU	< 5	<5	<1	<1
6.	Taste	Taste	Non-Objectionable / Acceptable	Obj/Non Obj	Non-Obj	Non-Obj
7.	Odour	Odor	Non-Objectionable / Acceptable	Obj/Non Obj	Non-Obj	Non-Obj
8.	Colour	TCU	≤ 15	≤ 15 TCU	02	01
9.	Phenolic Compounds	As Phenol (mg/L)	-	-	ND	ND
10.	Residual chlorine	Cl_2 (mg/L)	-	0.2-0.5	ND	ND
11.	Ph@25° C	PH	6.5-8.5	6.5 to 8.5	7.76	7.34
12.	Total Dissolved Solid	TDS (mg/L)	< 1000	< 1000	390	322
13.	Total Hardness	As $COCO_3$ (mg/L)	-	< 500	284	180
14.	Fluoride	F^{-1} (mg/L)	1.5	≤ 1.5	0.54	0.22
15.	Chloride	CL^{-1}(mg/L)	250	< 250	97.96	119.96
16.	Cyanide	CN^{-1}(mg/L)		≤ 0.05	ND	ND
17.	Nitrate	NO_3^{-1}(mg/L)	50	≤ 50	0.6	0.10
18.	Nitrite	NO_2^{-1}(mg/L)	3	≤3.0 (P)	0.007	0.02
19.	Antimony	Sb (mg/L)	0.02	≤0.005	ND	ND
20.	Aluminum	Al (mg/L)	0.2	≤0.2	ND	ND
21.	Arsenic	As (mg/L)	0.01	≤0.05	ND	ND
22.	Boron	B (mg/L)	0.3	0.3	ND	ND
23.	Barium	Ba(mg/L)	0.7	0.7	ND	ND
24.	Chromium Total	Cr(mg/L)	0.05	≤0.05	ND	ND
25.	Copper	Cu(mg/L)	2	2	ND	0.0050
26.	Cadmium	Cd(mg/L)	0.003	0.01	0.0045	ND
27.	Lead	Pb(mg/L)	0.01	≤0.05	ND	ND
28.	Manganese	Mn(mg/L)	0.5	≤0.5	0.1001	ND
29.	Mercury	Hg (mg/L)	0.001	≤0.001	ND	ND
30.	Nickel	Ni(mg/L)	0.02	≤0.02	ND	ND
31.	Selenium	Se(mg/L)	0.01	0.01	ND	ND
32.	Zinc	Zn (mg/L)	3	5	0.1634	ND

iii. Waste Water Test Results and Discussion

131. The waste water samples, were collected from the camp where all effluent converges into one outlet.

Table 5.10: Waste Water Monitoring at Camp site

S.No	Parameters	Unit	Testing Method	NEQS	Current Results	Previous SAEMR
1.	Temperature	°C	APHA 2550	≤3	30	29
2.	Ph@25° C	PH	APHA 4500 H	6 to 9	7.93	7.11
3.	Sulphide	Mg/L	APHA 4500 H-B	1	<1	<1
4.	Biological Oxygen Demand (BOD)	Mg/L	HACH 10099	80-250	38	60
5.	Chemical Oxygen Demand (COD)	Mg/L	HACH 8000	150-400	82	101
6.	Total Dissolved Solid	TDS (mg/L)	APHA 2540-C	< 1000	494	430
7.	Total Suspended Solids (TSS)	Mg/L	APHA 2540-C	200	162	189
8.	Oil & Grease	Mg/L	ASTM D-3921	10	02	02
9.	Cadmium	Cd(mg/L)	APHA 3111-B	0.01	0.0043	0.0050
10.	Copper	Cu(mg/L)	APHA 3111-B	2	0.0053	0.0090
11.	Iron	Mg/L	APHA 3111-B	8	0.0123	0.0102
12.	Lead	Pb(mg/L)	APHA 3111-B	≤0.05	ND	ND
13.	Manganese	Mn(mg/L)	APHA 3111-B	≤0.5	ND	ND
14.	Mercury	Hg (mg/L)	APHA 3112-B	≤0.001	ND	ND
15.	Nickel	Ni(mg/L)	APHA 3111-B	≤0.02	ND	ND
16.	Selenium	Se(mg/L)	APHA 3114-B	0.01	ND	ND
17.	Chromium Total	Cr(mg/L)	APHA 3111-B	≤0.05	ND	ND
18.	Zinc	Zn (mg/L)	APHA 3111-B	5	ND	ND
19.	Arsenic	As (mg/L)	APHA 3114-B	≤0.05	ND	ND
20.	Chlorine	Mg/L	HACH 10069	1.0	ND	ND
21.	Chloride	CL^{-1}(mg/L)	APHA 4500- Cl^{-1}	1000	299.90	319.90
22.	Cyanide	CN^{-1}(mg/L)	HACH Method 8027	≤ 0.05	0.002	0.002
23.	Fluoride	F^{-1} (mg/L)	HACH 8029	10	0.19	0.50
24.	Ammonia	Mg/L	HACH 8038	40	0.34	0.33
25.	Sulphate	Mg/L	HACH 8051	600	76	80
26.	An Ionic Detergent As MBAS	Mg/L	APHA 5540 C	20	01	02
27.	Phenolic Compounds	As Phenol (mg/L)	ASTM D-1783	0.1	ND	ND
28.	Boron	B (mg/L)	HACH 8015	6	ND	ND
29.	Barium	Ba(mg/L)	HACH 8014	1.5	ND	ND
30.	Silver	(mg/L)	APHA 3114-B	1.0	ND	ND

132. Generally, the results of the effluent parameters tested, fall within the permissible limits of NEQS.

5.5.4. Monitoring of Gaseous and Vehicles Emission

i. Methodology

133. During the reporting period, generator and vehicles emissions were monitored at the camp and construction site for the agreed parameters as given in the SSEMP. All lab results are provided as annexure VII.

5.6 Monitoring of Air, Noise and Water at Water Resources Building site

5.8.1. Ambient Air Monitoring

i. Methodology and Instrument Used

134. Ambient air quality monitoring was carried out for the assessment of Parameters (NO, NO2, SO2, CO, O3, SPM, PM10, PM2.5, humidity, wind direction, wind velocity, pressure etc). The Air Quality Monitoring Station (AQMS-09), employed for PM_{10} & $PM_{2.5}$, is a fully integrated air monitoring station that delivers 'near reference levels' of performance parameters. With a size of large suitcase, it can measure up to 20 different gaseous and particulate pollutants and environmental parameters simultaneously. The AQMS 09 offers optimal balance between performance and measuring criteria pollutants.

ii Test Results and Discussion

135. Ambient air quality (NO, NO_2, SO_2, CO, O_3, SPM, PM_{10}, $PM_{2.5}$, Humidity, Wind direction, Wind velocity, Pressure etc) were monitored for twenty-four (24) hours at the locations identified by the SC and results obtained are as under.

136. All the results are within the permissible limits and compliance with the BEQS, NEQS and WHO standards. However, it is worth noting that during the first quarter, the contractor

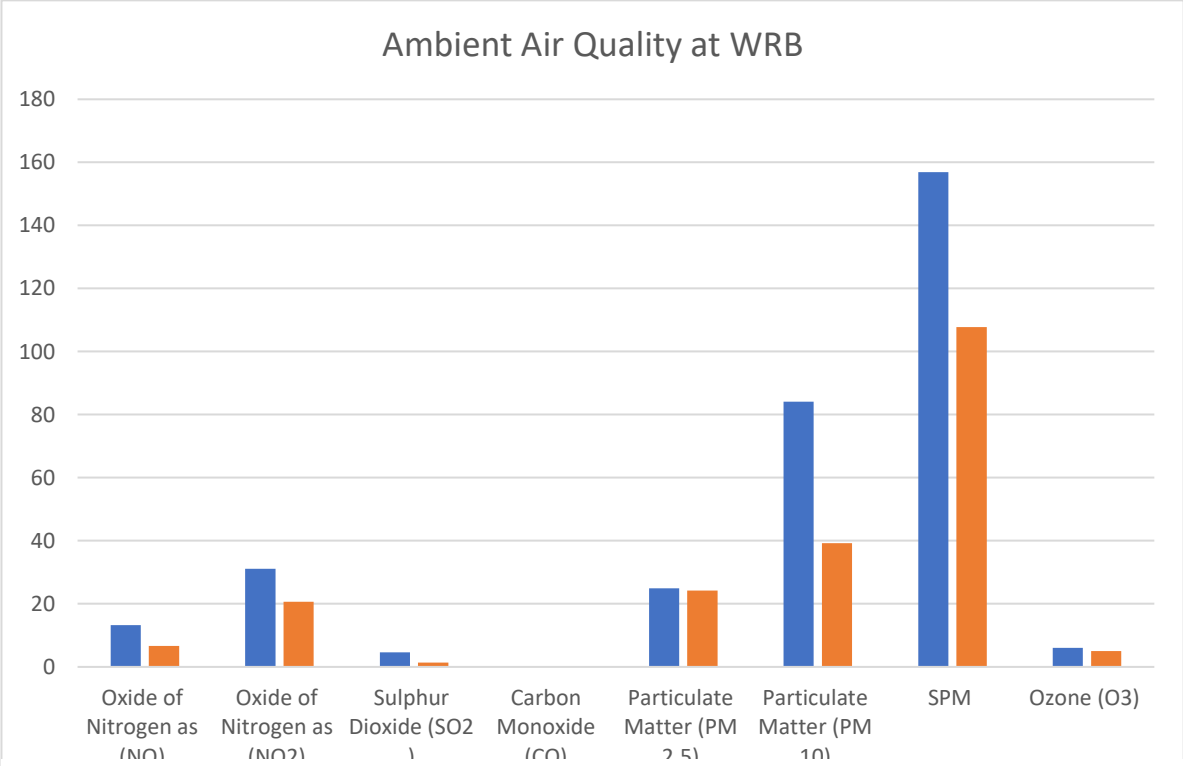


Figure 16: Ambient Air Quality at WRB

has not performed quarterly monitoring at the sub-project sites are shown as in Figure 5.4 and Table 5.10.

Table 5.10: Air Quality Monitoring Test Results

	Measuring Parameters	Location	Unit	Current Report	Previous SAEMR	WHO Limit	NEQS & BEQS Limits	Remarks
1.	Oxide of Nitrogen as (NO)	Camp	µg/m^3	13.27	6.65	-	40 (24 hrs.)	WL
2.	Oxide of Nitrogen as (NO_2)	Camp	µg/m^3	31.10	20.70	25(24 hrs.)	80 (24 hrs.)	WL
3.	Sulphur Dioxide (SO_2)	Camp	µg/m^3	4.64	1.38	40(24 hrs.)	120 (24 hrs.)	WL
4.	Carbon Monoxide (CO)	Camp	mg/m^3	0.047	0.023	4(24 hrs.)	5 (08 hrs.)	WL
5.	Particulate Matter (PM 2.5)	Camp	µg/m^3	24.96	24.23	15(24 hrs.)	35 (24 hrs.)	WL
6.	Particulate Matter (PM 10)	Camp	µg/m^3	84.07	39.2	45(24 hrs.)	150 (24 hrs.)	WL
7.	SPM	Camp	µg/m^3	156.90	107.8	-	500 (24 hrs.)	WL
8.	Ozone (O_3)	CAmp	µg/m^3	06	05	60(Peek Season)	130 (01 hr.)	WL

137. Considering the compliance with NEQS and WHO standards, there is no immediate need for additional mitigation measures to control dust, apart from the measures proposed in the SSEMP. These measures may include regular sprinkling of water to suppress dust and timely transportation or disposal of excess materials temporarily stored at the site.

138. It is important to regularly monitor and assess the dust levels and compliance with environmental standards throughout the project's implementation to ensure continued adherence to regulations and to address any potential concerns that may arise.

5.8.2. Noise Monitoring

139. The twenty-four (24) hours noise level monitoring was carried out at Water Resources Building site using Digital Noise level meter.

i. **Test Results and Discussion**

140. Following table's shows comparison of noise level monitoring results obtained during the instrumental monitoring.

Table 5.11: Noise Level Test Results

S. No	Time	Unit	Current Results	Previous SAEMR	WHO Limit	NEQS & BEQS Limits
01	10:00 AM		52.1	58.4	65 dB(A)	75 dB(A)

02	11:00 AM	**dB(A)**	53.5	56.6	(Day time)	(Day time)
03	12:00 PM		56.1	57.5		
04	01:00 PM		53.2	55.1		
05	02:00 PM		56.4	53.4		
06	03:00 PM		52.1	56.7		
07	04:00 PM		55.6	55.2		
08	05:00 PM		53.2	54.8		
09	06:00 PM		57.3	56.3		
10	07:00 PM		52.1	55.4		
11	08:00 PM		58.1	53.9		
12	09:00 PM		53.4	52.7		
13	10:00 PM		53.1	51.8		
14	11:00 PM		56.8	51.2	55 dB(A) (Night time)	65 dB(A) (Night time)
15	12:00 AM		59.2	50.3		
16	01:00 AM		53.2	50.2		
17	02:00 AM		42.4	47.8		
18	03:00 AM		46.8	45.4		
19	04:00 AM		49.1	43.9		
20	05:00 AM		47.9	44.5		
21	06:00 AM		45.5	46.8		
22	07:00 AM		46.8	48.2	65 dB(A) (Day time)	75 dB(A) (Day time)
23	08:00 AM		42.4	49.6		
24	09:00 AM		58.1	51.4		
Average			**52.2**	**51.9**		

141. The noise level monitoring at sites was carried out during day and night with the objective to assess the off working noise levels as well.

142. As evident from the results obtained, the average noise level at all intervals falls within the WHO, BEQS and NEQS limits of 65 and 75 dB set for areas.

5.8.3. Monitoring of Metrological Data

i. Methodology

143. During the reporting period, metrological conditions of the construction site was monitored for 24 hours. As evident from the below table, almost all parameters falls within the permissible limits set under NEQS.

144. Following is a comparison of the results obtained.

Table 5.12: Metrological Data Analysis

METROLOGICAL DATA					
S.No.	**TIME**	**Wind Direction**	**Wind Velocity**	**Humidity**	**Pressure**
	Hours		m/sec	%	Mm of Hg
01	10:00 AM	SW	1.34	91	757
02	11:00 AM	N	1.35	92	738
03	12:00 PM	N	1.34	94	766
04	01:00 PM	SW	1.35	96	721
05	02:00 PM	N	1.33	93	720
06	03:00 PM	SW	2.25	87	724
07	04:00 PM	NS	1.22	89	738
08	05:00 PM	NS	1.97	87	729
09	06:00 PM	NS	1.21	85	761
10	07:00 PM	N	2.31	83	738
11	08:00 PM	N	2.22	82	745
12	09:00 PM	NS	3.43	83	730
13	10:00 PM	N	3.31	86	787
14	11:00 PM	NS	3.65	82	798
15	12:00 AM	N	4.07	87	736
16	01:00 AM	N	5.35	86	735
17	02:00 AM	NS	5.36	89	770
18	03:00 AM	N	6.06	87	771
19	04:00 AM	NS	5.33	85	772
20	05:00 AM	NW	4.65	82	757
21	06:00 AM	NW	4.52	97	761
22	07:00 AM	NW	5.27	95	765
23	08:00 AM	N	4.63	92	761
24	09:00 AM	N	3.33	94	760

5.7 Monitoring of Air, Noise and Water at Kharzan Hatachi Infiltration Gallery

5.7.1. Ambient Air Monitoring

i. Methodology and Instrument Used

145. Ambient air quality monitoring was carried out at the camp site (east, west, north and south) for the assessment of parameters (temperature, humidity, $PM_{1.0}$, $PM_{2.5}$, PM_{10}, CO, SO_2, NO_2, O_2, formaldehyde, Total Volatile Organic Compounds (TVOC), O_3, etc). The Air Quality Monitoring Station (AQMS-09), employed for PM_{10} & $PM_{2.5}$, is a fully integrated air monitoring station that delivers 'near reference levels' of performance parameters. With a size of large suitcase, it can measure up to 20 different gaseous and particulate pollutants and environmental parameters simultaneously. The AQMS 09 offers optimal balance between performance and measuring criteria pollutants.

ii Test Results and Discussion

146. Ambient air quality (temperature, humidity, $PM_{1.0}$, $PM_{2.5}$, PM_{10}, CO, SO_2, NO_2, O_2, formaldehyde, Total Volatile Organic Compounds (TVOC), O_3) were monitored for twenty-four (24) hours at the locations identified by the SC and results obtained are shown as Annexure VII.

147. All the results are within the permissible limits and in compliance with the NEQS. However, it is worth noting that during the first quarter, the contractor did not perform quarterly monitoring at the sub-project sites.

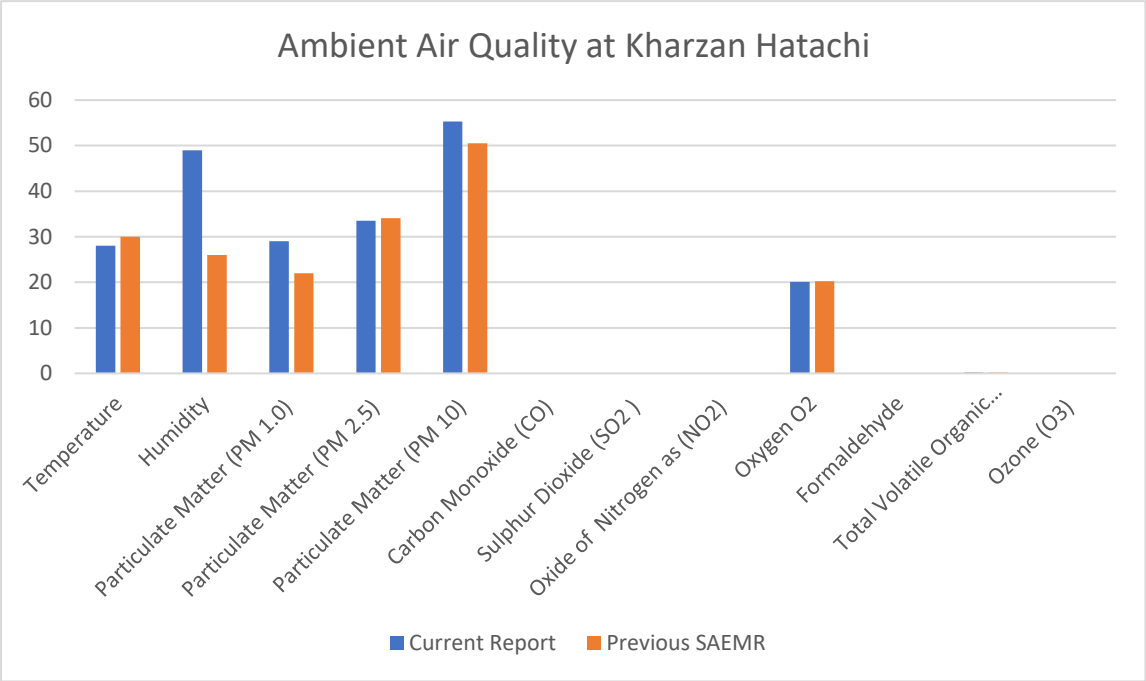


Figure 17: Ambient Air Quality at Kharzan Hatachi

148. Considering the compliance with NEQS there is no immediate need for additional mitigation measures to control dust, apart from the measures proposed in the SSEMP. These measures may include regular sprinkling of water to suppress dust and timely transportation or disposal of excess materials temporarily stored at the site.

Table 5.13: Ambient Air Quality

	Measuring Parameters	Unit	Current Report	Previous SAEMR	NEQS	Remarks
1.	Temperature	°C	28	30		
2.	Humidity	%	49	26		
3.	Particulate Matter (PM 1.0)	µg/m³	29	22	500	WL
4.	Particulate Matter (PM 2.5)	µg/m³	33.5	34.1	35 (24 hrs.)	WL
5.	Particulate Matter (PM 10)	µg/m³	55.3	50.5	150 (24 hrs.)	WL
6.	Carbon Monoxide (CO)	mg/m³	ND	ND	10 (08 hrs.)	WL
7.	Sulphur Dioxide (SO_2)	µg/m³	ND	ND	120 (24 hrs.)	WL
8.	Oxide of Nitrogen as (NO_2)	µg/m³	ND	ND	80 (24 hrs.)	WL
9.	Oxygen O_2	%	20.1	20.2	-	
10.	Formaldehyde	µg/m³	0.062	0.060	-	
11.	Total Volatile Organic Compounds (TVOC)	µg/m³	0.178	0.172	-	
12.	Ozone (O_3)	µg/m³	ND	ND	130 (01 hr.)	WL

149. It is important to regularly monitor and assess the dust levels and compliance with environmental standards throughout the project's implementation to ensure continued adherence to regulations and to address any potential concerns that may arise.

5.7.2. Noise Monitoring

150. The twenty-four (24) hours noise level monitoring was carried out at camp site and batching plant of Kharzan Hatachi sub-project NCB-02 by using Digital Noise level meter.

i. Test Results and Discussion

151. The following table shows a comparison of noise level monitoring results obtained during instrumental monitoring.

Table 5.14: Noise Monitoring Test Results at Camp site

Sr. No	Location	Unit	Method	Current Result	Previous SAEMR	NEQS
1.	East	dB	ASTM E1686-16	73.4	60.7	75
2.	West	dB	ASTM E1686-16	67.6	65.2	75
3.	North	dB	ASTM E1686-16	74.3	57.2	75
4.	South	dB	ASTM E1686-16	73.1	63.5	75
5.	Center Point	dB	ASTM E1686-16	72.1	69.8	75

152. The noise level monitoring at sites was carried out during day and night with the objective to assess the off working noise levels as well. As evident from the results obtained, the average noise level at all intervals falls within the NEQS limits of 65 and 75 dB set for areas.

5.7.3. Monitoring of Drinking/Tap Water Quality and Waste Water

i. Methodology

153. During the reporting period, drinking/Tap water quality and waste water quality of the Contractor's camp was monitored for the agreed parameters given in the SSEMP. High density sterilized polyethylene bottles were used for the sampling. The collected samples were preserved, sealed and chilled at 40C as recommended. APHA-1060 B & C method is used for sampling and preservation of water whereas.

ii. Drinking Water Test Results and Discussion

154. The drinking water demand is being met from Tubewell located near the contractor camp. At the first instance, water is pumped to elevated storage tank from where it is supplied to the consumer points through a pipe network.

Table 5.15: Drinking Water Monitoring at Camp Area

S.No	Parameters	Unit	Testing Method	NEQS Limits	Current Results	Previous SAEMR
1.	Total Bacteria Count	TBC (count/ml)	USEPA 1604	----------	ND	ND
2.	Total Coliform	TC (count/ml)	APHA 922 B	0/100 ml	ND	ND
3.	E-Coli	EC (count/ml)	USEPA 1604	0/100 ml	ND	ND
4.	Fecal Coliform	FC (count/ml)	USEPA 1604	0/100 ml	ND	ND
5.	Turbidity	NTU	APHA 2130	<5	<1	<1
6.	Taste	Taste	APHA 2160	Obj/Non Obj	Non-Obj	Non-Obj
7.	Odour	Odor	APHA 2150	Obj/Non Obj	Non-Obj	Non-Obj
8.	Colour	TCU	HACH 8025	≤ 15 TCU	01	02
9.	Phenolic Compounds	As Phenol (mg/L)	ASTM D-1783	-	ND	ND
10.	Residual chlorine	Cl_2 (mg/L)	HACH Method 10069	0.2-0.5	ND	ND
11.	Ph@25° C	PH	APHA 4500 H	6.5 to 8.5	7.75	8.03
12.	Total Dissolved Solid	TDS (mg/L)	APHA 2540-C	< 1000	406	318
13.	Total Hardness	As $COCO_3$ (mg/L)	ASTM D 1126	< 500	324	88
14.	Fluoride	F^{-1} (mg/L)	APHA 4500- F^{-1}	≤ 1.5	0.52	0.12
15.	Chloride	CL^{-1}(mg/L)	APHA 4500-Cl^{-1}	< 250	73.97	217.93
16.	Cyanide	CN^{-1}(mg/L)	HACH Method 8027	≤ 0.05	ND	ND
17.	Nitrate	NO_3^{-1}(mg/L)	HACH Method 8039	≤ 50	0.5	0.20
18.	Nitrite	NO_2^{-1}(mg/L)	HACH 8507	≤3.0 (P)	0.007	0.03
19.	Antimony	Sb (mg/L)	APHA 3111-B	≤0.005	ND	ND
20.	Aluminum	Al (mg/L)	APHA 3111-D	≤0.2	ND	ND
21.	Arsenic	As (mg/L)	APHA 3114-B	≤0.05	ND	ND
22.	Boron	B (mg/L)	HACH 8015	0.3	ND	ND
23.	Barium	Ba(mg/L)	HACH 8014	0.7	ND	ND
24.	Chromium Total	Cr(mg/L)	APHA 3111-B	≤0.05	ND	ND
25.	Copper	Cu(mg/L)	APHA 3111-B	2	ND	0.0053
26.	Cadmium	Cd(mg/L)	APHA 3111-B	0.01	ND	ND
27.	Lead	Pb(mg/L)	APHA 3111-B	≤0.05	ND	ND
28.	Manganese	Mn(mg/L)	APHA 3111-B	≤0.5	ND	ND
29.	Mercury	Hg (mg/L)	APHA 3112-B	≤0.001	ND	ND
30.	Nickel	Ni(mg/L)	APHA 3111-B	≤0.02	ND	ND
31.	Selenium	Se(mg/L)	APHA 3114-B	0.01	ND	ND
32.	Zinc	Zn (mg/L)	APHA 3111-B	5	ND	ND

iii. Drinking Water Monitoring at Construction site

Table 5.16: Drinking/Tap Water Monitoring at Construction Site

S.No	Parameters	Unit	Testing Method	NEQS Limits	Current Results	Previous SAEMR
1.	Total Bacteria Count	TBC (count/ml)	USEPA 1604	----------	ND	ND
2.	Total Coliform	TC (count/ml)	APHA 922 B	0/100 ml	ND	ND
3.	E-Coli	EC (count/ml)	USEPA 1604	0/100 ml	ND	ND
4.	Fecal Coliform	FC (count/ml)	USEPA 1604	0/100 ml	ND	ND
5.	Turbidity	NTU	APHA 2130	<5	<1	<1
6.	Taste	Taste	APHA 2160	Obj/Non Obj	Non-Obj	Non-Obj
7.	Odour	Odor	APHA 2150	Obj/Non Obj	Non-Obj	Non-Obj
8.	Colour	TCU	HACH 8025	≤ 15 TCU	01	02
9.	Phenolic Compounds	As Phenol (mg/L)	ASTM D-1783	-	ND	ND
10.	Residual chlorine	Cl_2 (mg/L)	HACH Method 10069	0.2-0.5	ND	ND
11.	Ph@25° C	PH	APHA 4500 H	6.5 to 8.5	8.14	8.39
12.	Total Dissolved Solid	TDS (mg/L)	APHA 2540-C	< 1000	344	320
13.	Total Hardness	As $COCO_3$ (mg/L)	ASTM D 1126	< 500	260	92
14.	Fluoride	F^{-1} (mg/L)	APHA 4500- F^{-1}	≤ 1.5	0.41	0.10
15.	Chloride	CL^{-1}(mg/L)	APHA 4500- Cl^{-1}	< 250	81.97	223.93
16.	Cyanide	CN^{-1}(mg/L)	HACH Method 8027	≤ 0.05	ND	ND
17.	Nitrate	NO_3^{-1}(mg/L)	HACH Method 8039	≤ 50	0.4	0.20
18.	Nitrite	NO_2^{-1}(mg/L)	HACH 8507	≤3.0 (P)	0.006	0.03
19.	Antimony	Sb (mg/L)	APHA 3111-B	≤0.005	ND	ND
20.	Aluminum	Al (mg/L)	APHA 3111-D	≤0.2	ND	ND
21.	Arsenic	As (mg/L)	APHA 3114-B	≤0.05	ND	ND
22.	Boron	B (mg/L)	HACH 8015	0.3	ND	ND
23.	Barium	Ba(mg/L)	HACH 8014	0.7	ND	ND
24.	Chromium Total	Cr(mg/L)	APHA 3111-B	≤0.05	ND	ND
25.	Copper	Cu(mg/L)	APHA 3111-B	2	ND	0.0055
26.	Cadmium	Cd(mg/L)	APHA 3111-B	0.01	ND	ND
27.	Lead	Pb(mg/L)	APHA 3111-B	≤0.05	ND	ND
28.	Manganese	Mn(mg/L)	APHA 3111-B	≤0.5	ND	ND
29.	Mercury	Hg (mg/L)	APHA 3112-B	≤0.001	ND	ND
30.	Nickel	Ni(mg/L)	APHA 3111-B	≤0.02	ND	ND
31.	Selenium	Se(mg/L)	APHA 3114-B	0.01	ND	ND
32.	Zinc	Zn (mg/L)	APHA 3111-B	5	ND	ND

iv. Waste Water Test Results and Discussion

156. The waste water samples, were collected from the camp where all effluent converges into one outlet.

Table 5.17: Waste Water Monitoring at Camp site

S.No	Parameters	Unit	Testing Method	NEQS Limits	Current Results	Previous SAEMR
1.	Temperature	°C	APHA 2550	≤3	31	31
2.	Ph@25° C	PH	APHA 4500 H	6 to 9	6.62	6.84
3.	Sulphide	Mg/L	APHA 4500 H-B	1	<1	<1
4.	Biological Oxygen Demand (BOD)	Mg/L	HACH 10099	80-250	69	74
5.	Chemical Oxygen Demand (COD)	Mg/L	HACH 8000	150-400	137	142
6.	Total Dissolved Solid	TDS (mg/L)	APHA 2540-C	< 1000	660	509
7.	Total Suspended Solids (TSS)	Mg/L	APHA 2540-C	200	184	294
8.	Oil & Grease	Mg/L	ASTM D-3921	10	03	04
9.	Cadmium	Cd(mg/L)	APHA 3111-B	0.01	0.0081	0.0028
10.	Copper	Cu(mg/L)	APHA 3111-B	2	0.0119	0.0113
11.	Iron	Mg/L	APHA 3111-B	8	0.0116	0.0120
12.	Lead	Pb(mg/L)	APHA 3111-B	≤0.05	ND	ND
13.	Manganese	Mn(mg/L)	APHA 3111-B	≤0.5	ND	ND
14.	Mercury	Hg (mg/L)	APHA 3112-B	≤0.001	ND	ND
15.	Nickel	Ni(mg/L)	APHA 3111-B	≤0.02	ND	ND
16.	Selenium	Se(mg/L)	APHA 3114-B	0.01	ND	ND
17.	Chromium Total	Cr(mg/L)	APHA 3111-B	≤0.05	0.0316	ND
18.	Zinc	Zn (mg/L)	APHA 3111-B	5	ND	ND
19.	Arsenic	As (mg/L)	APHA 3114-B	≤0.05	ND	ND
20.	Chlorine	Mg/L	HACH 10069	1.0	ND	ND
21.	Chloride	CL^{-1}(mg/L)	APHA 4500- Cl^{-1}	1000	419.86	399.87
22.	Cyanide	CN^{-1}(mg/L)	HACH Method 8027	≤ 0.05	0.004	0.003
23.	Fluoride	F^{-1} (mg/L)	HACH 8029	10	0.52	0.69
24.	Ammonia	Mg/L	HACH 8038	40	0.61	0.66
25.	Sulphate	Mg/L	HACH 8051	600	84	96
26.	An Ionic Detergent as MBAS	Mg/L	APHA 5540 C	20	02	03
27.	Phenolic Compounds	As Phenol (mg/L)	ASTM D-1783	0.1	ND	ND
28.	Boron	B (mg/L)	HACH 8015	6	ND	ND
29.	Barium	Ba(mg/L)	HACH 8014	1.5	ND	ND
30.	Silver	(mg/L)	APHA 3114-B	1.0	ND	ND

157. Generally, the results of the effluent parameters tested, fall within the permissible limits of NEQS.

5.7.4. Monitoring of Gaseous and Vehicles Emission

i. Methodology

During the reporting period, generator and vehicles emissions were monitored at the camp site and construction site for the agreed parameters as given in the SSEMP. All lab results are provided as annexure VII.

5.8 Monitoring of Air, Noise and Water at Kili Sardar Akhtar

5.8.1. Ambient Air Monitoring

i. Methodology and Instrument Used

158. Ambient air quality monitoring was carried out for the assessment of Parameters (NO, NO2, SO2, CO, O3, SPM, PM10, PM2.5, Humidity, Wind direction, Wind velocity, Pressure etc). The Air Quality Monitoring Station (AQMS-09), employed for PM_{10} & $PM_{2.5}$, is a fully integrated air monitoring station that delivers 'near reference levels' of performance parameters. With a size of large suitcase, it can measure up to 20 different gaseous and particulate pollutants and environmental parameters simultaneously. The AQMS 09 offers optimal balance between performance and measuring criteria pollutants.

ii Test Results and Discussion

159. Ambient air quality (NO, NO_2, SO_2, CO, O_3, SPM, PM_{10}, $PM_{2.5}$, Humidity, Wind direction, Wind velocity, Pressure etc) were monitored for twenty-four (24) hours at the locations identified by the SC and results obtained are shown as Annexure VII.

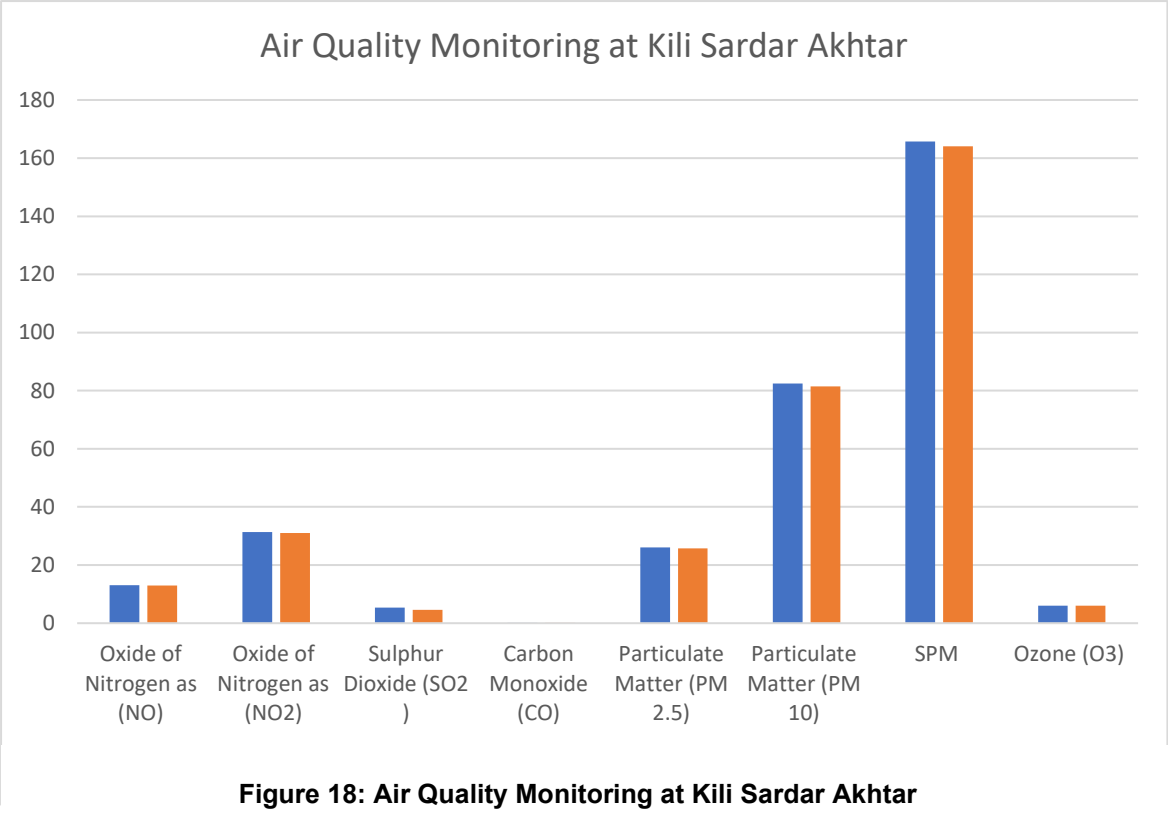


Figure 18: Air Quality Monitoring at Kili Sardar Akhtar

160. All the results are within the permissible limits and compliance with the BEQS, NEQS and WHO standards. However, it is worth noting that during the first quarter, the contractor has not performed quarterly monitoring at the sub-project sites.

Table 5.18: Air Quality Monitoring Test Results

	Measuring Parameters	Location	Unit	Current Report	Previous SAEMR	WHO Limit	NEQS & BEQS Limits	Remarks
1.	Oxide of Nitrogen as (NO)	Camp	µg/m^3	13.07	13.0	-	40 (24 hrs.)	WL
2.	Oxide of Nitrogen as (NO_2)	Camp	µg/m^3	31.34	31.03	25(24 hrs.)	80 (24 hrs.)	WL
3.	Sulphur Dioxide (SO_2)	Camp	µg/m^3	5.33	4.55	40(24 hrs.)	120 (24 hrs.)	WL
4.	Carbon Monoxide (CO)	Camp	mg/m^3	0.065	0.046	4(24 hrs.)	5 (08 hrs.)	WL
5.	Particulate Matter (PM 2.5)	Camp	µg/m^3	26.10	25.73	15(24 hrs.)	35 (24 hrs.)	WL
6.	Particulate Matter (PM 10)	Camp	µg/m^3	82.44	81.47	45(24 hrs.)	150 (24 hrs.)	WL
7.	SPM	Camp	µg/m^3	165.71	164.11	-	500 (24 hrs.)	WL
8.	Ozone (O_3)	CAmp	µg/m^3	06	06	60(Peek Season)	130 (01 hr.)	WL

161. Considering the compliance with NEQS and WHO standards, there is no immediate need for additional mitigation measures to control dust, apart from the measures proposed in the SSEMP. These measures may include regular sprinkling of water to suppress dust and timely transportation or disposal of excess materials temporarily stored at the site.

162. It is important to regularly monitor and assess the dust levels and compliance with environmental standards throughout the project's implementation to ensure continued adherence to regulations and to address any potential concerns that may arise.

5.8.2. Noise Monitoring

163. The twenty-four (24) hours noise level monitoring was carried out at Water Resources Building site using Digital Noise level meter.

i. **Test Results and Discussion**

164. Following table shows comparison of noise level monitoring results obtained during the instrumental monitoring.

Table 5.19: Noise Level Test Results

S. No	Time	Unit	Current Results	Previous SAEMR	WHO Limit	NEQS & BEQS Limits

01	09:00 AM	**dB(A)**	62.4	61.3	65 dB(A) (Day time)	75 dB(A) (Day time)
02	10:00 AM		63.5	64.5		
03	11:00 AM		64.5	63.2		
04	12:00 PM		61.2	61.3		
05	01:00 PM		63.6	63.9		
06	02:00 PM		63.5	64.9		
07	03:00 PM		63.7	62.9		
08	04:00 PM		63.5	63.5		
09	05:00 PM		63.4	64.6		
10	06:00 PM		68.2	63.3		
11	07:00 PM		67.2	63.5		
12	08:00 PM		56.1	58.2		
13	09:00 PM		53.5	51.2		
14	10:00 PM		56.7	58.2		
15	11:00 PM		53.5	53.2	55 dB(A) (Night time)	65 dB(A) (Night time)
16	12:00 AM		54.2	54.5		
17	01:00 AM		52.2	53.2		
18	02:00 AM		53.1	51.2		
19	03:00 AM		46.3	48.7		
20	04:00 AM		48.4	46.4		
21	05:00 AM		49.2	49.2		
22	06:00 AM		47.2	42.3		
23	07:00 AM		56.8	53.2	65 dB(A) (Day time)	75 dB(A) (Day time)
24	08:00 AM		57.2	56.2		
Average			57.8	57.1		

165. The noise level monitoring at sites was carried out during day and night with the objective to assess the off working noise levels as well.

166. As evident from the results obtained, the average noise level at all intervals falls within the WHO, BEQS and NEQS limits of 65 and 75 dB set for areas.

5.8.3. Monitoring of Metrological Data

i. Methodology

167. During the reporting period, metrological conditions of the construction site was monitored for 24 hours. As evident from the below table, almost all parameters falls within the permissible limits set under NEQS.

168. Following is the comparison of the results obtained.

Table 5.20: Metrological Data Analysis

METROLOGICAL DATA					
S.No.	**TIME**	**Wind Direction**	**Wind Velocity**	**Humidity**	**Pressure**
	Hours		m/sec	%	Mm of Hg
01	09:00 AM	SW	2.48	91	751
02	10:00 AM	N	2.46	92	738
03	11:00 PM	N	2.24	91	763
04	12:00 AM	SW	1.39	95	722
05	01:00 PM	N	2.38	96	721
06	02:00 PM	SW	2.26	84	728
07	03:00 PM	NS	1.25	93	734
08	04:00 PM	NS	2.84	85	724
09	05:00 PM	NS	1.34	83	767
10	06:00 PM	N	3.36	72	736
11	07:00 PM	N	2.29	76	749
12	08:00 PM	NS	1.42	79	733
13	09:00 PM	N	1.36	87	785
14	10:00 PM	NS	1.52	80	790
15	11:00 PM	N	2.12	88	731
16	12:00 AM	N	3.41	76	733
17	01:00 AM	NS	2.28	78	770
18	02:00 AM	N	4.07	81	771
19	03:00 AM	NS	4.36	84	778
20	04:00 AM	NW	4.25	84	738
21	05:00 AM	NW	3.42	91	769
22	06:00 AM	NW	5.31	92	754
23	07:00 AM	N	2.52	94	758
24	08:00 AM	N	1.25	94	756

5.8.4. Monitoring of Drinking Water Quality

i. Methodology

169. During the reporting period, drinking water quality of the Contractor's camp was monitored for the agreed parameters given in the SSEMP. High density sterilized polyethylene bottles were used for the sampling. The collected samples were preserved, sealed and chilled at 40°C as recommended. Grab method is used for sampling and preservation of water whereas.

ii. Drinking Water Test Results and Discussion

170. The drinking water demand is being met from bore hole dug out at the camp. At the first instance, water is pumped to elevated storage tank from where it is supplied to the consumer points through a pipe network.

171. Following is the comparison of the results obtained at source and consumer points.

172. As evident from the above table, almost all parameters of the drinking water, at the Contractor's camp, falls within the permissible limits set under BEQS, NEQS and WHO limits.

Table 5.21: Drinking Water Quality Report

S.No	Parameters	Unit	Testing Method	BEQS Limits	NEQS Limits	WHO Limits	Current Results	Previous SAEMR	Remarks
1.	Total Bacteria Count	TBC (count/ml)	Total Viable Count	----------	----------	----------	10	02	-
2.	Total Coliform	TC (count/ml)	APHA 922 B	0/100 ml	0/100 ml	0/100 ml	ND	ND	WL
3.	E-Coli	EC (count/ml)	Total Viable Count	0/100 ml	0/100 ml	0/100 ml	ND	ND	WL
4.	Facial Coli	FC (count/ml)	APHA 922 B	0/100 ml	0/100 ml	0/100 ml	ND	ND	WL
5.	Turbidity	NTU	HACH Turbidity meter	<15	<5	<15	<0.01	<0.02	WL
6.	Taste	Taste	Sensory Evolution	Obj/Non Obj	Obj/Non Obj	Obj/Non Obj	Non-Obj	Non-Obj	WL
7.	Odour	Odor	Sensory Evolution	Obj/Non Obj	Obj/Non Obj	Obj/Non Obj	Non-Obj	Non-Obj	WL
8.	Colour	TCU	Pt-Co method	≤ 15 TCU	≤ 15 TCU	≤ 15 TCU	< 1	< 1	WL
9.	Phenolic Compounds	As Phenol (mg/L)	ASTM D-1783	-	-	-	ND	ND	WL
10.	Residual chlorine	Cl_2 (mg/L)	HACH Method 8167	0.2-0.5	0.2-0.5	-	0.3	0.25	WL
11.	Ph@25° C	PH	ASTM D-1293	6.5 to 8.5	6.5 to 8.5	6.5 to 8.5	7.79	8.02	WL
12.	Total Dissolved Solid	TDS (mg/L)	APHA 2540-C	< 1000	< 1000	< 1000	669	351	WL
13.	Total Hardness	As $COCO_3$ (mg/L)	APHA 2340-C	< 500	< 500	-	74	76	WL
14.	Fluoride	F^{-1} (mg/L)	APHA 4500- F^{-1}	≤ 1.5	≤ 1.5	1.5	0.30	0.34	WL
15.	Chloride	CL^{-1}(mg/L)	APHA 4500- Cl^{-1}	< 250	< 250	250	165	169	WL
16.	Cyanide	CN^{-1}(mg/L)	HACH Method 8027	≤ 0.05	≤ 0.05	0.05	ND	ND	WL
17.	Nitrate	NO_3^{-1}(mg/L)	HACH Method 8192	≤ 50	≤ 50	50	0.15	0.38	WL
18.	Nitrite	NO_2^{-1}(mg/L)	APHA 4500- NO_2^{-1}-B	≤3.0 (P)	≤3.0 (P)	3	0.06	0.07	WL
19.	Antimony	Sb (mg/L)	ASTM D-3697	≤0.005	≤0.005	0.02	ND	ND	WL
20.	Aluminum	Al (mg/L)	ASTM D-857	≤0.2	≤0.2	0.2	0.02	0.03	WL
21.	Arsenic	As (mg/L)	ASTM D-2972	≤0.05	≤0.05	0.01	ND	ND	WL
22.	Boron	B (mg/L)	ASTM D-3082	0.3	0.3	0.3	ND	ND	WL
23.	Barium	Ba(mg/L)	ASTM D-4382	0.7	0.7	0.7	0.06	0.055	WL
24.	Chromium Total	Cr(mg/L)	ASTM D-1687	≤0.05	≤0.05	0.05	ND	ND	WL
25.	Copper	Cu(mg/L)	ASTM D-1688	2	2	2	<0.03	<0.02	WL

26.	Cadmium	Cd(mg/L)	ASTM D-3557	0.01	0.01	0.03	ND	ND	WL
27.	Lead	Pb(mg/L)	ASTM D-3559	≤0.05	≤0.05	0.01	ND	ND	WL
28.	Manganese	Mn(mg/L)	ASTM D-858	≤0.5	≤0.5	0.5	ND	ND	WL
29.	Mercury	Hg (mg/L)	ASTM D-3223	≤0.001	≤0.001	0.001	ND	ND	WL
30.	Nickel	Ni(mg/L)	ASTM D-3866	≤0.05	≤0.02	0.02	ND	ND	WL
31.	Selenium	Se(mg/L)	ASTM D-3858	0.01	0.01	0.01	ND	ND	WL
32.	Zinc	Zn (mg/L)	ASTM D-1691	5	5	3	0.05	0.04	WL

5.9 Soil Erosion

173. No damages to the agricultural lands due to borrow pits or soil erosion is observed.

5.10 Natural Habitat Protection

174. The contractors are advised to avoid damaging the natural habitats and to replant the damaged plants, if unavoidable, after construction. Also, the native wildlife and habitats should not be disturbed. However, no tree has been cut during construction processes on any of the sub-project. Similarly, no native species are being disturbed due to the construction activities.

175. Neither flora nor fauna was disturbed by the contractors at any of the sub-project area, since most of the sub-projects are of rehabilitation /restoration nature and are located far from any known wildlife habitat. Wildlife sanctuary does not exist near any sub-project site. No hunting of birds or animals was observed in the reporting period. Continuous monitoring is carried out by environmental inspectors of CSC to check any hunting activity or activities damaging vegetation or wildlife habitat.

5.11 Waste Management

5.11.1 Current Period

176. Currently, there are two types of waste at all sub-project areas.

a. Domestic waste from camps, offices, labours, etc.

b. Construction waste including hazardous waste from construction sites

5.11.2 Cumulative Waste Generation

177. The waste generated from the cutting of earth is reused for back filling. The unused excavated material is disposed of at designated sites. Negligible construction waste including wire cutters, plastic and paper, etc. is generated at the site which can be recycled and reused in second market. Currently, all such waste is segregated disposed of temporarily on designated sites, identified and demarked before construction. Such waste is then removed to be reused in second market on regular interval with the help of specified subcontractors, assigned by each contractor.

178. For all sub-project sites, the Contractors have provided waste collection bins at various locations to ensure proper waste management. Organic waste is collected at the same point to avoid its dispersal in the camp area. To maintain cleanliness and proper waste disposal, the Contractor's housekeeping staff is mobilized for the removal of solid waste. Currently, all wastes are segregated and disposed of in designated sites that were

identified and demarked before construction began. The waste is then removed and sent to specified subcontractors assigned by each contractor for reuse in the second market.

179. Sewage waste from the construction camp of Siri Toi dam is being disposed of by the development of on-site sanitation systems i.e., septic tank prior to discharge to nearby depression area/drain. Septic tanks are located adjacent to the construction camp. Similarly , septic tanks are present along camps of other subproject sites.

180. This process is carried out on a regular interval to ensure effective waste management and environmental sustainability.

5.12 Trends

181. During previous reporting period Oxides of Nitrogen exceeds from WHO limits at Siri Toi Dam Project, Water Resources Building and Kili Sardar Akhtar. Although the value slightly exceeds the more stringent limits of the WHO, it is important to note that it is still well below the local NEQs level. Efforts will be made to further reduce the value in order to comply with the most stringent NEQs.

Keeping in view the linear nature of the site and frequent shifting of the construction activities, nochanges in the baseline environmental conditions at work sites were observed. Therefore, construction activities have not changed the ongoing environmental trend of the sub-project sites.

5.13 Summary of the Monitoring Outcomes

182. The results obtained from the environmental monitoring of the air quality, noise levels and water quality, carried out during the reporting period, all the parameters falls within the permissible limits as compaired with BEQS, NEQS and WHO standartds.

183. By and large, it is inferred that construction activities have not inflected any long-term impact on the local environment. Photographic evidences of environmental monitoring are as under.

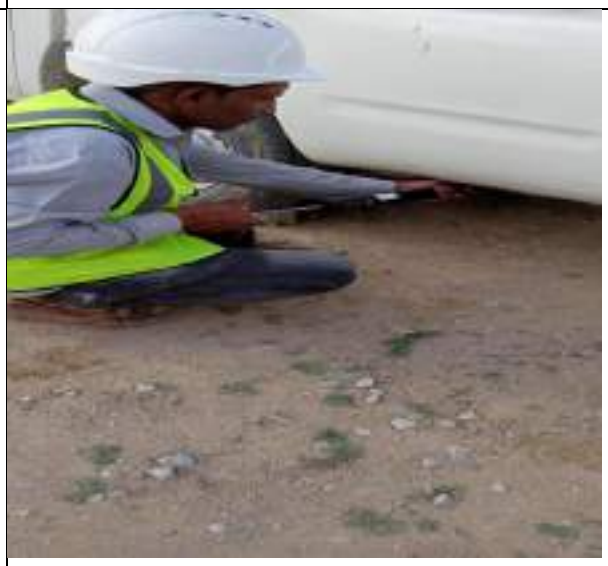
Ambient Air and Noise Monitoring

Vehicle Emission Monitoring

Generators Emissions Monitoring

Drinking Water Monitoring

Drinking water sample collection from nearby Tubewell



Vehicular emission test

Vehicular emission test

Ambient air test in Karakh camp site

Waste collection point at Siri Toi Dam

Garbage disposal area selected at Siri Toi Dam site

Waste bins at Kharzan Hatachi construction site

Solid waste collection bins at Karakh

5.13.1 Health and Safety

(1) Community Health and Safety

184. During the reporting period, the Contractor took a number of initiatives to promote community health and safety.

a. Siri Toi Dam Sub-project ICB 01

185. The contractor's environmental specialist is assisted by the consultant team in providing adequate training to staff for community health and safety. Signboards at designated spots and curves, as well as at the campsite, are installed at various locations to control vehicle speed limits. The campsite is barricaded and constantly monitored to ensure that local residents and domestic animals/livestock (cows, goats, sheep, and dogs) stay away from the construction area. However, no incident related to community health and safety could be reported.

186. The project site is cordoned-off, especially the areas where machinery is involved, with barricades and constant monitoring to ensure that local residents, particularly children, stay away from the construction area. Additionally, no machinery is being left unattended, especially in running condition. Drivers are provided orientation on safe driving practices

to minimize accidents and prevent the spillage of hazardous materials. Daily Tool Box Talk (TBT) is conducted by the HSE Supervisor in the morning before starting any activity on the site. The HSE Officer uses daily, weekly, and monthly environmental monitoring checklists to assess various environmental parameters, enabling the Environmental staff to take corrective action for any non-conformances observed (Annexure II,III, IV).

b. On access roads, several safety measures have been implemented. Signboards are properly installed at necessary locations along the access roads. A traffic management plan is effectively implemented at the sub-project site. Furthermore, entry points to the construction site are limited and monitored to prevent unauthorized access**Karakh Valley Development Sub-project NCB 01**

187. The unpaved service roads used by the Contractor's vehicles are regularly sprinkled to suppress dust and protect general commuters from the related impact and diseases. To avoid noise disturbance at night, no construction activities are carried out during nighttime.

c. Water Resources Building NCB 05

188. During the reporting period, the Contractor took utmost care for community health and safety. There have been no massive traffic activities initiated during this duration of the project. Only material supply vehicles are being used at the site for shifting materials. The project site is located near office buildings, and no heavy machinery is involved. No incidents related to community health and safety have occurred during the current reporting period (Annexure VI).

d. Kharzan Hatachi Infiltration Gallery Sub-project NCB 02

189. No incidents related to community health and safety have occurred or been reported yet.

5.13.2 Worker Safety and Health

a. Siri Toi Dam Sub-project ICB 01

190. The provision of an adequate First Aid kit, a medical room, an ambulance, and a medical technician have been ensured during site visits. Construction activities in the camp have minor impacts on the safety and health of workers. Prior to starting the project, engineering and administrative control measures are taken by the contractor. For example, the provision of Personal Protective Equipment (PPE) to the workforce is being ensured on-site. Other safety measures to avoid exposure to accidents due to construction operations, vehicle movements, and machinery operations are also being ensured. Additionally, the contractor has 4WD vehicles to deal with any kind of emergency (see

Annexure VIII, Section 5). No significant incidents related to the workers' health and safety have occurred during the current reporting period.

b. Water Resources Building NCB 05

191. First aid medical facilities are being provided by the contractor at the site. Proper supervision and monitoring of excavation and compaction activities during the construction phase are carried out in compliance with the Health and Safety requirements as per standard specifications outlined in the EMP and in the Contract. No incidents related to the workers' health and safety have occurred during the current reporting period. (Annexure VIII, Section 2).

c. Karakh Valley Development Sub-project NCB 01

192. For the construction workers, the Contractor has conducted trainings on safety issues with practical demonstrations of responses in case of any emergency. Before starting the work, toolbox talks focusing on HSE related issues were regularly held. The availability of First Aid Boxes is being ensured to provide emergency medical assistance in case of any incidents. The Contractor has also ensured the supply of clean drinking water to the workers, both at the camp and at the sites. The Contractor's camp is equipped with all basic necessities, including accommodation, dining halls, sanitation facilities, etc. (Annexure VIII, Section 3). No incidents related to the workers' health and safety have occurred or been reported yet.

d. Kharzan Hatachi Infiltration Gallery Sub-project NCB 02 and Kili Sardar Akhtar NCB 06

193. First aid kits are provided by the contractor at the campsite, and this provision is being ensured. The contractor also ensures the provision of Personal Protective Equipment (PPE) to the workforce on site. Additionally, other safety measures to avoid exposure to accidents due to construction, vehicle movements, and machinery operations are also ensured. The contractor has provided 4WD vehicles to deal with any kind of emergency (Annexure VIII, Section 4). No incidents related to the workers' health and safety have occurred or been reported yet.

5.14 Corrective Action Plans (CAPs):

194. During the reporting period, the Environment Specialist of PIC/SC conducted regular visits and monitored the project for the implementation of the Environmental Management Plan (EMP). As a result of these visits, Corrective Action Plans (CAPs) have been prepared for EMP non-compliance in various sub-projects, including Siri Toi Dam, Karakh valley development, Water Resources Building, Kharzan Hatachi and Kili Sardar Akhtar. The details of these CAPs are provided in the exhibits below.

Table 35- Siri Toi Dam sub-project Corrective Action Plan (Issues Resolved)

Sr. No	Date	Raised By	Location	Issues	Category*	Corrective Action	Responsibility	Original Target Date	Updated Status Closed/open
1	July-December 2023	CSC	Siri Toi Dam Sub-project	SSEMP clearance	Major	SSEMP cleared by ADB	Contractor	9th December 2022	Closed
2				Scarcity of safety signs	Moderate	Proper safety signs should be installed by the Contractor near diversions and slopes	Contractor	31st December 2022	Closed
3				Water Sprinkling	Moderate	Water sprinkling on sites and within camp is greatly required	Contractor	Regularly	Closed
4				Weekly Environmental Report/Checklist	Moderate	Weekly Environmental Report/Checklist are being submitted and maintained properly	Contractor HSE Supervisor	31st December 2022	Closed
5				Use of PPE's especially safety boots ensured	Major	Contractor should ensure use of PEE's especially safety boots to labors	Contractor HSE Supervisor	31st December 2022	Closed
6				Medical Health Facility available/First Aid Kits/ fire	Major	First Aid kits were not available on sites	Contractor HSE Supervisor	31st December 2022	Closed
7				Arrangement of waste disposal and management.	Major	Routinely	Contractor	31st December 2022	Closed
8				Hiring of HSE advisor	Major	Environmentalist/HSE advisor has been hired for monitoring Environmental Compliance	Contractor	31st Dec 2023	Closed

*Pictoral Evidences for closed issues are mentioned as annexure VIII

Table 36- Siri Toi Dam sub-project Corrective Action Plan (CAP) Carry forward issues

Sr. N	Date	Raised By	Date of Issues Raised	Issues	Category *	Corrective Action	Responsibility	Original Target Date	Updated Status
1	January-June 2023	CSC	15th June 2022	No Barricading of construction site	Major	Site should be barricaded especially, borrow areas and areas where construction activities are being carried on	Contractor	31st December 2023	Open
2			26 December 2023	Use of PPE's especially safety boots ensured	Major	Contractor should ensure use of PEE's especially safety boots to labors	Contractor HSE Supervisor	Immediately	Open
3			15th June 2022	Weekly Environmental Report/Checklist	Moderate	Weekly Environmental Report/Checklist submission is not maintained properly	Contractor HSE Supervisor	31st December 2023	Open
4			15th June 2022	Establishment of concrete base under generator	Major	Concrete base under generator should be established on first priority	Contractor	25 April 2023	Open
5			10th March 2023	Vehicles washing area not concrete	Moderate	Concrete base is required for vehicle washing area	Contractor	30 April	Open
6			30th June 2023	Submission of SAEMR to Consultant office	Major	Semi annual environmental monitoring report submission	Contractor Environmental Specialist	31st December 2023	Open
7			31st December 2023	Quarterly instrumental monitoring Test	Major	Must conduct quarterly instrumental test	Contractor	31st March 2024	Open

Table 37- Karakh Valley Development Subproject Corrective Action Plan (Issues Resolved)

Sr. No	Date	Raised By	Issues	Category	Corrective Action	Responsibility	Original Target Date	Updated Status Closed/open
1	Jan-June 2023	CSC	Use of PPE's including Helmets, gloves, safety vests not being ensured	Major	Implementation of health and safety measures shall be enforced and wearing of PPE be ensured during construction activities. Wearing of safety boots by all workers should be ensured. Number of safety jackets should be increased /maximize and provide to all workers.	Contractor	30th November 2021	Closed
3			Fire Safety Equipment	Major	Fire Safety Equipment especially Fire Extinguishers should be available in Contractor camp and construction site.	Contractor	30tt March 2023	Closed
3			Improper Toilet facilities with unhygienic condition	Moderate	Washrooms should be with sufficient facilities and hygienic condition	Contractor	30th November 2021	Closed
4			Monthly HSE Progress Report are not being submitted that is required as per contract documents	Major	Monthly HSE reports should be submitted on regular basis	Contractor	After approved SSEMP	Closed

5			Daily/weekly Environmental checklists are not being filled.	Moderate	Daily/weekly Environmental checklist should be filled on regular basis	Contractor	30th November 2021	Closed
6			Arrangement of waste disposal and management.	Major	Routinely	Contractor	30th November 2021	Closed
7			SSEMP is not approved	Major	Contractor shared revised SSEMP with client office for ADB approval.	Contractor	30th December 2022	Closed

*Pictoral Evidences for closed issues are mentioned as Annexure VIII.

Table 38- Karakh Valley Development Subproject Corrective Action Plan (Carry forward issues)

Sr. No	Date	Raised By	Date of Issue Raised	Issues	Category	Corrective Action	Responsibility	Target Date	Updated Status Closed/open
1	Jan-June 2023	CSC	15 March 2023	Medical health facility at camp site	Major	Ambulance availability on site in case of any emergency at contractor camp and at construction site	Contractor	20th March 2023	Still awaited/open
2			22 Dec 2021	Scarcity of Safety signs	Moderate	Proper safety signs should be installed by the contractor	Contractor	31st July 2023	Still awaited/open
3			22 Dec 2021	No Barricading of construction site	Major	Sites should be barricaded especially at borrow areas and areas	Contractor	31st July 2023	Still awaited/open
			31st December 2023	Quarterly instrumental monitoring Test	Major	Must conduct quarterly instrumental test	Contractor	31st March 2024	Open

Table 39- Water Resources Building sub project -Corrective Action Plan CAP (Issues Resolved)

	Date	Issue Raised	Issues	Category*	Corrective Action	Responsibility	Original Target Date	Updated Status Closed/open
1	July-December 2023	CSC	SSEMP is submitted	Major	SSEMP is conditionally approved	Contractor	27th February 2022	Closed
2			Unhygienic Toilet condition	Moderate	Washrooms should be with sufficient facilities and hygienic condition	Contractor	15th March 2022	Closed
3			Weekly Environmental Report/Checklist submitted	Moderate	Weekly Environmental Report/Checklist submission is maintained properly	Contractor	Timely submitted	Closed
4		10 June 2023	Side railing not installed at WR Building	Moderate	Side railing of Staircase should be installed at the earliest	Contractor	17 June 2023	Closed
5		10 June 2023	Elevator Shaft not barricaded properly	Major	Elevator Shaft should be barricaded properly	Contractor	15 June 2023	Closed
6		10 June 2023	Poor Housekeeping at WRB site	Moderate	Good housekeeping should be maintained on the working site.	Contractor	20 June 2023	Closed

Table 40- Water Resources Building sub project -Corrective Action Plan CAP (Carry forward Issues)

	Date	Raised By	Date of Issue Raised	Location	Issues	Category*	Corrective Action	Responsibility	Original Target Date	Updated Status Closed/open
1	Jan-June 2023	CSC	31st March 2023	Water Resources Building, Quetta	Scarcity of Safety signs	Moderate	Proper safety signs should be installed by the contractor	Contractor	15th April 2023	Still awaited/open
2			31st March 2023		Use of PPE's especially safety boots ensured	Major	Contractor should ensure use of PEE's especially safety boots by labor	Contractor	15th April 2023	Open
3			20th Feb 2023		Presence of register at construction site	Moderate	Maintenance of register to record patients number treated through first aid facility	Contractor Medical officer	15th March 2022	Open
4			31st December 2023		Quarterly instrumental monitoring Test	Major	Must conduct quarterly instrumental test	Contractor	31st March 2024	Open

Table 41- Kharzan Hatachi Infiltration Gallery sub-project Corrective Action Plan (Issues Resolved)

Sr. N	Date	Raised By	Location	Issues	Category *	Corrective Action	Responsibility	Original Target Date	Updated Status Closed/open
1	Jan-June 2023	CSC	Kharzan Hatachi Infiltration Gallery Subproject	Water Sprinkling	Moderate	Water sprinkling on construction sites and within camp is greatly required	Contractor	Regularly/ Continuous process	Closed
2				Weekly Environmental Report/Checklist	Moderate	Weekly Environmental Report/Checklist submission is maintained properly	Contractor HSE Supervisor	31st December 2022	Closed
3				Use of PPE's especially safety boots ensured	Major	Contractor should ensure use of PPE's especially safety boots by working labors	Contractor HSE Supervisor	31st December 2022	Closed
4				Medical Health Facility available/First Aid Kits/ fire extinguishers	Major	First Aid kits were not available on sites	Contractor HSE Supervisor	31st December 2022	Closed
5				Environmentalist/HSE advisor has been hired	Major	Environmentalist/HSE advisor has been hired for monitoring Environmental Compliance	Contractor	31st July 2022	Closed
6				Arrangement of waste disposal and management.	Major	Routinely	Contractor	31st December 2022	Closed
				SSEMP is submitted	Major	SSEMP submitted for ADB review	Contractor	16th May 2022	Closed

Table 42- Kharzan Hatachi Infiltration Gallery sub-project Corrective Action Plan (Carry forward Issues)

Sr. No	Date	Raised By	Date of Issue Raised	Location	Issues	Category *	Corrective Action	Responsibility	Target Date	Updated Status Closed/open
1	July-Decem 2023	CSC	22 Dec 2022	Kharzan Hatachi Infiltration Gallery Subproject	Scarcity of safety signs Boards	Moderate	Proper safety signs should be installed by the Contractor	Contractor	25th March 2023	Open
2			22 Dec 2022		No Barricading of construction site	Major	Site should be barricaded especially at borrow areas and areas where	Contractor	25th March 2023	Still awaited/open
3			31st December 2023		Quarterly instrumental monitoring Test	Major	Must conduct quarterly instrumental test	Contractor	31st March 2024	Open

Table 43- Kili Sardar Akhtar sub-project NCB 06 Corrective Action Plan (Carry forward Issues)

Sr. N	Date	Raised By	Date of Issue Raised	Location	Issues	Category *	Corrective Action	Responsibility	Original Target Date	Updated Status
1	July - December 2023	CSC		Zhob	SSEMP is submitted	Major	SSEMP submitted for ADB review	Contractor	6th June 2023	Open
2			11th March 2023		Scarcity of safety signs	Moderate	Proper safety signs should be installed by the Contractor	Contractor	31st Decemb 2023	Open
3			-do-		Water Sprinkling	Moderate	Water sprinkling on sites and within camp is greatly required	Contractor	Regularly	Open
4			-do-		No Barricading of construction site	Major	Site should be barricaded especially at borrow areas and areas where construction activities are	Contractor	31st Decemb 2023	Open
5			-do-		Monthly Environmental Monitoring Report/Checklist	Major	Monthly/ Semi Annual Environmental Monitoring Report/Checklist submission is maindatory to be submitted to SC for review.	Contractor HSE Supervisor	31st Decemb 2023	Open
6			-do-		Use of PPE's especially safety boots ensured	Major	Contractor should ensure use of PPE's especially safety	Contractor HSE Supervisor	31st Decemb 2023	Closed
7			-do-		Medical Health Facility available/First Aid Kits/ fire extinguishers	Major	First Aid kits must be available on sites	Contractor HSE Supervisor	31st Decemb 2023	Open
8			-do-		Environmentalist/HSE advisor has been hired	Major	Presence of environmentalist/HSE advisor is must to monitor Environmental Compliance	Contractor	31st Decemb 2023	Open
9			-do-		Arrangement of waste disposal and its management.	Major	Routinely	Contractor	30th June 2023	Still awaited/open

10			31st December 2023		Quarterly instrumental monitoring Test	Major	Must conduct quarterly instrumental test	Contractor	31st March 2024	Open

6 GOOD PRACTICE AND OPPORTUNITY FOR IMPROVEMENT

6.1 Good Practice

The good practices are mentioned as:

Siri Toi Dam Sub-project

- Environmental Specialist/ HSE advisor has been hired by the contractor.
- Establishment of the Contractor's camp has been done according to the permissible standards and parameters provided in SSEMP.
- Satisfactory installation of signboards is done at various locations in the campsite and construction site.
- Signboards are also installed on road diversions at various locations on unpaved roads.
- The officers' mess has been established with good housekeeping of the offices.
- A medical room is set up for first aid and emergency response, and an ambulance is available at the campsite.
- The dispensary is equipped with the required medicines, equipment, furniture, and a First Aid kit, all labeled, and is operational under the supervision of a qualified male nurse/Dispenser.
- Medicines are being provided in the First Aid Kit at the site.
- A mosque and a material testing laboratory is available in the camp, located close to the main entrance of the camp.
- The use of PPE's/safety boots, jackets, and safety helmets by workers has been noticed as a good practice.
- On-site sanitation at the subproject sites employs septic tanks for sewage waste disposal. These tanks are situated near construction camps and discharge into nearby drainage areas.
- A grievances register is placed at the campsite, and signboards are installed at the main entrance to guide where to record grievances.

Karakh Valley Development Sub-project

- The establishment of the Contractor's camp is in compliance with the permissible standards and parameters.
- The presence of an HSE officer on-site is ensured.

- The contractor's HSE officer properly maintains daily Toolbox Talks (TBT) with workers before starting any working activity.
- Cutting of trees for firewood is avoided as LPG is used instead of fuel wood.
- A complaint register is placed at the project site, and no complaint/conflict has been observed.
- A good liaison is established between PMO, Supervisory consultant, and contractor to ensure adherence to environmental safeguard guidelines.
- Monthly and weekly environmental monitoring checklists are timely submitted to the Supervision Consultant in the monthly Environmental Monitoring Report (Annexure I-VI).
- The use of PPE's by workers was noticed as a good practice.

Water Resources Building

- The Contractor has displayed temporary precautionary signboards and warning tapes inside the construction site, around material storage, and cement bags.
- Frequent water sprinkling is observed to prevent dust pollution.
- Clean drinking water is provided to workers and staff.
- Monthly and weekly environmental monitoring checklists are timely submitted in the monthly EMR report (Annexure III-VI).
- A good liaison is established between the PMO, Supervisory consultant, and contractor to ensure adherence to environmental safeguard guidelines.

Kharzan Hatachi Infiltration Gallery and Kili Sardar Akhtar

- Clean drinking water is provided to workers and staff.
- The Environmental Specialist and HSE Officer are available on-site during working hours.
- Daily correspondence with the supervision consultant is conducted to discuss day-to-day improvements and activities.
- The construction machinery is parked in designated locations.
- Monthly training and Toolbox Talks are being held and reported in the SAEMR.

6.2 Opportunities for Improvement

iii. Overall, the quality of work and the environment at the site is satisfactory. However, there are areas that require improvement:

- All concerned staff has been instructed to improve OHS performance levels, including mandatory use of PPE's by all site workers and adherence to working hours.

- Training sessions must be conducted more frequently.
- The quarterly environmental monitoring timeline should be strictly followed.
- The trucks carrying construction material should be covered with tarpaulin sheets to avoid dust pollution.
- Safety signboards, safety cones, fluorescent tape, and speed limit boards should be used at the junction point of the village and campsite road at Siri Toi Dam site.
- Washrooms should have sufficient facilities and maintain hygienic conditions.
- The generator should be placed away from the fuel pump and restrooms of workers and staff.
- Construction sites should be appropriately barricaded.
- Avoid contamination of the camp soil by oil leakage from machinery.
- Material transportation should be done during daylight hours to avoid any safety issues.
- Entrance of the public within the project vicinity must be prohibited, and increased vigilance is needed.
- The Contractor's Environment Specialist should continue to provide both off and on-site HSE training to the Contractor's top/middle management and workers for capacity building and providing necessary awareness on how to deal with HSE issues that arise on a day-to-day basis.
- The Environment Specialist should be present at the site throughout the construction period.

7 SUMMARY AND RECOMMENDATIONS

7.1 Summary

iv. The overall Health, Safety & Environment (HSE) implementation is satisfactory due to continuous efforts by the supervisory staff at the site, as the Contractor was pressed hard to follow the HSE guidelines in true letter and spirit. There are no major adverse impacts on surface water quality due to minor construction activities on the irrigation channels.

v. The impact of dust is reduced by regular water sprinkling. The use of PPE's is satisfactory during construction. The Supervisory Consultant visits construction sites on a regular basis and provides the needed feedback to the supervisory staff at the site. The overall working environment at the Project Area remained safe, as no major incidents/accidents or casualties were reported.

vi. The Contractor's Environmental Specialist is assisting in providing daily trainings to the workers for the implementation of EMP/SSEMP.

vii. Proper safety signs should be installed by the Contractor near diversions and slopes.

viii. Site should be barricaded especially the camp site, borrow areas, and areas where construction activities are being conducted.

ix. Concrete base under generator and vehicle washing area should be established on priority.

x. The objective of external monitoring is to review and assess the implementation of EMP/SSEMP on the project site. The external monitor carried out site visit in May, 2023 on Siri Toi Dam Project. During visit, external monitor visited camp site, construction sites, borrow areas and sites for waste management. Non-compliance and observations were recorded which are presented in the CAP of this report.

7.2 Recommendations

xi. All the sub-projects should implement the following recommendations

- The contract clause regarding health, safety, and environmental issues should be strictly followed.
- Strict compliance with SSEMP/EMP at the project site should be enforced.
- Before allowing any worker, regardless of their role or experience level, to enter a construction site, they must be fully aware of the potential hazards. Uninformed or

ignorant workers can pose significant risks at a construction site, as their lack of knowledge can lead to mistakes that put everyone else in danger. It is crucial for all workers to understand the potential dangers and maintain a constant state of alertness to prevent accidents.

- New Induction Trainings on Emergency Response and Preparedness, Workplace Safety Practices, Health and Hygiene should be provided to the workers.
- Trainings should be conducted with a photographic record and documentation in future report,
- The use of PPE's during masonry work and while working at height should be strictly enforced.
- The presence of a trained medical person and the contractor's environmental officer should be ensured during working hours.
- Stacking of construction materials at the site should be done according to EMP/SSEMP guidelines.
- Reflect all major findings and recommendations of this report in the next SAEMR.
- Warning signboards, diversion boards, and warning tapes should be mandatory at the construction sites.
- Timely submission of quarterly monitoring reports to the supervision consultant must be ensured, and there should be no delay in submission before June and December.
- Flagmen must be present near the construction site to avoid any accidents.

ANNEXURES

Annexure I: Completion Letter of Ahmedzai Sub-Project (NCB 08)

BWRDSP CONSULTANTS
For Project Design, Construction Supervision and Implementation Support for Balochistan Water Resources Development Sector Project

80/180-B, Near Allied Bank, Jinnah Town, Quetta, Pakistan
Ph: +92 (81) 2863094
Email: bwrdsp@gmail.com
: wa@respak.com.pk

Ref: 4078/061/HAB/01/NCB-08/929 Dated: January 27, 2023

M/s NOOR UL HAQ & BROTHERS,
Plot 8-C, 21th Commercial Lane,
DHA Phase-2 Extension,
Karachi.

BALOCHISTAN WATER RESOURCES DEVELOPMENT SECTOR PROJECT
Construction of Ahmedzai (PIS & FIS) Subproject (NCB-08), Zhob River Basin
SUBSTANTIAL COMPLETION OF WORKS

Reference: Your Letter No. NB/KH/6184 dated 28-11-2022

Dear Sir,

Having received your notice under GCOC Clause 69, we hereby certify that the Works have been substantially completed in accordance with the Contract on December 21, 2022, except those listed in the attached punch list and which shall not substantially affect the use of the Works for their intended purpose. It is notified that Defect Liability Period of the Contract starts with effect from December 22, 2022.

The contractor will complete the remaining works as mentioned in the attached punch list and will rectify any notified defects within the Defect Liability Period pursuant to GCOC Clause 43.

Yours faithfully,
for and on the behalf of BWRDSP Consultants

(HABIBULLAH BHUTTO)
Project Manager

Encl: As stated above

CC:
1. Project Director-BWRDSP, Jinnah Town, Quetta.
2. Contract Engineer, BWRDSP Consultants, Jinnah Town, Quetta.
3. Resident Engineer (Measurement), BWRDSP Consultants, Jinnah Town, Quetta.
4. Resident Engineer-ZRB, BWRDSP Consultants, Zhob.
5. Office Engineer, BWRDSP Consultants, Jinnah Town, Quetta.
6. Project File.

National Engineering Services Pakistan (Pvt) Limited Lahore (Lead Partner)
Rehman Habib Consultants (Pvt) Limited (JV Partner)
Engineering General Consultants EGC (Pvt) Limited (JV Partner)
Asian Advisory Services (Pvt) Limited

Annexure II: Weekly Monitoring Checklist BWR Building (NCB 05) Sub-Project

NCB-05 Construction of Water Resources Building at Quetta

AHB MS

Project Name: Construction of WRB Quetta Package # NCB-05

Monitoring Location: Camp and Project Site Date: 21/11/2023

Weekly Monitoring Check List

Description	Status	Comments
A- Physical Condition		
1- Soil Conditions		
Is any soil erosion observed?	☐ Yes ☑ No	
Has the movement of Construction equipment been restricted to work areas to avoid unnecessary disturbance to the soil types?	☑ Yes ☐ No	
Have the area along the access road been visually monitored and show any sign of soil erosion?	☑ Yes ☐ No	
2- Fuel / Lubricants		
Is regular inspection carried to check leaks & spills?	☑ Yes ☐ No	
Is there any combustible or flammable material in the fuel storage area?	☐ Yes ☑ No	
Are the fuels and oils handled in a safe manner, ensuring no leakage & Spillage?	☑ Yes ☐ No	
Have the entire oil and fuel storage areas provided with impervious floor underneath to prevent soil contamination from leaks or spills?	☑ Yes ☐ No	
Are the spilled oil or fuel and used clean up material being disposed of properly?	☑ Yes ☐ No	
Are the spills and leak thoroughly cleaned?	☑ Yes ☐ No	
3- Waste Material		
Is waste being stored temporarily on camp & sites within the designated area?	☑ Yes ☐ No	
Is any type of solid waste is being disposed of in the fields?	☐ Yes ☑ No	
Do the vehicles carry adequate container / trash bags for litter garbage and are they emptied at the camp site or other designated location regularly?	☑ Yes ☐ No	
4- Traffic Management		
Are the existing routes being used to access the project area?	☑ Yes ☐ No	
Are the number of routes kept to a minimum?	☑ Yes ☐ No	
Are shortcuts been used?	☐ Yes ☑ No	
Are all the vehicles and construction machinery properly maintained and tuned to maintain NEQS level?	☑ Yes ☐ No	
Are pressure horns being used?	☑ Yes ☐ No	

NCB-05 Construction of Water Resources Building at Quetta

AHB MS

5- Borrow Areas		
Is necessary approval for the borrow areas been obtained from the Engineer?	☑ Yes ☐ No	
Is the top soil of the borrow pits removed and conserved for rehabilitation of borrow areas?	☑ Yes ☐ No	
Is the condition of approval for excavation of the borrow pits are being compiled with?	☑ Yes ☐ No	
Is the drainage profile of the area is maintained to avoid any impoundment of the agriculture runoff or storm water in the borrow areas?	☑ Yes ☐ No	
6- Camp Site		
Are the generator in the construction camp properly maintained?	☑ Yes ☐ No	
Is the emergency response plan available in the camp	☑ Yes ☐ No	

Additional Comments (if any): _____

Contractor Environmentalist: _____ **PIC Environmentalist:** _____

Annexure III: Monthly Monitoring Check List Water Resources Building Sub-Project (NCB 05)

NCB-05 Water Resources Building at Quetta

Monthly Monitoring Checklist

Name of the Project: Construction of Water Resources Building

Environmental Compliance Checklist

Sr. No	Description	Week				Monthly Avg
		1	2	3	4	Dec 2023
Major Adverse Impacts (weightage 0-3)						
1	Copy of the Site specific EMP is provided at the camp site/contractors office?	1	2	3	3	2.25
2	The EMP instructions are understood?	3	3	3	3	3
3	An individual is nominated for implementation of EMP?	1	2	3	3	2.25
4	Camp Management, Health & Hygiene/ Heating, Cooling, Lighting and Housekeeping	2	2	2	3	2.75
5	Assembly Point is demarcated, alarming system.	1	1	1	1	1
6	Workforce use PPE at site?	1	2	3	2	2
7	Contractor provided PPE to their workforce?	2	2	3	3	2.5
8	Potable water is available to labor?	3	3	3	3	3
9	Medical Facilities, First Aid Kit is provided at camp and individual nominated for addressing emergency?	0	1	1	2	1
10	Contractor maintained Environmental Monitoring Record and submits monthly monitoring reports?	0	1	2	3	1.5
11	Contractor maintained Grievances Log and registered the complaints from community?	1	2	2	2	1.75
12	Contractors prohibited child labor and forced labor?	2	2	3	3	2.5
13	Borrow area is leased and the landowner is compensated as per a lease agreement?	0	1	2	3	1.5
14	Septic Tank and Soak Pits are designed for treatment of effluents?	0	0	0	0	0
15	No complaint filed regarding transmission of communicable diseases	3	3	3	3	3
Moderate Adverse Impacts (weightage 0-2)						
16	Provision of necessary welfare and hygiene requirements for the prevention of epidemic	1	1	2	2	1.5
17	Availability of an updated emergency vehicle (Ambulance)	1	1	2	2	1.5
18	Site selected for camp is 500 m from the human settlements and wildlife habitats?	2	2	2	2	2
19	No wood cutting for fuel?	2	2	2	2	2
20	LPG cylinders are provided for cooking or heating purposes?	1	2	2	2	1.75
21	Arrangement for proper storage and disposal for solid waste is planned?	1	1	2	2	1.5

NCB-05 Water Resources Building at Quetta

Name of the Project: Construction of Water Resources Building

Environmental Compliance Checklist

Sr. No	Description	Week				Monthly Avg
		1	2	3	4	Dec 2023
22	Safety signs are properly displayed?	2	2	2	2	2
23	Contractor provided training to workers to effectively implement project specific EMP?	2	2	2	2	2
24	Contractors followed HSE plan and Emergency Response Procedures	2	2	2	2	2
25	Contractors properly disposes debris materials in approved barren land/ TMA facilities preferably recycling, reuse process?	1	1	1	2	1.25
26	Natural areas with high elevation are normally selected as borrow areas?	1	1	1	1	1
27	Minimum damage to the agriculture land due to borrow pits on agriculture land?	1	1	2	2	1.5
28	Top 300 mm are stripped and stockpiled for redressing?	1	1	1	1	1
29	Stockpiling of Material, Construction Material Management	1	1	1	1	1
30	Waste being stored temporarily on camp & sites only within the designated area	1	1	2	2	1.5
31	Fuel/oil storage areas are away from watercourses?	2	1	2	2	1.75
32	Fuel/oil storage areas are paved & ventilated	1	1	2	2	1.5
33	Fire Extinguisher is placed near Fuel Storage area	0	0	1	1	0.5
34	No vegetation cover aside from that required as part of construction and inside the RoW removed?	2	2	2	2	2
35	Tree cutting restricted to RoW and shoulder areas only?	2	2	2	2	2
36	No damage reported to public services like electric, water, gas, sewer or telephone lines?	1	1	2	2	1.5
37	Batching Plant Material is taken from existing approved plants?	0	1	1	2	1
38	Batching Plant properly managed, no complaints	0	0	1	1	0.5
39	Maintenance of Roads, Hospitals, Buildings, Sewage facilities, Electric and water supply system	1	1	1	1	1
40	Project activities are displayed at proper locations	1	2	0	1	1
Minor Adverse Impacts & Good Practice (weightage 0-1)						
41	No complaints were made due to noise and vibration?	0.5	0.5	1	1	0.75
42	Contractor conduct Information, Education and Communication (IEC) campaign	0.1	0.1	0.1	0.1	0.1
43	Labor Screening at the time of induction	0.3	0.3	0.5	0.5	0.4
44	Fire Extinguisher are placed and checked properly	0	0	0.2	0.5	0.17
45	Contractors hiring of local labor?	1	1	1	1	1
46	Project site is fenced to prevent trespassing?	1	1	1	1	1

2

NCB-05 Water Resources Building at Quetta

Name of the Project: Construction of Water Resources Building

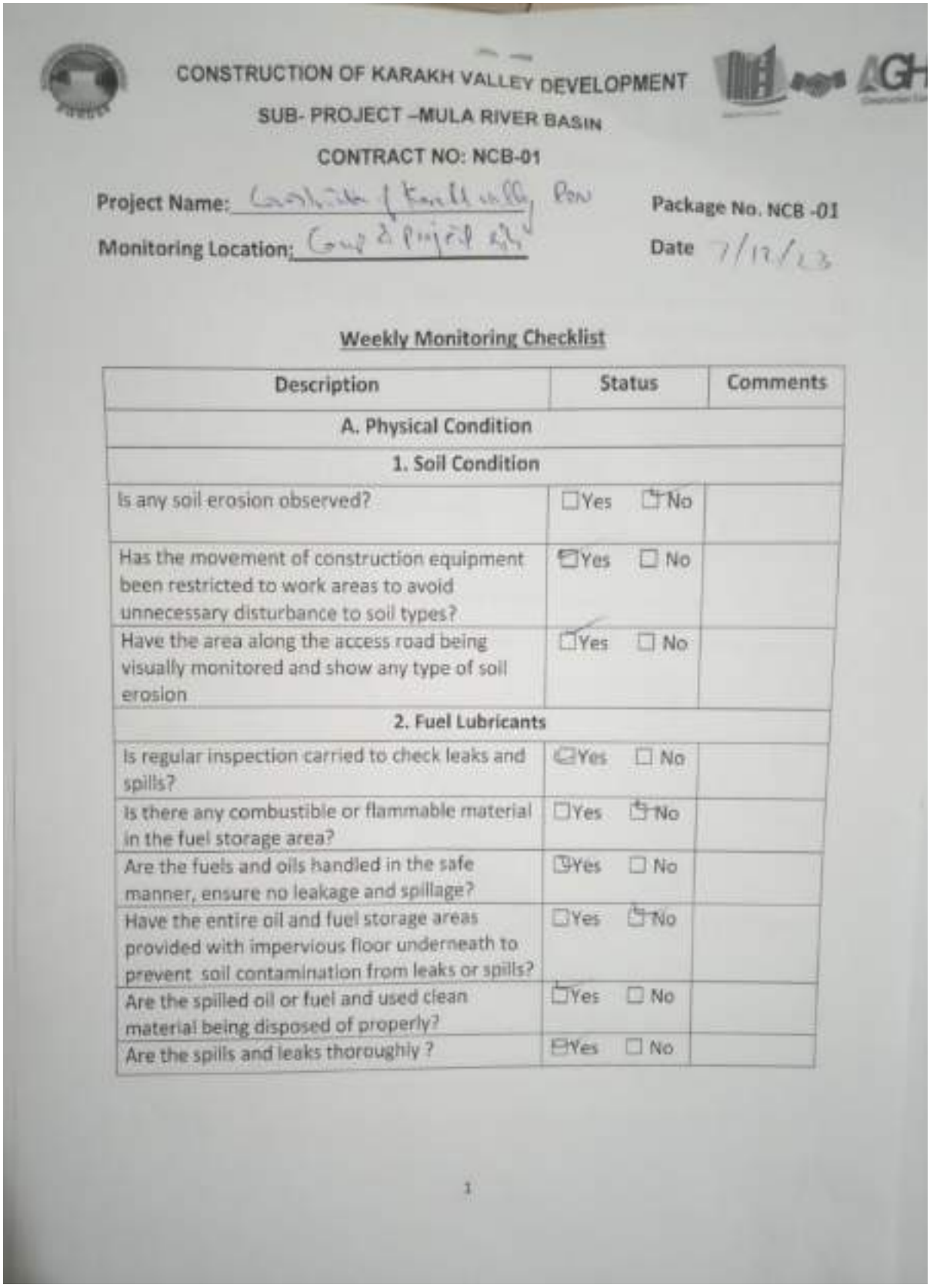
Environmental Compliance Checklist

Sr. No	Description	Week				Monthly Avg
		1	2	3	4	Dec 2023
47	Generator in the construction camp properly maintained	0.5	0.5	0.5	0.5	0.5
48	Community consultation has been carried out for project activities/concerns?	0	0	0.5	0.5	0.25
49	Adequate barriers are provided around areas where hazards may exist	1	1	1	1	1
50	Spilled oil or fuel and used clean up material being disposed of properly	0.5	0.5	0.5	1	0.62
51	Waste segregation at source	0	0	0	1	0.25
52	Construction & Maintenance of Walkways	0	0	0.4	0.5	0.22
53	Dust Generation during construction well managed and record exists	0.5	0.5	0.5	0.5	0.5
54	Number of routes kept to a minimum	1	1	1	1	1
55	Water Sprinkling Record is available	0.2	0.2	0.4	0.5	0.32
56	Provided lighting is adequate (minimum of 100 lux) and that personnel are not working in a shadow.	0.5	0.5	1	1	0.75
57	Photographic Record of Roads and agricultural fields is being maintained.	0	0	0.5	0.5	0.25
58	Materials will be stacked or stored in a safe manner that prevents sliding, falling or collapse	1	1	1	1	1
59	Spills and leak thoroughly cleaned	0.5	0.5	0.5	1	0.62
60	Construction machinery parked at designated areas?	0.5	0.5	1	1	0.75
61	Traffic issues managed well, no complaints on record	1	1	1	1	1
62	Daily, Weekly & Monthly Checklists are filled regularly	1	1	1	1	1
63	Storage of Hazardous Material in designated areas. MSDS available	0.5	0.5	0.5	1	0.62
64	Social Framework Agreement is prepared and signed	0	0	0	0	0
65	Construction activities carried out in daylight to reduce the impact of noise	1	1	1	1	1
	Total Weightage (out of 116)					**81.32**
	Monthly Percentage					**70.10%**
	Key: (Percentage) 100 = Excellent above 80 = Good above 60 = Average above 40 = Below Average Below 30 = Unsatisfactory					

Key

- Major Adverse Impact (Weightage 3)
- Moderate Adverse Impact (Weightage 2)
- Minor Adverse Impact and Good Practice (Weightage 0-1)

Annexure III: Weekly Environmental Monitoring Checklist Karakh Valley Development Sub-Project (NCB 01)



CONSTRUCTION OF KARAKH VALLEY DEVELOPMENT

SUB- PROJECT –MULA RIVER BASIN

CONTRACT NO: NCB-01

Project Name: Construction of Karakh valley Dev

Package No. NCB -01

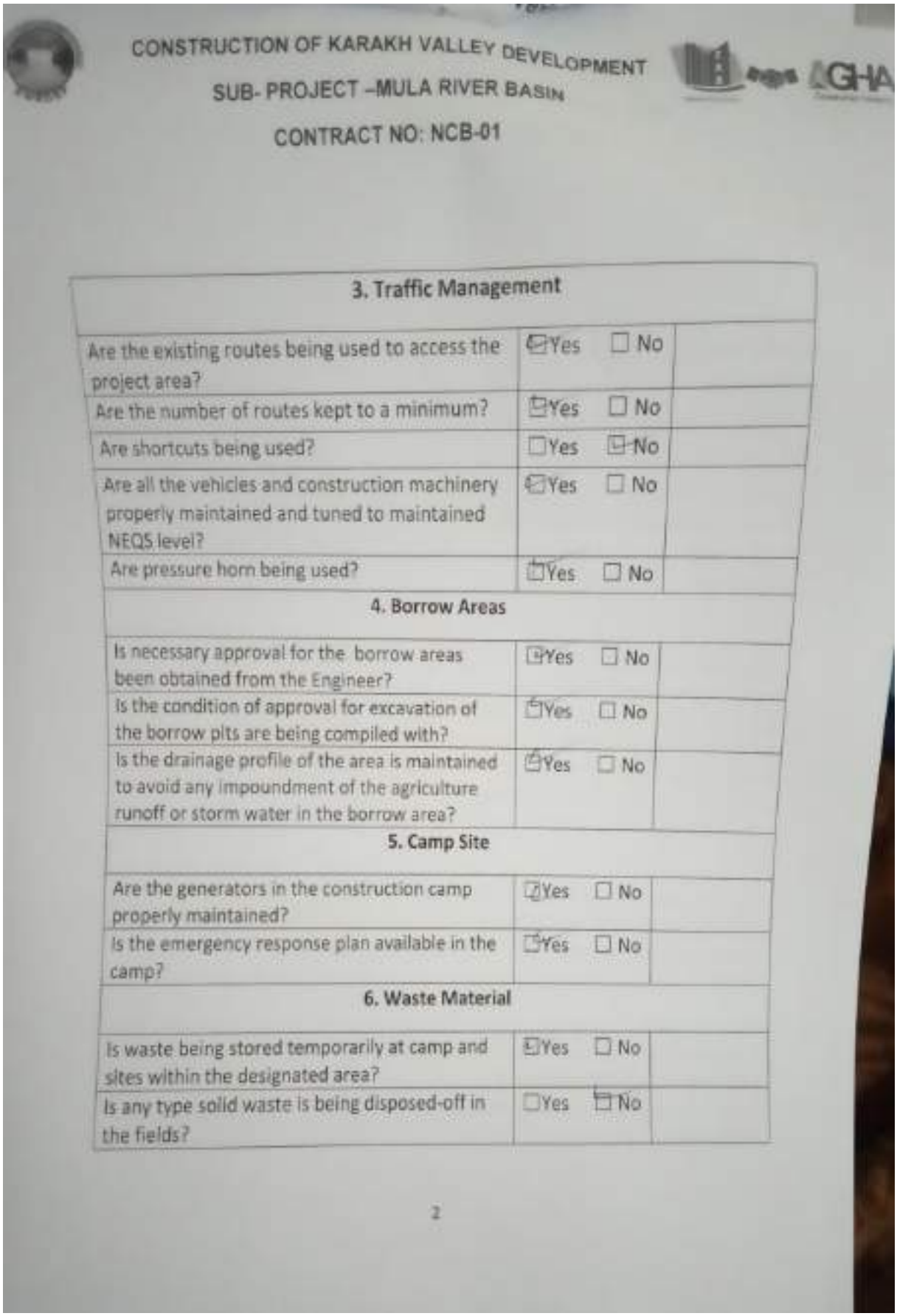
Monitoring Location: Gate 2 Project site

Date 7/12/23

Weekly Monitoring Checklist

Description	Status	Comments
A. Physical Condition		
1. Soil Condition		
Is any soil erosion observed?	☐Yes ☐No	
Has the movement of construction equipment been restricted to work areas to avoid unnecessary disturbance to soil types?	☑Yes ☐ No	
Have the area along the access road being visually monitored and show any type of soil erosion	☐Yes ☐ No	
2. Fuel Lubricants		
Is regular inspection carried to check leaks and spills?	☑Yes ☐ No	
Is there any combustible or flammable material in the fuel storage area?	☐Yes ☐No	
Are the fuels and oils handled in the safe manner, ensure no leakage and spillage?	☑Yes ☐ No	
Have the entire oil and fuel storage areas provided with impervious floor underneath to prevent soil contamination from leaks or spills?	☐Yes ☐No	
Are the spilled oil or fuel and used clean material being disposed of properly?	☐Yes ☐ No	
Are the spills and leaks thoroughly ?	☐Yes ☐ No	

1



CONSTRUCTION OF KARAKH VALLEY DEVELOPMENT
SUB- PROJECT –MULA RIVER BASIN
CONTRACT NO: NCB-01

3. Traffic Management		
Are the existing routes being used to access the project area?	☑ Yes ☐ No	
Are the number of routes kept to a minimum?	☑ Yes ☐ No	
Are shortcuts being used?	☐ Yes ☑ No	
Are all the vehicles and construction machinery properly maintained and tuned to maintained NEQS level?	☑ Yes ☐ No	
Are pressure horn being used?	☐ Yes ☐ No	
4. Borrow Areas		
Is necessary approval for the borrow areas been obtained from the Engineer?	☑ Yes ☐ No	
Is the condition of approval for excavation of the borrow pits are being compiled with?	☐ Yes ☐ No	
Is the drainage profile of the area is maintained to avoid any impoundment of the agriculture runoff or storm water in the borrow area?	☐ Yes ☐ No	
5. Camp Site		
Are the generators in the construction camp properly maintained?	☑ Yes ☐ No	
Is the emergency response plan available in the camp?	☐ Yes ☐ No	
6. Waste Material		
Is waste being stored temporarily at camp and sites within the designated area?	☑ Yes ☐ No	
Is any type solid waste is being disposed-off in the fields?	☐ Yes ☐ No	

2

CONSTRUCTION OF KARAKH VALLEY DEVELOPMENT
SUB- PROJECT –MULA RIVER BASIN
CONTRACT NO: NCB-01

Do the vehicles carry adequate container/ trash bags for litter garbage and are they emptied at the camp site or other designated location regularly?	☑ Yes ☐ No	

Additional Comments (if any): _____

_____

_____

Contractor Environmentalist: _____ **PIC Environmentalist:** _____

3

Annexure IV: Monthly Environmental Monitoring Check List Karakh Valley Development Sub-Project (NCB 01)

Name of The Project: Construction of Karakh Valley Development Sub-Project – Mulla River Basin						
Environmental Compliance Checklist						
Sr. no	**Description**	**Week**				**Monthly Avg**
		1	**2**	**3**	**4**	**Dec, 2023**
Major Adverse Impacts (weightage 0-3)						
1	Copy of the SSEMP provided at the camp site/contractor office?	3	3	3	3	3
2	The EMP instructions are understood?	3	3	3	3	3
3	An individual is nominated for implementation of EMP?	1	2	3	3	2.25
4	Camp Management Health and Hygiene/ Heating, Cooling, Lighting and Housekeeping	2	2	2	3	2.25
5	Workforce use PPE at site?	3	3	3	3	3
6	Contractor provide PPE to their workforce?	2	2	3	3	2.5
7	Potable water is available to labor	3	3	3	3	3
8	Medical Facilities, First Aid Kit is provided at camp and individual nominated for addressing emergency?	3	3	3	3	3
9	Contractor maintained Environmental Monitoring Record and submits monthly monitoring reports?	3	3	3	3	3
10	Contractor maintained Grievances Log registered the complaints from community?	1	2	2	2	1.75
11	Contractors prohibited child labor and forced labor?	2	2	3	3	2.5
12	Borrow area is leased and the landowner is compensated as per a lease agreement?	0	1	2	3	1.5
13	Septic tank and Soak Pits are designed for treatment of effluents?	2	2	2	2	2
14	No complaint filed regarding transmission of communicable diseases	3	3	3	3	3
Moderate Adverse Impacts (weightage 0-2)						
15	Provision of necessary welfare and hygiene requirements for the prevention of epidemic	1	1	2	2	1.5
16	Availability of an updated emergency vehicle (Ambulance)	1	1	2	2	1.5
17	Site selected for camp is 500 m from the human settlements and wildlife habitats?	2	2	2	2	2

18	No wood cutting for fuel?	2	2	2	2	2
19	LPG cylinders are provided for cooking or heating purposes?	2	2	2	2	2
20	Arrangements for proper storage and disposal solid waste is planned?	1	1	2	2	1.5
21	Safety signs are properly displayed?	0	0	1	1	0.4

Name of The Project: Construction of Karakh Valley Development Sub-Project – Mulla River Basin

Environmental Compliance Checklist

Sr. no	Description	Week				Monthly Avg
		1	2	3	4	Dec, 2023
22	Contractor provided training to workers to effectively implement project specific EMP?	2	2	2	2	2
23	Contractors followed HSE plan and Emergency Response Procedures	2	2	2	2	2
24	Contractors properly disposes debris materials in approved barren land/TMA facilities preferably recycling, reuse process?	1	1	1	2	1.25
25	Natural areas with high elevation are normally selected as borrow areas?	1	1	1	1	1
26	Minimum damage to the agriculture land due to borrow pits on agriculture land?	1	1	2	2	1.5
27	Stockpiling of Material , Construction Material Management	1	1	1	1	1
28	Waste being stored temporarily on camp and sites only within the designated area	2	2	2	2	2
29	Fuel/oil storage areas are away from watercourses?	2	2	2	2	2
30	Fuel/oil storage areas are paved and ventilated	1	1	2	2	1.5
31	Fire Extinguisher is placed near Fuel Storage area	2	2	2	2	2
32	Tree cutting restricted to RoW and shoulder areas only?	1	1	2	2	1.5
33	No damage reported to public services like electric, water, gas, sewer or telephone lines?	1	1	2	2	1.5
34	Batching plant properly managed, no complaints	0	0	1	1	0.5
35	Project activities are displayed at proper locations	1	2	0	1	1
Minor Adverse Impacts and Good Pracrtice (weightage 0-1)						
36	No complaints were made due to noise and vibration?	1	1	1	1	1

37	Contractor conduct Information, Education and Communication (IEC) campaign	0.1	0.1	0.1	0.1	0.1
38	Labor Screening at the time of induction	0.3	0.3	0.5	0.5	0.4
39	Fire Extinguisher are placed and checked properly	1	1	1	1	1
40	Contractors hiring of local labor?	1	1	1	1	1
41	Project site is fenced to prevent trespassing?	0	0	0	1	0.25
42	Community consultation has been carried out for project activities/concerns	1	1	1	1	1
43	Generator in the construction camp properly maintained	1	1	1	1	1
44	Adequate barriers are provided around areas where hazards may exist	0	0	0	1	0.25
45	Spilled oil or fuel and used clean up material being disposed of properly	1	1	1	1	1
46	Waste segregation at source	0	0	0	1	0.25
47	Construction and Maintenance of Walkways	0	0	0.4	0.5	0.22
48	Dust Generation during construction well managed and record exists	0.5	0.5	0.5	0.5	0.5
49	Water Sprinkling Record is available	1	1	1	1	1
50	Provided lighting is adequate (minimum of 100 lux) and that personnel are not working in a shadow	1	1	1	1	1
51	Photographic Record of roads and agricultural fields are being maintained	1	1	1	1	1
52	Materials will be stacked or stored in a safe manner that prevents sliding, falling or collapse	1	1	1	1	1
53	Spills and leak thoroughly cleaned	1	1	1	1	1
54	Construction machinery parked at designated areas?	1	1	1	1	1
55	Traffic issues managed well, no complaints on record	0.5	0.5	0.5	1	0.62
56	Daily, Weekly and Monthly Checklists are filled regularly	0	0	1	1	0.5
57	Storage of Hazardous Material in designated areas. MSDS available	1	1	1	1	1
58	Construction activities carried out in daylight to reduce the impact of noise	1	1	1	1	1
	Total Weightage (out of 116)					**84.55**
	Monthly Percentage					**72.89%**
	Key: (Percentage)					

	100 = Excellent
	Above 80 = Good
	Above 60 = Average
	Below 40 = Below Average
	Below 30 = Unsatisfactory

Annexure V: Onsite Training Photographs of Karakh Valley Sub-Project NCB 01

Training Attendance Karakh Valley Sub-project NCB 01

CONSTRUCTION OF KARAKH VALLEY DEVELOPMENT

SUB- PROJECT –MULA RIVER BASIN

CONTRACT NO: NCB-01

Training Attendance Sheet

Topic: IMPORTANCE OF SAFETY GADGETS Date: 9/12/23

S.no	Name	Designation	Signature
	Khalil Khan	Const Labour	
	Qurban	Const Labour	
	Sikandar	Const Labour	
	Mulla Mohammad	Const Labour	
	Saqlaq Ali	Const Labour	

Trainee Signature:

Annexure VI: Compliance and Non-Compliance on Construction sites

1. Siri Toi Dam Sub-project ICB 01

- **Contractor's Camp**

UPS

Front side

Front side

Parking Area

Assembly Area

- **Consultants' Camp**

Board

Front Road

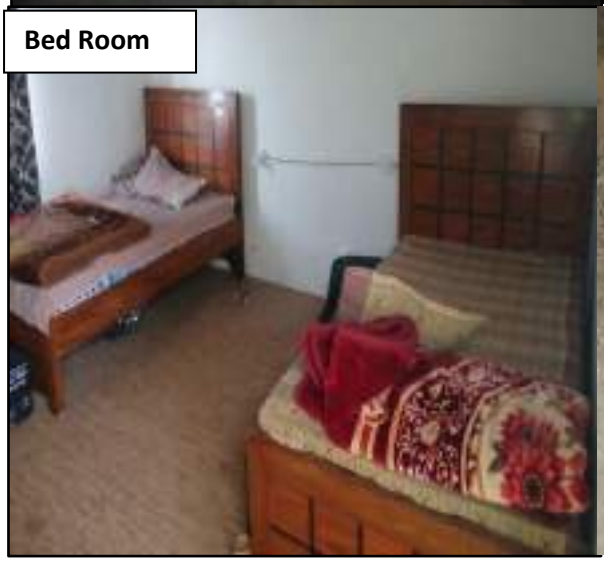
Office Area

Office

Kitchen

Dining Hall

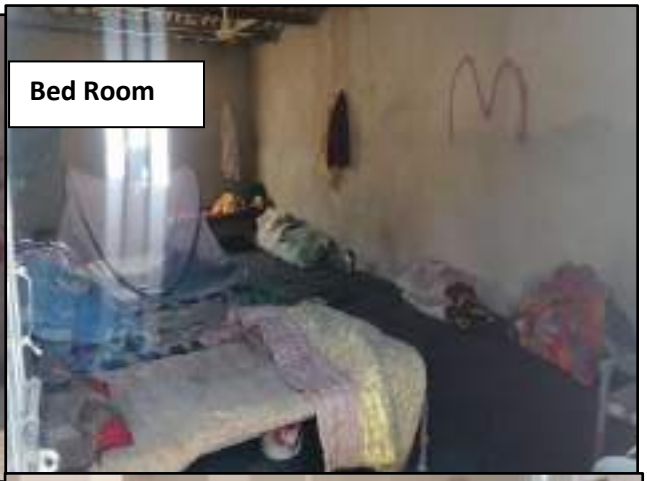
Bed Room



Stagnant Water

- **Labour Camp**


Board
LABOUR CAMP
SITE AREA


Bed Room


Bed Room


Eating Area

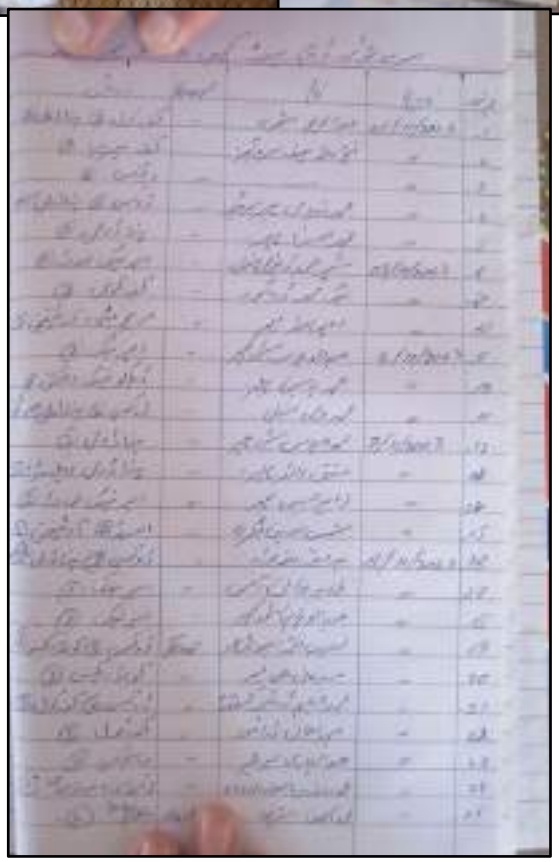

Water storage tank for washroom


Water taps


Waste Bin


Washrooms

- **Dispensary**



- **Laboratory**

Lab

Samples

Office

- **Store Room**

- **Oil Room**

- **Construction Site**

- **Others**

Scrap Yard

Fuel Filling Station

Welding Station

Dish Network

Car Wash Area

Stagnant Water

Solid waste and open pits

2. Karakh Sub-project NCB 01

3. BWR Building Sub-project NCB 05

4. Kharzan Hatachi Sub-project NCB 02







5 Meter
Depth


5 Meter
Depth

Annexure VII: Environmental Monitoring of Siri Toi Dam Project, Karakh Valley Development Project, Kharzan Hatachi, Water Resources Building and Kili Sardar Akhtar

Environmental Monitoring on Siri Toi Dam Project

Air Quality Monitoring

Sustainable Environmental Services | SES

Analysis Report Ref # SES/ENV/Dec/23/1943/1773-A **Date: 30-12-2023**

Description:

Sampling Location:	Camp Side	**Testing Instrument**	24 Hours Air Monitoring Station
Job Performed By:	Mr. Mohsin	**Job Date :**	19-Dec-2023 to 20-Dec-2023
Monitoring Duration	09:00AM to 08:00AM (24 Hrs.)		
Side Location:	(Construction of Siritoi Dam ICB -01)		
Client Name :	M/s NOOR UL HAQ & BROTHERS		

Air Quality Test Report

Parameters	Temp	NO	NO_2	SO_2	CO	$PM_{2.5}$	PM_{10}	SPM	O_3
NEQS &BEQS Limit	-	24 hrs. (40 µg/m³)	24 hrs. (80µg/m³)	24 hrs. (120µg/m³)	08 hrs. (5 mg/m³)	24 hrs. (35 µg/m³)	24 hrs. (150 µg/m³)	24 hrs. (500 µg/m³)	01 hr. (130µg/m³)
WHO Limit	-	-	24 hrs. (25µg/m³)	24 hrs. (40µg/m³)	08 hrs. (4 mg/m³)	24 hrs. (15 µg/m³)	24 hrs. (45µg/m³)	-	Peak Season (60µg/m³)
Time		Results							
09:00AM	13°C	14.31	32.5	5.54	0.041	24.2	78.2	149.6	06
10:00AM	12°C	15.53	37.7	6.64		25.3	86.2	162.4	-
11:00AM	12°C	16.34	35.9	7.22		24.2	98.7	161.8	-
12:00PM	13°C	17.83	37.18	7.73	0.096	26.1	93.5	169.5	-
01:00PM	15°C	18.54	34.33	7.34		24.2	96.8	173.8	-
02:00PM	16 °C	16.22	42.88	6.48		27.2	99.2	176.9	-
03:00PM	16 °C	17.59	34.54	7.15	0.025	25.2	109.3	185.4	-
04:00PM	16 °C	13.81	34.82	5.14		22.3	106.8	183.8	-
05:00PM	19 °C	11.43	35.23	6.64		25.2	99.2	179.6	-
06:00PM	19 °C	13.55	33.46	6.02	0.085	24.3	96.5	177.5	-
07:00PM	19 °C	14.51	32.29	7.14		27.3	98.9	175.9	-
08:00PM	18 °C	11.85	30.87	7.24		27.2	87.2	178.6	-
09:00PM	18 °C	08.66	29.26	8.55	0.095	26.6	86.7	173.2	-
10:00PM	16°C	09.84	27.84	9.37		27.2	86.2	171.6	-
11:00PM	16°C	10.68	26.03	6.52		25.3	80.3	169.4	-
12:00AM	14°C	09.47	26.18	5.41	0.062	23.3	76.8	166.8	-
01:00AM	10°C	8.91	25.36	3.58		22.2	79.3	164.9	-
02:00AM	09 °C	7.82	23.88	4.31		20.2	68.7	160.7	-
03:00AM	08 °C	7.23	24.24	2.76	0.082	21.2	69.2	156.2	-
04:00AM	06 °C	8.82	24.91	3.44		20.1	66.7	151.8	-
05:00AM	06 °C	9.29	23.32	4.42		22.6	64.3	148.3	-
06:00AM	07 °C	11.31	25.82	6.58	0.056	26.6	36.2	144.6	-
07:00AM	07 °C	13.69	26.63	5.20		27.1	68.2	147.9	-
08:00AM	09 °C	12.56	30.81	6.06		28.2	66.7	149.8	-
AVERAGE	13.0°C	14.31	32.5	5.54	0.067	24.72	84.15	165.8	06

ASCERT ASCERT ASCERT

New Head Office: Plot No SC-46 Block Commercial Sector 31/D P&T Society Korangi, Karachi.
Mob: +92(0)346-2225261,0333-2699016 Tel # 02135121125 E-mail: info@sespaklab.com Web: www.sespaklab.com

Air Ambient Quality

Sustainable Environmental Services | SES

Analysis Report **Ref # SES/ENV/Dec/23/1943/1773–B** **Date:30-12-2023**

Description:

Sampling Location:	Camp Side	**Testing Instrument**	24 Hours Air Monitoring Station
Job Performed By:	Mr. Mohsin	**Job Date :**	19-Dec-2023 to 20-Dec-2023
Monitoring Duration	09:00AM to 08:00AM (24 Hrs.)		
Side Location:	(Construction of Siritoi Dam ICB -01)		
Client Name :	**M/s NOOR UL HAQ & BROTHERS**		

Ambient Air Quality Monitoring

Sr.	Measuring Parameters	Unit	WHO Limit	NEQS & BEQS Limits	Average Test Result	Remarks
1.	Oxide Of Nitrogen as (NO)	$\mu g/m^3$	-	40 (24 hrs.)	14.31	WL
2.	Oxide Of Nitrogen as (NO_2)	$\mu g/m^3$	25(24 hrs.)	80 (24 hrs.)	32.5	WL
3.	Sulphur Dioxide (SO_2)	$\mu g/m^3$	40(24 hrs.)	120 (24 hrs.)	5.54	WL
4.	Carbon Monoxide (CO)	mg/m^3	4(24 hrs.)	5 (08 hrs.)	0.067	WL
5.	Particulate Matter (PM 2.5)	$\mu g/m^3$	15(24 hrs.)	35 (24 hrs.)	24.72	WL
6.	Particulate Matter (PM 10)	$\mu g/m^3$	45(24 hrs.)	150 (24 hrs.)	84.15	WL
7.	SPM	$\mu g/m^3$	-	500 (24 hrs.)	165.8	WL
8.	Ozone (O_3)	$\mu g/m^3$	60(Peek Season)	130 (01 hr.)	06	WL

Note:
BEQS=Baluchistan Environmental Quality Standards
The instruments used were dully calibrated.
The measurements were carried out on client's request.
The client is responsible for lawful usage of reported data in future.
This report is not valid for Court evidence/ Judicial knowledge
The measurement results based on the time of monitoring
WL= Within Limit

Field Analyst: M. Mohsin

Chief Chemist: Kashif Ahmed

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Noise Level

Sustainable Environmental Services | SES

Analysis Report **Ref # SES/ENV/Dec/23/1943/1773-D** **Date: 30-12-2023**

Description:

Sampling Location:	Camp Side	**Testing Instrument:**	Noise Meter
Job Performed By:	Mr. Mohsin	**Job Date :**	19-Dec-2023 to 20-Dec-2023
Monitoring Duration	09:00AM to 08:00AM (24 Hrs.)		
Side Location:	(Construction of Siritoi Dam ICB -01)		
Client Name :	**M/s NOOR UL HAQ & BROTHERS**		

Noise Test Report

S. No	Measuring Parameter	Testing Instrument	WHO Limit	NEQS & BEQS Limits	TIME	Results
01	Noise Level	Noise Meter	65 dB(A) (Day time)	75 dB(A) (Day time)	09:00AM	61.2
02					10:00AM	63.5
03					11:00AM	61.2
04					12:00PM	62.6
05					01:00PM	64.5
06					02:00PM	63.1
07					03:00PM	62.2
08					04:00PM	61.3
09					05:00PM	61.1
10					06:00PM	63.2
11					07:00PM	64.1
12					08:00PM	56.2
13					09:00PM	59.3
14					10:00PM	56.3
15			55 dB(A) (Night time)	65 dB(A) (Night time)	11:00PM	54.2
16					12:00AM	56.2
17					01:00AM	59.3
18					02:00AM	52.2
19					03:00AM	49.6
20					04:00AM	47.2
21					05:00AM	49.6
22					06:00AM	45.5
23			65 dB(A) (Day time)	75 dB(A) (Day time)	07:00AM	59.6
24					08:00AM	56.8
					Average Results	57.9

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Meteorological Data of the project site

Sustainable Environmental Services | SES

Analysis Report Ref # SES/ENV/Dec/23/1943/1773–C Date: 30-12-2023

Description

Sampling Location:	Camp Side	**Testing Instrument**	Metrological Equipment's
Job Performed By:	Mr. Mohsin	**Job Date :**	19-Dec-2023 to 20-Dec-2023
Monitoring Duration	09:00AM to 08:00AM (24 Hrs.)		
Side Location:	(Construction of Siritoi Dam ICB -01)		
Client Name :	**M/s NOOR UL HAQ & BROTHERS**		

METROLOGICAL DATA

S.No	TIME	Wind Direction	Wind Velocity	Humidity	Pressure
	Hours		m/sec	%	mm of Hg
1	09:00AM	SW	1.87	97	758
2	10:00AM	W	1.68	91	743
3	11:00AM	W	1.85	99	748
4	12:00PM	W	1.87	94	741
5	01:00PM	N	2.98	95	753
6	02:00PM	N	1.78	96	729
7	03:00PM	S	1.89	94	757
8	04:00PM	S	1.28	82	756
9	05:00PM	NW	1.76	89	798
10	06:00PM	N	2.27	87	778
11	07:00PM	SW	2.96	86	725
12	08:00PM	SW	2.63	88	735
13	09:00PM	NW	2.58	89	795
14	10:00PM	W	3.04	85	745
15	11:00PM	N	3.96	82	735
16	12:00AM	N	3.78	89	756
17	01:00AM	S	4.31	83	725
18	02:00AM	N	4.29	85	795
19	03:00AM	N	4.26	87	734
20	04:00AM	S	5.38	89	758
21	05:00AM	S	5.78	96	767
22	06:00AM	W	5.12	94	795
23	07:00AM	NW	4.78	99	736
24	08:00AM	NW	4.65	97	787

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Drinking Water Quality

Sustainable Environmental Services | SES

Analysis Report **Ref # SES/ENV/Dec/23/1943/1773--E** **Date: 30-12-2023**

Description:

Quantity of sample	1.0 Liter	**Sampling Methodology**	Grab	**Job Date**	19-Dec-2023
Analysis Type	Chemical Analysis		**Sampling Location**		Sirinai Dam Project
Side Location:	(Construction of Sirinai Dam KCB -01)				
Client Name :	M/s NOOR UL HAQ & BROTHERS				

Bore Water Report

S #	Parameters	Units	Testing Method	NEQS Limits	WHO Limits	BEQS Limits	Result	Remarks
01	Total Bacteria Count	TBC (count/ml)	Total Viable Count	----------	----------	----------	18	-
02	Total Coliform	TC (count/ml)	APHA 922 B	0/100 ml	0/100 ml	0/100 ml	ND	WL
03	E-Coli	EC(count/ml)	Total Viable Count	0/100 ml	0/100 ml	0/100 ml	ND	WL
04	Facial Coli	FC (count/ml)	APHA 922 B	0/100 ml	0/100 ml	0/100 ml	ND	WL
05	Turbidity	NTU	HACH Turbidity meter	<5	<35	<15	< 0.06	WL
06	Taste	Taste	Sensory Evolution	Obj/Non Obj	Obj/Non Obj	Obj/Non Obj	Non-obj	WL
07	Odour	Odor	Sensory Evolution	Obj/Non Obj	Obj/Non Obj	Obj/Non Obj	Non-obj	WL
08	Colour	TCU	Pt-Co method	≤ 15 TCU	≤ 15 TCU	≤ 15 TCU	< 2	WL
09	Phenolic Compounds	As Phenol (mg/L)	ASTM D-1783	-	-	-	ND	WL
10	Residual chlorine	Cl_2 (mg/L)	HACH Method 8167	0.2-0.5	-	0.2-0.5	0.6	WL
11	pH @ 25 °C	PH	ASTM D-1293	6.5 to 8.5	6.5 to 8.5	6.5 to 8.5	8.06	WL
12	Total Dissolved Solid	TDS (mg/L)	APHA 2540-C	< 1000	< 1000	< 1000	399	WL
13	Total Hardness	As COCO3(mg/L)	APHA 2340-C	< 500	-	< 500	76	WL
14	Fluoride	F^{-1} (mg/L)	APHA 4500-F^{-1}	≤1.5	1.5	≤1.5	0.57	WL
15	Chloride	Cl^{-1} (mg/L)	APHA 4500-Cl^{-1}	< 250	250	< 250	195	WL
16	Cyanide	CN^{-1}(mg/L)	HACH Method 8027	≤ 0.05	0.07	≤ 0.05	ND	WL
17	Nitrate	NO_3^{-1} (mg/L)	HACH Method 8192	≤ 50	50	≤ 50	0.17	WL
18	Nitrite	NO_2^{-1} (mg/L)	APHA 4500-NO_2^{-1}-B	≤ 3.0(P)	3	≤ 3.0(P)	0.06	WL
19	Antimony	Sb (mg/L)	ASTM D-3697	≤ 0.005	0.02	≤ 0.005	ND	WL
20	Aluminum	Al(mg/L)	ASTM D-857	≤ 0.2	0.2	≤ 0.2	0.02	WL
21	Arsenic	As (mg/L)	ASTM D-2972	≤ 0.05	0.01	≤ 0.05	ND	WL
22	Boron	B (mg/L)	ASTM D-3082	0.3	0.3	0.3	ND	WL
23	Barium	Ba(mg/L)	ASTM D-4382	0.7	0.7	0.7	0.004	WL
24	Chromium Total	Cr(mg/L)	ASTM D-1687	≤ 0.05	0.05	≤ 0.05	ND	WL
25	Copper	Cu (mg/L)	ASTM D-1688	2	2	2	<0.06	WL
26	Cadmium	Cd(mg/L)	ASTM D-3557	0.01	0.003	0.01	ND	WL
27	Lead	Pb(mg/L)	ASTM D-3559	≤ 0.05	0.01	≤ 0.05	ND	WL
28	Manganese	Mn(mg/L)	ASTM D-858	≤ 0.5	0.5	≤ 0.5	ND	WL
29	Mercury	Hg (mg/L)	ASTM D-3223	≤ 0.001	0.001	≤ 0.001	ND	WL
30	Nickel	Ni(mg/L)	ASTM D-3866	≤ 0.02	0.02	≤ 0.05	ND	WL
31	Selenium	Se(mg/L)	ASTM D-3858	0.01	0.01	0.01	ND	WL
32	Zinc	Zn (mg/L)	ASTM D-1691	5	3	5	0.07	WL

Note:
BEQS=Baluchistan Environmental Quality Standards
The instruments used were duly calibrated.
The measurements were carried out on client's request.
The client is responsible for lawful usage of reported data in future.
This report is not valid for Court evidence/ Judicial knowledge
The measurement results based on the time of monitoring.
WL= Within Limit
Field Analyst: Mr. Mohsin

Chief Chemi

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Photographic Evidences

Picture Evidence

Project name:	Construction of Siri Toi Dam project-Zhob River-Basin ICB -01
Client Name:	Balochistan Water Resources Development Sector (BWRDSP) ABD Loan no-3700-Pak Irrigation department Baiochistan
Consultants Name:	NESPAK, RHC, EGC (JV)
Contractor Name :	M/s NOOR UL HAQ & BROTHERS

Fig.1

Fig.2

Fig.3

Fig.4

Environmental Monitoring on Karakh Valley Development Project

Ambient Air Quality on Karakh Valley

ENVI TECH AL

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Lab Report No: 202311070-ACC-AAQ
Invoice Bill No: Inv-AGC-350

Page No: 1 of 1
Reporting Date: 23-November-2023

Report to:	M/s. Zahir Khan & Brothers (JV) Agha Construction Company Address Khuzdar, Balochistan, Pakistan.
Attention:	Mr. Shahmeer Email shahmeerahmed1980@gmail.com

Test ID:	AAQ-202311070
Test Performed Date:	14-November-2023
Test Description:	Ambient Air Quality (As per NEQS)
Test Type & Location:	Ambient Air Quality- Camp Site
Test Performed By:	Envi Tech Al

Test Report

Sr.#	Parameter/Analytes Description	Unit	Test Result	NEQS Limits
1	Temperature	°C	11	-
2	Humidity	%	55	-
3	Particulate matter (PM 1.0)	µg/m3	40	500
4	Particulate matter (PM 2.5)	µg/m3	32	35
5	Particulate matter (PM 10)	µg/m3	78	150
6	Carbon Monoxide (CO)	mg/m3	N.D.	10
7	Sulphur Dioxide (SO2)	µg/m3	N.D.	120
8	Nitrogen Dioxide (NO2)	µg/m3	N.D.	80
9	Oxygen (O2)	%	20	-
10	Formaldehyde	mg/m3	0.175	-
11	Total Volatile Organic Compounds (TVOC)	mg/m3	0.231	-
12	Ozone (O3)	µg/m3	N.D.	130

Note :Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.
NEQS Limits = National Environmental Quality Standard (Reference: NEQS)
N.D. = Not Detected

Analyzed By (Analyst) Reviewed By (Assistant Manager) Approved By (Lab Manager)

Disclaimer:
- Report is valid for current batch (sample).
- This report is not valid for any publication or judicial purpose.
- Envi Tech AL is not responsible for the sample identification and data shared by the client.
- The sample shall be discarded after five working days unless otherwise instructed.
- Our test report can be verified by scanning System-generated QR Code.

CTAL-LAB-130-17-07 Issue Date: 23-10-22 Issue 01 rev 03

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Lab Report No: 202311069-ACC-AAQ

Invoice Bill No: Inv-AGC-359

Page No: 1 of 1

Reporting Date: 21-November-2023

Report to:	M/s. Zahir Khan & Brothers (JV) Agha Construction Company Address Khuzdar, Balochistan, Pakistan.
Attention:	Mr. Shahmeer Email shahmeerahmed1960@gmail.com

Test ID:	AAQ 202311069
Test Performed Date:	14-November-2023
Test Description:	Ambient Air Quality (As per NEQS)
Test Type & Location:	Ambient Air Quality- Baching Plant
Test Performed By:	Envi Tech Al

Test Report

Sr.#	Parameter/Analytes Description	Unit	Test Result	NEQS Limits
1	Temperature	°C	28	-
2	Humidity	%	51	-
3	Particulate matter (PM 1.0)	µg/m3	38	500
4	Particulate matter (PM 2.5)	µg/m3	28.9	35
5	Particulate matter (PM 10)	µg/m3	62.8	150
6	Carbon Monoxide (CO)	mg/m3	N.D.	10
7	Sulphur Dioxide (SO2)	µg/m3	N.D.	120
8	Nitrogen Dioxide (NO2)	µg/m3	N.D.	80
9	Oxygen (O2)	%	20.1	-
10	Formaldehyde	mg/m3	0.172	-
11	Total Volatile Organic Compounds (TVOC)	mg/m3	0.208	-
12	Ozone (O3)	µg/m3	N.D.	130

Note: Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.
NEQS Limits = National Environmental Quality Standard (Reference: NEQS)
N.D. = Not Detected

Analyzed By (Analyst) Reviewed By (Assistant Manager) Approved By (Lab Manager)

Disclaimer:
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- The sample shall be discarded after five working days unless otherwise instructed.
- Our test reports can be verified by scanning System-generated QR Code.

Drinking Water Quality Tests on Karakh Valley

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Lab Report No: 202311053-ACC-DW

Invoice Bill No: Inv-AGC-350

Page No: 1 of 1

Reporting Date: 23-November-2023

Report to:	M/s. Zahir Khan & Brothers (JV) Agha Construction Company Address Khuzdar, Balochistan, Pakistan
Attention:	Mr. Shahmeer Email shahmeerahmed1960@gmail.com

Sample ID:	DW-202311053
Sample Collection Date:	14-November-2023
Sample Description:	Drinking Water
Sample Type:	Liquid Sample
Sample Collected / Submitted By:	Envi Tech AL
Date Of Analysis:	15-November-2023 to 22-November-2023
Test Description:	Drinking-Water-test as per NEQS

Analytical Test Report

Sr.#	Parameter/Analytes Description	Methods	Unit	Test Result	NEQS Limits
1	pH @ 25°C	*APHA 4500 H	-	7.78	6.5 - 8.5
2	Total Dissolved Solids (TDS)	*APHA 2540-C	mg/L	526	<1000
3	Total Hardness as CaCO3	ASTM D 1126	mg/L	304	< 500
4	Color	HACH 8025	TCU	N.D.	≤ 15
5	Turbidity	*APHA 2130	NTU	<1	≤ 5
6	Nitrite	HACH 8507	mg/L	0.004	≤ 3
7	Nitrate (NO3)	HACH 8039	mg/L	0.3	≤ 50
8	Taste	*APHA 2160	-	Tasteless	Non-Objectionable
9	Odor	*APHA 2150	-	Odorless	Non Objectionable
10	Chloride (Cl)	*APHA 4500 Cl	mg/L	19.99	≤ 250
11	Fluoride (F)	HACH 8029	mg/L	0.18	≤ 1.5
12	Aluminum (Al)	*APHA 3111-D	mg/L	N.D.	≤ 0.2
13	Nickel (Ni)	*APHA 3111-B	mg/L	N.D.	≤ 0.02
14	Lead (Pb)	*APHA 3111-B	mg/L	N.D.	≤ 0.05
15	Barium (Ba)	HACH 8014	mg/L	N.D.	0.7
16	Antimony (Sb)	*APHA 3111-B	mg/L	N.D.	≤ 0.005
17	Arsenic (As)	*APHA 3114-B	mg/L	N.D.	≤ 0.05
18	Boron (B)	HACH 8015	mg/L	N.D.	0.3
19	Cadmium (Cd)	*APHA 3111-B	mg/L	N.D.	0.01
20	Chromium (Cr)	*APHA 3111-B	mg/L	N.D.	≤ 0.05
21	Selenium (Se)	*APHA 3114-B	mg/L	N.D.	0.01
22	Copper (Cu)	*APHA 3111-B	mg/L	N.D.	1
23	Cyanide (CN)	HACH 8027	mg/L	N.D.	≤ 0.05

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Lab Report No: 202311053-ACC-DW **Page No:** 1 of 2

Invoice Bill No: Inv-AGC-350 **Reporting Date:** 23-November-2023

Report to:	**M/s.** Zahir Khan & Brothers (JV) Agha Construction Company **Address** Khuzdar, Balochistan, Pakistan
Attention:	**Mr.** Shahmeer **Email** shahmeerahmed1960@gmail.com

Sample ID:	DW-202311053
Sample Collection Date:	14-November-2023
Sample Description:	Drinking Water
Sample Type:	Liquid Sample
Sample Collected / Submitted By:	Envi Tech AL
Date Of Analysis:	15-November-2023 to 22-November-2023
Test Description:	Drinking-Water-test as per NEQS

Analytical Test Report

Sr.#	Parameter/Analytes Description	Methods	Unit	Test Result	NEQS Limits
24	Mercury (Hg)	*APHA 3112-B	mg/l	N.D.	≤ 0.001
25	Manganese (Mn)	*APHA 3111-B	mg/l	N.D.	≤ 0.5
26	Zinc (Zn)	*APHA 3111-B	mg/l	0.0042	≤ 5.0
27	Residual Chlorine	HACH 10069	mg/l	0.2	0.2 - 0.5
28	Phenolic Compounds as Phenols	ASTM-D 1783	mg/l	N.D.	-
29	Fecal Coliform	USEPA 1604	CFU/100 ml	N.D.	0 CFU/100 ml
30	Total Coliform	*APHA 922 B	CFU/100 ml	N.D.	0 CFU/100 ml
31	E-Coli	USEPA 1604	CFU/100 ml	N.D.	0 CFU/100 ml
32	Total Bacterial Count	USEPA 1604	CFU/100ml	N.D.	-

Note: Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand. Environmental Conditions at the time of Testing: Temperature: 24.9 °C (±1.3°C) & Humidity: 44 % (± 5%).

*APHA Standard Methods for Examination of water & wastewater 23rd Edition (2017).

HACH 8023 (HACH Edition 10, 2014), HACH 8022 (HACH Edition 09, 2014), HACH 10060 (HACH Edition 11, 2014), HACH 8029 (HACH Edition 10, 2014),

HACH 8015 (HACH Edition 08, 2014), HACH 8507 (HACH Edition 11, 2018), HACH 8039 (HACH Edition 10, 2019).

NEQS Limits = National Environmental Quality Standard (Reference: NEQS)

N.D. = Not Detected.

Analysed By (Analyst) Reviewed By (Assistant Manager) Approved By (Lab Manager)

Disclaimer:

- Report is valid for current batch (sample).
- This report is not valid for any publication or judicial purpose.
- Envi Tech AL is not responsible for the sample identification and data shared by the client.
- The sample shall be discarded after five working days unless otherwise instructed.
- Our test reports can be verified by scanning System generated QR Code.

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Tap Water Test Result

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Lab Report No: 202311054-ACC-DW

Invoice Bill No: Inv-AGC-350

Page No: 1 of 1

Reporting Date: 23-November-2023

Report to:	M/s. Zahir Khan & Brothers (JV) Agha Construction Company Address Khuzdar, Balochistan, Pakistan
Attention:	Mr. Shahmeer Email shahmeerahmed1960@gmail.com

Sample ID:	DW-202311054
Sample Collection Date:	14-November-2023
Sample Description:	Tap Water
Sample Type:	Liquid Sample
Sample Collected / Submitted By:	Envi Tech AL
Date Of Analysis:	15-November-2023 to 22-November-2023
Test Description:	Water Quality-Testing as per NEQS

Analytical Test Report

Sr.#	Parameter/Analytes Description	Methods	Unit	Test Result	NEQS Limits
1	pH @ 25°C	*APHA 4500 H	-	7.76	6.5 - 8.5
2	Total Dissolved Solids (TDS)	*APHA 2540-C	mg/L	390	<1000
3	Total Hardness as CaCO3	ASTM D 1126	mg/L	284	< 500
4	Color	HACH 8025	TCU	02	≤ 15
5	Turbidity	*APHA 2130	NTU	<1	≤ 5
6	Nitrite	HACH 8507	mg/L	0.007	≤ 3
7	Nitrate (NO3)	HACH 8039	mg/L	0.6	≤ 50
8	Taste	*APHA 2160	-	Tasteless	Non-Objectionable
9	Odor	*APHA 2150	-	Odorless	Non-Objectionable
10	Chloride (Cl)	*APHA 4500 Cl	mg/L	97.66	≤ 250
11	Fluoride (F)	HACH 8029	mg/L	0.54	≤ 1.5
12	Aluminum (Al)	*APHA 3111-D	mg/L	N.D.	≤ 0.2
13	Nickel (Ni)	*APHA 3111-B	mg/L	N.D.	≤ 0.02
14	Lead (Pb)	*APHA 3111-B	mg/L	N.D.	≤ 0.05
15	Barium (Ba)	HACH 8014	mg/L	N.D.	0.7
16	Antimony (Sb)	*APHA 3111-B	mg/L	N.D.	≤ 0.005
17	Arsenic (As)	*APHA 3114-B	mg/L	N.D.	≤ 0.05
18	Boron (B)	HACH 8015	mg/L	N.D.	0.5
19	Cadmium (Cd)	*APHA 3111-B	mg/L	0.0045	0.01
20	Chromium (Cr)	*APHA 3111-B	mg/L	N.D.	≤ 0.05
21	Selenium (Se)	*APHA 3114-B	mg/L	N.D.	0.01
22	Copper (Cu)	*APHA 3111-B	mg/L	N.D.	2
23	Cyanide (CN)	HACH 8027	mg/L	N.D.	≤ 0.05

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Lab Report No: 202311054-ACC-DW

Invoice Bill No: Inv-AGC-350

Page No: 1 of 2

Reporting Date: 23-November-2023

Report to:	M/s. Zahir Khan & Brothers (JV) Agha Construction Company Address Khuzdar, Balochistan, Pakistan
Attention:	Mr. Shahmeer Email shahmeerahmed1960@gmail.com

Sample ID:	DW-202311054
Sample Collection Date:	14-November-2023
Sample Description:	Tap Water
Sample Type:	Liquid Sample
Sample Collected / Submitted By:	Envi Tech AL
Date Of Analysis:	15-November-2023 to 22-November-2023
Test Description:	Water Quality Testing as per NEQS

Analytical Test Report

Sr.#	Parameter/Analytes Description	Methods	Unit	Test Result	NEQS Limits
24	Mercury (Hg)	*APHA 3112-B	mg/L	N.D.	≤ 0.001
25	Manganese (Mn)	*APHA 3111-B	mg/L	0.1001	≤ 0.5
26	Zinc (Zn)	*APHA 3111-B	mg/L	0.1634	≤ 5.0
27	Residual Chlorine	HACH 10069	mg/L	N.D.	0.2 - 0.5
28	Phenolic Compounds as Phenols	ASTM-D-1783	mg/L	N.D.	-
29	Fecal Coliform	USEPA 1604	CFU/100 ml	N.D.	0 CFU/100 ml
30	Total Coliform	*APHA 922 B	CFU/100 ml	N.D.	0 CFU/100 ml
31	E-Coli	USEPA 1604	CFU/100 ml	N.D.	0 CFU/100 ml
32	Total Bacterial Count	USEPA 1604	CFU/100ml	02	-

Note :Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand. Environmental Conditions at the time of Testing: Temperature: 24.7 °C (±1.3°C) & Humidity: 44 % (± 5%).

*APHA Standard Methods for Examination of water & wastewater 23rd Edition (2017).

HACH 8025 (HACH Edition 10, 2016), HACH 8027 (HACH Edition 09, 2014),HACH 10069 (HACH Edition 11, 2014), HACH 8029 (HACH Edition 10, 2014), HACH 8015 (HACH Edition 08, 2016), HACH 8507 (HACH Edition 11, 2015), HACH 8039 (HACH Edition 10, 2016).

NEQS Limits :- National Environmental Quality Standard (Reference: NEQS)

N.D. = Not Detected.

Analyzed By (Analyst) Reviewed By (Assistant Manager) Approved By (Lab Manager)

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ETAL-LAB-FRM-FF-02

Wastewater Quality Tests on Karakh Valley

ENVI TECH AL

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Lab Report No: 202311052-ACC-WW

Invoice Bill No: Inv-AGC-350

Page No: 1 of 1

Reporting Date: 23-November-2023

Report to:	M/s. Zahir Khan & Brothers (JV) Agha Construction Company Address Khuzdar, Balochistan, Pakistan
Attention:	Mr. Shahmeer Email shahmeerahmed1960@gmail.com

Sample ID:	WW-202311052
Sample Collection Date:	14-November-2023
Sampling Method:	APHA - 1060 B & C
Sample Description:	Waste water
Sample Type:	Liquid - Sample
Sample Collected By:	Envi Tech Al
Date Of Analysis:	15-November-2023 to 22-November-2023
Test Description:	Wastewater Testing as per NEQS

Analytical Test Report

Sr.#	Parameter/Analytes Description	Methods	Unit	Test Results	NEQS 1	NEQS 2	NEQS 3
1	Temperature 40°C	*APHA 2550	°C	30	≤ 40	≤ 40	-
2	pH	APHA 4500 H-B	-	7.93	6-9	6-9	-
3	Sulphide	*APHA 4500-S2-D	mg/L	<1	1	1	-
4	Biological Oxygen Demand(BOD)5	HACH 10099	mg/l	38	80	250	-
5	Chemical Oxygen Demand(COD)	*HACH 8000	mg/L	82	150	400	-
6	Total Dissolved Solids (TDS)	*APHA 2540-C	mg/L	494	3500	3500	-
7	Total Suspended Solids (TSS)	*APHA 2540-D	mg/L	182	200	400	-
8	Oil & Grease	USEPA 1664	mg/L	02	10	10	-
9	Cadmium	*APHA 3111-B	mg/L	0.0043	0.1	0.1	-
10	Copper	*APHA 3111-B	mg/L	0.0053	1	1	-
11	Iron	*APHA 3111-B	mg/L	0.0123	8	8	-
12	Lead	*APHA 3111-B	mg/L	N.D.	0.5	0.5	-
13	Manganese	*APHA 3111-B	mg/L	0.0048	1.5	1.5	-
14	Mercury	*APHA 3112-B	mg/L	N.D.	0.01	0.01	-
15	Nickel	*APHA 3111-B	mg/L	0.0231	1	1	-
16	Selenium	*APHA 3114-B	mg/L	N.D.	0.5	0.5	-
17	Chromium	*APHA 3111-B	mg/L	0.0044	1	1	-
18	Zinc	*APHA 3111-B	mg/L	N.D.	5	5	-
19	Arsenic	*APHA 3114-B	mg/L	N.D.	1	1	-
20	Chlorine	HACH 10069	mg/L	N.D.	1	1	-
21	Chloride	*APHA 4500 CL-B	mg/L	299.90	1000	1000	-
22	Cyanide	HACH 8027	mg/L	0.003	1	1	-
23	Fluoride	*HACH 8029	mg/L	0.10	10	10	-

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Lab Report No: 202311052-ACC-WW
Invoice Bill No: Inv-AGC-350

Page No: 1 of 2
Reporting Date: 23-November-2023

Report to:	M/s.	Zahir Khan & Brothers (JV) Agha Construction Company
	Address	Khuzdar, Balochistan, Pakistan

Attention:	Mr.	Shahmeer
	Email	shahmeerahmed1060@gmail.com

Sample ID:	WW-202311052
Sample Collection Date:	14-November-2023
Sampling Method:	APHA - 1060 B & C
Sample Description:	Waste water
Sample Type:	Liquid - Sample
Sample Collected By:	Envi Tech Al
Date Of Analysis:	15-November-2023 to 22-November-2023
Test Description:	Wastewater Testing as per NEQS

Analytical Test Report

Sr.#	Parameter/Analytes Description	Methods	Unit	Test Results	NEQS 1	NEQS 2	NEQS 3
24	Ammonia	*HACH 8038	mg/L	0.34	40	40	-
25	Sulphate	HACH 8051	mg/L	76	600	1000	-
26	An Ionic Detergent As MBAs	*APHA 5540 C	mg/L	01	20	20	-
27	Phenolic Compounds(as Phenol)	HACH 8047	mg/L	N.D.	0.1	0.3	-
28	Boron	HACH 8015	mg/L	N.D.	6	6	-
29	Barium	HACH 8014	mg/L	N.D.	1.5	1.5	-
30	Silver	*APHA 3111-B	mg/L	N.D.	1	1	-

Note: Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand. Environmental Conditions at the time of Testing: Temperature: 24.7 °C (± 1.1°C) & Humidity: 43 % (± 4%)
*APHA Standard Methods for Examination of water & wastewater 23rd Edition (2017).
HACH 8000 (HACH Edition 13, 2021), HACH 8051 (HACH Edition 11, 2019), HACH 10000 (HACH Edition 2, 2015), HACH 8027 (HACH Edition 09, 2014), HACH 10069 (HACH Edition 11, 2014), HACH 8023 (HACH Edition 10, 2018), HACH 8038 (HACH Edition 9, 2017), HACH 8014 (HACH Edition 09, 2014), HACH 8015 (HACH Edition 08, 2014)
NEQS Limits = National Environmental Quality Standard (Reference: NEQS).
1=NEQS for Municipal & Liquid Industrial Effluent into inland waters.
2= NEQS for Municipal & Liquid Industrial Effluent into Sewage Treatment.
N.D. = Not Detected.

Analyzed By (Analyst) | Reviewed By (Assistant Manager) | Approved By (Lab Manager)

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Noise Tests Results on Karakh Valley

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Lab Report No: 202311071-ACC-NA
Invoice Bill No: Inv-AGC-350

Page No: 1 of 1
Reporting Date: 23-November-2023

Report to:	**M/s.**	Zahir Khan & Brothers (JV) Agha Construction Company
	Address	Khuzdar, Balochistan, Pakistan.

Attention:	**Mr.**	Shahmeer
	Email	shahmeerahmed1560@gmail.com

Test ID:	NA-202311071
Test Performed Date:	**14-November-2023**
Test Type:	Noise Analysis
Test Performed By:	Envi Tech AL
Test Description:	Noise Analysis as per NEQS

Test Report

Sr.#	Locations	Methods	Unit	Result	NEQS Limits
1	Camp Site	ASTM E1686-16	dB	59.4	75
2	Baching Plant	ASTM E1686-16	dB	64.5	75

Note : Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.
NEQS Limits = National Environmental Quality Standard (Reference: NEQS)
N.D. = Not Detected.

Analyzed By (Analyst) — Reviewed By (Assistant Manager) — Approved By (Lab Manager)

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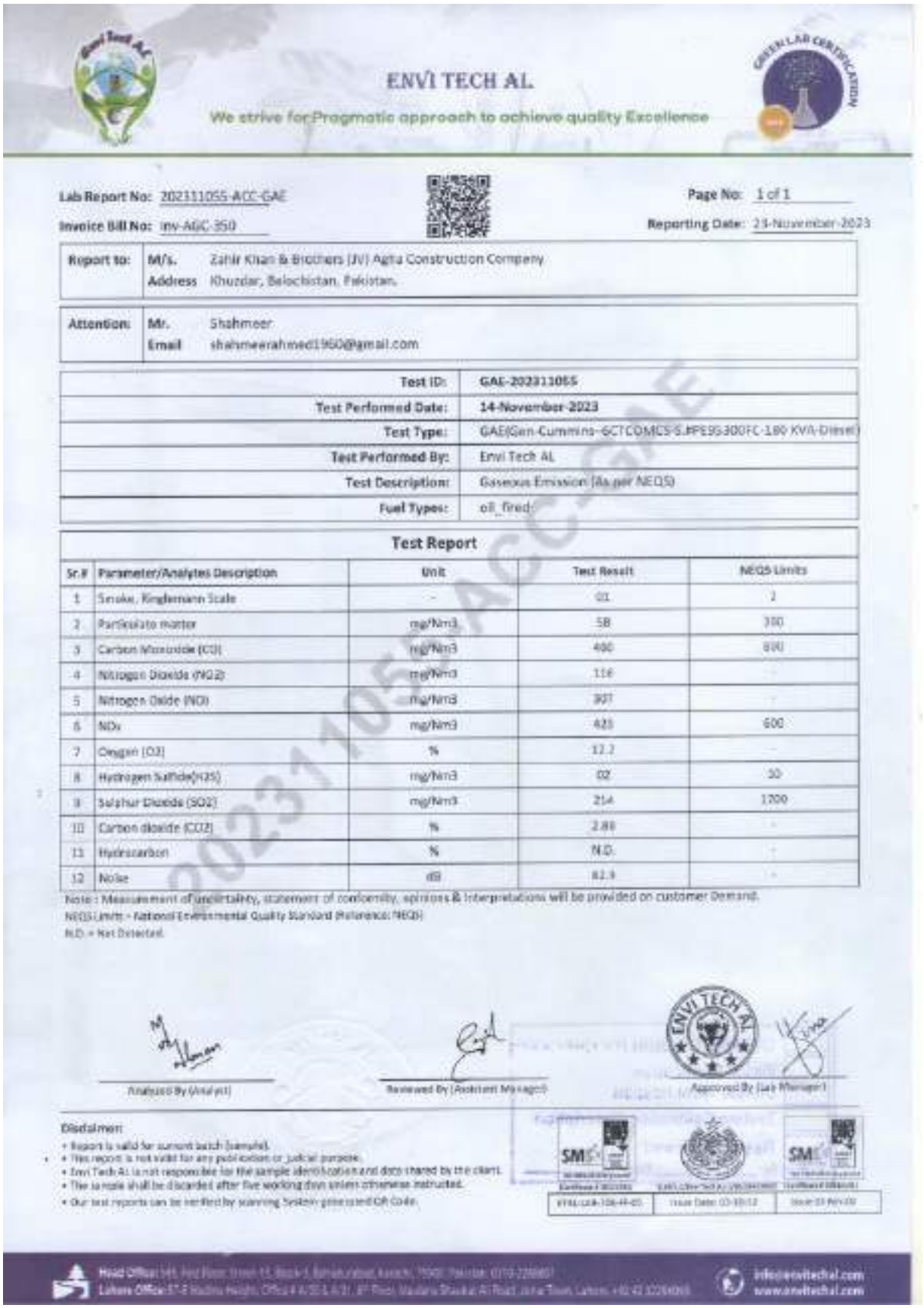
Gaseous Emission from generators test results on Karakh Valley



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Lab Report No: 202311055-ACC-GAE

Invoice Bill No: inv-AGC-350

Page No: 1 of 1

Reporting Date: 23-November-2023

Report to:	M/s. Zahir Khan & Brothers (JV) Agha Construction Company Address Khuzdar, Balochistan, Pakistan.
Attention:	Mr. Shahmeer Email shahmeerahmed1960@gmail.com

Test ID:	GAE-202311055
Test Performed Date:	14-November-2023
Test Type:	GAE(Gen-Cummins-6CTCOMCS-S.#PE9S300FC-180 KVA-Diesel)
Test Performed By:	Envi Tech AL
Test Description:	Gaseous Emission (As per NEQS)
Fuel Types:	oil_fired

Test Report

Sr.#	Parameter/Analytes Description	Unit	Test Result	NEQS Limits
1	Smoke, Ringlemann Scale	-	01	2
2	Particulate matter	mg/Nm3	58	300
3	Carbon Monoxide (CO)	mg/Nm3	400	800
4	Nitrogen Dioxide (NO2)	mg/Nm3	116	-
5	Nitrogen Oxide (NO)	mg/Nm3	307	-
6	NOx	mg/Nm3	423	600
7	Oxygen (O2)	%	12.2	-
8	Hydrogen Sulfide(H2S)	mg/Nm3	02	10
9	Sulphur Dioxide (SO2)	mg/Nm3	214	1700
10	Carbon dioxide (CO2)	%	2.89	-
11	Hydrocarbon	%	N.D.	-
12	Noise	dB	82.9	-

Note : Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.
NEQS Limit = National Environmental Quality Standard (Reference: NEQS)
N.D. = Not Detected.

Analyzed By (Analyst) Reviewed By (Assistant Manager) Approved By (Lab Manager)

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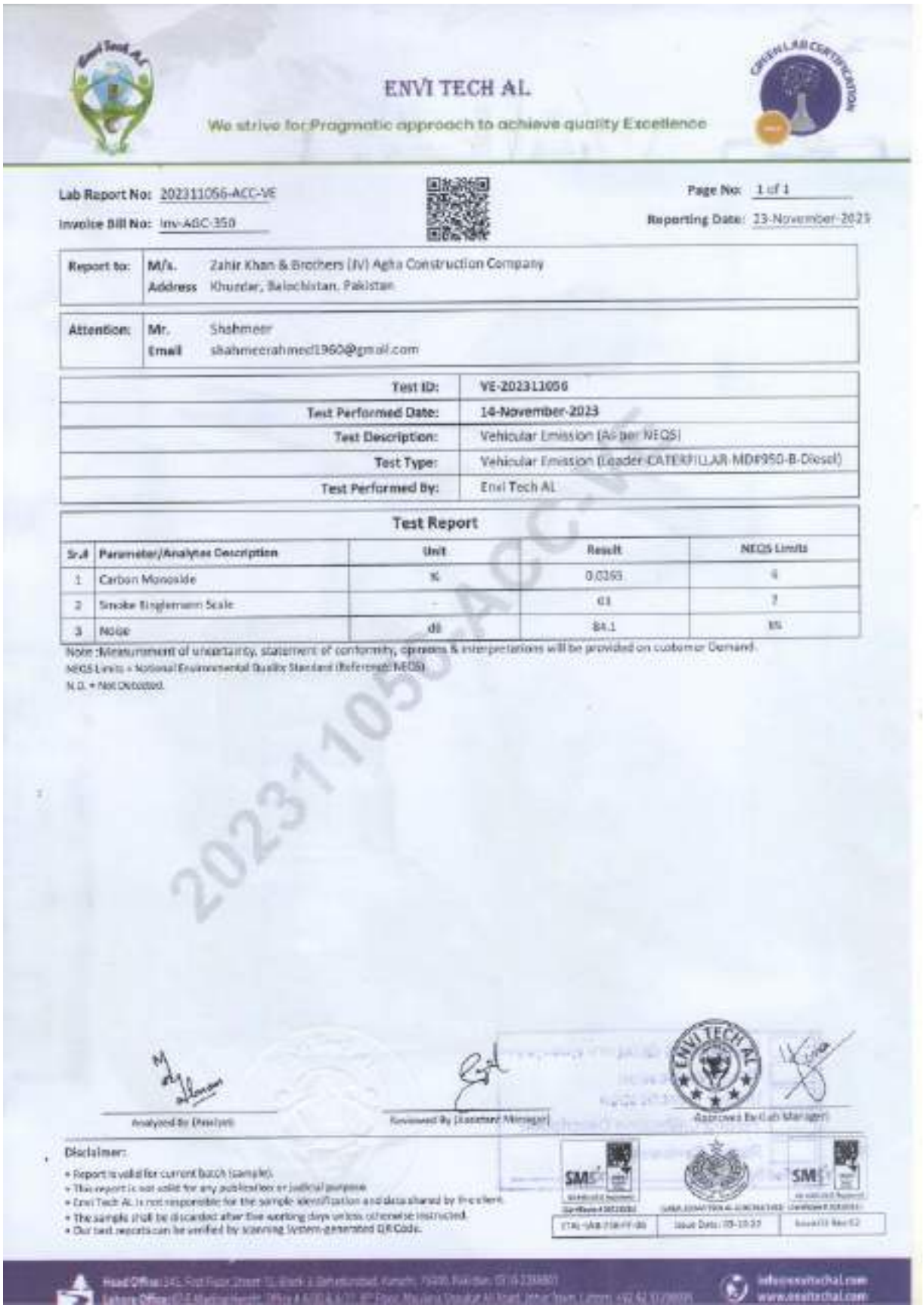
Vehicular Emission Tests Results on Karakh Valley



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Lab Report No: 202311066-ACC-VE

Invoice Bill No: Inv-AGC-350

Page No: 1 of 1

Reporting Date: 23-November-2023

Report to:	M/s.	Zahir Khan & Brothers (JV) Agha Construction Company
	Address	Khuzdar, Balochistan, Pakistan
Attention:	Mr.	Shahmeer
	Email	shahmeerahmed1960@gmail.com

Test ID:	VE-202311056
Test Performed Date:	14-November-2023
Test Description:	Vehicular Emission (As per NEQS)
Test Type:	Vehicular Emission (Loader-CATERPILLAR-MDP950-B-Diesel)
Test Performed By:	Envi Tech AL

Test Report

Sr.#	Parameter/Analytes Description	Unit	Result	NEQS Limits
1	Carbon Monoxide	%	0.0193	4
2	Smoke Ringlemann Scale	-	01	2
3	Noise	dB	84.1	85

Note :Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.

NEQS Limits = National Environmental Quality Standard (Reference: NEQS)

N.D. = Not Detected.

Analyzed By (Analyst)

Reviewed By (Assistant Manager)

Approved By (Lab Manager)

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Lab Report No: 202311057-ACC-VE

Invoice Bill No: Inv-AGC-350

Page No: 1 of 1

Reporting Date: 23-November-2023

Report to:	M/s.	Zahir Khan & Brothers (JV) Agha Construction Company
	Address	Khuzdar, Balochistan, Pakistan

Attention:	Mr.	Shahmeer
	Email	shahmeerahmed1960@gmail.com

Test ID:	VE-202311057
Test Performed Date:	14-November-2023
Test Description:	Vehicular Emission (As per NEQS)
Test Type:	Vehicular Emission(Chain Excavator-HITACHI-MOREX300-Diesel)
Test Performed By:	Envi Tech AL

Test Report

Sr.#	Parameter/Analytes Description	Unit	Result	NEQS Limits
1	Carbon Monoxide	%	0.0342	6
2	Smoke Ringlemann Scale	-	01	2
3	Noise	dB	79.3	85

Note :Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand

NEQS Limits = National Environmental Quality Standard (Reference: NEQS)

N.D. = Not Detected.

Analyzed By (Analyst) Reviewed By (Assistant Manager) Approved By (Lab Manager)

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Lab Report No: 202311058-ACC-VE

Invoice Bill No: Inv-AGC-350

Page No: 1 of 1

Reporting Date: 23-November-2023

Report to:	**M/s.**	Zahir Khan & Brothers (JV) Agha Construction Company
	Address	Khuzdar, Balochistan, Pakistan

Attention:	**Mr.**	Shahmeer
	Email	shahmeerahmed1960@gmail.com

Test ID:	VE-202311058
Test Performed Date:	14-November-2023
Test Description:	Vehicular Emission (As per NEQS)
Test Type:	Vehicular Emission(Roller-KOMATSU-5 #JV100WP-1-Diesel)
Test Performed By:	Envi Tech AL

Test Report

Sr.#	Parameter/Analytes Description	Unit	Result	NEQS Limits
1	Carbon Monoxide	%	0.0139	6
2	Smoke Ringlemann Scale	-	01	2
3	Noise	dB	81.2	85

Note: Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.

NEQS Limits = National Environmental Quality Standard (Reference: NEQS)

N.D. = Not Detected

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Lab Report No: 202311059-ACC-VE
Invoice Bill No: Inv-AGC-350

Page No: 1 of 1
Reporting Date: 23-November-2023

Report to:	M/s.	Zahir Khan & Brothers (JV) Agha Construction Company
	Address	Khuzdar, Balochistan, Pakistan

Attention:	Mr.	Shahmeer
	Email	shahmeerahmed1960@gmail.com

Test ID:	VE-202311059
Test Performed Date:	14-November-2023
Test Description:	Vehicular Emission (As per NEQS)
Test Type:	Vehicular Emission (Transit Mixer-HINO-MD# FS1FKB-Diesel)
Test Performed By:	Envi Tech AL

Test Report

Sr.#	Parameter/Analytes Description	Unit	Result	NEQS Limits
1	Carbon Monoxide	%	0.0439	6
2	Smoke Ringlemann Scale	-	01	2
3	Noise	dB	84.4	85

Note :Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.
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N.D. = Not Detected.

Analyzed By (Analyst) Reviewed By (Assistant Manager) Approved By (Lab Manager)

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Lab Report No: 202311060-ACC-VE

Invoice Bill No: Inv-AGC-350

Page No: 1 of 1

Reporting Date: 23-November-2023

Report to:	M/s.	Zahir Khan & Brothers (JV) Agha Construction Company
	Address	Khuzdar, Balochistan, Pakistan

Attention:	Mr.	Shahmeer
	Email	shahmeerahmed1960@gmail.com

Test ID:	VE-202311060
Test Performed Date:	14-November-2023
Test Description:	Vehicular Emission (As per NEQS)
Test Type:	Vehicular Emission (Transit/Mixer-HINO-MD# FS2KKB-Diesel)
Test Performed By:	Envi Tech AL

Test Report

Sr.#	Parameter/Analytes Description	Unit	Result	NEQS Limits
1	Carbon Monoxide	%	0.0426	6
2	Smoke Ringlemann Scale	-	01	2
3	Noise	dB	83.8	85

Note: Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.
NEQS Limits = National Environmental Quality Standard (Reference: NEQS)
N.D. = Not Detected

Analyzed By (Analyst)

Reviewed By (Assistant Manager)

Approved By (Lab Manager)

Disclaimer:

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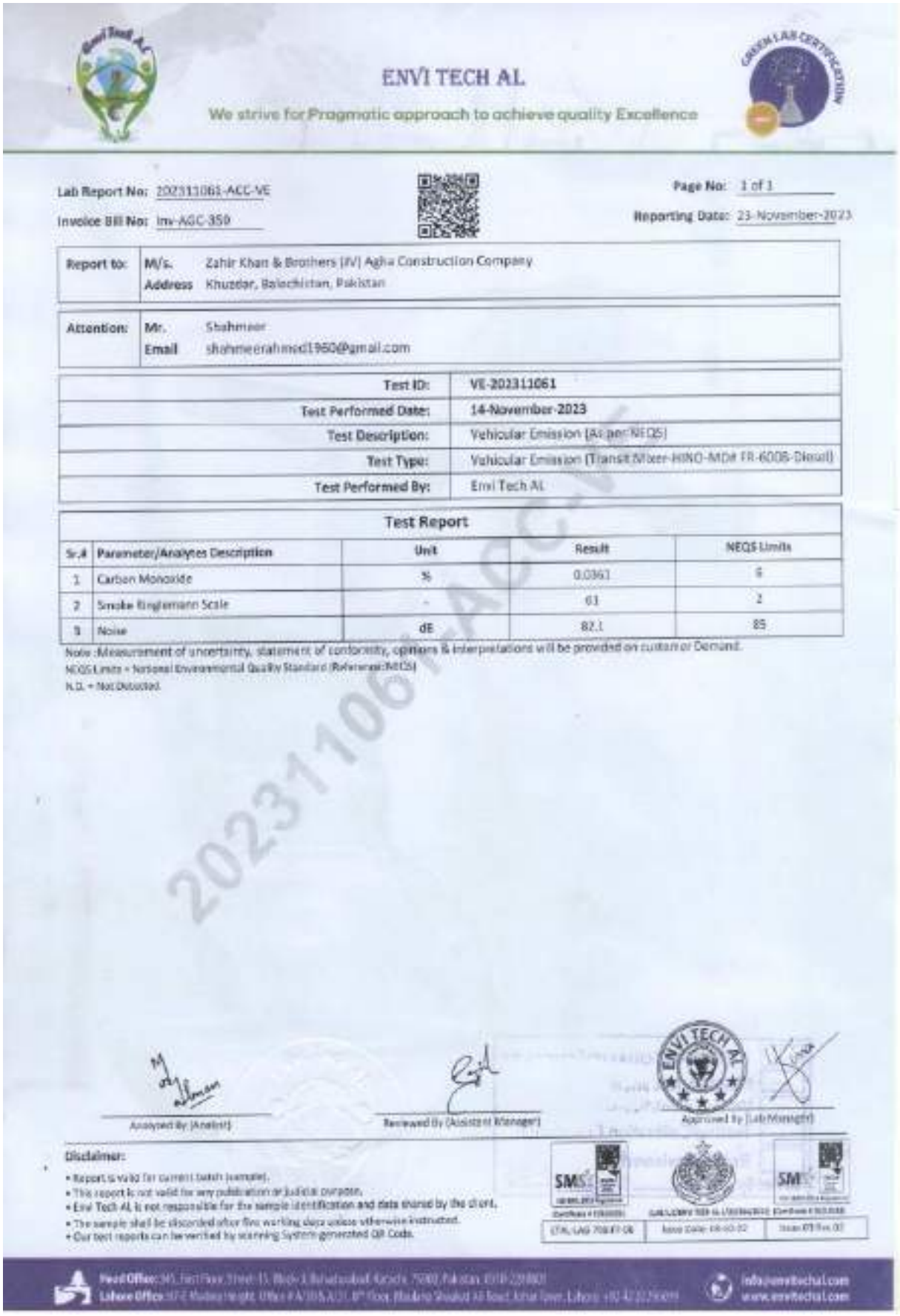

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Lab Report No: 202311061-ACC-VE

Invoice Bill No: inv-AGC-359

Page No: 1 of 1

Reporting Date: 23-November-2023

Report to:	M/s.	Zahir Khan & Brothers (JV) Agha Construction Company
	Address	Khuzdar, Balochistan, Pakistan
Attention:	Mr.	Shahmeer
	Email	shahmeerahmed1960@gmail.com

Test ID:	VE-202311061
Test Performed Date:	14-November-2023
Test Description:	Vehicular Emission (As per NEQS)
Test Type:	Vehicular Emission (Transit Mixer-HINO-MDH FR-6006-Diesel)
Test Performed By:	Envi Tech AL

Test Report

Sr.#	Parameter/Analytes Description	Unit	Result	NEQS Limits
1	Carbon Monoxide	%	0.0361	6
2	Smoke Ringlemann Scale	-	01	2
3	Noise	dE	82.1	85

Note :Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.
NEQS Limits = National Environmental Quality Standard (Reference:NEQS)
N.D. = Not Detected

Analysed By (Analyst)

Reviewed By (Assistant Manager)

Approved By (Lab Manager)

Disclaimer:

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Lab Report No: 202311062-ACC-VE

Invoice Bill No: Inv-AGC-350

Page No: 1 of 1

Reporting Date: 23-November-2023

Report to:	M/s.	Zahir Khan & Brothers (JV) Agha Construction Company
	Address	Khuzdar, Balochistan, Pakistan
Attention:	Mr.	Shahmeer
	Email	shahmeerahmed1960@gmail.com

Test ID:	VE-202311062
Test Performed Date:	14-November-2023
Test Description:	Vehicular Emission (As per NEQS)
Test Type:	Vehicular Emission(Dumper-NISSAN-MD#NIL1D604-Diesel)
Test Performed By:	Envi Tech AL

Test Report

Sr.#	Parameter/Analytes Description	Unit	Result	NEQS Limits
1	Carbon Monoxide	%	0.0469	6
2	Smoke Ringlemann Scale	-	01	2
3	Noise	dB	84.2	85

Note: Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.
NEQS Limits = National Environmental Quality Standard (Reference: NEQS)
N.D. = Not Detected.

Analyzed By (Analyst) | Reviewed By (Assistant Manager) | Approved By (Lab Manager)

Disclaimer:
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Lab Report No: 202311063-ACC-VE
Invoice Bill No: Inv-AGC-350

Page No: 1 of 1
Reporting Date: 23-November-2023

Report to:	M/s.	Zahir Khan & Brothers (JV) Agha Construction Company
	Address	Khuzdar, Balochistan, Pakistan

Attention:	Mr.	Shahmeer
	Email	shahmeerahmed1960@gmail.com

Test ID:	VE-202311063
Test Performed Date:	14-November-2023
Test Description:	Vehicular Emission (As per NEQS)
Test Type:	Vehicular Emission(Dumper-HINO-MD# TK 1921 L 30V -Diesel)
Test Performed By:	Envi Tech AL

Test Report

Sr.#	Parameter/Analytes Description	Unit	Result	NEQS Limits
1	Carbon Monoxide	%	0.0362	6
2	Smoke Ringlemann Scale	-	01	2
3	Noise	dB	81	85

Note :Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.
NEQS Limits = National Environmental Quality Standard (Reference: NEQS)
N.D. = Not Detected

Analyzed By (Analyst)   Reviewed By (Assistant Manager)   Approved By (Lab Manager)

Disclaimer:

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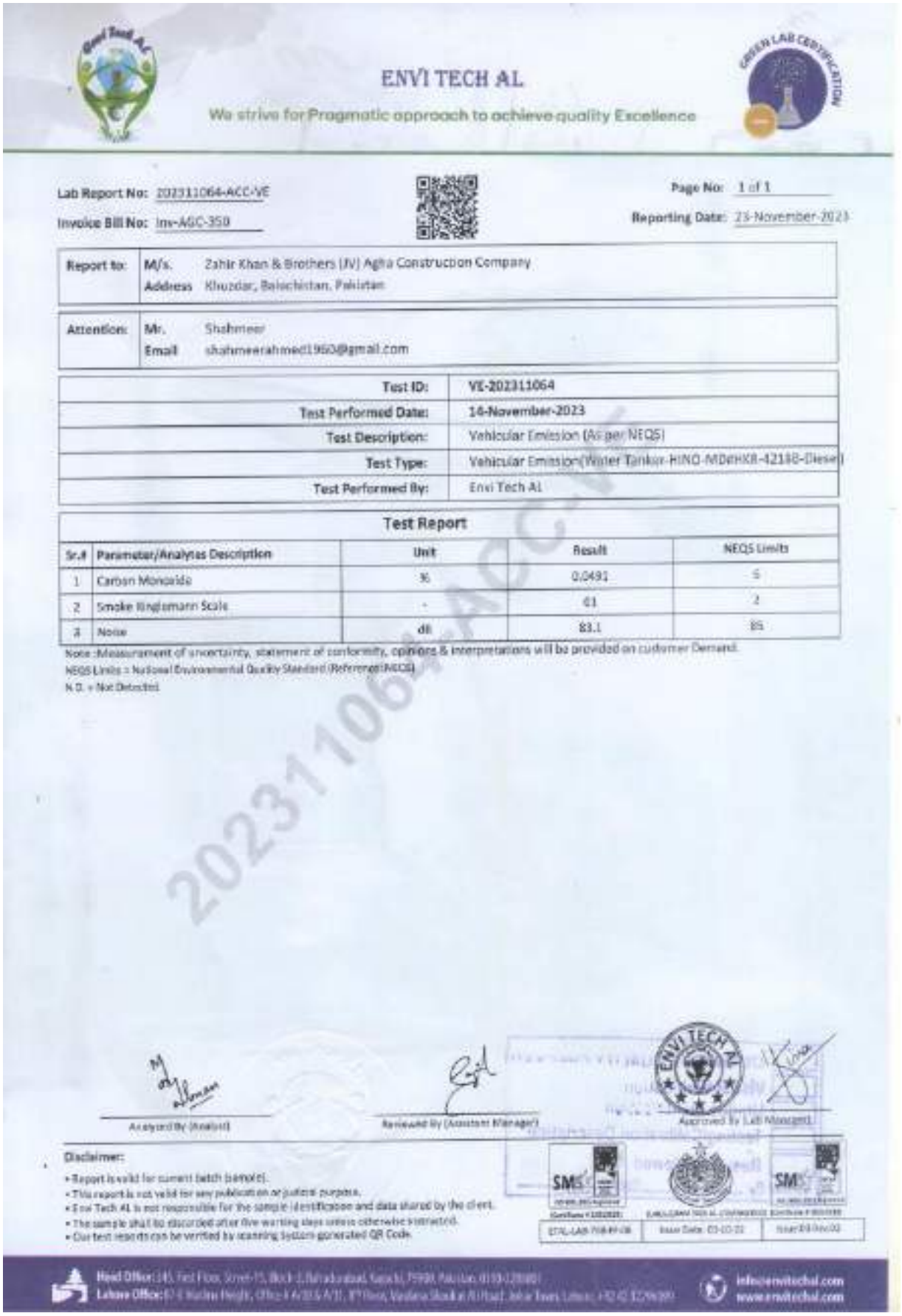

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Lab Report No: 202311064-ACC-VE

Invoice Bill No: Inv-AGC-359

Page No: 1 of 1

Reporting Date: 23-November-2023

Report to:	M/s. Zahir Khan & Brothers (JV) Agha Construction Company Address Khuzdar, Balochistan, Pakistan
Attention:	Mr. Shahmeer Email shahmeerahmed1960@gmail.com

Test ID:	VE-202311064
Test Performed Date:	16-November-2023
Test Description:	Vehicular Emission (As per NEQS)
Test Type:	Vehicular Emission(Water Tanker-HINO-MD8HXR-42188-Diesel)
Test Performed By:	Envi Tech AL

Test Report

Sr.#	Parameter/Analytes Description	Unit	Result	NEQS Limits
1	Carbon Monoxide	%	0.0491	6
2	Smoke Ringlemann Scale	-	01	2
3	Noise	dB	83.1	85

Note :Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.
NEQS Limits = National Environmental Quality Standard (Reference:NEQS)
N.D. = Not Detected

Analyzed By (Analyst)

Reviewed By (Assistant Manager)

Approved By Lab Manager

Disclaimer:

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ETAL-LAB-FM-FP-08

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Lahore Office: [illegible]

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Lab Report No: 202311065-ACC-VE

Invoice Bill No: Inv-AGC-350

Page No: 1 of 1

Reporting Date: 23-November-2023

Report to:	M/s.	Zahir Khan & Brothers (JV) Agha Construction Company
	Address	Khuzdar, Balochistan, Pakistan

Attention:	Mr.	Shahmeer
	Email	shahmeerahmed1960@gmail.com

Test ID:	VE-202311065
Test Performed Date:	14-November-2023
Test Description:	Vehicular Emission (As per NEQS)
Test Type:	Vehicular Emission(Excavator-HITACHI-MDREX100WD-Diesel)
Test Performed By:	Envi Tech AL

Test Report

Sr.#	Parameter/Analytes Description	Unit	Result	NEQS Limits
1	Carbon Monoxide	%	0.0377	6
2	Smoke Ringlemann Scale	-	01	2
3	Noise	dB	82.9	85

Note : Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.

NEQS Limits = National Environmental Quality Standard (Reference: NEQS)

N.D. = Not Detected.

Analyzed By (Analyst) Reviewed By (Assistant Manager) Approved By (Lab Manager)

Disclaimer:

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ETAL-LAB-708-FF-08 | Issue Date: 01-10-22

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Lab Report No: 202311066-ACC-VE

Invoice Bill No: Inv-AGC-350

Page No: 1 of 1

Reporting Date: 23-November-2023

Report to:	M/s.	Zahir Khan & Brothers (JV) Agha Construction Company
	Address	Khuzdar, Balochistan, Pakistan

Attention:	Mr.	Shahmeer
	Email	shahmeerahmed1960@gmail.com

Test ID:	VE-202311066
Test Performed Date:	14-November-2023
Test Description:	Vehicular Emission (As per NEQS)
Test Type:	VE (Tyre Excavator-HITACHI-MD#ROVEX-1400W-7A-Diesel)
Test Performed By:	Envi Tech AL

Test Report

Sr.#	Parameter/Analytes Description	Unit	Result	NEQS Limits
1	Carbon Monoxide	%	0.0306	6
2	Smoke Ringlemann Scale	-	01	2
3	Noise	dB	82.7	85

Note: Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.

NEQS Limits = National Environmental Quality Standard (Reference: NEQS)

N.D. = Not Detected

Analyzed By (Analyst)

Reviewed By (Assistant Manager)

Approved By (Lab Manager)

Disclaimer:

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Lab Report No: 202311067-ACC-VE
Invoice Bill No: Inv-AGC-350
Page No: 1 of 1
Reporting Date: 23-November-2023

Report to:	**M/s.**	Zahir Khan & Brothers (JV) Agha Construction Company
	Address	Khuzdar, Balochistan, Pakistan

Attention:	**Mr.**	Shahmeer
	Email	shahmeerahmed1960@gmail.com

Test ID:	**VE-202311067**
Test Performed Date:	**14-November-2023**
Test Description:	Vehicular Emission (As per NEQS)
Test Type:	Vehicular Emission (Pick up-TOYOTA-MDR/LN85R-TRKRS-Diesel)
Test Performed By:	Envi Tech AL

Test Report

Sr.#	Parameter/Analytes Description	Unit	Result	NEQS Limits
1	Carbon Monoxide	%	0.0333	6
2	Smoke Ringlemann Scale	-	01	2
3	Noise	dB	78.5	85

Note: Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.
NEQS Limits : National Environmental Quality Standard (Reference: NEQS)
N.D. = Not Detected.

Analyzed By (Analyst) | Reviewed By (Assistant Manager) | Approved By (Lab Manager)

Disclaimer

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Lab Report No: 202311068-ACC-VE
Invoice Bill No: Inv-AGC-350

Page No: 1 of 1
Reporting Date: 23-November-2023

Report to:	**M/s.**	Zahir Khan & Brothers (JV) Agha Construction Company
	Address	Khuzdar, Balochistan, Pakistan
Attention:	**Mr.**	Shahmeer
	Email	shahmeerahmed1960@gmail.com

Test ID:	VE-202311068
Test Performed Date:	14-November-2023
Test Description:	Vehicular Emission (As per NEQS)
Test Type:	Vehicular Emission (Grader KOMATSU-MD# GD-376H-Diesel)
Test Performed By:	Envi Tech AL

Test Report

Sr.#	Parameter/Analytes Description	Unit	Result	NEQS Limits
1	Carbon Monoxide	%	0.0327	6
2	Smoke Ringlemann Scale	-	01	2
3	Noise	dB	80.2	85

Note: Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.
NEQS Limits = National Environmental Quality Standard (Reference: NEQS)
N.D. = Not Detected

Analysed By (Analyst) | Reviewed By (Assistant Manager) | Approved By (Lab Manager)

Disclaimer:

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- Current reports can be verified by scanning System-generated QR Code.

Issue Date: 01-10-22

Head Office: ..., Karachi, Pakistan
Lahore Office: ... Lahore
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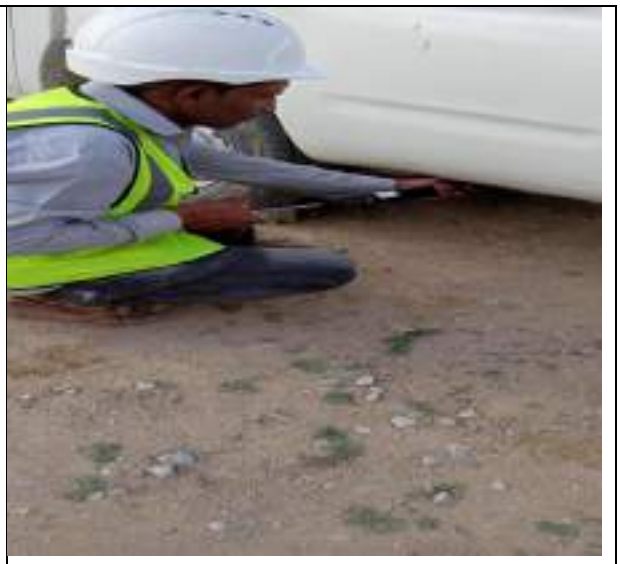
Photographic Evidences of Environmental Monitoring

Drinking water sample collection from nearby Tubewell



Vehicular emission test

Vehicular emission test

Ambient air test in Karakh camp site

Environmental Monitoring on Kharzan Hatachi during December 2023

Ambient Air Quality

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Lab Report No: 202311195-AGB-AAQ **Page No:** 1 of 1

Invoice Bill No: Inv-AGB-407 **Reporting Date:** 05-December-2023

Report to:	**M/s.**	Agha Brothers Construction Company
	Address	Khuzdar, Balochistan, Pakistan.

Attention:	**Mr.**	Waqas
	Email	aghabrotherscc799@gmail.com

Test ID:	**AAQ-202311195**
Test Performed Date:	**29-November-2023**
Test Description:	Ambient Air Quality (As per NEQS)
Test Type & Location:	Ambient Air Quality- East
Test Performed By:	Envi Tech Al

Test Report

Sr.#	Parameter/Analytes Description	Unit	Test Result	NEQS Limits
1	Temperature	°C	28	-
2	Humidity	%	49	-
3	Particulate matter (PM 1.0)	µg/m3	29	500
4	Particulate matter (PM 2.5)	µg/m3	33.5	35
5	Particulate matter (PM 10)	µg/m3	55.3	150
6	Carbon Monoxide (CO)	mg/m3	N.D.	10
7	Sulphur Dioxide (SO2)	µg/m3	N.D.	120
8	Nitrogen Dioxide (NO2)	µg/m3	N.D.	80
9	Oxygen (O2)	%	20.1	-
10	Formaldehyde	mg/m3	0.062	-
11	Total Volatile Organic Compounds (TVOC)	mg/m3	0.178	-
12	Ozone (O3)	µg/m3	N.D.	130

Note :Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.
NEQS Limits = National Environmental Quality Standard (Reference: NEQS)
N.D. = Not Detected

Analyzed By (Analyst) Reviewed By (Assistant Manager) Approved By (Lab Manager)

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Lab Report No: 202311196-AGB-AAQ

Invoice Bill No: Inv-AGB-407

Page No: 1 of 1

Reporting Date: 05-December-2023

Report to:	M/s.	Agha Brothers Construction Company
	Address	Khuzdar, Balochistan, Pakistan.

Attention:	Mr.	Waqas
	Email	aghabrotherscc799@gmail.com

Test ID:	AAQ-202311196
Test Performed Date:	29-November-2023
Test Description:	Ambient Air Quality (As per NEQS)
Test Type & Location:	Ambient Air Quality- West
Test Performed By:	Envi Tech Al

Test Report

Sr.#	Parameter/Analytes Description	Unit	Test Result	NEQS Limits
1	Temperature	°C	29	-
2	Humidity	%	46	-
3	Particulate matter (PM 1.0)	µg/m3	35	500
4	Particulate matter (PM 2.5)	µg/m3	32.3	35
5	Particulate matter (PM 10)	µg/m3	71.6	150
6	Carbon Monoxide (CO)	mg/m3	N.D.	10
7	Sulphur Dioxide (SO2)	µg/m3	N.D.	120
8	Nitrogen Dioxide (NO2)	µg/m3	N.D.	80
9	Oxygen (O2)	%	20.2	-
10	Formaldehyde	mg/m3	0.013	-
11	Total Volatile Organic Compounds (TVOC)	mg/m3	0.177	-
12	Ozone (O3)	µg/m3	N.D.	130

Note :Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.

NEQS Limits = National Environmental Quality Standard (Reference: NEQS)

N.D. = Not Detected

Analyzed By (Analyst)

Reviewed By (Assistant Manager)

Approved By (Lab Manager)

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Lab Report No: 202311197-AGB-AAQ

Invoice Bill No: Inv-AGB-407

Page No: 1 of 1

Reporting Date: 05-December-2023

Report to:	M/s.	Agha Brothers Construction Company
	Address	Khuzdar, Balochistan, Pakistan.

Attention:	Mr.	Waqas
	Email	aghabrotherscc799@gmail.com

Test ID:	AAQ-202311197
Test Performed Date:	29-November-2023
Test Description:	Ambient Air Quality (As per NEQS)
Test Type & Location:	Ambient Air Quality- North
Test Performed By:	Envi Tech Al

Test Report

Sr.#	Parameter/Analytes Description	Unit	Test Result	NEQS Limits
1	Temperature	°C	28	-
2	Humidity	%	43	-
3	Particulate matter (PM 1.0)	µg/m3	43	500
4	Particulate matter (PM 2.5)	µg/m3	28	35
5	Particulate matter (PM 10)	µg/m3	73.9	150
6	Carbon Monoxide (CO)	mg/m3	N.D.	10
7	Sulphur Dioxide (SO2)	µg/m3	N.D.	120
8	Nitrogen Dioxide (NO2)	µg/m3	N.D.	80
9	Oxygen (O2)	%	20.3	-
10	Formaldehyde	mg/m3	0.065	-
11	Total Volatile Organic Compounds (TVOC)	mg/m3	0.174	-
12	Ozone (O3)	µg/m3	N.D.	130

Note :Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.
NEQS Limits = National Environmental Quality Standard (Reference: NEQS)
N.D. = Not Detected

Analyzed By (Analyst)

Reviewed By (Assistant Manager)

Approved By (Lab Manager)

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Lab Report No: 202311198-AGB-AAQ

Invoice Bill No: Inv-AGB-407

Page No: 1 of 1

Reporting Date: 05-December-2023

Report to:	M/s.	Agha Brothers Construction Company
	Address	Khuzdar, Balochistan, Pakistan.

Attention:	Mr.	Waqas
	Email	aghabrotherscc799@gmail.com

Test ID:	AAQ-202311198
Test Performed Date:	29-November-2023
Test Description:	Ambient Air Quality (As per NEQS)
Test Type & Location:	Ambient Air Quality- South
Test Performed By:	Envi Tech Al

Test Report

Sr.#	Parameter/Analytes Description	Unit	Test Result	NEQS Limits
1	Temperature	°C	28.6	-
2	Humidity	%	46	-
3	Particulate matter (PM 1.0)	µg/m3	44	500
4	Particulate matter (PM 2.5)	µg/m3	34.1	35
5	Particulate matter (PM 10)	µg/m3	57.3	150
6	Carbon Monoxide (CO)	mg/m3	N.D.	10
7	Sulphur Dioxide (SO2)	µg/m3	N.D.	120
8	Nitrogen Dioxide (NO2)	µg/m3	N.D.	80
9	Oxygen (O2)	%	20.1	-
10	Formaldehyde	mg/m3	0.026	-
11	Total Volatile Organic Compounds (TVOC)	mg/m3	0.178	-
12	Ozone (O3)	µg/m3	N.D.	130

Note :Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.

NEQS Limits = National Environmental Quality Standard (Reference: NEQS)

N.D. = Not Detected

Analyzed By (Analyst)

Reviewed By (Assistant Manager)

Approved By (Lab Manager)

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Noise Analysis Test Results

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Lab Report No: 202311199-AGB-NA

Invoice Bill No: Inv-AGB-407

Page No: 1 of 1

Reporting Date: 05-December-2023

Report to:	**M/s.**	Agha Brothers Construction Company
	Address	Khuzdar, Balochistan, Pakistan.

Attention:	**Mr.**	Waqas
	Email	aghabrotherscc799@gmail.com

Test ID:	**NA-202311199**
Test Performed Date:	**29-November-2023**
Test Type:	Noise Analysis
Test Performed By:	Envi Tech AL
Test Description:	Noise Analysis as per NEQS

Test Report

Sr.#	Locations	Methods	Unit	Result	NEQS Limits
1	East	ASTM E1686-16	dB	73.4	75
2	West	ASTM E1686-16	dB	67.6	75
3	North	ASTM E1686-16	dB	74.3	75
4	South	ASTM E1686-16	dB	73.1	75
5	Center Point	ASTM E1686-16	dB	72.1	75

Note : Measurement of uncertainty,statement of conformity, opinions & interpretations will be provided on customer Demand.
NEQS Limits = National Environmental Quality Standard (Reference: NEQS)
N.D. - Not Detected.

Analyzed By (Analyst) | Reviewed By (Assistant Manager) | Approved By (Lab Manager)

Disclaimer:
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ETAL-LAB-708-FF-10	Issue Date: 03-10-22	Issue:03 Rev:02

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Gaseous Emission from generators test results

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Lab Report No: 202311168-AGB-GAE

Invoice Bill No: Inv-AGB-407

Page No: 1 of 1

Reporting Date: 05-December-2023

Report to:	M/s.	Agha Brothers Construction Company
	Address	Khuzdar, Balochistan, Pakistan.

Attention:	Mr.	Waqas
	Email	aghabrotherscc799@gmail.com

Test ID:	GAE-202311168
Test Performed Date:	29-November-2023
Test Type:	GAE (GEN-EXCELLENT 25 ES -5630519-25 KVA-Diesel)
Test Performed By:	Envi Tech AL
Test Description:	Gaseous Emission (As per NEQS)
Fuel Types:	oil_fired

Test Report

Sr.#	Parameter/Analytes Description	Unit	Test Result	NEQS Limits
1	Smoke, Ringlemann Scale	-	01	2
2	Particulate matter	mg/Nm3	49	300
3	Carbon Monoxide (CO)	mg/Nm3	196	800
4	Nitrogen Dioxide (NO2)	mg/Nm3	116	-
5	Nitrogen Oxide (NO)	mg/Nm3	297	-
6	NOx	mg/Nm3	413	600
7	Oxygen (O2)	%	12.4	-
8	Hydrogen Sulfide(H2S)	mg/Nm3	02	10
9	Sulphur Dioxide (SO2)	mg/Nm3	245	1700
10	Carbon dioxide (CO2)	%	2.88	-
11	Hydrocarbon	%	N.D.	-
12	Noise	dB	79.5	-

Note : Measurement of uncertainty, statement of conformity, opinions & Interpretations will be provided on customer Demand.
NEQS Limits = National Environmental Quality Standard (Reference: NEQS)
1=NEQS for Municipal & Liquid Industrial Effluent into inland waters.
2= NEQS for Municipal & Liquid Industrial Effluent into Sewage Treatment.
N.D. = Not Detected.

Analyzed By (Analyst)

Reviewed By (Assistant Manager)

ENVI TECH AL

Approved By (Lab Manager)

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Lab Report No: 202311169-AGB-GAE

Page No: 1 of 1

Invoice Bill No: Inv-AGB-407

Reporting Date: 05-December-2023

Report to:	M/s.	Agha Brothers Construction Company
	Address	Khuzdar, Balochistan, Pakistan.

Attention:	Mr.	Waqas
	Email	aghabrotherscc799@gmail.com

Test ID:	GAE-202311169
Test Performed Date:	29-November-2023
Test Type:	GAE (GEN - CUMMINS ONON-350 KVA-Diesel)
Test Performed By:	Envi Tech AL
Test Description:	Gaseous Emission (As per NEQS)
Fuel Types:	oil_fired

Test Report

Sr.#	Parameter/Analytes Description	Unit	Test Result	NEQS Limits
1	Smoke, Ringlemann Scale	-	01	2
2	Particulate matter	mg/Nm3	84	300
3	Carbon Monoxide (CO)	mg/Nm3	364	800
4	Nitrogen Dioxide (NO2)	mg/Nm3	. 132	-
5	Nitrogen Oxide (NO)	mg/Nm3	326	-
6	NOx	mg/Nm3	458	600
7	Oxygen (O2)	%	12.8	-
8	Hydrogen Sulfide(H2S)	mg/Nm3	06	10
9	Sulphur Dioxide (SO2)	mg/Nm3	343	1700
10	Carbon dioxide (CO2)	%	3.64	-
11	Hydrocarbon	%	N.D.	-
12	Noise	dB	84.7	-

Note : Measurement of uncertainty, statement of conformity, opinions & Interpretations will be provided on customer Demand.

NEQS Limits = National Environmental Quality Standard (Reference: NEQS)

N.D. = Not Detected.

Analyzed By (Analyst)

Reviewed By (Assistant Manager)

Approved By (Lab Manager)

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Lab Report No: 202311170-AGB-GAE **Page No:** 1 of 1

Invoice Bill No: Inv-AGB-407 **Reporting Date:** 05-December-2023

Report to:	**M/s.** Agha Brothers Construction Company **Address** Khuzdar, Balochistan, Pakistan.
Attention:	**Mr.** Waqas **Email** aghabrotherscc799@gmail.com

Test ID:	**GAE-202311170**
Test Performed Date:	**29-November-2023**
Test Type:	GAE (GEN - CUMMINS ONON-300 KVA-Diesel)
Test Performed By:	Envi Tech AL
Test Description:	Gaseous Emission (As per NEQS)
Fuel Types:	oil_fired

Test Report

Sr.#	Parameter/Analytes Description	Unit	Test Result	NEQS Limits
1	Smoke, Ringlemann Scale	-	01	2
2	Particulate matter	mg/Nm3	73	300
3	Carbon Monoxide (CO)	mg/Nm3	406	800
4	Nitrogen Dioxide (NO2)	mg/Nm3	122	-
5	Nitrogen Oxide (NO)	mg/Nm3	390	-
6	NOx	mg/Nm3	512	600
7	Oxygen (O2)	%	12.3	-
8	Hydrogen Sulfide(H2S)	mg/Nm3	05	10
9	Sulphur Dioxide (SO2)	mg/Nm3	352	1700
10	Carbon dioxide (CO2)	%	3.61	-
11	Hydrocarbon	%	N.D.	-
12	Noise	dB	79.5	-

Note : Measurement of uncertainty, statement of conformity, opinions & Interpretations will be provided on customer Demand.
NEQS Limits = National Environmental Quality Standard (Reference: NEQS)
N.D. = Not Detected.

Analyzed By (Analyst) Reviewed By (Assistant Manager) Approved By (Lab Manager)

Disclaimer:
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ETAL-LAB-708-FF-05	Issue Date: 09-10-22	Issue:03 Rev:02

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Drinking water test results (Camp site)

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GREEN LAB CERTIFICATION

Lab Report No: 202311167-AGB-DW **Page No:** 1 of 1

Invoice Bill No: Inv-AGB-407 **Reporting Date:** 05-December-2023

Report to:	**M/s.** Agha Brothers Construction Company **Address** Khuzdar, Balochistan, Pakistan.

Attention:	**Mr.** Waqas **Email** aghabrothersc799@gmail.com

Sample ID:	**DW-202311167**
Sample Collection Date:	**29-November-2023**
Sample Description:	**Drinking Water (Camp Area)**
Sample Type:	Liquid Sample
Sample Collected / Submitted By:	Envi Tech AL
Date Of Analysis:	30-November-2023 to 05-December-2023
Test Description:	Drinking-Water-test as per NEQS

Analytical Test Report

Sr.#	Parameter/Analytes Description	Methods	Unit	Test Result	NEQS Limits
1	pH @ 25°C	*APHA 4500 H	-	7.75	6.5 - 8.5
2	Total Dissolved Solids (TDS)	*APHA 2540-C	mg/L	406	<1000
3	Total Hardness as CaCO3	ASTM D 1126	mg/L	324	< 500
4	Color	HACH 8025	TCU	01	≤ 15
5	Turbidity	*APHA 2130	NTU	<1	≤ 5
6	Nitrite	HACH 8507	mg/L	0.007	≤ 3
7	Nitrate (NO3)	HACH 8039	mg/L	0.5	≤ 50
8	Taste	*APHA 2160	-	Tasteless	Non-Objectionable
9	Odor	*APHA 2150	-	Odorless	Non-Objectionable
10	Chloride (Cl)	*APHA 4500 Cl	mg/L	73.97	≤ 250
11	Fluoride (F)	HACH 8029	mg/L	0.52	≤ 1.5
12	Aluminum (Al)	*APHA 3111-D	mg/L	N.D.	≤ 0.2
13	Nickel (Ni)	*APHA 3111-B	mg/L	N.D.	≤ 0.02
14	Lead (Pb)	*APHA 3111-B	mg/L	N.D.	≤ 0.05
15	Barium (Ba)	HACH 8014	mg/L	N.D.	0.7
16	Antimony (Sb)	*APHA 3111-B	mg/L	N.D.	≤ 0.005
17	Arsenic (As)	*APHA 3114-B	mg/L	N.D.	≤ 0.05
18	Boron (B)	HACH 8015	mg/L	N.D.	0.3
19	Cadmium (Cd)	*APHA 3111-B	mg/L	N.D.	0.01
20	Chromium (Cr)	*APHA 3111-B	mg/L	N.D.	≤ 0.05
21	Selenium (Se)	*APHA 3114-B	mg/L	N.D.	0.01
22	Copper (Cu)	*APHA 3111-B	mg/L	N.D.	2
23	Cyanide (CN)	HACH 8027	mg/L	N.D.	≤ 0.05

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GREEN LAB CERTIFICATION

Lab Report No: 202311167-AGB-DW

Invoice Bill No: Inv-AGB-407

Page No: 1 of 2

Reporting Date: 05-December-2023

Report to:	M/s. Agha Brothers Construction Company Address Khuzdar, Balochistan, Pakistan.
Attention:	Mr. Waqas Email aghabrotherscc799@gmail.com

Sample ID:	DW-202311167
Sample Collection Date:	29-November-2023
Sample Description:	Drinking Water (Camp Area)
Sample Type:	Liquid Sample
Sample Collected / Submitted By:	Envi Tech AL
Date Of Analysis:	30-November-2023 to 05-December-2023
Test Description:	Drinking-Water-test as per NEQS

Analytical Test Report

Sr.#	Parameter/Analytes Description	Methods	Unit	Test Result	NEQS Limits
24	Mercury (Hg)	*APHA 3112-B	mg/L	N.D.	≤ 0.001
25	Manganese (Mn)	*APHA 3111-B	mg/L	N.D.	≤ 0.5
26	Zinc (Zn)	*APHA 3111-B	mg/L	N.D.	≤ 5.0
27	Residual Chlorine	HACH 10069	mg/L	N.D.	0.2 - 0.5
28	Phenolic Compounds as Phenols	ASTM-D-1783	mg/L	N.D.	-
29	Fecal Coliform	USEPA 1604	CFU/100 ml	N.D.	0 CFU/100 ml
30	Total Coliform	*APHA 922 B	CFU/100 ml	N.D.	0 CFU/100 ml
31	E-Coli	USEPA 1604	CFU/100 ml	N.D.	0 CFU/100 ml
32	Total Bacterial Count	USEPA 1604	CFU/100ml	N.D.	-

Note :Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand. Environmental Conditions at the time of Testing; Temperature: 24.7 °C (±1°C) & Humidity: 44 % (± 5%).

*APHA Standard Methods for Examination of water & wastewater 23rd Edition (2017).

HACH 8025 (HACH Edition 10, 2014), HACH 8027 (HACH Edition 09, 2014),HACH 10069 (HACH Edition 11, 2014), HACH 8029 (HACH Edition 10, 2018), HACH 8015 (HACH Edition 08, 2014), HACH 8507 (HACH Edition 11, 2019), HACH 8039 (HACH Edition 10, 2019).

NEQS Limits = National Environmental Quality Standard (Reference: NEQS)

N.D. = Not Detected.

Analyzed By (Analyst)

Reviewed By (Assistant Manager)

ENVI TECH AL

Approved By (Lab Manager)

Disclaimer:

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ETAL-LAB-708-FF-02	Issue Date: 03-10-22	Issue No 05 Rev02

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Drinking water test results (Construction site)

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Lab Report No: 202311166-AGB-DW

Invoice Bill No: Inv-AGB-407

Page No: 1 of 1

Reporting Date: 05-December-2023

Report to:	M/s. Agha Brothers Construction Company Address Khuzdar, Balochistan, Pakistan.
Attention:	Mr. Waqas Email aghabrotherscc799@gmail.com

Sample ID:	DW-202311166
Sample Collection Date:	29-November-2023
Sample Description:	Drinking Water (SITE Area)
Sample Type:	Liquid Sample
Sample Collected / Submitted By:	Envi Tech AL
Date Of Analysis:	30-November-2023 to 05-December-2023
Test Description:	Drinking-Water-test as per NEQS

Analytical Test Report

Sr.#	Parameter/Analytes Description	Methods	Unit	Test Result	NEQS Limits
1	pH @ 25°C	*APHA 4500 H	-	8.14	6.5 - 8.5
2	Total Dissolved Solids (TDS)	*APHA 2540-C	mg/L	344	<1000
3	Total Hardness as CaCO3	ASTM D 1126	mg/L	260	< 500
4	Color	HACH 8025	TCU	01	≤ 15
5	Turbidity	*APHA 2130	NTU	<1	≤ 5
6	Nitrite	HACH 8507	mg/L	0.006	≤ 3
7	Nitrate (NO3)	HACH 8039	mg/L	0.4	≤ 50
8	Taste	*APHA 2160	-	Tasteless	Non-Objectionable
9	Odor	*APHA 2150	-	Odorless	Non-Objectionable
10	Chloride (Cl)	*APHA 4500 Cl	mg/L	81.97	≤ 250
11	Fluoride (F)	HACH 8029	mg/L	0.41	≤ 1.5
12	Aluminum (Al)	*APHA 3111-D	mg/L	N.D.	≤ 0.2
13	Nickel (Ni)	*APHA 3111-B	mg/L	N.D.	≤ 0.02
14	Lead (Pb)	*APHA 3111-B	mg/L	N.D.	≤ 0.05
15	Barium (Ba)	HACH 8014	mg/L	N.D.	0.7
16	Antimony (Sb)	*APHA 3111-B	mg/L	N.D.	≤ 0.005
17	Arsenic (As)	*APHA 3114-B	mg/L	N.D.	≤ 0.05
18	Boron (B)	HACH 8015	mg/L	N.D.	0.3
19	Cadmium (Cd)	*APHA 3111-B	mg/L	N.D.	0.01
20	Chromium (Cr)	*APHA 3111-B	mg/L	N.D.	≤ 0.05
21	Selenium (Se)	*APHA 3114-B	mg/L	N.D.	0.01
22	Copper (Cu)	*APHA 3111-B	mg/L	N.D.	2
23	Cyanide (CN)	HACH 8027	mg/L	N.D.	≤ 0.05

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Lab Report No: 202311166-AGB-DW **Page No:** 1 of 2

Invoice Bill No: Inv-AGB-407 **Reporting Date:** 05-December-2023

Report to:	**M/s.** Agha Brothers Construction Company **Address** Khuzdar, Balochistan, Pakistan.
Attention:	**Mr.** Waqas **Email** aghabrotherscc799@gmail.com

Sample ID:	**DW-202311166**
Sample Collection Date:	**29-November-2023**
Sample Description:	**Drinking Water (SITE Area)**
Sample Type:	Liquid Sample
Sample Collected / Submitted By:	Envi Tech AL
Date Of Analysis:	30-November-2023 to 05-December-2023
Test Description:	Drinking-Water-test as per NEQS

Analytical Test Report

Sr.#	Parameter/Analytes Description	Methods	Unit	Test Result	NEQS Limits
24	Mercury (Hg)	*APHA 3112-B	mg/L	N.D.	≤ 0.001
25	Manganese (Mn)	*APHA 3111-B	mg/L	N.D.	≤ 0.5
26	Zinc (Zn)	*APHA 3111-B	mg/L	N.D.	≤ 5.0
27	Residual Chlorine	HACH 10069	mg/L	N.D.	0.2 - 0.5
28	Phenolic Compounds as Phenols	ASTM-D-1783	mg/L	N.D.	-
29	Fecal Coliform	USEPA 1604	CFU/100 ml	N.D.	0 CFU/100 ml
30	Total Coliform	*APHA 922 B	CFU/100 ml	N.D.	0 CFU/100 ml
31	E-Coli	USEPA 1604	CFU/100 ml	N.D.	0 CFU/100 ml
32	Total Bacterial Count	USEPA 1604	CFU/100ml	N.D.	-

Note :Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand. Environmental Conditions at the time of Testing; Temperature: 24.7 °C (±1°C) & Humidity: 44 % (± 5%).

*APHA Standard Methods for Examination of water & wastewater 23rd Edition (2017).

HACH 8025 (HACH Edition 10, 2014), HACH 8027 (HACH Edition 09, 2014),HACH 10069 (HACH Edition 11, 2014), HACH 8029 (HACH Edition 10, 2018), HACH 8015 (HACH Edition 08, 2014), HACH 8507 (HACH Edition 11, 2019), HACH 8099 (HACH Edition 10, 2019).

NEQS Limits = National Environmental Quality Standard (Reference: NEQS)

N.D. = Not Detected.

Analyzed By (Analyst) Reviewed By (Assistant Manager) Approved By (Lab Manager)

Disclaimer:

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ETAL-LAB-708-FF-02	Issue Date: 03-10-22	Issue No 03 Rev.02

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Waste water test results

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Lab Report No: 202311165-AGB-WW

Invoice Bill No: Inv-AGB-407

Page No: 1 of 1

Reporting Date: 05-December-2023

Report to:	**M/s.**	Agha Brothers Construction Company
	Address	Khuzdar, Balochistan, Pakistan.

Attention:	**Mr.**	Waqas
	Email	aghabrotherscc799@gmail.com

Sample ID:	**WW-202311165**
Sample Collection Date:	**29-November-2023**
Sampling Method:	APHA - 1060 B & C
Sample Description:	Waste water
Sample Type:	Liquid - Sample
Sample Collected By:	Envi Tech Al
Date Of Analysis:	30-November-2023 to 05-December-2023
Test Description:	Wastewater Testing as per NEQS

Analytical Test Report

Sr.#	Parameter/Analytes Description	Methods	Unit	Test Results	NEQS 1	NEQS 2	NEQS 3
1	Temperature 40°C	*APHA 2550	°C	31	≤ 3C	≤ 3C	-
2	pH	APHA 4500 H-B	-	6.62	6-9	6-9	-
3	Sulphide	*APHA 4500-S2-D	mg/L	<1	1	1	-
4	Biological Oxygen Demand(BOD)5	HACH 10099	mg/L	69	80	250	-
5	Chemical Oxygen Demand(COD)	*HACH 8000	mg/L	137	150	400	-
6	Total Dissolved Solids (TDS)	*APHA 2540-C	mg/L	660	3500	3500	-
7	Total Suspended Solids (TSS)	*APHA 2540-D	mg/L	184	200	400	-
8	Oil & Grease	USEPA 1664	mg/L	03	10	10	-
9	Cadmium	*APHA 3111-B	mg/L	0.0081	0.1	0.1	-
10	Copper	*APHA 3111-B	mg/L	0.0119	1	1	-
11	Iron	*APHA 3111-B	mg/L	0.0116	8	8	-
12	Lead	*APHA 3111-B	mg/L	N.D.	0.5	0.5	-
13	Manganese	*APHA 3111-B	mg/L	N.D.	1.5	1.5	-
14	Mercury	*APHA 3112-B	mg/L	N.D.	0.01	0.01	-
15	Nickel	*APHA 3111-B	mg/L	N.D.	1	1	-
16	Selenium	*APHA 3114-B	mg/L	N.D.	0.5	0.5	-
17	Chromium	*APHA 3111-B	mg/L	0.0316	1	1	-
18	Zinc	*APHA 3111-B	mg/L	N.D.	5	5	-
19	Arsenic	*APHA 3114-B	mg/L	N.D.	1	1	-
20	Chlorine	HACH 10069	mg/L	N.D.	1	1	-
21	Chloride	*APHA 4500 CL-B	mg/L	419.86	1000	1000	-
22	Cyanide	HACH 8027	mg/L	0.004	1	1	-
23	Fluoride	*HACH 8029	mg/L	0.52	10	10	-

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Lab Report No: 202311165-AGB-WW

Page No: 1 of 2

Invoice Bill No: Inv-AGB-407

Reporting Date: 05-December-2023

Report to:	M/s.	Agha Brothers Construction Company
	Address	Khuzdar, Balochistan, Pakistan.

Attention:	Mr.	Waqas
	Email	aghabrotherscc799@gmail.com

Sample ID:	WW-202311165 –
Sample Collection Date:	29-November-2023
Sampling Method:	APHA - 1060 B & C
Sample Description:	Waste water
Sample Type:	Liquid - Sample
Sample Collected By:	Envi Tech Al
Date Of Analysis:	30-November-2023 to 05-December-2023
Test Description:	Wastewater Testing as per NEQS

Analytical Test Report

Sr.#	Parameter/Analytes Description	Methods	Unit	Test Results	NEQS 1	NEQS 2	NEQS 3
24	Ammonia	*HACH 8038	mg/L	0.61	40	40	-
25	Sulphate	HACH 8051	mg/L	84	600	1000	-
26	An Ionic Detergent As MBAs	*APHA 5540 C	mg/L	02	20	20	-
27	Phenolic Compounds(as Phenol)	HACH 8047	mg/L	N.D.	0.1	0.3	-
28	Boron	HACH 8015	mg/L	N.D.	6	6	-
29	Barium	HACH 8014	mg/L	N.D.	1.5	1.5	-
30	Silver	*APHA 3111-B	mg/L	N.D.	1	1	-

Note :Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand. Environmental Conditions at the time of Testing; Temperature: 24.7 °C (± 1°C) & Humidity: 43 % (± 5%).

*APHA Standard Methods for Examination of water & wastewater 23rd Edition (2017).

HACH 8000 (HACH Edition 13, 2021), HACH 8051 (HACH Edition 11, 2019), HACH 10099 (HACH Edition 2, 2015), HACH 8027 (HACH Edition 09, 2014), HACH 10069 (HACH Edition 11, 2014), HACH 8029 (HACH Edition 10, 2018), HACH 8038 (HACH Edition 9, 2017), HACH 8014 (HACH Edition 09, 2014),HACH 8015 (HACH Edition 08, 2014).

NEQS Limits = National Environmental Quality Standard (Reference: NEQS).

1=NEQS for Municipal & Liquid Industrial Effluent into Inland waters.

2= NEQS for Municipal & Liquid Industrial Effluent into Sewage Treatment.

N.D. = Not Detected.

Analyzed By (Analyst) | Reviewed By (Assistant Manager) | Approved By (Lab Manager)

Disclaimer:

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ETAL-LAB-708-FF-01	Issue Date: 03-10-22	Issue:03 Rev:02

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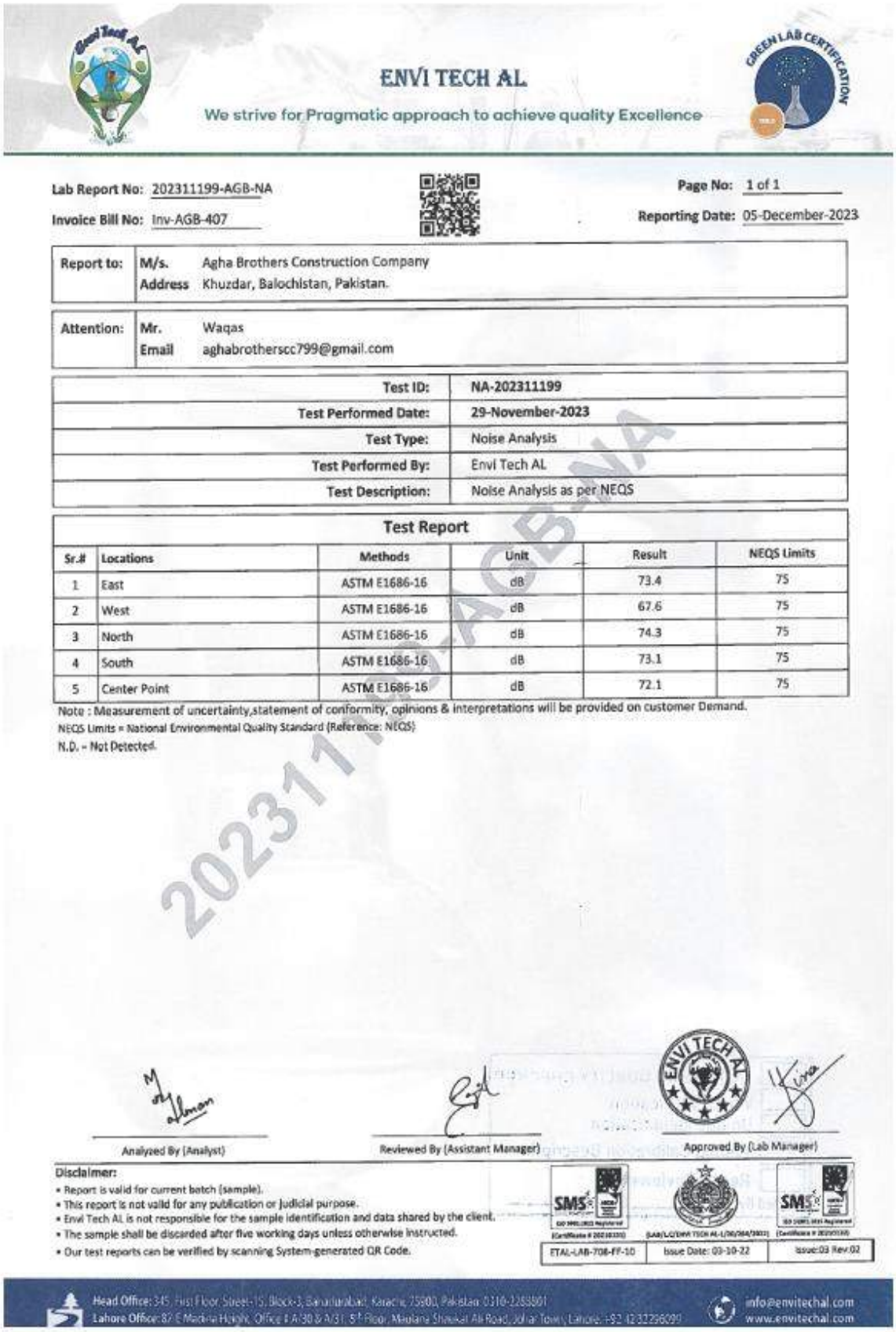
Noise Level test results



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GREEN LAB CERTIFICATION

Lab Report No: 202311199-AGB-NA

Page No: 1 of 1

Invoice Bill No: Inv-AGB-407

Reporting Date: 05-December-2023

Report to:	M/s.	Agha Brothers Construction Company
	Address	Khuzdar, Balochistan, Pakistan.
Attention:	Mr.	Waqas
	Email	aghabrotherscc799@gmail.com

Test ID:	NA-202311199
Test Performed Date:	29-November-2023
Test Type:	Noise Analysis
Test Performed By:	Envi Tech AL
Test Description:	Noise Analysis as per NEQS

Test Report

Sr.#	Locations	Methods	Unit	Result	NEQS Limits
1	East	ASTM E1686-16	dB	73.4	75
2	West	ASTM E1686-16	dB	67.6	75
3	North	ASTM E1686-16	dB	74.3	75
4	South	ASTM E1686-16	dB	73.1	75
5	Center Point	ASTM E1686-16	dB	72.1	75

Note : Measurement of uncertainty,statement of conformity, opinions & interpretations will be provided on customer Demand.
NEQS Limits = National Environmental Quality Standard (Reference: NEQS)
N.D. = Not Detected.

Analyzed By (Analyst)

Reviewed By (Assistant Manager)

Approved By (Lab Manager)

Disclaimer:
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ETAL-LAB-708-FF-10 | Issue Date: 03-10-22 | Issue:03 Rev:02

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Vehicular emission test results

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Lab Report No: 202311185-AGB-VE
Page No: 1 of 1
Invoice Bill No: Inv-AGB-407
Reporting Date: 05-December-2023

Report to:	**M/s.**	Agha Brothers Construction Company
	Address	Khuzdar, Balochistan, Pakistan.

Attention:	**Mr.**	Waqas
	Email	aghabrotherscc799@gmail.com

Test ID:	**VE-202311185**
Test Performed Date:	**29-November-2023**
Test Description:	Vehicular Emission (As per NEQS)
Test Type:	VE (Bulldozer-CAT-MD # DBK- S.# 77V-18090-Diesel)
Test Performed By:	Envi Tech AL

Test Report

Sr.#	Parameter/Analytes Description	Unit	Result	NEQS Limits
1	Carbon Monoxide	%	0.0223	6
2	Smoke Ringlemann Scale	-	01	2
3	Noise	dB	83.6	85

Note :Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.
NEQS Limits = National Environmental Quality Standard (Reference: NEQS)
N.D. = Not Detected.

Analyzed By (Analyst) | Reviewed By (Assistant Manager) | Approved By (Lab Manager)

Disclaimer:

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ETAL-LAB-708-FF-06	Issue Date: 03-10-22	Issue:03 Rev:02

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GREEN LAB CERTIFICATION

Lab Report No: 202311173-AGB-VE

Invoice Bill No: Inv-AGB-407

Page No: 1 of 1

Reporting Date: 05-December-2023

Report to:	M/s.	Agha Brothers Construction Company
	Address	Khuzdar, Balochistan, Pakistan.

Attention:	Mr.	Waqas
	Email	aghabrotherscc799@gmail.com

Test ID:	VE-202311173
Test Performed Date:	29-November-2023
Test Description:	Vehicular Emission (As per NEQS)
Test Type:	VE (Dumper-HINO-MD# FR1-K2H-S.# 12928-Diesel)
Test Performed By:	Envi Tech AL

Test Report

Sr.#	Parameter/Analytes Description	Unit	Result	NEQS Limits
1	Carbon Monoxide	%	0.0459	6
2	Smoke Ringlemann Scale	-	N.D.	2
3	Noise	dB	84	85

Note :Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.
NEQS Limits = National Environmental Quality Standard (Reference: NEQS)
N.D. = Not Detected.

Analyzed By (Analyst) Reviewed By (Assistant Manager) Approved By (Lab Manager)

ENVI TECH AL

Disclaimer:

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- This report is not valid for any publication or judicial purpose.
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- Our test reports can be verified by scanning System-generated QR Code.

ETAL-LAB-708-FF-06	Issue Date: 03-10-22	Issue:03 Rev:02

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GREEN LAB CERTIFICATION

Lab Report No: 202311174-AGB-VE

Page No: 1 of 1

Invoice Bill No: Inv-AGB-407

Reporting Date: 05-December-2023

Report to:	M/s.	Agha Brothers Construction Company
	Address	Khuzdar, Balochistan, Pakistan.

Attention:	Mr.	Waqas
	Email	aghabrotherscc799@gmail.com

Test ID:	VE-202311174
Test Performed Date:	29-November-2023
Test Description:	Vehicular Emission (As per NEQS)
Test Type:	VE (Dumper-HINO-MD# FR1-KXH-S.# 10896-Diesel)
Test Performed By:	Envi Tech AL

Test Report

Sr.#	Parameter/Analytes Description	Unit	Result	NEQS Limits
1	Carbon Monoxide	%	0.0287	6
2	Smoke Ringlemann Scale	-	N.D.	2
3	Noise	dB	84.6	85

Note :Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.
NEQS Limits = National Environmental Quality Standard (Reference: NEQS)
N.D. = Not Detected.

Analyzed By (Analyst)

Reviewed By (Assistant Manager)

Approved By (Lab Manager)

Disclaimer:

- Report is valid for current batch (sample).
- This report is not valid for any publication or judicial purpose.
- Envi Tech AL is not responsible for the sample identification and data shared by the client.
- The sample shall be discarded after five working days unless otherwise instructed.
- Our test reports can be verified by scanning System-generated QR Code.

ETAL-LAB-708-FF-06	Issue Date: 03-10-22	Issue:03 Rev:02

Head Office: 34-5, First Floor Street-15, Block-3, Bahadurabad, Karachi-75900, Pakistan. 0310-2288801

Lahore Office: 82-E Madina Height, Office # A/30 & A/31, 3rd Floor, Maulana Shaukat Ali Road, Johar Town, Lahore. +92-42-37296099

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Lab Report No: 202311175-AGB-VE
Page No: 1 of 1
Invoice Bill No: Inv-AGB-407
Reporting Date: 05-December-2023

Report to:	**M/s.**	Agha Brothers Construction Company
	Address	Khuzdar, Balochistan, Pakistan.

Attention:	**Mr.**	Waqas
	Email	aghabrotherscc799@gmail.com

Test ID:	**VE-202311175**
Test Performed Date:	**29-November-2023**
Test Description:	Vehicular Emission (As per NEQS)
Test Type:	VE (Dumper-MD# FS1-FKC-S.# 10294-Diesel)
Test Performed By:	Envi Tech AL

Test Report

Sr.#	Parameter/Analytes Description	Unit	Result	NEQS Limits
1	Carbon Monoxide	%	0.0247	6
2	Smoke Ringlemann Scale	-	N.D.	2
3	Noise	dB	84.1	85

Note :Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.
NEQS Limits = National Environmental Quality Standard (Reference: NEQS)
N.D. = Not Detected.

Analyzed By (Analyst) | Reviewed By (Assistant Manager) | Approved By (Lab Manager)

Disclaimer:

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ETAL-LAB-708-FF-06 | Issue Date: 03-10-22 | Issue:03 Rev:02

Head Office: 345, First Floor, Street-15, Block-3, Gulistan-e-Jauhar, Karachi, 75300, Pakistan. 0310-2788801
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GREEN LAB CERTIFICATION

Lab Report No: 202311176-AGB-VE
Invoice Bill No: Inv-AGB-407
Page No: 1 of 1
Reporting Date: 05-December-2023

Report to:	**M/s.**	Agha Brothers Construction Company
	Address	Khuzdar, Balochistan, Pakistan.

Attention:	**Mr.**	Waqas
	Email	aghabrothersc799@gmail.com

Test ID:	**VE-202311176**
Test Performed Date:	**29-November-2023**
Test Description:	Vehicular Emission (As per NEQS)
Test Type:	VE (Dumper-MD# FRI-FNB-S.# 10300-Diesel)
Test Performed By:	Envi Tech AL

Test Report

Sr.#	Parameter/Analytes Description	Unit	Result	NEQS Limits
1	Carbon Monoxide	%	0.0223	6
2	Smoke Ringlemann Scale	-	N.D.	2
3	Noise	dB	79.9	85

Note :Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.
NEQS Limits = National Environmental Quality Standard (Reference: NEQS)
N.D. = Not Detected.

Analyzed By (Analyst)

Reviewed By (Assistant Manager)

Approved By (Lab Manager)

Disclaimer:

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- Our test reports can be verified by scanning System-generated QR Code.

ETAL-LAB-708-FF-06	Issue Date: 03-10-22	Issue:03 Rev:02

Head Office: 345, First Floor Street: 15, Block-3 Bahadurabad, Karachi 75900 Pakistan. 0310-2358880
Lahore Office: 87-E Madina Height, Office # A/30 & A/31, 8th Floor, Maulana Shaukat Ali Road, Johar Town, Lahore +92 42 32296099
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Lab Report No: 202311177-AGB-VE
Invoice Bill No: Inv-AGB-407

Page No: 1 of 1
Reporting Date: 05-December-2023

Report to:	M/s.	Agha Brothers Construction Company
	Address	Khuzdar, Balochistan, Pakistan.

Attention:	Mr.	Waqas
	Email	aghabrotherscc799@gmail.com

Test ID:	VE-202311177
Test Performed Date:	29-November-2023
Test Description:	Vehicular Emission (As per NEQS)
Test Type:	VE (Tanker- MD # FF174LA- S. # 11667-Diesel)
Test Performed By:	Envi Tech AL

Test Report

Sr.#	Parameter/Analytes Description	Unit	Result	NEQS Limits
1	Carbon Monoxide	%	0.0388	6
2	Smoke Ringlemann Scale	-	N.D.	2
3	Noise	dB	83.9	85

Note :Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.
NEQS Limits = National Environmental Quality Standard (Reference: NEQS)
N.D. = Not Detected.

Analyzed By (Analyst) Reviewed By (Assistant Manager) Approved By (Lab Manager)

Disclaimer:

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ETAL-LAB-708-FF-06 | Issue Date: 03-10-22 | Issue:03 Rev:02

Head Office: 345, First Floor, Street-15, Block-3, Gulistan-e-Jauhar, Karachi, 75900, Pakistan
Lahore Office: Madina Heights, Office # A/30 & A/31, 8th Floor, Maulana Shaukat Ali Road, Johar Town, Lahore
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GREEN LAB CERTIFICATION

Lab Report No: 202311179-AGB-VE

Invoice Bill No: Inv-AGB-407

Page No: 1 of 1

Reporting Date: 05-December-2023

Report to:	**M/s.**	Agha Brothers Construction Company
	Address	Khuzdar, Balochistan, Pakistan.

Attention:	**Mr.**	Waqas
	Email	aghabrotherscc799@gmail.com

Test ID:	**VE-202311179**
Test Performed Date:	**29-November-2023**
Test Description:	Vehicular Emission (As per NEQS)
Test Type:	VE (Excavator-Hitachi-MD # 2005 EX- S. #24409415-Diesel)
Test Performed By:	Envi Tech AL

Test Report

Sr.#	Parameter/Analytes Description	Unit	Result	NEQS Limits
1	Carbon Monoxide	%	0.0524	6
2	Smoke Ringlemann Scale	-	N.D.	2
3	Noise	dB	82.5	85

Note :Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.
NEQS Limits = National Environmental Quality Standard (Reference: NEQS)
N.D. = Not Detected.

Analyzed By (Analyst) | Reviewed By (Assistant Manager) | Approved By (Lab Manager)

Disclaimer:

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- Our test reports can be verified by scanning System-generated QR Code.

ETAL-LAB-708-FF-06	Issue Date: 03-10-22	Issue:03 Rev:02

Head Office: 3?5, First Floor, Street-15, Block-3, Bahadurabad, Karachi, 75900, Pakistan. 0310-228880
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GREEN LAB CERTIFICATION

Lab Report No: 202311180-AGB-VE

Invoice Bill No: Inv-AGB-407

Page No: 1 of 1

Reporting Date: 05-December-2023

Report to:	M/s.	Agha Brothers Construction Company
	Address	Khuzdar, Balochistan, Pakistan.

Attention:	Mr.	Waqas
	Email	aghabrotherscc799@gmail.com

Test ID:	VE-202311180
Test Performed Date:	29-November-2023
Test Description:	Vehicular Emission (As per NEQS)
Test Type:	VE (Excavator-Hydraulic-MD # EX-270LC-Diesel)
Test Performed By:	Envi Tech AL

Test Report

Sr.#	Parameter/Analytes Description	Unit	Result	NEQS Limits
1	Carbon Monoxide	%	0.0304	6
2	Smoke Ringlemann Scale	-	01	2
3	Noise	dB	84.6	85

Note :Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.
NEQS Limits = National Environmental Quality Standard (Reference: NEQS)
N.D. = Not Detected.

Analyzed By (Analyst) | Reviewed By (Assistant Manager) | Approved By (Lab Manager)

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ETAL-LAB-708-FF-06 | Issue Date: 03-10-22 | Issue:03 Rev:02

Head Office: 345, First Floor, Street 15, Block 3, Bahadurabad, Karachi 75900, Pakistan. 0318-2288801
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GREEN LAB CERTIFICATION

Lab Report No: 202311181-AGB-VE

Invoice Bill No: Inv-AGB-407

Page No: 1 of 1

Reporting Date: 05-December-2023

Report to:	**M/s.**	Agha Brothers Construction Company
	Address	Khuzdar, Balochistan, Pakistan.

Attention:	**Mr.**	Waqas
	Email	aghabrotherscc799@gmail.com

Test ID:	**VE-202311181**
Test Performed Date:	**29-November-2023**
Test Description:	Vehicular Emission (As per NEQS)
Test Type:	VE (Excavator-Hydraulic-MD # EX-200-Diesel)
Test Performed By:	Envi Tech AL

Test Report

Sr.#	Parameter/Analytes Description	Unit	Result	NEQS Limits
1	Carbon Monoxide	%	0.0170	6
2	Smoke Ringlemann Scale	-	01	2
3	Noise	dB	84.4	85

Note :Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.
NEQS Limits = National Environmental Quality Standard (Reference: NEQS)
N.D. = Not Detected.

Analyzed By (Analyst)

Reviewed By (Assistant Manager)

Approved By (Lab Manager)

Disclaimer:

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- Our test reports can be verified by scanning System-generated QR Code.

ETAL-LAB-708-FF-06	Issue Date: 03-10-22	Issue:03 Rev:02

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Lab Report No: 202311182-AGB-VE

Invoice Bill No: Inv-AGB-407

Page No: 1 of 1

Reporting Date: 05-December-2023

Report to:	M/s.	Agha Brothers Construction Company
	Address	Khuzdar, Balochistan, Pakistan.

Attention:	Mr.	Waqas
	Email	aghabrotherscc799@gmail.com

Test ID:	VE-202311182
Test Performed Date:	29-November-2023
Test Description:	Vehicular Emission (As per NEQS)
Test Type:	VE (Excavator Chain-Hitachi-MD # 083 L-Diesel)
Test Performed By:	Envi Tech AL

Test Report

Sr.#	Parameter/Analytes Description	Unit	Result	NEQS Limits
1	Carbon Monoxide	%	0.0328	6
2	Smoke Ringlemann Scale	-	01	2
3	Noise	dB	82.5	85

Note :Measurement of uncertainty, statement of conformity, opinions & interpretations will be provided on customer Demand.
NEQS Limits = National Environmental Quality Standard (Reference: NEQS)
N.D. = Not Detected.

Analyzed By (Analyst) | Reviewed By (Assistant Manager) | Approved By (Lab Manager)

Disclaimer:

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- Our test reports can be verified by scanning System-generated QR Code.

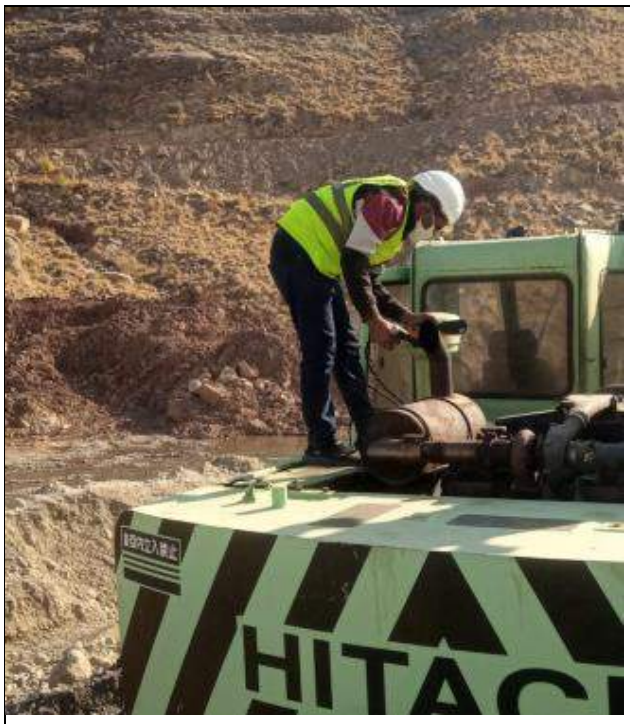
ETAL-LAB-708-77-06 | Issue Date: 03-10-22 | Issue:03 Rev:02

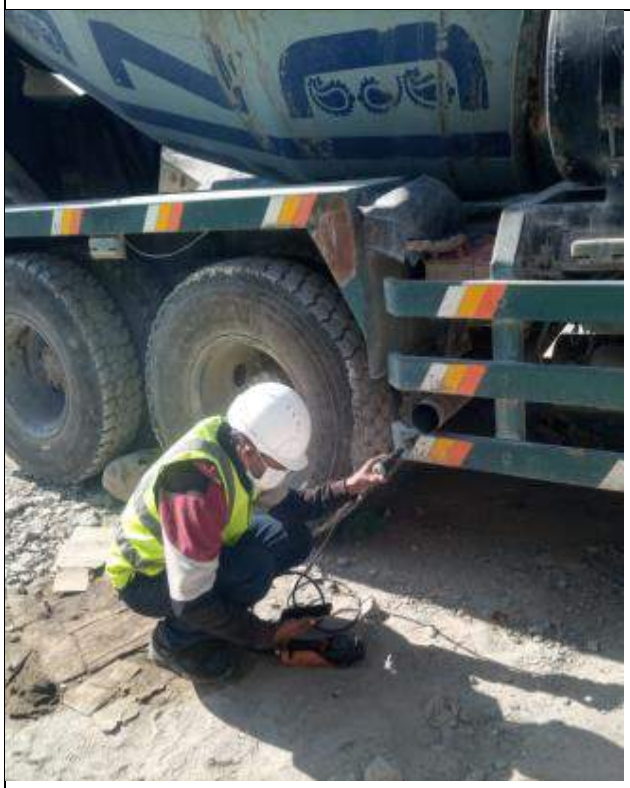
Head Office: 345, First Floor, Street-15, Block-3, Bahadurabad, Karachi, 75800, Pakistan. 0310-2288801
Lahore Office: 57-E Madina Heights Office # A/30 & A/31, 5th Floor, Maulana Shaukat Ali Road, Johar Town, Lahore. +92 42 35296099
info@envitechal.com
www.envitechal.com

Pictoral Evidences of Environmental Monitoring are as follows

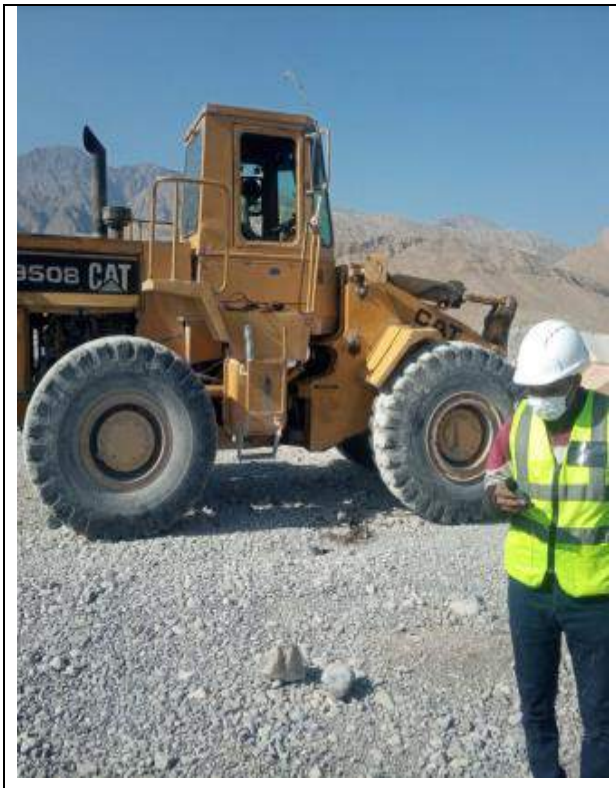
Ambient Air and Noise Monitoring

Vehicle Emission Monitoring





Vehicles Noise Emission Monitoring



Generators Emissions Monitoring

Drinking Water Monitoring

Environmental Monitoring on Water Resources Building

Ambient Air Quality on WRB

Sustainable Environmental Services | SES

Analysis Report **Ref # SES/ENV/Dec/23/1945/1775-B** **Date:30-12-2023**

Description:

Job Location:	Camp Side and Project.	**Testing Instrument**	24 Hours Air Monitoring Station
Job Performed By:	Mr. Mohsin	**Job Date :**	21-Dec-2023 to 22-Dec-2023
Monitoring Duration:	10:00AM to 09:00AM (24 Hrs.)		
Side Location :	Construction of Water Resource Building Quetta NCB-05)		
Contractor Name :	**M/s Haji Abdul Hameed Bangulzai** **M/s Muhammad Akbar Shahwani Brothers (Joint Venture)**		

Ambient Air Quality Monitoring

Sr.	Measuring Parameters	Unit	WHO Limit	NEQS & BEQS Limits	Average Test Result	Remarks
1.	Oxide Of Nitrogen as (NO)	$\mu g/m^3$	-	40 (24 hrs.)	13.27	WL
2.	Oxide Of Nitrogen as (NO_2)	$\mu g/m^3$	25(24 hrs.)	80 (24 hrs.)	31.10	WL
3.	Sulphur Dioxide (SO_2)	$\mu g/m^3$	40(24 hrs.)	120 (24 hrs.)	4.64	WL
4.	Carbon Monoxide (CO)	mg/m^3	4(24 hrs.)	5 (08 hrs.)	0.047	WL
5.	Particulate Matter (PM 2.5)	$\mu g/m^3$	15(24 hrs.)	35 (24 hrs.)	24.96	WL
6.	Particulate Matter (PM 10)	$\mu g/m^3$	45(24 hrs.)	150 (24 hrs.)	84.07	WL
7.	SPM	$\mu g/m^3$	-	500 (24 hrs.)	156.90	WL
8.	Ozone (O_3)	$\mu g/m^3$	60(Peak Season)	130 (01 hr.)	06	WL

Note:
BEQS=Baluchistan Environmental Quality Standards
The instruments used were dully calibrated.
The measurements were carried out on client's request.
The client is responsible for lawful usage of reported data in future.
This report is not valid for Court evidence/ Judicial knowledge
The measurement results based on the time of monitoring
WL= Within Limit

Field Analyst: _____

Chief Chemist: _____
Kashif Ahmed

ASCERT ASCERT ASCERT

New Head Office: Plot No SC-46 Block Commercial Sector 31/D P&T Society Korangi, Karachi.
Mob: +92(0)346-2225261,0333-2699016 Tel # 02135121125 E-mail: info@sespaklab.com Web: www.sespaklab.com

Sustainable Environmental Services | SES

Analysis Report Ref # SES/ENV/Dec/23/1945/1775-A **Date:30-12-2023**

Description:

Job Location:	Camp Side and Project.	**Testing Instrument**	24 Hours Air Monitoring Station
Job Performed By:	Mr. Mohsin	**Job Date :**	21-Dec-2023 to 22-Dec-2023
Monitoring Duration:	10:00AM to 09:00AM (24 Hrs.)		
Side Location :	(Construction of Water Resource Building Quetta NCB-05)		
Contractor Name :	**M/s Haji Abdul Hameed Bangulzai** **M/s Muhammad Akbar Shahwani Brothers (Joint Venture)**		

Air Quality Test Report

Parameters	Temp	NO	NO_2	SO_2	CO	$PM_{2.5}$	PM_{10}	SPM	O_3
NEQS &BEQS Limit	-	24 hrs. (40 µg/m³)	24 hrs. (80µg/m³)	24 hrs. (120µg/m³)	08 hrs. (5 mg/m³)	24 hrs. (35 µg/m³)	24 hrs. (150 µg/m³)	24 hrs. (500 µg/m³)	01 hr. (130µg/m³)
WHO Limit	-	-	24 hrs. (25 µg/m³)	24 hrs. (40 µg/m³)	08 hrs. (4 mg/m³)	24 hrs. (15 µg/m³)	24 hrs. (45µg/m³)	-	Peak Season (60µg/m³)
Time		**Results**							
10:00AM	9 °C	16.52	34.51	5.09		22.3	80.2	129.2	06
11:00AM	10 °C	16.21	33.25	4.28	0.057	25.4	81.6	130.1	-
12:00PM	11°C	16.74	33.23	5.32		24.5	83.1	134.2	-
01:00PM	11.4°C	15.33	32.24	5.30		25.3	85.3	141.2	-
02:00PM	12 °C	15.49	34.25	6.23	0.035	25.4	87.4	142.6	-
03:00PM	12°C	17.35	35.38	5.27		24.5	89.5	152.9	-
04:00PM	13 °C	18.64	36.22	5.28		24.4	91.7	164.4	-
05:00PM	14°C	16.41	37.31	4.06	0.060	22.1	93.6	168.9	-
06:00PM	13°C	15.62	38.37	6.45		25.8	95.4	172.6	-
07:00PM	13°C	14.21	34.26	5.28		24.6	94.3	174.2	-
08:00PM	12°C	13.45	33.36	5.35	0.059	22.7	93.7	176.6	-
09:00PM	11°C	14.95	32.30	5.59		22.3	89.8	177.3	-
10:00PM	11 °C	14.26	31.37	3.57		27.5	87.8	188.2	-
11:00PM	10 °C	15.63	30.28	4.42	0.066	24.4	86.7	176.4	-
12:00AM	10 °C	14.87	30.36	5.87		26.5	84.6	164.3	-
01:00AM	9 °C	13.52	29.35	5.28		28.2	82.5	161.4	-
02:00AM	9 °C	9.74	28.27	3.26	0.036	20.3	80.3	160.3	-
03:00AM	8 °C	7.95	28.67	3.25		25.4	79.8	159.9	-
04:00AM	8 °C	6.85	27.49	4.12		26.6	79.3	157.8	-
05:00AM	7 °C	6.69	26.48	2.74	0.028	27.8	78.4	151.2	-
06:00AM	6 °C	8.24	25.29	2.95		26.5	76.2	142.3	-
07:00AM	5 °C	8.12	25.28	4.32		27.2	74.4	143.7	-
08:00AM	6 °C	10.23	24.38	3.91	0.037	25.1	72.7	146.5	-
09:00AM	7°C	11.62	24.51	4.35		24.3	69.5	149.6	-
AVERAGE	9.89 °C	13.27	31.10	4.64	0.047	24.96	84.07	156.90	06

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New Head Office: Plot No SC-46 Block Commercial Sector 31/D P&T Society Korangi, Karachi.
Mob: +92(0)346-2225261,0333-2699016 Tel # 02135121125 E-mail: info@sespaklab.com Web: www.sespaklab.com

Meteorological Data Analysis on WRB

Sustainable Environmental Services | SES

Analysis Report Ref # SES/ENV/Dec/23/1945/1775-C Date:30-12-2023

Description

Job Location	Camp Side and Project.	**Testing Instrument**	Metrological Equipment's
Job Performed By:	Mr. Mohsin	**Job Location :**	21-Dec-2023 to 22-Dec-2023
Monitoring Duration:	10:00AM to 09:00AM (24 Hrs.)		
Side Location :	Construction of Water Resource Building Quetta NCB-05)		
Contractor Name :	**M/s Haji Abdul Hameed Bangulzai** **M/s Muhammad Akbar Shahwani Brothers (Joint Venture)**		

METROLOGICAL DATA

S.No	TIME	Wind Direction	Wind Velocity	Humidity	Pressure
	Hours		m/sec	%	mm of Hg
1	10:00AM	SW	1.34	91	757
2	11:00AM	N	1.35	92	738
3	12:00PM	N	1.34	94	766
4	01:00PM	SW	1.35	96	721
5	02:00PM	N	1.33	93	720
6	03:00PM	SW	2.25	87	724
7	04:00PM	NS	1.22	89	738
8	05:00PM	NS	1.97	87	729
9	06:00PM	NS	1.21	85	761
10	07:00PM	N	2.31	83	738
11	08:00PM	N	2.22	82	745
12	09:00PM	NS	3.43	83	730
13	10:00PM	N	3.31	86	787
14	11:00PM	NS	3.65	82	798
15	12:00AM	N	4.07	87	736
16	01:00AM	N	5.35	86	735
17	02:00AM	NS	5.36	89	770
18	03:00AM	N	6.06	87	771
19	04:00AM	NS	5.33	85	772
20	05:00AM	NW	4.65	82	757
21	06:00AM	NW	4.52	97	761
22	07:00AM	NW	5.27	95	765
23	08:00AM	N	4.63	92	761
24	09:00AM	N	3.33	94	760

New Head Office: Plot No SC-46 Block Commercial Sector 31/D P&T Society Korangi, Karachi.
Mob: +92(0)346-2225261,0333-2699016 Tel # 02135121125 E-mail: info@sespaklab.com Web: www.sespaklab.com

Noise Test on WRB

Sustainable Environmental Services | SES

Analysis Report **Ref # SES/ENV/Dec/23/1945/1775-D** **Date: 30-12-2023**

Description:

Job Location:	Camp Side and Project.	**Testing Instrument:**	Noise Meter
Job Performed By:	Mr. Mohsin	**Job Location :**	21-Dec-2023 to 22-Dec-2023
Monitoring Duration:	10:00AM to 09:00AM (24 Hrs.)		
Side Location :	Construction of Water Resource Building Quetta NCB-05)		
Contractor Name :	**M/s Haji Abdul Hameed Bungulzai** **M/s Muhammad Akbar Shahwani Brothers (Joint Venture)**		

Noise Test Report

S. No	Measuring Parameter	Testing Instrument	WHO Limit	NEQS & BEQS Limits	TIME	Results
01	Noise Level	Noise Meter	65 dB(A) (Day time)	75 dB(A) (Day time)	10:00AM	52.1
02					11:00AM	53.5
03					12:00PM	56.1
04					01:00PM	53.2
05					02:00PM	56.4
06					03:00PM	52.1
07					04:00PM	55.6
08					05:00PM	53.2
09					06:00PM	57.3
10					07:00PM	52.1
11					08:00PM	58.1
12					09:00PM	53.4
13					10:00PM	53.1
14			55 dB(A) (Night time)	65 dB(A) (Night time)	11:00PM	56.8
15					12:00AM	59.2
16					01:00AM	53.2
17					02:00AM	42.4
18					03:00AM	46.8
19					04:00AM	49.1
20					05:00AM	47.9
21					06:00AM	45.5
22			65 dB(A) (Day time)	75 dB(A) (Day time)	07:00AM	46.8
23					08:00AM	42.4
24					09:00AM	58.1
					Average Result	52.2

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Photographic Evidences of Environmental Monitoring on WRB

Environmental Monitoring of Construction on Kili Sardar Akhtar

Air Quality Monitoring

Sustainable Environmental Services | SES

Analysis Report Ref # SES/ENV/Dec/23/1944/1744-B Date:30-12-2023

Description:

Job Location:	Baseline Monitoring.	**Testing Instrument**	24 Hours Air Monitoring Station
Job Performed By:	Mr. Mohsin	**Job Date :**	20-Dec-2023 to 21-Dec-2023
Monitoring Duration:	09:00AM to 08:00AM (24 Hrs.)		
Side Location :	(KiliSardar Akhtar (PIS) sub-project NCB-06)		
Contractor Name :	M/s NOOR UL HAQ & BROTHERS		

Ambient Air Quality Monitoring

Sr.	Measuring Parameters	Unit	WHO Limit	NEQS & BEQS Limits	Average Test Result	Remarks
1.	Oxide Of Nitrogen as (NO)	$\mu g/m^3$	-	40 (24 hrs.)	13.07	WL
2.	Oxide Of Nitrogen as (NO_2)	$\mu g/m^3$	25(24 hrs.)	80 (24 hrs.)	31.34	WL
3.	Sulphur Dioxide (SO_2)	$\mu g/m^3$	40(24 hrs.)	120 (24 hrs.)	5.33	WL
4.	Carbon Monoxide (CO)	mg/m^3	4(24 hrs.)	5 (08 hrs.)	0.065	WL
5.	Particulate Matter (PM 2.5)	$\mu g/m^3$	15(24 hrs.)	35 (24 hrs.)	26.10	WL
6.	Particulate Matter (PM 10)	$\mu g/m^3$	45(24 hrs.)	150 (24 hrs.)	82.44	WL
7.	SPM	$\mu g/m^3$	-	500 (24 hrs.)	165.71	WL
8.	Ozone (O_3)	$\mu g/m^3$	60(Peek Season)	130 (01 hr.)	06	WL

Note:

BEQS=Baluchistan Environmental Quality Standards
The instruments used were dully calibrated.
The measurements were carried out on client's request.
The client is responsible for lawful usage of reported data in future.
This report is not valid for Court evidence/ Judicial knowledge
The measurement results based on the time of monitoring
WL= Within Limit

Field Analyst: _____

Chief Chemist: _____

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Analysis Report Ref # SES/ENV/Dec/23/1944/1744-A **Date: 30-12-2023**

Description:

Job Location:	Baseline Monitoring	**Testing Instrument**	24 Hours Air Monitoring Station
Job Performed By:	Mr. Mohsin	**Job Date :**	20-Dec-2023 to 21-Dec-2023
Monitoring Duration:	09:00AM to 08:00AM (24 Hrs.)		
Side Location :	(KiliSardar Akhtar (PIS) sub-project NCB-06)		
Contractor Name :	**M/s NOOR UL HAQ & BROTHERS**		

Air Quality Test Report

Parameters	Temp	NO	NO_2	SO_2	CO	$PM_{2.5}$	PM_{10}	SPM	O_3
NEQS &BEQS Limit	-	24 hrs. (40 µg/m³)	24 hrs. (80µg/m³)	24 hrs. (120µg/m³)	08 hrs. (5 mg/m³)	24 hrs. (35 µg/m³)	24 hrs. (150 µg/m³)	24 hrs. (500 µg/m³)	01 hr. (130µg/m³)
WHO Limit	-	-	24 hrs. (25µg/m³)	24 hrs. (40µg/m³)	08 hrs. (4 mg/m³)	24 hrs. (15 µg/m³)	24 hrs. (45µg/m³)	-	Peak Season (60µg/m³)
Time		Results							
09:00AM	10°C	13.52	31.25	4.21	0.041	22.5	81.6	132.4	06
10:00AM	12°C	14.26	31.65	4.26		23.3	84.2	146.9	-
11:00AM	12°C	14.14	31.68	4.85		23.5	93.5	155.7	-
12:00PM	13°C	15.26	32.15	6.92	0.052	26.8	99.6	168.2	-
01:00PM	13°C	15.18	32.65	5.26		27.2	92.5	176.9	-
02:00PM	13°C	16.78	32.65	5.24		26.6	96.8	185.1	-
03:00PM	14°C	17.21	36.98	6.85	0.089	26.5	97.2	188.2	-
04:00PM	15°C	16.56	37.41	6.92		24.2	92.7	179.4	-
05:00PM	15°C	17.47	40.32	6.62		29.9	99.5	187.2	-
06:00PM	13°C	17.65	41.63	4.42	0.062	27.2	100.6	185.7	-
07:00PM	13°C	15.74	39.14	4.32		26.5	96.8	176.9	-
08:00PM	13°C	15.99	36.24	6.45		29.6	84.7	174.2	-
09:00PM	12°C	16.25	36.25	4.85	0.035	27.2	86.8	182.6	-
10:00PM	12°C	15.23	27.74	5.95		24.9	86.1	179.1	-
11:00PM	12°C	14.63	26.87	6.35		26.7	83.2	168.1	-
12:00AM	12°C	10.26	29.52	3.24	0.087	25.1	76.9	169.5	-
01:00AM	12°C	10.85	26.24	2.85		29.3	75.4	166.8	-
02:00AM	11°C	10.52	27.78	2.41		26.8	68.2	162.4	-
03:00AM	11°C	09.96	26.96	8.38	0.098	26.2	66.6	159.2	-
04:00AM	10°C	08.14	22.74	1.95		26.1	65.4	168.4	-
05:00AM	09°C	08.21	26.58	6.62		25.5	55.2	124.6	-
06:00AM	09°C	06.32	23.95	3.35	0.056	26.4	56.9	145.8	-
07:00AM	09°C	06.63	24.62	8.87		22.1	68.7	146.6	-
08:00AM	08°C	06.94	29.38	6.95		26.4	69.6	147.2	-
AVERAGE	11.7°C	13.07	31.34	5.33	0.065	26.10	82.44	165.71	06

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Meteorological Data

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Analysis Report Ref # SES/ENV/Dec/23/1944/1744-C **Date:30-12-2023**

Description

Job Location:	Baseline Monitoring.	**Testing Instrument:**	Metrological Equipment's
Job Performed By:	Mr. Mohsin	**Job Date :**	20-Dec-2023 to 21-Dec-2023
Monitoring Duration:	09:00AM to 08:00AM (24 Hrs.)		
Side Location :	(KiliSardar Akhtar (PIS) sub-project NCB-06)		
Contractor Name :	**M/s NOOR UL HAQ & BROTHERS**		

METROLOGICAL DATA

S.No	TIME	Wind Direction	Wind Velocity	Humidity	Pressure
	Hours		m/sec	%	mm of Hg
1	09:00AM	SW	2.48	91	751
2	10:00AM	N	2.46	92	738
3	11:00AM	N	2.24	91	763
4	12:00PM	SW	1.39	95	722
5	01:00PM	N	2.38	96	721
6	02:00PM	SW	2.26	84	728
7	03:00PM	NS	1.25	93	734
8	04:00PM	NS	2.84	85	724
9	05:00PM	NS	1.34	83	767
10	06:00PM	N	3.36	72	736
11	07:00PM	N	2.29	76	749
12	08:00PM	NS	1.42	79	733
13	09:00PM	N	1.36	87	785
14	10:00PM	NS	1.52	80	790
15	11:00PM	N	2.12	88	731
16	12:00AM	N	3.41	76	733
17	01:00AM	NS	2.28	78	770
18	02:00AM	N	4.07	81	771
19	03:00AM	NS	4.36	84	778
20	04:00AM	NW	4.25	84	738
21	05:00AM	NW	3.42	91	769
22	06:00AM	NW	5.31	92	754
23	07:00AM	N	2.52	94	758
24	08:00AM	N	1.25	94	756

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Noise Test Reports

Sustainable Environmental Services | SES

Analysis Report Ref # SES/ENV/Dec/23/1944/1744-D **Date:30-12-2023**

Description:

Job Location:	Baseline Monitoring.	**Testing Instrument:**	Noise Meter
Job Performed By:	Mr. Mohsin	**Job Date :**	20-Dec-2023 to 21-Dec-2023
Monitoring Duration:	09:00AM to 08:00AM (24 Hrs.)		
Side Location :	(KaliSardar Akhtar (PIS) sub-project NCB-06)		
Contractor Name :	M/s NOOR UL HAQ & BROTHERS		

Noise Test Report

S. No	Measuring Parameter	Testing Instrument	WHO Limit	NEQS & BEQS Limits	TIME	Results
01	Noise Level	Noise Meter	65 dB(A) (Day time)	75 dB(A) (Day time)	09:00AM	62.4
02					10:00AM	63.5
03					11:00AM	64.5
04					12:00PM	61.2
05					01:00PM	63.6
06					02:00PM	63.5
07					03:00PM	63.7
08					04:00PM	63.5
09					05:00PM	63.4
10					06:00PM	68.2
11					07:00PM	67.2
12					08:00PM	56.1
13					09:00PM	53.5
14					10:00PM	56.7
15			55 dB(A) (Night time)	65 dB(A) (Night time)	11:00PM	53.5
16					12:00AM	54.2
17					01:00AM	52.2
18					02:00AM	53.1
19					03:00AM	46.3
20					04:00AM	48.4
21					05:00AM	49.2
22					06:00AM	47.2
23			65 dB(A) (Day time)	75 dB(A) (Day time)	07:00AM	56.8
24					08:00AM	57.2
					Average Results	57.8

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Drinking Watter Quality Test Results

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Analysis Report Ref # SES/ENV/Dec/23/1944/1744-E **Date: 30-12-2023**

Description:

Quantity of sample	1.0 Liter	**Sampling Methodology**	Grab	**Job Date**	20-Dec-2023
Analysis Type	Chemical Analysis	**Sampling Location**		Kili Akhtar Sardar Project	
Side Location :	KiliSardar Akhtar (PIS) sub-project NCB-06)				
Contractor Name :	M/s NOOR UL HAQ & BROTHERS				

Bore Water Test Report

S #	Parameters	Units	Testing Method	NEQS Limits	WHO Limits	BEQS Limits	Result	Remarks
01	Total Bacteria Count	TBC (count/ml)	Total Viable Count	----------	----------	----------	10	-
02	Total Coliform	TC (count/ml)	APHA 922 B	0/100 ml	0/100 ml	0/100 ml	ND	WL
03	E-Coli	EC(count/ml)	Total Viable Count	0/100 ml	0/100 ml	0/100 ml	ND	WL
04	Fecial Coli	FC (count/ml)	APHA 922 B	0/100 ml	0/100 ml	0/100 ml	ND	WL
05	Turbidity	NTU	HACH Turbidity meter	<5	<15	<15	< 0.01	WL
06	Taste	Taste	Sensory Evolution	Obj/Non Obj	Obj/ Non Obj	Obj/Non Obj	Non-obj	WL
07	Odour	Odor	Sensory Evolution	Obj/Non Obj	Obj/Non Obj	Obj/Non Obj	Non-obj	WL
08	Colour	TCU	Pt-Co method	≤ 15 TCU	≤ 15 TCU	≤ 15 TCU	< 1	WL
09	Phenolic Compounds	As Phenol (mg/L)	ASTM D-1783	-	-	-	ND	WL
10	Residual chlorine	O_2 (mg/L)	HACH Method 8167	0.2-0.5	-	0.2-0.5	0.3	WL
11	pH @ 25 °C	PH	ASTM D-1293	6.5 to 8.5	6.5 to 8.5	6.5 to 8.5	7.79	WL
12	Total Dissolved Solid	TDS (mg/L)	APHA 2540-C	< 1000	< 1000	< 1000	669	WL
13	Total Hardness	As $CaCO_3$(mg/L)	APHA 2340-C	< 500	-	< 500	74	WL
14	Fluoride	F^{-1} (mg/L)	APHA 4500-F^{-1}	≤1.5	1.5	≤1.5	0.30	WL
15	Chloride	Cl^{-1} (mg/L)	APHA 4500-Cl^{-1}	< 250	250	< 250	165	WL
16	Cyanide	CN^{-1}(mg/L)	HACH Method 8027	≤ 0.05	0.07	≤ 0.05	ND	WL
17	Nitrate	NO_3^{-1} (mg/L)	HACH Method 8192	≤ 50	50	≤ 50	0.15	WL
18	Nitrite	NO_2^{-1} (mg/L)	APHA 4500-NO_2^{-1}-B	≤ 3.0(P)	3	≤ 3.0(P)	0.06	WL
19	Antimony	Sb (mg/L)	ASTM D-3697	≤ 0.005	0.02	≤ 0.005	ND	WL
20	Aluminum	Al(mg/L)	ASTM D-857	≤ 0.2	0.2	≤ 0.2	0.02	WL
21	Arsenic	As (mg/L)	ASTM D-2972	≤ 0.05	0.01	≤ 0.05	ND	WL
22	Boron	B (mg/L)	ASTM D-3082	0.3	0.3	0.3	ND	WL
23	Barium	Ba(mg/L)	ASTM D-4382	0.7	0.7	0.7	0.008	WL
24	Chromium Total	Cr(mg/L)	ASTM D-1687	≤ 0.05	0.05	≤ 0.05	ND	WL
25	Copper	Cu (mg/L)	ASTM D-1688	2	2	2	<0.03	WL
26	Cadmium	Cd(mg/L)	ASTM D-3557	0.01	0.003	0.01	ND	WL
27	Lead	Pb(mg/L)	ASTM D-3559	≤ 0.05	0.01	≤ 0.05	ND	WL
28	Manganese	Mn(mg/L)	ASTM D-858	≤ 0.5	0.5	≤ 0.5	ND	WL
29	Mercury	Hg (mg/L)	ASTM D-3223	≤ 0.001	0.001	≤ 0.001	ND	WL
30	Nickel	Ni(mg/L)	ASTM D-3866	≤ 0.02	0.02	≤ 0.05	ND	WL
31	Selenium	Se(mg/L)	ASTM D-3858	0.01	0.01	0.01	ND	WL
32	Zinc	Zn (mg/L)	ASTM D-1691	5	5	5	0.05	WL

Note:
BEQS=Balochistan Environmental Quality Standards
The instruments used were dully calibrated.
The measurements were carried out on client's request.
The client is responsible for lawful usage of reported data in future.
This report is not valid for Court evidence/ Judicial knowledge
The measurment results based on the time of monitoring
WL= Within Limit
Field Analyst: Mr. Mohsin

Chief Chemist:

SUSTAINABLE ENVIRONMENTAL SERVICES

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Pictoral Evidences

Picture Evidence

Project name:	Construction of Kili Sardar Akhtar (PIS) sub-project Zhob River Basin (NCB-06)
Client Name:	Balochistan Water Resources Development Sector (BWRDSP) ABD Loan no-3700-Pak Irrigation department Balochistan
Consultants Name:	NESPAK, RHC, EGC (JV)
Contractor Name :	M/s NOOR UL HAQ & BROTHERS

Fig.1

Fig.2

Fig.3

Fig.4

Annexure VIII: Balochistan Environmental Quality Standards

Balochistan Quality Standards for Noise 2020

In dB(A) Leq(Time weighted average of the level of sound in decibel on scale A which is relatable to human hearing

S No	Area Type	Day time	Night time	Day time	Night time
1	Residential Area (A)	65	50	55	45
2	Commercial Area (B	70	60	65	55
3	Industrial Area (C)	80	75	75	65
4	Silent Zone (D)	55	45	50	45

Explanations

1. Day time hours are marked as to be from 6:00am to 10:00pm.
2. Night Time hours are marked as to be from 10:00 pm to 6:00 am.
3. Silence Zone: the following shall be the generally declared Silent Zone/areas. The DG EPA upon his own or by a written request can declared any other area as Silent Area
    a. An area comprising not less than 150 meters around a hospital, an educational institution and courts of law
4. Areas which cannot be distinguished on the basis of being Commercial, Industrial or Residential and which are the mixed of them, such areas can be declared all as Residential Areas and Noise protocols of Residential Area shall apply therein.

Balochistan Environmental Quality Standards for Ambient Air

Pollutant	Time-Weighted Average	Concentration in Ambient Air	Method of Measurement
Sulfer Dioxide (SO^2)	Annual average*	80 ug/m^3	Ultraviolet Fluorescence method
	24 hours**	120 ug/m^3	
Oxides of Nitrogen as (NO)	Annual average*	40 ug/m^3	Gas Phase Chemiluminescence
	24 hours**	40 ug/m^3	
Oxides of Nitrogen as (NO^2)	Annual average*	40 ug/m^3	Gas Phase Chemiluminescence
	24 hours**	80 ug/m^3	
Ozone (O^3)	1 hour	130 ug/m^3	Non Dispersive UV absorption method
Suspended particulate matter (SPM)	Annual average*	360 ug/m^3	High Volume sampling (average flow rate not less than 1.1 m^3/min)
	24 hours**	500 ug/m^3	
Respirable particulate matter PM 10	Annual average*	120 ug/m^3	Preferably B-Ray absorption method
	24 hours**	150 ug/m^3	
Respirable particulate matter PM 2.5	Annual average*	15 ug/m^3	Preferably B-Ray absorption method
	24 hours**	**35 ug/m^3**	

Pollutant	Time-Weighted Average	Concentration in Ambient Air	Method of Measurement
	1 hour	15 ug/m^3	
Lead (pb)	Annual average*	1 ug/m^3	ASS method after sampling using EPM 2000 or equivalent Filter Paper
	24 hours**	1.5 ug/m^3	
Carbon Monoxide (CO)	8 hours**	5 mg/m^3	Non Dispersive Infra Red (NDIR) method
	1 hour	10 mg/m^3	

* Annual arithmetic mean of minimum 104 measurements in a year taken twice a week 24 hourly at uniform interval.

** 24 hourly 18 hourly Values should be met 98% of the in a year. 2% of the time, it may exceed but not on two consecutive days.

Balochistan Environmental Quality Standards for Drinking Water

Properties/Parameters	Standard Values	WHO Standards	Remarks
All water intended for drinking (E. Coli or Thermo-tolerant Coliform bacteria	Must not be detectable in any 100 ml sample	Must not be in any 100 ml	Most Asian countries also follow WHO standards
Treated water entering the distribution system (E. Coli or thermo tolerant coliform and total coliform bacteria)	Must not be detectable in any 100 ml sample	Must not be detectable in any 100 ml sample	Most Asian countries also follow WHO standards
Treated water in the distribution system (E. Coli or thermo tolerant coliform and total coliform bacteria)	Must not be detectable in any 100 ml sample In case of large supplies, where sufficient samples are examined, must not be present in 95% of the samples taken throughout any 12- month period.	Must not be detectable in any 100 ml sample In case of large supplies, where sufficient samples are examined, must not present in 95% of the samples taken throughout any 12- month period.	Most Asian countries also follow WHO standards
Colour	<15 TCU	<15 TCU	
Taste	Non objectionable/ Acceptable	Non objectionable/ Acceptable	
Turbidity	Non objectionable/ Acceptable	Non objectionable/ Acceptable	
	<15 NTU	<15 NTU	

Properties/Parameters	Standard Values	WHO Standards	Remarks
Total hardness as $CaCO^3$	<500 mg/l	———	
TDS	<1000	< 1000	
pH	6.5—8.5	6.5—8.5	
Essential Inorganic	Mg/Liter	Mg/liter	
Aluminum (Al)mg/l	< 0.2	0.2	
Antiminey *Sb)	< 0.005(P)	0.02	
Arsenic (As)	<_0.05(P)	0.01	Standard for Pakistan similar to most Asian developing countries
Barium (Ba)	0.7	0.7	
Boron (B)	0.3	0.3	
Casmium (Cd)	0.01	0.003	Standard for Pakistan similar to most Asian developing countries
Chloride(Cl)	< 250	250	
Chromium(Cr)	<_0.05	0.05	
Copper(Cu)	2	2	
Toxic Inorganic	Mg/l	Mg/l	
Cyanide (CN)	<_0.05	0.07	Standard for Pakistan similar to most Asian developing countries

Fluoride(F)	< 1.5	1.5	
Lead(Pb)	<_0.05	0.01	Standard for Pakistan similar to most Asian developing countries
Manganese(Mn)	< 0.5	0.5	
Mercury(Hg)	<_0.001	0.001	
Nickle(Ni)	<_0.05	0.02	
Nitrate(NO^3)	<_50	50	
Nitrate(NO^2)	<_3 (P)	3	
Slenium(Se)	0.01 (P)	0.01	

Properties/Parameters	Standard Values	WHO Standards	Remarks
Residual Chlorine	0.2-0.5 at consumer end 0.5-1.5 at source		
Zinc (Zn)	5.0	3	Standard for Pakistan similar to most Asian developing countries
Organic			
Pesticides Mg/l			PSQCA No. 4639-2004, page No.1 Table No 3 Serial No 20-58 may be consulted
Phenolic Compounds (as Phenols) mg/l			
Poly nuclear aromatic hydrocarbons (as PAHs) g/l		0.01 (By GC/MS Method)	
Alpha Emitters bq/L or pCi	0.1	0.1	
Beta emitters	1	1	

- *Indicates priority health related inorganic constituents, which need regular monitoring.
- ** PSQCA: Pakistan Standards Quality Control Authority.