

Semi-annual Environmental Monitoring Report

Project Number GEO 51257-001

Reporting period: January – June 2024

#10 Semi-annual Report

July 2024

Georgia: North-South Corridors (Kvesheti – Kobi) Road Project

Loan No GEO 3803

(Financed by the Asian Development Bank (ADB) and European Bank for Reconstruction and Development (EBRD))

Prepared by Roads Department (RD) of the Ministry of Regional Development and Infrastructure of Georgia (MRDI) of Georgia for the Asian Development Bank (ADB)

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CURRENCY EQUIVALENTS

(As of June 2024)

Currency unit	–	United State Dollars (USD)
{GEL}1.00	=	\$ 0.36 USD
\$1.00	=	2.78 GEL

Abbreviations

ADB	Asian Development Bank
CAP	Corrective Action Plan
CC	Construction Contractor
CH	Cultural Heritage
CSEMP	Contractor's Contract Specific Environmental Management Plan
EBRD	European Bank for Reconstruction and Development
ECOW	Ecological Clerk of Works
FIDIC	The International Federation of Consulting Engineers
EIA	Environmental Impact Assessment
EDDR	Environment Due Diligence Report
CHDDR	Cultural Heritage Due Diligence
EG	Emergency Gallery
EMP	Environmental Management Plan
EMR	Environmental Monitoring Report
ESP	Environmental and Social Policy
ESR	Environmental Sensitive Receiver
ERP	Emergency Response Plan
GOGC	Georgian Oil and Gas Corporation
GARP	Goudauri Access Road Project
GRM	Grievance Redress Mechanism
GRCE	Grievance Redress Committee
HS	Health & Safety
H&S	Health & Safety
HSE	Health, Safety and Environment
HSMP	Health and Safety Management Plan
IFC	International Finance Corporation
MAC	Maximum Allowable Concentration
MoEPA	Ministry of Environmental Protection and Agriculture
MoESD	Ministry of Economy and Sustainable Development
MoRDI	Ministry of Regional Development and Infrastructure
MSs	Method Statements
m S/cm	Milli Siemens/ centimeter
N/A	Not Applicable, Not Available
NACHP	National Agency for Cultural Heritage preservation
NCN	Non-Conformance Notice
NCR	Non-Conformance Report
NFA	National Forest Agency
NOC	No Objection Certificate
PMSCS	"Project Management and Construction Supervision Contract
PPE	Personnel Protective Equipment'
PPT	Personnel Protective Technologies
PR	Performance Requirements of EBRD
PS	Performance Standards of IFC
PIU	Project Implementation Unit
QC	Quality Control
RD	Road Department
RoW	Right of Way
SAEMR	Semi Annual Environmental Monitoring Report
SC	Supervision Consultant
SDA	Spoil Disposal Area
SSEMP	Site Specific Environmental Management Plan
SFF	State Forest Fund
SPS	Safeguard Policy Statement
TBM	Tunnel Boring Machine
TBN	To Be Nominated

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1. INTRODUCTION

1.1 Preamble

1. This report presents the Semi-annual Environmental Monitoring review of North-South Corridor (Kvesheti – Kobi section) Road Project for the period of January to June 2024.
2. This report is the 10th Semi-Annual EMR for the North-South Corridors (Kvesheti – Kobi section) Road Project.

1.2 Headline Information

3. The length of the new alignment is 22.7 km and is divided into two construction packages, or 'Lots' as follows:
 - Lot 1: Tskere – Kobi: Chainage KM 12.7 – KM 22.7 (10 km)
 - Lot 2: Kvesheti – Tskere: Chainage KM 0.0 – KM 12.7 (12.7 km)
4. The project involves construction of 6 bridges and 5 tunnels, 6 grade junctions (1 for Lot 1 and 5 for Lot 2).
5. The Contract for "Project Management and Construction Supervision Contract (PMSCS) was awarded to UBM on June 24, 2019 by Road Department (RD) of Ministry of Regional Development and Infrastructure (MoRDI).
6. There are two separate contractors for each Lot1 and Lot2 as given below:
 - Lot 1: China Railway Tunnel Group Co. Ltd. (CRTG), contract signed on 05-09-2019;
 - Lot 2: China Railway 23rd Bureau Group CO. Ltd (CRCC), contract signed on 15-08-2019.
7. The Kvesheti-Kobi Road Project is the part of the program launched by the Government of Georgia and the road department to upgrade the major roads of the country. This will cover around 23 km of the highway and will replace the existing Kvesheti to Kobi Road section which is around 35 km long and crosses the Jvari Pass at an altitude of around 2,400 m with poor driving safety conditions. Thus, saving the travelling cost, time delay by reducing the travelling distance of 12 km through very difficult mountainous terrain, especially, during the winter and less fuel consumptions resulting in emissions savings.
8. The major benefits of the new Kvesheti-Kobi Road Project include: guaranteeing operational continuity during wintertime when transportation is hindered historically; locals having year-round access to the healthcare, education institutions; promoting trade and commerce, Improving quality of life in Kazbegi and Dusheti municipalities; Improvement of road safety by reduction in fatalities, injuries and accident rates; travel time savings for passengers and freight transport; Increase of tourist's flow in the region and less air pollution in Gudauri Resort.
9. The Project outline (km 0+000 – 22+700) from Kvesheti to Kobi:

Classification of road:	International highway
Design speed:	80 km/ hr.
Road length:	22.75 km (Lot1 10.03 km: Lot 12.72 km)
Road width:	15 m
Numbers of lanes:	2 ~ 3 lane

10. Based on Employer's letter # N2-05/10497 dated: 23-09-2020, PMCSC notified the Contractors through letter # 2020-09-UBM-CRTG-160 dated: 23-09-2020 that according to the subclause of 8.1 of the General Conditions of Contract (GCC), PMCSC hereby gives the CC notice to commencement of work and October 01, 2020 has been set up the date for the commencement.
11. Based on ADB Environmental Safeguards Policy (2009), this Project falls under ADB's project Category A as the project is considered to have significant diverse impacts over a wide area during construction and operation, such as noise and vibration on local residents and potentially on cultural heritage, significant quantities of spoil disposal, road safety impacts, impact on biodiversity and landscape. Road Department of Georgia submitted Environmental Impact Assessment (EIA) of the Project to the Ministry of Environment Protection and Agriculture in November 2018 in accordance to Georgian legislation, and that was approved by MoEPA on April 25, 2019 by order # N 2-354. The Project was also approved by the lenders, ADB approved the Project on August 1st and EBRD on October 2nd 2019.
12. Conditions of Approval from MoEPA include the implementation of EMPs, shall not disturb the water supply network of the communities, vibration monitoring, washing of vehicles tyres before coming on the road, submission of technical report on the Inventory of Stationary Sources of Atmospheric Air Pollution and their Emission, noise level monitoring, protection of rivers and proper design of water structures, mitigation measures to protect critical habitats and floral and faunal species in compliance with the international conventions and Red list of Georgia, installation of avalanches fences, protection of cultural heritages and prohibition for dumping of waste in Kazbegi National Park, etc.

2. PROJECT DESCRIPTION AND CURRENT ACTIVITIES

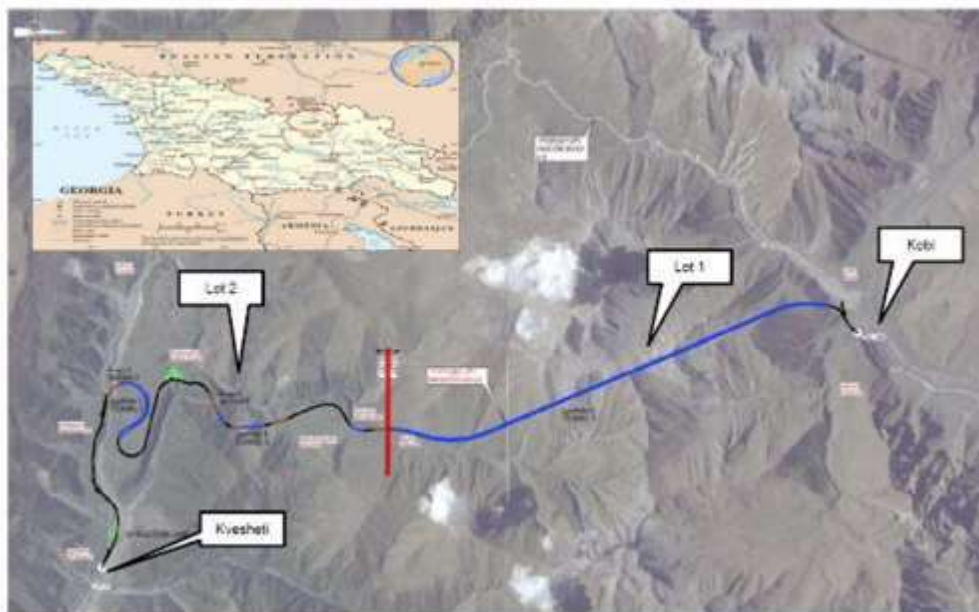
2.1 Project Description

13. Due to its geographic location, Georgia's role as a major transit country is momentous. Transport of goods into and through Georgia has increased over the past 10-15 years. Almost two-thirds of goods in Georgia are transported by road, and haulage by domestic and international truck companies is very evident on the country's highways. Many of the roads are, however, poorly equipped to cope with the volume of traffic and the proportion of heavy vehicles, and factors such as insufficient dual carriageways, routing through inhabited areas and inadequate maintenance and repair, hinder throughputs and increase transit times. This creates difficulties for haulage companies and their clients, truck drivers, Georgian motorists and local residents.
14. The Government of Georgia (GoG) has launched a program to upgrade the major roads of the country. The program is being managed by the Roads Department (RD) of the Ministry of Regional Development and Infrastructure (MoRDI). As a part of the program, upgrading of Kvesheti-Kobi section of the E117 is planned. This section includes the construction of 9 km long main tunnel that will cross the Caucasus ridge bypassing the existing road that connects Kvesheti to Kobi through Gudauri area and the Jivari pass. The project is located in Dusheti and Kazbegi municipalities, Mtskheta-Mtianeti region in the central northern part of Georgia (see Figure 1).
15. As for the residents of the Khadistskali gorge – the villages are poorly accessible in winter. According to official statistics (ref census 2002 and 2014) the decrease in community is significant. The decisive factor of decrease in population is the poor accessibility in winter especially for the localities at the higher altitude. The residents have to walk a long distance (for Tskere – around 7km) for basic food and medication. No first aid facilities are available in the area and no opportunity for children from the valley to remain in the villages and attend school. The road will improve access to the

settlements in particular those located higher in the gorge. Better access together with other benefits, ensured for permanent residents of the mountainous settlements under the national legislation, can be considered as one of the ways for reversing migration from the area.

16. Kvesheti Kobi road section with six junctions and three service roads will play an important role in the development of Kazbegi and Dusheti municipalities by facilitating the communities of Kvesheti, Bedoni, Tskere and Kobi by providing year-round access to markets, educational institution, health facilities of capital Tbilisi and increase the tourist attraction in Khada valley.

Figure 1: Location of Project Area



17. The length of the new alignment is 22.7 km is divided into two construction packages, or 'Lots' as follows
 - Lot 1: Tskere – Kobi: Chainage KM 12.7 – KM 22.7 (10 km);
 - Lot 2: Kvesheti – Tskere: Chainage KM 0.0 – KM 12.7 (12.7 km).

Lot 1 Summary

18. The Tskere-Kobi portion of the Project Road, also referred to as 'Lot 1', includes 8.86 km long tunnel with two cut and cover sections and a junction connecting to the existing road near Kobi. More specifically Lot 1 includes:
 - 178 m long section of road from Tskere to the south portal of Tunnel 5;
 - Tunnel 5: 8.86 km long bidirectional, 2 lane tunnels (max. gradient 2.35%);
 - Two cut and cover (C&C) sections of Tunnel 5 (200m –south portal and 8m – north portal) to protect from avalanches and move entrance portal farther from the Tskere;
 - 9.062 km emergency gallery parallel to Tunnel 5 and 17 connections to the main tunnel (6.4 meters wide);
 - Technical buildings next to the north and south portals – the buildings include facilities building, pumping station and ventilation room;
 - 0.8 km long section of road connecting the north portal of the tunnel with existing road. The alignment has been adapted to the current road with a maximum gradient of 4.2 % to keep on using the existing bridge (bridge length 42m, height 6m); and
 - 214 m long local road diversion.

Lot 2 Summary

19. The Kvesheti – Tskere section, or ‘Lot 2’ includes 2.5 km of tunnels and 1.5 km of bridges. The main elements of this section are:
- Kvesheti bypass road (length 3.2 km),
 - Bridge 1 (length 27.8m, height 14m, 2 lane)
 - Bridge 2 over the Aragvi river (length 435.28m, height 62m, 3 lanes)
 - Tunnel 1 (length 1540.64m, 2 lanes) with gallery (1092m) (New Austrian tunneling method- NATM)
 - Bridge 3 – Arch bridge over the river Khadistskali (length 426m, height 164m, 3 lane)
 - Tunnel 2 (length 193.42m, C&C, 3 lane)
 - Bridge 4 over the left tributary of river Khadistskali (length 147.80m, height 26m, 3 lane)
 - Tunnel 3 (length 388.38m)
 - Bridge 5 (length 322m, height 55m, 3 lane)
 - Tunnel 4 (length 299m, C&C, 3 lane)
 - Bridge 6 (length 218m, height 48m, 3 lane)
 - Five grade junctions are planned (KM0.3, KM1.7, KM3.1, KM7.7, KM10,5) and 3 service roads.
20. Technical features of the alignment considered during detail design include:

Lot 1

Road class	International
Design speed	80 km/hr.
Outside Total width (paved)	12 m
Lane width	3.5 m
Min shoulder	2.5 m
Min road side	1 m
Structures Total width	15 m
Lane width	3.5 m
Min clearance	2.5 m
Min way side	1.5 m
Tunnel Total width	12.5 m
Lane width	3.5 m
Min shoulder	1.5 + 1m median
Min sidewalk	0.75 m
Number of Junction	01

Lot 2

Road class	International
Design speed	80 km/hr.
Outside Total width (paved)	12 m
Lane width	3.5 m
Min shoulder	2.5 m
Min road side	1m
Structures total width	15m
Lane width	3.5 m
Min clearance	2.5 m
Min wayside	1.5 m
Tunnel Total width	12.5 m
Lane width	3.5 m
Min shoulder	1.5 + 1m median
Number of Junctions	05
Min sidewalk	0.75 m

2.2 Project Contracts and Management

21. Information related to the project execution is given in Table 1:

Table 1: Project Information

Employer	Road Department of Georgia, Ministry of Regional Development and Infrastructure of Georgia
Funding Source	Lot 1: Asian Development Bank (ADB) & European Bank for Reconstruction and Development (EBRD) Lot 2: Asian Development Bank (ADB)
"Project Management and Construction Supervision Contractor (PMCSC) (Engineer)"	UBM
Contractor	Lot 1: CRTG (China Railway Tunnel Group Co. Ltd.) Lot 2: CRCC (China Railway 23rd Bureau Group CO. Ltd)
Contract Number	KKRP/CW/CP-01R, 02R
Contract date	Lot 1: 05.09.2019 Lot 2: 15.08.2019
Commencement Date of Works	October 01, 2020.
Contract Period	Lot 1: 48 months (1460 days) Lot 2: 36 months (1080 days)
Project Completion date	Lot 1 30-09-2024 Lot 2 16-09-2025
Expired time	1369
Remaining time	Lot 1: 3 months Lot 2: 14.5 months
Defects Notification Period	2 years
Contract Price (GEL)	Lot 1: 909,024,280.61 GEL Lot 2: 316,370,802.91 GEL

22. The Terms of Reference (TOR) for the "Project Management and Construction Supervision Contract" (PMCSC) contains the following tasks for the environmental safeguard team:

- Ensure that the provisions of the approved Environmental Management Plan are reflected in the Contractor's specific environmental management plan(s) (SEMPs) prior to its acceptance by the PMCSC, the Employer and ADB and EBRD, and thereafter ensure that the Contractor complies in every respect with the provisions of the SEMP;
- Preparation and implementation of Biodiversity Monitoring and Evaluation Program (BMEP) and contract with the organizations such as universities and NGOs in order to commission surveys to be completed as a part of implementation of BAP;
- Protection of critical habitats to ensure that there is no net conservation loss or net conservation gain during the project implementation;
- Conduct environmental trainings and briefings to provide awareness to ADB SPS 2009 and EBRD performance requirements (PRs elaborated in EBRD ESP 2014) and national environmental requirements;

- Protection of cultural heritages in accordance with ADB SPS 2009, EBRD PR 8 and Georgian Law on cultural heritage 2007 updated in 2018, especially, Article 36 regarding buffer zones, perimeter of physical security of cultural heritage;
 - Develop an environmental auditing protocol for the construction period, regularly supervise the environmental monitoring, and submit the Monthly Environmental Monitoring Report (EMR) and Semiannual EMR based on the monitoring data and laboratory analysis reports. Monthly EMR will be included as an annex to the Consultant's Monthly Progress Report;
 - Develop a program for hands-on training of Contractor's staff in implementing the SEMP;
 - Ensure the safe work practices at the site, monitor the contractor is complying with all applicable safety regulations and safety of all persons entitled to be onsite;
 - Conduct post-construction environmental audit and prepare post-construction environmental audit report.
23. Obligation of the contractor, to safeguard, mitigate adverse impacts and rehabilitate the environment is addressed through environmental provisions in the FIDIC conditions of contract for construction, MDB harmonized addition – June 2010 and special clauses included in the contract related to environment, especially FIDIC clause 4.18 (protection of environment), 4.8 (safety procedures), 6.4 (labour laws), 16.3 (cessation of work/ remedial work), 2.3 b (employer's personnel), 4.21 (progress report) are important in this regard.
24. The PMCSC was awarded to UBM on June 24, 2019 for three phases of the project:
- Phase 1: Design review, to be completed in a period of three months and submitted to RD.
- Phase 2: Construction supervision and contract administration. The construction period is 36 months for Lot 1 and 48 months for Lot 2.
- Phase 3: Defects Notification Period, two years.
25. Summary of civil works contracts and works' progress is provided in Table 2. All awarded contracts included EMPs cleared by ADB and any conditions of applicable national EIA clearance by MoEPA. Subclause 4.18 in the contract KKR/CW/CP-01R and KKR/CW/CP-02 R contains all the information related to protection of environment and inclusion of the EIA and EMP in the contract.

Table 2. Summary of Civil Works Contracts and Works' Progress

Package	Contractor	Scope	Signed	Approval Date			Environmental Personnel		Civil Work		Progress as of	
				SSEMP	COVID-19 HSMP	ERP	Environmental officer	Health and Safety Manager	Start	End	31 Dec 2023	30 June 2024
Lot 1	CRTG	Tskere – Kobi: Chainage KM 12.7 – KM 22.7 (10 km) including 178 m long section of road from Tskere to the south portal of Tunnel 5; Tunnel 5: 8.86 km long bidirectional, 2 lane tunnels (max. gradient 2.35%); Two cut and cover (C&C) sections of Tunnel 5 (200m – south portal and 8m – north portal) to protect from avalanches and move entrance portal farther from the Tskere; 9.062 km emergency gallery parallel to Tunnel 5 and 17 connections to the main tunnel (6.4 meters wide); 0.8 km long section of road connecting the north portal of the tunnel with existing road.	05.09.2019	12-06-202	26-11-2020	26-11-2020	Paata Chankotadze	Vladimer Melia	October 01, 2020.	30-09-2024 (Planned)*	73.6 % (Emergency Gallery) 93.6 % Tunnel Boring Machine (TBM), Main Tunnel)	95 % (Emergency Gallery) 100 % Tunnel Boring Machine (TBM), Main Tunnel)
Lot 2	CRCC	Kvesheti – Tskere: Chainage KM 0.0 – KM 12.7 (12.7 km) Including construction of 6 bridges, 4 tunnels and 5 grade junctions	15.08.2019	12-06-202	27-11-2020	27-11-202	Tamta Kapanadze	Koba Gvalia	October 01, 2020.	16-09-2023 (planned)*	29.48 %	40.38 %

*Note: The Month/Years in brackets are planned schedule.

COVID-19 HSMP = COVID-19 Health and Safety Management Plan, ERP = Emergency Response Plan, SSEMP = Site-specific Environmental Management Plan

26. Information of ADB, EBRD, Construction Contractor (CC), “Project Management and Construction Supervision Contractor (PMCSC) and RD representatives involved in the project is given in Table 3; however, the contact details can be available on request.

Table 3: Main Environmental Staff of ADB, EBRD, RD, PMCSC and CC

Organization	Position	Name
ADB	Senior Environmental Specialist Environmental focal	Ninette Pajarillaga
	Associate Safeguards Officer Georgia Resident Mission	Nino Nadashvili
	Environment and Social Monitor	Tamar Lazarashvili
	Community Liaison Officer (CLO)	Tato Karelidze
EBRD	Principal Social Advisor Environment and Sustainability Department	Nurzhan Dzhumabaev
	Advisor, Environmental and Social - EBRD	Louis Collet
Client/ Borrower	Environmental Safeguard Consultant of RD	Luiza Bubashvili
	Environmental Specialist - RD	Rusudan Gholijashvili
	Head of Environmental and Social Division of RD	Mikheil Ujmajuridze
	Health and Safety consultant of RD	Mikheil Bagauri
Project Management and Construction Supervision Contractor (PMCSC) (Engineer)	International Environmental Specialist	Kashif Bashir
	Local Environmental Experts	Nikoloz Sopadze
		Giorgi Lagidze
		Simon Chachanidze
	International Occupational Health and Safety Specialist	Kemal Karaduman
	National Occupational Health and Safety Specialist	Paata Tavdgiridze
	Cultural Heritage Experts	Nikoloz Tskvitinidze
		Amiran Nadirashvili
Contractors	Project Manager	Lot 1 Cen Daoyong
		Lot 2 Yuan Yi

	Environmental Specialist	Lot 1 Paata Chankotadze Cell: +995 599 181753 ECoW and Environmental Specialist for Lot 1 Lela Bachiashvili
		Lot 2 Tamta Kapanadze Olga Tsikoridze
	HSE Specialist	Lot 1 Vladimer Melia
		Lot 2 Zhang Xu
	CH Specialist	Lot 1 Zviad Kvitsiani (part time)
		Lot 2 David Sul Khanishvili (part time) Nikoloz chaduneli (part time)

*Note: The above table only includes the main environmental staff. The PMCS also has in place Cultural Heritage Monitors and both Contracts have Ecological Clerk of Works amongst other environment focused roles. PMCS also has in place the H&S specialists.

27. Under the Contract, the Contractor shall comply with all applicable national and local environmental laws and regulations as well as applicable respective standards under the Contract. The Contractor shall:
- Establish an operational system for managing environmental impacts;
 - Develop the Specific EMPs as well as other site specific and topic specific EMPs by identifying environmental risks arising from the Works, the mitigation measures to be applied, and monitoring to be carried out;
 - Implement the required mitigation measures and monitoring;
 - Take any corrective or preventative actions set out in safeguards monitoring reports that the Employer will prepare from time to time to monitor implementation of the EMP/SEMP; and
 - Submit quarterly monitoring reports to the PMCS/RD as set in the EIA.
28. The Contractors, CRTG for Lot 1 and CRCC for Lot 2, are responsible for implementation of EMP/SEMP throughout the project during construction phase. The "Project Management and Construction Supervision Contractor" (PMCS) UBM (Engineer) is responsible to monitor the implementation of EMP/SEMP by the Contractor at all its active construction sites and project associated facilities.

29. Responsibility of daily management for environmental monitoring and implementation of the SEMP is given to the Environmental Protection Managers of the contractors CRTG and CRCC. The Environmental Managers have direct authority from the Project Manager to give instruction to all site staff regarding environmental issues.
30. Both contractors hired HS Specialists fulfilling the requirement of Article 7 “Organizing and Managing H&S” of Organic Law of Georgia on Labour Safety which states that “The employer having less than 20 employees can personally fulfil professional duties of an occupational safety specialist provided that s/he has completed the programme accredited according to paragraph 6 of this article. In case of 20-100 employees, the employer is obliged to appoint at least one OSH specialist. In case the number of employees is over 100 the special OSH unit needs to be set up, but with no less than two OSH specialist”. HS specialists are available onsite on daily basis and responsible for the maintenance of working environment, accident preventive measures and implementation of developed H&S requirements and procedures. Both contractors have established and are maintaining the medical facilities, and appointed medical staff practitioners.
31. At Lot 1 there are five National HS Specialists: Vladimer Melia (Health and Safety Manager), Akaki Malania (Safety Specialist), Mikheil Donadze (Safety Specialist) and Givi Gujaraidze (Safety Specialist for night shift at Kobi) at Kobi side and one HS Specialist, Giorgi Tandilashvili (Safety Specialist) at Tskere side. In addition to that, three Chinese HS Specialists: Li Yangie (Safety Specialist), Zhang Wenzhao (HSE Specialist) and Tian Yiming (Safety Engineer) are available at Kobi side. In total, there are 8 safety employees at Lot 1 Project.
32. At Lot 2 there are three National HS Specialists: Koba Gvalia (HS Manager), Achiko Otkavani (HS Specialist/Certified Scaffolder), Gia Chitauri (HS Specialist) and two Chinese HS Specialists: Liu Jiang and Zhang Xu. In total, there are 5 safety employees at Lot 2 Project.
33. Contractor for Lot 1 has one Environmental Manager, Paata Chankotadze and one Ecological Clerk of Works (ECoW), Lela Bachiasvili; Contractor for Lot 2 has an Environmental Manager, Tamta Kapanadze who is also responsible for the duties of ECoW. Ecological Clerk of Works (ECoW) of each contractor are responsible for the implementation of the Biodiversity Action Plan (BAP) and ensure that all the workers are aware of the sensitivity of the site in ecological perspective, carry out pre-construction/pre-work surveys for identification of critical habitats and key species and conduct regular biodiversity monitoring of Project area. Lot 2 has added one environmental specialist Olga tsikoridze during the reporting period. She is responsible for the site supervision and preparation of environment documents.
34. Both the Contractors for Lot 1 & Lot 2 have Cultural Heritage Specialists involved in the Project: Zviad Kviciani for Lot 1 and Davit Sul Khanishvili and Nikoloz Chaduneli for Lot 2.
35. The organizational charts for key management staff of CRTG and CRCC are given below in figures 2A & 2B respectively:

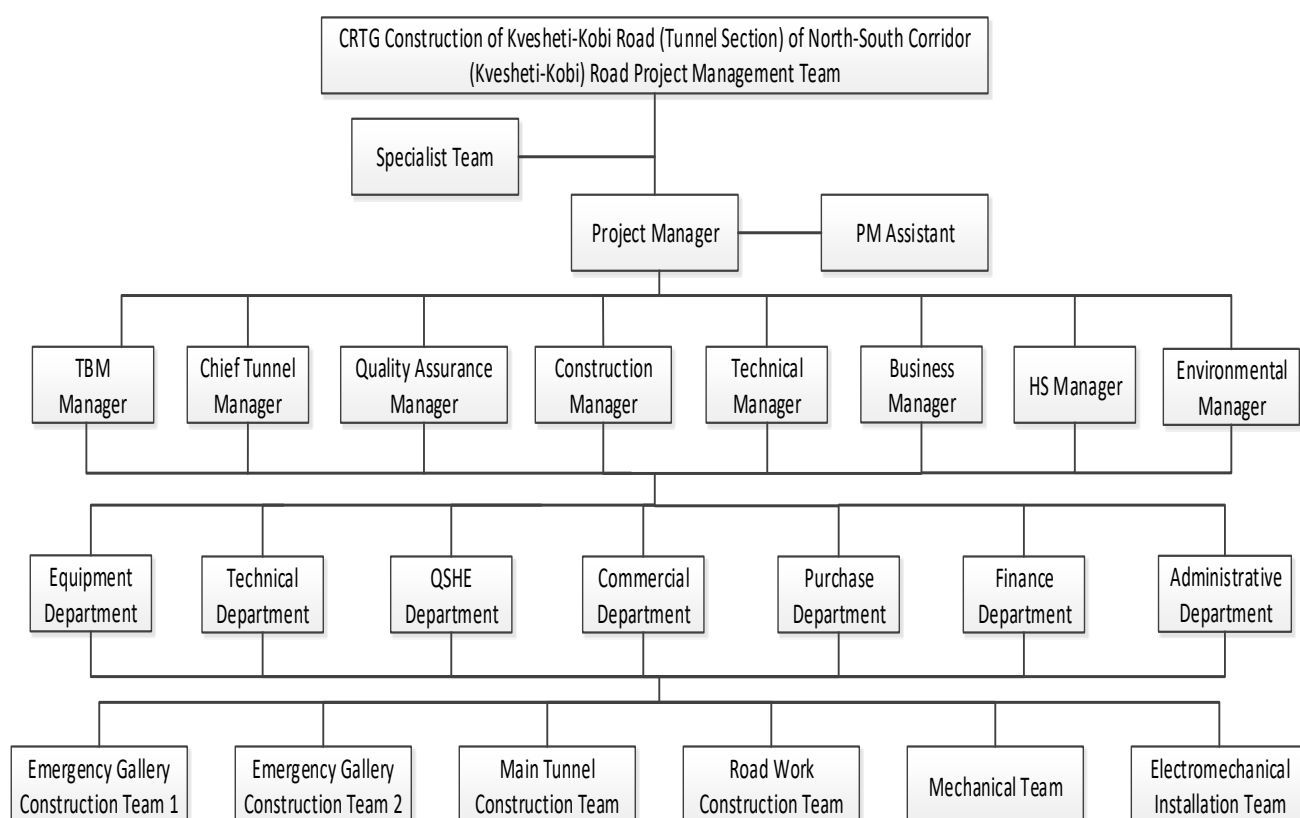
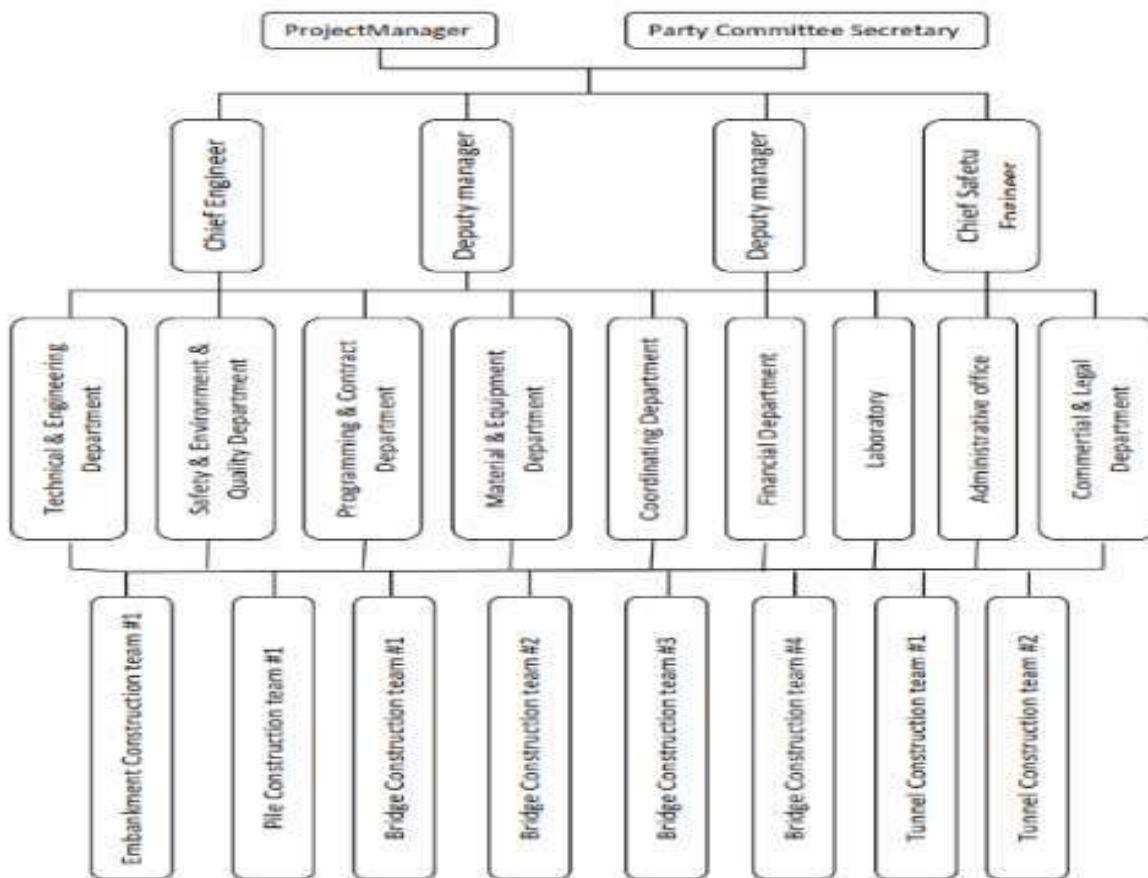
Figure 2A: Contractor (CRTG) Project Management Staff for Lot 1

Figure 2B: Contractor (CRCC) Project Management Staff for Lot # 2



2.3 Project Activities in the Current Reporting Period

Lot 1 Progress of Works up to June 2024:

- **General Items:**
 - Contractor's equipment mobilization – 200 sets (unit of machinery / equipment), 100 %.
 - TBM design and manufacturing – 100%.
 - TBM installation 100%. (The TBM operation of excavation started in October 2021).
 - Gas pipeline relocation design and approval – 100%.
 - Plans and MSs preparation and approval – 100 %.
- **Tunnelling:**
 - Excavation of the main tunnel – From December 31th 2023 to June 30th 2024, 591 m is excavated, until June 3th 2024 100% is excavated.
 - Pre-Tunnel and Post-Tunnel excavation and support – 15 m.
 - Main Tunnel north portal C&C excavation and support – 8860 m.
 - Main Tunnel south portal C&C excavation and support – 0m.
 - Main Tunnel north portal borehole drilling and grouting for fore poling – 100%.

- Main Tunnel south portal borehole drilling and grouting for fore poling 1 – 0m.
- Emergency Gallery-N-S D&B excavation and preliminary support – From December 31th 2023 to June 30th 2024, 1907 m is excavated, until June 30th 2024 95% is excavated.
- Emergency Gallery-S-N D&B excavation and preliminary support – 8269 m.
- Emergency Gallery north portal C&C excavation and support – 7457.2 m.
- Emergency Gallery south portal C&C excavation and support – 811.8 m
- Emergency Gallery north portal borehole drilling and grouting for fore poling – 100%.
- Emergency Gallery south portal borehole drilling and grouting for fore poling – 100%.
- **Bridge:**
 - BRI-7 rehabilitation 0%.
- **Roads:**
 - K12+720-K12+900 Road slop excavation – 0m³.
 - K12+720-K12+900 Road subgrade construction – 0m³.
 - K12+720-K12+900 Road pavement construction – 0m³.
 - K21+968-K22+751 Road embankment construction – 0m³.
 - K21+968-K22+751 Road pavement construction – 0m³.
 - Local Road LRD-12.7 construction – 0m.
 - Local Road LRD-12.9 subgrade and pavement construction – 0m.
 - Local Road LRD-13.1 construction – 0m.
 - Local Road GJ-22.3 subgrade and pavement construction – 0m.
 - Local Road EAO-12.7 construction – 0m.
 - Local Road EAO-22.5 construction – 0m.
- **Operation Area:**
 - OPA-12.8 slope excavation and support – 0m³.
 - OPA-22.0 slope excavation and support – 0m³.
 - OPA-12.8 Facility Building construction – 0%.
 - OPA-12.8 Pump Station construction – 0%.
 - OPA-22.0 Facility Building construction – 0%.
 - OPA-22.0 Pump Station construction – 0%.
- **Retaining Wall:**
 - RWL-12.6 Rockery Wall construction – 0 m³.
 - AWL-12.7 Anchored Concrete Wall construction – 0 m³.
 - CWL-12.7 Cantilever Concrete Wall construction – 0 m³.
 - RWR-12.9 Rockery Wall construction – 0 m³.
 - RWR-21.9 Rockery Wall construction – 0 m³.
- **Construction of Batching Plant, Segment Plant, Crusher and other Construction Facilities at Kobi and Tskere site.**
 - Kobi Batching Plant #1: 100%
 - Kobi Segment Plant: 100%
 - Kobi Crusher Plant: 100%
 - Kobi Explosive Storage Area: 100%
 - Kobi Campsite #1: 100%
 - Tskere Explosive Storage Area: 100%
 - Tskere Campsite #2: 100%
 - Tskere Batching Plant #2: 100%

- Quarries: Kobi near Tergi River, % completed ($303534 \text{ m}^3 / 412470 \text{ m}^3 \times 100$) = 73.6 %
- Quarries: Kobi upstream Tergi River, 100% completed ($113714 \text{ m}^3 / 113714 \text{ m}^3 \times 100$) = 100 % (License expired)

36. Progress of works carried out by Contractor for Lot 1 during the reporting period is summarized in table 4A below:

Table 4A: Construction Progress during Reporting Period for Lot 1 (January- June 2024)

WORK DESCRIPTION	DIMENSION	DESIGN	PROGRESS DURING JANUARY – JUNE 2024	CUMULATIVE PROGRESS FROM START	OVERALL PERCENTAGE %
Bill No.2 Preparatory Works					
A) Demolish					
Demolition of building and bridges	m ²	351	0	0	0
Demolition of reinforced or mass concrete	m ³	350	0	350	100
B) Site Preparation					
General setting out (Repetitive survey by CC for setting out reference points and to confirm the bench marking of the project site for works)	set	1	0	1	100
Site clearance	m ²	55000	0	55000	100
Cutting trees of more than 0.1 m diameter (No red list species uprooted)	set	1	0	1	100
C) Utilities Relocation					
Gas pipeline D700 mm	m	834	0	834	100
Gas pipeline D1200 mm	m	797	0	797	100
D100 cast pipe	m	116	0	116	100
Temporary division of fiber cable	m	920	0	920	100
Division of single mode fiber cable	m	920	0	920	100
Trench excavation and filling for pipes	m	540	0	540	100
D) Surveys					
Additional geotechnical investigation	m	360	0	360	100
Bill No.3 Earthworks					
A) Excavation					
Mechanical excavation	m ³	61900.34	0	61900.34	100

Blasting (<20%) and ripper excavation	m ³	135785.20	0	127136	95
Excavation by blasting	m ³	12876.36	0	12876.36	100
Excavation by pre-splitting blasting	m ³	850	0	850	100
B) Filling					
Embankment construction with material from excavations on site	m ³	276,226.12	0	0	0
Embankment construction with material from borrow pits	m ³	4500	0	0	0
Filling in spoil area, distance <2km	m ³	2135532.76	326404.8	1757945.25	82.3
Filling in spoil area, distance 2km~10km	m ³	548192.76	548192.76	548192.76	100
Riprap protection	m ³	43576.10	0	0	0
Filling on C&C structure	m ³	144672.77	0	0	0
B) Slope support and protection					
Spray concrete on slopes	m ³	91.58	0	91.58	100
Slope protection with wire mesh	m ³	915.84	0	915.84	100
Passive bolts for slope protection	M	465	0	465	100
Bill No.4 Road Pavements					
Asphalte surface course	t	26740.68	0	0	0
Asphalte base course	t	7168.59	0	0	0
Tack coat	m ²	142587.77	0	0	0
Prime Coat	m ²	46296.97	0	0	0
Crushed rock base course	m ³	5303.27	0	0	0
Frost blanket course	m ³	17506.74	0	0	0
Concrete pavement	m ³	9938.7	0	0	0
Bill No.5 Drainage					
A) Longitudinal Drainage					
Triangular ditch, 0.4m width	m	1400.7	0	0	0
Trapezoidal ditch, 2m width	m	585	0	0	0
Trapezoidal ditch, 1m width	m	730	0	0	0
Precast channel for drainage of spills from the tunnel	m	18136	0	0	0
Plain pvc pipe ø 350 mm	m	18196	0	0	0

Sewer manhole	set	353	0	0	0
B) Cross-drainage					
Reinforced concrete pipe on concrete bed ø 400 mm	m	134	0	0	0
Precast siphon manhole	set	302	0	0	0
Reinforced concrete pipe on concrete bed ø 1800 mm	m	190	0	0	0
C) Spoil Area Drainage					
Drainage for existing water courses	m	1723.66	0	0	0
Bill No.6 Tunnel 5					
A) South Portal Tskere					
French drain construction	m	2099.76	0	500	25
Passive bolt for slope protection	m	9,866.88	0	8200	95
Steel mesh for support	m ²	5776	0	5000	87
Cable anchor for slope protection	m	7038	0	0	0
Reinforced concrete	m ³	1010.8	0	500	50
Sprayed concrete	m ³	685.2	0	600	88
Umbrella micro pile ø 101 mm	m	705	0	705	100
Reinforced concrete in C&C section	m ³	13375.17	0	0	0
Corrugated steel bars in passive reinforcement	kg	1832374.35	0	0	0
PVC waterproofing	m ²	15,269.07	0	0	0
B) North Portal Kobi					
Passive bolt for slope protection	m	1976	0	1976	100
Cable anchor	m	475.8	0	475.8	100
Sprayed concrete	m ³	132.47	0	132.47	100
Umbrella micro pile ø 101 mm	m	1020	0	1020	100
Reinforced concrete in C&C section	m ³	642.33	0	642.33	100
Corrugated steel bars in passive reinforcement	kg	99561.03	0	99561.03	100
C) Underground Tunnel 5					
Main Tunnel excavation and support by TBM	m	8860	1501	8860	100
Pre-Tunnel and Post-Tunnel excavation and support	m	30	0	30	100
Emergency Gallery excavation and preliminary support	m	8854.59	1752	8553	95

Emergency Gallery invert construction	m	8854.59	0	2627	38
Emergency Gallery lining construction	m	8854.59	0	865	10
Cross Passages excavation and support	set	18	7	12	67
Traffic substructure construction	m	8860	0	1640	18
Ventilation structure construction	m	8860	0	142	1.6
Bill No.7 Bridge 7- Rehabilitation					
Bridge 7 rehabilitation	set	1	0	0	0
Bill No.8 Retaining Walls and Other Structures					
Rockery Wall RWL-12.6	set	1	0	0	0
Rockery Wall RWR-12.9	set	1	0	0	0
Rockery Wall RWR-21.9	set	1	0	0	0
Anchored Concrete Wall AWL-12.7	set	1	0	0	0
Cantilever Concrete Wall CWL-12.7	set	1	0	0	0
Bill No.9 Road Signaling, Marking and Safety Barriers					
Main roads	m	10031.16	0	0	0
Emergency Gallery	m	9068	0	0	0
Local roads	m	390	0	0	0
Bill No.10 Tunnel Facilities					
Power supply	set	1	0	0	0
Lighting	set	1	0	0	0
Ventilation	set	1	0	0	0
Fire fighting	set	1	0	0	0
Security, monitoring and control	set	1	0	0	0
Operation control center	set	1	0	0	0
Infrastructures	set	1	0	0	0
Bill No.11 Technical Buildings					
Facilities Building Tskere	set	1	0	0	0
Pumping Building Tskere	set	1	0	0	0
Facilities Building Kobi	set	1	0	0	0
Pumping Building Kobi	set	1	0	0	0
Facilities	set	1	0	0	0
Bill No.12 Road Equipment					
A) Infrastructure (Ducts)					
Duck bank	m	1350	0	0	0
Cast iron manhole	set	44	0	0	0
B) Medium Voltage					
Switching center	set	6	0	0	0
Three-phase line	m	9500	0	0	0
C) Road Lighting					
Main roads	m	963.16	0	0	0

Local roads	m	390	0	0	0
D) Telecom					
Fiber optic network	set	1	0	0	0
Lan multiservice network	set	1	0	0	0
Bill No.13 Environmental Measures					
Top soil excavation	m ³	51004.09	3152	64012.09	125.5
Distribution of top soil	m ³	50000	0	0	0
Manual seeding	m ²	150000	0	0	0
Planting of trees, shrubs and plants	lump-sum	1	0	0	0
Hydro-seeding of green slopes	lump-sum	1	0	0	0
Special measures and treatments during construction	lump-sum	1	0.09	0.66	66
Noise barriers	PS	1	0	0	
Soil stabilization treatments	lump-sum	1	0.14	0.67	67
Inspection, monitoring, control and reports	lump-sum	1	0.1	0.67	67
Fencing H=2.0 m	m	120	0	0	0
Asbestos PPE According to EMP	lump-sum	1	0	0	0
Bill No.14 Temporary Works and Diversions					
TD-13.1	SET	1	0	0	0
TD-22.3	SET	1	0	0	0
Bill No.15 Local Road Diversions, Service Roads and Emergency Access to OPAs					
LRD-12.9 (TSEKERE AXIS)	SET	1	0	0	0
LRD-13.1	SET	1	0	0	0
EAO-12.7	SET	1	0	0	0
EAO-22.5	SET	1	0	0	0

Lot 2 Progress of Works up to June 2024

- **General Items**

- Contractor's equipment mobilization – 125 sets (unit of machinery / equipment), 80 %
- Plans and MSs preparation and approval – 100 %.

- **Tunnel 1**

T1:

- Top guide 1:0m. (TOP Headings I、II)
 - Top guide 2: 0m.
 - Bottom guide 3:106m (Bench III、IV、V)
 - Bottom guide 4: 13m
 - Bottom guide 5: 197.5m
 - Elevation arch 6: 451.2m
 - Final lining : 635.7m
- (Note: excavation for tunnel 1 completed)

- **Tunnel 2:** Excavation 0 m³

- **Tunnel 3:**

T3 exit:

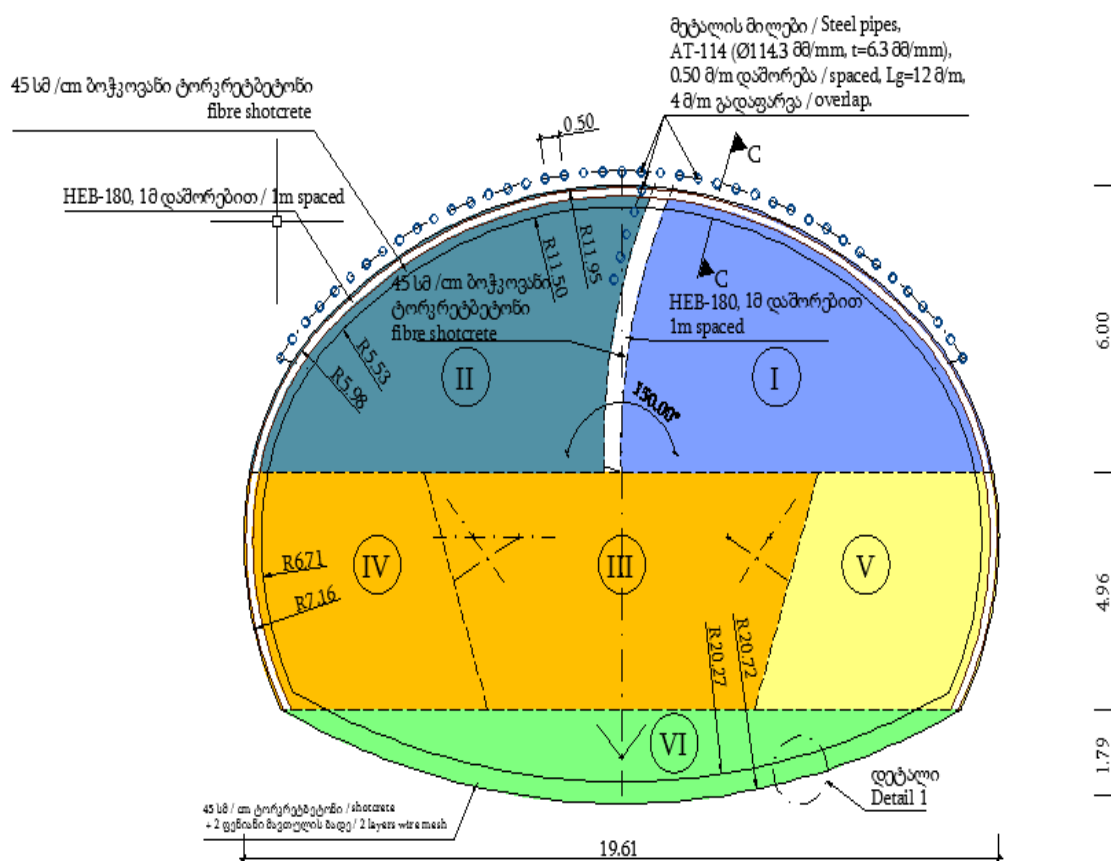
- Top guide 1: 0m. (TOP Headings I, II)
- Top guide 2: 0m.
- Bottom guide 3: 0m (Bench III, IV, V)
- Bottom guide 4: 0m
- Bottom guide 5: 0m
- Final lining: 310m

(Note: Excavation for tunnel 3 completed)

- **Tunnel 4:** Excavation 11000m³

37. In the monitoring period the contractor for LOT 2 (CRCC) has embarked on earthworks along the Gudauri access road. This phase of the project involved the removal of topsoil, a process closely scrutinized by the Engineers' Cultural Heritage team.
38. The details about the working face of tunnel excavation inside the tunnel including top and bottom guide of the tunnel is given in Figure 3.

Figure 3: Working face for tunnel excavation



- **Bridges:**
 - B2 (Bridge N2): 90 each pile foundations completed. All pile cap and All pier has been finished, P4 beam has been completed 42m, A1-P1 beam has been completed 67m, P3 beam has been completed 32m, P1-P2 beam has been completed 30m
 - B3: P1、 P2、 P21、 P22、 P19 pile foundations completed.
 - B4: A1、 P1、 P2 pile foundations completed. A1and P1 pile cap has been finished, A1Abutment and P1 pier has been finished.
 - B5: P1、 P5、 P6、 A2 pile foundations completed, A2and P6 pile cap has been finished, A2 Abutment and P6 pier has been finished.
 - B6: A1、 P1、 P4、 A2 pile foundations completed ,A1\P1\A2\P4 pile cap has been finished, A2、 A1 Abutment and P4、 P1 pier has been completed .
- **Roads:**
 - KM0+200-400 - 50000 m³.
Filling 50000m³, Filling- 100%.
 - KM0+400-800 220000 m³.
Filling 220000 m³, Filling- 100%,
 - KM0+800-1+100 190000 m³.,
Filling 190000 m³, Filling- 100%,
 - KM1+100-km1+260 80000 m³
Filling 52000 m³ -65%.
 - KM5+920-KM6+180 26000m³
Filling 26000 m³ -100%
 - KM6+180-KM6+300 25000m³
Filling 25000- 100%
 - KM6+300-KM6+400 14000m³
Filling 14000- 100%
 - KM6+400-km6+770 32000 m³
Filling 32000 -100%
 - KM6+870-KM7+545 40000 m³
Excavation completed 40000-100%
 - KM9+020-KM9+140 40000
40000m³ of excavation, excavation completed-55%
 - KM9+980-10+160 15000 m³
15000m³ of excavation, excavation completed-40%
- **0.7 culvert:**
Has been finished
- **1.0 culvert:**
Has been finished
- **2.2 culvert:**
Has been finished
- **2.6 culvert:**
Has been finished
- **5.9 culvert:**
Has been finished
- **7.6 culvert**
Has been finished
- **7.9 culvert**

- Has been finished
- **CWR1.3**
Has been finished
- **CWR2.3:**
Has been completed 20%
- **CWL2.7:**
Has been finished
- **CWL9.2:**
Has been completed 70%
- **CWR10.1:**
Has been completed 30%
- **Temporary Facilities:**
 - Camp # 1 100 %
 - Camp# 2 100 %
 - Camp # 3 100 %
 - Batching Plant 1 100 %
 - Batching Plant 2 100 %
 - Batching Plant 3 100%
 - Parking and maintenance area 100%
 - Explosive Storage Area: 100 %
- **Quarry Area:**
 - Mleta Quarry – 90%
 - Quarry Near Parking area – 90%

39. Progress of works carried out by Contractor for Lot 2 during the reporting period is summarized in table 4B below:

Table 4B: Construction Progress During Reporting Period for Lot 2 (Jan-June 2024)

Work description	Dimension	Design	Actual during reporting period	Cumulative	%
Bill No.2 Setting Out and Site Clearance					
Site clearance, average depth=20 cm	m ²	200000	161641.84	358906.88	100
Tree felling, trunk diameter	each	350	0	350	100
BILL No. 3. Earthworks					
Excavation of soil mechanically	m ³	624751.30	0	218985.37	35
Excavation of soil by means of blasting	m ³	1100470.8	0	167744	15
Construction of embankment	m ³	1138441.2	0	827292.92	72.67
Slope protection	m ³	2651.02	0	289.81	10.93
BILL No. 4. Road Pavements					
Frost blanket course (fbc)	m ³	63663.16	0	0	0
Crushed rock base course (crbc)	m ³	33352.92	0	0	0
Asphalt base course (abc)	t	64940.45	0	0	0
Asphalt surface course (asc)	t	54012.21	0	0	0
BILL No. 5. Drainage					
Longitudinal ditches	m	27710	0	1334.63	4.8
Cross-drainage	m	1742	0	500	28.7
BILL No. 6. Tunnels 4 sets					

Tunnel 1	set	1	0.12	0.94	94
Tunnel 2 (C&C 9.0)	set	1	0	0	0
Tunnel 3	Set	1	0.24	0.98	98
Tunnel 4 (C&C 12.0)	set	1	0	0	0
BILL No. 7. Bridges 5 sets					
Bridge-2	set	1	0.03	0.56	56
Bridge-3	set	1	0.01	0.03	3
Bridge-4	set	1	0	0.26	26
Bridge-5	set	1	0.02	0.12	12
Bridge-6	set	1	0.012	0.19	19
BILL No. 8. Retaining walls and other structures					
Retaining walls	piece	10	2	4.2	42
Box culvert – 15m X 5.5m	Linear meter	45	0	45	100
Box culvert – 13m X 6.65m	Linear meter	14.6	0	14.6	100
Box culvert – 15.82m X 3.8m	Linear meter	15.82	15.82	15.82	100
Box culvert – 4m X 5.5m	Linear meter	18	0	18	100
Box culvert – 2.5m X3m	Linear meter	20.38	0	20.38	100
BILL No. 9. Road signaling, marking and safety barriers					
Main roads	Km	12.72	0	0	0
Secondary roads	Km	4.96	0	0	0
BILL No. 10. Tunnel facilities					
Tunnel 1	set	1	0	0	0
Tunnel 2 (C&C 9.0)	set	1	0	0	0
Tunnel 3	set	1	0	0	0
Tunnel 4 (C&C 12.0)	set	1	0	0	0
BILL No. 11. Technical buildings					
Technical buildings	set	4	0	0	0

2.4 Information of Personnel Working on Construction Site

40. Overall staff hired by the Contractors CRTG and CRCC up to June 2024 and working at site are given below in Table 5A & 5B respectively:

Lot 1 (CRTG Contractor) – June 2024

Total number of employees – 651

Foreign Staff – 331

Georgian Staff (total) – 320

Table 5A: Information of Personnel Working at Site during Reporting Period (Lot 1)

#	Position	Contractor		Subcontractor		Sum
		Foreigner	National	Foreigner	National	
1	Project Manager	1	-			1
2	PM Assistant	1	-			1
3	Chief Tunnel Manager	1	-			1
4	TBM Manager	0	-			0
5	Deputy TBM Manager	1	-			1
6	Technical Manager	1	-			1
7	Construction Manager	2	-			2

8	QA/QC Manager	1	-			1
9	HS Manager	-	1			1
10	HS Specialist	3	4			7
11	Environmental Manager	-	1			1
12	ECoW	-	1			1
13	Technical Department	26	1			27
14	Finance & Administration	2	0			2
15	Commercial Engineer	3	0			3
16	Foreman	53	-			53
17	Repairman	7	8			15
18	Mechanical Department	10	-			10
19	Driver	59	92			151
20	Skilled Labour	119	25			144
21	Unskilled Labour	37	169			206
22	Community Liaison Officer	0	1			1
23	CH specialist	0	1			1
24	Security Guards	0	12			12
25	Medical Staff	0	3			3
26	Kitchen Staff	5	3			8
27	Cleaners	0	2			2
	Total	331	320			651

Lot 2 (CRCC Contractor)

Total number of employees – 406

Foreign staff – 256

Georgian staff (total) – 150

**Table 5B: Information of personnel working at site during reporting period (Lot2)
June 2024**

#	Position	CRCC		SUBS		SUM
		Foreign	National	Foreign	National	
1	Project Manager	1	0			1
2	Deputy Manager	3	0			3
3	Deputy chief engineer	2	0			2
4	Engineer staff	6	1			7
5	Office workers (Administration)	3	0			3
6	Technicians	6	1			7
7	Skilled labor	6	4			10
8	Unskilled labor	5	5			10
9	Drivers	6	2			8
10	Operator	22	40			62
11	Bridge and culvert team	95	2			97

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

12	Finance and administration	3	1			4
13	Environmental Manager – EcoW	0	1			1
14	Environmental field assistant	0	1			1
15	Health and Safety Manager	0	1			1
16	Health and Safety Specialist	2	2			4
17	Foreman	6	0			6
18	Repairman	7	4			11
19	Pile works crew	31	15			46
20	Security Guards	0	6			6
21	Mechanical department	4	1			5
22	Tunnel works crew	42	46			88
23	Cultural heritage officers(part time)	0	2			2
24	Community Liaison Officer	1	1			2
25	Geological survey staff	0	2			2
26	Cook	4	4			8
27	Cleaner	0	2			2
28	Medical staff	0	6			6
	Total	256	150			406

41. The graphical presentation of number of foreign and local staff hired by the contractor CRTG and CRCC and working at site is shown in the figures 4A & 4B respectively.

Figure 4A: CRTG Personal at Site as of June2024 (Lot 1)

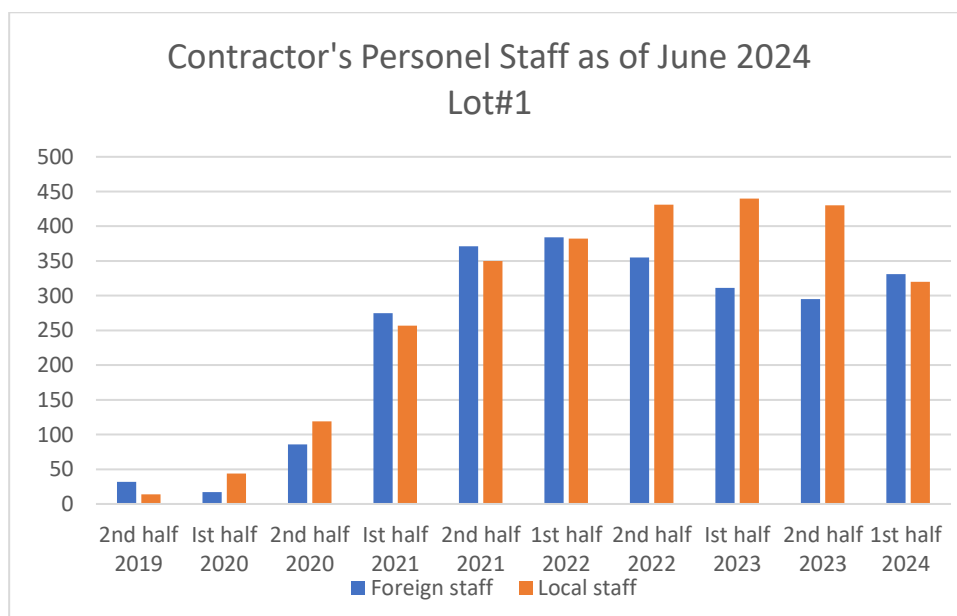
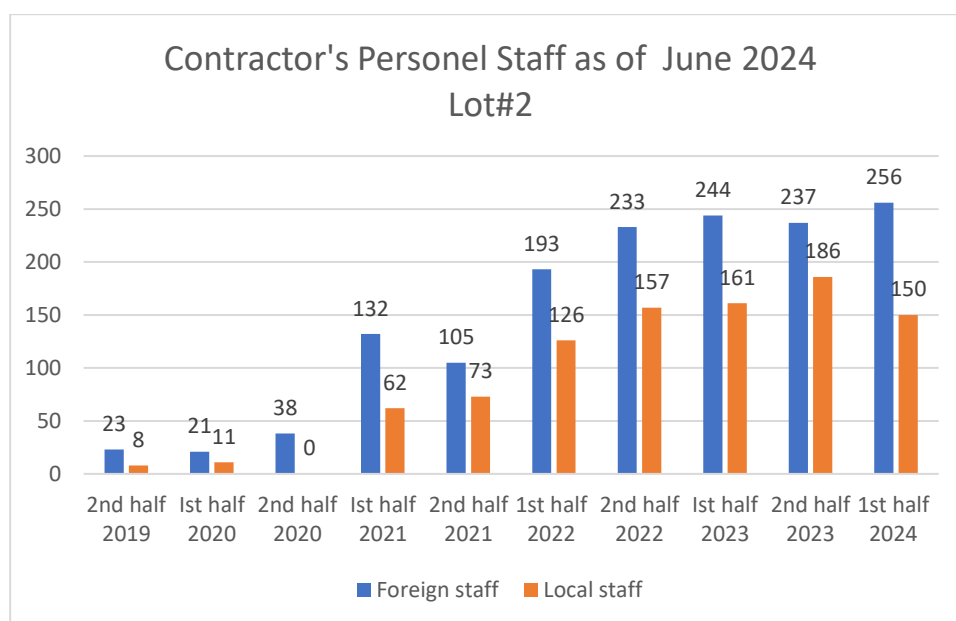


Figure 4B: CRCC Personal at site as of June 2024 (Lot 2)

42. Minor decrease in total number of staff for Lot 1 and Lot-2 was observed during the reporting period depending upon the nature of ongoing activities and construction progress made by the Contractors. The ratio of the local to foreign workers is 50.8 % foreign and 49.2 % local workers for Lot 1; while 63 % foreign workers and 37 % national workers for Lot 2. Lot 1 national staff was decreased because the works have been decreased in the segment plant and completion of TBM excavation.
43. Information regarding the mobilization of “Project Management and Construction Supervision Contractor” (PMCSC) staff is given in the Table 6.

Table 6: Information of PMCSC (Engineer) Staff Status (June 2024)

NO	Name of Team Member	Position held	Mobilization Status
International Staff			
1	Kemal Karaduman (CP01,CP02)	Senior Occupational Health and Safety Specialist	Mobilized
2	Abdul Hameed (CP01,CP02)	Senior Resettlement/ Social Development Specialist	Mobilized
3	Kashif Bashir (CP01,CP02)	Senior Environmental Specialist	Mobilized
National Staff			
1	Nikoloz Sophadze (CP01, CP02)	Environment Specialist	Mobilized
2	Tamar Javakhi (CP01, CP02)	Resettlement/ Social Development Specialist	Mobilized
3	Paata Tavdgiridze (CP01, CP02)	Occupational Health and Safety Specialist	Mobilized
4	Zaza Devdariani (CP01, CP02)	Road Safety Engineer	Mobilized
5	Giorgi Chalatashvili (CP 01)	Occupational Health and Safety Specialist	Mobilized

6	Emir Ibrahimov (CP 02)	Occupational Health and Safety Specialist	Mobilized
7	Lado Gorsiridze	Occupational Health and Safety Specialist	Mobilized
Non-Key Staff			
1	Nikoloz Tskvitinidze (CP01, CP02)	Cultural Heritage Expert	Mobilized
2	Amiran Nadirashvili (CP01, CP02)	Cultural Heritage Expert	Mobilized
3	Simon Chachanidze (CP01)	Environment Field Officer	Mobilized
4	Giorgi Lagidze (CP02)	Environment Field Officer	Mobilized

2.5 Description of Any Changes to Project Design

44. No change in the project design was approved during the reporting period.

2.6 Description of Any Changes to Agreed Construction Methods

45. No changes to the agreed construction methods were approved during the reporting period.

3. ENVIRONMENT SAFEGUARD ACTIVITIES

3.1 Description of Environment Safeguards Activities

46. **General** - During the daily monitoring, the PMCSC's environmental specialists check the environmental impacts caused by the construction activities and the compliance with the requirements of EIA, EMP, with national and international standards and conditions of contracts.
47. **Biodiversity** – The Project Management and Construction Supervision's international environmental expert prepared Biodiversity Monitoring and Evaluation Program (BEMP) and monitors the implementation of Biodiversity Action Plan (BAP) along with the Contractors' Ecological Clerk of Works (ECoW).
48. A standalone Project "Biodiversity Action Plan (BAP)" for those specific species or habitats of greater note has been prepared. The BAP will help ensure no net loss, or if required, net gain of natural habitats and support notable species of conservation importance. The responsibility for the implementation of the BAP is both with the PMCSC and Contractor who will outsource specific components of the BAP to external organizations, such as conservation societies, NGOs or universities.
49. The personnel hired as ECoWs for Lot 1 and Lot 2 involved in the project continue to work. The ECoWs have carried out the biodiversity pre-construction survey for the whole project and for each site before the commencement of any construction activity. During the reporting period, a pre-construction biodiversity survey was also conducted for the Gudauri Access Road by Lot 2. For Lot 2, three Photo traps have been installed at different places in the project area and the locations for the camera are being changed from time to time. For Lot 1, three camera traps were installed in Kobi and two ones installed in Tskere site. Contractor for Lot-1 has bought one camera for fish monitoring in May 2024 and started fish monitoring in the Khada River. The ECoWs

from each Contractor are monitoring the species movement in the Project Area of Influence (For detail see section 4.1.1 Biodiversity Monitoring).

50. **Cultural Heritage** - Cultural Heritage (CH) Monitors of PMCSC and Contractors are responsible for ensuring the protection of cultural heritage in the Project Area of Influence (AoI) in accordance with the Georgian Law on Cultural Heritage and coordinating with the Ministry of Culture and Monument Protection of Georgia.
51. The cultural heritage specialists of PMCSC have developed an online map dedicated to CH sites. This innovative tool serves as a dynamic and accessible resource for project stakeholders, construction teams, and the IFIs. The online map includes all cultural heritage assets identified by the National Agency for Cultural Heritage Preservation (NACHP) during their thorough survey. This encompasses archaeological sites, historical structures, cultural landscapes, and other significant elements. One of the primary advantages of this online map is its ability to provide real-time updates. Cultural Heritage Specialists can input data about chance finds as they occur, ensuring that the map remains current and accurate. The map also serves as a vital tool for risk mitigation. It highlights construction zones in relation to known cultural heritage sites, enabling construction teams to take proactive measures to avoid or minimize potential impacts.
52. Detailed information about cultural heritage and archaeological activities carried out in the reporting period is presented in section 4.1.2 Cultural Heritage Monitoring.
53. **Occupational and Community Health and Safety** – Health and Safety Specialists of PMCSC and Contractors are responsible for ensuring an effective health and safety management system is maintained during implementation of the Project. Detailed information about HS related activities carried out in the reporting period is presented in section 4.1.3 Health and Safety.
54. **Non-compliance** - identification and reporting of non-compliance at site, finding solutions to improve non-compliance issues with PMSCS and the Contractors relevant personnel and setting deadlines for corrective actions. PMSCS is following up on corrective actions and deadlines. The non-compliances are recorded, and in case of corrective actions delay, the Contractor is informed in written by issuing the letter and Non-Compliance Report (NCR) to take corrective actions. Contractor is required to take the corrective action during the time period additionally mentioned in the NCR. PMCSC follow up for the corrective action and inspect the site. If during the inspection the Contractor fails to implement properly the corrective actions, another NCR will be issued. Before issuing NCR, the issues are being highlighted through HSE weekly reports, with official letters, verbally and based on these CC is providing Corrective Action Reports to close these issues and if not resolved, PMCSC is issuing the NCR to CC.
55. During the reporting period PMCSC issued several letters to the contractors for Lot 1 & Lot 2 to correct the non-compliance observed and speed up the response from the contractor. However, response for replying to the letter from Contractor for Lot 2 was slow. The details of the important letters are given in Table 8D. No NCR issued during the reporting period related to environment safeguard.
56. **Reporting** - The PMCSC's international and national environmental specialists prepare the monthly and semi-annual reports that are submitted to the RD. These reports depict the ongoing construction activities, environmental safeguard issues and

the status of compliance. Contractors are submitting the monthly and quarterly Environmental Monitoring Reports as set in the EIA.

57. **Site Visits** - Environmental specialists of the contractor and the PMCSC conduct weekly joint site visits to monitor the compliance with EMP. Besides that, PMCSC conducts daily inspections of active and passive sites. Topsoil stripping, waste management at camps and construction sites, and wastewater proper management is supervised by PMCSC on a daily basis, etc. In addition to that, the Contractor's and PMCSC's H&S specialists monitor the compliance of the Project activities with the health and safety requirements and procedures through daily worksite visits and inspections. These visits include daily inspection of all tunnels works, bridge construction activities, scaffolding systems, elevated platforms and behaviour of workforce. During worksite inspections, attention is always paid to community health and safety to ensure proactive identification of the problems. Worksite fencing and signages are permanently checked and if necessary, replaced/fixed to alert locals about hazards associated with the construction process and prevent unauthorized access to worksites. Health, Safety and Environmental (HSE) report is being prepared by PMCSC specialists regularly. CH experts of PMCSC and the Contractors are available at sites for visual monitoring of the CH Sites. They are responsible for continuous monitoring of earth moving works, especially, close to the CH Sites and daily monitoring of preservation works of CH Site.
58. Activities carried out by PMCSC during the reporting period (international and national, respectively) are provided in Table 7A below.

Table 7A: Environmental Safeguards Activities Carried out During Reporting Period (January - June 2024)

Environmental Safeguard Activities	
The International Environmental Expert (Kashif Bashir) of PMCSC (PMCSC)	
-	Field activities: Frequent site visits were carried out during reporting period from January - June 2024 by the environmental experts of the PMCSC at the Lot 1 active construction site at TUN5 North Portal and Emergency Gallery (EG) and South Portal at Tskere, spoil disposal areas and temporary facilities, and Lot 2 worksites, temporary facilities and access roads and Gudaury Access road to monitor the compliance of mitigation measures suggested in the EMP. The method adopted for inspection include visual inspection, interview with workers and community and checking the accident records, permits obtained, daily and weekly quality control reports. From February to April 2024, several visits were carried out to monitor the drainage issues at Lot 1 SDA 3 in Kobi, tunnel water discharge from the TUN5 specifically in Tskere, drainage issues for the batching plants in Kobi and Tskere, hazardous material storage area in crushing plant related to oil spill and hazardous material storage, slope stability issues at Tskere, and access road 4 for Lot 2, drainage issues for batching plants on plateau, flooding of private land and fencing of batching plant 2 for Lot 2, and housekeeping and drainage issues at campsite 1,2 &3 for Lot-2. During the months of March 2024, joined the ADB country resident mission for the site visits and later on CRP mission in June 2024 and gave the briefing about the project environment safeguard. Conducted several meetings with contractors for Lot-1 and Lot 2 during the month of May 2024 to eliminate the non compliances at the site and improve the housekeeping at Lot-1 and Lot-2 Specifically, to remove the hazardous waste behind the segment plant in Kobi. Supervised the cleaning of the sedimentation ponds to treat the tunnel water in Kobi as well as in Tskere as the turbidity levels increased due to washing of the TBM tunnel. Helped the contractor for the Lot-2 to prepare the SEMP documents for Gudaury Access Road Project and Dust amangement plan for Lot-2.

- Prepared the Semi-annual report covering the period of January -June 2024 based on the monitoring, non-compliances observed, letters issues during the reporting period, corrective actions taken by the contractor and further recommendations made by PMCSC for the upcoming quarters. - Conducted training for Contractors' Management on environmental safeguard requirements at pre-construction, construction and decommissioning stages. - Monitor the corrective actions are implemented by the deadline. Followed up with the CC for the corrective action during the weekly progress meeting and by writing letters for the compliance. - Coordinated with RD and the lenders, attended meetings with client, lenders, CRP and Contractors.
The National Environmental Expert (Nikoloz Sofadze) and Field Officers (Simon Chachanidze, Giorgi Lagidze) of PMCSC (UBM)
- Field Activities: Prepared the Checklists for monitoring compliance during site visits and pre-construction requirements to be fulfilled before starting the new construction activity by Contractor for Lot 2 at Bridge 3, Bridge 4, Bridge 5 & Bridge 6 and signed by PMCSC. During the reporting period from January- June 2024 monitored the campsites and active construction sites on a daily basis and with CC environmental officer on weekly basis, gave instruction for the non-compliances observed in the field, uploaded the pictures on WhatsApp group, issued official letters along with instructions. Discusses sensitive issues at HSE meetings. Monitored the instrumental monitoring is being carried out by the certified laboratory for air, noise, ground water, surface water and vibration on a monthly basis. - Monthly EMR: Coordinated with International Expert for preparation of monthly EMR and reviewed the CCs EMR and Environmental Instrumental Monitoring Reports. - Monitored the corrective actions are implemented, followed up with the CC in weekly progress meetings to take corrective actions and replied to the letters from RD and CCs. Reviewed and approved updated plans submitted by the Contractors. - Provided guidance to the Contractors and coordinated with the Lenders and RD. - Coordinated site inspections with the field officers: Simon Chachanidze, responsible for site inspection at Lot 1 and Giorgi Lagidze, responsible for site inspection at Lot 2. They were trained by PMCSC environment specialist to prepare the weekly monitoring reports.
CH Expert Duties Performed: Nikoloz Tskvitinidze and Amiran Nadirashvili of PMCSC (UBM)
- Attended all earth-moving activities to ensure protection and proper treatment of the chance finds. - Daily monitoring of CH Sites during the monitoring period from January – June 2024, including monitoring of CH Sites under conservation such as CH Site #10, on Didveli Plateau and Archaeological works at ROW km 10-11 in Khada Valley. - Ensured the corrective actions were implemented, followed up with the CC in weekly progress meetings to take corrective actions, and replied to the letters from RD and CCs. Provided advice to the Project Engineers and other staff to fulfil the requirements of the SEMP and CHMP; - Preservation of known and unknown (archaeological) cultural heritage sites, the presence and nature of which could not be established (or established with sufficient accuracy) in advance of development. - Ensured the Contractor follows his Cultural Heritage Management Plan and follows the Chance Find Procedure; remained present during site clearance (i.e. clearing, Topsoil stripping, grading, etc.) and earthworks to assist with the initial evaluation of archaeological chance finds, helping to distinguish archaeological finds from non-archaeological anomalies and to communicate initial data on such findings to Contractors project personnel, the Engineers Team Leader / Resident Engineer, Ministry of Culture and Sport and the RD; - Visual inspection of above ground cultural heritage that could be affected by vibration impacts as outlined in the EIA. - Prepared monthly EMR and reviewed the CCs EMR and vibration monitoring reports. - Permanently monitored vibration on certain CH Sites. - Managed GIS online map/database system prepared within the project (by the CH specialists of PMCSC).
Activities Performed by H&S Team of PMCSC (UBM) & RD

- Conducted regular worksite inspections during the reporting period. These inspections were carried out separately by the Contractor and the Engineer and as well as together. The inspections were documented on the inspection check list and signed by all parties.
- Attended the First Aid training was conducted on Lot 2 section by a third party, invited company. As a result, 15 first aiders were trained. All first aiders were allocated at different worksite and hence, all working crews have first aiders permanently available with them.
- Supervised arrangement of a medical facility at Tskere worksite which was equipped with necessary medical equipment. Also, additional doctor was mobilized at Tskere on full time basis, permanently available at Tskere worksite.
- Attended the emergency response drill conducted at Lot 1 for evacuation and protection measures from avalanche risks.
- Attended the emergency response drill conducted at Lot 1 Tskere campsite with the fire emergency scenario. The alarm system, coordination of personnel evacuation and medical assistance are being tested during the drill. First aiders were involved in the evacuation of the injured person and providing a first aid.
- Provided several trainings on H&S requirements for both Contractors.
- Participated in permanent inspection of all scaffolding systems at Lot 2 section. Certified scaffolder specialist is responsible for it who inspects scaffoldings and applies scaff-tags. Also, the scaffolding erection process is carried out under the supervision of certified scaffolder.
- Regular inspection of atmospheric hazards in tunnels at both Lots. The Engineer takes a gas test at different, predetermined locations along the tunnels.

3.2 Site Audits and Inspections

59. Frequent site visits were carried out by the safeguard team of the PMCSC, RD and Lender's representatives of the following sites:
- Construction Campsites of the Contractors
 - Segment Plant and waste yard behind segment plant
 - Access roads
 - Spoil Disposal Areas
 - Topsoil storage areas
 - Tunnels
 - TBM
 - Bridges
 - Under Passes
 - Culverts
 - Batching Plants
 - Workshops
 - Explosive Storage Areas
 - Crushing Plant
 - Quarries
 - Road Sections
60. The method adopted for inspection by PMCSC and RD include visual inspection (helping with relevant devices, JPS, drone and etc)., interview with workers and community, checking Contractors' documentation, conducting daily and weekly progress meeting with the Contractors' safeguard team as well as ad-hoc meetings to discuss the sensitive environmental safeguard issues with Contractors.
61. In March 2024, an environmental safeguard review mission was conducted by ADB (including safeguards specialists and consultants). ADB, RD, PMCSC and Contractors representatives conducted one day field visit. The findings from the field observations

were subsequently discussed and actions agreed individually with each Contractor at the relevant campsites. RD forwarded ADB review mission report summarizing the findings and agreed actions to PMCSC to ensure implementation of the agreed corrective actions in a proper and timely manner by Contractors. For details refer to section 7.3 ADB Mission Corrective Action Plan.

62. In April 2024, EBRD's E&S monitore, GAEA Consulting Ltd, conducted a site visit. The monitoring report is expected to be delivered in the next reporting period.
63. In June 2024 Compliance Review Panel (CRP) conducted a four-day field visit from June 04 -07, 2024 and held meetings with PMCSC and visited both the sites Lot-1 and Lot 2 of the project area. The issues discussed with PMCSC mainly included: safeguard staff of PMCSC, spoil management and capacity of SDAs at Lot 1 and Lot 2, tunnel water management, and treatment, Gudauri Access road approval of SEMP's and ongoing construction activities, project overall progress, vibration measurement at the site, photo traps installed at the site and movement of the faunal species, GIS mapping of the CH site and conservation of the CH site and dust management issues for Lot 2.
64. As a result of this visit, the CRP recommended addressing dust management issues by developing and implementing a Dust Management Plan for Lot-2.
65. Based on the safeguard policy requirements of ADB and Government of Georgia, to conduct an external independent monitoring and assessment of the projects' environmental compliance and reporting, the qualified External Environmental Monitoring Firm was engaged for all Environment Category A Road projects in Georgia, including KGRP. The objectives of external environmental monitoring are to provide an independent review and assessment of (i) the achievements of Georgian Transport Sector projects in environmental safeguards objectives and principles, (ii) the effectiveness, impact and sustainability of taken measures to minimize, mitigate and/or compensate environmental impacts, (iii) the necessity of further mitigation measures if any, (iv) to identify strategic lessons for future policy formulation and planning, and (v) capacity building in environmental safeguards.
66. The external environmental monitoring firm (EEMF) "Ecospectri" Ltd conducted the site inspection at KGRP On 20.06.24. The representatives of the EEMF "Ecospectri" Ltd on behalf of RD conducted the site inspection to verify compliance with the Lot 1 and Lot 2 Contractors Environmental Management Plans (EMPs) and progress toward the expected outcomes. The EEMF will document the monitoring results, identify the necessary corrective actions, and reflect them in a corrective action plan.
67. ADB Environmental and Social Monitors (ESM) conducts regular field visits, which include inspection of Contractors worksites and facilities, interviews with project personnel (RD, PMCSC, Contractors) and discussion of environmental safeguard issues, including findings from the field observations, with the relevant staff of RD, PMCSC and Contractors. The field observations with the agreed corrective actions and timeline are included in E&S Action Tracker as an annex to the Weekly Environmental and Social Monitoring Report prepared by ADB ESM. RD forwards the mentioned report to PMCSC for their follow up on a weekly basis.
68. Table 8A displays the non-conformances with the EMP and SEMP's identified by PMCSC during the reporting period, while Table 8C outlines pending non-conformances from the previous reporting period (July-December 2023), including the necessary corrective actions and their current status. Table 8B presents a summary of

the issues identified by the ADB Social and Environment Monitor during the weekly field visits throughout the reporting period. Some issues identified by PMCSC and ADB ESM refer to the same issue of concern. The non-conformance issues are prioritized as Low, Medium and High as follows: (i) High risk – environmental, health and safety and CH related issues which require immediate action, risk to potential non-compliance with loan covenants, lack of readiness by Contractors to implement the agreed corrective actions or low progress which may result in potential safeguards non-compliance, systematic issues observed on specific safeguards areas. (ii) Medium risk – environmental, health and safety and CH related concerns requiring attention, moderate potential for non-compliance with loan covenants, some readiness by Contractors to implement corrective actions, gradual progress towards compliance with safeguards regulations, and occasional systematic issues noted in specific safeguards areas. (iii) Low risk – minimal environmental, health and safety and CH related challenges, low potential for non-compliance with loan covenants, adequate readiness by Contractors to implement corrective measures, steady progress towards compliance with safeguards regulations, and rare systematic issues observed in specific safeguards areas.

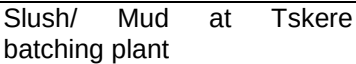
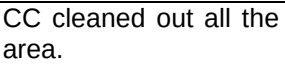
Table 8A: Non-Conformances Identified by PMCSC (January- June 2024)

#	Locations	Date	Issue	Priority	Mitigation	Target Date	Action Taken	Status
Lot -1 Responsibility								
1	Lot-1 Tskere	Jan 2024	Concrete washout pit filled with frozen water and concrete	Low	Cc to clean washout pit, otherwise concrete would be consolidated with concrete.	Feb 2024	Pit cleaned out 	Closed May 2024
2	Lot-1	Feb 2024	Cleaning of conveyer belts required	Low	Clean the conveyer belt of TBM	Feb 2024	CC cleaned the conveyer belt 	Closed Feb 2024

								
3	Lot-1 Kobi	Feb 2024	Cleaning of sedimentation ponds for treatment of tunnel water	High	CC to clean all the tunnel water treatment ponds on regular basis for efficient treatment	February 2024	CC cleaned all the ponds in Feb 2024 in regular basis. 	Closed Feb 2024 Being repeated and closely monitored by engineer

								
4	Lot-1 Tskere	February 2024	Cleaning of the sedimentation tank for tunnel water treatment	High	CC to regularly clean the sedimentation ponds	Feb 2024	CC cleaning the sedimentation ponds on regular basis. 	Closed Feb 2024

								
5	Lot-1 Kobi Batching Plant	February 2024	Cleaning of the sedimentation pit at batching plant in Kobi	High	CC to regularly clean the sedimentation pit for the batching plants	ASAP	CC cleaning the sedimentation pits on regular basis.  	Closed Feb 2024
6	Benian Begoni Lot-1	February 2024	Snow on the access road 1	Medium	CC to remove the snow from the access road	ASAP	CC removed the snow from Access Road 1 from Benian Begoni	Closed Feb 2024

							 	
7	Lot-1 Tskere	Feb 2024	Broken effluent pipe of the STP in Tskere 	Med	CC to repair the pipe	March 2024	CC repaired the pipe 	Closed March 2024
8	Lot-1 Tskere	Feb 2024	Slush/ Mud at Tskere batching plant 	Med	CC to clean out the area	March 2024	CC cleaned out all the area. 	Closed March 2024

								
9	Lot-1 Tskere	Feb 2024	Scrap placed on the topsoil in Tskere	Med	Material should be placed in the designated area	March 15, 2024	CC placed the material in the designated area near batching plant.	Closed March 2024
10	Lot-1 Kobi	Feb 2024	Septic tank leaking in front of engineer office causing nuisance 	Med	CC to repair the septic and install the new line up to main septic tank to avoid overflowing	March 2024	CC installed the pipe and repaired septic tank 	Closed
11	Lot-1 batching plant Kobi	March 2024	Cleaning of sedimentation pit and batching plant area	Low	Clean the pit and batching plat in Kobi	ASAP	CC cleaned the pit and floor of batching plant	Closed March 2024

							 	
12	Lot-1 Tskere	Feb/ Mar 2024	High flow of turbid water from the tunnel directly flowing in the River 	High	Divert the flow with high-capacity pipe to sedimentation ponds and clean the ponds on daily basis	March 2024	CC diverted the water but more than half of the water coming from tunnel flowing directly in to the river	Pending However turbidity level decreased due to break in TBM excavation

13	Lot-1 Khada River	March 2024	Fish monitoring in Khada River in Tskere	Medium	CC to start fish monitoring in Khada River	May 2024	CC bought the fish monitoring Camera and started fish monitoring but need to be regularized as camera cannot be installed permanently. 	In progress
14	Lot-1 Tskere	Mar 2024	Sedimentations Pit need to be cleaned out	Low	Cc to clean out sedimentation ponds	March 2024	Sedimentation Pits cleaned out 	Closed Mar 2024

								
15	Lot-1 Tskere Batching Plant	March 2024	Waste containers thrown in batching plant area 	Low	CC to remove the used containers from the site and store at appropriate manner	March 2024	Contractor cleaned out the area and removed use containers. 	Closed
16	Lot-1 Tskere	Feb 2024	Used iron support placed on the slopes	Med	Material should be placed in the designated area	March 2024	Contractor removed the scarp and stored it in scrap yard.	Closed

								
17	Lot-1 Kobi	Mar 2024	Poor housekeeping at Kobi Camp site	Med	CC to clean out the area	March 15	 	Closed March 2024

18	Lot-1 batching plant Kobi	April 2024	Cleaning of sedimentation pit and batching plant area	Low	Clean the pit and batching plat in Kobi	ASAP	CC cleaned the pit and floor of batching plant 	Closed April 2024
19	Lot-1 Tskere sedimentati on ponds.	April2024	Sedimentations Pit need to be cleaned out	Low	Cc to clean out sedimentation ponds	April 2024	Sedimentation Pits cleaned out 	Closed April 2024

								
20	Lot-1 Kobi Campsite	April 2024	Poor housekeeping at Kobi Camp site	Med	Cc to clean out the area	April 15	Cc cleaned out the area in April 2024 	Closed April 2024
21	Lot-1 Tskere Sedimentation ponds	May 2024	Sedimentations Pit need to be cleaned out	Low	Cc to clean out sedimentation ponds	May 2024	Sedimentation Pits cleaned out by diverting water and the pit was washed out completely. 	Closed May 2024

								
22	Lot-1 batching plant Kobi	May 2024	Cleaning of sedimentation pit and batching plant area	Low	Clean the pit and batching plat in Kobi	ASAP	CC cleaned the pit and floor of batching plant in May 2024 	Closed May 2024

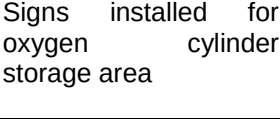
								
23	Lot-1 Kobi Behind Segment plant	June 2024	Used oil drums, containers, and tyres behind segment plant in Kobi	Medium	Remove the used drums, containers, arrange the tires in a proper way.	ASAP	Cc handed over the used drums, containers to third party, arranged the tiers in proper manner by covering with the ventilation tube 	Closed June 2024

24	Lot-1 Tskere	June 2024	Repairing of the water channel carrying the tunnel water	Medium	CC to repair the water channel along access road to avoid flooding	June 2024	CC repaired the water channel. 	Closed June 2024
25	Lot-1 Kobi	June 2024	Poor housekeeping at Kobi Camp site	Med	CC to clean out the area	June 2024	Cc cleaned out the area in June 2024 	Closed June 2024
26	LOT-1 Tskere	June 2024	Oil spill in Tskere	Low	Clean the spill and treat the soil as hazardous material to handover to licensed contractor.	June 2024	Spill cleaned	Closed June 2024

								
27	Lot-1 Car wash Area	June 2024	Car wash area to be developed to avoid car washing in TBM Tunnel	Low	CC to arrange the car wash area in designated site near sedimentation ponds in Kobi	June 2024	CC developed the car washing area near sedimentation pond in Kobi and started vehicle washing overthere.	Closed June 2024
28	Lot-1 Kobi	June 2024	Dust on Access Road and E-117	Low	CC to sprinkle water on regular basis on access road from the tunnel, SDA3, and E-117	June 2024	CC sprinkling water on regular basis in Kobi 	Closed June 2024

								
29	Lot-1 Kobi Campsite	June 2024	Waste overflowing from the containers	Medium	Call the municipality to collect the waste	ASAP	Municipality collected the waste. CC cleaned the area.  	Closed June 2024
30	Lot-1 Tskere	June 2024	Sedimentations Pit need to be cleaned out	Low	Cc to clean out sedimentation ponds	June 2024	Sedimentation Pits cleaned out completely.	Closed June 2024

								
31	Lot-1 Cemetery village Mugure	June 2024	Fence of the Cemerty in village Mughure damaged.	Medium	CC to repair the fence	ASAP	CC repaired the fence 	Closed June 2024
32	Lot-1 SDA 3 Kobi	June 2024	Conservation of the old ruins near SDA 3	Medium	Contractor to provide the fence to the old ruins near SDA 3 to conserve it.	June 2024	Contractor provided the fence.  	Closed June 2024
33	Lot-1 Tskere	June 2024	Warning signs are missing for the oxygen cylinder storage areas.	Medium	CC to install the signs	June 2024	Signs installed for oxygen cylinder storage area 	Closed June 2024

								
Lot-2								
34	Lot-2 campsites 1	Jan 2024	Poor housekeeping and waste collection 	High	CC to collect the waste by calling municipality truck	ASAP	CC cleared the snow from the access road so that the truck can reach to the waste containers.  	Closed Jan 2024

								
35	Lot-2 Camp 3	Jan 2024	Waste collection from the camp 3	Medium	CC to arrange the vehicle to bring the waste down to Kvesheti to deliver to municipality truck	ASAP	CC arranged one pickup to bring the waste down which was later replaced by mini truck standing all the time there.	Closed May 2024
36	Lot-2 Permit for tree felling Gudauri Access road	Jan 2024	Obtained non-forest fund tree felling permit for the Gudauri Access Road Project	Medium	CC to obtain the permit for tree felling	ASAP	National Agency of State Property of Georgia issued a permit for tree felling on non-forest land within the RoW of the Gudauri Access Road Project.	Closed Jan 2024
37	Lot-2	Feb 2024	Recultivation Plan and waste management Plan	Low	Complete the plans and submit to engineer	March 2024	Plans submitted to the engineer and approved	Closed April 2024
38	Camp 2 and Camp 3	February 2024	Waste collection from Camp 3 and Camp 2 is required.	High	CC to regularize the waste collection especially from camp 3 as the municipality truck cannot reach there and	February 2024	CC collecting waste by his own vehicle from camp 3 but need to regularize. Waste from camp 2 is being	Closed February 2024

					Contractor has to bring by its own to Kvesheti to deliver it to Dusheti Municipality.		collecting by Dusheti municipality compactor truck.	
							 	
39	Lot-2	Feb 2024 Pending since long time	Hiring of Environment officer	High	Contractor will hire one environmental officer and tell the date to engineer when he would be at the site.	March 2024	CC hired the Environmental specialist during reporting period.	Closed March 2024
40	Lot 2 Kvesheti	Feb 2024	SDA 3 filling area	Low	Contractor will start filling the area at SDA 3 and	March 2024	CC started filling the SDA 3 by shifting from	In progress

					provide the start date for the activity		the RoW Benian Begoni.	
41	Lot-2	Feb 2024	Topsoil Management plan	Low	Complete the plans and submit to engineer and get approval from MoEPA	March 2024	Approved by MoEPA March 2024	Closed March 2024
42	Lot-2 Camp 2	Mar 2024	STP Leaking	Med	CC to repair the STP	Mar 2024	CC repaired the STP and cleaned out the area 	Closed March 2024
43	Lot-2 BP 1	Mar 2024	Concrete washout pit cleaning required	Med	Celan out the washout pit and maintain it	Mar 2024	Contractor cleaned out the washout pit 	Closed March 2024

44	Lot-2 BP 2	Mar 2024	Land contamination near BP 2 	Med	Clean out the washout pit and surrounding area	Mar 2024	CC cleaned out the area 	Closed March 2024
45	Lot-2 BP 2	Mar 2024	Concrete waste stored at Batching Plant	Med	Contractor to shift the waste at SAD 1	Mar 2024	CC started the cleaning works but need to remove concrete waste	Closed May 2024 CC removed the concrete waste from the Batching plant 2
46	Lot-2 Tun1 Exit	Mar 2024	Oil spill and oil/ chemical container on the ground	Med	Contractor to collect the contaminate soil and remove the container	Mar 2024	CC removed the container and clean out the area. 	Closed May 2024

								
47	Lot-2 Tun 1Exit	Mar 2024	Poor housekeeping, containers , waste of different kinds on ground 	Med	Contractor to clean out the area	Mar 2024	CC cleaned out al the area at the tunnel 1 exit and started slope protection works. 	Closed June 2024

48	Lot-2 BP 2	Mar 2024	Concrete washout pit cleaning required	Med	Celan out the washout pit and maintain it	Mar 2024	Contractor cleaned out the washout pit 	Closed March 2024
49	Lot-2 RoW near parking area and SDA 3 in Kvesheti	Dec 23/ March 24	Wooden Logs and branches of trees should be collected from the RoW near parking area and SDA 3. In Kvesheti	Medium	Contractor to collect the wood logs and handover to NFA/r community	March15 2024	Contractor started removing wood logs 	In progress March 2024
50	Lot-2 BP 2	Mar 2024	BP 2 Storm water pipe maintenance 	Med	Contractor will repair storm water management pipe and make sure no water will be going to private land. Kitchen water should go to the STP and not allowed flowing towards batching plant as according to permit kitchen water should be flowing only through STP	March 2024	Action required	Pending

51	Lot-2 Khada valley	Pending from the last summer 2023	Dust in Khada Valley	Med	Contractor will mobilize 3 water truck during dry and windy season 1 for Khada Valley, 1 for plateau, and one for access road 2	March 20 2024	Action Required	Closed for the time being but repeated again in May-June 2024 as significant issue
52	Lot 2 Kvesheti	April 2024	SDA 3 filling area	Low	Contractor will start filling the area at SDA 3 and provide the start date for the activity	May 2024	CC started transportation of spoil from Khada valley to SDA 3  	In progress June 2024

								
53	Lot-2 BP 2	April 2024	Concrete washout pit cleaning required	Med	Clean out the washout pit and maintain it	April 2024	Contractor cleaned out the washout pit 	Closed April 2024
54	Lot-2	April 2024	Training for workers stripping the topsoil at Gudauri Access road	Med	Provide trainings to the workers stripping topsoil	April 2024	Completed as CC provided the training	Closed
55	Lot-2 Camp 3	May 2024	Outlet pipe of the STP damaged.	Low	Contractor to repair the damaged pipe	May 2024	CC repaired the outlet pipe	Closed May 2024

								
56	Lot-2 Camp 3	June 2024	Poor housekeeping in camp 3	Medum	CC to clean all the camp including drains, toilets, floor and collection of the waste.	June 2024	CC cleaned the camp completely, and collected the waste.   	June 2024

								
57	Lot-2 Engineer's office	June 2024	Waste in front of engineer office	Low	CC to clean out the area	June 2024	CC cleaned out the area 	Closed June 2024
58	Lot-2 Khada valley and Plateau	Pending from the last summer 2023	Dust in Khada Valley and plateau	Med	Contractor will mobilize 3 water truck during dry and windy season 1 for Khada Valley, 1 for plateau, and one for access road 2	April 2024	CC started watering of access road however, need to improve by taking additional measures.	In progress

							   CC submitted the Dust management plan to combat the fugitive dust in Plateau and Khada valley	
59	Lot-2 camp 2	May 2024	Concrete blocks and waste on the private land	Low	Contractor to remove the blocks and waste from private land	May 2024	Cc removed the concrete blocks and cleaned the area	Closed June 2024

								
60	Lot-2 Camp 2	May 2024	Waste thrown in the drainage line behind camp 	Low	Clean the drainage line by collecting the waste	May 2024	Cc cleaned out the area 	Closed June 2024

61	Lot-2 Construction site	June 2024	Lack of safety signs on the site	medium	CC to install the warning signs at the missing places pointed out by the PMCSC	June 2024	CC installed the safety signs at the required places.	Closed June 2024
							 	

62	Lot-2 Tunnel exit 1	June 2024	Poor housekeeping in front of tunnel exit 1	Low	Clean the area Infront of Tunnel exit 1.	May 2024	Cc cleaned out the area 	Closed June 2024
63	Lot-2 Camp 2	June 2024	Poor housekeeping at Camp 2, containers filled with the waste.	Low	Contractor to call municipality to collect the waste from the containers.	ASAP	Waste collected by the municipality.	Closed June 2024

								
64	Lot-2 Gudauri Access Road	May/June 2024	Wood logs at Gudauri Access Road from tree cuttings.	Medium	Contractor to collect the wood logs at one place to handover to NFA/ Local public.	June 2024	Contractor started collecting the wood logs to collect at one place to handover to NFA	In progress

							 	
65	Lot-2 Gudaure Access road	May/June 2024	Topsoil collection and storage	Medium	Contractor to collect all the topsoil stripped from the GARP and store at topsoil storage area in Plateau and vehicles should not be allowed to compact the soil.	June 2024	CC collecting the top soils and storing at topsoil storage area.	In progress

								
66	Lot-2 BP 3	June 2024	Sludge Infront of camp 3 	Medium	Collect the sludge and clean area.	June 2024	CC cleaned out the area 	Closed June 2024
67	Lot-2 Tunnel exit 1	June 2024	Waste stored at the tunnel exit 1 	Low	CC for lot-2 to clean the area	June 2024	CC cleaned out the area 	Closed June 2024
68	Lot-2 BP 2	June 2024	Waste spread at the batching plant	Low	CC for lot-2 to clean the area	June 2024	CC cleaned out the area	Closed

								
69	Lot-2 Khada Vally	June 2024	Improper storage of the topsoil in the RoW 	Low	CC for lot-2 to clean the area	June 2024	CC for Lot-2 improved the storage of topsoil and drainage of the area.	Closed
70	Lot 2 Constructio n site	June 2024	Refresher course required for workers training regarding wearing of PPES	High	Training for wearing PPEs required	June 2024	Training provided to the workers	Closed June 2024

69. Out of 70 issues highlighted during the reporting period by PMCSC 61 issues were closed and 9 issues remain outstanding.

Table 8B: Summary of Issues from ADB ESM's Weekly Monitoring Reports for the Reporting Period (January-June 2024)

#	ID AT	Date	Location	Description	Priority	Category	Required Action	Target Date	Status	Close out date	Corrective Action Agreed/ Taken
Lot-1 Responsibility											
1	154	1/11/2024	Khada Valley	Despite the Lot 1 Contractor's commitment to initiate continuous avalanche monitoring in Tskere through engagement with the National Environmental Agency (NEA) starting December 2023, the matter remains unresolved. The Contractor should follow the Contractor's Emergency Response Plan and engage NEA to ensure prompt notification of workers about potential avalanche risks, facilitating their timely and secure evacuation from the camp and emergency gallery.	High	H&S	The Lot 1 Contractor is recommended to ensure continuous avalanche monitoring in the village Tskere through engagement with the National Environmental Agency (NEA).	1/15/2024	Closed	3/21/2024	The issue was closed in March as there was no avalanche risk in the village Tskere anymore.
2	155	2/8/2024	SDA #3	The Lot 1 Contractor continues dumping excess spoil on the SDA #3 in the village Kobi. Although Kazbegi Municipality has granted permission for the Contractor to expand the SDA #3, the necessary documentation for MoEPA approval of the expansion is still pending. The Lot 1 Contractor should get approval on expansion of the SDA #3 from MoEPA to adhere to regulatory requirements.	Low	Env.	The Lot 1 Contractor is recommended to ensure the timely preparation and submission of the required documentation on expansion of the SDA #3 to MoEPA for approval.	3/8/2024	In progress	Expansion of the SDA 3 is not required at this stage.	SDA1 and SDA 3 has enough space for the generated spoil.

3	156	3/7/2024	Tunnel #5 SP	The Lot 1 Contractor has disregarded the tunnel water management requirements in the village Tskere. Despite ongoing discussions with RD, UBM, and the Contractor since October 2024, the Lot 1 Contractor has failed to take any corrective measures to address this issue. Specifically, tunnel water is being discharged into the Khadistskali river through two streams: one directly into the river (an illegal action), and another through sedimentation tanks that are filled with sediment and unable to effectively treat the water. As a result, the high-turbidity river water continues to flow from the village Tskere to the village Bedoni, where the Khadistskali river merges with the Aragvi river. Hence, biodiversity and aquatic life face a significant risk of being impacted.	High	Env.	The Lot 1 Contractor is recommended to: • stop direct discharge of untreated tunnel water into the river Khadistskali; The method of collecting the clean groundwater inside the emergency gallery to be applied, if possible, as it has been done in the emergency gallery from Kobi side; • clean the sedimentation tanks to ensure effective treatment of tunnel water; • ensure fish monitoring in the Khadistskali river by the ichthyologist (refer to outstanding issue WR-23-41-EV_04 in the E&S Action Tracker) and take the required actions based on fish monitoring results.	3/15/2024	Closed	5/2/2024	CC started installation of discharge pipes and cleaning of sedimentation tanks and installed sorbent to catch oil.
4	157	3/7/2024	SDA #3	Cleaning the drainage channel, along with the flume pipe connecting the two segments of SDA #3, is required to eliminate sediment accumulation. This proactive action	Medium	Env.	The Lot 1 Contractor is recommended to clean the drainage	3/15/2024	Closed	4/18/2024	Channel was cleaned.

				is necessary in preventing flooding and facilitating unrestricted water flow, especially during snow melting periods.			channel and the flume pipe from sediment.				
5	158	3/7/2024	BP in Kobi	Although the Lot 1 Contractor was recommended to ensure the car washing area was operational at the Batching Plant area in the village Kobi, the Contractor has yet to address this easily resolvable issue. This issue needs to be sorted out to avoid pollution of the river water by washing of the trucks in the rivers Narvani or Baidara.	Medium	Env.	The Lot 1 Contractor is recommended to take the corrective actions and ensure the car washing area is operational in the village Kobi.	3/15/2024	Closed	4/18/2024	Car washing was arranged
6	159	3/7/2024	Old cemetery in Kobi	Although the Lot 1 Contractor was recommended to upgrade the fence around the old cemetery located next to the campsite in the village Kobi, the Contractor has yet to address this easily resolvable issue. Additionally, the area of the cemetery was found to be polluted with waste. The Lot 1 Contractor should follow the CHMP requirements and ensure the cemetery is fenced off and kept clean.	Low	CH	The Lot 1 Contractor is recommended to: • clean the old cemetery area from waste, and • upgrade the mesh fence around the cemetery.	3/16/2024	Closed	4/22/2024	The fence provided.
7	160	4/4/2024	SDA #3	During the site visit, it was observed that the Lot 1 Contractor intentionally created gaps (three in total) between the spoil berms along the running track from the rock crusher to the	Medium	Env.	Contractor is recommended to close the gaps between the berms to	4/8/2024	Closed	5/30/2024	CC filled the gaps.

				SDA #3, aiming to drain the slurry from the track surface. However, the slurry flow reaches the river Narvani, which is connected to the river Tergi, resulting in pollution of surface water.			mitigate the pollution of the river water.				
8	161	4/24/2024	Village Tskere	Although the Lot 1 Contractor was recommended to upgrade the fence at Mughure cemetery last week, the corrective action was not implemented.	Low	CH	Contractor to upgrade the damaged section at the Mughure cemetery.	4/30/2024	Closed	5/16/2024	The fence was upgraded.
9	162	5/23/2024	Village Kobi	Although the Lot 1 Contractor was recommended several times to enhance waste management practices, particularly concerning hazardous waste, at the Kobi site, no corrective actions have been taken. During a site visit, it was observed that hazardous waste, including used oil drums and filters, was mixing with non-hazardous waste and directly stored on land behind the Batching Plant area in the village Kobi. Additionally, the Contractor was utilizing the designated hazardous waste storage area as a workshop instead of storing hazardous waste there as required. Furthermore, the Lot 1 Contractor is required to revise the waste management plan, which was originally drafted and approved by MoEPA in 2021, to ensure	Medium	Env.	The Lot 1 Contractor is recommended: 1. To arrange a relevant hazardous waste storage area for proper storage of the hazardous waste (liquid and solid waste) until its handover to the authorized waste management sub-contractor; 2. Segregate the construction waste dumped behind the Kobi Batching Plant and ensure its proper storage before handover to the relevant authorized waste management sub-contractors;	6/2/2024	Closed	19/09/2024	CC arranged the hazardous material storage area in Kobi.

				compliance with the Waste Code of Georgia, specifically Article 14, which stipulates „A company waste management plan shall be revised every three years or when there are substantial changes in the types and quantities of waste generated, or in processes of waste treatment. “			3. Submit the updated Waste Management Plan to MoEPA as required by the Waste Code of Georgia.				
Lot-2 Responsibility											
10	168	3/7/2024	Campsite #3, Benian-Begoni	The Lot 2 Contractor continues ignoring waste management requirements at the campsite #3 and batching plant #3. Waste was dumped directly on the Batching Plant area. The waste bins were damaged and the Contractor was burning general waste at the Batching Plant area instead of transferring it to Dusheti Municipal landfill. The Lot 2 Contractor completely neglects the legal requirements (Waste Code of Georgia) and Project pollution prevention requirements. The management and supervision of the Contractor's environmental performance need improvement.	High	Env.	The Lot 2 Contractor is required to: • replace the damaged waste bins with the proper ones and ensure adequate number of waste bins are in place at BP and Campsite #3; • conduct TBT on housekeeping and waste management requirements to the workforce as the personnel present were unaware that waste burning was an issue of concern. UBM is recommended to improve supervision of Contractors environmental activities to promptly	3/15/2024	Closed	5/2/2024	CC collected waste from the camp and adjacent areas. Waste was transferred to Dusheti Municipal Landfill.

							identify issues and ensure that necessary preventive actions are implemented.				
11	169	3/7/2024	Khada Valley	It was observed that the Lot 2 contractor could not use the existing bridge for transporting piling equipment to BR #4 in Khada Valley. Instead, they arranged an inappropriate crossing over the river Khadistskali. Specifically, the equipment crossed the river directly without utilizing the portable steel bridge. Both banks of the river were lowered and covered with gravel to facilitate the equipment crossing. The Lot 2 Contractor neglects the requirements for preventing surface water pollution and protecting the river bed.	Medium	Env.	The Lot 2 Contractor is recommended: • to install the steel metal bridge for transportation of the piling equipment back from the BR #4; • to barricade both banks of the river to prevent crossing the river by other trucks; • to reinstate the river banks after transportation of the piling equipment back from the worksite.	3/15/2024	Closed	5/2/2024	Contractor filled the banks of the river with soil and increased the level of the river banks to prevent truck movement.
12	170	3/14/2024	Campsite #2	During the site inspection following the snow melt, it was noted the Lot 2 Contractor failed to address the water leakage from the STP, leading to flooding of the neighboring area (a leased private land parcel). The ongoing water flow poses a risk of damage to land. Hence, it is required to address the issue promptly to prevent flooding of the land.	High	Env.	The Lot 2 Contractor is recommended to: • fix the water leakage problem; • test the soil for contamination; • reinstate the land plot, if required.	3/20/2024	Closed	4/4/2024	The issue was fixed.
13	171	3/28/2024	CH Site #28	The Lot 2 Contractor resumed piling activities at the BR #6 in close	Medium	CH	The Lot 2 Contractor is recommended to	4/1/2024	Closed	4/11/2024	Vibration monitoring

				proximity of the CH Site #28 – old mill remains. Despite the Lot 2 Contractor's commitment to commence vibration monitoring at CH Site #28, the action was not carried out. Based on UBM CH Monitor's information, vibration monitoring is ongoing at the CH Sites #29 (the vibration monitoring device is installed at the church of the Virgin which also covers the tower and old cemetery; these three CH sites are given the same field ID - #29). The CH Sites are located on the hill in about 30 meters from the CH Site #28; however, due to the proximity of piling activities at CH Site #28, it is strongly advised to start vibration monitoring at CH Site #28 to monitor the construction related vibration and to adhere to the requirements of the Cultural Heritage General Action Plan issued by NACHP.			start vibration monitoring at the CH Site #28.				started from 06.04.2024.
14	172	3/28/2024	CH Site #26	The Lot 2 Contractor provided the Method Statement for the relocation of CH Site #26, prepared by the Cultural Heritage Contractor in Georgian language. Translation of this document into English will be completed by next week. However, the provided documentation lacks certain environmental safeguard details, such as the provision of an access road between the existing	Medium	Env. CH	Lot 2 Contractor is recommended to draft and submit to UBM for approval the MES for relocation of the CH Site #26.	4/10/2024	Closed	6/3/2024	CC provided the updated MES on 03.06.2024.

				CH Site and its new location, arrangements for topsoil storage, and designated areas for storing stones after the demolition of the CH Site before its relocation to a new location. Following discussions with RD, UBM, and the Lot 2 Contractor, it was agreed that the missing information would be provided by the Lot 2 Contractor for UBM's approval prior to the commencement of relocation works.							
15	173	3/28/2024	Campsite #3, Benian-Begoni	The STP of the campsite #3 was not operational and the sewage discharge pipes were broken.	Medium	Env.	The Contractor is recommended to repair the STP and discharge pipes and take water samples for test.	4/10/2024	Closed	12/09/2024	The STP was turned on and the discharge pipes were repaired. Water testing conducted.
16	174	4/4/2024	Gudauri Access Road	During the site visit, it was observed that the Lot 2 Contractor was removing wet topsoil and temporarily storing it along the edge of RoW in an area covered with snow. The melting snow beneath the topsoil piles was causing erosion and washing away the topsoil. Removal of wet topsoil is strictly prohibited as it causes damage to its quality. The issue was promptly raised with UBM Environmental Specialists who stated that they could not stop the work and prevent the Contractor from continuing damaging topsoil as	High	Env.	UBM is recommended to fulfil their responsibilities concerning oversight and supervision of Contractor activities, ensuring that the Contractor's environmental performance aligns with ADB SPS and meets legal requirements. UBM is recommended	4/10/2024	Closed	8/08/2024	CC completed the topsoil stripping. and stored in topsoil storage aarea. Topsoil storage area was approved by MoEPA.

				the Contractor was focused on construction progress. Such disregard for environmental regulations, which are governed by national laws like the Law on Soil Protection, as well as compliance with ADB SPS and Contractor's SEMP's (including the Topsoil Management Plan and Re-cultivation Plan), is entirely unacceptable.			to check whether the topsoil stockpiles are stored temporarily within the RoW to avoid impact on land outside of the RoW. Contractor is recommended to stop stripping of wet topsoil. Contractor is recommended to transport the stripped topsoil to the designated topsoil storage area.				
17	175	4/4/2024	Gudaure Access Road	During the site visit, it was noted that the Contractor was carrying out earthworks, such as topsoil removal and grading, on the Gudaure Access Road without the presence of a CH Monitor. Furthermore, construction activities had started without providing heritage training to the staff assigned to the works. Although the Lot 2 Contractor was reminded several times to ensure full-time presence of CH Monitors on site and compliance with CHMP requirements, the Contractor failed to mobilize a CH Monitor on site.	Medium	CH	The Lot 2 Contractor is recommended to: • mobilize CH Monitor to ensure full-time presence of CH Monitor on site during earthmoving activities; • conduct cultural training to workers assigned to Gudaure Access Road project; • use machines with the toothless bucket at the area close to Sameba Complex - potential Physical	4/8/2024	Closed	12/09/2024	CC completed topsoil stripping. CH Monitor presents on site.

							Cultural Resource site; mobilize adequate number of vibration monitoring devices to ensure continuous vibration monitoring at the required CH Sites during construction works at Gudauri Access Road.				
18	176	4/25/2024	CH Site #27	Although the Lot 2 Contractor was recommended to upgrade the fence at the tower remains (CH Site #27) last week, the corrective action was not implemented.	Low	CH	Contractor is recommended to fence off the CH Site #27 in the village Benian-Begoni.	4/30/2024	Closed	5/16/2024	The site was fenced off.
19	177	4/25/2024	BR #6	Although the need of provision of safe access to the Pier #3 (BR #6) worksite was highlighted with the Lot 2 Contractor last week, it was identified during the site visit, that no corrective actions were taken to address the issue. (i) Currently, the Lot 2 Contractor workers continue using the earth steps, without handrail/guardrail, made on the steep and unstable slope to shorten the access to Pier #3 worksite. (ii) In addition, the worksite is located on the slope above the Khadistskali	High	H&S	The UBM and Lot 2 Contractor H&S Specialists are recommended to make the site-specific risk assessment and ensure all required risk mitigation measures are in place, such as: (i) provide safe walkway to the Pier #3 worksite; (ii) Fence off the worksite and install the safety warning signs;	4/29/2024	Closed	5/23/2024	16.05.24 - CC fenced off the site, installed the safety signs, conducted TBT to workers and did housekeeping. UBM engineers continue site visual monitoring for signs of erosion. Contractor committed to provide the alternative and

				river and there is a need to fence off the area to prevent fall of a worker from the worksite. (iii) The proper housekeeping is required to mitigate the slip, trip and fall risks as the scattered construction material pose the slip, trip and fall risks at the worksite. (iv) The signs of erosion were identified on the cut slope at the worksite. Reinforcement of the slope is required to prevent its collapse and injury of a person or equipment.			(iii) ensure proper housekeeping to mitigate slip, trip and fall risks; (iv) reinforce the cut slope to avoid collapse of the slope.				safe access to the worksite. CC implemented all required safety precaution measures. The unsafe access to the worksite was closed; the workers are transported to the worksite through the approved access road.
20	178	4/25/2024	Village Benian-Begoni	Although last week, the Lot 2 Contractor was recommended to upgrade the fences around the mud pits located in the village Benian-Begoni to prevent any accidental fall of a human or animal into them, it was observed during the site visit that the Contractor has not yet implemented the necessary corrective actions.	Medium	H&S	Contractor is recommended to fence off properly the mud pits located at the worksite in the village Benian-Begoni.	4/29/2024	Closed	5/16/2024	The mud pits were fenced off.
21	179	4/25/2024	Gudauri Access Road	The Lot 2 Contractor continuous construction works without adequately setting up the site or providing training or Toolbox Talks to personnel regarding site-specific H&S requirements. During site visit, it was noted that an	Low	H&S	The Lot 2 Contractor is required to: (i) provide the required safety signs at the Gudauri AR worksite; (ii) provide the goal	4/30/2024	Closed	5/10/2024	CC took the required corrective actions.

				excavator and a dump truck were operating near overhead electrical cables without the provision of safety signs or goal posts at the site.			posts at the overhead power lines at the worksite; (iii) provide site-specific H&S Toolbox Talk to personnel involved in works at Gudauri AR.				
22	180	5/2/2024	Gudauri Access Road	The Lot 2 Contractor continues disregarding the topsoil storage requirements at the temporary topsoil storage area on Didveli Plateau. The mentioned area has already been used for storage of the topsoil removed from KKRPP RoW in 2022 and 2023. UBM approved to accommodate topsoil from the Gudauri Access Road after confirming available free space there (refer to Contractor's Topsoil Management Plan). However, instead of utilizing the allocated free space, dump trucks have been observed compacting and damaging the already stored topsoil stockpiles, which had naturally revegetated. The issue resulted from a failure to mark the space allocated for storage of topsoil from Gudauri Access Road and neglecting the need to raise awareness of relevant staff on topsoil storage requirements.	High	Env.	UBM and Contractor Environmental Specialists are recommended to improve oversight of construction activities and ensure the required environmental mitigation measures are proactively implemented. Contractor is recommended to: • demarcate the space allocated for storage of topsoil from Gudauri Access Road; • shape the topsoil stockpiles properly to avoid their erosion; • demarcate the area around the trees to keep distance from	5/15/2024	Closed	15/09/2024	CC carried out corrective actions, such as: fencing and signposting the topsoil stockpiles and access road, removed the timber remains and rocks, conducted TBT to the personnel involved in topsoil stripping, etc.

				Upon notification, the UBM Environmental Specialist together with a Contractor Environmental Officer intervened by providing training and installing signage for topsoil storage. However, the main issue of movement on topsoil stockpiles and dumping additional topsoil remained unresolved within the reporting period. The designated storage space has not been demarcated. The Contractor should address the issue promptly to avoid further damage of topsoil, and follow the requirements included in Contractor's re-cultivation plan approved by UBM and MoEPA.			them to avoid damage to them; • provide drainage channel, where required, to avoid flooding of the land.				
23	181	5/23/2024	Gudauri Access Road	Although the construction works are ongoing at Gudauri Access Road, vibration monitoring is ongoing at one CH Site (Sameba Tower – Field ID #19) out of 5 CH Sites recommended by NACHP (refer to CH General Action Plan). As per UBM CH Monitor's information, continuous vibration monitoring is ongoing at Sameba Tower (CH Site #19) due to its significance and the necessity for ongoing vibration monitoring at other CH Sites will be	Low	CH	The Lot 2 Contractor and UBM CH Monitors are recommended to: 1. identify all sites within the Gudauri AR where vibration monitoring is needed and is not currently in place, and ensure vibration monitoring is conducted there; 2. to identify the sites where the recommended continuous vibration	5/31/2024	Closed	4/7/2024	Vibration Moonitoring report submitted.

				evaluated on-site and the subsequent actions will be defined.			monitoring is not necessary, providing justification for this decision.				
24	182	5/24/2024	Tunnel #1	The issue regarding discharge of tunnel water from the Tunnel #1 Entrance Portal into the forest land still has not been resolved.	Medium	Env.	Lot 2 Contractor should repair the damaged pipes to avoid land erosion and ensure discharge of water into the river Tetri Aragvi as per approval.	6/2/2024	Closed	6/13/2024	The discharge pipe was repaired.
25	183	5/23/2024	Gudaauri AR	The Lot 2 Contractor is neglecting the timber management requirements. Despite numerous discussions on-site and during meetings about the necessity to remove timber from the Gudaauri AR, no action has been taken. During the site visit, it was observed that the Contractor was filling or raising the level of the project road, which poses a risk that the timber stored outside of the RoW may become inaccessible. This situation could make it impossible to remove the timber for handover to the forestry agency, as required by the tree felling permit.	Medium	Env.	The Lot 2 Contractor is recommended to remove the timber and handover it to the relevant authorities (forest agency).	6/2/2024	In progress	New target date 15/10/2024	CC handed over 46 cubic meters of wood logs to NFA.

70. Out of 25 issues highlighted during the reporting period by ADB ESM, 23 issues were closed and for 2 issues resolution is in progress.

Table 8 C: Implementation Status of Pending Corrective Actions Proposed in the Previous Monitoring Report(s)

#	Affect ed Locati on	Date	Issue	Required Action	Respon sibility	Priority	Timing (Target dates)	Description of Resolution and Timing (Actual)	If not yet resolved, indicate the reason why and specify further required action and timeframe.
Issues Identified by PMCSC									
Lot 1 & Lot 2									
1	Lot 2 BP 2	October 2022	Storm water pipe from the pre-treatment sedimentation pond creating soil pollution and water pollution on the ground.	CC to repair the pipe carrying water from the sediment ponds for storm water to concrete washout pit so the water can be pumped with already installed submersible pump in to the drain going in to river. .	CRCC	Low	Nov 2022	Contractor to repair the pipe as it is damaged again from storm water pit to concrete washout pit.	Pending Since October 2022 due to ignorance of the issue by CC. issue resolved by the contractor but arised again.
2	Lot 1	Sept 2021	CC stockpiled crushing material in the river protection zone of Narvani River Pending since September 2021	CC to stockpile the material 10 meters away from the edge of the river	CRTG	Low	October 2021	CC to remove the material 10 meters away from the edge of River Narvani	Pending Issue will be resolved after completion of works at SDA 1 in Kobi
3	BP 2 Lot 2	Feb 2023	Broken Fence along the private land at BP 2	Repair the fence	CRCC	Low	One week	Action Required	Pending due to ignorance of the issue by CC.

									Contractor reminded several times by the PMC
4	Lot 1	May 2023	Damaged roof of material storage yard	CC to repair the roof and check the structural stability of the structure	CRTG	Low	April 30, 2023	Actions required	Pending CC repaired the roof but it was damaged again during the snow.
5	Lot-2 Bridge 6	June 2023	Improper storage of topsoil	Contractor to drain all the water and store topsoil according to topsoil management plan	CRCC	Medium	June 2023	Contractor started collecting the topsoil and storing it.	Resolved Cc collected the topsoil from bridge 6
6	Tunnel #5 SP	Oct 2023	South portal tunnel flooding due to unexpected water source met during the blasting in emergency gallery October 18, 2023 Engineer letter# 2023-11-UBM-CRTG-878 dated 5-11-2023.	CC to ensure groundwater management.	CRTG	High	Nov 2024	CC has managed the flooding of the tunnels and completed the installation of the Uunderground pipe in the ROW in Tskere	Resolved May 2024
7	Tskere	Nov 203	Laying of pipe in Tskere for tunnel water and treatment of tunnel water. Ref letter # 2023-11-UBMCRTG-878 dated: 05-11-2023	CC to complete installation of tunnel water pipe from the tunnel portal to sedimentation pond in Tskere	CRTG	High	Nov 2023	Contractor completed the laying of the pipe in Tskere.	Resolved May 2024

8	Khada Valley Lot-1 & Lot-2	Oct/ Nov 2023	Fugitive dust emission in Khada Valley Ref letter: 2023-11-UBM-CRCC-1181 dated: 15-11-2023	Both the contractors to have one water sprinkler truck in Khada valley to sprinkle water on access road 1. Each truck will sprinkle water to allotted portion of each contractor for access road and to suppress the dust by their ongoing construction activities.	CRCC	High	March 2023	CC for Lot 2 to sprinkle water according to currently prepared Dust Management Plan CC for lot-1 is not using anymore this road for Tskere. CC for lot-2 mobilized three water truck for watering the access roads.	In progress
9	Kobi	Dec 2023	Concrete washout pit filled with frozen water at Batching Plant	CC to clean washout pit, otherwise concrete would be consolidated with concrete.	CRTG	Medium	ASAP	CC cleaned out the pit and reusing water for batching plant	Resolved May 2024
10	TBM and Emergency Tunnel	Nov/Dec 2023	Tunnel Water management in Tskere	CC to submit the plan to engineer how to handle the tunnel water when TMB will reach near Tskere and gravity flow is towards Tskere. CC to update Tunnel water Management Plan.	CRTG	High	ASAP	CC installed the pipe to carry tunnel water to Khada valley and cleaning the sedimentation ponds on regular basis.	Resolved May 2024
11	Environmental Management	Oct 2023	Hiring of Environmental Specialist	CC to complete the hiring of environmental specialist to fill the vacant position	CRCC	High	Nov 2023	Engineer demanded from CRCC via letter# 2023-11-UBM-CRCC-1163 and various Emails and weekly progress meetings.	Resolved April 2024

								CC mobilized the Environmental Specialist	
12	Khada Valley	Oct/Nov 2023	Topsoil storage in Patches in Khada valley	CC to collect the topsoil from all the patches and store it according to legal requirements in Khada Valley in the designated area.	CRCC	Medium	Nov 2023	CC collected the topsoil and stored at one place.	Resolved May 2024
13	Khada Valley	Oct/ Nov 2023	Spoil Dumping in Khada valley in RoW	CC to collect the dumped spoil which is not in use and transfer to SDA 3 in Kvesheti.	CRCC	Medium	Nov 2023	CC started shifting all the dumped material to SDA 3	Resolved CC started shifting all the dumped material to SDA 3
14	Arakhveti Camp	Dec 2023	Waste spread in front of Engineer office in camp 1 Arkhveti	CC to increase the frequency of collection of waste by Dusheti municipality	CRCC	High	ASAP	Cleaned out all the area and shifted the waste bins from the engineer office parking to contractor's parking may 2025	Resolved May 2024
15	Camp 3	Dec 2023	Camp 3 waste spread at the floor and covered with snow	As access is blocked in Khada Valley to snow, whenever it is possible bring the waste down to Kvesheti and deliver to Dusheti municipality. Ref letter: 2023-10-UBM-CRCC-1147 dated: 22-10-2023 2023-11-UBM-CRCC-1159 dated: 1-11-2023	CRCC	High	ASAP	Closed CC cleaned the camp completely during May 2024 and provided Mini truck to carry waste from camp 3	Resolved May 2024

16	Tunnel 1 Entrance	Dec 2023	Tunnel 1 Entrance oil leakage from the	Provide drip tray to contain the leaked oil. Reference letter# 2023-11-UBM-CRCC-1176 dated: 7-11-2023	CRCC	High	Dec 2023	CC cleaned the spill and cleaned out all the area. Removed the compressor excavation completed.	Resolved Will be opened again if oil spills observed. May 2024
17	RoW near parking area and SDA 3 in Kvesheti	Dec 2023	Wooden Logs and branches of trees should be collected from the RoW near parking area and SDA 3. In Kvesheti	Contractor to collect the wood logs and handover to NFA/r community	CRCC	Medium	ASAP	CC started collecting the wood logs at one place to handover to NFA	In progress
18	Didveli plateau	Aug. 2023	Conservation of Ch #10 tower	CC to complete the CH 10 conservation works.	CRCC	High	2024 May	The conservation works is in progress but did not resume after winter.	In progress
Issues Identified by ESM ADB									
Lot 1									
19	Village Tskere	10/27/2022	The Lot 1 Contractor worksites, such as Batching Plant, Campsite and the Tunnel #5 South Portal are located in the avalanche prone area and provision of the avalanche protection measures are required there.	PMCSC to work closely with the Lot 1 Contractor to speed up the review and approval of the design of the avalanche protection measures to ensure the relevant avalanche protection measures are in place before snow in the village Tskere.	CRTG	High	11/15/2022	Based on RD's information, CC will demobilize all temporary worksites from Tskere till winter 2024 as per the construction schedule. Hence, the avalanche related risk will be eliminated.	Resolved 29-05-2024

								In case the construction schedule is not followed and there avalanche related risk poses, the issue will be raised again.	
20	4/13/2023	SDA #2 (former)	It was observed that the Contractor dumped the removed slurry (mud) close to the river Narvani bank on the proposed SDA#2 area, which has been rejected due to presence of the water boreholes owned by the "Kobi Water" Plant.	• Stop disposal of the slurry (mud) on the unapproved area (rejected SDA #2); • remove the dumped slurry (mud) to the SDA #3; • reinstate the impacted land within the rejected SDA #2 area.	CRTG	high	20-04-2023	CC will remove the spoil from the former SDA #2 at the end of construction, when the proper access to the site is provided. On 29.05.24 RD provided information that the CC was applied by the Kobi Factory owner requesting to keep the spoil on the area and add some more spoil to protect the area from flooding in the flooding seasons. RD committed to provide the request letter and the acceptance letter	In progress

								after completion of works.	
21	4/27/2023	Permit Condition	The Contractor needs to complete the Condition 21 of the Environmental Decision: "the RD to ensure continuous monitoring of the Geodynamic Processes in the Project Area and submit the monitoring results to the Ministry for consideration once a year."	The Contractor to update the Geodynamic Process Monitoring Report as per the comments received from MoEPA in December, 2022 and re-submit it to MoEPA.	CRTG	Low	10-05-2023	CC signed the agreement with Geologist and he will present the report. cc submitted the geodynamic survey report which was approved by the Engineer and submitted to MoEPA	Closed June 2024
22 ID 147	Naraidze's Tower	9/7/2023	The residents of the village Tskere were concerned that the floor of the second floor of the tower had collapsed during conservation works at the Naraidze's Tower. The damaged part of the floor was reinforced with wooden poles by the sub-contractor. The locals have an expectation that the damaged part of the floor would be repaired and reinforced properly as they think it is not	It is recommended to investigate the issue and take the relevant corrective actions to make sure the tower is properly reinforced and safe and the locals are happy with the conservation works.	CH	High	9/15/2023	RD discussed the issue with the sub-contractor and NACHP. Response from NACHP is required. On 17.05.24 NACHP representatives and UBM CH Monitor surveyed the damaged floor inside the tower. The survey report with recommendations will be issued by NACHP.	In progress

			safe to enter the tower used as a shrine, currently.						
23 ID 148	Village Tskere	9/7/2023	The new bridge over the river Khadistskali needs to be provided with the guardrails. The old guardrails were damaged and removed by the Lot 1 Contractor recently.	The Lot 1 Contractor is recommended to provide the guardrails at the new bridge and the relevant safety warning signs.	H&S	Low	9/15/2023	The mesh fence was provided as guard rails.	CLOSED
24 ID 150	Rivers Khadistskali, Tergi, Narvani	10/12/2023	Contractor is required to conduct fish monitoring in the rivers (under the project impact) as per the requirements of the Appendix 5 of the EIA "Critical Habitat Assessment (CHA) and Appropriate Assessment (AA) Screening" Refer to section 6.5 Potential Impacts on CH/ PBF.	CC to coordinate with PMCSC on the conduct of water quality testing and fish monitoring.	Env.	Medium	10/30/2023	Fish monitoring is planned to be conducted in Spring 2024. 16.05.24 - Negotiations with the national expert is ongoing on fish monitoring. 29.05.24 - CC purchased two cameras for fish monitoring in the Khadistskali river water. Installation of cameras was recommended by national experts as per UBM's information.	In progress
25	Tunnel #5 SP	10/12/2023	Currently, only tunnelling water from the emergency	CC to work closely with PMCSC to estimate the quantity of discharge from the	Env.	Medium	10/20/2023	CC arranged two additional sedimentation	Closed 2-05-2024

ID 151			gallery is being discharged to the 3 sedimentation tanks; additional water from the main tunnel may be discharged by Jan 2024 needing more sedimentation tanks or more frequent cleaning. However, there is no available space for additional sedimentation tank(s).	main tunnel and emergency gallery (provide estimate to ADB by 20 Oct 2023). PMCSC to further discuss with contractor on the management of the increased water discharge.				ponds and installed a screen for catching waste and a sorbant curtain to catch oil in the first desimentation pond. The discharge water turbidity visually was high. It was agreed to test water in the river Khadistskali by mid of May, 2024.	
26 ID 152	Village Tskere	11/23/2023	Although the Lot 1 Contractor was recommended several times to replace the existing tunnel water discharge channel (made with metal sheets) with the discharge pipes, the recommendation was not considered. It was observed that the tunnel discharge water was leaking and overflowing from	The Lot 1 Contractor is recommended to replace the tunnel water discharge channel, made of metal sheets, with the plastic pipes to avoid leakage of discharge water and subsequent damage to the land.	Env.	Medium	11/30/2023	CC started fixing the issue on 30.04.2024. 16.05.24 - the final section of the discharge pipe connected to the sedimentation tank needs repair/replacement .	In progress

			the metal discharge channel leading to erosion of the adjacent land plots.						
27 ID 153	Village Tskere	12/7/2023	The Lot 1 Contractor discharged the slurry, removed from the tunnel water sedimentation tanks, onto the adjacent steep slope. There exists a potential hazard of slurry runoff reaching the river Khadistskali.	The Lot 1 Contractor is recommended to remove the slurry from the slope and discharge it at the dedicated area within the RoW, above the Tskere Campsite.	Env.	Medium	12/12/2023	The issue will be resolved during final reinstatement works.	On hold
Lot 2									
28	Khada Valley	15-12-2022	The Lot 2 Contractor dumped spoil at several locations along the Khada Valley Road in the RoW.	The Lot 2 Contractor is recommended to: • draft the plan of the berm installation along the Khada Valley road, considering the environmental, H&S and social requirements; • agree the plan with PMCSC; • remove the dumped excessive spoil, if required. PMCSC is recommended to ensure the Lot 2 Contractor follows the berm installation plan and removes the dumped excessive spoil, if required.	CRCC/ PMCSC	Medium	25/12/2023	CC planned to reuse the material for road embankment and the rest of the material will be dumped in the SDA 3 in Kvesheti.	On hold

29	SDA #4	2/2/2023	Finalize all remaining procedures regarding spoil disposal site #4, such as paying compensation to relevant authorities for approval to dispose spoil on the SDA #4 in the village Bedoni.	The Lot 2 Contractor to finalize all remaining procedures regarding SDA #4 in the village Bedoni.	CRCC	Medium	30-03-2023	CC applied to NEA for approval of the design of spoil dumping area. Spoil dumping can be considered as an area improvement (area filling) activity in the village Benian-Begoni. In January 2024 NEA rejected to review the design stating that it was under responsibility of local municipality and advised to refer to local municipality. CC plans to conduct the detailed environmental assessment (such natural disaster assessment) of the area and apply to the local municipality.	In progress
30	6/22/2023	AR #4	The Lot 2 Contractor was observed dumping spoil, generated at the Tunnel #3 Exit Portal, from the AR #4 down	• to stop unauthorized dumping of spoil from the Tunnel #3 Exit Portal; • to store the tunnel cuttings within the RoW until getting approval from the landowners on using their land plots for	CRCC	Medium	26-06-2023	CC stopped spoil dumping on the slope. According to the PMSC's information, the slope reinstatement will be a part of the	On hold

			the slope.	spoil disposal at the SDA #3 in the village Kvesheti.				entire reinstatement works at the end of the project.	
31 ID 142	BP #2	8/24/2023	The land plots adjacent to the BP #2 were littered and polluted with an unorganized flow of the contaminated (cement and oily contaminated) drainage water from the BP #2 area due to lack of the drainage channels. The fence was damaged at certain locations at the BP #2 and the area was easily accessible for cattle.	The Lot 2 Contractor is recommended: • to provide the drainage channels at all sides of the Batching Plant #2 area which will be connected to the concrete washout pit to avoid the land pollution with the contaminated drainage water flow from the Batching Plant. • to upgrade the fence to restrict access of cattle to the BP area.	Env.	Low	9/15/2023	CC cleaned the area; however, provision of the drainage system is required.	In progress
32 ID 143	Village Benian - Begoni	8/31/2023	The Lot 2 Contractor continues spoil dumping on the temporary spoil storage area within the RoW in the village Benian-Begoni. Currently, the spoil stockpile is within the project footprint (confirmed by PMCSC	The Lot 2 Contractor is recommended to: • find another location within the RoW in the village Benian-Begoni for spoil, especially, rocky spoil storage, if it is possible; • install the silt fence along the spoil stockpile to avoid sediment run-off from the site. PMCSC to discuss the issue	Env.	Medium	9/15/2023	CC made the earth drainage channel and started removal of spoil.	In progress

			Environmental Specialist), but as the stockpile is located at the edge of the RoW and the slope of the stockpile is about 45 degree and there are no sediment run-off and erosion control measures in place, there is a risk of damage to the adjacent land plots and fence due to rock falling and sediment run-off in rainy weather conditions and during rock dumping. The issue was discussed on site two weeks ago; however, no preventive measures have been taken up to now.	with the Lot 2 Contractor to make sure the agreed sediment run-off and erosion control measures are in place to avoid damage to the adjacent land plots due to rock falling or sediment run-off the spoil stockpile. It is highly recommended to speed up starting installation of the avalanche protection dams in the villages Tskere and Benian-Begoni to use the spoil there and thus, avoid the issues related to spoil storage in Khada Valley.					
33 ID 146	Village Benian - Begoni	9/7/2023	The Lot 2 Contractor still had not resolved the construction traffic related dust issue in Khada Valley. The residents of the village Benian-	The Lot 2 Contractor is recommended: • to assign a proper water truck for dust suppression in the village Benian-Begoni.	Env.	High	9/15/2023	CC started watering of the road, however, frequency is not sufficient. Improvement is required. UBM will closely monitor the issue.	On hold

			Begoni were concerned due to long-standing issue and threatened to block the road in case the Lot 2 Contractor did not assign the water truck for watering the village road. The Lot 2 Contractor ignores the Project pollution prevention requirements and makes impact on environment and people health by lack of dust suppression.					The issue is not relevant in the winter season and was assigned the status "on hold." On 16.04.24 dust was an issue again. The locals started complaining. CC is required to water the roads.	
34 ID 148	Camps ites #2 and #3	9/14/202 3	The land outside of the campsites #2 and #3 was littered with general waste by the camp residents. The issue is especially sensitive for the land parcels around the campsite #2 on Didveli Plateau as they are private land plots and cattle is pasturing there. In addition, the area within the campsites #2 and #3 were	The Lot 2 Contractor is recommended: • to clean up the area outside and inside of the campsite #2 and camp 3; • increase waste bins in campsite, strictly require contractors to put wastes in bins or designated areas; • increase delivery of wastes to collection point (minimum 2x weeks) to avoid accumulation in the campsite.	Env.	Medium	9/20/202 3	CC removed waste from both camps and adjacent areas.	Closed 2-5-2024

			littered with waste and proper housekeeping is required there.						
35 ID 152	General	10/12/2023	Removed trees and vegetation need to be disposed properly (applicable to all sites)	Handover of removed trees/timber to Forestry Agency before Nov 2023/winter season.	Env.	Medium	11/15/2023	CC started collection of the timber at Truck Parking Area.	In progress
36 ID 153	AR #4	10/12/2023	Grave sites will need fencing/protection/additional barrier to protect from rockfall	Provide protection measures for the grave sites (immediately).	CH	Medium	10/15/2023	Fence was provided	Resolved 04-07-2024
37 ID 154	Gudaure Access Road	10/12/2023	Contractor is required to start drafting the required SSEMPs for Gudaure Access Road.	CC to prepare and submit to PMCSC the site-specific environmental management plan based on disclosed IEE and conduct the pre-construction surveys and drone videos prior to start of construction.	Env.	Medium	12/25/2023	All SSEMPs submitted and approved	Resolved 23-05-2024
38 ID 155	Rivers Khadistkali and Aragvi	10/12/2023	Contractor is required to conduct fish monitoring in the rivers (under the project impact) as per the requirements of the Appendix 5 of the EIA "Critical Habitat Assessment (CHA) and Appropriate Assessment (AA)	CC to coordinate with PMCSC on the conduct of water quality testing and fish monitoring.	Env.	Medium	10/30/2023	Fish monitoring is planned to be conducted in Spring 2024. 16.05.24 - negotiations on fish monitoring with the expert is in progress.	In progress

			Screening” Refer to section 6.5 Potential Impacts on CH/ PBF.						
39 ID161	General	10/26/2023	The Lot 2 Contractor demarcated the cracks on the walls of the houses within 25 meters of the road alignment during the pre-construction building survey (refer to Summary of Pre-construction Building Survey). The plasters, which were applied on the cracks, got old and damaged and could not be used as a crack monitoring tool any more.	The Lot 2 Contractor is recommended to upgrade the plasters on the cracks of the houses according to the priority areas, where the construction activities (such as road compaction works, jack hammer operation) are ongoing.	Social	Low	11/30/2023	Plasters were upgraded on the cracks of the buildings in the villages: Arakhveti, Kvesheti and Zakatkari. 20-06-2024	Closed 20-06-2024
40 ID 164	Bedoni Village	11/9/2023	The new water pipeline installed by the Lot 2 Contractor in 2022 is getting damaged due to movement of trucks on the area under which the pipeline passes. The Contractor repairs the damaged sections of the pipeline (sometimes	PMCSC and Lot 2 Contractor are recommended to discuss the issue in details and develop and implement the corrective action plan to ensure proper and long-term protection of the Bedoni village water pipeline.	Social	High	11/30/2023	CC covered the pipeline with spoil at the required locations. The villagers have no issue in water supply.	Closed 02-05-2024

			the repair works take some days and the village is out of water for that period), however, it is a short-term solution to the problem. The Contractor should take corrective actions to ensure the long-term solution to the problem - proper protection of the pipeline during and after the project works. In case the water pipeline is damaged during the winter, there is a high risk that the water will be frozen inside the pipes and the village Bedoni residents will be left without water until spring.						
41 ID165	CH Site #10	11/9/2023	The Lot 2 Contractor dumped slurry on the land next to the project road on Didveli Plateau. The slurry also covered some area within the fenced CH Site #10.	The Lot 2 Contractor is recommended to clean the impacted area under supervision of PMCSC CH Monitor (slurry from the CH Site #10 area should be removed manually);	Env. CH	Medium	11/15/2023	CC removed the spoil	Closed 30-05-2024

			The issue was identified last week and the Lot 2 Contractor was instructed to investigate the cause of slurry dumping on unauthorized area and to remove the slurry and clean the impacted area, however, no actions were taken by the Lot 2 Contractor to sort out the issue.	PMCSC is recommended to conduct a refresh TBT to Lot 2 Contractor workers on spoil management and pollution prevention requirements.					
42ID1 67	CH #28	11/23/20 23	Although the Lot 2 Contractor was recommended to remove the large rocks placed at the edge of the CH Site #28 (Old Mill) from the side of the river Khadistskali, the corrective actions have not been implemented. The Lot 2 Contractor's Cultural Heritage Management Requirements such as "ensure	PMCSC and the Lot 2 Contractor CH Monitors are recommended: • to supervise the rock removal from the edge of the CH Site #28; • to demarcate the site with mesh fence; • to install the warning signs at the CH Site.	CH	Low	11/30/20 23	Rocks will be removed during final reinstatement	On hold

			implementation and effectiveness of monuments protection measures," etc. should be followed to avoid any impact on the cultural heritage monuments by the Project.						

71. Out of 42 issues pending from the previous reporting period identified by PMCSC and ADB E&SM, 21 issues were closed and 21 issues remain outstanding; however, resolution works for these is in progress.
72. The corresponding details between PMCSC, RD and Contractors during the reporting period regarding resolving the non-compliances and taking corrective actions for environmental issues is given in the Table 8D.

Table 8D: Important Correspondence between PMCSC, RD and Contractors to Resolve Environmental Issue during the Reporting Period

Date	Engineer Letter	Subject	Issue/ Concern	Required Action	Target Date of completion	Progress
18/01/2024	2024-01-UBM-RD-604	Acceptance of Monitoring results of the geodynamic process with in the project area for Lot-1	Updating the geodynamic process report	PMCSC accepted the revised version of the document	-	Completed
05/02/2024	2024-02-UBM-RD-614	Acceptance of Noise Control Plan for GARP Lot-2	Noise Control Plan for GARP	PMCSC accepted the document	-	Completed
06/02/2024	2024-02-UBM-RD-615	Acceptance of Waste management plan for GARP Lot-2	Waste management plan for GARP	PMCSC accepted the document	-	Completed
06/02/2024	2024-02-UBM-RD-616	Acceptance of Air Quality Management Plan for GARP Lot-2	Air quality management plan for GARP	PMCSC accepted the document	-	Completed
28/02/2024	2024-02-UBM-RD-624	Acceptance of Spoil management plan for GARP Lot-2	Spoil management Plan for GARP	PMCSC accepted the document	-	Completed
24/03/2024	2024-03-UBM-RD-629	Mr. NikolozTskvitinidze Appointed as Cultural Heritage manager	Appointment of CH Manager	-	-	Completed
16/04/2024	2024-04-UBM-RD-644	Acceptance of updated Site specific EMP (SSEMP) for GARP Lot-2	SSEMP for GARP	PMCSC accepted the document	-	Completed

30/05/2024	2024-05-UBM-CRTG-697	Acceptance of Geodynamic process report covering period July 2022 to July 2023	Geodynamic process Report	PMCSC accepted the document	-	Completed
20/05/2024	2024-05-UBM-CRCC-1311	Improper Storage of Topsoil from GARP	Topsoil storage	Storage of topsoil according to topsoil management plan	Immediately	In progress
21/05/2024	2024-05-UBM-CRCC-1318	Approval of vibration monitoring Plan	Vibration monitoring plan	PMCSC accepted the document	-	Completed
27/05/2024	2024-02-UBM-RD-614	Acceptance of Preconstruction Ecological Audit report for GARP Lot-2	Preconstruction Ecological Audit	PMCSC accepted the document	-	Completed

3.3 Issue Tracking (Based on Non-Compliances Observed)

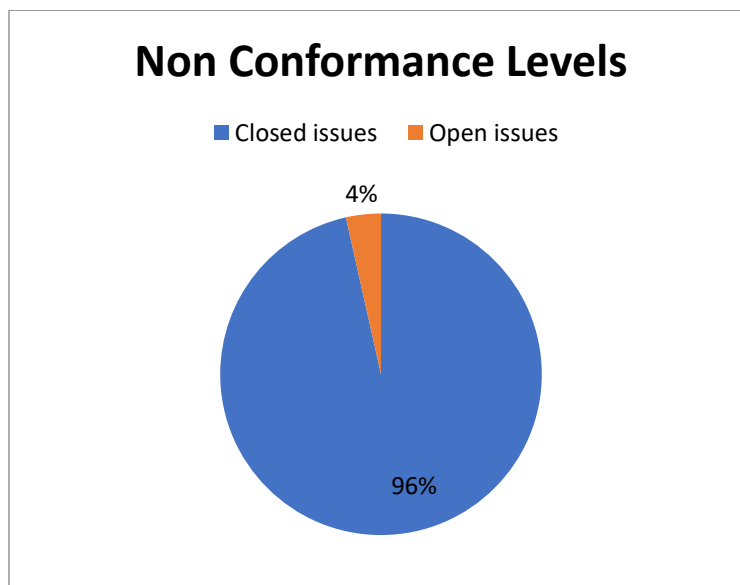
73. Description of issues tracked by PMCSC during the reporting period is given in the Table 9.

Table 9: Summary of issue tracking during the project life up to June 2024

Total number of issues raised during the the Project life (from start of the project)	428
Number of open issues (for next Q)	15
Number of closed issues (during project life)	413
Percentage closed	96.4 %
Issues opened this reporting period	9
Issues pending from previous reports	6
Issues closed this reporting period including from previous report	73

74. Data on the number of closed and open issues is presented in Figure 5. This data is based on the issues that were observed and have been closed or remained open during the Project. this

Figure 5: Non-Conformance levels during the Project



75. Out of four hundred twenty-eight (428) issues during the project life, four hundred thirteen (413) issues were closed and some of them were partially mitigated or corrective action in progress requiring further improvement. Table 9 shows the number of emerged and closed issues during the reporting period.

76. There are 06 issues pending from the previous reports identified by the PMCSC as mentioned in Table 8C for which resolution is in progress.
77. Pending issues from previous reports include: (i) storm water drainage at Lot 2 BP 2 pending since October 2022; (ii) broken fence at Lot 2 BP pending since February 2023; (iii) Lot 1 CC stockpiled crushing material in the river protection at crushing plant which is of low significance as river changed the direction pending from September 2022; (iv) damaged roof of material yard causing safety and material lost low risk since May 2023 Lot-1 (v) fugitive dust emission in Khada valley and Plateau Lot-2(vi) collection of wood logs and branches of tress from SDA 3 Lot-2 pending from previous reporting period. Resolution process for most of them is in progress and anticipated to be completed during the next reporting period.
78. In the reporting period, totally, 70 issues (33 for Lot 1 and 37 for Lot 2) were registered by PMCSC. 61 issues (31 for Lot 1 and 30 for Lot 2) were sorted out; 2 issues (1 for Lot 1 and 1 for Lot 2) are pending due to unexected high flow in Tunnel 5 and negligence of the contractor for Lot-2 at BP 2. Resolution of 7 issues (1 for Lot 1 and 6 for Lot 2) are in progress.
79. These issues have been reported to contractor through letters, NCRs, weekly inspection reports with the required Corrective Actions. Furthermore, there are regular discussions made about best practices to be adopted during progress review meetings and minutes of meetings of such meetings are officially recorded for tracking the progress. PMCSC safeguard team is highlighting the issues at the spot by sharing the pictures in WhatsApp group for immediate response from the Contractors.

3.4 Trends

80. During the reporting period, Lot 1 demonstrated improvement in addressing the safeguard issues. CC conducted the required environmental instrumental monitoring in Kobi and Tskere on a monthly basis; cleaned out the TBM conveyer belt, increased the frequency of cleaning the sedimentations ponds to treat tunnel water in Tskere and Kobi, cleaned out the sedimentation pits and floor of batching plants on rgular basis, removed the snow from the access road in Tskere,when required, completed the installation of tunnel water pipes to carry tunnel water from TBM and EG, collected the waste on regular basis from Kobi and Tskere campsite, mainatained the Access road to SDA3, installed the fence for old ruines at SDA 3, maintained the scrap area behind segment plant by handing over the used drums and used containers to third party, and storing the leftover waste in a proper way and covered with used ventilation tube sheet, where required, regular water sprinkling in kobi to suppress the dust by using one good water truck, and maintaining the absorbants and spill kits in the hazardous material storage areas and cleaned out all the oil spills duirn th May 2024, repaired the guard rail in TBM, monitoring of hazardous gases in the tunel, alcohol testing for the drivers and provided the trainings. In addition to that CC for Lot-1 has bought one camera for the fish monitoring from the Khada river and stratrted recording.
81. However, Lot 1 needs to adopt a forward-thinking approach to planning activities with foresight. CC has to address the outstanding issues identified during the current and previous reporting periods by PMCSC, RD, ADB. Increased turbidity was a problem due to washing activities in the TBM tunnel during the reporting problem which has been reduced during the month of June 2024 but contractor need to maintain the cleaning of sedimentation ponds. Contracot is required to strictly control the speed of dump trucks in the tunnel, provision of safe access to the worksite and safe conditions for working at

height, eye protection to the workers, improve illumination in the TBM tunne, safe handling of oxygen cylinders, installation of the barriers around concrete washout pit at batching plant in Kobi.

82. Overall, during the reporting period, Lot 1 Contractor improved response for resolving the non-compliances highlighted from the RD/PMCSC and showed improvement in addressing the safeguard issues, despite a few issues recurring due to worker behaviour and unforeseen natural events. However, the Lot 1 should take a more proactive approach in identifying safeguard issues and planning activities ahead.
83. Overall, during the reporting period, efforts to address outstanding safeguard issues from Lot 2 Contractor was improved during the reporting period, specifically, to improve housekeeping at campsites and active construction sites. Nonetheless, RD and PMCSC consistently urging the contractor to rectify all the issues at the site to prevent environmental damage. The WhatsApp group established by RD, overseen by the RD Deputy Chairman and involving the CC for Lot 2 safeguard team and management staff, continues to be utilized for ongoing communication and the prompt resolution of non-compliances flagged by PMCSC's safeguard team. CC for Lot-2 has hired an Environmental Specialist to address a long-pending issue and mobilized them at the site during the reporting period. The specialist is proactively involved in improving site environmental conditions, has completed the SEMP documents for the Gudauri Access Road, and has submitted the pre-construction environmental audit report, which was approved by PMCSC. Cleaned out all the sites in the first week of June 2024, including the campsite, batching plants, and Tunnel 1 entrance and exit. Controlled the leakage from the STP for Camp 2, repaired the pipe for the STP at Camp 3, cleaned out all the washout pits at the batching plants, improved the drainage for the temporary topsoil stored in Benian Begoni, and started shifting spoil from Khada Valley to SDA3 and embankments in Kvesheti. Added a mini truck to transfer waste from Camp 3, collected oil spills specifically from Tunnel 1, installed the required HSE signs, cleared the passage to Camp 3, and started collecting wood logs from the Gudauri Access Road and Kvesheti to hand over to NFA/locals.
84. Although there have been improvements, fugitive dust management remains a significant problem in Khada Valley and the plateau due to the dry and windy weather. Additionally, there is a need to stabilize the weak slopes near Bridge 3 (north section) to prevent rock mass flow that could damage the slope forest.

HSE issues requiring improvements include: PPE usage, violations, working at height, open electrical wiring due to worker behavior, electrical cables on the ground, and scaffolding issues. The contractor should also resume conservation work on CH 10, which was suspended due to winter, and address the relocation of CH 26.

3.5 Unanticipated Environment Impacts or Risk

85. No unanticipated event occurs during the reporting at both the lots. All the environment issues are the same reoccurring with the passage of time and contractors are maintain these.

4. RESULTS OF ENVIRONMENTAL MONITORING

4.1 Overview of the Monitoring Conducted During the Reporting Period

86. The certified laboratory Gergili LLC, contracted by Contractor for Lot 1, continued carrying out monthly instrumental monitoring for noise, vibration, air quality and testing surface water and ground water quality for the reporting period. Based on the test results, Gergili LLC issued the monthly Environmental Instrumental Monitoring Reports, which were forwarded to PMSCS for review.
87. Monitoring location for air quality, noise and vibration, water quality and ground water levels were selected considering the ongoing construction activities and as per Appendix B of the EIA as shown in Figures 6,7A & 7 B (Lot 1). The objective was to evaluate the potential impacts on the environment resulting from the construction activities. The results of the instrumental monitoring are given in tabular form while, details are presented in Annex 2.

Figure 6: Location of Sampling Points for instrumental monitoring on the Northern Site of the Project Lot 1 (January – June 2024)



Figure 7A: Location of Sampling Points for air, noise and vibration monitoring in on the Southern Site of the Project Lot 1 (January – June 2024)



Figure 7B: Location of Sampling Points for surface water monitoring from Khadastkali river in Tskere Lot 1 (January – June 2024)



88. The certified laboratory Gergili LLC, contracted by Contractor for Lot 2, continued carrying out instrumental monitoring for vibration, noise, air quality and testing surface water quality for the reporting period on a monthly basis. Based on the test results Gergili LLC issues the monthly Environmental Instrumental Monitoring Reports. Sampling locations for instrumental monitoring for the reporting period are shown in Figure 7 C.

Figure 7 C: Location of Sampling Points for Lot 2 (January – June 2024)



Ground Water Quality and Level Monitoring

89. For Lot 1 ground water quality testing was not carried out from January to May 2024 as it was not possible to collect the sample from the spring due to heavy snow as shown in Figure 7 D.
90. In June 2024, samples were collected from the well located on the upper part of the accommodation camp (coordinate 459946.172E 4711509.980N) in Kobi Village. The ground water test results as indicated in table 10 were compared with Georgian Acceptable Limits (resolution of the Georgian government #58 on the "Approval of technical regulations of potable water). All the tested chemicals parameters were within the National Acceptable Limits and ground water was not contaminated in terms of chemical contamination. However, Total Coliform detected in the spring water.
91. During reporting periods contractor did not take any action to eliminate the Total Coliform in the water. PMCSC has advised several times in meetings to start chlorine dosing to eliminate the coliform bacteria. As it is quite probable that the presence of coliforms is due to degradation of leaf/ grass and due to animal dung (grazing in that area during summer) entering in spring with rain water.

Figure 7 D: Heavy snow during March 2024 restricted ground water sampling from spring in Kobi



92. Ground water levels were measured in Kobi and Tskere during the reporting period. Ground water levels are measured on quarterly basis by CC for Lot 1 and results are recorded in Contractor's Quarterly Environment and Social Monitoring Reports. Due to heavy snow, it was not possible to measure ground water levels in Tskere. The details of measured ground levels are given below.
93. In January 2024 ground water levels were measured in Kobi while during April 2024, ground water levels have been measured at Tskere:
 - Kobi Site - 3.6 meters (coordinates: N470266.4; E461517), Jan 18, 2024
 - Tskere Site Downhill - 3.28 meter (coordinates: N 470266.4174 E 461517.817), Apr 18, 2024
 - Tskere Site Uphill - 6.1 meters (Coordinates: E4704018.00/N461849.00). Apr 18, 2024
94. Ground water level was measured in Tskere on April 18, 2024, coordinates: N470266.174/E461517.817, the water level was 3.28 meters high (under the mountain) and coordinates: E4704018.00/ 461849.00, water level was 6.1 meters high (on the mountain);

Table10: Groundwater Quality Monitoring Results Lot 1**Location: Spring in Kobi Village**

Parameter	Measurement unit	Method used	June 2024	Maximum permissible limit
Organoleptic Parameters				
Color	degrees	GOST 23268.1-91	0	<15
Physical-chemical Parameters				
pH	-	ISO10523:2008	7.55	6--9
Turbidity	NTU	ISO 7024:1:2016	0.75	N/A
TPH	mg/L	ISO 11504:2017	<0.005	0.3
TDS	Mg/L		133.6	<1000
Microbiological Parameters				
Total Coliforms	cfu/300 mL	ISO9308-1:2014	10	Not permissible

Surface Water Quality

95. For Lot 1, during the reporting period, the surface water samples were collected from the river Tergi to see the effect of tunnel water on the water quality of the river Tergi. Surface water samples were collected from the 150-meter upstream and 150 meters downstream from the disposal of tunnel water. The objective for the sampling was to evaluate potential impact on river water quality due to construction activities. The results are presented in Table 11A.
96. The results shown in the Table 11A indicates that there is no significant difference in the results upstream and downstream of tunnel water discharge point. In January 2024, COD levels were higher than MAC at the upstream level. Overall, the volume of water and turbidity decrease on Kobi side as most of the water was flowing towards Tskere due to gravity flow.

Figure 8: Downstream Surface Water Sampling in Tergi River, June 2024

97. pH values around 7-8 throughout the season reveals that River Tergi water is healthy for the Aquatic microorganisms as normally aquatic organism are severely stressed below 5.5 (acidic in nature). Moreover, at this pH (7-8) certain toxic minerals such as aluminium, lead, mercury, are insoluble and relatively harmless.

Table 11A: Surface Water Results River Tergi, (January – June 2024) Lot 1

Measurement in January 2024							
Location: Upstream, Downstream Riv. Tergi							
#	Parameters	River Tergi		Baseline Result from EIA River Tergi	Unit	National Maximum allowable Concentration (MAC)	IFC indicative values for treated sanitary sewage discharge
		Upstream 150 m	Downstream 150 m				
Physical & Chemical Tests							
1	pH	8.51	8.42	7.6	pH	6.5-8.5	6-9
2	Turbidity	2.64	3.14	50	NTU	N/A	-
3	TPH	<0.005	<0.005	<0.04	mg/l	0.3	-
4	COD	52.4	25.6	<15	mg/l	30	125
5	Conductivity	292	643	0.0343 S/m	m S/cm	N/A	-
Microbiological							
6	Total Coliform bacteria	ND	ND	560 (MPN in 1000 ml)	MPN in 100 ml	10000 (MPN in 1000 ml)	400 MPN/100 ml N/A for tunnel water
Measurement in February 2024							
Location: Upstream, Downstream Riv. Tergi							
#	Parameters	River Tergi		Baseline Result from EIA	Unit	National MAC	IFC indicative values for treated sanitary sewage discharge
		Upstream 150 m	Downstream 150 m				
Physical & Chemical Tests							
1	pH	8.40	8.49	7.6	pH	6.5-8.5	6-9
2	Turbidity	2.68	4.82	50	NTU	N/A	-
3	TPH	0	0	<0.04	mg/l	0.3	-
4	COD	10.5	18.5	<15	mg/l	30	125
5	Conductivity	678	698	0.0343 S/m	Micro S/cm	N/A	-
Microbiological							

6	Total Coliform bacteria	1300	60	560 (MPN in 1000 ml)	MPN in 100 ml	10000 (MPN in 1000 ml)	400 MPN/100 ml N/A for tunnel water
Measurement in March 2024							
Location: Upstream, Downstream Riv. Tergi							
#	Parameters	River Tergi		Baseline Result from EIA	Unit	National MAC	IFC indicative values for treated sanitary sewage discharge
		Upstream 150 m	Downstream 150 m				
Physical & Chemical Tests							
1	Turbidity	6.49	7.78	50	NTU	N/A	-
2	pH	7.56	3.89	7.6	pH	6.5-8.5	6-9
3	Conductivity	0.738	0.676	0.0343 S/m	Micro S/m	N/A	-
6	COD	5.76	0	<15	mg/l	30	125
7	TPH	<0.005	<0.005	<0.04	mg/l	0.3	-
Microbiological							
8	Total Coliform bacteria	40	190	560 (MPN in 1000 ml)	MPN in 100 ml	10000 (MPN in 1000 ml)-	400 MPN/100 ml N/A for tunnel water
Measurement in April 2024							
Location: Upstream, Downstream Riv. Tergi							
#	Parameters	River Tergi		Baseline Result from EIA	Unit	National MAC	IFC indicative values for treated sanitary sewage discharge
		Upstream 150 m	Downstream 150 m				
Physical & Chemical Tests							
1	pH	7.47	7.46	7.6	pH	6.5-8.5	6-9
2	Turbidity	32.90	14.40	50	NTU	N/A	-
3	TPH	<0.005	<0.005	<0.04	mg/l	0.3	-
4	COD	0	5.76	<15	mg/l	30	125
5	Conductivity	0.537	0.580	0.0343 S/m	Micro S/cm	N/A	-
Microbiological							
6	Total Coliform bacteria	70	ND	560 (MPN in 1000 ml)	MPN in 100 ml	10000 (MPN in 1000 ml) -	400 MPN/100 ml N/A for tunnel water
Measurement in May 2024							
Location: Upstream, Downstream Riv. Tergi							

#	Parameters	River Tergi		Baseline Result from EIA	Unit	National MAC	IFC indicative values for treated sanitary sewage discharge
		Upstream 150 m	Downstream 150 m				
Physical & Chemical Tests							
1	pH	7.86	7.94	7.6	pH	6.5-8.5	6-9
2	Turbidity	1.95	3.02	50	NTU	N/A	-
3	TPH	<0.005	<0.005	<0.04	mg/l	0.3	-
4	COD	0	0	<15	mg/l	30	125
5	Conductivity	0.771	0.591	0.0343 S/m	Micro S/cm	N/A	-
Microbiological							
6	Total Coliform bacteria	90	230	560 (MPN in 1000 ml)	MPN in 100 ml	10000 (MPN in 1000 ml) -	400 MPN/100 ml N/A for tunnel water
Measurement in June 2024							
Location: Upstream, Downstream Riv. Tergi							
#	Parameters	River Tergi		Baseline Result from EIA	Unit	National MAC	IFC indicative values for treated sanitary sewage discharge
		Upstream 150 m	Downstream 150 m				
Physical & Chemical Tests							
1	pH	8.09	8.07	7.6	pH	6.5-8.5	6-9
2	Turbidity	96.80	100	50	NTU	N/A	-
3	TPH	0	0	<0.04	mg/l	0.3	-
4	COD	0	0	<15	mg/l	30	125
5	Conductivity	0.217	0.277	0.0343 S/m	Micro S/cm	N/A	-
Microbiological							
8	Total Coliform bacteria	100	370	560 (MPN in 1000 ml)	MPN in 100 ml	10000 (MPN in 1000 ml)	400 MPN/100 ml N/A for tunnel water

98. Due to heavy snow in Tskere during the months of January to March 2024 there was no access to River Khadistskali, therefore it was not possible to take water sample upstream and downstream of the river.

Figure 9: Heavy snow during January 2024 restricted water sampling from River Khadistskali



99. During the reporting period contractor conducted water quality test in River Khadistskali from April to June 2024 and increase in turbidity levels were observed however less than the previous reporting period as TBM excavation has been completed during April 2024.
100. The limited capacity of the current sedimentation tanks, compounded by an unexpected rise in groundwater inflow in TBM, and the lack of regular maintenance of the tanks, resulted in the discharge of high-turbid tunnel water into River Khadistskali. However in the second quarter of 2024, RD and PMSCS strictly monitored the issued and compelled the contractor to clean sedimentation ponds on daily basis. Contractor cleaned out the sedimentation ponds in Tskere by using dry techniques (diverting water and washed out the tanks) in June 2024.
101. The presence of Total Coliforms observed in the Khadastkali River is due to discharge of Tskere community sewage water. However, Total Coliforms are below the maximum allowable concentration (MAC) in the surface water according to ordinance # 425 of Georgia.

Table 11B: Surface water results River Khadistskali (January – June 2024) Lot 1

Measurement in April 2024							
Location: Upstream, Downstream River Khadistskali							
#	Parameters	River Khadistskali		Baseline Result from EIA	Unit	National MAC Ordinance # 425	IFC indicative values for treated sanitary sewage discharge
		Upstream 150 m	Downstream 150 m				
Physical & Chemical Tests							
1	pH	7.87	7.83	7.72	pH	6.5-8.5	6-9
2	Turbidity	1.72	25.40	5.0	NTU	N/A	-
3	TPH	<0.005	<0.005	<0.04	mg/l	0.3	-

4	COD	4.80	5.28	<15	mg/l	30	125
5	Conductivity	0.259	0.217	0.0235 S/m	Micro S/cm	N/A	-
Microbiological							
6	Total Coliform bacteria	10	60	2000 (MPN in 1000 ml)	MPN in 100 ml	10000 (MPN in 1000 ml)	400 MPN/100 ml N/A for tunnel water
Measurement in May 2024							
Location: Upstream, Downstream River Khadistskali							
#	Parameters	River Khadistskali		Baseline Result from EIA	Unit	National MAC	IFC indicative values for treated sanitary sewage discharge
		Upstream 150 m	Downstream 150 m				
Physical & Chemical Tests							
1	pH	8.16	8.01	7.72	pH	6.5-8.5	6-9
2	Turbidity	1.33	77.90	5.0	NTU	N/A	-
3	TPH	<0.005	<0.005	<0.04	mg/l	0.3	-
4	COD	0.00	0.00	<15	mg/l	30	125
5	Conductivity	0.238	0.237	0.0235 S/m	Micro S/cm	N/A	-
Microbiological							
6	Total Coliform bacteria	130	90	2000 (MPN in 1000 ml)	MPN in 100 ml	10000 (MPN in 1000 ml)-	400 MPN/100 ml N/A for tunnel water
Measurement in June 2024							
Location: Upstream, Downstream River Khadistskali							
#	Parameters	River Khadistskali		Baseline Result from EIA	Unit	National MAC	IFC indicative values for treated sanitary sewage discharge
		Upstream 150 m	Downstream 150 m				
Physical & Chemical Tests							
1	pH	8.20	8.19	7.72	pH	6.5-8.5	6-9
2	Turbidity	5.00	39.70	5.0	NTU	N/A	-
3	TPH	<0.005	<0.005	<0.04	mg/l	0.3	-
4	COD	0	0	<15	mg/l	30	125
5	Conductivity	0.203	0.192	0.0235 S/m	Micro S/cm	N/A	-
Microbiological							
6	Total Coliform bacteria	40	520	2000 (MPN in 1000 ml)	MPN in 100 ml	10000 (MPN in 1000 ml) -	400 MPN/100 ml N/A for tunnel water

Tunnel Water testing

102. Tunnel water testing conducted on a quarterly basis during the reporting period both in Kobi and Tskere. Tunnel water in Kobi is being treated through trash rack to collect debris and trash and series of sedimentation ponds to collect oil and trap the sediments. These sedimentation ponds are cleaned on regular basis. The water volume and turbidity levels have been decreased significantly towards Kobi side during the reporting period as high volume of water flowing towards Tskere due to gravity flow. Contractor started the lining of the EG during the reporting period.
103. In Tskere the Tunnel water is being treated through the sedimentation pond. High volume of ground water inflow in EG and soft rock excavation resulted in sedimentation accumulation in the tunnel discharge water. Increased TSS levels in Tskere are also due to washing activities of the tunnel and TBM. Contractor is cleaning the sedimentation ponds on regular basis and washed the sedimentation ponds completely during the month of June 2024 for effective treatment of tunnel water by diverting water directly in to the river for the washing time. Test results for Tunnel water discharge after treatment through sedimentation ponds at Tskere and Kobi are given below:

Table 11C: Tunnel Water Discharge Testing in Kobi and Tskere Lot 1

Parameter	Measuring Unit	Test Result in Kobi tunnel water discharge point	Test results in Tskere tunnel water discharge point.	Maximum permissible limits for tunnel water discharge ordinance # 17
January 2024				
pH		8.47	-	6.5-8.5
TPH	Mg/l	0.025	-	≤0.3
TSS	Mg/l	124	-	60
BOD	Mg/l	4	-	25
April 2024				
pH		7.33	7.54	6.5-8.5
TPH	Mg/l	0	0	≤0.3
TSS	Mg/l	67	120	60
BOD	Mg/l	0.25	3.02	25

104. For Lot 2 surface water measurement details and results are given in the Table 11D and results show that the downstream result of turbidity levels are on higher in River Aragvi since March 2024 that could be due to construction activities for bridge 2 and

lack of proper mitigation measures in place. Concentration of the all the measured parameters is within acceptable range of Applicable Standard MAC; however, CC for Lot 2 is required to monitor the Total Coliform also for the next monitoring in order to fulfil the requirement of Appendix B, Table B2 of the EIA.

Table 11D: Surface water results (January – June 2024) Lot 2

Measurement in January 2024							
Location: Upstream and downstream Riv. Aragvi							
#	Parameters	River Aragvi			Baseline Result from EIA River Aragvi	Unit	Applicable Standard MAC
		Upstream 150 m	Downstream 150 m	Near Bridge crossing on Aragvi River in Aarkhveti			
		Physical & Chemical Tests					
1	pH	8.65	8.81	8.74	8.1	-	6-9
2	Turbidity	3.55	2.69	9.91	348.0	NTU	N/A
3	TPH	<0.005	<0.005	<0.005	0	mg/L	0.1
4	COD	104	97.6	105	<15	mg/L	30
5	Conductivity	0.252	0.264	0.273	0.0255 (mS/m)	mS/cm	200-1000
Measurement in February 2024							
Location: Upstream, Downstream Riv. Aragvi							
#	Parameters	River Aragvi			Baseline Result from EIA	Unit	Applicable Standard MAC
		Upstream 150 m	Downstream 150 m	Near Bridge crossing on Aragvi River in Arkhveti			
		Physical & Chemical Tests					
1	pH	8.25	8.23	8.24	8.1	-	6-9
2	Turbidity	11.60	1.59	42.6	348.0	NTU	N/A
3	TPH	<0.005	<0.005	<0.005	0	mg/L	0.1
4	COD	1.92	2.88	0.96	<15	mg/L	30
5	Conductivity	0.296	0.328	0.341	0.0255 (mS/m)	mS/cm	200-1000
Measurement in March 2024							
Location: Upstream, Downstream Riv. Aragvi							
#	Parameters	River Aragvi			Baseline Result from EIA	Unit	Applicable Standard MAC
		Upstream 150 m	Downstream 150 m	Near Bridge crossing on Aragvi River in Arkhveti			

		Physical & Chemical Tests					
1	pH	7.88	8.07	7.96	8.1	-	6-9
2	Turbidity	1.56	2.78	8.25	348.0	NTU	N/A
3	TPH	<0.005	<0.005	<0.005	0	mg/L	0.1
4	COD	0	0	4.8	<15	mg/L	30
5	Conductivity	0.316	0.306	0.303	0.0255 (mS/m)	mS/cm	200-1000
Measurement in April 2024							
Location: Upstream, Downstream Riv. Aragvi							
#	Parameters	River Aragvi			Baseline Result from EIA	Unit	Applicable Standard MAC
		Upstream 150 m	Downstrea m 150 m	Near Bridge crossing on Aragvi River in Arkhveti			
		Physical & Chemical Tests					
1	pH	7.84	7.93	7.83	8.1	-	6-9
2	Turbidity	33.6	40.70	103	348.0	NTU	N/A
3	TPH	<0.005	<0.005	<0.005	0	mg/L	0.1
4	COD	0.48	0	0	<15	mg/L	30
5	Conductivity	0.327	0.297	0.282	0.0255 (mS/m)	mS/cm	200-1000
Measurement in May 2024							
Location: Upstream, Downstream Riv. Aragvi							
#	Parameters	River Aragvi			Baseline Result from EIA	Unit	Applicable Standard MAC
		Upstream 150 m	Downstrea m 150 m	Near Bridge crossing on Aragvi River in Arkhveti			
		Physical & Chemical Tests					
1	pH	7.46	7.72	7.82	8.1	-	6-9
2	Turbidity	6.65	27.70	13.40	348.0	NTU	N/A
3	TPH	<0.005	<0.005	<0.005	0	mg/L	0.1
4	COD	21.10	16.80	11.60	<15	mg/L	30
5	Conductivity	0.300	0.316	0.347	0.0255 (mS/m)	mS/cm	200-1000
Measurement in June 2024							
Location: Upstream, Downstream Riv. Aragvi							
#	Parameters	River Aragvi			Baseline Result from EIA	Unit	Applicable Standard MAC
		Upstream 150 m	Downstrea m 150 m	Near Bridge crossing on Aragvi River in Arkhveti			
		Physical & Chemical Tests					
1	pH	8.28	8.26	8.25	8.1	-	6-9

2	Turbidity	23.0	36.40	18.0	348.0	NTU	N/A
3	TPH	<0.005	<0.005	<0.005	0	mg/L	0.1
4	COD	0	0	0	<15	mg/L	30
5	Conductivity	0.246	0.246	0.274	0.0255 (mS/m)	mS/cm	200-1000

Wastewater Test Results for Lot 1

105. The wastewater samples were collected from the wastewater effluent discharge from the treatment system installed at Lot 1 campsites in Kobi and Tskere during the reporting period as per requirement of MoEPA in April 2024. As indicated in the Table 11E, Total Nitrogen levels at both the plants and Total suspended solids in Tskere are exceeding the IFC and MAC. Contractor for Lot 1 has been advised to remove the old sludge from septic tanks by calling cesspool truck of waste management company Sanitary LLC (results attached as an Annex-2)

Table 11E: Test Results of Wastewater Effluent from the Sewage Treatment Plants (STP) in Kobi & Tskere, April 2024

Parameter	Units	Results In Kobi	Results in Tskere	Indicative Guideline Value for treated sanitary water discharge.	Max Permissible limits according to Georgian ordinance # 17
pH	pH	7.33	7.11	6-9	6.5-8.5
BOD5	mg/l	0.24	3.02	30	25
COD	mg/l	4.80	1.92	125	125
Total Nitrogen	mg/l	29.40	30.80	10	15
Total phosphorus	mg/l	0.018	0.02	2	2
Total suspended solids	mg/l	80.67	24.33	50	60
Grease and Oil	mg/l	<5	<5	10	≤5
Phenol	mg/l	0.13	<0.10	-	≤0.1
Detergents	mg/l	0.1	<0.1	-	≤0.2

Wastewater Test Results for Lot 2

106. CC for Lot 2 did not carry out waste water monitoring for STP during the reporting period. Contractor is required to conduct wastewater monitoring during the next reporting period to evaluate the treatment of STPs.

Noise

107. During the reporting period for Lot 1, sampling locations for noise levels were selected to evaluate the impact on the residential area of Kobi village due to construction activities at TUN 5 North portal, and at Tskere side South portal of TUN 5 to evaluate the impact of

noise on the residential area of Tskere village. The average equivalent noise levels (LAeq) recorded are indicated in Table 12 A with location detail and compared with the day time and night time IFC limits 55 dB(A) and 45 dB(A) respectively for the residential areas.

108. For Lot 1 overall, the LAeq results vary between 35 dBA to 65 dBA. The increased levels observed in June 2024 in Kobi from the range of IFC standard 55 d(BA) for residential areas during the day time. The increased high levels in Tskere in February 2024 are anticipated to be due noise of water flowing from the tunnel to sedimentation ponds in Tskere. In Kobi the increased noise levels are due to cumulative effect of traffic on E-117 and construction activities in Kobi. Graphical presentation of the day time levels at Lot 1 is shown in the Figure 10. The difference of 3dB(A) is hardly to be detected by the human ear.
109. The night time noise levels in village Kobi and Almasiani were within the limits of the standard which is (45 dBA). In Kobi, crushing plant has been surrounded by SDA 1 and stockpile height has been increased enough and that is acting as a noise barrier especially for the village Almasiani. Night time noise levels were not conducted in Tskere as there was no construction activity in Tskere in the night time. Graphical presentation of the night time levels at Lotv1 is shown in the Figure 11.

Table 12A: Average Equivalent Noise Levels Result during the Reporting Period Lot 1

Location	Average Equivalent Noise level (LAeq) Measurement dB(A) (1 Hour Averaging Period)							IFC Standard dB(A) for Residential Area
	Baseline Results	Jan 2024	Feb 2024	Mar 2024	Apr 2024	May 2024	Jun 2024	
Day Time								
Residential Area of Kobi Village	51	55.9	58.05	35.1	47.15	57.35	65.25	55
Tskere settlement	47	47.45	60.3	54.55	45.9	49.4	50.25	
Night Time (Averaging period 30 minutes)								
Residential Area of Kobi Village	-	34.4	37.4	38.7	38.7	43	39	45
Village Almasiani (church)	-	42.6	40.6	30.8	30.8	38	40	
Village Almasiani (residential area)	-	31.9	33.9	36.3	36.3	41	43	

Figure 10: Average Equivalent Day Time Noise levels (LAeq) Lot-1

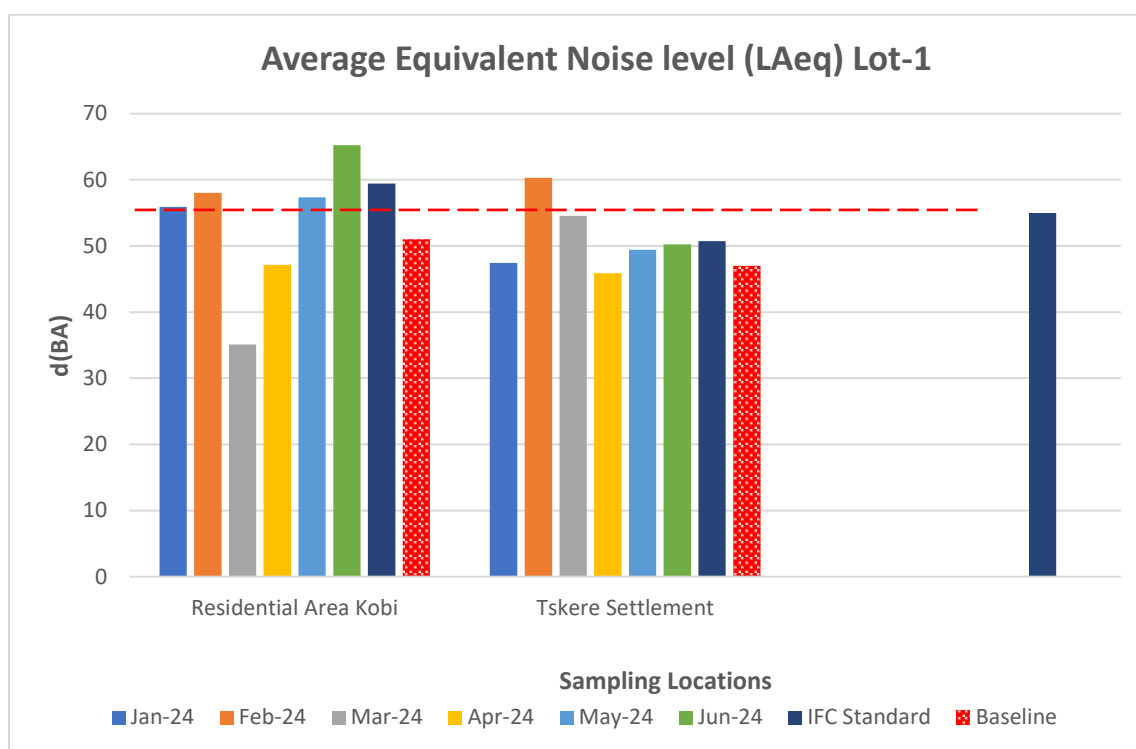
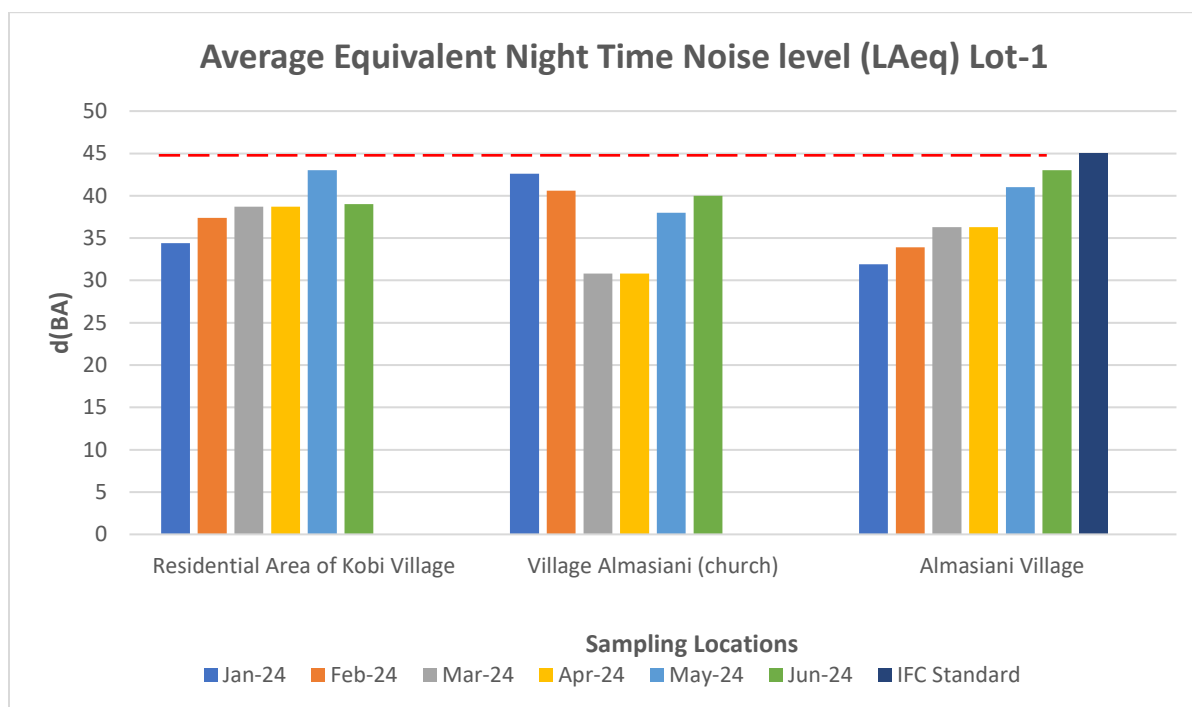


Figure 11: Average Equivalent Night Time Noise levels (LAeq) Lot-1

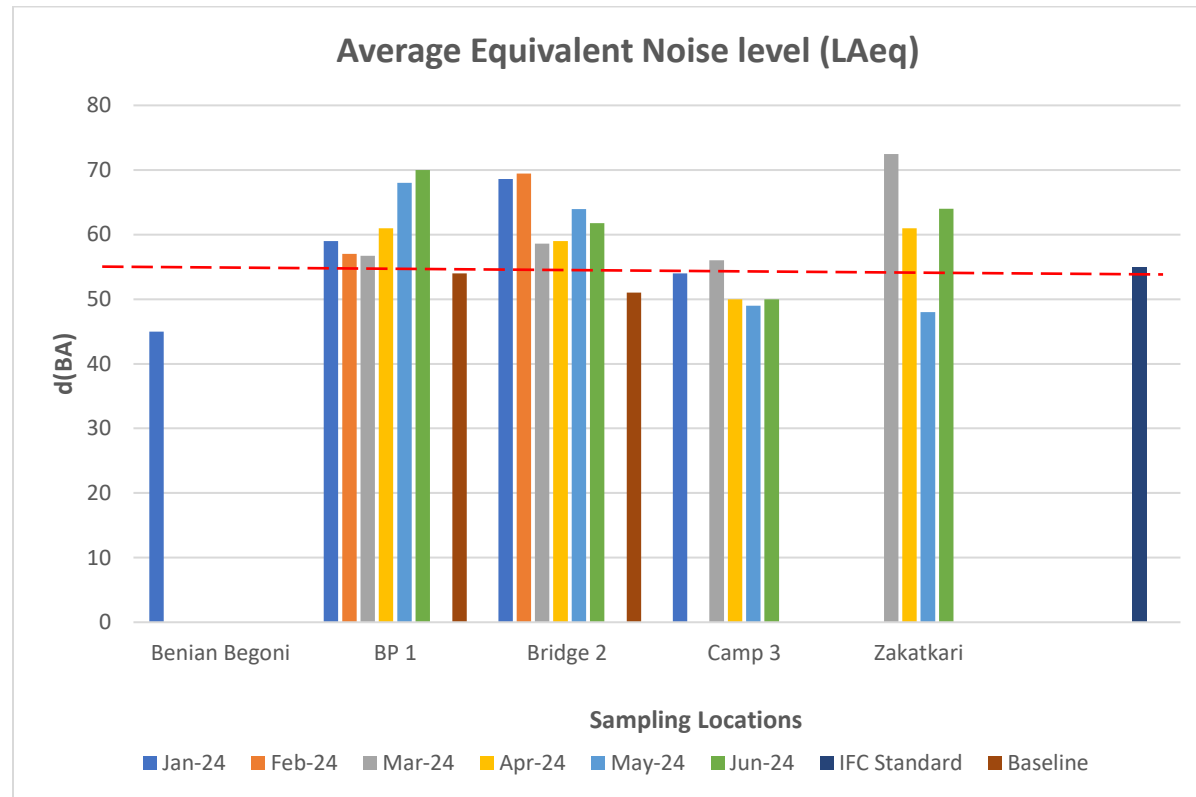


110. Noise monitoring results detail for Lot 2 is given in Table 12C. As indicated in the Table 12C and shown in Figure 12, along the E-117 noise levels are exceeding the day time IFC limits for residential area due to heavy traffic movements on the highway and construction activities; however, these are below the IFC limits of commercial noise levels 70 dB(A). Lot 2
111. High noise levels observed in village Zakatkari are due to construction activities. Contractor does not conduct any construction activities at night time and there is no need for night time noise monitoring for Lot 2.

Table 12C: Average Equivalent Noise Levels (LAeq) Result during the Reporting Period for Lot 2

Parameter	Unit	IFC Standard dB(A) Residential Area (Day time noise levels)	Sampling Locations							
			Parking Area	Kvesheti village	Bridge 2	Zakatkari	Camp 3	Benian Begoni	BP 1 along the road	
Baseline Results										
Day time Noise Levels	dB(A)	55	54.5	58.6	50.9	-	-	-	54	
Results January 2024										
Daytime Noise levels	dB(A)	55			68.6	-	54.05	45.45	58.8	
Results February 2024										
Daytime Noise levels	dB(A)	55	-		69.45			-	57.05	
Results March 2024										
Daytime Noise levels	dB(A)	55	-	-	58.6	72.45	56.7	-	56.7	
Results April 2024										
Daytime Noise levels	dB(A)	55			59	60.95	49.4	-	60.65	
Results May 2024										
Daytime Noise levels	dB(A)	55	-	-	63.95	48.2	48.9	-	67.95	
Results June 2024										
Daytime Noise levels	dB(A)	55	-	-	61.75	64.2	50.5	-	70	

Figure 12: Average Equivalent Day Time Noise levels (LAeq) Lot-2



Vibration

112. During the reporting period, Lot 1 conducted continuous vibration monitoring at one sampling point: Kvelatsminda Church building in Tskere Village. The device also covers Naraidze Tower, Zakaidze Tower and the old graves in Tskere. No exceedance of the reference value of DIN 4150-3 standard was observed due to construction activities in Tskere. Exceedance observed are due to change in battery, physical contact by locals.
113. For Kobi, CC for Lot 1 stopped vibration monitoring in St. George church because works on Kobi side are nearly complete and avoidance of the vibration has never been detected during the tunnel activities.
114. Cultural Heritage specialists have direct access to all vibration devices. Information on vibration exceedances is immediately provided online (via email and text) to the PMCS and Contractor's CH specialists.
115. Location for installation of vibration monitoring device is shown in the map below.

Figure 13 A: Location for the Vibration Monitoring Point at Lot 1 in Tskere



Figure 14: Vibration monitoring in Tskere Kvelatsminda Church



Table 13A: Continuous Vibrational Monitoring Results (January – June 2024) Lot 1

Location	Peak Particle Velocity (PPV) mm/sec			Guideline value for vibration with DIN 4150-3 Standard
	Longitudinal (X)	Transitional (Y)	Vertical (Z)	
Measurement in January 2024				3 mm/sec
Tskere, Kvelatsminda church	0.45 mm/s	0.51 mm/s	0.56 mm/s	
Measurement in February 2024				
Tskere, Kvelatsminda church	0.15 mm/s	0.65 mm/s	0.85 mm/s	
Measurement in March 2024				
Tskere, Kvelatsminda church	0.67 mm/s	0.32 mm/s	0.93 mm/s	
Measurement in April 2024				
Tskere, Kvelatsminda church	0.96 mm/s	0.25 mm/s	0.85 mm/s	
Measurement in May 2024				
Tskere, Kvelatsminda church	0.07 mm/s	0.06 mm/s	0.07 mm/s	
Measurement in June 2024				
Tskere, Kvelatsminda church	0.05 mm/s	0.07 mm/s	0.07 mm/s	

116. In addition to that, vibration was monitored in village Banian-Begoni by LLC Gergili, contracted by Lot 1, using REED instrument SD-8205 series and the results as given below shows that no vibro acceleration was detected due to construction activities:

Table 13B: Vibration Monitoring Results in the Village of Benian Begoni

Month	LAF av (m/Sec ²)	Month	LAF av (m/Sec ²)
January 2024	0	April 2024	0
February 2024	0	May 2024	-
March 2024	0	June 2024	-

117. For Lot 2, during the reporting period continuous vibration monitoring was conducted at the locations shown in the map below. Vibration monitoring devices were not installed at all locations recommended by NACHP. The Contractor has 5 devices for all CH sites. For the monitoring of cultural heritage sites, those places that are close to construction areas were selected.

Figure 15: Location for the Vibration Monitoring Points at Lot 2



Figure 16: Continuous Vibrational Monitoring at CH Site 29, Mughure, Lot 2



Table 13C: Continuous Vibrational Monitoring Results (Jan – June 2024), Lot 2

Location	Peak Particle Velocity (PPV) mm/sec			Guideline value for vibration with DIN 4150-3 Standard
	Longitudinal (X)	Transitional (Y)	Vertical (Z)	
Measurement in January 2024				3 mm/sec
CH #4, Didveli Plateau	1.35 mm/s	1.31 mm/s	2.06 mm/s	
Sviannant Tower in Svianaant old village	4.71 mm/s	1.35 mm/s	1.58 mm/s	
St. Mary church in Mughure village	2.75 mm/s	1.36 mm/s	4.67 mm/s	
Measurement in February 2024				3 mm/sec
CH #4, Didveli Plateau	1.05 mm/s	2.65 mm/s	2.56 mm/s	

Sviannant Tower in Svianaant old village	1.45 mm/s	0.32 mm/s	1.96 mm/s
St. Mary church in Mughure village	1.85 mm/s	1.02 mm/s	2.75 mm/s
Measurement in March 2024			
CH #4, Didveli Plateau	4.64 mm/s	2.31 mm/s	4.46 mm/s
Sviannant Tower in Svianaant old village	1.56 mm/s	0.46 mm/s	1.64 mm/s
St. Mary church in Mughure village	4.35 mm/s	2.06 mm/s	3.98 mm/s
Measurement in April 2024			
CH #19, Sameba tower	0.87 mm/s	1.16 mm/s	0.62 mm/s
CH #28, Mill	7.31 mm/s	2.89 mm/s	3.43 mm/s
Sviannant Tower in Svianaant old village	2.74 mm/s	0.62 mm/s	0.52 mm/s
St. Mary church in Mughure village	0.45 mm/s	0.11 mm/s	0.13 mm/s
Measurement in May 2024			
CH #19, Sameba tower	0.95 mm/s	0.24 mm/s	0.09 mm/s
CH #28, Mill	4.7 mm/s	2.8	3.56
Sviannant Tower in Svianaant old village	2.60 mm/s	0.96 mm/s	0.78 mm/s
St. Mary church in Mughure village	0.45 mm/s	0.85 mm/s	0.09 mm/s
Measurement in June 2024			
CH #19, Sameba tower	0.86 mm/s	0.26 mm/s	0.08 mm/s
CH #28, Mill	3.50 mm/s	4.4 mm/s	2.33 mm/s
Sviannant Tower in Svianaant old village	2.5 mm/s	0.84 mm/s	0.83 mm/s
St. Mary church in Mughure village	3.80 mm/s	1.81 mm/s	2.16 mm/s

118. No significant Exceedance was observed due to construction activities at the locations mentioned in Table 13C. The exceedances observed in March 2024 & June 2024 were due to contact with animals or due to change of batteries or shifting of devices.

Ambient Air Quality Monitoring

119. For Lot 1, dust levels were measured during the reporting period to determine the impact on air quality due to ongoing construction activities at TUN 5 North Portal and Tskere village. The air quality monitoring location and results are summarized in Table 14A.
120. For Lot 1 during the reporting period, the main emission source was the construction activities being carried out at the Tunnel 5 North and South Portals and movement of heavy machinery. The construction activities were ongoing for earthwork in Tskere side.
121. PM10 levels including the concentration levels of NO₂, SO₂, CO and dust levels as indicated in Table 14A are within the national limits for air quality in Georgia and IFC guidelines (for trend of PM 10 Levels during reporting period (see figure 17). CC for Lot 1 was carrying out regular water sprinkling at Kobi; however, CC for Lot-1 is not using the access road 1 as they have access for Tskere through tunnel 5.

Table 14A: Ambient Air Quality Monitoring Results Lot 1 (January- June 2024)

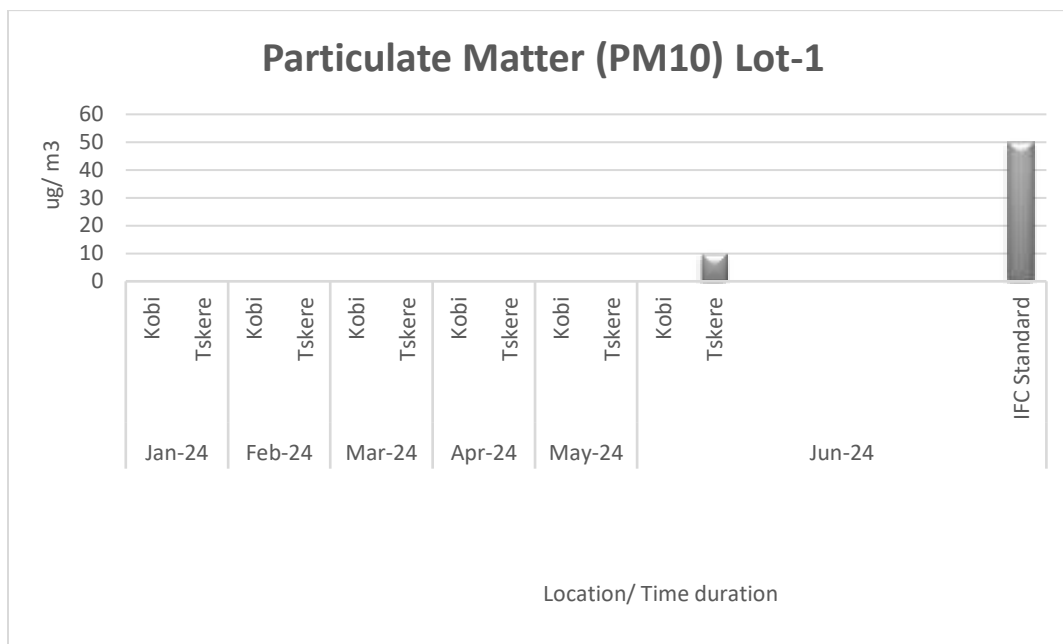
Measurement in January 2024					
Indicator	IFC Guidelines (Averaging Period)	Georgian Standards (Averaging Period)	Unit	Kobi Site	Tskere Village
Particulate Matter (PM ₁₀)	50 (24 hrs.)	50 (1 hr.)	µg/m ³	0.014	0.017
Particulate Matter (PM _{2.5})	25 (24 hrs.)	25 (1 year)	µg/m ³	0.003	0.009
Carbon Monoxide (CO)	-	10000 (Max daily or hourly mean) ^c	µg/m ³	1.23	1.2
Nitrogen Dioxide (NO ₂)	200 (1 hr.)	200 (1 hr.)	µg/m ³	0	0
Sulphur Dioxide (SO ₂)	20 (24 hrs.) 500 (10 min)	50 (1 hr.)	µg/m ³	0	0
Measurement in February 2024					
Indicator	IFC Guidelines (Averaging Period)	Georgian Standards (Averaging Period)	Unit	Kobi Site	Tskere Village
Particulate Matter (PM ₁₀)	50 (24 hrs.)	50 (1 hr.)	µg/m ³	0.012	0.012
Particulate Matter (PM _{2.5})	25 (24 hrs.)	25 (1 year)	µg/m ³	0.006	0.006
Carbon Monoxide (CO)	-	10000 (Max daily or hourly mean) ^c	µg/m ³	0	0
Nitrogen Dioxide (NO ₂)	200 (1 hr.)	200 (1 hr.)	µg/m ³	0	0
Sulphur Dioxide (SO ₂)	20 (24 hrs.) 500 (10 min)	50 (1 hr.)	µg/m ³	0	0
Measurement in March 2024					
Indicator	IFC Guidelines (Averaging Period)	Georgian Standards (Averaging Period)	Unit	Segment Plant Kobi	Tskere Village
Particulate Matter (PM ₁₀)	50 (24 hrs.)	50 (1 hr.)	µg/m ³	0.014	0.002
Particulate Matter (PM _{2.5})	25 (24 hrs.)	25 (1 year)	µg/m ³	0.002	0.001
Carbon Monoxide (CO)	-	10000 (Max daily or hourly mean) ^c	µg/m ³	12.8	3.7
Nitrogen Dioxide (NO ₂)	200 (1 hr.)	200 (1 hr.)	µg/m ³	0	0
Sulphur Dioxide (SO ₂)	20 (24 hrs.) 500 (10 min)	50 (1 hr.)	µg/m ³	0	0
Measurement in April 2024					
Indicator	IFC Guidelines (Averaging Period)	Georgian Standards (Averaging Period)	Unit	Segment Plant Kobi	Tskere
Particulate Matter (PM ₁₀)	50 (24 hrs.)	50 (1 hr.)	µg/m ³	0.021	0.008

Particulate Matter (PM _{2.5})	25 (24 hrs.)	25 (1 year)	µg/m ³	0.003	0.003
Carbon Monoxide (CO)	-	10000 (Max daily or hourly mean) ^c	µg/m ³	0	0
Nitrogen Dioxide (NO ₂)	200 (1 hr.)	200 (1 hr.)	µg/m ³	0.009	0
Sulphur Dioxide (SO ₂)	20 (24 hrs.) 500 (10 min)	50 (1 hr.)	µg/m ³	0	0
Measurement in May 2024					
Indicator	IFC Guidelines (Averaging Period)	Georgian Standards (Averaging Period)	Unit	Segment Plant Kobi	Tskere Settlement
Particulate Matter (PM ₁₀)	50 (24 hrs.)	50 (1 hr.)	µg/m ³	0.016	0.003
Particulate Matter (PM _{2.5})	25 (24 hrs.)	25 (1 year)	µg/m ³	0.004	0.001
Carbon Monoxide (CO)	-	10000 (Max daily or hourly mean) ^c	µg/m ³	0.1	5.9
Nitrogen Dioxide (NO ₂)	200 (1 hr.)	200 (1 hr.)	µg/m ³	0	0
Sulphur Dioxide (SO ₂)	20 (24 hrs.) 500 (10 min)	50 (1 hr.)	µg/m ³	0	0
Measurement in June 2024					
Indicator	IFC Guidelines (Averaging Period)	Georgian Standards (Averaging Period)	Unit	Segment Plant Kobi	Tskere Settlement
Particulate Matter (PM ₁₀)	50 (24 hrs.)	50 (1 hr.)	µg/m ³	0.029	0.010
Particulate Matter (PM _{2.5})	25 (24 hrs.)	25 (1 year)	µg/m ³	0.004	0.003
Carbon Monoxide (CO)	-	10000 (Max daily or hourly mean) ^c	µg/m ³	3.2	0.0
Nitrogen Dioxide (NO ₂)	200 (1 hr.)	200 (1 hr.)	µg/m ³	0.0	0
Sulphur Dioxide (SO ₂)	20 (24 hrs.) 500 (10 min)	50 (1 hr.)	µg/m ³	0	0

^B: IFC guidelines for 24 hours are being used except NO₂ as standard is available for one-hour averaging period

^C: For CO Georgian National standard is 10mg/ m³ µg/m³) maximum hourly or daily basis. For EU, the standard is 10 mg/m³ for 8 hours. For USEPA the standard is 10 mg/m³ (9 ppm) for 8 hrs. And 44 mg/ m³ (35 ppm) for one hour. There is no IFC standard for CO

Figure 17: Dust Levels (PM10) at Lot 1 (January – June 2024)



122. CC for Lot 2 monitored air quality from January to June 2024. The details of locations and results are provided in the Table 14B. All the parameters measured are within the permissible limits of IFC guidelines. Graphical presentation is shown in the Figure 18 to see the trends during the reporting period and ambient air is very clean. Fugitive dust emissions are being observed at the access road when heavy vehicles moving on the access roads during dry and windy days. Contractor is required to regularize the water sprinkling in Khada Valley and Didveli plateau to suppress the fugitive dust. Fugitive dust levels are the major issue in Khada Valley and Plateau at access road while vehicles travelling on access road during dry and windy season. Lot 2 has prepared dust management plan consisting of Action Plan to combat the dust and need to be properly implemented and UBM field officers should monitor on daily basis.

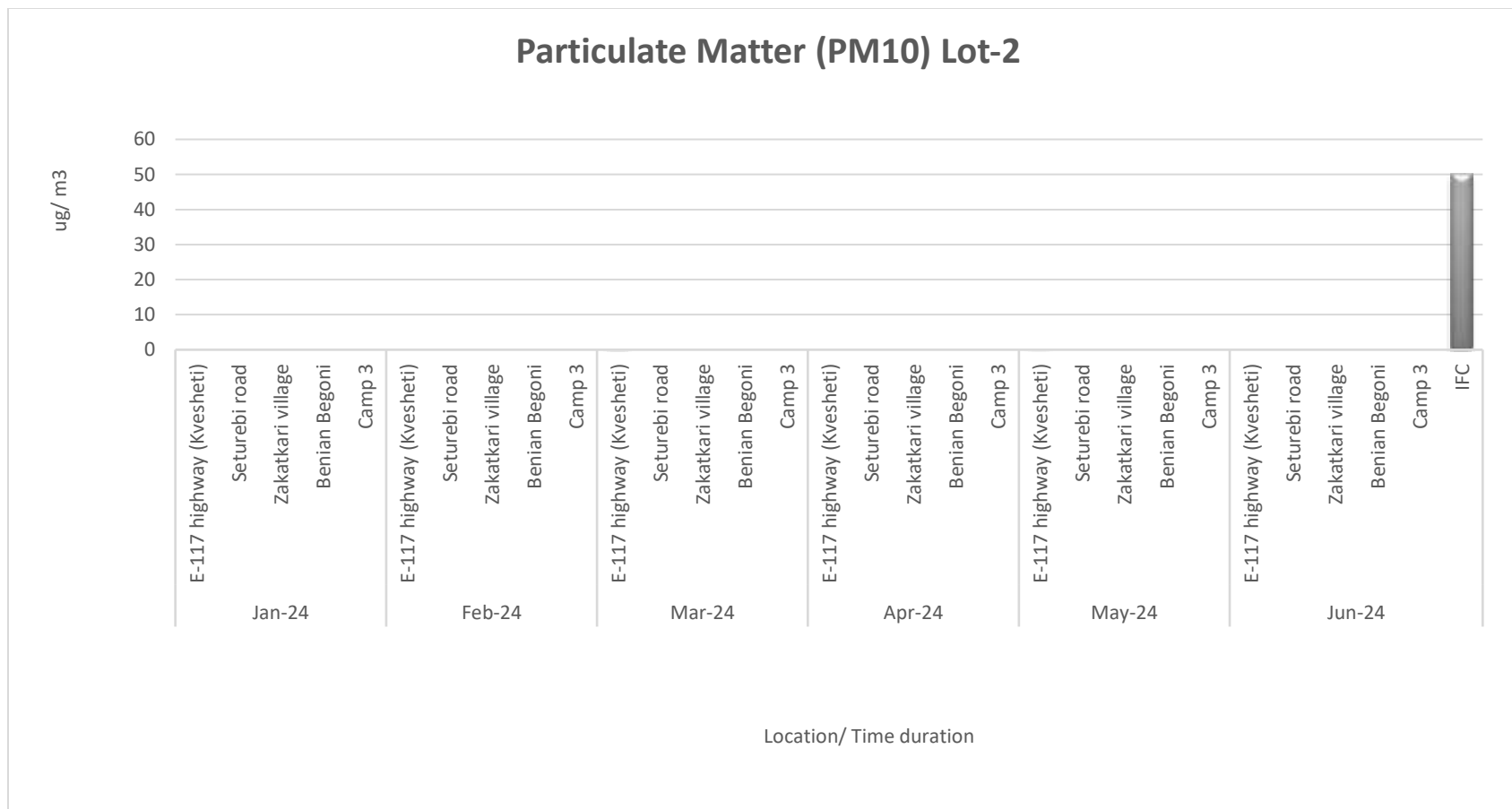
Table 14 B: Ambient Air Quality Monitoring Results Lot 2 (January- June 2024)

Parameter	Units	Limits (IFC) (Averaging Period)	Georgian Standards (Averaging Period)	Locations				
				E-117 highway (Kvesheti)	Seturebi road	Zakatkari village	Benian Begoni	Camp 3
Measurement results in January 2024 (averaging Period 1 hr.)								
Particulate Matter (PM10)	µg/m3	50 (24 hrs.)	50	0.002	0.024	0.002	0.001	N/A
Particulate Matter (PM 2.5)	µg/m3	25 (24 hrs.)	25 (1 hr.)	0.001	0.002	0.001	0.001	N/A
Carbon Monoxide (CO)	ug/m3	-	10000 (Max daily or hourly mean) c	0	9.1	1.0	6.3	N/A
Sulphur Dioxide (SO2)	µg/m3	20 (24 hrs.) 500 (10 min)	50 (1 hr.)	0	0	0	0	N/A
Nitrogen Dioxide (NO2)	µg/m3	200 (1 hr.)	40 (1 hr.)	0	0	0.003	0	N/A
Parameter	Units	Limits (IFC) (Averaging Period)	Georgian Standards (Averaging Period)	Locations				
				E-117 highway (Kvesheti)	Setureb i road	Zakatkari village	Benian Begoni Village	Camp 3
Measurement results in February 2024 (averaging Period 1 hr.)								
Particulate Matter (PM10)	µg/m3	50 (24 hrs.)	50	0.024	0.007	N/A	N/A	N/A
Particulate Matter (PM 2.5)	µg/m3	25 (24 hrs.)	25 (1 hr.)	0.007	0.003	N/A	N/A	N/A
Carbon Monoxide (CO)	ug/m3	-	10000 (Max daily or hourly mean) c	7.1	9.2	N/A	N/A	N/A
Sulphur Dioxide (SO2)	µg/m3	20 (24 hrs.) 500 (10 min)	50 (1 hr.)	0	0	N/A	N/A	N/A
Nitrogen Dioxide (NO2)	µg/m3	200 (1 hr.)	40 (1 hr.)	0.005	0	N/A	N/A	N/A
Measurement results in March 2024 (averaging Period 1 hr.)								
Particulate Matter (PM10)	µg/m3	50 (24 hrs.)	50	0.273	0.043	0.057	0.086	0.015

Particulate Matter (PM 2.5)	µg/m3	25 (24 hrs.)	25 (1 hr.)	0.034	0.025	0.031	0.026	0.009
Carbon Monoxide (CO)	ug/m3	-	10000 (Max daily or hourly mean) c	0	11.3	11.0	11.3	5.4
Sulphur Dioxide (SO2)	µg/m3	20 (24 hrs.) 500 (10 min)	50 (1 hr.)	0	0	0	0	0.0
Nitrogen Dioxide (NO2)	µg/m3	200 (1 hr.)	40 (1 hr.)	0.039	0	0	0	0.013
Measurement results in April 2024 (averaging Period 1 hr.)								
Particulate Matter (PM10)	µg/m3	50 (24 hrs.)	50	0.002	0.009	0.026	0.007	0.009
Particulate Matter (PM 2.5)	µg/m3	25 (24 hrs.)	25 (1 hr.)	0.003	0.002	0.008	0.001	0.002
Carbon Monoxide (CO)	ug/m3	-	10000 (Max daily or hourly mean) c	0	0	0	0	0
Sulphur Dioxide (SO2)	µg/m3	20 (24 hrs.) 500 (10 min)	50 (1 hr.)	0	0	0	0	0
Nitrogen Dioxide (NO2)	µg/m3	200 (1 hr.)	40 (1 hr.)	0	0	0	0	0
Measurement results in May 2024 (averaging Period 1 hr.)								
Particulate Matter (PM10)	µg/m3	50 (24 hrs.)	50	0.204	0.003	0.003	0.005	0.003
Particulate Matter (PM 2.5)	µg/m3	25 (24 hrs.)	25 (1 hr.)	0.148	0.002	0.001	0.002	0.001
Carbon Monoxide (CO)	ug/m3	-	10000 (Max daily or hourly mean) c	0.0	5.6	5.8	0.0	0.0
Sulphur Dioxide (SO2)	µg/m3	20 (24 hrs.) 500 (10 min)	50 (1 hr.)	0.0	0.0	0.0	0.0	0.0
Nitrogen Dioxide (NO2)	µg/m3	200 (1 hr.)	40 (1 hr.)	0.0	0.0	0.0	0.0	0.0
Measurement results in June 2024 (averaging Period 1 hr.)								
Particulate Matter (PM10)	µg/m3	50 (24 hrs.)	50	0.007	0.006	0.059	0.013	0.022
Particulate Matter (PM 2.5)	µg/m3	25 (24 hrs.)	25 (1 hr.)	0.001	0.001	0.003	0.001	0.004
Carbon Monoxide (CO)	ug/m3	-	10000 (Max daily or hourly mean) c	2.3	0	0	0.5	0

Sulphur Dioxide (SO ₂)	µg/m ³	20 (24 hrs.) 500 (10 min)	50 (1 hr.)	0	0	0	0.0	0
Nitrogen Dioxide (NO ₂)	µg/m ³	200 (1 hr.)	40 (1 hr.)	0	0	0	0.0	0

Figure 18: Dust Levels (PM₁₀) for Lot 2 (January – June 2024)



4.1.1 Biodiversity Monitoring

123. At Lot 1, in Kobi worksites surrounding area, two cameras are operating: - one camera is located at the SDA 3 for potential otter habitat and, potential habitat of corncrake species; - second camera is located upper hill of Narvani River. Two trap-cameras have been installed on Tskere Site at Khadistkali River and upper hill of the campsite. The monitoring of fish has been conducted in Khadistkali River; Water vision camera has been operating for the monitoring. The monitoring results from from the Cameras are being recorded in Contractor's Quarterly Environmental and Social Monitoring Report.
124. For Lot 1 seasonal biodiversity monitoring at the Kobi and Tskere Sites has been conducted. No accidental damage of fauna was identified during the reporting period. Animal mortality due to the project activities was not revealed.

Figure 19: Locations of Camera Traps Installed by Lot 1

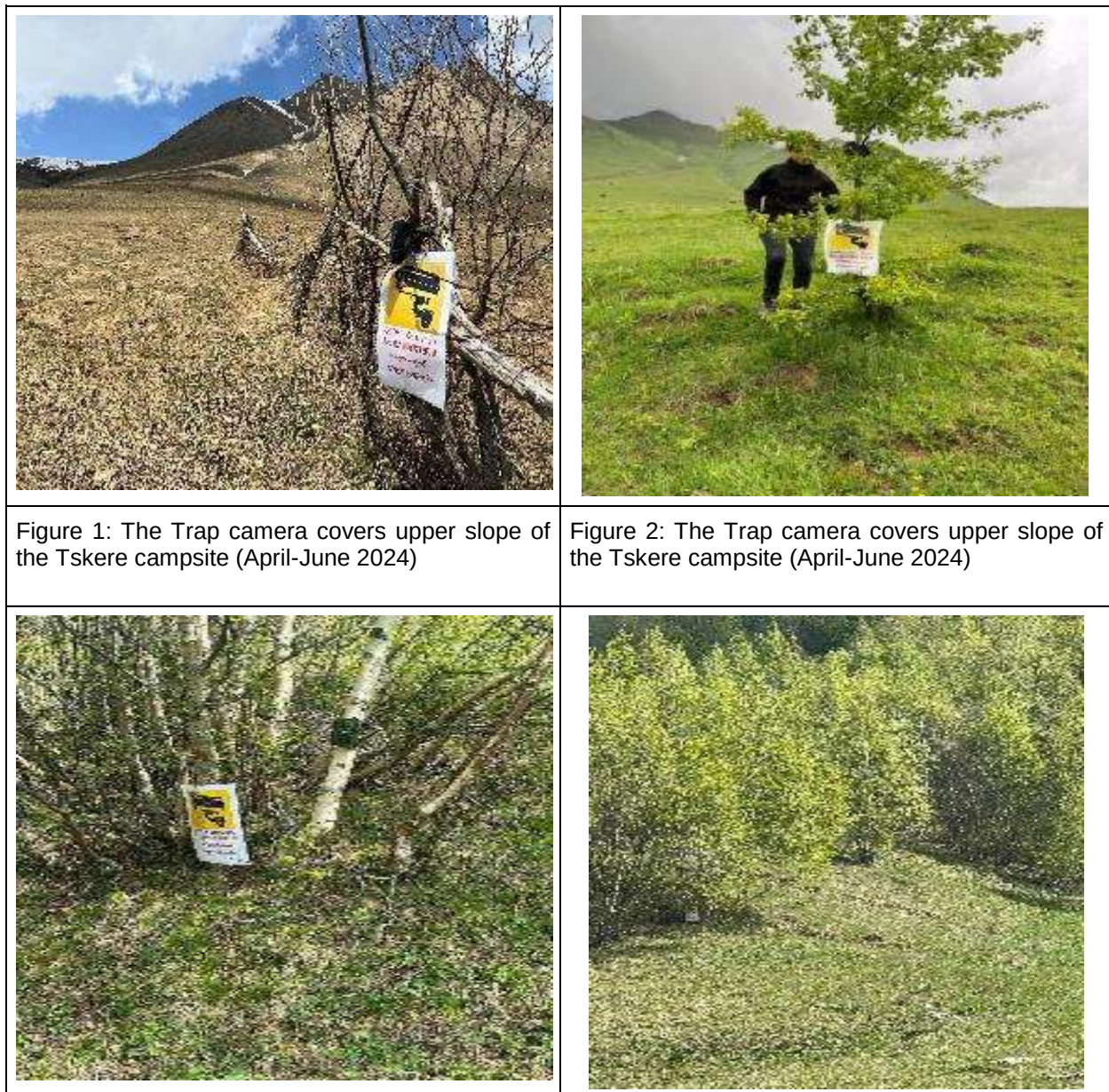


Figure 3: The Trap camera covers SDA #3 area. (April-June 2024)



Figure 4: The trap camera covers Narovani River upstream. (April-June 2024)



	
Monitoring process on fish by water vision camera on Khadistkali River (May-June 2024)	Monitoring process on fish by water vision camera on Khadistkali River (May-June 2024)

125. Wolves, foxes, a bear and Partridges were caught in spring 2024 at the upper hill of the Kobi campsite and at the SDA 3. Detailed findings of the survey carried out during the reporting periods are given in Table 15A with pictures.

Table 15A : Details of Findings of Biodiversity Features in Lot 1 during Reporting Period (January – June 2024)

	Wolf, uphill, Kobi, April, 2024
	Bear, uphill, May, 2024

	Fox, SDA 3, April, 2024
	Ravens (few individuals) - Campsite (Kobi), May 2024
	Partridges on SDA #3 (Kobi), May, 2024

	Partridges on SDA #3 (Kobi), June, 2024
	Tskere, May-June, 2024

Figure 20. Details of Plants Observed and Recorded by Contractor ECoW (Spring-Summer period, 2024) – Lot 1 (Kobi and Tskere)

		
Primula farinosa L.-Bird-eye primrose	Cardamine pratensis L.- Lady's-smock	Gentiana verna L.



Broad-leaved Marsh-orchid



Potentilla concinna Richardso



Fritillaria tubiformis Gren. & Godr.



Anemone narcissiflora L



Alpen-Kreuzblume



Marsh dandelion



Cardamine raphanifolia Pourr.	Myosotis alpestris F.W.Schmidt	Mountain Buttercup
		
Primula elatior (L.) Hill	Pedicularis kernerii Dalla Torre	Bistorta officinalis Delarbre
		
Pontechium maculatum (L.) Böhle & Hilger	Gymnadenia densiflora (Wahlenb.) A.Dietr.	Tanacetum coccineum (Willd.) Grierson



Veronica gentianoides Vahl
Gentian speedwell



Centaurea cheiranthifolia Willd.



Dactylorhiza majalis (Rchb.)
P.F.Hunt & Summerh.



Carum carvi L. Caraway



Betonica macrantha K.Koch. Big
Betony



Veronica chamaedrys L.
Germander Speedwell



Some wild spread plants In Tskere.

LOT-2

126. For Lot 2, three cameras have been installed at different places in the project area and the locations for the cameras are being changed from time to time. In case of mammals, CC also checked for any evidence for the foot prints or faeces in or around the project area. Monitoring of focused species was held according to biodiversity monitoring plan, revealed results are shown in Tables 15B and 15C below.

Table 15B: Faunal Species Movement around the Project Corridor Lot 2

Monitoring objects during January-June 2024				
Mammals				
Species	Status by Georgian red list	Action	Location	Results
1. Brown Bear <i>Ursus arctos</i> 2. Eurasian lynx <i>Lynx lynx</i> 3. Eurasian otter <i>Lutra lutra</i> 4. Dahestanian tur <i>Capra cylindricornis</i>	1. VU 2. CR 3. VU 4. VU	1. Visual observation and collaborate with local people by asking if they saw this specie 2. Visual observation and collaborate with local people by asking if they saw this specie 3. Visual observation 4. Visual observation	1. Near T3 entrance, Khada valley 2. Plateau, B3, Camp3. 3. Near village Bedoni, riv. Khadistskali territory 4. Near Camp3	1. Photo was taken by photo trap 2. No footprint, excrement and fur were found or taken any photo 3. No signs of vital activity were found 4. No signs of vital activity were found

Rodents				
Species	Status by Georgian red list	Action	location	Results
1. Caucasian Squirrel – <i>Sciurus anomalus</i>	1. -	1. Visual observation, especially on the trees	1. Tunnel N2, Plateau, B3	1. No squirrels were seen
Birds				
Species	Status by Georgian red list	Action	Location	Results
1. Egyptian vulture - <i>Neophron percnopterus</i> 2. Cinereous or black vulture - <i>Aegypius monachus</i> 3. Great rosefinch - <i>Carpodacus rubicilla</i> 4. White winged redstart - <i>Phoenicurus erythrogastus</i> 5. Common blackbird – <i>Turdus merula</i> 6. White wagtail - <i>Motacilla alba</i>	1. VU 2. VU 3. VU 4. VU 5. – 6. -	1. Visual observation near possible nest 2. Visual observation 3. Visual observation 4. Visual observation 5. Visual observation 6. Visual observation	1. Near tunnel N1 2. Whole territory of Lot N2 3. Whole territory of Lot N2 4. Whole territory of Lot N2 5. Whole territory of Lot N2 6. Whole territory of Lot N2	1. No vulture were found (possible nest of vulture seems left) 2. No Cinereous black vulture were seen 3. No great rosefinch were seen near camp N3 4. This species was not found 5. This specie was found everywhere 6. This specie was found everywhere
Bats				
Species	Status by Georgian red list	Action	location	Results
1. Lesser mouse-eared myotis - <i>Myotis blythii</i> 2. Greater horseshoe bat - <i>Rhinolophus ferrumequinum</i> 3. Lesser horseshoe bat -	1. – 2. – 3. -	1. Visual observation 2. Visual observation 3. Visual observation	1. near tunnel N 1, access road N1, B2 2. near tunnel N, access road N1, B2 3. near tunnel N1,	1. This specie wasn't found 2. This specie wasn't found 3. This specie wasn't found

<i>Rhinolophus hipposideros</i>			access road N1, B2	
Plants				
Species	Status by Georgian red list	Action	location	Results
1. Mountain oak 2. Common elm 3. Smooth-leaved elm 4. Common alder 5. European ash 6. Georgian oak 7. Common hornbeam 8. Litwinow birch 9. Field maple 10. Oriental beech	1. VU 2. VU 3. VU 4. – 5. – 6. – 7. – 8. – 9. – 10. -	1. Visual observation 2. Visual observation 3. Visual observation 4. Visual observation 5. Visual observation 6. Visual observation 7. Visual observation 8. Visual observation 9. Visual observation 10. Visual observation	1. Tunnel N1, Access road N2,4, B3 2 Tunnel N1, Access road N2,4, B3 3. Tunnel N1, Access road N2,4, B3 4. Tunnel N1, Access road N2,4, B3 5. Tunnel N1, Access road N2,4, B3 6. Tunnel N1, Access road N2,4, B3 7. Tunnel N1, Access road N2,4, B3 8. Tunnel N1, Access road N2,4, B3 9. Tunnel N1, Access road N2,4, B3 10. Tunnel N1, Access road N2,4, B3	1. This species wasn't found 2. This species wasn't found 3. This species wasn't found 4. During the reporting period mentioned specie was not necessary to cut 5. During the reporting period mentioned specie was not necessary to cut 6. During the reporting period mentioned specie was not necessary to cut 7. During the reporting period mentioned specie was not necessary to cut 8. During the reporting period mentioned specie was not necessary to cut 9. During the reporting period mentioned specie was not necessary to cut 10. Some individuals of this species were cut in case of B3 working activities from Khada valley side (access road N5) - In 2023 January and environmental specialist was attending the process
Fish				
Species	Status by Georgian red list	Action	location	Results

1. Salmo 2. Bullhead 3. Caucasian chub 4. Barbell 5. Mursa	VU - - - -	1. - 5. Observation and control fishing	1. Aragvi, Khadistskali 2. Aragvi 3. Aragvi 4. Aragvi, Khadistskali 5. Khadistskali	None of fishes was caught or observed.

Table 15C: Photographs of Species Movement Noted by Camera Traps, Lot 2

	Photo trap model: Browning
 Above T3, 2024 spring	<i>Canis lupus</i> – Grey wolf – LC status by IUCN – not included in Georgian red list

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

	<i>Ursus arctos</i> – Brown bear - LC status by IUCN – EN status by Georgian red list
 Surroundings of entrance T3 and exit of T3, Khada valley	<i>Capreolus capreolus</i> – roe deer – LC by IUCN – No status by Georgian red list
 Didveli Plateau spring 2024	

	<i>Canis familliaris</i> – domestic dog
	<i>Genus Equus</i> – domestic horse

Didveli Plateau

Didveli Plateau, winter 2024

4.1.2 Cultural Heritage Monitoring

127. In the monitoring period the contractor for LOT 2 (CRCC) has embarked on earthworks along the Gudauri access road. This phase of the project involved the removal of topsoil, a process closely scrutinized by the Engineers' Cultural Heritage team. Diligent observation during the earthworks revealed no evidence of cultural heritage remains.
128. The Lot 2 Contractor started topsoil stripping at 3+200 Km. the Engineers CH specialists closely monitored the process. The chance find was not detected.
129. In the monitoring period the Contractor commenced earthworks at 10+600 Km, near the CH 26. The Engineers and The Contractors' CH specialists monitored the process. The chance find was not detected.

Figure 21: Earthworks near CH 26



130. In December 2023, the Contractor initiated conservation efforts targeting the CH 10 tower. Originally slated for completion by December 8, 2023, the project encountered delays due to adverse weather conditions, stalling the subcontractor's progress. Consequently, the National Agency for Cultural Heritage Preservation (NACHP) revised the project's deadline to May 2024 to accommodate these setbacks. However, the contractor could not complete the work even in May. Accordingly, he applied to NACHP for a new permit. The subcontractor received a new permit deadline of August 26, 2024

Figure 22: Conservation Works of Didveli Backed Tower (CH Site #10)



131. The contractor for Lot 2 hired CH sub-contractor for the relocation of CH Site #26 (remains of backed tower in Natsvliant village) the relocation permit (№5/12/263) was issued by NACHP on 01.12.2023. The CH Site #26 will be relocated to the area located west of the village Gomurni selected based on an archaeological survey conducted in September 2023 by NACHP. The CH Site #26 relocation works will be commenced in 2024. Based on the methodology approved by the NACHP the Contractor together with Engineeris CH team prepared method statement which provides a comprehensive guide to ensure the relocation is carried out effectively, preserving the historical and cultural integrity of the object.
132. Consequently, the Contractor for Lot 2 started topsoil stripping as part of their construction activities. PMCSC Cultural Heritage Specialists closely monitored the earthworks and throughout the monitoring process, no cultural heritage artifacts or remains were discovered.
133. Both Contractors continued continuous vibration monitoring at several CH Sites. The detailed information is presented in Section 4.1 “Vibration.”
134. Both Contractors’ and PMCSC Cultural Heritage Specialists have permanent access to the website where the vibration data is reflected in live mode. Also, as soon as the exceedance of vibration is detected, the specialists automatically receive a notification in the form of a message or e-mail. As soon as the PMCSC CH specialists receive the notification, it is verified from the website immediately and the exact figures are analyzed. PMCSC CH Specialists start looking for the cause together with the Contractor. If it is found that an exceedance has been observed as a result of construction works, appropriate mitigation measures will be taken. At the end of each month, the vibration monitoring sub-contractor submits the monthly monitoring report with all the monitoring data.
135. In the reporting period, PMCSC CH Specialists constantly monitored the identified CH Sites. Construction didn’t affect any identified CH Sites.
136. The Contractor for Lot 2 upgraded and reinforced the damaged fences around the required CH sites. The contractor for Lot 2 fenced Svianaant Old Village with wire mesh to avoid physical damage during construction works.

Figure 23: Tskere, Zakaidze tower



Figure 24: CH Site #25



4.1.3 Health and Safety

137. The Engineer continues to monitor and supervise the KKR activities through the involvement of 4 H&S specialists: one international H&S specialist, one senior H&S specialist who is responsible for both Lots and two H&S specialists mobilized separately for each Lot. Proceeding from it, effective monitoring of all construction activities is ensured through the constant presence of H&S specialists at worksites. .

138. The Engineer together with the Contractors continue to carry out regular worksite inspections. These inspections are done separately as well as jointly (PMCSC and the Contractors together). These worksite inspections are proactively identifying unsafe conditions and negative tendencies which contributes to the prevention of any unwanted events and accidents in the future. Both, the Contractors and the Engineer continue to deliver H&S trainings to the project personnel in order to improve the safety awareness and safety culture across the project.
139. In addition, RD's HS specialist continues to conduct regular monitoring of project activities, revises HS documentation and consults the Contractors on health and safety matters.

4.1.3.1 Community Health & Safety

140. During the reporting period, the Engineer continued to monitor the compliance of community health and safety with the established and national standards. The monitoring of community health and safety is carried out on a daily basis as this is a part of daily worksite inspections.
141. Warning signs and fences are required to be properly installed at all necessary locations. The Contractor permanently upgrading all fences and signs across the worksites, especially after the winter period as adverse weather and heavy snow significantly damages these ones. The identification of damaged fences/signs at some point was not done proactively by the Contractor but this shortcoming was mitigated by the presence of the Engineer's and ADB's monitors who identified the locations with the need of upgrade and timely informed the Contractor.

Worksites, adjacent to local populated areas were fenced off and the Contractor delivered permanent maintenance of fencing and warning signs.

142. To ensure community health and safety, both Contractors carried out different activities during the reporting period:
- Cleaning of the local roads to villages Seturebi, Zakatkari and Jaghmiani from snow at Didveli Plateau (Pic 1)
 - Regular clearing of Khada Valley main road and access roads from snow by both LOTs (Pic 2)
 - LOT 1 Contractor was conducting noise monitoring during nighttime at a different period of time in Tskere in order to ensure that TBM which was at that time approaching South portal, did not generate any noise which could exceed the permissible limits and bother local community. As a result, no exceedances were detected, and the monitoring results were communicated with the locals.
 - Road works in Arakhveti resulted in the temporary narrowing of the roadway and hence, the movement of traffic became difficult which required mitigation measures to ensure smooth traffic movement. For this purpose, the LOT 2 Contractor, according to the recommendations provided by the Engineer's Road Safety specialist, installed additional traffic signs from both directions of the narrowed section. Also, flashing cone lights were installed to increase the awareness of road

users during the nighttime. In addition, two flagmen were mobilized from both directions to facilitate the traffic control at that section. (Pic 3,4)

- Lot 2 Contractor resumed works at the Bridge No. 3 worksite from both sides, (Didveli Plateau and Khada Valley). Consequently, two flagmen have been mobilized to regulate traffic under Bridge No. 3 worksite in Khada Valley.
 - Upgrading and maintenance of fence at Bridge 2, Lot 2
 - LOT 2 Contractor has fenced off mud pits in the village Benian-Begoni. The Contractor did not proactively install the necessary fencing but as a result of the Engineer's effort, the issue was closed timely (Pic 5)
 - Fencing of the excavations at different locations along the Arakhveti village, adjacent to the highway and residential areas
143. The residents of the village Bedoni expressed their concern regarding LOT2 Contractor's dump trucks driving on the road section which connects highway to this village. According to the local's explanation, it was disturbing and unsafe to drive on that road together with the dump trucks and it was creating a risk to their safety. Also, dump trucks were damaging this road. As a follow up on, the Contractor has diverted all dump trucks to the ROW section, avoiding driving on that local road. In addition, necessary signs were installed from both directions of this road's section, forbidding the dump trucks entering that section. Necessary instructions were also delivered to the dump truck drivers through the training session regarding this issue. (Pic 6,7)
144. The Engineer's H&S and Social Specialist together with the RD's H&S specialist conducted a community meeting with the residents of the village Tskere at a campsite. The meeting was also attended by Lot 1 Contractor CLO, and the ADB CLO. During the meeting, H&S issues were discussed with locals, which might arise during the upcoming activities at Tskere such as TBM disassembling. Air quality, noise and vibration control and wastewater management were also a subject of discussion at the meeting. Locals were informed that dismantling and storing the TBM parts would require mobilization of gantry crane which will also create risks associated with the lifting activities. Also, importance of ensuring children's safety during these activities was emphasized as children would visit the village for summer vacation.
145. During this meeting, locals stated that night shift activities at the tunnel portal (excavation of C&C section) might create noise which can disturb children at night. It was agreed with the Contractor that night activities will take a place at the different location, distant from the village and hence, no disturbing noise at nighttime can be expected. (Pic 8)

Figure 25: Community Health and Safety Actions Implemented during the Reporting Period by Lot 1 and Lot 2

Pic 1	Pic 2
	
Pic 3	Pic 4
	

INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

Pic 5	Pic 6
	
Pic 7	Pic 8
	

4.1.3.2 Occupational Health & Safety

146. The Engineer and Contractors of both Lots continued to carry out regular safety inspections of worksites during the reporting period. Both Contractors' H&S specialists were permanently assigned to different worksites (Tskere, Kobi, Khada valley, Didveli Plateau) in an organized manner to ensure effective safety coverage. This improves the quality of supervision and tracking of ongoing issues. In addition, the Engineer's H&S specialists permanently monitor the compliance with the safety requirements through regular visits and inspections. They are also assigned to their respective areas of operation in the organized manner which improves the quality of supervision. The inspection results are documented by the Contractors and the Engineer in the checklists and inspection reports.
147. Lot 1 Contractor successfully broke through Tunnel No. 1 with Tunnel Boring Machine (TBM). The mutual effort of the Contractor and the Engineer as well as permanent

supervision ensured the safe completion of Tunnel 1 excavation without major incident or any other unwanted event. Safety procedures and mechanisms which were developed for the safe operation of TBM were strictly followed by the Contractor until completion of tunnel excavation which ensured safe working environment during the whole construction phase. The completion of this work significantly reduced the safety risks in the Tunnel No. 1 as TBM operation was extremely complex and challenging activity. The Engineer continues to closely monitor the remaining activities in Tunnel No.1 which are mostly the construction of driveway shoulders and arrangement of substructure basement (Pic 1)

148. As for the Emergency Gallery of LOT 1, the excavation is still ongoing and expected to be broken through soon (withing 2 months). Beside the excavation, invert and final lining works are already in the progress in EG. Drill and blast remain the main challenge for the safety in EG and the Contractor implements all necessary controls to ensure safety. These controls include permanent forced ventilation, implementation of safety procedures for blasting (re-entry period, testing of the gases, permanent supervision), necessary emergency equipment (hand radios and self-rescuers). Blasting in the EG is carried out by authorized and competent, third-party company. Beside the Contractor, the Engineer carries out atmospheric hazard independently with their own gas detectors.
149. During the reporting period Lot 2 Contractor broke through the EG of Tunnel No. 1 which was the last tunnel at LOT 2 section advancing into rocks and requiring drill and blast of the face. The completion of this work significantly reduced the risks associated with the tunnel excavation, drill and blast and possible accumulation of toxic gases. In addition, installation of tunnel temporary supports which is a high-risk activity, was also completed. At the present moment, forced ventilation is not required as natural ventilation is strong enough and no more blasting activities are carried out which was the main source of the accumulation of toxic gases.
150. It shall be outlined that air quality monitoring in tunnels at both LOTs was carried out in compliance with the required standards. Both, the Contractors and the Engineer were separately checking the air quality with the portable gas detectors. The results of these inspections were recorded by the Contractor permanently. No exceedances of allowable gas levels were identified which indicates that ventilation system together with all other controls was working effectively.
151. The Engineer together with both Contractors continues to deliver trainings during the reporting period to the tunnel personnel targeting safety requirements for the tunnel construction. During these trainings, not only theoretical materials are delivered to workers, but practical application takes a place targeting proper use of self-rescue equipment etc. (Pic 2, Pic 3)
152. Following modules were discussed during these training sessions:
 - The Contractor's responsibilities (Organic Law of Georgia)
 - Workers' rights and responsibilities (Organic Law of Georgia)
 - Atmospheric hazards and their controls
 - Self-rescue equipment
 - Ventilation (Regulation no. 431 of the Government of Georgia)
 - Loose rocks, scaling (BS 6164)

- Limited visibility
 - Emergency
 - Blasting
153. The biggest challenge for health and safety at Lot 2 section during the reporting period remained the construction of P3 and P4 at Bridge No.2. The stair towers, scaffolding and guardrail systems are a subject of permanent inspection carried out by a certified scaffolder, who is mobilized by the Contractor on a full-time basis. In addition to it, the Contractor's and the Engineer's HS specialists carry out permanent joint inspections of P3 and P4, when the results are documented in the HS reports and check lists. The Engineer also uses a drone system to inspect P3 and P4 worksites, when the inspection is required immediately. Drone system allows the Engineer to promptly and remotely check the situation at worksite which significantly facilitates this process and makes it much more effective (Pic 4).
 154. The Construction of both Piers (No. 3 and No. 4) was completed within the reporting period and hence, they will not increase in height anymore. Currently, casting (cast-in-situ cantilever method) of box girders is in progress which will finally connect P2, P3, P4 and A 2 with each other.
 155. Collective protective measures are prioritized over the PPE during the construction of Bridge No. 2 and this requirement is strictly controlled by the Engineer. Proceeding from the fact that guardrail system is much more effective than PPE and does not rely on the safe behavior of workers, the Contractor is instructed to arrange guardrail system at every location where it is possible and practical.
 156. The use of PPE during work at height is also strictly controlled. All workers have been trained on the proper use of fall arrest system during the training sessions
 157. Inspection of fall arrest equipment is done regularly by the workers prior to every use and regularly by HS specialists when results are documented. This ensures that fall arrest system is in good working condition and is of a proper type for the task being performed (Pic 5)
 158. The Contractor has resupplied the personnel with the new fall arrest systems during the reporting period, which is a proactive and good practice, when the old PPEs are timely taken out of the use (Pic 6).
 159. The Engineer together with both Contractors continued to deliver trainings during the reporting period for the personnel working at Bridge No. 2 targeting safety requirements for work at height. Work at height training is mandatory for every employee who is involved in this activity and is delivered prior to the start of work as well as at a regular interval. (Pic 7, Pic 8).
 160. Following modules are discussed during work at height training sessions:
 - Introduction and definition
 - Roles and Responsibilities (Technical regulation No. 477 regarding work at height)
 - Ladders (Technical Regulation No. 477 of the Government of Georgia)
 - Scaffolding (Technical Regulation No. 477 of the Government of Georgia)

- Fall arrest equipment (Technical Regulation No. 477 of the Government of Georgia)
 - PPE inspection
 - Guardrails (Technical Regulation No. 477 of the Government of Georgia)
 - Rescue plan
 - Dropped objects
161. During the reporting period, the Lot 2 Contractor conducted emergency drill with the scenario of worker's medical evacuation due to the breathing problems. The worker was evacuated from the Pier No. 3 of Bridge 2 with the height of 45 meters. Stretcher and man cage was used for the evacuation from the pier when man cage was lifted and controlled by the stationary crane. The Contractor's ambulance and doctors were also involved in the emergency drill, providing medical assistance.
162. This was the first drill of this type, and it required effective coordination between all parties: medical staff, workers, rescue team and stationary crane operator. For the first run, this drill familiarized individuals with their roles and responsibilities, procedures for this scenario and identified areas for improvement. The emergency drill report was documented, and findings/necessary improvements were communicated with the relevant parties.
163. This drill will help the Contractor in the future to respond to this type of emergencies, as a lot of activities are currently carried out at that height and even suspended trauma (if fall from height occurs) will require the Contractor to initiate rescue from height operation (Pic 9, Pic 10, Pic11)
164. The Contractors of both LOTs continue to effectively manage their medical facilities and timely supply them with all necessary medicines and medical equipment. Project doctors are still involved on full time basis ensuring permanent medical coverage of all worksites.
165. During the reporting period in the month of March, the Contractor of LOT 2 started the construction of Gudauri access road section. Prior to the commencement of work, site specific management plans were prepared with regards to health and safety. These plans included Health and Safety Management plan, Emergency Response Plan and Traffic Management Plan. These documents were prepared specifically for the Gudauri access road construction and all controls were developed specifically for the risks which were identified during the risk assessment process. All SSEMPs were approved by the Engineer will be reviewed as required and/or upon the need.
166. One of the main challenges for the construction of Gudauri Access Road was the presence of different utility services such as OHPL and gas pipelines. Despite the fact that the locations were identified during the preplanning process, the Contractor did not properly mark these locations and did not deliver TBT to the personnel and mobile equipment operators regarding these locations and precaution measures. This shortcoming was identified by the ADB's monitors and the Engineer, and immediate instructions were provided to the Contractor. Proper signs and necessary instructions were immediately

arranged at a Gudauri Access Road by the Contractor under the close supervision of the Engineer.

167. Not having proper marks at the gas pipeline locations resulted in the fact that during the earth works the Contractor at some point approached the gas pipeline too close with the mobile equipment, breaching a safe distance. Also, spoil generated during the earth works was deposited over the underground gas pipeline. The Engineer immediately initiated the meeting with the Contractor and gas pipeline owner GGTC (Georgia Gas Transportation Company) where all mentioned above issued were discussed and proper coordination established. As a result, the supervision of activities near the underground services was improved through the permanent presence of GGTC's and the Engineer's representatives.
168. The Engineer ensures that the Contractor strictly follows the methods provided by GGTC regarding working near or driving over the pipelines. Three pipeline crossing points were arranged where the Contractor was allowed to drive over with the mobile equipment. These crossing points were arranged according to the instructions provided by GGTC. The compliance with these instructions was monitored by the Engineer during the construction process.
169. LOT 1 Contractor demonstrated good practice for the management of mobile equipment. The Contractor delivered toolbox talks to the drivers and operators permanently during the whole reporting period. All shortcomings related to the transport and mobile equipment were immediately followed up and improved. In addition, to control the speed limits in the tunnels, the Contractor started to use a speed gun which allows to effectively identify speeding from the distance (Pic 12)
170. As for the LOT 2 Contractor, he needs to improve the management of mobile equipment operation. On multiple occasions, dump trucks were observed driving overloaded with the spoil. Overloaded truck increases a risk of brake failure if driven fast and/or driven on a steep slope. Necessary instructions were provided to the Contractor by the Engineer regarding this issue, but this violation could still be observed afterwards.

Despite the good practice demonstrated by the LOT 2 Contractor and fact that dump trucks all technical inspections were documented, on a few occasions this inspection and maintenance were observed to be reactive and overdue. Trucks could be seen in not a good condition e.g. damaged headlight, mirrors. All these issues were communicated with the Contractor and necessary maintenance was provided afterwards. The Contractor was instructed to improve overall this process and the Engineer continues to monitor this issue.
171. The LOT 1 Contractor has completed the revision of Health and Safety management plant in the reporting period. This revision was periodic review in order to ensure that document remains current and effective. During the revision, existing controls were updated and improved as well as some work processes added. Currently, the Contractor is preparing necessary safety documentation (risk assessment and procedures) for the upcoming TBM disassembling works to ensure safe and smooth operation.
172. Not quite effective management of health and safety was observed at LOT 2 section during the construction of Bridge No. 6. The personnel were using unsafe route (steep slope) to get to the Pier No. 3, as a shortcut. The Contractor was immediately instructed to prevent this unsafe behaviour, restrict the access to unsafe route and deliver TBT.

173. The Contractor did not manage to ensure immediate correction of this shortcoming and this violation was observed again in the following week, with no actions taken.
174. The Engineers involvement on this issue resulted in the implementation of all required actions such as installation of guardrail system (physically restricting the access to the unsafe shortcut), provision of all necessary signs and delivery of toolbox training regarding this issue. The supervision was also improved to ensure that all instructions were followed by the personnel. As a result of all efforts, the personnel stopped using unsafe shortcut and started using the approved access. Currently, works at P3 are completed.
175. Both Contractors continued to deliver Toolbox Talks on a regular basis. Toolbox talks are targeting general safety requirements as well as specific topics for different work activities. Despite the fact that comparing to previous reporting period Lot 2 Contractor increased the number of TBT, it is still required to improve the frequency. As for LOT 1 Contractor, the frequency and the quality of TBT is of a good standard (Pic 13).
176. During the reporting period, E&S monitoring visit of EBRD was carried out at LOT 1 by the GAEA Consulting Ltd. This visit was led by EBRD representative. The visit lasted 5 days and included meetings with RD, the Engineer, ADB monitors, the Contractor and wrap up meeting. All worksites of LOT1 section were visited during the mission and relevant documentation was checked. The mission was focused on the compliance with the EBRD E&S policy which includes H&S, Environment, Social and CH aspects. The report of monitoring results has not been provided yet.
177. Both Contractors continued to deliver Toolbox Talks on a regular basis. Toolbox talks are targeting general safety requirements as well as specific topics for different work activities. Despite the fact that comparing to previous reporting period Lot 2 Contractor increased the number of TBT, it is still required to improve the frequency. As for LOT 1 Contractor, the frequency and the quality of TBT is of a good standard (Pic 13).
178. Trainings conducted during the reporting period at both LOTs, but not limited to:
 - General safety requirements
 - Safety requirements during the tunnel construction
 - Defensive driving
 - Proper use of personal self-rescue equipment.
 - Safety requirements for welding and cutting works (hot works)
 - Safety requirements for work at height
 - Refresher induction trainings
 - Lifting safety
 - Electrical safety

Figure 26: Health and Safety Related Trainings Conducted in the Reporting Period by Lot 1 and Lot 2

Pic 1



Pic 2



Pic 3



Pic 4



Pic 5



Pic 6



Pic 7



Pic 8



Pic 9



Pic 10



Pic 11



Pic 12



Pic 13



Pic 14



179. It shall be outlined that no incidents happened during last two reporting periods (over 1 year) at Lot 1 section, while two incidents occurred at Lot 2 section during this reporting period are given in the Table 16 below.

Table 16. Accidents occurred during the Reporting Period

#	Date	Description	Investigation results	Corrective measures
1	April 13, 2024 LOT 2	On 13th of April, during electrical installation works in Tunnel No. 1, short circuit occurred generating sparks. As a result, the Contractor's employee suffered burns of a lower part of upper limbs, up to wrist. The affected person is a certified electrician and was authorized to carry out this type of electrical works. The investigation identified that the power distribution board had an improper cable connection installed previously, which contributed to short circuit. In addition, electrical system was not switched off completely prior to the electrical works. Unfortunately, the affected person did not notice the improper connection at power board and proceeded with the works which resulted in a short circuit.	Immediate cause- failure to follow a safety procedure (power was not completely switched off prior to electrical works) and inattention of affected person, as he did not notice the improper cable connection on the electrical distribution board. Root cause - insufficient supervision and not effective implementation of established procedures as power was not completely shut off prior to electrical works.	Refresher training on electrical safety was delivered to the Contractor's electricians including affected person. TBT targeting electrical safety was provided to all tunnel No. 1 workers. All electrical units and distribution boards were inspected in Tunnel No. 1 by electricians and were confirmed to be in a safe condition. In addition, two local certified electricians were mobilized to the project in order to improve the supervision and preventive maintenance of electrical units/equipment.
2	April 30, 2024. LOT 2	On April 30th, during the slope reinforcement drilling works, drill rod became stuck. In an attempt to dislodge the stuck drill rod, CRCC employee's finger accidentally got caught in the rotation mechanism, leading to an injury. After the incident, affected person was immediately transported to the Contractor's clinic at Camp No. 1. Where Contractor's doctor examined him and decided to transfer him to a hospital in Tbilisi for further medical treatment where he received small surgery and was released on the same day.	The immediate cause of the incident was a contact with the drill rod of drilling machine. No effective communication was established between the affected person and drilling machine operator which resulted in the fact that machine was started. The safety procedures were not followed and in addition all this was contributed by the inattention. The root cause was identified as training/knowledge transfer. Not enough	Training on safety requirements during the slope reinforcement works/drilling operations were delivered to the whole personnel involved in this activity. At the same time, this training will be delivered regularly, with the increased frequency. Supervision of this activity was also improved though the permanent presence of supervisor.

			trainings were delivered to the affected person targeting safety during the slope reinforcement works. Despite the fact that all necessary trainings were delivered prior to the incident, only one toolbox talk was done targeting specifically slope reinforcement works/drilling operations. More toolbox talks, as well as trainings could have improved the awareness of workers and incident might be prevented.	

180. Accidents occurred during the reporting period and in total are given in Table 17A and 17B for Lot 1 and Lot 2 respectively.

Table 17A: T Accidents Reported (January-June 2024) Lot 1

Accident Type	Reporting Period (January – June 2024)	Total (from commencement)
Near Miss	2	23
Incidents	0	8

Table 17B: Accidents Reported (January- June 2024) Lot 2

Accident Type	Reporting Period (January- June 2024)	Total (from commencement)
Near Miss	5	15
Incidents	2	13

4.2 Summary of Environmental Instrumental Monitoring Outcomes

181. For Lot 1 ground water quality testing was not carried out from January to May 2024 as it was not possible to collect the sample from the spring due to heavy snow. In June 2024, samples were collected from the well located on the upper part of the accommodation camp (coordinate 459946.172E 4711509.980N) in Kobi Village. The ground water test results as indicated in table 10 were compared with Georgian Acceptable Limits (resolution of the Georgian government #58 on the "Approval of technical regulations of potable water). All the tested chemicals parameters were within the National Acceptable Limits and ground water was not contaminated in terms of chemical contamination. However, Total Coliform detected in the spring water.

182. Ground water levels were measured in Kobi and Tskere during the reporting period. Ground water levels are measured on quarterly basis by CC for Lot 1 and results are recorded in Contractor's Quarterly Environment and Social Monitoring Reports. Due to heavy snow, it was not possible to measure ground water levels in Tskere. The details of measured ground levels are given below.

In January 2024 ground water levels were measured in Kobi while during April 2024, ground water levels have been measured at Tskere:

- Kobi Site - 3.6 meters (coordinates: N470266.4; E461517), Jan 18, 2024
- Tskere Site Downhill - 3.28 meter (coordinates: N 470266.4174 E 461517.817), Apr 18, 2024
- Tskere Site Uphill - 6.1 meters (Coordinates: E4704018.00/N461849.00). Apr 18, 2024

183. Ground water level was measured in Tskere on April 18, 2024, coordinates: N470266.174/E461517.817, the water level was 3.28 meters high (under the mountain) and coordinates: E4704018.00/ 461849.00, water level was 6.1 meters high (on the mountain);
184. There is no significant difference in the results upstream and downstream of tunnel water discharge point in Tergi River. In January 2024, COD levels were higher than MAC at the upstream level. Overall, the volume of water and turbidity decrease on Kobi side as most of the tunnel water was flowing towards Tskere due to gravity flow.
185. During the reporting period contractor conducted water quality test in River Khadistskali from April to June 2024 and increase in turbidity levels were observed however less than the previous reporting period as TBM excavation has been completed during April 2024. Increased turbidity levels were due to washing of TBM tunnel and ongoing blasting operations in Emergency gallery. Contractor for Lot-1 increased the frequency of cleaning of the sedimentation ponds.
186. For Lot 2 surface water measurement details and results are given in the Table 11E and results show that the downstream result of turbidity levels are on higher in River Aragvi since March 2024 that could be due to construction activities for bridge 2 and lack of proper mitigation measures in place. Concentration of the all the measured parameters is within acceptable range of Applicable Standard MAC
187. For Lot 1 overall, the LAeq results vary between 35 dBA to 65 dBA. The increased levels observed in June 2024 in Kobi from the range of IFC standard 55 d(BA) for residential areas during the day time. The increased high levels in Tskere in February 2024 are anticipated to be due noise of water flowing from the tunnel to sedimentation ponds in Tskere. In Kobi the increased noise levels are due to cumulative effect of traffic on E-117 and construction activities in Kobi. The difference of 3dB(A) is hardly to be detected by the human ear.
188. For Lot-2 along the E-117 noise levels are exceeding the day time IFC limits for residential area due to heavy traffic movements on the highway and construction activities; however, these are below the IFC limits of commercial noise levels 70 dB(A). High noise levels observed in village Zakatkari are due to construction activities
189. No significant Exceedance was observed due to construction activities at the locations mentioned in Table 13C. The exceedances observed in March 2024 & June 2024 were due to contact with animals or due to change of batteries or shifting of devices.

190. For Lot-1 PM10 levels including the concentration levels of NO2, SO2, CO and dust levels as indicated in Table 14A are within the national limits for air quality in Georgia and IFC guidelines (for trend of PM 10 Levels during reporting period)
191. For Lot 2 for air quality, all the parameters measured are within the permissible limits of IFC guidelines. Graphical presentation is shown in the Figure 18 to see the trends during the reporting period and ambient air is very clean. Fugitive dust emissions are being observed at the access road when heavy vehicles moving on the access roads during dry and windy days. Contractor is required to regularize the water sprinkling in Khada Valley and Didveli plateau to suppress the fugitive dust. Fugitive dust levels are the major issue in Khada Valley and Plateau at access road while vehicles travelling on access road during dry and windy season. Lot 2 has prepared dust management plan consisting of Action Plan to combat the dust and need to be properly implemented and UBM field officers should monitor on a daily basis.

4.3 Loan Agreement Compliance Status

192. Status of compliance with environmental safeguards related covenants in the Project's Loan Agreement signed between Government of Georgia and ADB on 20 June 2019¹ is summarized in Table 18.

Table 18. Loan Agreement Compliance Status

Schedule	Paragraph	Covenant	Compliance Status
7	38	<u>Environment</u> No physical works will be allowed prior to approval of the SEMP by the construction supervision consultant and RD.	Being Complied with SEMPs for both Lot 1 and Lot 2 have been approved and being implemented. IEE of the Gudauri Access Road published in March 2023 and SEMPs has been updated and approved considering Gudauri access road for Lot 2 as per requirement of table 81 & 82 of the IEE. Detail given in table 22C. CC for Lot 2 updated waste management plan on May 14, 2024. CC for Lot 1 updated waste management plan on May 30, 2024.

¹ ADB. Loan Agreement (Ordinary Operations [Concessional]) for Loan L3803: Georgia: North–South Corridor (Kvesheti–Kobi) Road Project (20 June 2019). <https://www.adb.org/sites/default/files/project-documents/51257/51257-001-pam-en.pdf>

			Both Lots updated their Re-cultivation Plans including the landscape reinstatement requirements prepared based on Visual Landscape Assessment Report.
7	39	The EMP, which also defines the institutional arrangements and responsibilities for its implementation, will be included in the bidding documents, and in the ensuing contracts. The SEMP will be implemented under close monitoring provided by the construction supervision consultant and the service of environment and social issues of the RD. The RD will submit semiannual environmental monitoring reports to ADB for disclosure on the ADB website. The capacity building of the RD environment specialist, the contractors and supervision consultants will also be conducted through Central and West Asia Department's ongoing regional TA.	Being complied with. EMP as a part of bidding documents and Technical Specification. RD submitting Semiannual monitoring report and all the set forth measures in EIA, Conditions set by MoEPA, and National Legislations are addressed in the SAEMR This is the 10th Semiannual Monitoring Report
9	53	<u>Safeguards Monitoring and Reporting</u> Project performance monitoring. RD will require the Engineer to (i) collect additional data from relevant agencies, including local governments and statistics bureaus, (ii) to measure the performance indicators at inception, at completion, and 3 years after project completion; and (iii) report key findings quarterly to ADB through the project's quarterly project reports.	Ongoing
9	54	Compliance monitoring. RD will provide an annual report on the project's compliance with legal, financial, economic, environmental, social and other covenants.	Ongoing Audited Project Financial Statements (January – December 2022) is published on ADB website in June 2023.
4	55	Safeguards monitoring. RD will monitor the implementation of the environment and resettlement action plans. The semi-annual report will include the status of these plans. The EMP will be monitored and reported to ADB bi-annually with the assistance of supervision consultant team, the performance and results of which (through EMP reports) will be uploaded in ADB website. Construction	Complied with RD submitting Social Monitoring Semiannual Report describing the Implementation status of LARP and Semi-Annual Environmental Monitoring Report describing the status of implementation of the EMP and its site specific and Topic specific Plans and

		environmental monitoring is a day-to-day process, which ensures that departures from the EMP are avoided or quickly rectified, or that any unforeseen impacts are quickly discovered and remedied. Specific actions in the EMP that are to be monitored are included in the EIA. In addition to the above, BAP implementation will also need to be monitored and this will be reported within the bi-annual environmental monitoring reports. If there are any unforeseen safeguards impacts or incidents these will be reported to ADB immediately for necessary action. RD will engage individual consultants for periodic inspection and reporting on safeguard matters.	are being submitted to ADB and published on ADB website after approval. Weblink for the document's disclosure by RD for KKR project is http://www.georoad.ge/?lang=eng&act=pages&func=menu&pid=1536737215
9	57	Evaluation 57. Within six months of physical completion of the project, RD will submit a project completion report to ADB.	Not applicable at this stage
9	58	Reporting 58. The RD will provide ADB with (i) quarterly progress reports in a format consistent with ADB's project performance reporting system; (ii) consolidated annual reports including (a) progress achieved by output as measured through the indicator's performance targets, (b) key implementation issues and solutions, (c) updated procurement plan, and (d) updated implementation plan for the next 12 months; and (iii) a project completion report within six months of physical completion of the project. To ensure that projects will continue to be both viable and sustainable, project accounts and the executing agency audited financial statement together with the associated auditor's report, should be adequately reviewed. The RD will also be responsible for submitting to ADB quarterly safeguards monitoring reports to ADB for approval and disclosure on the RD and ADB websites.	Ongoing RD providing Semiannual reports for social Monitoring and Environmental Monitoring on the format prescribed by ADB applicable at this stage. Currently the project is at construction stage and commencement was October 2020. Procurement Plan for KKR project published in June 2019. Procurement Plan for KKR project updated in February 2023.

4.4 Material Resource Utilization

193. During the reporting period, following materials were mobilized on site by the Contractor for Lot 1:

Table 19 A: Material Mobilization by Lot 1 During the Reporting Period (January- June 2024)

No.	Material	Quantity	Unit
1	Concrete	39765	m ³
2	Rebar	1077	t
3	Section steel	247.38	t
4	Steel plate	108	t
5	Cement	20159.9	t
6	Concrete brick 20*20*40cm	0	pcs
7	Concrete brick 10*20*40cm	0	pcs
8	Sand	97540	m ³
9	Gravel	97380	m ³
10	Diesel	774.93	t
11	Electricity	7485401	KWh
12	Water used	265000	m ³

Note: Gravel comes from the quarry in the village Kobi, Kazbegi Municipality, License #10002555 & another quarry license #10002992. CC extracted the licensed amount of gravel from the quarry under license #10002555 and closed that quarry.

194. During the reporting period, following materials were mobilized on site by the Contractor for Lot 2 based on data provided by CC for Lot 2:

Table 19 B: Material Mobilization by Lot 2 During the Reporting Period (January- June 2024)

No.	Material	Quantity from annuarry to June 2024	Unit
1.	Concrete	40641.6	m ³
2.	Rebar	2460.83	t
3.	Section steel	144.03	t
4.	Steel plate	12.69	t
5.	Cement	18558.32	t
6.	Sand	26314.64	m ³
7.	Gravel	27325.06	m ³
8.	Diesel	903180	liter
9.	Steel Pipe	63.76	t
10.	Steel fiber	0	kg
11.	Accelerator	177860	kg
12.	Water reducer	92800	kg

13.	Geotextile	40000	m ²
14.	Electricity	1813486.2	KWh
15.	Water Used		m ³
16.	Reinforced mesh	53.16	t
17.	Waterproofing menbrane	51385.20	m ²

Note: Gravel comes from Mleta quarry (license N10001711) and quarry near parking area (license N10001723).

4.5 Waste Management

195. CC for Lot 1 has a waste management plan. The Contractor has signed an agreement with the Kazbegi Municipality regarding provision of the waste containers, collection and transportation of household waste. In addition to that the contractor has signed an agreement with the licensed company – Medical Technology LLC for collection, transportation and treatment of the hazardous waste. Temporary hazardous waste storage areas have been arranged since October 2019 at the segment plant/crusher in village Kobi and in Tskere near batching plant. Different types of hazardous waste are kept in the restricted area (fenced on impervious base with roof) before transporting by the licensed waste transportation/treatment company. Other types of waste including plastic containers, used tyres, and scrap material is stored behind batching plant in Kobi and contractor has to designate some area in Tskere for this kind of waste; however, contractor has used many plastic containers to fence the spoil stored.
196. Information regarding the generation of waste during reporting period is given in the Table 20 A.

Table 20 A: Waste Management for Lot 1 During Reporting Period (January-June 2024)

#	Domestic/Hazardous Waste & Sewage	Estimated Volume of Waste	Storage Area	Licensed Company Collecting the waste
1	Household waste	4500 m ³	Camp sites, Workshops, Construction sites	Kazbegi Municipality and Dusheti Municipality
2	Sewage water	500 m ³ 15 m ³ / day Waste water is treated by STP.	Wastewater treatment plant	Ltd. Sanitary
3	Used tires	8 m ³	Temporary waste storage area at the Workshop	TRC Ltd.
4	Absorbents, hydraulic oil and contaminated soil, filters, rugs,	270 kg	Temporary waste storage area at the Workshop	Medical Technology LLC
5	Waste paints and varnishes	10 kg	Temporary waste storage area at the Workshop	Medical Technology LLC

6	Chemical additive tanks	65 pcs	Temporary waste storage area at the Workshop	Medical Technology LLC
7	Oil drums	45 pcs	Temporary waste storage area at the Workshop	Medical Technology LLC
8	Used food oil	200 liters	Camp separate wastebaskets	Medical Technology LLC
9	Printer tonner	5 kg.	Temporary waste storage area at the Workshop	Medical Technology LLC
10	Medical Waste	2 kg	Temporary waste storage area at the Workshop	Medical Technology LLC

197. CC for Lot 2 has a waste management plan. The Contractor has signed an agreement with the Dusheti Municipality regarding provision of the waste containers, collection and transportation of household waste.
198. In addition to that the contractor has signed an agreement with the licensed company – “Sanitary” Ltd for collection, transportation and treatment of the waste from biological treatment plants, in case of hazardous waste the contractor has agreement with “Medical technology” Company.
199. Temporary hazardous waste storage area has been arranged in Batching plant1, in camp2 & camp 3 and in parking area. Different types of hazardous waste are kept in the restricted area (fenced on impervious base with roof) before transporting by the licensed waste transportation/treatment company. Non-Hazardous waste including scrap is stored at the exit of Tunnel1. Information regarding the generation of waste during reporting period is given in the Table 20B.

Table 20 B: Waste Management for Lot 2 During Reporting Period (January-June 2024)

#	Domestic/Hazardous Waste & Sewage	Estimated Volume	Storage Area	Licensed Company collecting the waste
1	Household waste	4000 kg	Camp sites, Workshops, Construction sites	Dusheti Municipality
2	Sewage water	360 m ³	Septic Tanks Camp1 , 2& 3	Ltd. Sanitary
3	Used tires	1000 kg	Temporary waste storage area at the Workshop	Ltd. Medical technology

4	Hydraulic and used oil	50	Temporary waste storage area at the Workshop	
5	Waste paints and varnishes	10	Temporary waste storage area at the Workshop	
6	Chemical additive tanks	0	Temporary waste storage area at the Workshop	Ltd. Medical technology
7	Oil drums	0	Temporary waste storage area at the Workshop	Ltd. Medical technology
8	Used food oil	70	Camp separate waste baskets	
9	Printer tonner	0	Temporary waste storage area at the Workshop	
10	Absorbents (e.g. oil filters, polluted clothes and materials)	20 kg.	Temporary waste storage area at the Workshop	Ltd. Medical technology
11	Medical Waste	1	Temporary waste storage area at the Workshop	Ltd. Medical technology

4.5.1 Current Period

200. The main source that generates the big amount of the waste is earthworks, specifically, excavation of the soil and rock soil material excavated from the tunnels.

201. Estimated calculations for spoil generation at Lot 1 is given below:

Lot 1:

- Estimated spoil generation for Lot 1: 2,730,299 m³
- Estimated spoil reuse for Lot 1: 150,003 m³
- Estimated spoil to be disposed of in SDAs for Lot 1: 2580,296 m³

202. For Lot 1, the main sources that generate the big amount of the waste is tunnel construction, specifically: excavation of the soil and rock material from the Tunnel 5. Estimated calculations for spoil generation and excavated material up to June 2024 are given below:

Lot 1: Current Estimated volume

- Total Generated up to June 2024: 2,873,894 m³
- Spoil dumped in SDA 1: 321715 m³
- Spoil dumped in SDA 3: 2424895 m³
- Spoil dumped in Tskere: 37284 m³
- Reused for backfilling in Kobi = 90,0000 m3

203. For Lot 2 the main source of generation of spoil is the material generated from Tunnel 1, Tunnel 2, Tunnel 3 and Tunnel 4 excavation.

204. Estimated calculations for spoil generation and excavated material up to June 2024 are given below):

- Spoil Material excavated up to June 2024 = 341,000 m3
- Excavated from Gudauri Access Road = 23000 m3
- Total Material Stored at Didveli Plateau SDA 1 = 40,000 m3
- Reused for road Embankments = 222,000 m3
- Spoil material stored temporarily in Khada valley = 45,000 m3
- Spoil Material shifted to Kvesheti SDA 3 = 35000 m3

205. CC for Lot 2 has signed a land lease agreement with locals in Kvesheti – owners of the land plots located within the SDA 3 and started dumping of spoil in the area agreed with the landowners.

4.5 Trainings

206. The following trainings were carried out by Lot 1 Contractor during the reporting period, with the support of the PMCSC and RD's H&S specialists. Most of the topics of these trainings were repeated on a monthly or weekly basis during the reporting period.

Lot 1

- Safety trainings for drivers
- Safety training for new workers
- Safety training for EG lining workers
- Safety training for blasting workers
- Safety trainings for Deck workers
- Safety training for TBM workers
- Safety training for electricians
- Safety trainings for lifting workers
- Safety training for workers in Tskere
- Induction training
- Safety training for explosive transportation

Figure 27: Photographs of Training Session at Lot 1



207. The following trainings were carried out by Lot 2 Contractor during the reporting period, with the support of the PMSCS, RD's H&S specialists and third-party companies.

Lot 2

- Topsoil stripping and storing for Gudauri access road.
- Hazardous waste management
- Working at height for camp 1
- Electrical safety training
- Induction training for drivers
- TBT for safe access road for pedestrians
- TBT for Gudauri Access road Operation
- Safety trainings for drivers

Figure 28: Photographs of Toolbox Meeting and Training Session at Lot 2



208. Environmental monitoring training during the construction supervision project was provided by European investment Bank in April 2024.

Figure 29: Photographs of Training Session conducted by EIB



209. The photos of H&S trainings are presented in Annex 4, while the sample attendance sheets are annexed as Annex 5.

4.7 Grievance Redress Mechanism and Complaints

210. Grievance Redress Committees (GRCEs) at Municipality levels were established during the EIA study with the office order from RD. For Lot 2 GRCE for Dusheti municipality is based in Kvesheti; while, for Lot 1 GRCE for Kazbegi Municipality is based in Kobi village.
211. In response to RD letter# N2-12/3725 dated: 25-03-2020, The contractor for Lot #1 submitted through letter # 200330-0021-CRG-RDMRDI the name of the candidates for grievance resolution committee: Lela Bachiasvili (+ 995 593132361, lelabachi@yahoo.com) and Liang Hong Jun (+995 557466348, liang.hongjun@crtg.cn). Since mobilization the Contractor's Social Specialist Lado Shonia (+995 59 913777, lado_shon@yahoo.com) has also become a member of GRCE commission.
212. For the PMCSC, for social concerns Tamar Javakhi, (Contact: +995 599613196, javakhitako@gmail.com) and for environment, Nikoloz Sopadze, (Contact: +995 597728871, nikasofadze@gmail.com) were nominated as focal persons.
213. As for Lot 2, Song Linzhi (Maxim) phone number + 995 577036926 and CLO Gocha Mghebrishvili (+995 579907199, gmghebrishvili71@gmail.com) are responsible for the resolution of complaints.

Grievances Received & Redressed up to Reporting Period at Level 1 (GRCE)

214. As of 30 June 2024, 147 grievances (9 categories) have been received by GRCE. 35 grievances are from Lot 1 section and 112 from - Lot 2. People mostly (90) apply concerning damage to infrastructure/assets due to the Contractor's activities. Out of 81 closed complaints only 14 were unsubstantiated and therefore, rejected which indicates to the fact that the Contractors should proactively assess the risks before commencement of the civil works. All nine open grievances are from Lot 2 section. Two cases are pending with Levan Samkharauli Forensics Bureau for assessment.

215. Totally 19 grievances are open. Action from Samkharauli Forensics Bureau is awaited to close out two grievances. Five cases which are related to the damage to the houses due to vibration, are under monitoring. These cases are on tech. hold and the monitoring will proceed after resuming of the works adjacent to houses. Two grievances are related to the encroachment of private properties. In one case the owner's visit on site is required to check the quality of reinstatement works and take over the land plot, while another grievance need field survey of the Engineer's surveyor. As for other grievances the details are as follows:

- Two grievances are related to the loss of bee families for which APs blame construction related vibration and dust. In this regard, Road Department is planning to purchase beehives for APs under Livelihood Restoration Plan. Due to snow and access road issues related to adverse weather conditions consultation meeting with APs to agree the timeline and other details related to hand over process of beehives was postponed several times during the reporting period. Road Department plans to organize a meeting until the end of January 2024.
- Two grievances require action from the Contractor: 1. Preparation design for culvert in Zakhatkevi gorge and 2. Preparation layout design of additional underpasses, bus stops, footpaths at Arakhveti section of the Project Road.
- One grievance is related to the flooding of the property due to improper water discharge.
- One grievance is related to the complaint from AP that RoW is coming to close to her house and she is requesting increasing of distance.
- One grievance related to the damage of private land plot is in Court.
- To close out one grievance actions should be agreed with Cultural Heritage Agency.
- Joint complaint submitted to ADB by 8 APs will be closed after grievances separately filed by them will be resolved.
- For the statistics, please refer to the tables below.

Table 21 A: Summary of the grievances by category with the status of Resolution received by GRCE since commencement of the Project including reporting period

Number of Complaints by Category:	Closed	Tech.hold	Open	Total	%
Damage to Infrastructure / Assets	81	4	5	90	61,22%
Crop Compensation	0	0	0	0	0,00%
Other	10	1	3	14	9,52%
Inclusion in LARP	5	0	0	5	3,40%
Disturbance: Noise / Vibration / Dust	3	2	2	7	4,76%
Restriction or loss of access	20	0	0	20	13,61%
Recruitment / Employment	5	0	0	5	3,40%

Loss of business	0	0	1	1	0,68%
Compensation Rate	0	0	0	0	0,00%
Registration / Ownership Status	0	0	0	0	0,00%
HSE Concerns	4	0	0	4	2,72%
Road Upgrading	0	0	1	1	0,68%
Total	128	7	12	147	100%

Table 21 B: Summary of the grievances by category with status of Resolution received during the Reporting Period by GRCE (01.01.2024 – 30.06.2024)

Number of Complaints by Category:	Closed	Tech.hold	Open	Total	%
Damage to Infrastructure / Assets	6	0	2	8	72,73%
Crop Compensation	0	0	0	0	0,00%
Other	1	0	1	2	18,18%
Inclusion in LARP	0	0	0	0	0,00%
Disturbance: Noise / Vibration / Dust	0	0	1	1	9,09%
Restriction or loss of access	0	0	0	0	0,00%
Recruitment / Employment	0	0	0	0	0,00%
Loss of business	0	0	0	0	0,00%
Compensation Rate	0	0	0	0	0,00%
Registration / Ownership Status	0	0	0	0	0,00%
HSE Concerns	0	0	0	0	0,00%
Road Upgrading	0	0	0	0	0,00%
Total	7	0	4	11	100%

Grievances Received & Redressed up to the Reporting Period at Level 2 (GRCN)

216. A total of 66 persons have submitted 6 categories of grievances to the GRCN out of which 59 grievances have been resolved as of 30 June 2024. 2 grievances are from Lot 1 section and the

remaining ones from Lot 2. People now mostly (28 Nos.) are complaining about inclusion in the acquisition list out of which all cases are closed out. Compensation rates were disputed by 11 APs, out of which all the cases have been resolved.

217. No grievances were received during the reporting period.

Table 21C: Summary of the grievances by category with status of Resolution since the commencement of the Project including the Reporting Period

Number of Complaints by Project:	Closed	Tech.hold	Open	Total	%
Kvesheti-Kobi	59	2	5	66	21,48%

Table 21D: Summary of the grievances by category with status of Resolution received during the Reporting Period by GRCN

Number of Complaints by Project:	Closed	Tech.hold	Open	Total	%
Kvesheti-Kobi	0	0	0	0	0%

5. FUNCTIONING OF SEMP

5.1 SEMP Review

218. PMCSC approved SEMP for both Lot 1 on 12-06-2020 and Lot 2 on 25-05-2020 respectively and the no objection has been given by ADB/EBRD in November 2020 with the condition that SEMP is a 'live document' and will need to be updated throughout the construction period, whenever required, due to arise of unforeseen potential impacts.
219. SEMP status is being reviewed regularly in joint E&S weekly meetings between the lenders, RD and PMCSC. An Environmental & Social Management System Action Tracker has been developed by ADB and has been provided to the PMCSC use and take forward to support their management of the project. The tracker is updated on each six-month basis to speed up the process of development of safeguard documents, getting the respective permits/approvals from the relevant authorities, meeting the conditions set in the EIA approval from MoEPA, compliance with the suggested mitigation measures set in the EMP, and resolution of the complaints from the project affected communities and workers.

5.2 Preparation of Topic Specific Plans

220. In the reporting period, the Visual Landscape Assessment (VLA) Report was prepared to describe the landscape in details, identifying key viewpoints within the Project area and to propose measures to reduce the visual impact of the project, including those resulting from project aspects, such as spoil disposal areas. Both Contractors updated their Re-cultivation plans based on the recultivation requirements proposed by VLA.
221. The updated status for the approvals of site specific and topic specific plans for Lot 1 up to June 2024 is given in the Table 22 A.

Summary of Approvals for Lot 1

Total submitted by CC=32

Approved = 32

Not approved = 0

Not relevant at this stage = 2

% approved = 100 %

Table 22 A: Updated Approval Status for the Site Specific and Topic Specific Plans Lot 1

No.	Plans	Revision Version	Approval Date	Status
1	SEMP	E	10/8/2020 Updated on November 06, 2023 including SDA 3 and avalanche protection measures.	Approved
2	Topsoil Management Plan	E	23.10.2023	Approved
3	Waste Management Plan	D	23.06.2021 Approved by MoEPA on 17.03.21	Approved
4	Waste Water Management Plan	E	25.01.2023	Approved
5	Noise Control Plan	D	02.12.2020	Approved
6	Air Quality Management Plan	C	28.04.2021	Approved
7	Construction Vibration Management Plan	B	23.07.2020	Approved
8	Spill Management Plan	D	23.10.2020	Approved
9	Occupational and Community Health and Safety Plan	D	20.10.2020	Approved
10	Labor and Working Conditions Management Plan	E	06.12.2023	Approved
11	Traffic Management Plan	A	06.05.2020	Approved
12	Emergency Response Plan	F	15.03.2021	Approved
13	Ground Water Management Plan	E	23.03.2022	Approved
14	Recultivation/Land Restoration Plan Kobi	C	29.12.23	Approved
15	Recultivation/Land Restoration Plan Tskere	D	29.12.23	Approved
16	Biodiversity Management Plan	I	20.05.2021	Approved
17	Tunnel Blasting Plan	C	22.06.2020	Approved

18	Cultural Heritage Management Plan	Final Document updated on 27-09-2023	29-09-2023	Approved Updated version
19	Local Content Management Plan	E	02.11.2020	Approved
20	Spoil Disposal Area SDA 1 Kobi	E	30-03-2022	Approved
21	Spoil Disposal Area SDA 3 Kobi	B	23-10-2023	Approved
22	Asphalt Plant Management Plan	N/A	-	Not relevant yet
23	Concrete Batching Plant Management Plan – Kobi	B	6.04.22	Approved
24	Concrete Batching Plant Management Plan – Tskere	B	22-03-2022	Approved
25	Construction Camp Management Plan # 1 Kobi Camp site	E	02.12.20	Approved
26	Construction Camp #2 Management Plan (Tskere Camp)	B	23-03-2022	Approved
27	OHS Plans for Tunnels	C	24.08.2020	Approved
28	Accommodation Option Risk Assessment Kobi and Tskere Camps	F	04.03.22	Approved
29	Code of Conduct (for workers)	E	05.12.23	Approved
30	Tunnel Transition Plan	-	-	Not relevant yet
31	MES for Temporary Access Roads and River Crossings.	C	4/19/2022	Approved
32	Method statements for temporary storage areas	A	4/13/2022	Approved
33	Method Statement for Kobi Quarry # 1	A	4/14/2022	Approved
34	Method Statement for Kobi Quarry # 2	A	5/03/ 2023 submitted and approved on 23-10-2023	Approved

222. The updated status for the approvals of site specific and topic specific plans for Lot 2 up to June 2024 is given in the Table 22 B.

Summary of Approvals for Lot 2

- Total submitted =30

- Approved = 30
- Not approved = 0
- Not required at this stage =2
- % approved = 100 %

Table 22 B: Updated approval status for the site specific and topic specific plans Lot 2

No.	Plan	Revision Version	Approval Date	Status
1	SEMP	D	20.10.2020	Approved
2	Topsoil Management Plan	B	21.02.2022	Approved
3	Waste Management Plan	B	19.12.2020 Approved by MoEPA	Approved
4	Waste Water Management Plan	B	28-03-2022	Approved
5	Air quality Management Plan	A	15.02-2022	Approved
6	Noise Control MP	1v.	15-02-2022	Approved
7	Spill management Plan	A	19.02.2020	Approved
8	Traffic Management Plan	C	02.11.2020	Approved
9	OHS Management plan	A	11.05.2020	Approved
10	Labor and Working Condition MP	A	27.10.2020	Approved
11	Code of Conduct	A	4.10.2020	Approved
12	Emergency Response Plan	A	20.04.2020 Will be improved after the design for avalanche protection measures	Approved
13	Ground water MP	A	20.10.2020	Approved
14	Recultivation/Land restoration.	B	29.12.2023	Approved
15	Biodiversity MP	A	Sept 2021	Approved
16	Vibration MP	B	Main plan is approved on 24 January, 2022. Update, if any, will be provided by Gamma.	Approved
17	Tunnel Blasting Plan	B	24-09-2021	Approved
18	Cultural Heritage MP	9	26.09.23	Approved
19	Local Content MP	B	26-03-2021	Approved
20	Spoil Disposal Management Plan SDA# 1	A	3/1/2022	Approved
21	Spoil Disposal Management Plan SDA# 2	A	3/1/2022	Approved
22	Spoil Disposal Management Plan SDA# 3 (Kvesheti)	A	07-04-2022 approved by MoEPA. Approved on 25-10-2023 by PMCSC	Approved
23	Accommodation option risk assessment (Camp 1,2 & 3)	B	24.10.2020	Approved

24	Camp Management Plan (Camp 1,2 & 3)	A	PMCSC approved the document on 21 February, 2022.	Approved
25	Concrete Batching Plant MP	A	31.10.2020 PMCSC submitted the plan to RD on 21 February, 2022.	Approved
26	Asphalt plant MP	-	-	Not Relevant
27	MES for Temporary Access Roads and River Crossings.	C	PMCSC has reviewed the updated document and approved it on 25 February 2022.	Approved
28	Method Statement for Temporary Storage Area	B	Feb 21, 2022	Approved
29	Bridge Construction plan	B	11-03-2022	Approved
30	Tunnel transition Plan	-	-	Not Relevant yet
31	MES for Temporary Access Roads and River Crossings.	A	PMCSC has reviewed the updated document and approved it on 25 February. It was shared with RD on 1 March	Approved
32	Method Statement for Mleta Quarry	A	02-08-2021	Approved

223. CC for Lot 2 has updated the SEMP by including Gudauri Access road and update the subplans of SEMP as per requirement of Table 81 & 82 of the IEE for Gudauri Access Road and get it approved from the relevant authorities.

224. Summary of Approvals for Gudauri Access Road Project is as under:

Total submitted by CC=15

Approved = 15

Not approved = 0

% approved = 100 %

Table 22 C: Updated approval status for the site specific and topic specific plans for GARPLot 2

No.	Plan	Revision/Version	Approval Date	Status
1	SEMP	V1	4/17/2024	approved
2	Topsoil Management Plan	V2	3/26/2024	Approved
3	Waste Management Plan	V1	2/22/2024	Approved
4	Air Quality Management Plan	V1	2/22/2024	Approved

5	Noise Control Plan	V1	2/5/2024	Approved
6	Traffic Management Plan	V1	2/22/2024	Approved
7	Occupational and Community Health and Safety Plan	V2	4/17/2024	Approved
8	Emergency Response Plan	V1	2/22/2024	Approved
9	Re-cultivation/Land Restoration Plan	V1	3/26/2024	Approved by UBM and NACHP (11.04.24)
10	Construction Vibration Management Plan	V1	5/23/2024	Approved
11	Cultural Heritage Management Plan	V1	3/26/2024	Approved (The KKRPP CHMP was updated by incorporating information on Gudauri ARP)
12	Local Content Management Plan	V2	3/27/2024	Approved
13	Labor and Working Conditions Management Plan	V2	3/27/2024	Approved
14	Code of Conduct	V1	5/23/2024	Approved
15	Spoil Management Plan	V1	3/7/2024	Approved

225. Environmental Due Diligence Report (EDDR) and Cultural Heritage Due Diligence Report (CHDDR) for avalanche protection walls in Khada Valley have been completed.
226. The contractor for Lot-1 and Lot-2 completed the geodynamic process survey report in compliance with condition 21, stating that the construction of the project has no significant impact on the geological conditions of the project's rocks.
227. CC for lot-2 carried out preliminary construction ecological and cultural heritage survey and submitted the preliminary construction audit report that was approved by the PMCSC. The report is attached as an Annex-8

5.3 Permitting Status

228. The updated status for the approvals and permits from MoEPA and other relevant authorities as per requirement of National Legislation and requirement of the EIA for both Lot 1 and Lot 2 up to June 2024 is given in the Table 23 A and 23 B.

Table 23 A: Updated Status for the National Permits/ Approval from MoEPA and other Relevant Authorities for Lot 1

#	Item	Current Status	Approval Date	Comments
1	Campsite Layout Plan - Kobi	Approved / Being Implemented	Approved on 11-10- 2021 by letter # 10640-01-2-202110111800	N/A
2	Campsite Layout Plan - Tskere	Approved / Being Implemented	Approved by MoEPA on 18.03.22.	N/A
3	Forest use agreement	Approved / Being Implemented	Approved. The tree cutting permit No 11/67971 10-03-2019	N/A
4	Approval of construction or upgrade activities	Approved / Being Implemented	CC Obtained the permission from Kazbegi Municipality for construction/upgrade of the access road to quarry near Kobi village 21-03-2022	N/A
5	Transportation permit	Approved / Being Implemented	Approved from Ministry of Internal Affairs for oversized and over weight - Permit No 2-03171 30-8-2021	N/A
6	Spoil disposal approval – SDA 1 (Kobi) Environmental Decision	Approved / Being Implemented	Approved on 11-10- 2021 by letter # 10640-01-2-202110111800	N/A
7	Spoil Disposal approval- SDA 3 (Kobi)	Approved / Being Implemented	Approved on 28-12-2022. Letter # N 21/8291	N/A
8	Permit to use explosives	Approved / Being Implemented	Issued by the Ministry of Sustainable Development and Infrastructure - Permit N000310 01-10-2020	N/A
9	Construction permit	Approved / Being Implemented	Approved by Public Law Legal Entity Technical and Construction Supervision Agency - 6 - 11- 2019 #188-04	N/A

10	Batching Plant Layout Plan - Kobi	Approved / Being Implemented	Approved on 11-10- 2021 by letter # 10640-01-2-202110111800	N/A
11	Batching Plant Layout Plan - Tskere	Approved / Being Implemented	The Layout Plan approved by MoEPA on 18.03.22.	N/A
12	Emissions of hazardous substances in to ambient air from stationary sources for batching plant - Kobi BP	Approved / Being Implemented	Approved for Kobi site - N 14248/01, 31.12.2021	N/A
13	Emissions of hazardous substances in to ambient air from stationary sources for batching plant - Tskere BP	Approved / Being Implemented	Approved on 27.05.22.	N/A
14	Emissions of hazardous substances in to ambient air from stationary sources for Crusher - Kobi side	Approved / Being Implemented	Approved with Crusher Screening.	N/A
15	Waste Management Report	Approved / Being Implemented	Approved by MoEPA in March 17, 2021	N/A
16	Maximum Permissible discharges of Pollutants discharged to Surface Water Tunnel #5 Water and Car washing Facility	Approved / Being Implemented	Approved on 10-12-2021 by MoEPA.	N/A
17	Maximum Permissible discharges of Pollutants discharged to Surface water for Sewage Water - Kobi Campsite	Approved / Being Implemented	Approved. STP screening document, covering permit on MPDP, by MoEPA on 01.06.22.	N/A
18	Maximum Permissible discharges of Pollutants discharged to Surface water for Sewage Water - Tskere Campsite	Approved / Being Implemented	Approved STP screening document, covering permit on MPDP, by MoEPA on 24.05.22.	N/A
19	Water extraction from River Baidara for Batching Plant - Kobi	Approved / Being Implemented	Approved by MoEPA on 23.05.22.	N/A
20	Water extraction for TBM	Approved / Being Implemented	Approved on 25-11-2022	N/A
21	Water extraction for Camp in Kobi	Approved / Being Implemented	approved 10-05-2021	N/A
22	Water extraction for Crusher in Kobi	Approved / Being Implemented	Approved 10-05-2021	N/A
23	Water extraction for Tskere Camp	Approved / Being Implemented	Approved. 10-05-2021	N/A

24	Water extraction for Tskere Batching Plant	Approved / Being Implemented	Approved 10-05-2021	N/A
25	Quarry # 1 Kobi	Approved / Being Implemented	CC got the license from Kobi quarry Operator 10-10-2019Add	N/A
26	Quarry # 2 Kobi	Approved / Being Implemented	27-07-2022	N/A
27	Explosive Storage Area - Kobi	Approved / Being Implemented	CC got approval from MoEPA. 13-07-2021	N/A
28	Explosive Storage Area - Tskere	Approved / Being Implemented	Approved CC got approval from HACHP and local municipality. 21-10-2022	N/A
39	Re-cultivation Plan - Tskere	Approved	Approved 11-09-2022	N/A

Table 23 B: Updated Status for the National Permits/ Approval from MoEPA and other Relevant Authorities for Lot 2

#	Item	Current Status	Approval date	Comment
1	Campsite Layout Plan #1	Approved / Being Implemented	The layout plan was approved on 16.03.22 by MoEPA.	N/A
2	Campsite Layout Plan #2	Approved / Being Implemented	The layout plan was approved on 10.03.22 by MoEPA.	N/A
3	Campsite Layout Plan #3	Approved / Being Implemented	Approved by MoEPA on 30.05.22.	N/A
4	Forest use agreement	Approved / Being Implemented	Approval granted for RoW and Access roads. The tree cutting permit No 11/67971, No 11/66281, 2598/S 21-11-2019	N/A
5	Approval of construction or upgrade activities	Approved / Being Implemented	Obtained from Dusheti Municipality for construction/upgrade of access roads. 25-12-2019	N/A
6	Transportation permit	Approved / Being Implemented	Approved 22-07-2020	For TBM not applicable to Lot 2
7	Spoil disposal approval – SDA #1 Environmental Decision - Plateau	Approved / Being Implemented	Approved by MoEPA on 28-09-2021	N/A
8	Spoil disposal approval – SDA #2 Environmental Decision - Plateau	Approved / Being Implemented	Approved by MoEPA on 25.02.22.	N/A

9	Spoil disposal approval – SDA #3 Environmental Decision (covers two areas 0.4 km and 0.8 km approval (Kvesheti))	Approved / Being Implemented	Approved on 07.04.22.	N/A
10	Environmental Decision	Approved / Being Implemented	Approved by MoEPA 25-04-2019 Order # 2354	N/A
11	Construction permit	Approved / Being Implemented	Approved by Public Law Legal Entity Technical and Construction Supervision Agency - 6 -11- 2019 #188-04	N/A
12	Batching Plant Layout Plan #1	Approved / Being Implemented	Approved by MoEPA on 18-11-2021.	N/A
13	Batching Plant Layout Plan #2	Approved / Being Implemented	The layout plan was approved on 10.03.22 by MoEPA.	N/A
14	Batching Plant Layout Plan #3	Approved / Being Implemented	Approved by MoEPA on 30.05.22.	N/A
15	BP# 1 - Emissions of hazardous substances in to ambient air from stationary sources for batching plant	Approved / Being Implemented	Approved by MoEPA by Permit # N 13163/01 dated: 15/12/2021.	N/A
16	BP# 2 Emissions of hazardous substances in to ambient air from stationary sources for batching plant	Approved / Being Implemented	Approved 26-09-2022	N/A
17	BP# 3 Emissions of hazardous substances in to ambient air from stationary sources for batching plant	Approved / Being Implemented	Approved 20-07-2022	N/A
18	Waste Management Report	Approved / Being Implemented	- Approved by MOEPA On 05-07-2021 - The updated version, which also covers the Gudauri bypass, was approved on 14.06.2024	N/A
19	Camp 1 Maximum Permissible discharges of Pollutants discharged to Surface Water	Approved Screening documents for biological treatment approved	25-11-2022	N/A
20	Camp 2 Maximum Permissible discharges of	Approved	Screening documents for biological treatment approved. 16-09-2022	N/A

	Pollutants discharged to Surface Water			
21	Camp 3 Maximum Permissible discharges of Pollutants discharged to Surface Water	Approved Screening documents for biological treatment approved;	13-09-2022	N/A
22	TUN# 1 Maximum Permissible discharges of Pollutants discharged to Surface Water	Approved	September 2023	N/A
23	Surface Water extraction for BP #1	Approved	29-07-2022	N/A
24	Surface Water extraction for BP #2 and Campsite #2	Approved	25-10-2022	N/A
25	Quarries	Approved / Being Implemented	Permit # 1088 dated: 28-09-2020 by Ministry of Economy	N/A
26	Explosive Storage Area	Approved / Being Implemented	Construction permit obtained on 21-06-2021 from Dusheti Municipality. Permit to use explosive from Ministry of Economy and Sustainable Development on 30-06-2021.	N/A

229. The updated status for the approvals and permits from MoEPA and other relevant authorities as per requirement of National Legislation and requirement of the IEE of GARP is given in the Table 23C.

Table 23 C: Updated Status for the National Permits/ Approval from MoEPA and other Relevant Authorities for GAR Project Lot 2

#	Item	Current Status	Comment	Actions
Pre-construction				
1	Waste Management Plan	Under Completion / Low Risk	On 14.05.24 Lot 2 Contractor submitted plan to MoEPA for review and approval.	Response from MoEPA is expected by 15.06.24.
2	Cultural Heritage Clearance	Approved / Being Implemented	The NACHP's General Action Plan includes CH clearance for Gudauri ARP.	N/A
Construction				

3	Forest Use Agreement	Approved / Being Implemented	Forestry Agency issued the tree felling permit.	N/A
4	Non-forest Land Use Agreement	Approved / Being Implemented	-	N/A
5	Re-cultivation Plan	Approved / Being Implemented	Approved on 11.04.24 by MoEPA	N/A
6	Approval of the Topsoil Storage	Approved / Being Implemented	Approved on 11.04.24 by MoEPA	N/A

6. GOOD PRACTICES

6.1 Good Practices

230. The following good practices were adopted by the Contractors for Lot 1 and Lot 2 during the reporting period.

Lot 1

- CC cleared the access road to local power station in Benian Begoni
- Tunnel water is being reused for all the tunnel activities for the conservation of water resources
- Contractor helped the locals to get trapped vehicle out of snow
- Contractor fenced the cemetery in village Mugure
- Contractor bought fish monitoring cameras to install in the Khada River.
- Cleaned out the sedimentation ponds in Tskere by drying out technique
- Contractor provided old water supply pipes to the the residents of Benian Begoni village on their request.

Figure 30: Best Practices Adapted by Contractor for Lot 1



Clearing the access road to the local power station

Lot-1 helping the locals get out vehicles from the snow



Pipes supplied by CRTG to the residents of Benian Begoni Village

Lot 2

- Contractor cleanout the all the campsite and batching plants and the active construction site in the first week of June 2024.
- Contractor prepared the dust management plan to combat fugitive dust at the site.
- CC installed new safety signs at the required locations during June 2024.
- CC conducted training for the crew involved in soil stripping for GARP
- Provide protection measure to grave near access road # 4

Figure 31: Best Practices adopted by Contractor for Lot 2



Soil stripping training provided to the crew involved	CRCC Environmental specialist involved in cleaning operation in May 2024

PMCSC

- Helped the Contractor for Lot 2 to prepare SEMP and Dust management Plan to combat fugitive dust emission
- Hired two field officers for Environment compliance monitoring one for Lot-1 and one for Lot-2 and increased their input.
- Conducted training for the Managers of the Contractors and UBM to combat dust emissions.
- Tracking progress of resolution of the issues of concern included in the E&S Action Tracker prepared by ADB ESM on a weekly basis.

RD

- Followed and speed up the process to obtain all the required permits from the relevant authorities.
- The RD safeguards team, led by the Deputy Chairperson, conducts regular site visits for compliance monitoring, coordinating with the PMCSC team and the Contractors safeguard teams. RD actively urge the Contractors to address all non-compliance issues in a timely manner.
- Conducted training in coordination with EIB for the capacity building of RD staff, Contractor and PMCSC staff.
- The safeguards team, under the guidance of the Deputy Chairperson, has weekly meetings with the ADB safeguards team to review the issues raised by the ADB ESM and ADB CLO in the Weekly E&S Monitoring Reports.
- RD Environmental Specialists visiting the site on a regular basis and are thoroughly familiar with the issues present on-site. During the reporting frequency of visits was increased.
- RD's Health and Safety Consultant is permanently present at the worksites on a full-time basis, undertakes regular worksite inspections, tracks and revises the monthly H&S monitoring reports, checks the adequacy of corrective measures, provides necessary instructions and trainings to the Contractor.

7. SUMMARY AND RECOMMENDATION

7.1 Summary

231. During the reporting period, Lot 1 continued construction activities for development of TUN 5 both TBM tunnel and Emergency Gallery. TBM excavation was completed in April 2024.. For Lot 2, construction activities were carried out for lining of Tunnel 1 both exits and Emergency Gallery for Tunnel 1, piling for bridges 2, 4, 5 & 6, preliminary work for bridge 3, excavation of TUN 2 and TUN 4, construction of underpasses, culverts and retaining wall, rock filling for the embankment and road compaction at certain locations within the RoW. Lot 2 completed excavation of Tunnel 1 (main tunnel) and Tunnel 3; however, tunnel lining works are being carried out.
232. Minor decrease in total number of staff for Lot 1 and Lot-2 was observed during the reporting period depending upon the nature of ongoing activities and construction progress made by the

Contractors. The ratio of the local to foreign workers is 50.8 % foreign and 49.2 % local workers for Lot 1; while 63 % foreign workers and 37 % national workers for Lot 2. Lot 1 national staff was decreased because the works have been decreased in the segment plant and completion of TBM excavation.

233. Both Contractors conducted environmental instrumental monitorings. The summary of the monitoring outcome is presented in section 4.2 Summary of Environmental Instrumental Monitoring Outcomes.
234. Both Contractors' ECoWs carried out biodiversity monitoring and recorded the monitoring outcomes in the monthly and quarterly reports respectively. No issues of concern were identified by ECoWs. For details refer to section 4.1.1 Biodiversity Monitoring. Contractor for Lot-1 has bought the camera for fish monitoring and it has been tested in the Khadistskali River. Contractor will continue fish monitoring in Khadistskali River
235. Lot 2 Contractor collection of wood logs from tree cutting from Gudauri access to store at one place to handover to NFA.
236. Lot 2 Contractor conducted pre-construction Ecological environment audit report which was accepted by the PMCSC.
237. Contractor for Lot 2 (CRCC) has embarked on earthworks along the Gudauri access road. This phase of the project involved the removal of topsoil, a process closely scrutinized by the Engineers' Cultural Heritage team. Diligent observation during the earthworks revealed no evidence of cultural heritage remains.
238. The Contractor for Lot 2 upgraded and reinforced the damaged fences around the required CH sites. The contractor for Lot 2 fenced Svianaant Old Village with wire mesh to avoid physical damage during construction works.
239. RD, PMCSC and Contractors HS Specialists continued to ensure safe working environment at worksites, proactive identification of unsafe conditions and tendencies, delivery of H&S trainings to the Contractors personnel and implementation of regular worksite inspection.
240. There were two health and safety incidents reported during the reporting period in the Lot 2 section. However, no incidents occurred in the Lot 1 section. For further information, refer to Table 16. Works Related Accidents Reported during the Reporting Period.
241. Both Contractors continued fencing off the worksites, adjacent to local populated areas and delivered permanent maintenance of fencing and warning signs. In addition, those worksites were also fenced off which were not in the close proximity to populated areas but still presented a hazard for the cattle during the grazing.
242. Both Contractors continued to implement control measures in the tunnels and other worksites to ensure safe working environment. Lot-1 contractor is repairing the damaged guard rail in the TBM from time to time for safe driving in the tunnel.
243. Lot 1 Contractor effectively managed the Medical Facility (room) at Tskere campsite, and ensured timely supply with all necessary medicines and medical equipment. Project doctor is at Tskere worksite on full time basis and also covers Lot 2 camp 3 and worksite, which is located close to the Tskere.

244. Both Contractors continued to deliver safety Toolbox Talks and trainings on a regular basis to the workforce. Toolbox Talks and trainings were delivered on a general topic as well as targeting some specific scenarios/procedures.
245. Out of four hundred twenty-eight (428) issues during the project life, four hundred thirteen (413) issues were closed and fifteen of them were partially mitigated or corrective action in progress requiring further improvement. There are 06 issues pending from the previous reports identified by the PMCSC as mentioned in Table 8C which are in progress.
246. Out of 25 issues highlighted during the reporting period by ADB ESM, 17 issues were closed and for 8 issues resolution is in progress. For details refer to Table 8B.
247. Overall, during the reporting period, Lot 1 demonstrated improvement in addressing the safeguard issues. However, Lot 1 needs to adopt a forward-thinking approach to planning activities with foresight. CC has to address the outstanding issues identified during the current and previous reporting periods by PMCSC, RD, ADB and EBRD Increased turbidity was a problem due to the flooding season and washing activities in the TBM tunnel during the reporting problem which has been reduced during the month of June 2024 but contractor need to maintain the cleaning of sedimentation ponds. Contracot is required to strictly control the speed of dump truck drivers in the tunnel, provision of safe access to the worksite and safe conditions for working at height, eye protection to the workers, improve illumination in the TBM tunne, safe handling of oxygen cylenders, and installation of the barriers around concrete washout pit at batching plant in Kobi. The outstanding issues with the recommendations for corrective actions are listed in the section 7.2 Recommendations
248. Overall, during the reporting period, efforts to address outstanding safeguard issues from Lot 2 Contractor was improved during the reporting period, specifically, to improve housekeeping at campsites and activie construction sites. Nonetheless, RD and PMCSC consistently urging the contractor to rectify all the issues at the site to prevent environmental damage. Although improved; however, fugitive dust management is still a significant problem in Khda valley and plateau due to the dry and windy weather and to stabilize the week slopes near bridge 3 north section to avoid rock mass flow on the slopes and damaging the slope forest. HSE issue requiring improvements include: PPEs, violation, working at height, open electrical behaviour due to behaviour of workers, electrical cables on the ground, and scaffolding issue. Contractor should start conservation of CH 10 which was suspended due to winter and relcation of CH 26.
249. Regular site visits were carried out by ADB and RD safeguard teams, including site visits during ADB environmental safeguard mission in March 2024.
250. The external environmental monitoring firm (EEMF) "Ecospectri" Ltd conducted the site inspection at KKR P On 20.06.24. The representatives of the EEMF "Ecospectri" Ltd on behalf of RD conducted the site inspection to verify compliance with the Lot 1 and Lot 2 Contractors Environmental Management Plans (EMPs) and progress toward the expected outcomes. The EEMF will document the monitoring results, identify the necessary corrective actions, and reflect them in a corrective action plan.

7.2 Recommendations

251. Both contractors are recommended to improve the progress in resolving the current outstanding safeguard issues and to ensure proactive planning of future activities ensuring alignment with safeguard requirements and obtaining approval from PMCSC prior to start of new activities.
252. The Table 24 presents all outstanding issues/non-compliances identified during the reporting period (January – June 2024) and pending issues from the previous monitoring report(s), as well as the recommended mitigation measures which contractors are required to adopt in the 3rd and 4th quarter of 2024 to meet the requirements furnished in the EMP and conditions of the contract.

Table 24: Summary of Recommendations and Responsibilities

Recommendations for Lot 1 and Lot 2 for Q3 and Q4 of Year 2024	Responsibility
Lot# 1	
CC to monitor the slopes at the southern portal, especially, behind batching plant and material stored behind campsite posing safety risk.	CC for Lot# 1 to implement and PMCSC to monitor
CC to extend the effluent pipe from STP in Tskere to River for ultimate discharge of treated water	CC for Lot# 1 to implement and PMCSC to monitor
Regular cleaning of concrete washout pits, sedimentation ponds and change of absorbents to treat tunnel water in Tskere and Kobi	CC for Lot# 1 to implement and PMCSC to monitor
Start planning of rehabilitation/ recultivation of SDA 1 in Kobi	CC for Lot# 1 to implement and PMCSC to monitor
CC to remove the stockpiled crushing material from the river protection zone of Narvani River.	CC for Lot 1 to implement and PMCSC to monitor
CC to repair the damaged roof of material storage area in Kobi and check the structural stability of the structure	CC for Lot 1 to implement and PMCSC to monitor
CC to continue maintenance of the small septic tank near engineer's office as it is smelling, specifically, when wind direction is towards east.	CC for Lot 1 to implement and PMCSC to monitor
Regular cleaning of the septic tank in Kobi	CC for Lot 1 to implement and PMCSC to monitor
CC to clean the access road for SDA 3 in Kobi with provision of derange channel along it and the stormwater should be passed through sedimentation pond before discharging in to water bodies and clean the sedimentation ponds all the time.	CC for Lot# 1 to implement and PMCSC to monitor
Regular water sprinklings required at the access roads in Kobi and E-117 during dry and windy season.	CC for Lot# 1 to implement and PMCSC to monitor
Regular cleaning of campsites in Tskere and Kobi	CC for Lot# 1 to implement and PMCSC to monitor
Regular cleaning of concrete washout pits, sedimentation ponds and change of absorbents to treat tunnel water in Tskere and Kobi and maintain all the time as this is one of the high priority issues.	CC for Lot# 1 to implement and PMCSC to monitor
Continue Tunnel gas monitoring on regular basis in TBM as well as EG.	CC for Lot# 1 to implement and PMCSC to monitor
Repair the guard rail in TBM and maintain all the time	CC for Lot# 1 to implement and PMCSC to monitor
All the vehicles should be washed at washing area in Kobi near sedimentation ponds and no vehicle washing allowed in TBM tunnel	CC for Lot# 1 to implement and PMCSC to monitor

Carry out fish monitoring and water quality testing in Khdistskali River	CC for Lot# 1 to implement and PMCSC to monitor
Call the third party for collection of scrap, tires, and leftover hazardous material	CC for Lot# 1 to implement and PMCSC to monitor
Care should be taken not to enter in the fence of old building remain at SDA 3 while dumping spoil in SDA 3	CC for Lot# 1 to implement and PMCSC to monitor
Regular inspection to check the water from sedimentations ponds in crushing plant should not be entering in to the river Tergi and clean the ponds	CC for Lot# 1 to implement and PMCSC to monitor
Call the company to take stray dogs as population being increased in Kobi Camp	CC for Lot# 1 to implement and PMCSC to monitor
Repair the sewage pipe in Kobi campsite and maintain all the time	CC for Lot# 1 to implement and PMCSC to monitor
Remove the garbage near EG exit in Kobi and maintain all the time	CC for Lot# 1 to implement and PMCSC to monitor
ADB ESM Recommendation	
The Lot 1 Contractor is recommended to ensure the timely preparation and submission of the required documentation on expansion of the SDA #3 to MoEPA for approval in case of required expansion.	CC for Lot# 1 to implement and PMCSC to monitor
The Lot 1 Contractor is recommended: 1. to arrange a relevant hazardous waste storage area for proper storage of the hazardous waste (liquid and solid waste) until its handover to the authorized waste management sub-contractor; 2. segregate the construction waste dumped behind the Kobi Batching Plant and ensure its proper storage before handover to the relevant authorized waste management sub-contractors; 3. submit the updated Waste Management Plan to MoEPA as required by the Waste Code of Georgia.	CC for Lot# 1 to implement and PMCSC to monitor
The Lot 1 Contractor is recommended to replace the tunnel water discharge channel, made of metal sheets, with the plastic pipes to avoid leakage of discharge water and subsequent damage to the land.	CC for Lot# 1 to implement and PMCSC to monitor
Lot# 2	
CC to repair the Fence at Batching Plant 2 and clean that area from concrete waste	CC for Lot# 2 to implement and PMCSC to monitor
Monitor all the STPs for the leakage and repair STPs and outlet pipes immediately when required	CC for Lot# 2 to implement and PMCSC to monitor
No concrete waste is allowed to place near washout pits, immediately remove and dump at dump sites	CC for Lot# 2 to implement and PMCSC to monitor
Don't disturb the private land by parking vehicle and due to movement of vehicles	CC for Lot# 2 to implement and PMCSC to monitor
Take Stric measures to avoid gas pipelines while stripping the soil at GARP	CC for Lot# 2 to implement and PMCSC to monitor
Fugitive dust is the main issue at the site, follow the recommendations given in dust management plan to control the dust	CC for Lot# 2 to implement and PMCSC to monitor
No timbers are allowed to place at private land while tree cutting activities at GARP	CC for Lot# 2 to implement and PMCSC to monitor
Take strict measure to avoid rock mass / boulders movement to block the access road 1 at bridge 3	CC for Lot# 2 to implement and PMCSC to monitor

Maintain safety warning signs all the time at the site	CC for Lot# 2 to implement and PMCSC to monitor
No direct discharge of tunnel water is allowed in the forest land	CC for Lot# 2 to implement and PMCSC to monitor
Provide solution for the stormwater at BP 2 and restrict kitchen water flowing towards batching plant 2. Direct the water to the STP for treatment.	CC for Lot# 2 to implement and PMCSC to monitor
Waste should not be overflowed from the containers at camp 2 to private land and keep the area clean all the time	CC for Lot# 2 to implement and PMCSC to monitor
CC to submit the quarterly Environment and Social Monitoring reports and instrumental monitoring reports on monthly basis	CC for Lot# 2 to implement and PMCSC to monitor
All the drilling pits should be well maintained, equipped with silt fence and should not be overflowing in to water bodies at bridge# 3,4,5 & 6.	CC for Lot# 2 to implement and PMCSC to monitor
All the drilling machines should be in good conditions and there should be no oil spills at site and don't do maintenance works for equipment on access roads.	CC for Lot# 2 to implement and PMCSC to monitor
Topsoil should not be stored in patches, take all the topsoil from GARP and Khada Valley to designated areas and store according to legal requirements with provision of drainage	CC for Lot# 2 to implement and PMCSC to monitor
CC to stabilize the slope at access road # 4 and avoid the flow of rock masses while working close to slopes.	CC for Lot# 2 to implement and PMCSC to monitor
CC to clean all the concrete washout pits on regular basis at all the batching plants.	CC for Lot# 2 to implement and PMCSC to monitor
CC to remove the municipal waste on regular basis from camp site 3 and all the campsites	CC for Lot# 2 to implement and PMCSC to monitor
CC to provide rain water management system with proper drainage not contaminating the private land at BP# 2 and install floating wall switch to automatic running of water pump.	CC for Lot# 2 to implement and PMCSC to monitor
CC to provide drips trays for all the Generators at the site	CC for Lot# 2 to implement and PMCSC to monitor
CC to handover all the used tiers and containers to licensed contractor	CC for Lot# 2 to implement and PMCSC to monitor
CC to collect all the timbers from GARP and Kvesheti, place at one place and handover to NFA.	CC for Lot# 2 to implement and PMCSC to monitor
CC to collect all the topsoil at GARP and store according to topsoil management Plan.	CC for Lot# 2 to implement and PMCSC to monitor
CC to start rehabilitation of SDA# 1 according to Spoil disposal management plan by fixing the height and completing the drainage channel and revegetation of the area	CC for Lot# 2 to implement and PMCSC to monitor
Add one water sprinkling truck for Khada valley road water and should spray water at least three times a day during windy and dry days. Repair the damaged water truck and follow the dust management plan.	CC for Lot# 2 to implement and PMCSC to monitor
Provide drip trays to Generator at Tunnel 1 Entrance and maintain the build secondary containment for oil/chemical contained equipment at TUNI 1 exit.	CC for Lot# 2 to implement and PMCSC to monitor
Geological study required to take measures against the landslide at access road # 4 and CC to start slope protection work otherwise the whole section would be destabilized	CC for Lot# 2 to implement and PMCSC to monitor
Complete the conservation of CH site 10 on Didveli Plateau.	CC for Lot 2 to implement and PMCSC to monitor

Carry out relocation of CH # 26.	CC for Lot 2 to implement and PMCSC to monitor
ADB E&SM Monitor recommendations	
Identify all sites within the Gudauri AR where vibration monitoring is needed and is not currently in place, and ensure vibration monitoring is conducted there;	CC for Lot# 2 to implement and PMCSC to monitor
The Lot 2 Contractor is recommended to remove the timber and handover it to the relevant authorities (forest agency).	CC for Lot# 2 to implement and PMCSC to monitor
The Contractor is recommended to repair the STP and discharge pipes and take water samples for test.	CC for Lot# 2 to implement and PMCSC to monitor
UBM is recommended to fulfil their responsibilities concerning oversight and supervision of Contractor activities, ensuring that the Contractor's environmental performance aligns with ADB SPS and meets legal requirements. UBM is recommended to check whether the topsoil stockpiles are stored temporarily within the RoW to avoid impact on land outside of the RoW. Contractor is recommended to stop stripping of wet topsoil. Contractor is recommended to transport the stripped topsoil to the designated topsoil storage area.	PMCSC to monitor
The Lot 2 Contractor is recommended to: Mobilize CH Monitor to ensure full-time presence of CH Monitor on site during earthmoving activities; Conduct cultural training to workers assigned to Gudauri Access Road project; Use machines with the toothless bucket at the area close to Sameba Complex - potential Physical Cultural Resource (PCR) site; Mobilize adequate number of vibration monitoring devices to ensure continuous vibration monitoring at the required CH Sites during construction works at Gudauri Access Road.	CC for Lot# 2 to implement and PMCSC to monitor
UBM and Contractor Environmental Specialists are recommended to improve oversight of construction activities and ensure the required environmental mitigation measures are proactively implemented. Contractor is recommended to: • demarcate the space allocated for storage of topsoil from Gudauri Access Road; • shape the topsoil stockpiles properly to avoid their erosion; • demarcate the area around the trees to keep distance from them to avoid damage to them; • provide drainage channel, where required, to avoid flooding of the land.	CC for Lot# 2 to implement and PMCSC to monitor
The Lot 2 Contractor to finalize all remaining procedures regarding SDA #4 in the village Bedoni.	CC for Lot# 2 to implement and PMCSC to monitor
Stop unauthorized dumping of spoil from the Tunnel #3 Exit Portal;	CC for Lot# 2 to implement and PMCSC to monitor

Store the tunnel cuttings within the RoW until getting approval from the landowners on using their land plots for spoil disposal at the SDA #3 in the village Kvesheti.	
The Lot 2 Contractor is recommended: • to provide the drainage channels at all sides of the Batching Plant #2 area which will be connected to the concrete washout pit to avoid the land pollution with the contaminated drainage water flow from the Batching Plant. • to upgrade the fence to restrict access of cattle to the BP area.	CC for Lot# 2 to implement and PMCSC to monitor
Assign a proper water truck for dust suppression in the village Benian-Begoni.	CC for Lot# 2 to implement and PMCSC to monitor
Handover of removed trees/timber to Forestry Agency	CC for Lot# 2 to implement and PMCSC to monitor
CC to coordinate with PMCSC on the conduct of water quality testing and fish monitoring.	CC for Lot# 2 to implement and PMCSC to monitor

7.3 ADB Mission Corrective Action Plan (CAP)

253. ADB Mission led by ADB Senior Environmental Specialist along with RD, PMCSC and Contractors visited the site in March 2024 for one day and gave recommendations to bring the project in compliance with the safeguard requirements. Maximum efforts will be carried out to address these comments in the upcoming quarters and to address in the next report. Corrective Action Plan (CAP) of the recommendations along with the implementation status is given below in the Table 25.

Table 25: CAP for recommendations by ADB Mission (March 2024)

Observations	Responsibility	Status
Continue discussions with Lot 2 contractor to improve waste management at worksites and campsites (until waste storage, collection and disposal are improved);	RD PMCSC CC for Lot-2	Contractor for Lot-2 improved the housekeeping and cleaned up the whole site in June 2024 including all the campsites and batching plants. Contractor provided mini truck at camp 3 to bring the waste down to Kvesheti to deliver to municipality
Provide instructions to Lot 2 contractor to ensure wastewater treatment facilities at campsites are regularly serviced/maintained to avoid impacts to adjacent land (continuous basis);	RD PMCSC CC for Lot-2	No leakage was observed from the STPs during the month of June 2024. Contractor repaired the effluent pipe of STP at camp 3.
Share the method statement for Cultural Heritage (CH) No. 26 (once completed); and	CC for Lot-2	Method statement has been shared with the PMCS
Continue close coordination with the CSC and contractors to close pending issues/concerns as reported in the weekly environment and social report (continuous basis).	RD PMCSC CC for Lot-2	In progress RD sharing the E&SM monitoring report on weekly basis and PMCSC sharing the issues with the contractors for the compliance and

		monitor to speed up the progress to close the issues.

ANNEXES

Annex 1: Project Pictures

Pictures	Description
	Noise monitoring close to batching plant 1 lot 2 during Jnaury 2024
	Air quality monitoring near Zakatkari village lot-2 during Jnaury 2024

	ADB Mission with RD site visit on 29-04-2024
	CRP meeting at site June 2024
	

	Training at site Lot-2 June 2024
	Cleaning activities at Lot-2 May 2024
	Cleaning of washout pit at BP 3 Lot- 2 May 2024

	Waste collected by municipality lot-2 May 2024
 Sprinkling access roads	Water sprinkling at access roads Lot-2 May 2024
	Surface water sampling from Aragvi River during February 2024 lot 2

	Air quality monitoring in Tskere April 2024
	Air quality monitoring in Kobi April 2024
Figure 3.5.1 Down Stream Water Quality Monitoring SWS #4 	Downstream water quality monitoring in River Khadistskali April 2024

Figure 3.3.1 Down Stream Water Quality Monitoring (SWS - #2) 	Water quality monitoring in Tergi River April 2024
Figure 5.1.1 Noise (NM#1) Monitoring Point in Kobi 	Noise level monitoring in Kobi April 2024
	Noise level monitoring in Tskere April 2024



Vibration monitoring point in Benian Begoni
April 2024



Night time noise level measurement in village
Almasiani





Housekeeping at Tskere camp and Kobi
cansite Feb 2024



On 29-01-2024 National Environment
Supervision company visited the site for Lot-2



Sedimentation ponds cleaning in Tskere
February 2024



Absorbants at site lot-1 February 2024







Site cleaning in Kobi batching plant and diesel facility March 2024



Sedimentation ponds cleaning in Tskere March 2024

	
 	Sedimentation ponds cleaning in Kobi March 2024

	
	Conveyer belt cleaning Feb 2024 Lot-1
	



Washout pit cleaning Kobi BP Feb 2024



Tunnel water pipe underground being arranged by LOT-1 CC Tskere. March 2024



	
	Topsoil stripping at GARP lot-2 April 2024
	Cleaning and changing grass filters for sedimentation ponds at BP 2 lot-2 April 2024



	Water sprinkling at acces road plateau Lot-2 2April 2024
	Campsite 3 cleaning works April 2024



45.Clean the trash can



Housekeeping activities at Lot-1 March 2024



Installation of signs at topsoil storage area
April 2024



Cleaning activities Lot-2 June 2024



Annex 2: Instrumental Monitoring Test Results

(Sample reports only for vibration and instrumental monitoring for air, noise water. Summary of results for all the reports is in the section 4.1)

Environmental Monitoring Report : Lot 1 (March 2024)





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1. General Information

Project number: #110324

Date of the monitoring: 11.03.2024

Gergili LLC team undertakes monthly monitoring services for ambient air quality, noise, and water quality monitoring on Kvesheti-Kobi highway construction.

LLC Gergili is a subcontractor of China Railway Tunnel Group Co., Ltd. Branch In Georgia (CRTG) and is responsible for execution of monitoring works and preparation of monthly reports for the environmental instrumental monitoring for the Kvesheti-Kobi highway construction project, which includes following:

- Atmospheric Air Pollution (NO₂, SO₂, CO, Dust)
- Water (Surface water, ground water, sanitary sewage water...)
- Noise Level
- Vibration

This report represents the results of the monitoring activities performed by Gergili team in March, 2024. Tatia Gamezardashvili (Laborant) and Lizi Kakalashvili (QC Lab Manager) from Gergili team and from CRTG – Vince Wenzhao Zhang (HSE Officer) participated in the monitoring.

The work was done according to the proposal prepared for Kvesheti-Kobi highway construction. The methodology and procedures follow international guidelines.

During the monitoring, the construction was in an active phase, all the technique was on and working. Therefore, the results of the monitoring activities represent the actual, full-scale impact of the construction activities on the environment.

Monitoring activities included ambient air monitoring of the following parameters: PM₁₀, PM_{2.5}, NO₂, SO₂, and CO concentrations, surface and ground water quality analysis, noise and vibration monitoring.

2. Description of the Performed Works

For March's monitoring, there were 2 different points for water quality. Both points for surface water monitoring. Air quality was assessed at 1 point in the village of Tskere and 1 point in Kobi: measured parameters at both locations - carbon monoxide (CO) and pollution (PM_{2.5}, PM₁₀), sulfur dioxide (SO₂) and nitrogen dioxide (NO₂). Noise was measured at 2 locations: 1 point in Kobi and another point in the village of Tskere. Short-term vibration monitoring was conducted in the village of Beniani.

During the monitoring activities, Gergili team used Aeroqual Series 500 for ambient air monitoring (all parameters), water monitoring has not been done at the location, water was sampled and then analyzed in the lab. For noise monitoring, REED instruments 9300 was used. While, the vibration level was measured by REED instruments SD-8205.



The monitoring took place on 11th of March, 2024. In Kobi the weather was -9°C, in Tskere the weather was -6° C.

All the equipment was calibrated, cleaned, and tested for the field work.

Table 2.1 GPS coordinates of the monitoring points

#	Monitoring PointReference	Type Of Monitoring	E	N	Date
1	SWS #1	Surface Water	459160	4711681	11.03.2024
2	SWS#2	Surface Water	459256	4711930	11.03.2024
6	AAS #1	PM2.5, PM10, CO, NO ₂ , SO ₂	459307	4711741	11.03.2024
7	AAS #2	PM2.5, PM10, CO, NO ₂ , SO ₂	459494	4711616	11.03.2024
8	NM #1	Noise (Kobi)	459943	4711826	11.03.2024
9	NM #2	Noise (Tskere)	44.535226	42.480379	11.03.2024
10	VM #1	Vibration (Beniani)	44.532508	42.468296	11.03.2024



Figure 2.1. Monitoring Points on Kobi-Kvesheti Construction Site in March



Figure 2.2 Monitoring Points on Kobi-Kvesheti Construction Site in March





Figure 2.3 Monitoring Points in Village of Tskere Construction Site – March



Figure 2.4 Monitoring Points in Village of Beniani Construction Site – March





3. Water Quality Monitoring

3.1 Ground Water Monitoring – GWS-#1

Due to the heavy snowfall, there was no access road to the ground water, so it was not possible to take a sample of the ground water in Kobi.



3.2 Surface Water Sampling Point – SWS-#1

The first sample of surface water was taken from the river Tergi, approximately 150 meters above from the tunnel water discharge point. A sterile bottle was used for sampling. Sampled water was transported to the lab for analysis. The volume of the water was – 5 liters.

The weather was -9°C, Sunny weather.

The sampling time was – 10:25



Figure 3.2.1 Upstream Water Quality Monitoring (SWS - #1)



Table 3.2.1 Results of Laboratory Analysis with Permissible Norms and Used Methods for SW#1

Parameter	Measurement unit	Method used	Results	Maximum permissible limit according to ordinance #425
Physical-chemical Parameters				
pH	-	SST ISO10523:2008/2010	7.56	6.5-8.5
Turbidity	NTU	ISO 7027-1:2016	6.49	N/A
Conductivity	mS/cm	SST ISO 7888:1985	0.738	N/A
Chemical Oxygen Demand (COD)	mgO/L	SST ISO 6060:1989	5.76	≤30
TPH	mg/L	ISO9377-1-2000	<0.005	≤0.3
Microbiological Parameters				
Total Coliforms	cfu/1 L	ISO9308-1:2014	40	≤10 000/ 1 L



3.3 Surface Water Sampling Point - SWS-#2

Second sample of the surface water was taken from the same river Tergi, approximately 150 meters below the tunnel water discharge point. The team used the sterile bottle for sampling. The sample was taken in the lab for the analysis. The volume of the water was – 5 liters.

The weather was -9°C, Sunny weather.

The sampling time was -10:15

Figure 3.3.1 Down Stream Water Quality Monitoring (SWS - #2)



Table 3.3.1 Results of the Laboratory Analysis with Permissible Norms and Used methods for SW#2

Parameter	Measurement unit	Method used	Result	Maximum permissible limit according to ordinance #425
Physical-chemical Parameters				
pH	-	SST ISO10523:2008/2010	7.78	6.5-8.5
Turbidity	NTU	ISO 7027-1:2016	3.89	N/A
Conductivity	mS/cm	SST ISO 7888:1985	0.676	≤0.3



Chemical Oxygen Demand (COD)	mgO/L	SST ISO 6060:1989;	0.00	≤30
TPH	mg/L	ISO9377-1-2000	<0.005	N/A
Microbiological Parameters				
Total Coliforms	cfu/1 L	ISO9308-1:2014	190	≤10 000/ 1 L

3.4 Surface Water Sampling Point – SWS-#3/#4

Due to the heavy snowfall, there was no access road to the river, therefore it was not possible to take water samples from the above and below reaches of the village of Tskere.

Figure 3.4.1 Down Stream Water Quality Monitoring (SWS #3/#4)



3.5 Conclusion

In the water samples taken on March 11, 2024, according to Resolution #425, in the current month, exceeding the maximum permissible concentration was not observed;



4. Air Quality Monitoring

Ambient air monitoring is an integral part of an effective air quality management system. The purpose of air quality monitoring is to study if an area has an air pollution problem and how construction works affect the air quality, which can lead to negative impacts on the environment, working personnel and the local population in close proximity of the works. Monitoring helps in assessing the level of pollution in relation to the ambient air quality standards.

In order to evaluate dust particle concentration in the air, the team used Aeroqual Series 500, which includes PM10, PM2.5 sensors. The specific sensor is calibrated and tested for its accuracy and precision. CO concentration was also evaluated using Aeroqual series 500, with specific CO sensor, which is also calibrated and tested.

Table 4.1.1 Dust Particles; Carbon Monoxide (CO); Nitrogen Oxides (NO₂) and Sulfur Oxides (SO₂) Concentration Permissible Limits

Parameter	Time Interval	Maximum Permissible Concentration $\mu\text{g}/\text{m}^3$	National limit for Human Rights of Health –MPC, $\mu\text{g}/\text{m}^3$	IFC/WHO (updated 2016) –guideline value, $\mu\text{g}/\text{m}^3$	EU Air Quality Standards, Permitted Exceedences Per Year $\mu\text{g}/\text{m}^3$
PM 2.5	1 hr	25		25	
	1 year	10	12-17	10	25 / n/a
PM 10	1 hr	50		50	
	24 hrs	50	25-35		50 / 35
	1 year	20	20-28	20	40 / n/a
CO	8 hour mean	10	5-7		1000
NO ₂	1 hour	200	35-140	200	200 / 18
	1 year	40	26-32	40	40 / n/a
SO ₂	1 hour	350	350	500	350 / 3
	24 hrs	125	5	20	125 / 24
	1 year	500			



4.1 Air Monitoring Point -AAS #1

Air monitoring point is located near the factory. At this location, carbon monoxide and particulate matter concentrations were evaluated.

During the AQ monitoring in Kobi, there was only heavy vehicle movement around the monitoring point, about 10-20 meters away.

The monitoring time was – 10:40

The weather was -9°C, Sunny weather.

Figure 4.1.1 Air Quality Monitoring Point in Kobi (AAS- #1)



Table 4.1.2 #AAS-#1 Dust Particles; Carbon Monoxide (CO); Nitrogen Oxides (NO₂) and Sulfur Oxides (SO₂) monitoring results (µg/m³)

Parameters	Minimum	Maximum	Average value of measurements	Methods used
Wind speed and wind direction in the AQ monitoring in Kobi was – 0.2 m/s, from west to east.				
PM 10	0.003	0.030	0.014	Aeroqual SERIES500-PM Sensor



PM 2.5	0.001	0.002	0.002	Aeroqual SERIES500-PM Sensor
CO	11.5	13.9	12.8	Aeroqual SERIES500-CO Sensor
NO ₂	0.0	0.0	0.0	Aeroqual SERIES 500-NO ₂ Sensor
SO ₂	0.0	0.0	0.0	Aeroqual SERIES500-SO ₂ Sensor

4.2 Air Monitoring Point in the village of Tskere #AAS-#2

Air monitoring 2 point is located in Tskere settlement. At this location, Dust Particles; Carbon Monoxide (CO); Nitrogen Oxides (NO₂) and Sulfur Oxides (SO₂) were monitored. For these measurements, the device (Aeroqual SERIES 500) was working for 1 hour to the parameters.

During the AQ monitoring in Tskere, there were heavy vehicles and excavation around the monitoring point, about 70-80 meters away. In Tskere, workers were doing excavation with drilling rig. During the monitoring one excavator was working.

The monitoring time was- 11:30,

The weather was -6°C, Cloudy weather

Figure 4.2.1 Air Monitoring Point in the village of Tskere #AAS-#2





Table 4.2.1 #AAS-#2 Dust Particles; Carbon Monoxide (CO); Nitrogen Oxides (NO₂) and Sulfur Oxides (SO₂) monitoring results (µg/m³)

Parameters	Minimum	Maximum	Average value of measurements	Methods used
Wind speed and Wind direction in the AQ monitoring in Tskere was – 0.4 m/s, From west/south to north/east.				
PM 10	0.001	0.002	0.002	Aeroqual SERIES 500-PM Sensor
PM 2.5	0.001	0.001	0.001	Aeroqual SERIES 500-PM Sensor
CO	0.2	4.1	3.7	Aeroqual SERIES 500-CO Sensor
NO₂	0.0	0.0	0.0	Aeroqual SERIES 500-NO ₂ Sensor
SO₂	0.0	0.0	0.0	Aeroqual SERIES 500-SO ₂ Sensor

4.3 Conclusion

The results of the air quality monitoring conducted on March 11th, 2024, carried out with the AEROQUAL 500 SERIES monitor in the villages of Tskere and Kobi, according to the above standards, the quality of air pollution in the current month does not exceed the permissible norms.



5. Noise Level Monitoring

Optimal Limits of Noise Level. These limits are based on IFC guidelines

Recipient status	Time interval	The average permissible norm of noise (dB)	Maximum permissible norm of noise (dB)
Populated area	7:00-23:00	55	70
Populated area	23:00-7:00	45	60
Industrial; Commercial	Day-Night	60	75

Noise level was determined at 2 locations - NM#1, NM#2, in Kobi and in the village of Tskere. The purpose of noise level monitoring is to determine how construction works affect the population. The noise level was determined using REED instruments 9300 (417 Sound Level).

5.1 Noise Level Monitoring first point – NM#1

The Monitoring time in Kobi was 10:00

The weather was -9°C, Sunny weather.

In Kobi, the distance of the monitoring point from the noise source was 100 meter to main highway, 100 meter to living camp, 600 meter to batching plant and 3 kilometers to tunnel.

During noise monitoring, heavy vehicles were moving around the monitoring point in Kobi.0020



Figure 5.1.1 Noise (NM#1) Monitoring Point in Kobi



Table 5.1.1 Noise (NM#1) Monitoring Results in Kobi

Different Parameters of NoiseLevel	Result (dB)
LAF _{max}	40.5
LAF _{min}	29.7
LAF _{av}	35.1

5.2 Noise Level Monitoring second point – NM#2

The monitoring time in Tskere was – 11:45

The weather was -6°C, Cloudy weather.

During the monitoring there were excavation and heavy vehicles around the monitoring point about 150-200 meter away.

During noise monitoring in Tskere, there were heavy vehicles and excavation around the monitoring point, about 70-80 meters away. In Tskere, workers were doing excavation with drilling rig. During the monitoring one excavator was working.



Figure 5.2.1 Noise (NM#2) monitoring 2 point



Table 5.2.1 Noise (NM#2) Monitoring Results in the village of Tskere

Different Parameters of NoiseLevel	Result (dB)
LAF_{max}	60.9
LAF_{min}	48.2
LAF_{av}	54.55

5.3 Conclusion

The results of the noise level monitoring conducted on March 11th, 2024, in the villages of Tskere and Kobi, according to the above standards, the noise of level in the current month does not exceed the permissible norms.



6. Vibration Level Monitoring

Vibration level was determined at 1 locations-in the village of Beniani. The purpose of vibration level monitoring is to determine how construction works affect the population. The vibration level was determined using REED instruments SD-8205.

Optimal permissible levels of vibration

The following table shows the technical regulation # 297 / n, "On the approval of the norms of quality of the environment", subsection VII. "Limit values of industrial vibration, permissible values of vibration for residential and public buildings", Table 9.

Average Geometric Frequencies of Octave Zones (Hz)	Allowable Values X0,Y0, Z0			
	Vibro-acceleration		Vibro-speed	
	m/sec ²	dB	m/sec 10 ⁻⁴	dB
2	4.0	72	3.2	76
4	4.5	73	1.8	71
8	5.6	75	1.1	67
16	11.0	81	1.1	67
31.5	22.0	87	1.1	67
63	45.0	93	1.1	67
Corrected and equivalent corrected values and their levels	4.0	72	1.1	67



6.1 Vibration Monitoring point

The monitoring time in Beniani was 12:15

The weather was Sunny, -6°C.

The vibration measuring receiver is a metal armature.

At the time of the monitoring point, no works were carried out in the village of Beniani, the construction site of Tskere is located about 3.5 kilometers from this point

Figure 6.1.1 Vibration Monitoring point is located in Beniani settlement



Table 6.1.1 Vibration Monitoring Results in the village of Beniani.

Different Parameters of Vibration Level	Result (mm/s)
LAF_{max}	0.0
LAF_{min}	0.0
LAF_{av}	0.0



6.2 Conclusion

The results of the short-term monitoring conducted on March 11th, 2024, conducted by the REED instruments SD-8205 series in the villages of Beniani, allow us to conclude, that the results do not exceed the permissible norms. Therefore, we can say, that the mentioned procedures and works, which were ongoing during the measurement period, do not have a dangerous impact on the environment and surrounding buildings nearby the measurement location.



7. Methodology and Instruments Used

7.1 Air

For air monitoring, Gergili team used 4 different sensors of Aeroqual Series 500 (PM10/PM2.5, CO, NOx, SOx).

The Series 500 Portable Air Quality Monitor is a handheld portable monitor used to measure up to 30 pollutants using the unique sensor head format. Sensors are housed within an interchangeable cartridge (“head”) that attaches to the monitor base. The head can be removed and replaced in seconds, allowing users to measure as many gases as they wish. Sensor heads feature active fan sampling which ensures a representative sample is taken, increasing measurement accuracy.

A long-life lithium battery and in-field zero and span calibration make this an easy-to-use device. Monitor ID identifies the monitor uniquely and ensures that all data from it are tied to that monitor. Location ID can be used to tag measurements to a specific location – helpful when sampling at multiple sites over the course of a day or week.

Figure 7.1.1 Air Quality Measuring Instrument Aeroqual Series 500



7.2 Noise

The noise monitoring spot was chosen so it could fully show the impact of construction processes on the population. Noise was monitored for an hour. Gergili team used REED instruments 9300 to determine the noise level.



The sound level meter consists of a calibrated microphone, electronic circuits, and a display. The microphone detects small air pressure variations associated with sound and converts them into electrical signals. The aforementioned signals are then processed using the instrument's electronic circuitry. The display shows the sound level in decibels.

The sound level meter acquires the sound pressure level at a particular location.

A sound level meter is used for acoustic measurements. It is a hand-held instrument with a microphone.

Figure 7.2.1 Noise level is determined by the REED INSTRUMENTS 9300 model adapter



7.3 Wind

Wind speed is determined by testo anemometer 405i.

Figure 7.3.1 Testo anemometer 405i





7.4 Vibration

Vibration level is determined by the REED instruments SD-8205 model adapter.

Vibration analysis is a process that monitors vibration levels and investigates the patterns in vibration signals. It is commonly conducted both on the time waveforms of the vibration signal directly, as well as on the frequency spectrum, which is obtained by applying Fourier Transform on the time waveform.

Figure 7.4.1 REED instruments SD-8205 model adapter





8. Measurement Reports



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Identification Number: 405347469



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ISO/IEC 17025:2017/2018



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Report № 260324 - 1

Date of Report Delivery – 26.03.2024

Sampling Place: River Tergi, Up Stream, China Railway Tunnel Group Co., Ltd. Territory.

Client Name: Ltd. "Gergili", ID 405353610

Sample name and quantity: Surface water, 5 Liters

Sample was taken by: Tatia Gamezardashvili

Sample Received in The Laboratory: 11.03.2024

Sample ID: 110324 - 1

The Analysis Completed: 18.03.2024

Analysis Done By: The Exam Laboratory of the Scientific Research Laboratory of G.Natadze Sanitation, Hygiene and Medical Ecology Scientific Research Institute.

*Microbiological parameters prepare by Ltd Scientific Research firm "GAMMA".

Parameter	Measurement Unit	Used Method	Result	**Maximum permissible limit according to ordinance #425
Physical-chemical Parameters				
pH	-	SST ISO10523:2008/2010	7.56	6.5-8.5
Turbidity	NTU	ISO 7027-1:2016	6.49	N/A
Conductivity	mS/cm	SST ISO 7888:1985	0.738	N/A
Chemical Oxygen Demand (COD)	mgO/L	SST ISO 6060:1989	5.76	≤30
TPH	mg/L	ISO9377-1-2000	<0.005	≤0.3
Microbiological Parameters				
*Total Coliforms	cfu/1 L	ISO 9308-1:2014	40	≤10 000/1 L

**Maximum Permissible Limit According to Ordinance #425 On the Approval of The Technical Regulations against surface water pollution in Georgia – 31.12.2013 Tbilisi, Georgia

Note: 1. It shall be inadmissible to partially reproduce the protocol of the exam without the written permission of the laboratory.

2. The results belong only to an experienced pattern.

QC Lab Manager: L.kakalashvili

Agreed: Director of Laboratory I. Ramishvili





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Report № 260324 - 2

Date of Report Delivery – 26.03.2024

Sampling Place: River Tergi, Down Stream, China Railway Tunnel Group Co., Ltd. Territory.

Client Name: Ltd. "Gergili", ID 405353610

Sample name and quantity: Surface water, 5 Liters

Sample was taken by: Tatia Gamezardashvili

Sample Received in The Laboratory: 11.03.2024

Sample ID: 110324 - 2

The Analysis Completed: 18.03.2024

Analysis Done By: The Exam Laboratory of the Scientific Research Laboratory of G.Natadze Sanitation, Hygiene and Medical Ecology Scientific Research Institute.

*Microbiological parameters prepare by Ltd Scientific Research firm "GAMMA".

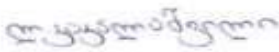
Parameter	Measurement Unit	Used Method	Result	**Maximum permissible limit according to ordinance #425
Physical-chemical Parameters				
pH	-	SST ISO10523:2008/2010	7.78	6.5-8.5
Turbidity	NTU	ISO 7027-1:2016	3.89	N/A
Conductivity	mS/cm	SST ISO 7888:1985	0.676	N/A
Chemical Oxygen Demand (COD)	mgO/L	SST ISO 6060:1989	0.00	≤30
TPH	mg/L	ISO9377-1-2000	<0.005	≤0.3
Microbiological Parameters				
*Total Coliforms	cfu/1 L	ISO 9308-1:2014	190	≤10 000/1 L

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2. The results belong only to an experienced pattern.

QC Lab Manager: L.kakalashvili

Agreed: Director of Laboratory I. Ramishvili




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Report № 260324 - 3



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Date of Report Delivery - 26.03.2024

Measurement type: Air Quality Monitoring

Client Name: Ltd. "Gergili", ID 405353610

Sampling place: Village of Kobi (AAS#1) China Railway Tunnel Group Co., Ltd.
Territory.

Measuring date: 11.03.2024

Measurements Done By: Tatia Gamezardashvili

Parameters	Minimum	Maximum	Average	Methods used
Wind speed and Wind direction in the AQ monitoring in Tskere was – 0.2 m/s, From west/south to north/east.				
PM 10	0.003	0.030	0.014	Aeroqual SERIES 500-PM Sensor
PM 2.5	0.001	0.002	0.002	Aeroqual SERIES 500-PM Sensor
CO	11.5	13.9	12.8	Aeroqual SERIES 500-CO Sensor
NO ₂	0.0	0.0	0.0	Aeroqual SERIES 500-NO ₂ Sensor
SO ₂	0.0	0.0	0.0	Aeroqual SERIES 500-SO ₂ Sensor

Examiner: T.Gamezardashvili

თ. გამეზარდაშვილი

QC Lab Manager: L.kakalashvili

ლ. კაკალაშვილი

Agreed: Director of Laboratory I. Ramishvili





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Report № 260324 - 4

Date of Report Delivery - 26.03.2024

Measurement type: Air Quality Monitoring

Client Name: Ltd. "Gergili", ID 405353610

Sampling place: Village of Tskere (AAS#2) China Railway Tunnel Group Co., Ltd. Territory.

Sampling date: 11.03.2024

Measurements Done By: Tatia Gamezardashvili

Parameters	Minimum	Maximum	Average value of measurements	Methods used
Wind speed and Wind direction in the AQ monitoring in Tskere was – 0.4 m/s, From west/south to north/east.				
PM 10	0.001	0.002	0.002	Aeroqual SERIES 500-PM Sensor
PM 2.5	0.001	0.001	0.001	Aeroqual SERIES 500-PM Sensor
CO	0.2	4.1	3.7	Aeroqual SERIES 500-CO Sensor
NO ₂	0.0	0.0	0.0	Aeroqual SERIES 500-NO ₂ Sensor
SO ₂	0.0	0.0	0.0	Aeroqual SERIES 500-SO ₂ Sensor

Examiner: T.Gamezardashvili

T. Gamezardashvili

QC Lab Manager: L.kakalashvili

L. Kakalashvili

Agreed: Director of Laboratory I. Ramishvili





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Identification Number: 405347469

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Date of Report Delivery - 26.03.2024
Measurement type: Noise Level Monitoring
Client Name: Ltd. "Gergil", ID 405353610
Sampling place: Kobi (NM#1) China Railway Tunnel Group Co., Ltd. Territory.
Measuring date: 11.03.2024
Measurements Done By: Tatia Gamezardashvili

Different Parameters of Noise Level	Result (dB)
LAF _{max}	40.5
LAF _{min}	29.7
LAF _{av}	35.1

Examiner: T.Gamezardashvili

თ. გიგეზაშვილი

QC Lab Manager: L.kakalashvili

ლ. კაკაშვილი

Agreed: Director of Laboratory I. Ramishvili





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Date of Report Delivery – 26.03.2024

Measurement type: Noise Level Monitoring

Client Name: Ltd. "Gergili", ID 405353610

Sampling place: Village of Tskere (NM#2) China Railway Tunnel Group Co., Ltd.
Territory.

Measuring date: 11.03.2024

Measurements Done By: Tatia Gamezardashvili

Different Parameters of Noise Level	Result (dB)
LAF _{max}	60.9
LAF _{min}	48.2
LAF _{av}	54.55

Examiner: T.Gamezardashvili

თ. გამეზარდაშვილი

QC Lab Manager: L.kakalashvili

ლ. კაკალაშვილი

Agreed: Director of Laboratory L. Ramishvili





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Identification Number: 405347469

Report № 260324 - 7



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[BBE GE](#)

Date of Report Delivery - 26.03.2024

Measurement type: Vibration level monitoring

Client Name: Ltd. "Gergili", ID 405353610

Sampling place: Village of Beniani, China Railway Tunnel Group Co., Ltd. Territory.

Measuring date: 11.03.2024

Measurements Done By: Tatia Gamezardashvili

Different Parameters of Vibration Level	Result (mm/s)
LAF _{mat}	0.0
LAF _{ms}	0.0
LAF _w	0.0

Examiner: T.Gamezardashvili

თ. გამეზარდაშვილი

QC Lab Manager: L.kakalashvili

ლ. კაკალაშვილი

Agreed: Director of Laboratory I. Ramishvili





9. Annex 1 – Calibration Certificates

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საქ GAC
GAC – CL – 0017
სსტ ისო/იეკ 17025:2017/2018
11.11.2021 – 11.11.2025

საკალიბრებელი ლაბორატორია
CALIBRATION LABORATORY
დაკალიბრების სერტიფიკატი № 5521
CALIBRATION CERTIFICATE

გაცემის თარიღი Date of issue	17.11.2023 წ.
დაკალიბრების ობიექტი Calibrated item	ანემომეტრი ციფრული testo 450i №48951415 გაზომვის საშუალების დასახელება/იდენტიფიკაცია measuring instrument/identification
დამკვეთი Customer	შპს „ბი-ბი-ი“ სამეცნიერო კვლევითი საგამოცდო ლაბორატორია, თბილისი, ვაჟა-ფშაველას მე-3 კვარტალი, კორპ. 7 სარდაფი 13ა დასახელება, მისამართი name of customer, address
დაკალიბრების მეთოდი Calibration method	CP-088.G; ISO 17713-1:2007 მეთოდის დასახელება/იდენტიფიკაცია method name/identification
დაკალიბრება შესრულებულია Calibration is performed by using	ანემომეტრი ციფრული №23004047/23010495 სერტ. №HZ-2302169/02 12.07.2023 საწიგნო გაზომვის საშუალების დასახელება/იდენტიფიკაცია description of the standard measuring instrument/identification
მიკვლევადობა Traceability	PENTA OTOMASYON/UME
დაკალიბრების ადგილი Calibration Site	☒ შემსრულებლის ლაბორატორია/Supplier's Lab. ☐ დამკვეთის ობიექტი/Customer's Site
დაკალიბრების პირობები Ambient condition	(20-22)°C; (55-54)%RH; (97.3-97.5)kPa
დაკალიბრების შედეგები იხილეთ მე-2 გვერდ(ებ)ზე See Calibration Results on page(s)	
ლაბორატორიის უფროსი Chief of laboratory	ლ. ნანოზაშვილი სახელი, გვარი name
პირის ხელმოწერა, რომელმაც ჩაატარა დაკალიბრება Signature of the person who performed calibration	ლ. ბეგაშვილი სახელი, გვარი name







გვ. 1 2-დან

დაუშვებელია წილობრივ სერტიფიკატის ნაწილობრივი კლავირება და გავრცელება შპს „მეტროლოგი“ წერილობითი ნებართვის გარეშე
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სერტიფიკატი № 5521
Certificate №

დაკალიბრების შედეგები CALIBRATION RESULTS

გარეგნული დათვალიერების შედეგი: ☒ დამაკმაყოფილებელი ☐ არადამაკმაყოფილებელი
მოსინჯვის შედეგი: ☒ დამაკმაყოფილებელი ☐ არადამაკმაყოფილებელი

დაკალიბრების წერტილი, m/s	სანიმუშო ხელსაწყოების ჩვენება, m/s	დასაკალიბრებელი ხელსაწყოების ჩვენება, m/s	აბს. ცდომილება, m/s	განუსაზღვრელობა U, m/s
2.5	2.55	1.69	-0.86	0.12
5.0	4.97	3.59	-1.38	0.30
10.0	9.46	8.16	-1.30	0.34
15.0	14.70	12.28	-2.42	0.68

გადართობელი განუსაზღვრელობის მნიშვნელობა მიღებულია სტანდარტული განუსაზღვრელობის მნიშვნელობის წამყვანი მომდევნოების კოეფიციენტზე $k=2$, რაც ნორმალური განაწილების შემთხვევაში შესაბამისი დაფარვის 95% აღზატონას.

დაკალიბრების თარიღი
Calibration date

17.11.2023 წ.

დამატებითი ინფორმაცია
Additional Information

1 (ერთი) წელი

დაკალიბრებათმორის ინტერვალი დამკვეთის მოთხოვნის შემთხვევაში
Calibration interval, if requested by the customer

პირის ხელმოწერა, რომელმაც
ჩაატარა დაკალიბრება
Signature of the person
who performed calibration

ლ. ზეგაშვილი
სახელი, გვარი
name

ს. ლომიძე, მგაშვი
signature, stamp

გვ. 2 2-დან

დაუშვებელია წინამდებარე სერტიფიკატის ნაწილობრივი კლავირებისა და გავრცელება მისი „მეტროლოგის“ წერილობითი ნებართვის გარეშე
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11.11.2021 – 11.11.2025

საკალიბრაციო ლაბორატორია
CALIBRATION LABORATORY

დაკალიბრების სერტიფიკატი №5525
CALIBRATION CERTIFICATE

გაცემის თარიღი Date of issue	17.11.2023
დაკალიბრების ობიექტი Calibrated item	ვიზრაციის მზომი ხელსაწყო REED INSTRUMENTS SD-8250 S/N R.040438 ვიზრაციის მზომი მაგნიტური სენსორით ვაზომვის საშუალების დასახელება/იდენტიფიკაცია measuring instrument/identification
დამკვეთი Customer	შპს „ბი-ბი-ი“ სამეცნიერო კვლევითი საგამოცდო ლაბორატორია, თბილისი, ვაჟა-ფშაველას მე-3 კვარტალი, კორპ. 7 სარდაფი 13ა დასახელება, მისამართი name of customer, address
დაკალიბრების მეთოდი Calibration method	CP-062.G; გოსტ 30652-99 პროცედურის დასახელება/იდენტიფიკაცია name of the procedure/identification
დაკალიბრება შესრულებულია Calibration is performed by using	ვიზროგარდამხმნელი ABC-034-03 № 8113994 სერტ. № GE/M1/05-01708-23 30.08.23; ვიზროსტენდი B3/IC-10A სანიშნო ვაზომვის საშუალების დასახელება/იდენტიფიკაცია description of the standard measuring instrument /identification
მიკვლევადობა Traceability	GeoSTM/Ukrmetteststandard/BIPM/CMC
დაკალიბრების ადგილი Calibration Site	☒ შემსრულებლის ლაბორატორია/Supplier's Lab. ☐ დამკვეთის ობიექტი/Customer's Site
დაკალიბრების პირობები Ambient condition	t 20.1°C; RH 42%
დაკალიბრების შედეგები იხილეთ მე-2 გვერდ(ებ)ზე See Calibration Results on page(s)	
ლაბორატორიის უფროსი Chief of laboratory	ლ. ნანოზაშვილი სახელი, გვარი name
პირის ხელმოწერა, რომელმაც ჩაატარა დაკალიბრება Signature of the person who performed calibration	ზ. ცქიტიშვილი სახელი, გვარი name




გვ. 1 2-დან

დაუშვებელია ნაწილობრივ სერტიფიკატის ნაწილობრივი კლიენტისთვის და გერდევნა შპს „მეტროლოგი“ წერილობითი მფარველის გარეშე.
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სერტიფიკატი №5525

Certificate №

დაკალიბრების შედეგები

CALIBRATION RESULTS

გარეგნული დათვალიერების შედეგი: ☒ დამაკმაყოფილებელი ☐ არადაამაკმაყოფილებელიმოსინჯვის შედეგი: ☒ დამაკმაყოფილებელი ☐ არადაამაკმაყოფილებელივიბროაჩქარების გაზომვა სიხშირეზე $f=160 \text{ Hz}$

A ნომინალური, m/s^2	3.0	6.0	10.0	12.0	30.0
A დასაკალიბრებელი ვიბრომეტრის ჩვენება, m/s^2	3.0	6.4	11.0	13.3	32.8
აბს. ცდომილება, m/s^2	0	0.4	1.0	3.3	2.8
განუსაზღვრელობა U, m/s^2	0.81	0.82	0.82	0.81	0.81

ვიბროაჩქარების გაზომვა სიხშირის დიაპაზონში:

სიხშირე, Hz	20	40	80	160	315
A ნომინალური, m/s^2	10	10	10	10	10
A დასაკალიბრებელი ვიბრომეტრის ჩვენება, m/s^2	11.9	9.8	10.1	11.0	11.6
აბს. ცდომილება, m/s^2	1.9	-0.2	0.1	1.0	1.6
განუსაზღვრელობა U, m/s^2	0.85	0.82	0.82	0.86	0.81

გაფართოებული განუსაზღვრელობის მნიშვნელობა მიღებულია სტანდარტული განუსაზღვრელობის მნიშვნელობის მამრადლით მომცელობის კოეფიციენტზე $k=2$ რაც ნორმალური განაწილების შემთხვევაში შეესაბამება დაფარვის 95% ალბათობას.

დაკალიბრების თარიღი

17.11.2023

Calibration date

დამატებითი ინფორმაცია

Additional Information

1 (ერთი) წელი

დაკალიბრებათაშორის ინტერვალის მოთხოვნის შემთხვევაში
Calibration interval, if requested by the customer

პირის ხელმოწერა, რომელმაც

ჩაატარა დაკალიბრება

Signature of the person
who performed calibration

ზ. ცქიტიშვილი

სახელი, გვარი
NAME

სერტიფიკატი №5525
Signature, Date
07

გვ. 2 2-დან

დუბლირებული წინამდებარე სერტიფიკატის ნაწილობრივი კვლიდრეობა და გავრცელება მას „მეტროლოგის“ წერილობითი ნებართვის გარეშე
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11.11.2021 – 11.11.2025

საკალიბრაციო ლაბორატორია
CALIBRATION LABORATORY

დაკალიბრების სერტიფიკატი № 5522
CALIBRATION CERTIFICATE

გაცემის თარიღი Date of issue	17.11.2023 წ.
დაკალიბრების ობიექტი Calibrated item	უნივერსალური ხელსაწყო SD-9300 №000793, ხმურის ადაპტერი REED INSTRUMENTS SL-417 S/N 067603 გაზომვის საშუალების დასახელება/იდენტიფიკაცია measuring instrument/identification
დამკვეთი Customer	შპს „ბი-ბი-ი“ სამეცნიერო კვლევითი საგამოცდო ლაბორატორია, თბილისი, ვაჟა-ფშაველას მე-3 კვარტალი, კორპ. 7 სარდაფი 13ა დასახელება, მისამართი name of customer, address
დაკალიბრების მეთოდი Calibration method	CP-092.G, გოსტ 8.635-2013 მეთოდის დასახელება/იდენტიფიკაცია method name/identification
დაკალიბრება შესრულებულია Calibration is performed by using	ხმაურზომების კალიბრატორი № E1-23071137, სერტ. №202300306-82875 06.03.2023 საწიგნო გაზომვის საშუალების დასახელება/იდენტიფიკაცია description of the standard measuring instrument /identification
მიკვლევადობა Traceability	West Caldwell Calibration Laboratories, inc. / NIST
დაკალიბრების ადგილი Calibration Site	☒ შემსრულებლის ლაბორატორია/Supplier's Lab. ☐ დამკვეთის ობიექტი/Customer's Site
დაკალიბრების პირობები Ambient condition	(20-22)°C; (55-54)%RH; (97.3-97.5)kPa
დაკალიბრების შედეგები იხილეთ მე-2 გვერდ(ებ)ზე See Calibration Results on _____ page(s)	
ლაბორატორიის უფროსი Chief of laboratory	ლ. ნანოშაშვილი სახელი, გვარი name
პირის ხელმოწერა, რომელმაც ჩაატარა დაკალიბრება Signature of the person who performed calibration	ლ. ბეგაშვილი სახელი, გვარი name



ხელმოწერა, ბეჭედი
signature, stamp



ხელმოწერა, ბეჭედი
signature, stamp

გვ. 1 2-დან

დაუშვებელია წინამდებარე სერტიფიკატის ნაწილობრივი კვლევარობის და გავრცელების შპს „მეტროლოგი“ წერილობითი ნებართვის გარეშე
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სერტიფიკატი № 5522
Certificate №

დაკალიბრების შედეგები

CALIBRATION RESULTS

გარეგნული დათვალიერების შედეგი: ☒ დამაკმაყოფილებელი ☐ არადამაკმაყოფილებელი
მოსინჯვის შედეგი: ☒ დამაკმაყოფილებელი ☐ არადამაკმაყოფილებელი

სიხშირე 1 kHz			სიხშირე 4 kHz			სიხშირე 125 Hz		
ფაქტობრივი მნიშვნელობა, dB	დასაკალიბრებელი ხელისაწყოების ჩვენება, dB	განუსაზღვრელობა U, dB	ფაქტობრივი მნიშვნელობა, dB	დასაკალიბრებელი ხელისაწყოების ჩვენება, dB	განუსაზღვრელობა U, dB	ფაქტობრივი მნიშვნელობა, dB	დასაკალიბრებელი ხელისაწყოების ჩვენება, dB	განუსაზღვრელობა U, dB
დიაპაზონი 50-100 dB								
74	72.9	0.12	74	72.9	0.12	74	72.9	0.12
84	82.9	0.12	84	82.9	0.12	84	82.9	0.12
94	92.9	0.12	94	92.9	0.12	94	92.9	0.12
დიაპაზონი 80-130 dB								
84	82.4	0.12	84	82.5	0.12	84	82.5	0.12
94	92.6	0.12	94	92.6	0.12	94	92.6	0.12
104	102.6	0.12	104	102.7	0.12	104	102.7	0.12
114	112.9	0.12	114	113.0	0.12	114	113.0	0.12

გაფართოებული განუსაზღვრელობის მნიშვნელობა მიღებულია სტანდარტული განუსაზღვრელობის მნიშვნელობის წარმავლით მოშვების კოეფიციენტზე $k=2$ -სა და ნორმალური განაწილების შემთხვევაში შეესაბამება დაფარვის 95% ალბათობას.

დაკალიბრების თარიღი
Calibration date 17.11.2023 წ.

დამატებითი ინფორმაცია
Additional Information

1 (ერთი) წელი

დაკალიბრებათმშობის ინტერვალი დამკვეთის მოთხოვნის შემთხვევაში
Calibration interval, if requested by the customer

პირის ხელმოწერა, რომელმაც
ჩაატარა დაკალიბრება
Signature of the person
who performed calibration

ლ. ზეგაშვილი
სახელი, გვარი
name

ს. ზეგაშვილი
ხელმოწერა, ბეჭედი
signature, stamp

გვ. 2 2-დან

დაუშვებელია წიგნდებარე სერტიფიკატის ნაწილობრივი კლავირირება და გავრცელება მისი კუთვნილების მფლობელის წერილობითი ნებართვის გარეშე.
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Aeroqual Limited
 460 Rosebank Road, Avondale, Auckland 1026, New Zealand.
 Phone: +64-9-623 3013 Fax: +64-9-623 3012
 www.aeroqual.com

Calibration Certificate No. 68364

Calibration Date: 27 Jun 2023 09:48

Model: Carbon Monoxide 0-100ppm GSE

Serial No: ECN-2606231-003

Environmental Conditions

Temperature 21.8 °C

Relative Humidity 39.4 %

Measurements

Calibration Standard /ppm	0.0	50.0	0.0	0.0
AQL Sensor (Mean) /ppm	0.0	50.1	0.0	0.0
AQL Sensor (Std. Dev) /ppm	0.000	0.057	0.000	0.000

*The Mean and Standard Deviation are calculated from three consecutive readings.

Calibration Standard

This sensor was calibrated against a certified mixture of carbon monoxide in synthetic air diluted with zero air using mass flow controllers with calibrations traceable to the National Institute of Standards and Technology (NIST).

QC Approval: Takao Yamasaki

Date: 27 Jun 2023



Aeroqual Limited
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Calibration Certificate No. 69494

Calibration Date: 06 Sep 2023 12:12

Model: Nitrogen dioxide 0-1 ppm

Serial No: END-1506232-001

Environmental Conditions

Temperature °C

Relative Humidity %

Measurements

Calibration Standard /ppm	0.015	0.449	0.000	0.000
AQL Sensor (Mean) /ppm	0.015	0.451	0.000	0.000
AQL Sensor (Std. Dev) /ppm	0.001	0.001	0.000	0.000

*The Mean and Standard Deviation are calculated from three consecutive readings.

Calibration Standard

The Aeroqual sensor is calibrated against a chemiluminescence NOx analyser. The calibration of this analyser is traceable to primary standards.

QC Approval: Takao Yamasaki

Date: 06 Sep 2023



aeroqual

Aeroqual Limited

460 Rosebank Road, Avondale, Auckland 1026, New Zealand.
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 www.aeroqual.com

Calibration Certificate

Calibration Date: 23 Aug 2023

Model: PM2.5 / PM10 0 - 1.000 mg/m3

Serial No: SHPM 5005-ACC2-001

Measurements

	PM2.5 (mg/m3)	PM10 (mg/m3)
Reference Zero	0.000	0.000
AQL Sensor Zero	0.000	0.000
Reference Span	0.023	0.130
AQL Sensor Span	0.023	0.132

Calibration Standards

Standard	Manufacturer	Model	Serial Number	Calibration Due
Optical Particle Counter	MetOne Instruments	GT-526S	B10009	20-Apr-2025
Test aerosol	Powder Technology Inc.	ISO 12103-1, A1 ultrafine test dust	n/a	n/a

QC Approval: Farid Yanes



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 www.aeroqual.com

Calibration Certificate No. 69417

Calibration Date: 05 Sep 2023 16:56

Model: Sulphur Dioxide 0-10 ppm

Serial No: ESO-0509235-003

Environmental Conditions

Temperature 25.1 °C

Relative Humidity 38.7 %

Measurements

Calibration Standard /ppm	0.00	4.99	0.00	0.00
AQL Sensor (Mean) /ppm	0.00	5.00	0.00	0.00
AQL Sensor (Std. Dev) /ppm	0.000	0.000	0.000	0.000

*The Mean and Standard Deviation are calculated from three consecutive readings.

Calibration Standard

The Aeroqual sensor is calibrated against a certified UV fluorescence analyser.

QC Approval: Farid Yanes

Date: 05 Sep 2023



Hach Lange GmbH

Maintenance and Servicing Report

Dear customer,

Our certification according to DIN EN ISO 9001:2015 (Hach Lange GmbH) makes sure that all our equipment meets the requirements of these norms during the development, production and customer service.

We have fixed within our quality management system that our test resources can be traced back by national standards, there where it is possible. Therefore, your Hach Lange calibration certificate, supported by this protocol, provides the necessary documentation and audit trail for the control of your measuring and testing equipment.

Device Name: DR 3900 Device type: LPG 440 39.00001 S/N: 1727595

Results of hardware check:

Software version	<u>1.29(14148 221319 611)</u>	Battery voltage	<u>3.0250</u>
Touch screen	☒ ok	USB ports	☒ ok
Cell compartment	☒ ok	Halogen lamp	☒ ok
Barcode system	☒ ok	Light shield	☒ ok
RFID system	☒ ok		

Photometric accuracy

Wavelength: 546 nm Inspection set: VAA591 Set no.: 0755 Valid until: 31/03/24

Cuvette	Nominal value [Abs]	Tolerance [Abs]	Actual value [Abs]
NG11/2	<u>0.308</u>	<u>0.302 - 0.314</u>	<u>0.310</u>
NG5/2	<u>0.616</u>	<u>0.604 - 0.628</u>	<u>0.618</u>
NG9/1	<u>1.472</u>	<u>1.443 - 1.501</u>	<u>1.474</u>

Stray light

Cuvette	Wavelength [nm]	Nominal value [Abs]	Actual value [Abs]
KV450/3	<u>340</u>	<u>> 2.8</u>	<u>4.037</u>

Wavelength accuracy

Cuvette	Nominal value [nm]	Tolerance [nm]	Actual value [nm]
BG20/2	<u>807</u>	<u>+/- 2</u>	<u>807</u>

The DR 3900 is within specification and has passed calibration.

Suggested next calibration: 21/11/2024

Date: 21/11/2023Service Technician: Paula GogotschSignature: [Signature]

Vibration Monitoring Report : Lot-1 March 2024**North–South Corridor (Kvesheti–Kobi) Road
Project****Tskere Village Vibration Monitoring Report**

Prepared by: LLC Gergili
Georgia, Tbilisi, Vaja-Pshavela Str. Build. 7
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Director: Sophio Berishvili

Tbilisi
March, 2024



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1. Introduction

Vibration induced in buildings are a frequent concern in cities around the world. Commonly, complaints are made by homeowners, as heavy construction vehicles travel at various speeds on adjacent roads, resulting in annoying vibrations and possible structural damage. Passenger vehicles rarely produce perceptible vibrations to cause significant structural damage. Generally, traffic induced vibrations are caused by heavy vehicles. These vibrations are generated by road surface irregularities, namely: potholes, cracks, and uneven pavement joints. Dynamic interaction forces between the vehicle and pavement are created by these irregularities resulting in a generation of stress waves that travel through the adjacent soils.

Vibrations produce damaging stress waves that quickly reach building foundations, causing them to vibrate. Several factors may contribute to vibration levels, including: road condition, vehicle speed, vehicle weight, soil conditions, building characteristics, vehicle suspension system, season of the year, and distance between the structure and the road. When a large vehicle strikes an irregularity, an impact load, as well as an oscillating load due to the "axle hop" of the vehicle are generated. The impact load generates ground vibrations that are predominant at the natural vibration frequencies of the soil, whereas the axle hop generates vibrations at the hop frequency, which is a characteristic of the vehicle's suspension system. Vibrations can be amplified if the natural frequency of the building coincides with the natural frequency of the soil.

Soil type and stratification can influence the level of vibration greatly. Vibration levels increase as soil stiffness and damping decrease. Traffic vibrations appear worst in areas underlain by a soft silty clay layer between 7 meters and 15 meters deep. The natural frequencies of the soil may coincide with the natural frequency of the structures at these locations. Seasonal variations and the moisture content of the soil are also a consideration when measuring vibrations. In locations where the topsoil freezes, vibration levels can be less than half those in other seasons.

Vibration sources such as construction activities and road traffic, are among the sources considered potentially dangerous to buildings and structures. In general, structural damages to buildings are extremely rare and are in general caused by other sources. Structural damages occur when the permissive levels of vibration are exceeded. Degrees of damage are methodologically defined and vary from those that do not affect the structural safety of the buildings but affect the value of assets – e.g. formation of cracks in the plaster, increase in existing cracks, damage of architectural elements etc.

The classification of damage categories used in analysis of vibration impacts is determined by ISO 4866 and is the following:

- **Damage threshold:** Formation of cracks on the surfaces of the thread-like drywall, increase of existing cracks on the plaster surfaces or on the surfaces of dry stone walls; also cracks in the mortar joints in the thread-like construction in brick and concrete;
- **Minor damage:** Widening of cracks, detachment and fall of plaster or pieces of plaster drywall; formation of cracks in blocks of brick or concrete;
- **Major damage:** Damage of structural elements; cracks in the support columns; opening of joints; set of cracks in masonry.

Tskere Village Vibration Monitoring Report



In the present work the effects of vibration in terms of nuisance/annoyance to people are not considered, and only the potential damage to structures are evaluated.

Based on the 2020 december agreement signed between parties LLC "Gergili" and "China railway tunnel group Co., Ltd. Branch in Georgia", LLC "Gergili" conducted a study on the propagation of vibration in Tskere Village, during tunnel construction works.



2. Project Description

The Government of Georgia (GoG) has launched a program to upgrade the major roads of the country. The program is being managed by the Roads Department (RD) of the Ministry of Regional Development and Infrastructure (MoRDI). As a part of the program, upgrading of Kvesheti-Kobi section of the E117 is planned. This section includes the construction of 9 km long main tunnel that will cross the Caucasus ridge bypassing the existing road that connects Kvesheti to Kobi through Gudauri area and the Jivari pass. The project is located in Dusheti and Kazbegi municipalities, Mtskheta-Mtianeti region in the central northern part of Georgia.

Kvesheti Kobi road section with six junctions and three service roads will play an important role in the development of Kazbegi and Dusheti municipalities by facilitating the communities of Kvesheti, Bedoni, Tskere and Kobi by providing year-round access to markets, educational institution, health facilities of capital Tbilisi and increase the tourist attraction in Trege valley.

The tunnel provides more secure and reliable conditions for passengers on the road in winter. Besides The National Park of Kazbegi and Gudauri Winter Resort will avoid the traffic flow by the help of the new road. The road will also improve the livelihood conditions of inhabitants living in gorge. They are isolated from outside world in winter and the villages of Khada are almost empty. There are no grocery store and pharmacy and the medical assistance is not available. Because of the nonexistence of the road and severe weather conditions local people have to go to Kvesheti on foot, which is connected with a lot of difficulties and risks. We must take into consideration the fact that there are mostly middle aged and elderly people living in the upper villages of gorge. It's especially hard for them to pass this road in winter.

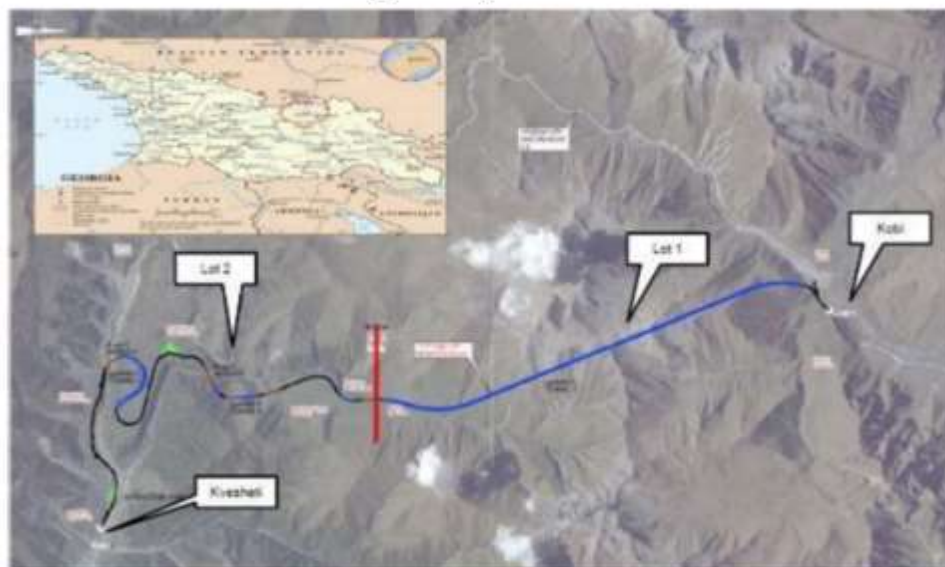
After project realization, distance between Kvesheti and Kobi will be reduced by 12 km instead of existing 35 km road, and travel time will be reduced to 20 minutes instead of 1 hour.

The construction works of Kvesheti-Kobi section is financing by Asian Development Bank and European Bank for Reconstruction and Development. The construction works started in the end of 2019 and will be completed in 2023.

During this reporting period project is at construction stage. Contractor is carrying out activities related to tunnel construction, permitting, machinery mobilization, approval and designing of gas pipeline relocation, identification and fulfilling the requirements for spoil disposal areas, development of living arrangements, get approved site specific and topic specific management plans.



Figure 1: Project Location



The length of the new alignment is 22.7 km and will be divided into two construction packages, or 'Lots' as follows:

- Lot 1: Tskere – Kobi; Chainage KM 12.7 – KM 22.7 (10 km);
- Lot 2: Kvesheti – Tskere; Chainage KM 0.0 – KM 12.7 (12.7 km).

The present vibration survey report covers lot 1 – Tskere village section.



3. Vibration Monitor SWARM

The SWARM vibration monitor is the most efficient and high-quality vibration monitor on the market and uses MEMS (Micro-ElectroMechanical Systems) technology. Geophones are no longer needed.

The SWARM vibration monitor worldwide in construction and infrastructure and also to measure vibrations of other nature, such as vibrations at windmills, vibrations at data centers and vibrations from heavy traffic. The SWARM is used to measure potential damage to structures and to measure nuisance for people in buildings.

The SWARM is IP65 rated, complies with industry standards and measures according to the latest and relevant standards and guidelines.

The measurement data is automatically sent from the SWARM to the Honeycomb platform via 4G/LTE or WiFi. There is no need to retrieve monitoring data from the jobsite. Saving time and manpower through the unprecedented efficiency of the SWARM.

Omnidots SWARM measures the Vtop (PPV / Peak Particle Velocity) and the Atop (PPA / Peak Particle Acceleration) for guidelines DIN4150-3, BS7385 and SBR-A.

All monitoring data is saved as CSV, Excel or retrieve the data using the Omnidots API. Honeycomb is capable of generating notifications for Vtop (PPV) and also for Atop (PPA).

Figure 2. Vibration Monitor SWARM



Installing the SWARM is incredibly fast and easy, as you can see in this video. You can configure the measuring points remotely via the Honeycomb web platform. There you can also access your measurement data 24/7, from anywhere in the world from your laptop, smartphone or tablet.



- Complies with industry standards: DIN4150-2, DIN4150-3, DIN 45669-1, BS7385, BS6841, ISO2631, SBR-A 2010, SBR-A 2017, SBR-B, Circulaire du 23/07/1986, ISEE (USBM RI8507 & OSMRE) and SN640312a.
- The SWARM continuously sends the measurement data automatically to Honeycomb via 4G/LTE, WiFi or PoE using an adapter.
- Mounting is very quick and easy.
- The SWARM is compact, lightweight, and IP65 rated



4. Measuring in accordance with DIN 4150-3 Standard

DIN 4150-3 is the most widely applied standard internationally for measuring structural vibrations. The measurement procedure can be found in a similar form in other national standards, for example the Italian UNI 9916. The assessment parameter is the maximum value (V_i) of the three individual components (peak values) of vibration velocity at frequencies of 1 to 80 Hz.

The measurements are carried out at the foundation. Vibrations in the ceiling of the upper most outer walls also provide valuable information for analysis. These detect the horizontal response of the building to the vibration at the foundation. Only the greatest value of both the horizontal components is then used for the analysis.

The standard provides guide values for permissible vibration velocities for short time and sustained vibrations in three types of buildings (Notes from DIN 4150-3 about the guide values is given in Table 1, 2).

Table 1: Guide values for transient vibration

Guide values for vibration velocity for analyzing the effects of transient vibration					
Building Type	Foundation Frequency of the Significant Vibration			Upper ceiling	
Frequency range	1 – 10 Hz	10 – 50 Hz	50 – 100 Hz	All frequencies	
Direction	X / Y / Z	X / Y / Z	X / Y / Z	X / Y	Z
Reinforced or framed structures. Industrial and heavy commercial buildings	20 mm/s	20 – 40 mm/s	40 – 50 mm/s	40 mm/s	20 mm/s
Unreinforced or light framed structures/ Residential or light commercial type buildings	5 mm/s	5 – 15 mm/s	15 – 20 mm/s	15 mm/s	20 mm/s
Delicate, listed buildings e.g. historical monuments	3 mm/s	3 – 8 mm/s	8 – 10 mm/s	8 mm/s	20 mm/s



Table 2: Guide values for continuous vibration

Guide values for vibration velocity v_i for analyzing the effects of continuous vibration		
Building Type	Upper ceiling level, all Frequencies	
Direction	X / Y (horizontal)	Z (vertical)
Reinforced or framed structures industrial and heavy commercial buildings	10 mm/s	10 mm/s
Unreinforced or light framed structures, residential or light commercial type buildings	5 mm/s	10 mm/s
Delicate buildings, listed buildings e.g. historical monuments	2.5 mm/s	-

Vertical continuous vibration with a vibration velocity below 10 mm/s normally do not cause damage to ceilings in houses. For delicate buildings there are no guide values available.

For sustained vibrations on pipelines, the guide values for short time vibrations, reduced by 50%, can be applied.

The following advice is given in DIN 4150-3 for the placement of sensors:

- For foundation vibrations the transducer should be placed on the lowest floor at the foundation or on the outer wall.
- In the upper ceiling level, the sensor should be placed inside or very close to the outer wall.
- For buildings without a basement the measurement location must not be higher than 0.5m above the ground level.
- The measurement location should predominantly be on the side of the building facing the excitation.
- One of the lateral coordinates (X / Y) should be parallel to an outside edge of the building.
- Buildings with larger ground areas should be measured at several points.
- In addition to measuring at the foundation and the upper ceiling, if required, measurements can be carried out in the vertical direction on the ceilings, where the strongest vibrations are to be expected (mostly central).
- When measuring pipelines, where possible, the sensor should be placed on the pipeline itself.



5. Evaluation of Effects of Vibration on Buildings

5.1 DIN 4150-3 Standard

Categorization of buildings: Table 1, 2 contains building categorization determined by DIN 4150, in particular: Category 1: Commercial/Industrial buildings and similar; Category 2: Residential building and similar; and Category 3: Sensitive Buildings.

Short or long vibration: In case of construction of the road as well as in case of road operation, the buildings will be subject to short vibration impacts – impacts that occur for short period of time (e.g. the period of time when roller compactor is working or when a heavy vehicle is crossing in front of an impacted building). Characterization of long (transient) and short vibrations is defined in DIN 4150-3. Nevertheless, only for demonstration purpose, in comparison of modelled vibration impact to the damage thresholds, thresholds for both – short and long vibration impacts for II category buildings assigned to structures have been referred.

5.2 ISO 4866:2010 Standard – Mechanical Vibration and Shock

The principles for carrying out vibration measurement and processing data regarding the effects of vibration on structures are established by the International Standard ISO4866:2010 - "Mechanical vibration and shock, Vibration of fixed structures, Guidelines for the measurement of vibrations and evaluation of their effects on structures".

The most common and frequent structural damage from man-made sources occurs in the frequency range from 1 to 150 Hz.

Natural sources, such as earthquakes and wind excitation, usually contain damage-level energy at lower frequencies, in the range from 0,1 Hz to 30 Hz.

The classes are defined with reference to a building Unreinforced or light framed structures/ Residential or light commercial type. The reference building shall not have any constructional defects nor shall it have sustained accidental damage. If the construction does not fulfil these requirements, it shall be allocated to a lower class.

5.3 Description of Damage

For the purposes of this International Standard ISO 4866:2010, the damages classified into the following categories:

- **Cosmetic.** The formation of hairline cracks on drywall surfaces (see ISO 4356), or the growth of existing cracks in plaster or drywall surfaces; in addition, the formation of hairline cracks in mortar joints of brick/concrete block construction.
- **Minor.** The formation of large cracks or loosening and falling of plaster or drywall surfaces, or cracks through bricks/concrete blocks.
- **Major.** The damage to structural elements of the structure, cracks in support columns, loosening of joints, splaying of masonry cracks, etc.



6. Vibration Propagation Study

On 11th of March, 2024, the measurement device's battery was changed, vibration survey field works were carried out by the representatives of LLC "Gergili". The research procedure was conducted in accordance with the form approved by the organization. The aim of the study was to assess the impact of vibration generated during construction works on the surrounding buildings. One point was defined as the location of the vibrating device:

- 1) Church adjacent to the construction site in Tskere.

Figure 3: Study Area





Figure 4: Measurement Point - The Church



Figure 5: Cultural Heritage Structure, where the measurement device is installed in window of the church





The tables below show the measurement protocol N1, where the technical details of the measurements are presented. Vibration measurement and data collection at point N1 was done during March:

Measurement protocol N1	
1. General	
1.1 Person in charge:	Irakli Ramishvili – Head of the BBE Science Research Laboratory
1.2 Measurement period	01/03/2024 13:26:00 – 31/03/2024 13:27:59
2. Kind of vibration	
2.1 Excitation	Construction work
2.2 Operating conditions	Intensive construction works
3. Structure	
3.1 Name and address	Church in Village Tskere
3.2 Classification	Sensitive building. According to DIN 4150-3 standard N3 categories of buildings (sensitive buildings)
3.3 Description	Stone building
4. Location and position	
4.1 Source of vibration	
5. Environmental conditions	
6. Subjective observations	
7. Measuring chain	



8. Measurement result	
8.1 Event chart	
Peak vibration velocity/frequency	
9. Evaluation	Construction vibration does not affect the overall condition
10. Signs	
Signature	Irakli Ramishvili

As can be seen from the data from the protocol, the level of vibration exposure generated by the construction at the control points are much lower than the reference values specified in DIN 4150-3.

Tskere Village Vibration Monitoring Report



Following exceedances of vibration levels were observed in March:

Exceedances						
Date	X Fdom (Hz)	X Vmax (mm/s)	Y Fdom (Hz)	Y Vmax (mm/s)	Z Fdom (Hz)	Z Vmax (mm/s)
March 8, 2024 14:30:29	10.5	1.7065	11.5	2.2661	33.0	1.8549
March 11, 2024 17:29:29	13.0	2.4231	13.0	2.8502	13.0	1.8984
March 12, 2024 19:03:59	12.5	2.5999	12.5	2.9106	31.5	2.4329
March 23, 2024 09:26:59	12.5	2.0041	13.5	2.4127	12.5	1.5931
March 23, 2024 09:27:14	12.5	2.0019	13.5	3.3095	12.5	1.4435
March 24, 2024 10:08:44	10.0	2.4608	14.0	1.9641	32.5	1.5398
March 26, 2024 18:19:14	12.0	1.8733	11.0	2.6337	8.5	1.2114
March 27, 2024 19:16:14	10.5	1.8841	11.0	2.5359	8.0	1.7481

On March 11, the Gergil team removed the vibration device, based on the client's request, the excesses recorded on March 11 belong to the removal of the device by the Gergil team.

As for the rest of the days where the excess occurred, we do not have any information regarding the said excess



Conclusion

1. Based on the agreements dated 2020 December 17th (No. CRTG-KKHSE-2020-0002) and dated 2021 June 22nd (Amendment Agreement – Amendment #1) signed between parties LLC "Gergili" and "China railway tunnel group Co., Ltd. Branch in Georgia", LLC "Gergili" conducted a study on the propagation of vibration in Tskere Village, during tunnel construction works.
2. One point was selected as vibration location: The church near the construction site (about 50 m from the project zone).
3. Vibration survey was performed in accordance with the German standard DIN 4150-3 and the standard of the International Certification Organization ISO 4866: 2010, as well as following the procedures of vibration survey developed by the company.
4. Vibration level data was collected:
N1 point - 01/03/2024 13:26:00 – 31/03/2024 13:27:59
5. Annex N1 shows the vibration level values in 2-second intervals for N1 point. Exceedance of the reference value of DIN 4150-3 standard at N1 was observed several times in March, 2024. Vibration measurement and data collection at point N1 was done during whole March, from where,
 - On March 11, the Gergil team removed the vibration device, based on the client's request, the excesses recorded on March 11 belong to the removal of the device by the Gergil team.
 - As for the rest of the days where the excess occurred, we do not have any information regarding the said excess.
6. At the given stage, the construction works are accomplished with heavy vehicles and works done by personnel, so there is no source of a permanent vibration as a result of the construction activities. An analysis of the measurement values at point N1 in March shows that cases of sharp increases in vibration levels was not observed during vibration measurement and data collection in March.
7. At the measurement point the vibration data obtained as a result of construction works is significantly less than the values provided by the standard during most of the measurement period.



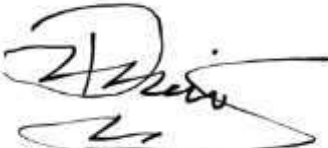
7. Calibration Certificate

Calibration report

Certificate of Calibration

Certificate number: 20231121707372798779



Manufacturer	Omnidots B.V.
Location of calibration	Omnidots Potklei 5 9351 VS Leek
Model	SWARM V2.2b-G
Name	FIHOWO
Date of calibration*	2023-11-21 (YYYY-MM-DD)
Temperature (°C)	20±3°C
Humidity (% RH)	60±30%
Signature:	

* Recommended calibration interval is 24 months from first day of use, unless otherwise required by local standards and/or local laws.

Calibration report

Certificate of Calibration

Certificate number: 20231121707372798779



Calibration procedure

The Swarms are mounted on the calibration mounts. The shaker then targets a speed and keeps the same power for 60 seconds. Over this time measurement samples are logged and compared to the reference sensor.

Calibration report

Certificate of Calibration

Certificate number: 20231121707372798779



Calibration equipment used

Model	Serial number	Description	Calibration certificate
OMNSH01	0002	Horizontal shaker	n.a.
OMNMO01	0004	Calibration mount	n.a.
OMNMO01	0005	Calibration mount	n.a.
OMNMO01	0006	Calibration mount	n.a.
OMNDR01	0002	Shaker driver	n.a.
Epson A352AD	00000540	Reference sensor	2020-11-24
Swarm	HOJIFI	Reference check	2022-08-01
n.a.	76d2765	Calibration software	n.a.

Calibration report

Certificate of Calibration

Certificate number: 20231121707372798779



Calibration results after measurement

Axis	Frequency	Reference measurement Vref (Vref*weighting(f))	Excitation measurement of the device Vmeas	Deviation 100 X (Vmeas-Vref)/ Vref	Result
X	16.0	8.86	8.97	1.26	PASS
Y	16.0	9.80	9.89	0.97	PASS
Z	16.0	8.98	9.12	1.64	PASS

Name

FIHOWO

Date of calibration*

2023-11-21 (YYYY-MM-DD)

* Recommended calibration interval is 24 months from first day of use, unless otherwise required by local standards and/or local laws.

Environmental Monitoring Report : Lot 2 (April 2024)



LLC BBE Scientific Research Laboratory

Kvesheti-Kobi Highway Lot 2 Kvesheti – Tskere
Section
Environmental Measurement Report – April
2024



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Director: Irakli Ramishvili

April 2024



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1. General Information

Project number: #1204024

Date of the monitoring: 12.04.2024

BBE LLC team undertakes monthly monitoring services for ambient air quality, noise, and water quality monitoring on Kvesheti-Kobi highway Lot 2 Kvesheti-Tskere section.

This report represents the results of the monitoring activities performed by BBE team in April, 2024. The work was done according to the proposal prepared for Kvesheti-Kobi highway Lot 2 Kvesheti-Tskere section. The methodology and procedures follow international guidelines.

During the monitoring, the construction was in an active phase, all the technique was on and working. Therefore, the results of the monitoring activities represent the actual, full-scale impact of the construction activities on the environment.

Monitoring activities included ambient air monitoring of the following parameters: PM10, PM2.5, NO₂, SO₂, and CO concentrations, surface water quality analysis noise level monitoring.

2. Description of the Performed Works

For April's monitoring, there was 3 points for water quality. Air quality was assessed at 5 points: measured parameters - carbon monoxide (CO) and pollution (PM2.5, PM10), sulfur dioxide (SO₂) and nitrogen dioxide (NO₂). Noise was measured at 4 locations.

Rusudani Zedginidze (Laboratory assistant) from BBE team and from CRCC – Tamta Kapanadze (Environmental Manager) participated in the monitoring.

During the monitoring activities, Rusudani Zedginidze from BBE team used Aeroqual Series 500 for ambient air monitoring (all parameters), water monitoring has not been done at the location, water was sampled and then analyzed in the lab. For noise monitoring, REED instruments 9300 was used.

The monitoring took place on 12th of April, 2024. The weather was sunny, 17° C.

All the equipment was calibrated, cleaned, and tested for the field work.

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Table 2.1 GPS coordinates of the monitoring points

#	Monitoring Point Reference	Type Of Monitoring	E	N	Date
1	SWS #1	Surface water	44.5085630° E	42.4308274° N	12.04.24
2	SWS #2	Surface water	44.5182498° E	42.4284740° N	12.04.24
3	SWS #3	Surface water	44.529248° E	42.427485° N	12.04.24
4	AAS #1	PM2.5, PM10, CO, NO ₂ , SO ₂	44.524469° E	42.433225° N	12.04.24
5	AAS #2	PM2.5, PM10, CO, NO ₂ , SO ₂	44.497582° E	42.448308° N	12.04.24
6	AAS #3	PM2.5, PM10, CO, NO ₂ , SO ₂	44.532888° E	42.468643° N	12.04.24
7	AAS #4	PM2.5, PM10, CO, NO ₂ , SO ₂	44.532870° E	42.468635° N	12.04.24
8	AAS #5	PM2.5, PM10, CO, NO ₂ , SO ₂	44.575948° E	42.420784° N	12.04.24
9	NM#1	Noise (Batching plant)	44.575948° E	42.420784° N	12.04.24
10	NM#2	Noise (Bridge #2)	44.524606° E	42.426190° N	12.04.24
11	NM#3	Noise (Zakhathkari)	44.524469° E	42.433225° N	12.04.24
12	NM#4	Noise (near to the camp #3)	44.532870° E	42.468635° N	12.04.24



3. Water Quality Monitoring

3.1 Surface Water Monitoring - SWS-#1

In the water sampling area there were several activities which can impact river water: Mleta quarry activities, Bridge N2 pilling activities, and heavy vehicle movement near temporary bridge N1 (which is connecting village Kvesheti to village Bedoni and also Khada valley).

At an upstream location, there are no activities (which can cause an impact on river) of Kvesheti-kobi lot 2 project. Thus, river water at selected area is itself as it is – that's why it is identified as up-stream.

The first sample of surface water, upstream water was taken from the Aragvi river. The volume of water was 5 liters. The team used sterile bottles for sampling. The samples were not examined/analyzed at the location. Instead, they were sent to the lab considering all the safety rules.

The weather was -11, sunny weather.

Time of sampling -13:00

Figure 3.1.1 Surface Water Quality Monitoring (SWS-#1)





Table 3.1.1 Results of Surface Water Sample (SWS-#1) with Permissible Norms and Used Methods

Parameter	Measurement unit	Method used	Result	Maximum permissible limit according to ordinance #425
Physical-chemical Parameters				
pH	-	SST ISO 10523:2008/2010	7.84	6.5-8.5
Turbidity	NTU	ISO 7027-1:2016	33.60	N/A
TPH	mg/L	ISO 9377-1-2000	<0.005	≤0.3
Chemical Oxygen Demand (COD)	mg/L	SST ISO 6060:1989	0.48	≤30
Conductivity	Ms/cm	SST ISO 7888:1985	0.327	N/A

3.2 Surface Water Monitoring - SWS-#2

This area was selected because of bridge N2 pilling. Those pilling areas are located near the river, that's why water quality has been checked to reveal if there is any impact on it.

The second sample of surface water, downstream water was taken from the Aragvi river. The volume of water was 5 liters. The team used sterile bottles for sampling. The samples were not examined/analyzed at the location. Instead, they were sent to the lab considering all the safety rules.

The weather was - 12°C, sunny weather.

Time of sampling – 13:18

Figure 3.2.1 Surface Water Quality Monitoring (SWS - #2)





Table 3.2.1 Results of Surface Water Sample (SWS-#2) with Permissible Norms and Used Methods

Parameter	Measurement unit	Method used	Result	Maximum permissible limit according to ordinance #425
Physical-chemical Parameters				
pH	-	SST ISO 10523:2008/2010	7.93	6.5-8.5
Turbidity	NTU	ISO 7027-1:2016	40.70	N/A
TPH	mg/L	ISO 9377-1-2000	<0.005	≤0.3
Chemical Oxygen Demand (COD)	mg/L	SST ISO 6060:1989	0.00	≤30
Conductivity	Ms/cm	SST ISO 7888:1985	0.297	N/A

3.3 Surface Water Monitoring - SWS-#3

This area was selected because of heavy vehicle movement on temporary bridge N1 which is located on the river Aragvi. To reveal if there is any impact from accidental spill or falling of any materials which can be carried by trucks.

The third sample of surface water, downstream # 2 water was taken from the Aragvi river. The volume of water was 5 liters. The team used sterile bottles for sampling. The samples were not examined/analyzed at the location. Instead, they were sent to the lab considering all the safety rules.

The weather was - 17°C, sunny weather.

Time of sampling – 15:00

Figure 3.3.1 Surface Water Quality Monitoring (SWS - #3)



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Table 3.3.1 Results of Surface Water Sample (SWS-#3) with Permissible Norms and Used Methods

Parameter	Measurement unit	Method used	Result	Maximum permissible limit according to ordinance #425
Physical-chemical Parameters				
pH	–	SST ISO 10523:2008/2010	7.83	6.5-8.5
Turbidity	NTU	ISO 7027-1:2016	103	N/A
TPH	mg/L	ISO 9377-1-2000	<0.005	≤0.3
Chemical Oxygen Demand (COD)	mg/L	SST ISO 6060:1989	0.00	≤30
Conductivity	Ms/cm	SST ISO 7888:1985	0.282	N/A

3.4 Conclusion

During the monitoring of the water on the 12th of April, 2024, no exceedance of the maximum allowable concentration was observed.



4. Air Quality Monitoring

Ambient air monitoring is an integral part of an effective air quality management system. The purpose of air quality monitoring is to study if an area has an air pollution problem and how construction works affect the air quality, which can lead to negative impacts on the environment, working personnel and the local population in close proximity of the works. Monitoring helps in assessing the level of pollution in relation to the ambient air quality standards.

Table 4.1.1 Dust Particles; Carbon Monoxide (CO); Nitrogen Oxides (NO₂) and Sulfur Oxides (SO₂) Concentration Permissible Limits

Parameter	Time Interval	Maximum Permissible Concentration $\mu\text{g}/\text{m}^3$	National limit for Human Rights of Health –MPC, $\mu\text{g}/\text{m}^3$	IFC/WHO (updated 2016) –guideline value, $\mu\text{g}/\text{m}^3$	EU Air Quality Standards, Permitted Exceedences Per Year $\mu\text{g}/\text{m}^3$
PM 2.5	1 hr	25		25	
	1 year	10	12-17	10	25 / n/a
PM 10	1 hr	50		50	
	24 hrs	50	25-35		50 / 35
	1 year	20	20-28	20	40 / n/a
CO	8 hour mean	10	5-7		1000
NO ₂	1 hour	200	35-140	200	200 / 18
	1 year	40	26-32	40	40 / n/a
SO ₂	1 hour	350	350	500	350 / 3
	24 hrs	125	5	20	125 / 24
	1 year	500			

In order to evaluate dust particle concentration in the air, the team used Aeroqual Series 500, which includes PM10, PM2.5 sensors. The specific sensor is calibrated and tested for its accuracy and precision. CO concentration was also evaluated using Aeroqual series 500, with specific CO sensor, which is also calibrated and tested.



4.1 Air Quality Monitoring First Location

The mentioned monitoring point is located in Zakatkari. The concentration of carbon monoxide, sulfur and nitrogen dioxide and dust in the air were measured at this point.

During the AQ monitoring, a work process was carried out around the monitoring point, about 10 meters away. Trucks were moving and one excavator was working.

At the time of measuring, A full working process was underway. A truck was moving and one excavator was working.

Temperature - 10°C, Sunny Weather
Monitoring Time – 10:30

Figure 4.1.1 Air Quality Monitoring - Zakatkari(AAS- #1)





Table 4.1.1 #AAS-#1 Dust Particles; Carbon Monoxide (CO); Nitrogen Oxides (NO₂) and Sulfur Oxides (SO₂) monitoring results (µg/m³)

Parameters	Minimum	Maximum	Average	Methods used
Wind speed and Wind direction in the AQ monitoring access road to the second camp – 0.4 m/s, From west/south to north/east.				
PM 10	0.008	0.062	0.026	Aeroqual SERIES 500-PM Sensor
PM2.5	0.002	0.017	0.008	Aeroqual SERIES 500-PM Sensor
CO	0.0	0.0	0.0	Aeroqual SERIES500-CO Sensor
SO ₂	0.0	0.0	0.0	Aeroqual SERIES500-SO ₂ Sensor
NO ₂	0.0	0.0	0.0	Aeroqual SERIES 500-NO ₂ Sensor

4.2 Air Quality Monitoring Second Location

The mentioned monitoring point is located in Seturebi road. The concentration of carbon monoxide, sulfur and nitrogen dioxide and dust in the air were measured at this point.

During the AQ monitoring, a second camp is located around the monitoring point, about 2 km away. Batching plant N2 was working and also nearly 2 heavy and small vehicles were moving around this area.

Temperature - 10°C, Sunny Weather

Monitoring Time –11:07

Figure 4.2.1 Air Quality Monitoring Kvesheti – Seturebi Road (AAS- #2)





Table 4.2.1 #AAS-#1 Dust Particles; Carbon Monoxide (CO); Nitrogen Oxides (NO₂) and Sulfur Oxides (SO₂) monitoring results (µg/m³)

Parameters	Minimum	Maximum	Average	Methods used
Wind speed and Wind direction in the AQ monitoring access road to the second camp – 0.3 m/s, From west/south to north/east.				
PM 10	0.007	0.014	0.009	Aeroqual SERIES 500-PM Sensor
PM2.5	0.001	0.002	0.002	Aeroqual SERIES 500-PM Sensor
CO	0.0	0.0	0.0	Aeroqual SERIES 500-CO Sensor
SO ₂	0.0	0.0	0.0	Aeroqual SERIES500-SO ₂ Sensor
NO ₂	0.0	0.0	0.0	Aeroqual SERIES 500-NO ₂ Sensor

4.3 Air Quality Monitoring Third Location

The mentioned monitoring point is located near Begoni/Beniani houses. The concentration of carbon monoxide, sulfur and nitrogen dioxide and dust in the air were measured at this point.

During the AQ monitoring, a work process was carried out around the monitoring point, about 70 meters away.

Temperature – -11 °C, Sunny Weather

Monitoring Time – 12:48

Figure 4.3.1 Air Quality Monitoring Benian - Begoni / Near houses (AAS- #3)





Table 4.3.1 #AAS-#1 Dust Particles; Carbon Monoxide (CO); Nitrogen Oxides (NO₂) and Sulfur Oxides (SO₂) monitoring results (µg/m³)

Parameters	Minimum	Maximum	Average	Methods used
Wind speed and Wind direction in the AQ monitoring access road to the second camp – 0.3 m/s, From west/south to north/east.				
PM 10	0.005	0.009	0.007	Aeroqual SERIES 500-PM Sensor
PM2.5	0.001	0.002	0.001	Aeroqual SERIES 500-PM Sensor
CO	0.0	0.0	0.0	Aeroqual SERIES 500-CO Sensor
SO ₂	0.0	0.0	0.0	Aeroqual SERIES500-SO ₂ Sensor
NO ₂	0.0	0.0	0.0	Aeroqual SERIES 500-NO ₂ Sensor

4.4 Air Quality Monitoring fourth Location

The mentioned monitoring point is located close to camp #3. The concentration of carbon monoxide, sulfur and nitrogen dioxide and dust in the air were measured at this point

the work process was carried out around the monitoring point, about 2 km away. Work was underway near the third tunnel.

Temperature - 13°C, Cloudy Weather

Monitoring Time – 12:57

Figure 4.4.1 Air Quality Monitoring close to camp #3. / (AAS- #4)





Table 4.4.1 #AAS-#1 Dust Particles; Carbon Monoxide (CO); Nitrogen Oxides (NO_x) and Sulfur Oxides (SO_x) monitoring results (µg/m³)

Parameters	Minimum	Maximum	Average	Methods used
Wind speed and Wind direction in the AQ monitoring access road to the second camp – 0.3 m/s, From west/south to north/east.				
PM 10	0.006	0.011	0.009	Aeroqual SERIES 500-PM Sensor
PM2.5	0.002	0.003	0.002	Aeroqual SERIES 500-PM Sensor
CO	0.0	0.0	0.0	Aeroqual SERIES 500-CO Sensor
SO ₂	0.0	0.0	0.0	Aeroqual SERIES500-SO ₂ Sensor
NO ₂	0.0	0.0	0.0	Aeroqual SERIES 500-NO ₂ Sensor

4.5 Air Quality Monitoring fifth Location

The mentioned monitoring point is located near the first concrete plant. The concentration of carbon monoxide, sulfur and nitrogen dioxide and dust in the air were measured at this point

During the AQ monitoring, a work process was carried out around the monitoring point

Temperature – 17°C, Sunny Weather

Monitoring Time – 15:05

Figure 4.5.1 Air Quality Monitoring near the first concrete plant / (AAS- #5)





Table 4.5.1 #AAS-#1 Dust Particles; Carbon Monoxide (CO); Nitrogen Oxides (NO₂) and Sulfur Oxides (SO₂) monitoring results (µg/m³)

Parameters	Minimum	Maximum	Average	Methods used
Wind speed and Wind direction in the AQ monitoring access road to the second camp – 0.3 m/s, From west/south to north/east.				
PM 10	0.006	0.045	0.022	Aeroqual SERIES 500-PM Sensor
PM2.5	0.001	0.007	0.003	Aeroqual SERIES 500-PM Sensor
CO	0.0	0.0	0.0	Aeroqual SERIES 500-CO Sensor
SO ₂	0.0	0.0	0.0	Aeroqual SERIES500-SO ₂ Sensor
NO ₂	0.0	0.0	0.0	Aeroqual SERIES 500-NO ₂ Sensor

4.6 Conclusion

The results of the air quality monitoring conducted on April 12th, 2024, carried out with the AEROQUAL 500 SERIES monitor according to the above standards, the quality of air pollution in the current month does not exceed the permissible norms.



5. Noise Level Monitoring

Optimal Limits of Noise Level. These limits are based on IFC guidelines

Recipient status	Time interval	The average permissible norm of noise (dB)	Maximum permissible norm of noise (dB)
Populated area	7:00-23:00	55	70
Populated area	23:00-7:00	45	60
Industrial; Commercial	Day-Night	70	70

Noise levels were measured at 4 locations. The purpose of noise level monitoring is to determine what impact the workflow has on residents. Noise was measured using the REED Instruments 9300-(417-sound level).

5.1 Noise Level Monitoring first Point

The mentioned monitoring point is located near the first concrete plant.

During the noise level monitoring near the first concrete plant, the work process was carried out around the monitoring point, 2 heavy vehicle was moving. This location was measured on the track where the cars were moving.

Temperature -17°C, Sunny Weather

Monitoring Time – 15:05



Figure 5.1.1 Noise (NM#1) Monitoring Point – Close to the First Batching Plant



Table 5.1.1 Noise (NM#1) Monitoring Results – Close to the First Batching Plant

Different Parameters of Noise Level	Result (dB)
LAF _{max}	70.9
LAF _{min}	50.4
LAF _{av}	60.65

5.2 Noise Level Monitoring second Point

The mentioned monitoring point is located near Bridge 2.

During the noise monitoring near Bridge 2, the work process was carried out around the monitoring point, about 700 meters away. During the monitoring, a tractor was working in the tunnel and heavy machinery was moving around the tunnel. During the monitoring, only the noise received from the work was recorded. Construction of bridge N2 girders was in progress.

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Temperature -13°C, Sunny weather
Monitoring Time – 12:00

Figure 5.2.1 Noise (NM#2) Monitoring Point – Around the Bridge #2



Table 5.2.1 Noise (NM#2) Monitoring Results - Around the Bridge #2

Different Parameters of Noise Level	Result (dB)
LAF_{max}	77.4
LAF_{min}	40.6
LAF_{av}	59

5.3 Noise Level Monitoring third Point

The mentioned monitoring point is located in Zakatkari
During the noise monitoring in Zakatkari, the work process was carried out around the monitoring point, about 10 meters away.

Temperature - 10°C, Sunny weather
Monitoring Time – 10:30



Figure 5.3.1 Noise (NM#3) Monitoring Point – Zakatkari



Table 5.3.1 Noise (NM#3) Monitoring Results - Around the Bridge #2

Different Parameters of Noise Level	Result (dB)
LAF_{max}	75.5
LAF_{min}	46.4
LAF_{av}	60.95

5.4 Noise Level Monitoring Fourth Point

The mentioned monitoring point is located close to camp #3.

During the noise monitoring near camp #3, the work process was carried out around the monitoring point, about 2 km away. Work was underway near the third tunnel.

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Temperature -13°C, Sunny Weather
Monitoring Time – 12:57

Figure 5.4.1 Noise (NM#4) Monitoring Point – Close to Camp #3



Table 5.4.1 Noise (NM#4) Monitoring Results - Close To Camp #3

Different Parameters of Noise Level	Result (dB)
LAF _{max}	63.9
LAF _{min}	34.9
LAF_{av}	49.4

5.5 Conclusion

The results of the noise level monitoring conducted on the 12th of April, 2024 no exceedance of the maximum allowable concentration was observed.



6. Methodology and Instruments Used

6.1 Air

For air monitoring, BBE team used 4 different sensors of Aeroqual Series 500 (PM10/PM2.5, CO, NOx, SOx).

The Series 500 Portable Air Quality Monitor is a handheld portable monitor used to measure up to 30 pollutants using the unique sensor head format. Sensors are housed within an interchangeable cartridge (“head”) that attaches to the monitor base. The head can be removed and replaced in seconds, allowing users to measure as many gases as they wish. Sensor heads feature active fan sampling which ensures a representative sample is taken, increasing measurement accuracy.

A long-life lithium battery and in-field zero and span calibration make this an easy-to-use device. Monitor ID identifies the monitor uniquely and ensures that all data from it are tied to that monitor. Location ID can be used to tag measurements to a specific location – helpful when sampling at multiple sites over the course of a day or week.

Figure 6.1.1 Air Quality Measuring Instrument Aeroqual Series 500



6.2 Noise

The noise monitoring spot was chosen so it could fully show the impact of construction processes on the population. Noise was monitored for an hour. BBE team used REED instruments 9300 to determine the noise level.



The sound level meter consists of a calibrated microphone, electronic circuits, and a display. The microphone detects small air pressure variations associated with sound and converts them into electrical signals. The aforementioned signals are then processed using the instrument's electronic circuitry. The display shows the sound level in decibels.

The sound level meter acquires the sound pressure level at a particular location.

A sound level meter is used for acoustic measurements. It is a hand-held instrument with a microphone.

Figure 6.2.1 Noise level is determined by the REED INSTRUMENTS 9300 model adapter



6.3 Wind

Wind speed is determined by testo anemometer 405i.

Figure 6.3.1 Testo anemometer 405i



Vibration Monitoring Report Lot-2 March 2024

LLC Gergili

**Kvesheti-Kobi Highway Lot 2 Kvesheti –
Tskere Section
Long-Term Vibration Monitoring Report–
March, 2024**



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1. Introduction

Vibration induced in buildings are a frequent concern in cities around the world. Commonly, complaints are made by homeowners, as heavy construction vehicles travel at various speeds on adjacent roads, resulting in annoying vibrations and possible structural damage. Passenger vehicles rarely produce perceptible vibrations to cause significant structural damage. Generally, traffic induced vibrations are caused by heavy vehicles. These vibrations are generated by road surface irregularities, namely: potholes, cracks, and uneven pavement joints. Dynamic interaction forces between the vehicle and pavement are created by these irregularities resulting in a generation of stress waves that travel through the adjacent soils.

Vibrations produce damaging stress waves that quickly reach building foundations, causing them to vibrate. Several factors may contribute to vibration levels, including: road condition, vehicle speed, vehicle weight, soil conditions, building characteristics, vehicle suspension system, season of the year, and distance between the structure and the road. When a large vehicle strikes an irregularity, an impact load, as well as an oscillating load due to the "axle hop" of the vehicle are generated. The impact load generates ground vibrations that are predominant at the natural vibration frequencies of the soil, whereas the axle hop generates vibrations at the hop frequency, which is a characteristic of the vehicle's suspension system. Vibrations can be amplified if the natural frequency of the building coincides with the natural frequency of the soil.

Soil type and stratification can influence the level of vibration greatly. Vibration levels increase as soil stiffness and damping decrease. Traffic vibrations appear worst in areas underlain by a soft silty clay layer between 7 meters and 15 meters deep. The natural frequencies of the soil may coincide with the natural frequency of the structures at these locations. Seasonal variations and the moisture content of the soil are also a consideration when measuring vibrations. In locations where the topsoil freezes, vibration levels can be less than half those in other seasons.

Vibration sources such as construction activities and road traffic, are among the sources considered potentially dangerous to buildings and structures. In general, structural damages to buildings are extremely rare and are in general caused by other sources. Structural damages occur when the permissive levels of vibration are exceeded. Degrees of damage are methodologically defined and vary from those that do not affect the structural safety of the buildings but affect the value of assets – e.g. formation of cracks in the plaster, increase in existing cracks, damage of architectural elements etc.

The classification of damage categories used in analysis of vibration impacts is determined by ISO 4866 and is the following:

- **Damage threshold:** Formation of cracks on the surfaces of the thread-like drywall, increase of existing cracks on the plaster surfaces or on the surfaces of dry-stone walls; also cracks in the mortar joints in the thread-like construction in brick and concrete;
- **Minor damage:** Widening of cracks, detachment and fall of plaster or pieces of plaster drywall; formation of cracks in blocks of brick or concrete;
- **Major damage:** Damage of structural elements; cracks in the support columns; opening of joints; set of cracks in masonry.



In the present work the effects of vibration in terms of nuisance/annoyance to people are not considered, and only the potential damage to structures are evaluated.

Based on the March 1, 2022 agreement signed between parties LLC "Gergili" and "Constant Department (Branch) of China Railway 23rd Bureau Group Co. LTD", LLC "Gergili" conducted a study on the propagation of vibration during tunnel construction works in:

1. Begoni (VM#2 – Ciklopi 25);
2. Mughure (VM#5 - Cultural Heritage #29);
3. VM #7 – Kvesheti – Guramis Saxli.

2. Project Description

The Government of Georgia (GoG) has launched a program to upgrade the major roads of the country. The program is being managed by the Roads Department (RD) of the Ministry of Regional Development and Infrastructure (MRDI). As a part of the program, The Kvesheti – Tskere section, or 'Lot 2' includes 2.5 km of tunnels and 1.5 km of bridges. The main elements of this section are:

- Kvesheti bypass road (length 3.2 km),
- Bridge 1 (length 27.8m, height 14m, 2 lane)
- Bridge 2 over the Aragvi river (length 435.28m, height 62m, 3 lanes)
- Tunnel 1 (length 1540.64m, 2 lanes) with gallery (1092m) (New Austrian tunneling method-NATM 3)
- Bridge 3 - Arch bridge over the river Khadistskali (length 426m, height 164m, 3 lane)
- Tunnel 2 (length 193.42m, C&C, 3 lane)
- Bridge 4 over the left tributary of River Khadistskali (length 147.80m, height 26m, 3 lane)
- Tunnel 3 (length 388.38m)
- Bridge 5 (length 322m, height 55m, 3 lane)
- Tunnel 4 (length 299m, C&C, 3 lane)
- Bridge 6 (length 218m, height 48m, 3 lane)
- Five grade junctions are planned (KM0.3, KM1.7, KM3.1, KM7.7, KM10.5) and 3 service roads.

The Lot 2 Project impacts eight villages – Kvesheti, Arakveti, Zakatkari, Beniani, Begoni, Sviana, Rostiani and Mughure.

The tunnel provides more secure and reliable conditions for passengers on the road in winter. Besides The National Park of Kazbegi and Gudauri Winter Resort will avoid the traffic flow by the help of the new road. The road will also improve the livelihood conditions of inhabitants living in gorge. They are isolated from outside world in winter and the villages of Khada are almost empty. There are no grocery store and pharmacy and the medical assistance is not available. Because of the nonexistence of the road and severe weather conditions local people have to go to Kvesheti on foot, which is connected with a lot of difficulties and risks. We must take into consideration the fact that there are mostly middle aged and elderly people living in the upper villages of gorge. It's especially hard for them to pass this road in winter.



After project realization, distance between Kvesheti and Kobi will be reduced by 12 km instead of existing 35 km road, and travel time will be reduced to 15 minutes instead of 1 hour.

The construction works of The Kvesheti-Tskere Section is financing by Asian Development Bank. The construction works started in the end of 2019 and will be completed in 2023.

During this reporting period project is at construction stage:

1. VM#2 – Ciklopi 25 - Tevdore's Tower- Located near the Khadistskali Gorge, the monument is located 9 meters from the only road leading to various facilities. Due to the proximity to the construction area, heavy equipment traffic is frequent on this section.
Main works: removal of the fertile soil layer along the 3rd camp; Moving heavy and light equipment.
2. VM#5 – Cultural Heritage #29;
3. VM #7 - Kvesheti - Guramis Saxli.

The length of the new alignment is 22.7 km and will be divided into two construction packages, or 'Lots' as follows:

- Lot 1: Tskere – Kobi: Chainage KM 12.7 – KM 22.7 (10 km);
- Lot 2: Kvesheti – Tskere: Chainage KM 0.0 – KM 12.7 (12.7 km).

The present vibration survey report covers Lot 2 - section.



Figure 1: Locations of Vibration Devices



Figure 2: Location of Vibration Device





Figure 3: Location of Vibration Device



3. Vibration Monitor SWARM

The SWARM vibration monitor is the most efficient and high-quality vibration monitor on the market and uses MEMS (Micro- ElectroMechanical Systems) technology. Geophones are no longer needed.

The SWARM vibration monitor worldwide in construction and infrastructure and also to measure vibrations of other nature, such as vibrations at windmills, vibrations at data centers and vibrations from heavy traffic. The SWARM is used to measure potential damage to structures and to measure nuisance for people in buildings.

The SWARM is IP65 rated, complies with industry standards and measures according to the latest and relevant standards and guidelines.

The measurement data is automatically sent from the SWARM to the Honeycomb platform via 4G/LTE or WiFi. There is no need to retrieve monitoring data from the jobsite. Saving time and manpower through the unprecedented efficiency of the SWARM.

Omnidots SWARM measures the Vtop (PPV / Peak Particle Velocity) and the Atop (PPA / Peak Particle Acceleration) for guidelines DIN4150-3, BS7385 and SBR-A.

All monitoring data is saved as CSV, Excel or retrieve the data using the Omnidots API. Honeycomb is capable of generating notifications for Vtop (PPV) and also for Atop (PPA).



Figure 2. Vibration Monitor SWARM



Installing the SWARM is incredibly fast and easy, as you can see in this video. You can configure the measuring points remotely via the Honeycomb web platform. There you can also access your measurement data 24/7, from anywhere in the world from your laptop, smartphone or tablet.

1. Complies with industry standards: DIN4150-2, DIN4150-3, DIN 45669-1, BS7385, BS6841, ISO2631, SBR-A 2010, SBR-A 2017, SBR-B, Circulaire du 23/07/1986, ISEE (USBM RI8507 & OSMRE) and SN640312a.
2. The SWARM continuously sends the measurement data automatically to Honeycomb via 4G/LTE, WiFi or PoE using an adapter.
3. Mounting is very quick and easy.
4. The SWARM is compact, lightweight, and IP65 rated.



4. Measuring in accordance with DIN 4150-3 Standard

DIN 4150-3 is the most widely applied standard internationally for measuring structural vibrations. The measurement procedure can be found in a similar form in other national standards, for example the Italian UNI 9916. The assessment parameter is the maximum value (V_i) of the three individual components (peak values) of vibration velocity at frequencies of 1 to 80 Hz.

The measurements are carried out at the foundation. Vibrations in the ceiling of the upper most outer walls also provide valuable information for analysis. These detect the horizontal response of the building to the vibration at the foundation. Only the greatest value of both the horizontal components is then used for the analysis.

The standard provides guide values for permissible vibration velocities for short time and sustained vibrations in three types of buildings (Notes from DIN 4150-3 about the guide values is given in Table 1, 2).

Table 1: Guide values for transient vibration

Guide values for vibration velocity for analyzing the effects of transient vibration					
Building Type	Foundation Frequency of the Significant Vibration			Upper ceiling	
Frequency range	1 – 10 Hz	10 – 50 Hz	50 – 100 Hz	All frequencies	
Direction	X / Y / Z	X / Y / Z	X / Y / Z	X / Y	Z
Reinforced or framed structures. Industrial and heavy commercial buildings	20 mm/s	20 – 40 mm/s	40 – 50 mm/s	40 mm/s	20 mm/s
Unreinforced or light framed structures/ Residential or light commercial type buildings	5 mm/s	5 – 15 mm/s	15 – 20 mm/s	15 mm/s	20 mm/s
Delicate, listed buildings e.g. historical monuments	3 mm/s	3 – 8 mm/s	8 – 10 mm/s	8 mm/s	20 mm/s



Table 2: Guide values for continuous vibration

Guide values for vibration velocity v_i for analyzing the effects of continuous vibration		
Building Type	Upper ceiling level, all Frequencies	
Direction	X / Y (horizontal)	Z (vertical)
Reinforced or framed structures industrial and heavy commercial buildings	10 mm/s	10 mm/s
Unreinforced or light framed structures, residential or light commercial type buildings	5 mm/s	10 mm/s
Delicate buildings, listed buildings e.g. historical monuments	2.5 mm/s	-

Vertical continuous vibration with a vibration velocity below 10 mm/s normally do not cause damage to ceilings in houses. For delicate buildings there are no guide values available.

For sustained vibrations on pipelines, the guide values for short time vibrations, reduced by 50%, can be applied.

The following advice is given in DIN 4150-3 for the placement of sensors:

- For foundation vibrations the transducer should be placed on the lowest floor at the foundation or on the outer wall.
- In the upper ceiling level, the sensor should be placed inside or very close to the outer wall.
- For buildings without a basement the measurement location must not be higher than 0.5m above the ground level.
- The measurement location should predominantly be on the side of the building facing the excitation.
- One of the lateral coordinates (X / Y) should be parallel to an outside edge of the building.
- Buildings with larger ground areas should be measured at several points.
- In addition to measuring at the foundation and the upper ceiling, if required, measurements can be carried out in the vertical direction on the ceilings, where the strongest vibrations are to be expected (mostly central).
- When measuring pipelines, where possible, the sensor should be placed on the pipeline itself.



5. Evaluation of Effects of Vibration on Buildings

5.1 DIN 4150-3 Standard

Categorization of buildings: Table 1, 2 contains building categorization determined by DIN 4150, in particular: Category 1: Commercial/Industrial buildings and similar; Category 2: Residential building and similar; and Category 3: Sensitive Buildings.

Short or long vibration: In case of construction of the road as well as in case of road operation, the buildings will be subject to short vibration impacts – impacts that occur for short period of time (e.g. the period of time when roller compactor is working or when a heavy vehicle is crossing in front of an impacted building). Characterization of long (transient) and short vibrations is defined in DIN 4150-3. Nevertheless, only for demonstration purpose, in comparison of modelled vibration impact to the damage thresholds, thresholds for both – short and long vibration impacts for II category buildings assigned to structures have been referred.

5.2 ISO 4866:2010 Standard – Mechanical Vibration and Shock

The principles for carrying out vibration measurement and processing data regarding the effects of vibration on structures are established by the International Standard ISO4866:2010 - "Mechanical vibration and shock, Vibration of fixed structures, Guidelines for the measurement of vibrations and evaluation of their effects on structures".

The most common and frequent structural damage from man-made sources occurs in the frequency range from 1 to 150 Hz.

Natural sources, such as earthquakes and wind excitation, usually contain damage-level energy at lower frequencies, in the range from 0,1 Hz to 30 Hz.

The classes are defined with reference to a building Unreinforced or light framed structures/ Residential or light commercial type. The reference building shall not have any constructional defects nor shall it have sustained accidental damage. If the construction does not fulfil these requirements, it shall be allocated to a lower class.

5.3 Description of Damage

For the purposes of this International Standard ISO 4866:2010, the damages classified into the following categories:

- **Cosmetic.** The formation of hairline cracks on drywall surfaces (see ISO 4356), or the growth of existing cracks in plaster or drywall surfaces; in addition, the formation of hairline cracks in mortar joints of brick/concrete block construction.
- **Minor.** The formation of large cracks or loosening and falling of plaster or drywall surfaces, or cracks through bricks/concrete blocks.
- **Major.** The damage to structural elements of the structure, cracks in support columns, loosening of joints, splaying of masonry cracks, etc.



6. Vibration Propagation Study

On 01.08 – 31.08 2023, Vibration survey field works were carried out by the representatives of LLC "Gergili". The research procedure was conducted in accordance with the form approved by the organization. The aim of the study was to assess the impact of vibration generated during construction works on the surrounding buildings. 7 points were defined as the location of the vibrating device:

- 1) Tevdore's Tower- Located near the Khadistskali Gorge. (Ciklopi 25)
- 2) Cultural Hertigae #29 – located in Mughure;
- 3) VM #7 - Kvesheti - Guramis Saxli.

Figure 3: Study Area





Figure 4: Measurement Point – VM#2 – Ciklopi 25



Figure 4.1: Vibration monitor SWARM was installed outside on the stone of the Monument





Figure 6: Measurement Point – VM#5 – Cultural Heritage #29



Figure 6.1: Vibration monitor SWARM was installed outside on the wall of the Tower





The tables below show the measurement protocol VM#2, VM#5, VM#7, where the technical details of the measurements are presented. Construction work was intensive while receiving the vibration data. Data collection at point ,VM#2, VM#5, VM#7, took during 01.03.24 – 31.03.24, 30 days continuously.

Measurement protocol VM#2 - Ciklopi 25	
1. General	
1.1 Person in charge	Irakli Ramishvili - Head of the BBE Science Research Laboratory
1.2 Measurement period	01/03/24 13:24:00 – 31/03/24 13:27:59
2. Kind of vibration	
2.1 Excitation	Construction work
2.2 Operating conditions	Intensive construction
3. Structure	
3.1 Name and address	Tevdore's Tower in Begoni
3.2 Classification	Sensitive building. According to DIN 4150-3 standard N3 categories of buildings (sensitive buildings)
3.3 Description	Stone building
4. Location and position	
4.1 Source of vibration	- [42.458977, 44.529776]
	
5. Environmental conditions	Open space, smooth surface.
6. Subjective observations	The vibration of the working specifics affect minor on the general condition
7. Measuring chain	Threshold for measurement storage: 0.2 mm/s
	Guideline: DIN4150-3 80Hz
	Measuring interval (seconds): 2
	Measurement method: DIN 4150-3;
	Settings: Long term;

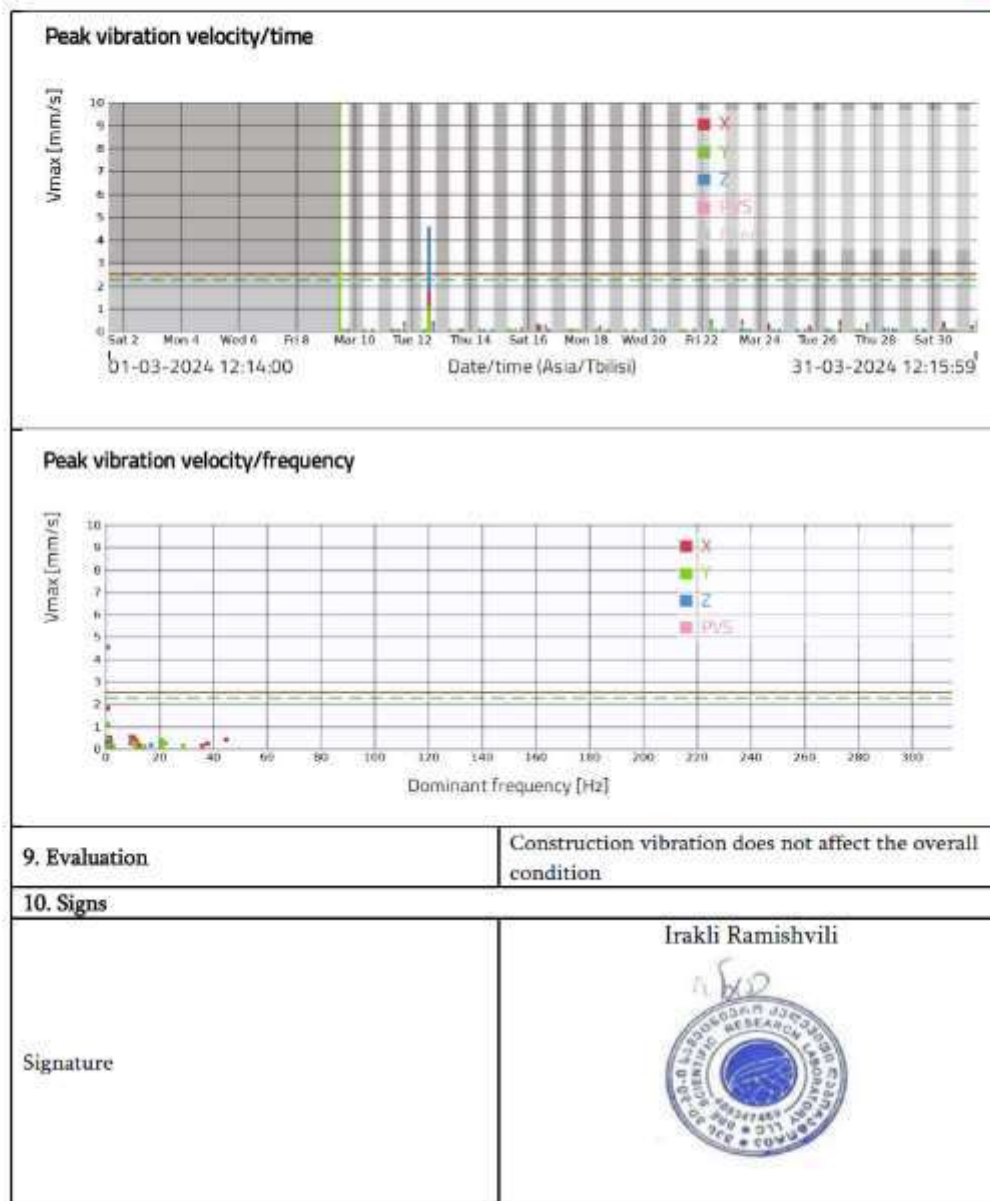


	Calculate Vmax (Peak vibration velocity): On Measurement processing and report generation done with MEMS software.
8. Measurement result	
8.1 Event chart	
Peak vibration velocity/frequency	
9. Evaluation	Construction vibration does not affect the overall condition
10. Signs	
Signature	Irakli Ramishvili



Measurement protocol VM#5 – Cultural Heritage #29	
1. General	
1.1 Person in charge	Irakli Ramishvili – Head of the BBE Science Research Laboratory
1.2 Measurement period	01/03/24 12:14:00 - 31/03/24 12:15:59
2. Kind of vibration	
2.1 Excitation	Construction work
2.2 Operating conditions	Intensive construction
3. Structure	
3.1 Name and address	Cultural Heritage in Mughure
3.2 Classification	Sensitive building. According to DIN 4150-3 standard N3 categories of buildings (sensitive buildings)
3.3 Description	Stone building
4. Location and position	
4.1 Source of vibration - [X: 42.47488271 Y: 44.53275790]	
5. Environmental conditions	Open space, smooth surface.
6. Subjective observations	The vibration of the working specifics affect minor on the general condition
7. Measuring chain	Threshold for measurement storage: 0.2 mm/s Guideline: DIN4150-3 80Hz Measuring interval (seconds): 2 Measurement method: DIN 4150-3; Settings: Long term; Calculate Vmax (Peak vibration velocity): On Measurement processing and report generation done with MEMS software.
8. Measurement result	
8.1 Event chart	

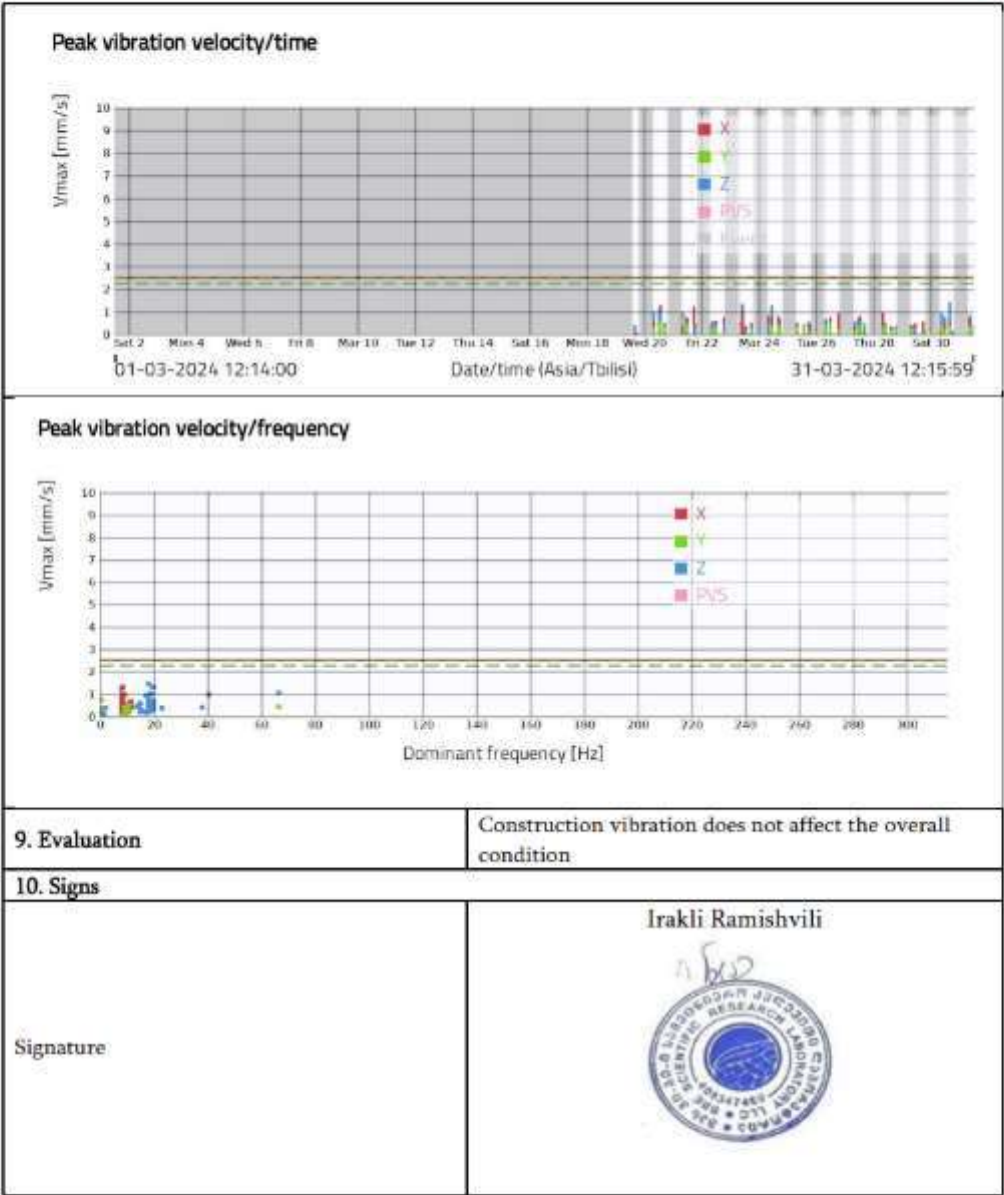
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Measurement protocol VM#7 – Gurami's house	
1. General	
1.1 Person in charge	Irakli Ramishvili - Head of the BBE Science Research Laboratory
1.2 Measurement period	01/03/24 12:14:00 - 31/03/24 12:15:59
2. Kind of vibration	
2.1 Excitation	Construction work



2.2 Operating conditions	Intensive construction
3. Structure	
3.1 Name and address	Gurami's house
3.2 Classification	Sensitive building. According to DIN 4150-3 standard N3 categories of buildings (sensitive buildings)
3.3 Description	Wooden and Stone building
4. Location and position	
4.1 Source of vibration	- [0463276; 4697428]
5. Environmental conditions	Closed space.
6. Subjective observations	The vibration of the working specifics affect minor on the general condition
7. Measuring chain	Threshold for measurement storage: 0.2 mm/s Guideline: DIN4150-3 80Hz Measuring interval (seconds): 2 Measurement method: DIN 4150-3; Settings: Long term; Calculate Vmax (Peak vibration velocity); On Measurement processing and report generation done with MEMS software.
8. Measurement result	
8.1 Event chart	



As can be seen from the data from the protocol, the level of vibration exposure generated by the construction at the control points are much lower than the reference values specified in DIN 4150-3.

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Exceedances of vibration levels were observed in March:

1. VM#2 – Ciklopi 25

Date	X Fzcm (g)	X Vmax (mm/s)	Y Fzcm (g)	Y Vmax (mm/s)	Z Fzcm (g)	Z Vmax (mm/s)
March 8, 2024 13:10:59	0.5	302.9677	1.5	265.2388	1.0	288.2286
March 8, 2024 13:11:44	0.5	5.0156	0.5	10.4163	2.0	2.1862
March 9, 2024 13:12:14	0.5	10.1746	0.5	18.779	2.5	6.4234
March 9, 2024 13:12:29	0.5	116.3996	0.5	106.5821	0.5	29.3982
March 9, 2024 13:12:44	0.5	6.5861	0.5	9.4208	0.5	1.7465
March 16, 2024 08:56:14	17.5	0.828	20.5	2.27	21.0	1.6241
March 16, 2024 09:03:29	27.0	1.0564	0.5	1.9815	68.5	2.5874
March 16, 2024 09:20:59	19.5	8.1493	20.5	4.5535	20.0	4.1588
March 16, 2024 09:33:14	25.5	1.9446	24.0	2.8214	25.5	4.3512
March 16, 2024 09:46:29	28.5	3.1817	27.5	1.744	27.5	2.3547
March 16, 2024 10:02:14	25.0	1.866	33.0	2.7363	30.0	3.7452
March 16, 2024 10:05:14	28.5	2.1883	0.5	2.6889	29.5	2.8747
March 16, 2024 11:05:59	31.0	2.7911	1.0	0.7827	1.5	0.5161
March 16, 2024 11:10:44	32.5	1.3031	1.0	3.1208	29.5	2.0467
March 16, 2024 11:32:59	30.0	3.8517	28.0	1.3918	1.5	0.8828
March 16, 2024 11:33:14	35.5	0.9304	30.5	3.245	32.0	2.5517
March 16, 2024 11:48:44	0.5	5.5475	0.5	7.9436	27.0	5.5371
March 16, 2024 11:54:29	25.5	5.5815	31.5	4.520	31.5	6.4065
March 16, 2024 12:08:59	32.5	2.4268	37.5	1.0095	37.5	1.4826
March 16, 2024 12:12:14	25.5	3.7804	37.5	0.8670	44.0	2.0033
March 16, 2024 12:16:14	0.5	6.9138	0.5	1.1121	65.0	2.6447
March 16, 2024 12:17:44	44.5	1.2528	33.0	3.1346	44.5	2.8049
March 16, 2024 12:39:59	31.5	1.9145	44.0	1.5238	71.5	2.2532
March 16, 2024 12:43:59	32.0	2.8917	31.5	7.6065	44.5	6.8001
March 16, 2024 12:45:44	0.5	20.6286	0.5	6.5429	37.0	8.2639
March 16, 2024 13:20:29	71.0	2.3087	1.0	1.1374	1.0	4.5484
March 16, 2024 15:45:29	32.0	3.971	1.0	0.9576	83.0	4.5911
March 17, 2024 10:28:59	33.5	2.5939	33.5	2.3357	17.5	1.2388
March 17, 2024 11:18:44	24.0	9.7082	0.0	11.1586	1.0	6.1091
March 18, 2024 10:13:44	25.0	2.3282	24.5	3.8518	24.0	5.9447

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Date	X Fcbrn (g/s)	X Vmax (mm/s)	Y Fcbrn (g/s)	Y Vmax (mm/s)	Z Fcbrn (g/s)	Z Vmax (mm/s)
March 19, 2024 10:43:14	30.0	1.1089	0.5	2.3149	34.5	1.9281
March 19, 2024 10:48:58	30.5	1.2726	31.5	1.6929	76.5	2.6968
March 19, 2024 11:07:28	30.0	6.2576	1.0	1.1743	30.0	2.7118
March 19, 2024 11:24:59	30.0	4.1886	0.5	1.363	74.0	3.3373
March 20, 2024 09:56:29	30.0	6.6528	21.0	3.8904	21.0	4.299
March 20, 2024 09:58:44	21.0	2.5852	1.0	3.6028	20.5	2.6935
March 20, 2024 10:09:29	30.8	1.141	22.0	0.3061	77.0	2.2744
March 22, 2024 08:30:44	0.5	3.8201	23.0	1.7568	21.0	1.3871
March 22, 2024 10:40:28	25.5	2.1805	27.5	3.443	69.5	6.4909
March 22, 2024 11:13:44	39.5	1.0140	36.0	3.3544	38.0	2.4746
March 22, 2024 11:26:59	31.5	3.9311	0.5	2.5108	69.0	3.0306
March 22, 2024 11:35:14	33.5	1.3088	40.5	1.8012	73.0	4.0738
March 22, 2024 11:45:29	27.0	1.8058	1.0	1.4965	69.5	3.8171
March 22, 2024 12:19:44	0.5	12.8223	39.0	5.2235	38.0	13.9278
March 22, 2024 12:36:29	36.5	1.1827	35.0	4.2086	35.0	3.8691
March 22, 2024 13:25:14	30.5	3.647	30.5	3.3583	73.5	8.2524
March 22, 2024 13:52:29	1.0	1.070	1.0	2.3159	39.5	1.734
March 22, 2024 14:19:14	0.5	2.6616	0.5	6.6041	29.5	4.9226
March 23, 2024 10:03:29	51.5	2.5348	52.0	0.4431	70.0	2.0083
March 23, 2024 10:57:14	41.0	1.4581	71.0	0.3658	68.5	2.4749
March 23, 2024 10:59:44	39.5	0.9462	40.0	1.6289	76.0	2.6719
March 24, 2024 09:51:44	33.5	2.5623	0.5	1.3669	84.5	0.84
March 24, 2024 11:05:44	1.0	1.8586	1.0	1.7955	1.0	3.0881
March 24, 2024 12:06:14	39.0	2.0592	0.5	3.0067	1.0	4.1632
March 24, 2024 12:25:14	35.0	13.2437	1.0	14.5711	1.0	11.3336
March 24, 2024 12:32:14	38.5	3.8976	35.0	4.1855	60.5	5.8826
March 24, 2024 13:29:29	38.5	2.3952	35.5	3.1588	31.0	3.0823
March 25, 2024 11:40:44	46.5	0.794	29.0	2.4145	21.5	1.7184
March 25, 2024 12:18:44	35.5	1.3646	27.0	2.2614	27.5	1.9638
March 25, 2024 12:28:59	25.5	1.9274	25.5	1.86	25.5	2.5441
March 25, 2024 13:01:14	49.0	3.8857	0.5	5.7803	26.0	5.2629
March 25, 2024 13:09:29	45.0	2.3116	28.5	1.3682	29.0	1.953

Kvesheti-Kobi Highway Lot 2 Kvesheti – Tskere Section
Long-term Vibration Monitoring Report – March, 2024



Date	X Fdom (Hz)	X Vmax (mm/s)	Y Fdom (Hz)	Y Vmax (mm/s)	Z Fdom (Hz)	Z Vmax (mm/s)
March 25, 2024 13:12:14	1.0	0.5926	30.0	1.9361	31.0	2.495
March 25, 2024 13:29:59	26.5	0.973	27.5	0.6943	75.0	3.0586
March 25, 2024 14:01:14	49.0	1.9512	0.5	1.2297	72.5	3.0477
March 25, 2024 14:07:14	52.5	2.0719	36.5	2.5422	36.5	2.948
March 28, 2024 10:45:29	24.5	0.9922	24.0	2.8528	24.0	2.3587
March 28, 2024 13:52:44	1.0	1.4948	1.0	1.7633	1.0	2.5722
March 29, 2024 15:25:14	0.5	2.5737	0.5	6.1624	2.0	1.735
March 29, 2024 15:32:59	13.5	1.1399	13.5	2.5106	13.5	1.3936
March 30, 2024 14:04:29	13.5	2.7933	14.0	3.7541	14.0	2.5446
March 31, 2024 09:51:59	6.0	2.3613	6.0	2.5783	6.0	1.4566
March 31, 2024 10:34:59	9.5	2.2692	0.5	3.0183	12.0	1.3448

From where, all exceedances observed in March we do not have an information on exact reason of the exceedances.

2. VM#5 – Cultural Heritage #29

Exceedances						
Date	X Fdom (Hz)	X Vmax (mm/s)	Y Fdom (Hz)	Y Vmax (mm/s)	Z Fdom (Hz)	Z Vmax (mm/s)
March 9, 2024 12:13:14	1.0	552.611	2.5	389.2993	1.0	639.6136
March 12, 2024 16:56:44	1.0	1.7838	1.0	1.0689	1.0	4.5389

From where, all exceedances observed in March we do not have an information on exact reason of the exceedances.



7. Conclusion

1. Based on the agreement, dated March 1, 2022 (No. E/OT/96-2022) and signed between parties LLC "Gergili" and "Constant Department (Branch) of China Railway 23rd Bureau Group Co. LTD", LLC "Gergili" conducted a study on the propagation of vibration in Kvesheti, Lukho, Begoni and Gudaure, during construction works of tunnel and bridges.
2.

First VM#1 point was selected as vibration location: X: 462145.54 Y: 4697533.05 (about 50 m from the project zone)

Second VM#2 point was selected as vibration location: 42.458977, 44.529776 (about 9 m from the project zone)

Third VM#5 point was selected as vibration location: 42.47488271, 44.53275790
3. Vibration survey was performed in accordance with the German standard DIN 4150-3 and the standard of the International Certification Organization ISO 4866:2010, as well as following the procedures of vibration survey developed by the company.
4. Vibration level data were collected:

VM#2 point – 01/03/24 13:24:00 – 31/03/24 13:27:59

VM#5 point – 01/03/24 12:14:00 – 31/03/24 12:15:59

VM#7 point – 01/03/24 12:14:00 – 31/03/24 12:15:59

Annex VM#2, VM#5, VM#7 shows the vibration level values in 2-second intervals for VM#2, VM#5, VM#7 point. Exceedance of the reference value of DIN 4150-3 standard at VM#2, VM#5, VM#7 was observed in March, 2024. We do not have an information on exact reason of the exceedances.
5. At the given stage, the construction works are accomplished with heavy vehicles and works done by personnel, so there is no source of a permanent vibration as a result of the construction activities. An analysis of the measurement values at point VM#2, VM#5, VM#7 in March shows that some cases of sharp increases in vibration levels were observed.
6. At the measurement points the vibration data obtained as a result of construction works is significantly minimal than the values provided by the standard during most of the measurement period.

Kvesheti-Kobi Highway Lot 2 Kvesheti – Tskere Section
Long-term Vibration Monitoring Report – March, 2024



8. Calibration certificates

Calibration report Certificate of Calibration Certificate number: 20211102717390658069		

Manufacturer	OmniDots B.V.
Location of calibration	Industrieweg 98 7903 AK Hogeveen Nederland
Model	SWARM V2.2c-G
Name	GIZAPE
Date of calibration*	2021-11-02 (YYYY-MM-DD)
Temperature (°C)	20±3°C
Humidity (% RH)	60±30%
Signature:	

* Recommended calibration interval is 24 months from first day of use, unless otherwise required by local standards and/or local laws.

OmniDots B.V. | Verkoopweg 2 | 5721 DA Best | Nederland | info@omnidots.com | www.omnidots.com

Page 1 of 4

Calibration report Certificate of Calibration Certificate number: 20211102717390658069		

Calibration procedure

The Swarms are mounted on the calibration mounts. The shaker then targets a speed and keeps the same power for 60 seconds. Over this time measurement samples are logged and compared to the reference sensor.

Calibration report Certificate of Calibration

Certificate number: 20211102717390658069



Calibration equipment used

Model	Serial number	Description	Calibration certificate
OMNSH01	0001	Horizontal shaker	n.a.
OMNMO01	0001	Calibration mount	n.a.
OMNMO01	0002	Calibration mount	n.a.
OMNMO01	0003	Calibration mount	n.a.
OMNDR01	0001	Shaker driver	n.a.
Epson MA351AU	B0001691	Reference sensor	180911
Swarm	VELOHU	Reference check	2018-02-26
n.a.	8e5aae6	Calibration software	n.a.

Calibration report Certificate of Calibration

Certificate number: 20211102717390658069



Calibration results after measurement

Axis	Frequency	Reference measurement V_{ref} ($V_{ref} \cdot \text{weighting}(f)$)	Excitation measurement of the device V_{meas}	Deviation $100 \times (V_{meas} - V_{ref}) / V_{ref}$	Result
X	16.0	9.34	9.50	1.66	PASS
Y	16.0	9.98	10.10	1.20	PASS
Z	16.0	9.92	9.86	-0.64	PASS

Name

GIZAPE

Date of calibration*

2021-11-02 (YYYY-MM-DD)

* Recommended calibration interval is 24 months from first day of use, unless otherwise required by local standards and/or local laws.

Calibration report Certificate of Calibration

Certificate number: 20230303746972738385

**OMNI
DOTS**

Manufacturer	Omnidots B.V.
Location of calibration	Omnidots Potklei 5 9351 VS Leek
Model	SWARM V2.2c-G
Name	JEHISU
Date of calibration*	2023-03-03 (YYYY-MM-DD)
Temperature (°C)	20±3°C
Humidity (% RH)	60±30%
Signature:	

* Recommended calibration interval is 24 months from first day of use, unless otherwise required by local standards and/or local laws.

Omnidots B.V. | Potklei 5 | 9351 VS Leek | Netherlands | www.omnidots.com | info@omnidots.com

Page 1 of 4

Calibration report Certificate of Calibration

Certificate number: 20230303746972738385

**OMNI
DOTS**

Calibration procedure

The Swarms are mounted on the calibration mounts. The shaker then targets a speed and keeps the same power for 60 seconds. Over this time measurement samples are logged and compared to the reference sensor.

Calibration report

Certificate of Calibration

Certificate number: 20230303746972738385



Calibration equipment used

Model	Serial number	Description	Calibration certificate
OMNSH01	0002	Horizontal shaker	n.a.
OMNMO01	0004	Calibration mount	n.a.
OMNMO01	0005	Calibration mount	n.a.
OMNMO01	0006	Calibration mount	n.a.
OMNDR01	0002	Shaker driver	n.a.
Epson A352AD	00000540	Reference sensor	2020-11-24
Swarm	HOJIFI	Reference check	2022-08-01
n.a.	76d2765	Calibration software	n.a.

Calibration report

Certificate of Calibration

Certificate number: 20230303746972738385



Calibration results after measurement

Axis	Frequency	Reference measurement V_{ref} ($V_{ref} \times \text{weighting}(f)$)	Excitation measurement of the device V_{meas}	Deviation $100 \times (V_{meas} - V_{ref}) / V_{ref}$	Result
X	16.0	6.80	7.28	7.04	PASS
Y	16.0	8.93	9.07	1.62	PASS
Z	16.0	6.26	6.59	5.25	PASS

Name

JEHISU

Date of calibration*

2023-03-03 (YYYY-MM-DD)

* Recommended calibration interval is 24 months from first day of use, unless otherwise required by local standards and/or local laws.

Calibration report Certificate of Calibration

Certificate number: 20211029768587698173

**OMNI
DOTS**

Manufacturer	Omnidots B.V.
Location of calibration	Industrieweg 98 7903 AK Hogeveen Nederland
Model	SWARM V2.2c-G
Name	LUWEQI
Date of calibration*	2021-10-29 (YYYY-MM-DD)
Temperature (°C)	20±3°C
Humidity (% RH)	60±30%
Signature:	

* Recommended calibration interval is 24 months from first day of use, unless otherwise required by local standards and/or local laws.

Calibration report Certificate of Calibration

Certificate number: 20211029768587698173

**OMNI
DOTS**

Calibration procedure

The Swarms are mounted on the calibration mounts. The shaker then targets a speed and keeps the same power for 60 seconds. Over this time measurement samples are logged and compared to the reference sensor.

Calibration report

Certificate of Calibration

Certificate number: 20211029768587698173



Calibration equipment used

Model	Serial number	Description	Calibration certificate
OMNSH01	0001	Horizontal shaker	n.a.
OMNMO01	0001	Calibration mount	n.a.
OMNMO01	0002	Calibration mount	n.a.
OMNMO01	0003	Calibration mount	n.a.
OMNDR01	0001	Shaker driver	n.a.
Epson MA351AU	B0001691	Reference sensor	180911
Swarm	VELOHU	Reference check	2018-02-26
n.a.	8e5aae6	Calibration software	n.a.

Calibration report

Certificate of Calibration

Certificate number: 20211029768587698173



Calibration results after measurement

Axis	Frequency	Reference measurement V_{ref} ($V_{ref} \cdot \text{weighting}(f)$)	Excitation measurement of the device V_{meas}	Deviation $100 \times (V_{meas} - V_{ref}) / V_{ref}$	Result
X	16.0	9.18	9.30	1.28	PASS
Y	16.0	8.94	9.08	1.66	PASS
Z	16.0	9.07	9.22	1.70	PASS

Name

LUWEQI

Date of calibration*

2021-10-29 (YYYY-MM-DD)

* Recommended calibration interval is 24 months from first day of use, unless otherwise required by local standards and/or local laws.

Calibration report Certificate of Calibration Certificate number: 20211029777374738673		
Manufacturer:	OmniDots B.V.	
Location of calibration	Industrieweg 98 7903 AK Hoogeveen Nederland	
Model	SWARM V2-2c-G	
Name	Mijve	
Date of calibration*	2021-10-29 (YYYY-MM-DD)	
Temperature (°C)	20 ± 3 °C	
Humidity (% RH)	60 ± 20%	
Signature:		

* Recommended calibration interval is 24 months from first day of use, unless otherwise required by local standards and/or local laws.

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Page 2 of 2

Calibration report Certificate of Calibration Certificate number: 20211029777374738673		

Calibration procedure

The Swarms are mounted on the calibration mounts. The shaker then targets a speed and keeps the same power for 60 seconds. Over this time measurement samples are logged and compared to the reference sensor.

Calibration report Certificate of Calibration

Certificate number: 20211029777374738673



Calibration equipment used

Model	Serial number	Description	Calibration certificate
OMNSH01	0001	Horizontal shaker	n.a.
OMNMO01	0001	Calibration mount	n.a.
OMNMO01	0002	Calibration mount	n.a.
OMNMO01	0003	Calibration mount	n.a.
OMNDR01	0001	Shaker driver	n.a.
Epson MA351AU	B0001691	Reference sensor	180911
Swarm	VELOHU	Reference check	2018-02-26
n.a.	8e5aae6	Calibration software	n.a.

Calibration report Certificate of Calibration

Certificate number: 20211029777374738673



Calibration results after measurement

Axis	Frequency	Reference measurement Vref (Vref*weighting(f))	Excitation measurement of the device Vmeas	Deviation 100 X (Vmeas-Vref)/Vref	Result
X	16.0	8.94	8.93	-0.11	PASS
Y	16.0	9.07	9.13	0.66	PASS
Z	16.0	9.18	9.19	0.11	PASS

Name

Mijivi

Date of calibration*

2021-10-29 (YYYY-MM-DD)

* Recommended calibration interval is 24 months from first day of use, unless otherwise required by local standards and/or local laws.

Calibration report Certificate of Calibration Certificate number: 20211029786572698473		
Manufacturer:	Omnidots B.V.	
Location of calibration:	Industrieweg 58 7903 AK Hoogeveen Nederland	
Model:	SWARM V2.2c-G	
Name:	NAHETI	
Date of calibration*:	2021-10-29 (YYYY-MM-DD)	
Temperature (°C):	20 ± 3°C	
Humidity (% RH):	60 ± 30%	
Signature:		
* Recommended calibration interval is 24 months from first day of use, unless otherwise required by local standards and/or local laws.		

Calibration report

Certificate of Calibration

Certificate number: 20211029786572698473



Calibration procedure

The Swarms are mounted on the calibration mounts. The shaker then targets a speed and keeps the same power for 60 seconds. Over this time measurement samples are logged and compared to the reference sensor.

Calibration report Certificate of Calibration

Certificate number: 20211029786572698473



Calibration equipment used

Model	Serial number	Description	Calibration certificate
OMNSH01	0001	Horizontal shaker	n.a.
OMNMO01	0001	Calibration mount	n.a.
OMNMO01	0002	Calibration mount	n.a.
OMNMO01	0003	Calibration mount	n.a.
OMNDR01	0001	Shaker driver	n.a.
Epson MA351AU	B0001691	Reference sensor	180911
Swarm	VELOHU	Reference check	2018-02-26
n.a.	8e5aae6	Calibration software	n.a.

Calibration report Certificate of Calibration

Certificate number: 20211029786572698473



Calibration results after measurement

Axis	Frequency	Reference measurement V_{ref} ($V_{ref} \times \text{weighting}(f)$)	Excitation measurement of the device V_{meas}	Deviation $100 \times (V_{meas} - V_{ref}) / V_{ref}$	Result
X	16.0	9.07	9.23	1.83	PASS
Y	16.0	9.18	9.19	0.14	PASS
Z	16.0	8.94	9.01	0.85	PASS

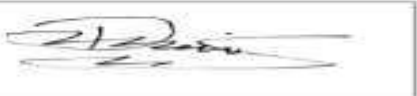
Name

NAHETI

Date of calibration*

2021-10-29 (YYYY-MM-DD)

* Recommended calibration interval is 24 months from first day of use, unless otherwise required by local standards and/or local laws.

Calibration report Certificate of Calibration Certificate number: 20230302887983857873		
Manufacturer	Omnidots B.V.	
Location of calibration	Omnidots Potkiet 5 9351 VS Leek	
Model	SWARM V2.2c-G	
Name	XOSUNI	
Date of calibration*	2023-03-02 (YYYY-MM-DD)	
Temperature (°C)	20±3°C	
Humidity (% RH)	50±30%	
Signature:		

* Recommended calibration interval is 24 months from first day of use, unless otherwise required by local standards and/or local laws.

OMNIDOTS B.V. | POTKIE 5 | 9351 VS LEEK | THE NETHERLANDS | 0031-512070000 | 0031-512070000 | 0031-512070000

Page 4 of 4

Calibration report Certificate of Calibration Certificate number: 20230302887983857873		

Calibration procedure

The Swarms are mounted on the calibration mounts. The shaker then targets a speed and keeps the same power for 60 seconds. Over this time measurement samples are logged and compared to the reference sensor.

Calibration report Certificate of Calibration

Certificate number: 20230302887983857873



Calibration equipment used

Model	Serial number	Description	Calibration certificate
OMNSH01	0002	Horizontal shaker	n.a.
OMNMO01	0004	Calibration mount	n.a.
OMNMO01	0005	Calibration mount	n.a.
OMNMO01	0006	Calibration mount	n.a.
OMNDR01	0002	Shaker driver	n.a.
Epson A352AD	00000540	Reference sensor	2020-11-24
Swarm	HOJIFI	Reference check	2022-08-01
n.a.	76d2765	Calibration software	n.a.

Calibration report Certificate of Calibration

Certificate number: 20230302887983857873



Calibration results after measurement

Axis	Frequency	Reference measurement V_{ref} ($V_{ref} \cdot \text{weighting}(f)$)	Excitation measurement of the device V_{meas}	Deviation 100 X ($V_{meas} - V_{ref}$) / V_{ref}	Result
X	16.0	7.82	8.07	3.23	PASS
Y	16.0	7.91	8.15	3.14	PASS
Z	16.0	9.75	9.85	1.04	PASS

Name

XOSUNI

Date of calibration*

2023-03-02 (YYYY-MM-DD)

* Recommended calibration interval is 24 months from first day of use, unless otherwise required by local standards and/or local laws.

Calibration report Certificate of Calibration Certificate number: 20211029908588658073		

Manufacturer:	Omnidots B.V.
Location of calibration:	Industrieweg 98 7903 AK Hoozeveen Nederland
Model:	SWARM V2.2c-G
Name:	ZUXAPI
Date of calibration*:	2021-10-29 (YYYY-MM-DD)
Temperature (°C):	20±3°C
Humidity (% RH):	60±30%
Signature:	

* Recommended calibration interval is 24 months from first day of use, unless otherwise required by local standards and/or local laws.

Omnidots B.V. | Industrieweg 98 | 7903 AK Hoozeveen | Nederland | www.omnidots.com | info@omnidots.com

Page 1 of 4

Calibration report Certificate of Calibration Certificate number: 20211029908588658073	

Calibration procedure

The Swarms are mounted on the calibration mounts. The shaker then targets a speed and keeps the same power for 60 seconds. Over this time measurement samples are logged and compared to the reference sensor.

Calibration report Certificate of Calibration

Certificate number: 20211029908588658073



Calibration equipment used

Model	Serial number	Description	Calibration certificate
OMNSH01	0001	Horizontal shaker	n.a.
OMNMO01	0001	Calibration mount	n.a.
OMNMO01	0002	Calibration mount	n.a.
OMNMO01	0003	Calibration mount	n.a.
OMNDR01	0001	Shaker driver	n.a.
Epson MA351AU	B0001691	Reference sensor	180911
Swarm	VELOHU	Reference check	2018-02-26
n.a.	8e5aae6	Calibration software	n.a.

Calibration report Certificate of Calibration

Certificate number: 20211029908588658073



Calibration results after measurement

Axis	Frequency	Reference measurement V_{ref} ($V_{ref} \cdot \text{weighting}(f)$)	Excitation measurement of the device V_{meas}	Deviation 100 X ($(V_{meas} - V_{ref}) / V_{ref}$)	Result
X	16.0	9.03	9.09	0.68	PASS
Y	16.0	9.95	9.96	0.14	PASS
Z	16.0	9.03	9.18	1.60	PASS

Name

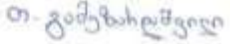
ZUXAPI

Date of calibration*

2021-10-29 (YYYY-MM-DD)

* Recommended calibration interval is 24 months from first day of use, unless otherwise required by local standards and/or local laws.

Tunnel water kobi test results sample

		LLC BBE Scientific Research Examining Laboratory Identification Number: 405347409		 GAC-TL-0286 ISO/IEC 17025:2017/2018	
+995 593 11 90 10 bbelab2019@gmail.com Georgia, Tbilisi, Vaja-Pahavela Str., Block III, Build #7 https://www.facebook.com/bbelaboratory BBE GP		Report № 310124 - 3 Date of Report Delivery – 31.01.2024 Sampling Place: well located in kobi, China Railway Tunnel Group Co., Ltd. Territory. Client Name: Ltd. "Gergili", ID 405353610 Sample name and quantity: Tunnel water, 5 Litres. Sample was taken by: The sample was taken by the customer. Sample Received in The Laboratory: 15.01.2024 Sample ID: 150124-3 The Analysis Completed: 24.01.2024 Analysis Done By: Tatia Gamezardashvili. *Analysis for TPH; Prepared by The Exam Laboratory of the Scientific Research Laboratory of G.Natadze Sanitation, Hygiene and Medical Ecology Scientific Research Institute.			
Parameter	Measurement Unit	Used Method	Result	***Maximum permissible limit according to ordinance #17	
Physical-chemical Parameters					
pH	-	Apera Instruments PC60	8.47	6.5-8.5	
Total Suspended Solids	mg/L	HACH Method 8006	124	60	
**Chemical Biological Demand (BOD)	mg/L	HACH LANGE LCK 555	4	25	
*TPH	mg/L	ISO9377-1-2000	0.025	≤0.3	
<i>**The analyse Biological Oxygen Demand is prepared out of sphere</i> <i>***Maximum Permissible Limit According to Ordinance #17 On the Approval of The Technical Regulations for the discharge of waste water into surface water – 03.01.2014 Tbilisi, Georgia</i> <i>Note: 1. It shall be inadmissible to partially reproduce the protocol of the exam without the written permission of the laboratory.</i> <i>2. The results belong only to an experienced pattern.</i> <i>3. The sample is taken by client.</i>					
Examiner: T.Gamezardashvili					
QC Lab Manager: L.kakalashvili					
Agreed: Director of Laboratory L. Ramishvili		 			
LLC BBE Scientific Research Examining Laboratory			Page 2 of 2		

Sewage water results in Tskere (April 2024)



შ.პ.ს. „ზი-ზი-ი“ სამეცნიერო-კვლევითი საგანმედიო ღონისძიებები
საიდენტიფიკაციო ნომერი: 405347469



GAC TL-0286
სსტ ენობიკი 17025:2017/2018

Report № #300424-13

Date of Report Delivery –30.04.2024

Sampling Place: well located in Village Tskere, , China Railway Tunnel Group Co., Ltd. Territory.

Client Name: Ltd. "Gergili", ID 405353610

Sample name and quantity: Sewage water, 5 Liters

Sample was taken by: The sample was taken by the customer.

Sample Received in The Laboratory: 10.04.2024

Sample ID: #100424-8

The Analysis Completed: 25.04.2024

Analysis Done By: The Exam Laboratory of the Scientific Research Laboratory of G. Natadze Sanitation, Hygiene and Medical Ecology Scientific Research Institute.

*Analysis for Grease&oils, Phenols, Detergents; prepare by Ltd Scientific Research firm "GAMMA".

Physical-chemical Parameters

Parameter	Measurement Unit	Used Method	Result	**Maximum permissible limit according to ordinance #17
pH	-	SST ISO10523:2008/2010	7.11	6.5-8.5
Total Suspended Solids	mg/L	ISO 11923-1997	24.33	60
Chemical Oxygen Demand (COD)	mgO/L	SST ISO 6060:1989;	1.92	125
Biological Oxygen Demand (BOD)	mgO/L	ISO 5815-2:2003	3.02	25
Total Nitrogen	mg/L	HI-SOP-C77	30.80	15
Total Phosphorus	mg/L	ISO 6878-2004	0.02	2
*Grease & Oils	mg/L	Epa 1664-B-10	<5.0	5
*Phenols	mg/L	HACH CLK 345	<0.10	0.1
*Detergents	mg/L	HANNA Method HI 96769	<0.1	2

**Maximum Permissible Limit According to Ordinance #17 On the Approval of The Technical Regulations for the discharge of waste water into surface water – (03.01.2014 Tbilisi, Georgia)

Note: 1. It shall be inadmissible to partially reproduce the protocol of the exam without the written permission of the laboratory.
2. The results belong only to an experienced pattern.
3. The sample is taken by client.

შ.პ.ს. „ზი-ზი-ი“ სამეცნიერო-კვლევითი საგანმედიო ღონისძიებები

Page 1 of 2



შ.პ.ს. „ზი-ზი-ი“ სამეცნიერო-კვლევითი საგამოცდო ლაბორატორია
საიდენტიფიკაციო ნომერი: 405347469



GAC-TL-0286

სსრტ ისო/იეკ 17025:2017/2018

QC Lab Manager: L. Kakalashvili

ლ. კაკალაშვილი

Agreed: Director of Laboratory I. Ramishvili



Sewage water results in Kobi (April 2024)



შ.პ.ს. „ბი-ბი-ი“ სამეცნიერო-კვლევითი საგამოცდო ლაბორატორია
საიდენტიფიკაციო ნომერი: 405347469



GAC-TL-0286
სსიპ იმს/იკი 17025:2017/2018

Report № #300424-11

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bbelab2019@gmail.com

საქართველო თბილისი, ვაჟა-ფშაველას III კვ. კორპ. #7

<https://www.facebook.com/bbelaboratory>

[BBE.GE](https://www.bbe.ge)

Date of Report Delivery – 30.04.2024

Sampling Place: well located in kobi, , China Railway Tunnel Group Co., Ltd. Territory.

Client Name: Ltd. "Gergili", ID 405353610

Sample name and quantity: Sewage water, 5 Liters

Sample was taken by: The sample was taken by the customer.

Sample Received in The Laboratory: 10.04.2024

Sample ID: #100424-6

The Analysis Completed: 25.04.2024

Analysis Done By: The Exam Laboratory of the Scientific Research Laboratory of G. Natadze Sanitation, Hygiene and Medical Ecology Scientific Research Institute.

*Analysis for Grease&oils, Phenols, Detergents; prepare by Ltd Scientific Research firm "GAMMA".

Parameter	Measurement Unit	Used Method	Result	**Maximum permissible limit according to ordinance #17
Physical-chemical Parameters				
pH	-	SST ISO10523:2008/2010	7.33	6.5-8.5
Total Suspended Solids	mg/L	ISO 11923-1997	80.67	60
Chemical Oxygen Demand (COD)	mgO/L	SST ISO 6060:1989;	4.80	125
Biological Oxygen Demand (BOD)	mgO/L	ISO 5815-2:2003	0.24	25
Total Nitrogen	mg/L	HI-SOP-C77	29.40	15
Total Phosphorus	mg/L	ISO 6878-2004	0.018	2
*Grease & Oils	mg/L	Epa 1664-B-10	<5.0	5
*Phenols	mg/L	HACH CLK 345	<0.10	0.1
*Detergents	mg/L	HANNA Method HI 96769	<0.1	2

**Maximum Permissible Limit According to Ordinance #17 On the Approval of The Technical Regulations for the discharge of waste water into surface water – 03.01.2014 Tbilisi, Georgia

Note: 1. It shall be inadmissible to partially reproduce the protocol of the exam without the written permission of the laboratory.
2. The results belong only to an experienced pattern.
3. The sample is taken by client.

შ.პ.ს. „ბი-ბი-ი“ სამეცნიერო-კვლევითი საგამოცდო ლაბორატორია
Page 1 of 2



შ.პ.ს. „ბი-ბი-ი“ სამეცნიერო-კვლევითი საგამოცდო ლაბორატორია
საიდენტიფიკაციო ნომერი: 405347469



GAC-TL-0286

სსტ იხმ/იკ 17025:2017/2018

QC Lab Manager: L. Kakalashvili

დ. კაკაღაშვილი

Agreed: Director of Laboratory I. Ramishvili



Annex 3: NCR Register

(No NCR Issued during reporting period all non-compliances sent through letters. Details of letter given in Table 8 D)

Lot 1 NCRs issued During the Project Life

Title	NCR #	Type	Status	Date of Issue
Absence of secondary retention	No.0001	NCR2	Closed	04/01/21
Missing medical service with ambulance	No.0002	NCR2	Closed	05/03/21
Electrical Failure	No.0003	NCR2	Closed	05/03/21
Improper refueling process	No.0004	NCR2	Closed	12/03/21
Not performing the sealing shotcrete and fore pole	No.0005	NCR2	Closed	26/03/21
Violation of Working at Height	No.0006	NCR3	Closed	06/04/21
Absence of sedimentation tank	No.0007	NCR2	Closed	06/04/21
Violations on Construction of Emergency Gallery	No.0008	NCR2	Closed	09/04/21
Violation on Backfilling of Voids and Cavities in Emergency Gallery	No.0009	NCR3	Closed	09/04/21
Lack of 2nd Layer of Shotcrete in Emergency Gallery	No.0010	NCR2	Closed	09/04/21
Unsupported Length of Tunnel in Emergency Gallery	No.0011	NCR3	Closed	09/04/21
Related to Main Tunnel	No.0012	NCR2	Closed	17/04/21
Improper storage and usage of oxygen cylinders	No.0013	NCR3	Closed	16/06/21
Improper Storage and Usage of oxygen cylinders	No.0014	NCR3	Closed	8/2/2021
Absence of HS Representative	No.0015	NCR3	Closed	10/1/2021
TBM Excavation	No.0016	NCR3	Closed	10/1/2021
Drainage system of Batching Plant N 2.	No.0017	NCR3	Closed	6/26/2022
Septic System in Tskere	No.0018	NCR3	Closed	6/26/2022
Sludge removal from sedimentation ponds	No.0022	NCR1	Closed	01/12/2022
Oil Spill	No.0021	NCR1	Closed	11/28/2022
Mixed waste at batching Plant in Tskere	No.0023	NCR1	Closed	12/2/2022
Covering of Diesel facility	No.0024	NCR1	Closed	12/2/2022
Improper placement of Used oil drums	No. 0025	NCR1	Closed	17/1/2023
Poorly managed scrap yard in Kobi	No. 0039	NCR1	Closed	20/06/2023

Lot 2 NCRs issued During the Project Life

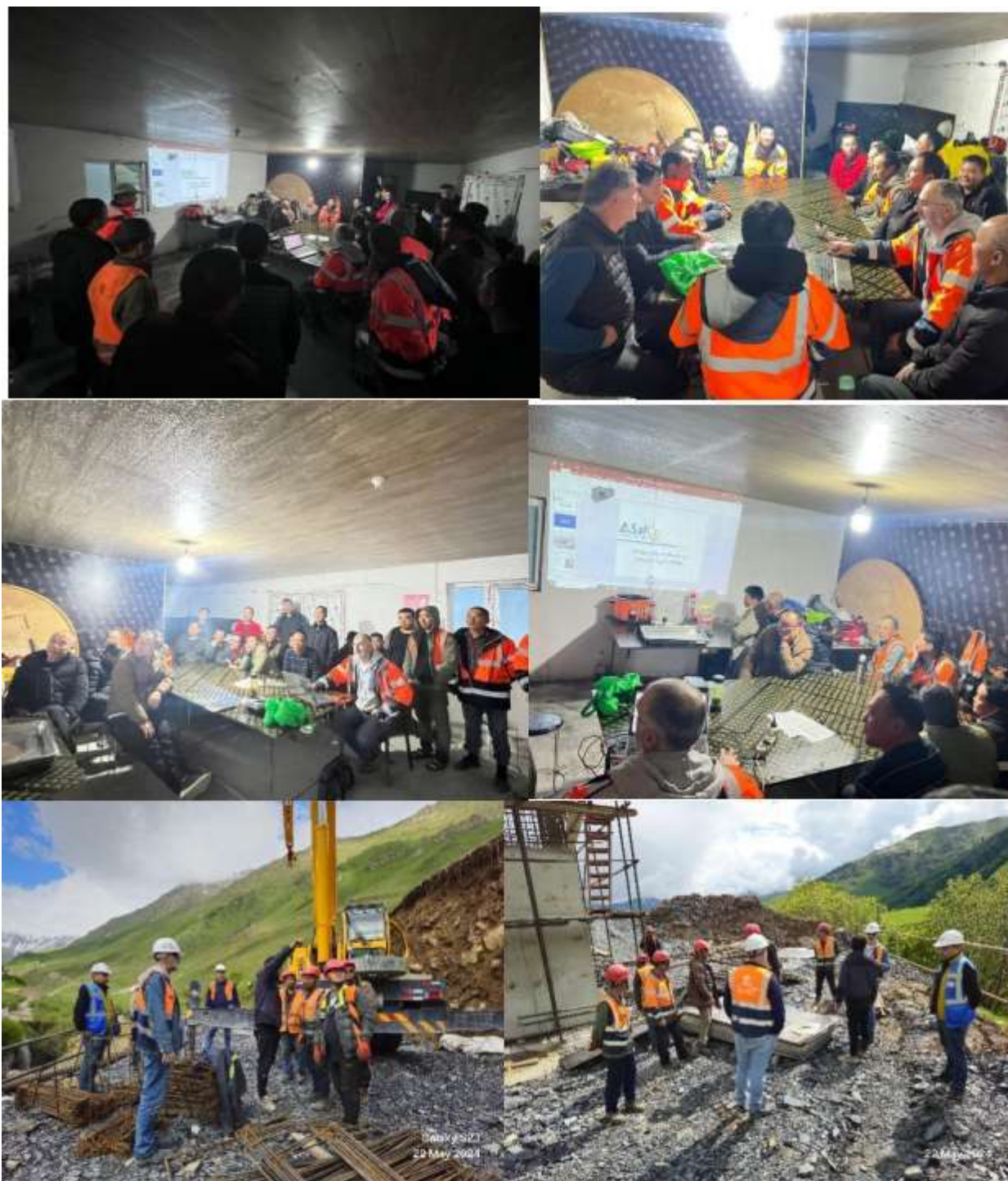
Title	NCR #	Type	Status	Date of Issue
Absence of secondary retention	No.0001	NCR1	Closed	2/27/2021
Waste Burning on the Site	No.0002	NCR2	Closed	2/27/2021
Waste Disposal Area	No.0003	NCR3	Closed	2/10/2021
Potable Water at Campsite 2	No.0004	NCR 2	Open	6/8/2021
Unsanitary Condition in the Canteen and Kitchen at Campsite 2	No.0005	NCR3	Closed	6/8/2021
Violation of Boundaries	No.0006	NCR2	Closed	7/21/2021
Improper Topsoil Management	No.0007	NCR3	Closed	7/21/2021
Lack of Hazardous Material Management and Spill Management	No.0008	NCR3	Closed	7/21/2021
Improper Storage of Topsoil	No.0010	NCR3	Closed	9/11/2021
Absence of Health and Safety Representatives on Sites	No.0011	NCR3	Closed	9/23/2021
Absence of the and Safety Representatives on Sites	No.0012	NCR3	Closed	9/28/2021
Lack of waste water and waste management	No.0013	NCR3	Closed	11/4/2021
Oil Spill at TUN 1 Exit	No.0035	NCR1	Closed	11/28/2022
Chemical Spill at TUN# 1 Entrance	No.0030	NCR1	Closed	12/2/2022
Oil spill and scattered waste at TUN# 1 exit	No.0060	NCR 1	Closed	20/06/2023

NCR 1: Issue to be consider and take corrective action

NCR 2: Issue with high importance more severe than type 1

NCR 3: Issue with very high importance

Annex 4: Photo evidences of training sessions conducted during the Reporting Period (January – June 2024)



INTERNAL. This information is accessible to ADB Management and staff. It may be shared outside ADB with appropriate permission.

 中国中铁隧道集团有限公司 CHINA RAILWAY ENGINEERING CORPORATION LIMITED	Construction of Kyesheti-Kobi Road Tunnel Section				
TRAINING REPORT					
Course (科目): <u>公路隧道</u> Lecturer (指导教师): <u>王成林</u> Trainee (学员): <u>李成林</u>	Date: <u>2014.6.2</u> Term: <u>12-30</u> Name: <u>李成林</u> Sex: <u>男</u> Age: <u>32</u> Position: <u>项目经理</u> Telephone: <u>135 2010 8888</u> Signature: <u>李成林</u> Date: <u>2014.6.2</u>				
ATTENDEES (参会人员)					
No.	Name (姓名)	Position (职位)	Signature (签字)	Date	Remarks (备注)
1	王成林	项目经理	王成林	2014.6.2	
2	李成林	项目经理	李成林	2014.6.2	
3	张成林	项目经理	张成林	2014.6.2	
4	赵成林	项目经理	赵成林	2014.6.2	
5	刘成林	项目经理	刘成林	2014.6.2	
6	陈成林	项目经理	陈成林	2014.6.2	
7	周成林	项目经理	周成林	2014.6.2	
8	吴成林	项目经理	吴成林	2014.6.2	
9	孙成林	项目经理	孙成林	2014.6.2	
10	李成林	项目经理	李成林	2014.6.2	
11	张成林	项目经理	张成林	2014.6.2	
12	赵成林	项目经理	赵成林	2014.6.2	
13	刘成林	项目经理	刘成林	2014.6.2	
14	陈成林	项目经理	陈成林	2014.6.2	
15	周成林	项目经理	周成林	2014.6.2	
16	吴成林	项目经理	吴成林	2014.6.2	
17	孙成林	项目经理	孙成林	2014.6.2	
18	李成林	项目经理	李成林	2014.6.2	
19	张成林	项目经理	张成林	2014.6.2	
20	赵成林	项目经理	赵成林	2014.6.2	
21	刘成林	项目经理	刘成林	2014.6.2	
22	陈成林	项目经理	陈成林	2014.6.2	
23	周成林	项目经理	周成林	2014.6.2	
24	吴成林	项目经理	吴成林	2014.6.2	
25	孙成林	项目经理	孙成林	2014.6.2	
26	李成林	项目经理	李成林	2014.6.2	
27	张成林	项目经理	张成林	2014.6.2	
28	赵成林	项目经理	赵成林	2014.6.2	
29	刘成林	项目经理	刘成林	2014.6.2	
30	陈成林	项目经理	陈成林	2014.6.2	
31	周成林	项目经理	周成林	2014.6.2	
32	吴成林	项目经理	吴成林	2014.6.2	
33	孙成林	项目经理	孙成林	2014.6.2	
34	李成林	项目经理	李成林	2014.6.2	
35	张成林	项目经理	张成林	2014.6.2	
36	赵成林	项目经理	赵成林	2014.6.2	
37	刘成林	项目经理	刘成林	2014.6.2	
38	陈成林	项目经理	陈成林	2014.6.2	
39	周成林	项目经理	周成林	2014.6.2	
40	吴成林	项目经理	吴成林	2014.6.2	
41	孙成林	项目经理	孙成林	2014.6.2	
42	李成林	项目经理	李成林	2014.6.2	
43	张成林	项目经理	张成林	2014.6.2	
44	赵成林	项目经理	赵成林	2014.6.2	
45	刘成林	项目经理	刘成林	2014.6.2	
46	陈成林	项目经理	陈成林	2014.6.2	
47	周成林	项目经理	周成林	2014.6.2	
48	吴成林	项目经理	吴成林	2014.6.2	
49	孙成林	项目经理	孙成林	2014.6.2	
50	李成林	项目经理	李成林	2014.6.2	
51	张成林	项目经理	张成林	2014.6.2	
52	赵成林	项目经理	赵成林	2014.6.2	
53	刘成林	项目经理	刘成林	2014.6.2	
54	陈成林	项目经理	陈成林	2014.6.2	
55	周成林	项目经理	周成林	2014.6.2	
56	吴成林	项目经理	吴成林	2014.6.2	
57	孙成林	项目经理	孙成林	2014.6.2	
58	李成林	项目经理	李成林	2014.6.2	
59	张成林	项目经理	张成林	2014.6.2	
60	赵成林	项目经理	赵成林	2014.6.2	
61	刘成林	项目经理	刘成林	2014.6.2	
62	陈成林	项目经理	陈成林	2014.6.2	
63	周成林	项目经理	周成林	2014.6.2	
64	吴成林	项目经理	吴成林	2014.6.2	
65	孙成林	项目经理	孙成林	2014.6.2	
66	李成林	项目经理	李成林	2014.6.2	
67	张成林	项目经理	张成林	2014.6.2	
68	赵成林	项目经理	赵成林	2014.6.2	
69	刘成林	项目经理	刘成林	2014.6.2	

[illegible]

中国中铁股份有限公司 CHINA RAILWAY GROUP LIMITED		Construction of Kvesheti-Kobi Road Tunnel Section	
TRAINING REPORT 安全培训记录表		DATE 日期: 2014.5.18	TIME 时间: 09:00
Training Site By 培训地点: 项目部会议室		Trainer Name 培训师姓名: 王小明	Trainer Title 培训师职位: 安全员
Training Topic 培训主题: 安全生产知识		Participant Name 参训人员姓名: 张三	Participant Title 参训人员职位: 工人
ATTENDEES 参加培训人员			
NO.	NAME 姓名	POSITION 职位	ATTENDEE 参训人员
1	张三	工人	
2	李四	工人	
3	王五	工人	
4	赵六	工人	
5	孙七	工人	
6	周八	工人	
7	吴九	工人	
8	郑十	工人	
9	陈十一	工人	
10	黄十二	工人	
11	宋十三	工人	
12	马十四	工人	
13	朱十五	工人	
14	徐十六	工人	
15	孙十七	工人	
16	李十八	工人	
17	王十九	工人	
18	张二十	工人	
19	陈二十一	工人	
20	黄二十二	工人	
21	宋二十三	工人	
22	马二十四	工人	
23	朱二十五	工人	
24	徐二十六	工人	
25	孙二十七	工人	
26	李二十八	工人	
27	王二十九	工人	
28	张三十	工人	
29	陈三十一	工人	
30	黄三十二	工人	
31	宋三十三	工人	
32	马三十四	工人	
33	朱三十五	工人	
34	徐三十六	工人	
35	孙三十七	工人	
36	李三十八	工人	
37	王三十九	工人	
38	张三十	工人	
39	陈四十一	工人	
40	黄四十二	工人	
41	宋四十三	工人	
42	马四十四	工人	
43	朱四十五	工人	
44	徐四十六	工人	
45	孙四十七	工人	
46	李四十八	工人	
47	王四十九	工人	
48	张三十	工人	
49	陈五十一	工人	
50	黄五十二	工人	
51	宋五十三	工人	
52	马五十四	工人	
53	朱五十五	工人	
54	徐五十六	工人	
55	孙五十七	工人	
56	李五十八	工人	
57	王五十九	工人	
58	张三十	工人	
59	陈六十一	工人	
60	黄六十二	工人	
61	宋六十三	工人	
62	马六十四	工人	
63	朱六十五	工人	
64	徐六十六	工人	
65	孙六十七	工人	
66	李六十八	工人	
67	王六十九	工人	
68	张三十	工人	
69	陈七十一	工人	
70	黄七十二	工人	
71	宋七十三	工人	
72	马七十四	工人	
73	朱七十五	工人	
74	徐七十六	工人	
75	孙七十七	工人	
76	李七十八	工人	
77	王七十九	工人	
78	张三十	工人	
79	陈八十一	工人	
80	黄八十二	工人	
81	宋八十三	工人	
82	马八十四	工人	
83	朱八十五	工人	
84	徐八十六	工人	
85	孙八十七	工人	
86	李八十八	工人	
87	王八十九	工人	
88	张三十	工人	
89	陈九十一	工人	
90	黄九十二	工人	
91	宋九十三	工人	
92	马九十四	工人	
93	朱九十五	工人	
94	徐九十六	工人	
95	孙九十七	工人	
96	李九十八	工人	
97	王九十九	工人	
98	张三十	工人	
99	陈一百一	工人	
100	黄一百二	工人	

TOPICS 培训主题		
☐ HAND TOOLS 手工工具	☐ ELECTRICAL POWER TOOLS 电动工具	☐ GAS BOILER 燃气锅炉
☐ FALLING OBJECTS 坠落物体	☐ MANUAL HANDLING 手动搬运	☒ FIRE PREVENTION 防火预防
☐ CONFINED SPACE ENTRY 受限空间作业	☐ LIFTING EQUIPMENT OPERATING 起重设备操作	☒ WORKPLACE HYGIENES workplace hygiene
☐ HOT WORKING 热工作业	☐ PRESSURE TESTING 压力测试	☐ HANDING LOGGING AND MARKING 搬运、记录和标记
☐ SHIELDING AND CUTTING 屏蔽和切割	☒ WELDING AND CUTTING 焊接和切割	☐ WORKLOADING AND UNLOADING 装卸作业
☐ MOBILE CRANE OPERATIONS 移动式起重机操作	☐ FORMS TO WORK 脚手架作业	☒ PPE 个人防护装备
☐ HAZARDOUS WASTES 危险废物	☐ SITE MEDICAL EMERGENCY RESPONSE 现场医疗应急响应	☐ EMERGENCY EVACUATION 紧急疏散
☐ CERTIFICATION OF SCHEMES 认证方案	☐ DEFENSIVE DRIVING SCHOOL RULES 防御性驾驶学校规则	☐ WEAR AND TARE CONDITIONAL MARK 穿戴和 tare 条件标记
☒ WASTE MANAGEMENT 废物管理	☐ POLLUTION PREVENTION 污染预防	☒ SOIL SPILL RESPONSE 土壤泄漏响应
☒ REPAIRING 维修	☒ TOP SOIL MANAGEMENT 顶层土壤管理	☐ CRIMINAL ACT CONTROL 犯罪行为控制
☐ CULTURAL HERITAGE 文化遗产	☐ ACCESS ROAD MANAGEMENT 通道管理	☐ OTHER 其他

NOTES 备注
防火安全注意事项 / Fire work Safety rules. 劳保穿戴 / PPE 高处作业要求 / Requirements of working at high 文明施工 / house keeping 环境保护 / Environmental protection

Annex 6: Delivery Notes for Handing Over Hazardous Material

Lot-1

[illegible]

WASTE TRANSFER NOTE		Ref No. 102188																																				
ಕರ್ನಾಟಕ ಸರ್ಕಾರ																																						
WASTE TRANSFER CERTIFICATE																																						
A. CONSIGNMENT DETAILS / ಸಾರ್ವಜನಿಕ ಸಂಸ್ಥೆಯ ವಿವರ																																						
1. Waste described herein is dispatched from / ಇಲ್ಲಿಂದ ವ್ಯರ್ಜಿತವಾಗಿರುವುದು: 100, 100, 100 Date / ದಿನ: 21/05/24																																						
2. Declared as waste / ವ್ಯರ್ಜಿತವಾಗಿರುವುದು: 100, 100, 100																																						
3. Declared as waste / ವ್ಯರ್ಜಿತವಾಗಿರುವುದು: 100, 100, 100																																						
4. Declared as waste / ವ್ಯರ್ಜಿತವಾಗಿರುವುದು: 100, 100, 100																																						
B. DESCRIPTION OF WASTE / ವ್ಯರ್ಜಿತವಾಗಿರುವುದು																																						
No. of additional sheets / ಇತರ ಪುಟಗಳ ಸಂಖ್ಯೆ: 10																																						
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Waste type / ವ್ಯರ್ಜಿತದ ವಿಧ</th> <th>Waste code / ವ್ಯರ್ಜಿತದ ಕೋಡ್</th> <th>Waste quantity / ವ್ಯರ್ಜಿತದ ಪ್ರಮಾಣ</th> <th>Waste quantity / ವ್ಯರ್ಜಿತದ ಪ್ರಮಾಣ</th> <th>Waste quantity / ವ್ಯರ್ಜಿತದ ಪ್ರಮಾಣ</th> <th>Waste quantity / ವ್ಯರ್ಜಿತದ ಪ್ರಮಾಣ</th> </tr> </thead> <tbody> <tr> <td>100, 100, 100</td> <td>100, 100, 100</td> <td>100, 100, 100</td> <td>100, 100, 100</td> <td>100, 100, 100</td> <td>100, 100, 100</td> </tr> <tr> <td>100, 100, 100</td> <td>100, 100, 100</td> <td>100, 100, 100</td> <td>100, 100, 100</td> <td>100, 100, 100</td> <td>100, 100, 100</td> </tr> <tr> <td>100, 100, 100</td> <td>100, 100, 100</td> <td>100, 100, 100</td> <td>100, 100, 100</td> <td>100, 100, 100</td> <td>100, 100, 100</td> </tr> <tr> <td>100, 100, 100</td> <td>100, 100, 100</td> <td>100, 100, 100</td> <td>100, 100, 100</td> <td>100, 100, 100</td> <td>100, 100, 100</td> </tr> <tr> <td>100, 100, 100</td> <td>100, 100, 100</td> <td>100, 100, 100</td> <td>100, 100, 100</td> <td>100, 100, 100</td> <td>100, 100, 100</td> </tr> </tbody> </table>			Waste type / ವ್ಯರ್ಜಿತದ ವಿಧ	Waste code / ವ್ಯರ್ಜಿತದ ಕೋಡ್	Waste quantity / ವ್ಯರ್ಜಿತದ ಪ್ರಮಾಣ	Waste quantity / ವ್ಯರ್ಜಿತದ ಪ್ರಮಾಣ	Waste quantity / ವ್ಯರ್ಜಿತದ ಪ್ರಮಾಣ	Waste quantity / ವ್ಯರ್ಜಿತದ ಪ್ರಮಾಣ	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100	100, 100, 100
Waste type / ವ್ಯರ್ಜಿತದ ವಿಧ	Waste code / ವ್ಯರ್ಜಿತದ ಕೋಡ್	Waste quantity / ವ್ಯರ್ಜಿತದ ಪ್ರಮಾಣ	Waste quantity / ವ್ಯರ್ಜಿತದ ಪ್ರಮಾಣ	Waste quantity / ವ್ಯರ್ಜಿತದ ಪ್ರಮಾಣ	Waste quantity / ವ್ಯರ್ಜಿತದ ಪ್ರಮಾಣ																																	
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Consignor's Signature / ಸಹಿ: 100, 100, 100																																						
C. TRANSPORTER DETAILS / ಸಾರ್ವಜನಿಕ ಸಂಸ್ಥೆಯ ವಿವರ																																						
1. Transporter name / ಸಾರ್ವಜನಿಕ ಸಂಸ್ಥೆಯ ಹೆಸರು: 100, 100, 100																																						
2. Transporter address / ಸಾರ್ವಜನಿಕ ಸಂಸ್ಥೆಯ ವಿಳಾಸ: 100, 100, 100																																						
3. Transporter contact number / ಸಾರ್ವಜನಿಕ ಸಂಸ್ಥೆಯ ಸಂಪರ್ಕ ಸಂಖ್ಯೆ: 100, 100, 100																																						
4. Transporter signature / ಸಾರ್ವಜನಿಕ ಸಂಸ್ಥೆಯ ಸಹಿ: 100, 100, 100																																						
5. Transporter stamp / ಸಾರ್ವಜನಿಕ ಸಂಸ್ಥೆಯ ಮುದ್ರೆ: 100, 100, 100																																						
D. CONSIGNEE CERTIFICATE / ಸಾರ್ವಜನಿಕ ಸಂಸ್ಥೆಯ ವಿವರ																																						
1. Consignee name / ಸಾರ್ವಜನಿಕ ಸಂಸ್ಥೆಯ ಹೆಸರು: 100, 100, 100																																						
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Waste type / ವ್ಯರ್ಜಿತದ ವಿಧ

Waste code / ವ್ಯರ್ಜಿತದ ಕೋಡ್

Waste quantity / ವ್ಯರ್ಜಿತದ ಪ್ರಮಾಣ

Waste type / ವ್ಯರ್ಜಿತದ ವಿಧ

Waste code / ವ್ಯರ್ಜಿತದ ಕೋಡ್

Waste quantity / ವ್ಯರ್ಜಿತದ ಪ್ರಮಾಣ

[illegible]

Annex 7: License for Medical Technology



საქართველოს გარემოს დაცვისა და სოფლის მეურნეობის მინისტრი

ბრძანება N 2-714

26/07/2019

ქ. თბილისი

შპს „მედიკალ ტექნოლოგის“ ნარჩენების განთავსების (ინსინერაციის) საწარმოს მოწყობასა და ექსპლუატაციაზე გარემოსდაცვითი გადაწყვეტილების გაცემის შესახებ

მიმდინარე წლის 17 ივლისს სამინისტროს მომართა შპს „მედიკალ ტექნოლოგის“ წარმომადგენელმა და ითხოვა გარემოსდაცვითი გადაწყვეტილების მიღება.

2015 წელს სამინისტროს მიერ შპს „მედიკალ ტექნოლოგის“ ნარჩენების განთავსების (ინსინერაციის) საწარმოს მოწყობისა და ექსპლუატაციის პროექტზე გაიცა №74 (29.12.2015) ეკოლოგიური ექსპერტიზის დასკვნა.

„გარემოსდაცვითი შეფასების კოდექსის“ 48-ე მუხლის მე-4 ნაწილის თანახმად, პირი, რომელზედაც 2018 წლის 1 იანვრამდე გზშ-ის სფეროში გაცემულია შესაბამისი აღმშენებელი ადმინისტრაციულ-სამართლებრივი აქტი, ვალდებულია 2021 წლის 1 იანვრამდე, განცხადების საფუძველზე მოითხოვოს გარემოსდაცვითი გადაწყვეტილების გაცემა. სამინისტრო აღნიშნული აღმშენებელი ადმინისტრაციულ-სამართლებრივი აქტის საფუძველზე, ამ კოდექსით გარემოსდაცვითი გადაწყვეტილების გაცემისთვის განსაზღვრული პროცედურების გარეშე, მარტივი ადმინისტრაციული წარმოების წესით გასცემს გარემოსდაცვით გადაწყვეტილებას.

აღნიშნულის გათვალისწინებით მომზადდა მინისტრის ბრძანების პროექტი, რომლის შესაბამისად გარემოსდაცვითი გადაწყვეტილება გაიცემა 2015 წლის №74 სახელმწიფო ეკოლოგიური ექსპერტიზის დასკვნის პროექტის საფუძველზე და საქმიანობის განმახორციელებელს დაეკისრება ვალდებულება, უზრუნველყოს გარემოსდაცვითი გადაწყვეტილებით განსაზღვრული პირობების შესრულება.

ამავდროულად ძალადაკარგულად ცხადდება „შპს „მედიკალ ტექნოლოგი“-ს ნარჩენების განთავსების (ინსინერაცია) საწარმოს მოწყობასა და ექსპლუატაციაზე ეკოლოგიური ექსპერტიზის დასკვნის დამტკიცების შესახებ“ საქართველოს გარემოსა და ბუნებრივი რესურსების დაცვის მინისტრის 2015 წლის 30 დეკემბრის №ი-1037 ბრძანება, თუმცა აღნიშნული გარემოსდაცვითი გადაწყვეტილებით იურიდიულ ძალას ინარჩუნებს 2015 წლის სახელმწიფო ეკოლოგიური ექსპერტიზის დასკვნა პროექტზე, რომელიც დანართის სახით თან დაერთვება მოცემულ გადაწყვეტილებას.

ზემოაღნიშნული გარემოებებისა და „გარემოსდაცვითი შეფასების კოდექსის“ 48-ე მუხლის მე-4 ნაწილის საფუძველზე,

ვ ბ რ ძ ა ნ ე ბ:

1. შპს „მედიკალ ტექნოლოგის“ ნარჩენების განთავსების (ინსინერაციის) საწარმოს მოწყობასა და ექსპლუატაციაზე გაიცეს გარემოსდაცვითი გადაწყვეტილება თანდართული ეკოლოგიური ექსპერტიზის დასკვნის საფუძველზე (დასკვნა №74; 29.12.2015);
2. გარემოსდაცვითი გადაწყვეტილების მფლობელი ვალდებულია დაიცვას თანდართული ეკოლოგიური ექსპერტიზის დასკვნის პირობები;
3. ამ ბრძანების პირველი პუნქტით გათვალისწინებული გარემოსდაცვითი გადაწყვეტილება გაიცეს განუსაზღვრელი ვადით;
4. ძალადაკარგულად გამოცხადდეს „შპს „მედიკალ ტექნოლოგი“-ს ნარჩენების განთავსების (ინსინერაცია) საწარმოს მოწყობასა და ექსპლუატაციაზე ეკოლოგიური ექსპერტიზის დასკვნის დამტკიცების შესახებ“ საქართველოს გარემოსა და ბუნებრივი რესურსების დაცვის მინისტრის 2015 წლის 30 დეკემბრის №ი-1037 ბრძანება;
5. გარემოსდაცვითი გადაწყვეტილების სხვა პირზე გადაცემის შემთხვევაში გარემოსდაცვითი გადაწყვეტილების გადაცემა განახორციელოს „გარემოსდაცვითი შეფასების კოდექსით“ დადგენილი წესით;
6. ბრძანება დაუყოვნებლივ გაეგზავნოს შპს „მედიკალ ტექნოლოგის“;
7. ბრძანება ძალაში შევიდეს შპს „მედიკალ ტექნოლოგის“ მიერ ამ ბრძანების გაცნობისთანავე;
8. ბრძანების გაცემიდან 3 დღის ვადაში აღნიშნული ბრძანება განთავსდეს სამინისტროს ოფიციალურ ვებგვერდზე;
9. ეს ბრძანება შეიძლება გასაჩივრდეს თბილისის საქალაქო სასამართლოს ადმინისტრაციულ საქმეთა კოლეგიაში (თბილისი, დ. აღმაშენებლის ხეივანი, მე-12 კმ. N6) მხარის მიერ მისი ოფიციალური წესით გაცნობის დღიდან ერთი თვის ვადაში.

ლევან დავითაშვილი



მინისტრი



საქართველოს გაეროს ღაცვისა და სოფლის მეურნეოგის მინისტრი

ბრძანება N 2-1261

31/12/2020

ქ. თბილისი

შპს „მედიკალ ტექნოლოგის“ ნარჩენების აღდგენის და განთავსების (ნარჩენების გაუვნებელყოფა-დეტოქსიკაცია, ვერცხლისწყლის შემცველი ნარჩენების დემერკურიზაცია და გამოყენებული ზეთების რეგენერაცია) საწარმოს ექსპლუატაციაზე გადაწყვეტილების გაცემის შესახებ

2020 წლის 10 დეკემბერს სამინისტროს მომართა შპს „მედიკალ ტექნოლოგის“ დირექტორმა და ითხოვა გარემოსდაცვითი გადაწყვეტილების მიღება.

2017 წელს საქართველოს გარემოსა და ბუნებრივი რესურსების დაცვის სამინისტროს მიერ შპს „მედიკალ ტექნოლოგის“ ნარჩენების აღდგენასა და განთავსებაზე (ნარჩენების გაუვნებელყოფა-დეტოქსიკაცია, ვერცხლისწყლის შემცველი ნარჩენების დემერკურიზაცია და გამოყენებული ზეთების რეგენერაცია) გაიცა №4 (11.01.2017) ეკოლოგიური ექსპერტიზის დასკვნა და გარემოზე ზემოქმედების ნებართვა.

„გარემოსდაცვითი შეფასების კოდექსის“ 48-ე მუხლის მე-4 ნაწილის თანახმად, პირი, რომელზედაც 2018 წლის 1 იანვრამდე გზმ-ის სფეროში გაცემულია შესაბამისი აღმჭურველი ადმინისტრაციულ-სამართლებრივი აქტი, ვალდებულია 2021 წლის 1 იანვრამდე, განცხადების საფუძველზე მოითხოვოს გარემოსდაცვითი გადაწყვეტილების გაცემა. სამინისტრო აღნიშნული აღმჭურველი ადმინისტრაციულ-სამართლებრივი აქტის საფუძველზე, ამ კოდექსით გარემოსდაცვითი გადაწყვეტილების გაცემისთვის განსაზღვრული პროცედურების გარეშე, მარტივი ადმინისტრაციული წარმოების წესით გასცემს გარემოსდაცვით გადაწყვეტილებას.

აღნიშნულის გათვალისწინებით მომზადდა მინისტრის ბრძანების პროექტი, რომლის შესაბამისად გარემოსდაცვითი გადაწყვეტილება გაიცემა 2017 წლის 11 იანვრის №4 ეკოლოგიური ექსპერტიზის დასკვნის საფუძველზე და საქმიანობის განმახორციელებელს დაეკისრება ვალდებულება, უზრუნველყოს გარემოსდაცვითი გადაწყვეტილებით განსაზღვრული პირობების შესრულება.

ამავდროულად ძალადაკარგულად ცხადდება „ნარჩენების აღდგენის და განთავსების (ნარჩენების გაუვნებელყოფა-დეტოქსიკაცია, ვერცხლისწყლის შემცველი ნარჩენების დემერკურიზაცია და გამოყენებული ზეთების რეგენერაცია) საწარმოს ექსპლუატაციაზე გარემოზე ზემოქმედების ნებართვის გაცემის შესახებ“ საქართველოს გარემოსა და ბუნებრივი რესურსების დაცვის მინისტრის 2017 წლის 13 იანვრის №ი-14 ბრძანება, თუმცა აღნიშნული გარემოსდაცვითი გადაწყვეტილებით იურიდიულ ძალას ინარჩუნებს

2017 წლის №4 ეკოლოგიური ექსპერტიზის დასკვნა, რომელიც დანართის სახით თან დაერთვება მოცემულ გადაწყვეტილებას.

ზემოაღნიშნული გარემოებებისა და „გარემოსდაცვითი შეფასების კოდექსის“ 48-ე მუხლის მე-4 ნაწილის საფუძველზე,

ვ ბ რ ძ ა ნ ე ბ ა:

1. შპს „მედიკალ ტექნოლოგის“ ნარჩენების აღდგენის და განთავსების (ნარჩენების გაუვნებელყოფა-დეტოქსიკაცია, ვერცხლისწყლის შემცველი ნარჩენების დემერკურიზაცია და გამოყენებული ზეთების რეგენერაცია) საწარმოს ექსპლუატაციაზე გაიცეს გარემოსდაცვითი გადაწყვეტილება თანდართული ეკოლოგიური ექსპერტიზის დასკვნის საფუძველზე (დასკვნა №4; 11.01.2017);
2. გარემოსდაცვითი გადაწყვეტილების მფლობელი ვალდებულია დაიცვას თანდართული ეკოლოგიური ექსპერტიზის დასკვნის პირობები;
3. ამ ბრძანების პირველი პუნქტით გათვალისწინებული გარემოსდაცვითი გადაწყვეტილება გაიცეს განუსაზღვრელი ვადით;
4. ძალადაკარგულად გამოცხადდეს „ნარჩენების აღდგენის და განთავსების (ნარჩენების გაუვნებელყოფა-დეტოქსიკაცია, ვერცხლისწყლის შემცველი ნარჩენების დემერკურიზაცია და გამოყენებული ზეთების რეგენერაცია) საწარმოს ექსპლუატაციაზე გარემოზე ზემოქმედების ნებართვის გაცემის შესახებ“ საქართველოს გარემოსა და ბუნებრივი რესურსების დაცვის მინისტრის 2017 წლის 13 იანვრის №ი-14 ბრძანება;
5. გარემოსდაცვითი გადაწყვეტილების სხვა პირზე გადაცემის შემთხვევაში გარემოსდაცვითი გადაწყვეტილების გადაცემა განხორციელდეს „გარემოსდაცვითი შეფასების კოდექსით“ დადგენილი წესით;
6. ბრძანება დაუყოვნებლივ გაეგზავნოს შპს „მედიკალ ტექნოლოგის“;
7. ბრძანება ძალაში შევიდეს შპს „მედიკალ ტექნოლოგის“ მიერ ამ ბრძანების გაცნობისთანავე;
8. ბრძანების გაცემიდან 5 დღის ვადაში აღნიშნული ბრძანება განთავსდეს სამინისტროს ოფიციალურ ვებგვერდზე;
9. ბრძანება შეიძლება გასაჩივრდეს თბილისის საქალაქო სასამართლოს ადმინისტრაციულ საქმეთა კოლეგიაში (თბილისი, დ. აღმაშენებლის ხეივანი, მე-12 კმ. N6) მხარის მიერ მისი ოფიციალური წესით გაცნობის დღიდან ერთი თვის ვადაში.

ლევან დავითაშვილი



მინისტრი

**Annex: 8: Preconstruction Ecological and Cultural Heritage Survey Audit Report of GARP
Lot-2**

North-South Corridor (Kvesheti-Kobi) Road Project,
Georgia – Gudauri Access Road



**Within the framework of the North-South Corridor (Kvesheti-Kobi)
road project, the construction project of the approximately 5 km
long access road to Gudauri**

Pre-construction ecological audit

2024

North-South Corridor (Kvesheti-Kobi) Road Project,
Georgia – Gudauri Access Road

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North–South Corridor (Kvesheti–Kobi) Road Project,
Georgia – Gudauri Access Road

1 Introduction

This document concerns the pre-construction ecological audit of the construction corridor selected for the construction of the approximately 5 km long access road to Gudauri within the framework of the North-South Corridor (Kvesheti-Kobi) road project, where the current (pre-construction) environmental conditions are described, which in turn includes:

- determination of climatic conditions
- study of existing geological and hydrogeological conditions within the territory
- Biodiversity research and study of existing habitats
- Study of the top soil layer within the territory
- Assessment of cultural heritage in the project road buffer
- Determination of social conditions
- Waste management

An unmanned aerial vehicle reconnaissance of the project buffer took place within the territory.

The document is prepared by permanent branch of the 23rd Bureau Group of China Railway Company.

Within the territory, field work was carried out in the autumn season of 2023.

The purpose of this environmental audit is to describe and assess the environmental conditions in the project area before the start of construction in order to identify specific environmental risks tailored to the site and manage them appropriately during the construction process, in compliance with national and international regulations (see paragraph 2). Based on the above, a strategy for mitigating the negative impact on the environment of the natural, social and cultural heritage and monitoring issues will be developed in the form of separate plans.

2 Basic legislative framework

2.1 National legislation and normative requirements in the field of environmental protection

In this paragraph, it is reviewed the national and international legal framework, including standards and strategic documents, which should be taken into account during the implementation of the project in the context of the protection of individual components of the environment.

National legislation and normative requirements in the field of environmental protection

In Georgia, the Ministry of Environment and Agriculture and the legal entity of public law included in the system of the Ministry - "National Environment Agency" (NEA) are responsible for the regulation of the natural environment. The Ministry participates in the development of the state environmental policy and implements all policies intended for environmental protection, conservation, sustainable use and management of Georgia's natural resources. This includes controlling activities that may have a negative impact on the environment and natural resources.

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Georgia's legislation includes the Constitution, Environmental Laws, International Agreements, By-law, Normative Acts, Presidential Orders and Government Decrees, Instructions and Rules. In parallel with the national rules, Georgia has signed a number of international conventions, including those related to environmental protection.

Environmental protection legislation of Georgia is based on existing international concepts and criteria. The main parts of the legislation related to environmental protection are:

Law of Georgia "On Environmental Protection" (Framework Law): The law regulates legal relations between state authorities and natural and legal persons in the field of environmental protection and nature use in the entire territory of Georgia, including its territorial waters, airspace, continental shelf and special economic zone. The law deals with environmental education, environmental management, economic sanctions, licensing, standards, environmental impact assessment and related issues.

The main objectives of the law are to promote the preservation of biological diversity, rare, endemic and endangered species of flora and fauna characteristic of the country, protection of the marine environment and ensuring ecological balance.

Law of Georgia "Environmental Assessment Code". The Code regulates issues related to such strategic documents and public or private activities, the implementation of which may have a significant impact on the environment, human life and/or health. The scope of regulation of the Code includes procedures for environmental impact assessment, strategic environmental assessment, cross-border environmental impact assessment, public participation in the relevant decision-making process, and conducting expertise.

According to Annex I of the Code, the construction of a highway of international or domestic significance.

Reconstruction and/or modernization of a highway of international or domestic importance, the total length is 5 kilometers or more than 5 kilometers.

Construction of a tunnel and/or bridge located on a highway of international or domestic importance.

According to Annex II: arrangement of intra-river road;

According to these parameters of the Gudauri connecting project road in question, the construction-operation of the project does not belong to the scope of regulation of the Environmental Assessment Code.

Law of Georgia "On Animality". The main purpose of the law is to ensure the protection and restoration of the animal world, its habitat, preservation of species diversity and genetic resources, stability and creation of conditions for sustainable development, taking into account the interests of present and future generations. The purpose of Anon is also to provide legal protection of the animal world (including in-situ and ex-situ conservation, translocation and reproduction of the animal world) and the state regulation of the use of the animal world objects.

Law of Georgia "Forest Code of Georgia". The purpose of the Code is to protect the biodiversity of the forest of Georgia, to maintain and improve its qualitative characteristics, as well as the quantitative and qualitative characteristics of the forest resources, in order to fulfill the ecological, social and economic functions of the forest. The code also defines the main principles of forest management, which should be based on sustainable forest management.

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Law of Georgia "On the System of Protected Areas". The law determines the objectives of planning, selection of categories, establishment and functioning of each protected area system in the territory of Georgia. Defines the categories of protected areas (national parks, nature reserves, natural monuments, restricted, protected landscape, multiple-use sites) and establishes a framework for actions allowed in these areas.

Law of Georgia "On the "Red List" and "Red Book" of Georgia". The law regulates legal relations in the field of drawing up the "Red List" and "Red Book" of Georgia, protection and use of endangered species. The main goal of the law is to ensure the protection and recovery of endangered species common on the territory of Georgia, preservation of species diversity and genetic resources, sustainability and creation of conditions for their sustainable development.

Law of Georgia "On Soil Protection". The purpose of the law is to ensure the integrity of soil cover, growth and maintenance of fertility. The document defines the duty and responsibility of land users, landowners and the state to protect the soil and create conditions for the production of ecologically clean products. In order to ensure human health, to protect the plant cover and the animal world, the natural environment in general, this law establishes the norms and standards of the maximum allowable concentrations of harmful substances in the soil.

Law of Georgia "On Water". The purpose of the law is to ensure the implementation of a unified state policy in the field of water protection and use. Also ensure the protection of water bodies and rational use of water resources, taking into account the interests of present and future generations and the principles of sustainable development. The law also regulates the basic legal relationship a) between state authorities and physical and legal entities in the field of water protection, study and use.

Law of Georgia "On protection of Atmospheric Air". This sphere regulation of regulation of the law is the protection of atmospheric air in the entire territory of Georgia from harmful anthropogenic influences. The purpose of the law is to ensure the protection of one of the main components of the environment – atmospheric air, in accordance with the ecological and economic interests of society and taking into account interests of current and future generations. The emission of harmful substances into the atmospheric air is regulated by the same law.

Law of Georgia "On Cultural Heritage". The purpose of the law is to protect the cultural heritage of Georgia and regulate the legal relations arising in this field.

Law of Georgia "Waste Management Code". The purpose of the Code is to create a legal basis in the field of waste management for the implementation of such measures that will contribute to the prevention of waste and the increase of their reuse, the processing of waste in an environmentally safe way. The purpose of the code is to protect the environment and human health by preventing or reducing the generation of waste and their negative impact. According to the Code, an individual or a legal entity, whose activities generate more than 200 tons of non-hazardous waste or any amount of hazardous waste or in the case of an individual - more than 1,000 tons of inert waste, and in the case of a legal entity - more than 400 tons of inert waste, is obliged to develop and To agree with the Ministry on the waste management plan of the company.

The list of the main environmental normative documents related to the planned activity is presented in table 2.1.1.

Table 2.1.1. Basic normative documents in the field of environmental protection

North-South Corridor (Kvesheti-Kobi) Road Project,
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Date of receiving	Name of normative document	Registration code
31/12/2013	<u>Resolution No. 425 of the Government of Georgia.</u> Technical regulation - "On protection of surface waters of Georgia from pollution".	300160070.10.003.017650
31/12/2013	<u>Resolution No. 435 of the Government of Georgia.</u> Technical regulation - "instrumental method of determining the actual amount of emission from stationary sources of pollution into the atmospheric air, the standard list of special measuring and control equipment for determining the actual amount of emission from stationary sources of pollution into the atmospheric air, and calculation methodology of the actual amount of emission into the atmospheric air from stationary sources of pollution according to technological processes".	300160070.10.003.017660
31/12/2013	<u>Resolution No. 415 of the Government of Georgia.</u> Technical regulation - "Soil fertility level determination" and "Soil conservation and fertility monitoring" provisions.	300160070.10.003.017618
31/12/2013	<u>Resolution No. 424 of the Government of Georgia.</u> Technical regulation - "On the removal, storage, use and recultivation of the fertile soil layer".	300160070.10.003.017647
31/12/2013	<u>Resolution of the Government of Georgia No. 440</u> Technical regulations - about the water protection zone	300160070.10.003.017640
31/12/2013	<u>Resolution of the Government of Georgia No. 408</u> Technical regulations for the calculation of the norms of marginally permissible emission of harmful substances into the ambient air	300160070.10.003.017622
03/01/2014	<u>Resolution No. 8 of the Government of Georgia.</u> Technical regulation - "On protection of atmospheric air in adverse meteorological conditions".	300160070.10.003.017603
03/01/2014	<u>Resolution No. 17 of the Government of Georgia.</u> Environmental technical regulations.	300160070.10.003.017608
06.01.2014	<u>Resolution No. 42 of the Government of Georgia.</u> Technical regulation of inventory of stationary sources of atmospheric air pollution	300160070.10.003.017588
17/02/2015	<u>Resolution No. 61 of the Government of Georgia.</u> "Rule of implementation of state control by the environmental supervision department of the state sub-agency institution of the Ministry of Environment and Natural Resources Protection of Georgia".	040030000.10.003.018446
04/08/2015	<u>Order No. 211 of the Minister of Environment and Natural Resources Protection of Georgia</u> Technical regulation - "Rules for reviewing and agreeing on the company's waste management plan".	360160000.22.023.016334
11/08/2015	<u>Resolution No. 422 of the Government of Georgia:</u> "On production of waste accounting, form and content of reporting"	360100000.10.003.018808
17/08/2015	<u>Resolution N426 of the Government of Georgia.</u> Technical regulation - "On determining and classifying the list of waste according to types and characteristics".	300230000.10.003.018812
01/04/2016	<u>Resolution No. 159 of the Government of Georgia:</u> "On the procedure for collecting and processing municipal waste"	300160070.10.003.019224

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29/03/2016	<u>Resolution No. 144 of the Government of Georgia:</u> "On the rules and conditions for registration of waste collection, transportation, preliminary treatment and temporary storage"	360160000.10.003.019209
29/03/2016	<u>Resolution No. 145 of the Government of Georgia:</u> Technical regulation - on special requirements for the collection and processing of hazardous waste"	360160000.10.003.019210
29/03/2016	<u>Resolution No. 143 of the Government of Georgia:</u> Technical regulation - on approval of waste transportation rules	300160070.10.003.019208

International conventions and obligations in the field of environmental protection

- Convention on Wetlands of International Importance, Especially Areas Suitable for Waterfowl Habitat, Ramsar 1971;
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Washington, 1973;
- Convention on the Protection of European Wildlife and Natural Habitats (Bern Convention, 1979);
- Bonn Convention on the Protection of Migratory Species of Wild Animals, 1983;
- Vienna Convention on the Protection of the Ozone Layer, 1985;
- Montreal Protocol on substances that deplete the ozone layer, Montreal, 1987;
- Treaty of European and Mediterranean countries on major disasters, 1987;
- Convention on the Control of Transboundary Shipments of Hazardous Wastes and Their Disposal (Basel Convention, 1989);
- Convention on Biodiversity, Rio de Janeiro, 1992;
- United Nations Framework Convention on Climate Change, New York, 1994;
- United Nations Convention to Combat Desertification, Paris 1994;
- Kyoto Protocol, Kyoto, 1997;
- Convention on access to information related to environmental issues, public participation in the decision-making process and access to justice in this area (Aarhus Convention, 1998)
- Convention on the Protection of European Cultural Heritage;
- Convention on the Protection of European Archaeological Heritage.

3 Project territory description

The ARP comprises a short section of new road, approximately 5 km in length, connecting the KK Project road at Zakatkari interchange with an existing road just south of Gudauri. The road will comprise two lanes, 3.5m in width with a design speed of 60 km per hour. The road is intended to serve as a link between the new KK Project road and the existing road to Gudauri from Tbilisi, thereby avoiding a dangerous set of hairpin turns which currently provide access to Gudauri immediately after Arakhveti, adjacent to the Aragvi river.

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The ARP is a road construction project. The road is in Dusheti municipality, Mtskheta-Mtianeti region. The ARP comprises the Zakatkhari – Gudauri access road and connects the existing road to Zakatkhari where it will join up with the KK Project road which is currently under construction (see drawing N3.1).



Drawing N3.1. Relation of the new 5 km long Gudauri project road to the Kobi-Kvesheti project

As already mentioned, the project road will be organized in Dusheti Municipality, in the territories of Zakatkari, Kaishauri and Seturi villages. The initial section of the project road coincides with 7.75 km of the Kobi-Kvsheti road.

The initial section of the project road, or PK 0 + 0, is located near the village of Zakatkari, the approximate coordinates are: X 460655 Y4698530 H 1607 m. And the final section of PC 4+9 in Seturi village has approximate coordinates: X 458281 Y4700161 H 1870 m. The middle part of the

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access road PK 2+9 meets near the village of Kaishaurni. Approximate coordinates are: X 459606 Y4698719 H 1780 m.

The initial approximately 800 m section of the project road coincides with the meadow-type pasture area, sparsely forested areas, windbreaks and arable land plots. (See Figure N3.1.1) It should be noted that the design road buffer mainly coincides with the existing track/road used for cattle movement and agricultural plots, as well as internal rural roads.



Figure N 3.1.1

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Within the territory, there are mainly herbaceous vegetation, and rarely wooded areas. The section is slightly inclined in the northeast direction, the top soil layer is about 15-25 cm thick. The said section of the project road crosses:

- 110 kV electrical transmission line of "Energo-Pro Georgia" above ground;
- 3 intersections of the underground JSC "Georgian Oil and Gas Corporation" (SNGK) pipeline;
- Overground JSC "Energo-Pro Georgia" 6/10 kV electric transmission line;

The nearest residential house is located 100 meters to the north, in the village of Zakatkari.

The second section of the project road, conditionally divided, is part of a road of about 1000 m, the beginning of which crosses the existing secondary road and goes around the small hill there from the south to the west, where the nearest residential house is located, and follows the right and left sides of the existing road, the area also includes part of the existing road. The area is quite inclined to the south and east. See Figure N3.1.2



Figure N3.1.2

The territory consists mainly of pastures and herbaceous vegetation, sparsely forested areas, which serve as windbreaks. During the field survey here, approximate coordinates X460020 Y4698425, a swallow's nest was observed (See Figure N3.1.3)

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Figure N3.1.3

At the same section, it is worth noting that the project road crosses the lands of the Forestry Fund. The project road with an area of about 80 m² crosses the lands of the Forest Fund, the approximate coordinates are (X459985 Y4697997 H1690). (See Figure N3.1.4) Within the framework of the project road, the mentioned forestry fund crossing is the only one and it does not happen anywhere else.



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Figure N3.1.4

The top soil layer of the soil in the area is fragmented and its thickness does not exceed 10 cm, which in many cases is of low value and mixed with gravel.

The said section of the project road crosses:

- 110 kV electrical transmission line of "Energo-Pro Georgia" above ground;
- 3 intersections of the underground JSC "Georgian Oil and Gas Corporation" (SNGK) pipeline;
- Overground JSC "Energo-Pro Georgia" 6/10 kV electric transmission line;
- 3 intersections of the existing land (Seturebi-Zakatkari road);

The nearest residential house is located 60 meters to the north, village Kaishaurni.

The conditionally divided 3rd section with a length of 1200 meters goes to the elevation in the north of the territory, in the direction of the village of Kaishaurni, which goes around the hill from the north to the west and goes to the arable and pasture areas, which surrounds the village of Kaishaurni. The area is quite sloping in the east and north directions.

Within the mentioned section, there is a grazed area on the slopes of the hill, which then turns into arable land plots and a part of the narrow dirt road near the village of Kaishaurni. (See Figure N3.1.5)



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Figure N3.1.5

In the initial part of the mentioned section, mainly on the slopes, the fertile soil layer is of low value, which is depleted due to grazing and other anthropogenic or natural factors, the maximum thickness is 10 cm. As for the section that corresponds to the agricultural land plots, there is a fertile layer of soil about 15-20 cm thick.

The said section of the project road crosses:

- Overground JSC "Energo-Pro Georgia" 6/10 kV electric transmission line;
- Underground LLC "SOCAR Georgia Gas";
- 2 intersections of the existing dirt road;

The nearest residential house is located next to the buffer of the project road, village Kaishaurni.

The last approximately 1800 m section of the project road coincides with the existing secondary road in the village of Seturi (see Figure N3.1.6) on the right and left sides of which there are residential houses, the area is slightly inclined towards the south-east, there are rarely artificially planted trees and plants, the top soil layer is practically not significant, if we do not consider the places under high anthropogenic influence near the existing road, where the top soil layer is characterized by low value, high degree of exhaustion, in which the gravel content is more than 80%.

The said section of the project road crosses:

- 110 kV electrical transmission line of "Energo-Pro Georgia" above ground;
- Underground JSC "Georgian Oil and Gas Corporation" (SNGK) pipeline;
- Overground JSC "Energo-Pro Georgia" 6/10 kV electric transmission line;

There are many residential houses in the village of Seturi adjacent to the mentioned section.

Within the project area, there is no surface water body, such as a river, lake, or wetland, which could be directly affected by road construction and operation. However, it is worth noting the small gullies on which engineering structures, mainly water pipes, are planned.



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Figure N3.1.6

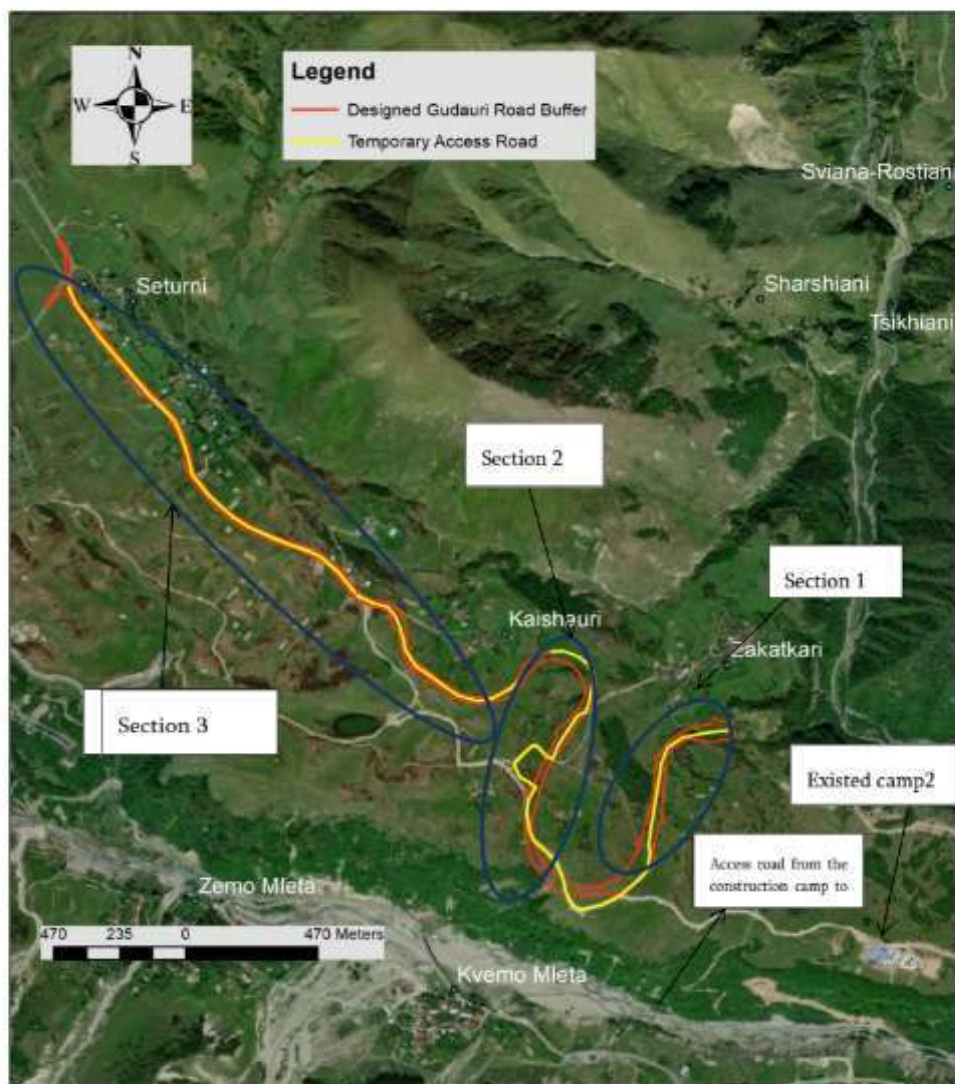
Access roads

The main transportation road for moving to the project areas will be the existing Seturebi-Zakatkari road and its various branches, which are mainly the existing rural roads. The said road follows the entire length of the project corridor and crosses it.

For the transportation of materials and labor needed at the construction stage will also be also used the existing road of Seturebi-Zakatkari. At the beginning of APR construction site 7th kilometer of the KK- road will be used to access the initial section of the project road (the so-called section 1), from where the project Gudauri access road buffer starts and the existing buffer along the access road will be used, the next section, (so-called section 2), from which approximately 30% coincides with or is planned to be adjacent to the existing road, the mentioned Seturebi- Zakatkari road will be used, and the remaining 70% will be accessed by the project road buffer. To the south direction of village Kaishaurni existed construction sites (the so-called section 3) there is a rural road for transportation and the existing seturebi passing through the village of Seturebi is the initial section of the Zakatkari road, see drawing N3.1.2

At this stage, according to the provided scheme, the project does not envisage the arrangement of bridge crossings. Only a short length (about 100-150 m) dirt road may be necessary in the middle section of the road (mainly around the village of Kaishaurni), which will not pass through a terrain of significant difficulty, and therefore the construction of the road does not require extensive works.

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Drawing N3.1.2 ARP buffer zone and access roads

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3.1 Construction equipment required during the construction phase

Table 3.1.1 provides indicative lists of the key equipment required in the construction phase.

No	Equipment Type and Characteristics	Min. Number required	Characteristics
1.	Bulldozer 165 HP	1	SHANTUI SD22 23.45t
2.	Grader 3.7m wide	1	blade*chord 3865*610 GR180
3.	Excavator 95 HP	3	HYUNDAI 220LC-90 HP150
4.	Backhoe loader 50-90 HP	1	XCMG LW160K 1.05m ³
5.	Loader 80-170 HP	2	ZL50GN 3m ³
6.	Articulated truck 250 HP 20 ton	4	HOWO 22.5t
7.	Vibrating roller-roller, 14-18 ton	1	XD133E 13t
8.	Concrete mixer truck	3	HOWO 10m ³
9.	Generator	1	50kw
10.	Generator	1	250kw
11.	watering truck	1	10m ³
12.	Light truck	1	5t
13.	Dump truck	5	20t
14.	Forklift truck	1	liugong 5t

Note: The equipment used in the construction phase may be modified and corrected both their types and numbers by the construction contractor as it will be necessary.

3.2 Organization of construction

According to the preliminary project, the construction period is set at 12 months. During the construction works, 50-60 people will be employed, 70-80 percent of whom are local residents.

The construction will be carried out from the camp N2 and batching plant N2 on the Zakatkari plateau, where the necessary infrastructure and equipment for the construction have already been arranged and mobilized.

The stage of construction works includes the following:

- improvement of access roads (see the previous paragraph);
- Cleaning the territory from the top soil layer and tree vegetation;
- In the design buffer, necessary works for road preparation (territory improvement, leveling, arrangement of slopes and corners, laying of road surface)
- Final works, including the arrangement and reclamation of the territories.

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3.3 Waste management

Taking into account the existing terrain conditions in the project corridor, it is not expected that a large amount of spoil mater will be generated at the construction stage, which will need to be permanently stockpiled. The largest part of the soil generated during the development of the slopes will be used for the purposes of the project (according to the project, it will be necessary to raise the road surface for the pre-opt road), including for the arrangement of the roads, backfilling, filling of various damaged areas and strengthening works, etc. According to preliminary calculations, 92,571.09 m³ of spoil material will be generated during the construction period, and for construction purposes 267 281.95 m³, accordingly, there is no need for permanent stockpiling of spoil within the framework of the construction of the new 5 km long access road to Gudauri.

Spoil management will be implemented in such a way that there is no need for new storage facilities: during construction spoil stockpiles will be stored within ROW, until final reuse.

In the course of construction, before the commencement of construction activities topsoil layer will be removed and stored mainly inside the ROW (right of way), also in case of necessity pre-selected, approved location until reuse during re-cultivation. The table N6 below represents the expected topsoil and its thicknesses inside the planned Gudauri access road.

The volume of the topsoil layer to be removed in m³ (for detail information please refer to top soil management plan):

Table N3.3.1.

Sect	Area ha2	Volume of the top soil m3	Note
1	3.5 ha	7 000 m3	The thickness of the top soil layer is 20 cm
2	1.9/0.76 ha	304 m3	The thickness of the top soil layer is a maximum 10 cm and covers about 40% of the area.
3	1.6/1.12 ha	1680 m3	The thickness of the top soil layer is a maximum of 10-15 cm and covers about 70% of the territory (the buffer of the project road coincides with and crosses the existing secondary roads and their adjacent anthropogenic areas)
4	1.4 ha	2800 m3	The thickness of the top soil layer is 20 cm
5	1.6 ha	640 m3	The thickness of the top soil layer is a maximum of 10 cm and covers about 40% of the area (the access road will be arranged mainly on existing secondary roads and the soil around them is heavily eroded).
6	4 ha	-	The topsoil layer is practically not found, the new access road will be arranged within the existing secondary road, with a slight modification, where the removal of the topsoil layer is unprofitable, the area has a high anthropogenic impact
Sum	14/8.38 ha	12 424 m3	

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As it is already mentioned mainly for storing topsoil will be used right of way (ROW). Topsoil stockpiles will be stored inside the ROW until re-cultivation purposes. Also, in case of necessity, some amount of topsoil will go existing topsoil storage area in Dusheti municipality, village Zakatkhari, with cadastral code: 71.62.56.708. The total area for this selected territory is 11 872 m².

Before the excavation of topsoil, the territory will be re-assessed for the identification of locations and to determine the thickness of the humus layer.

Removal of the topsoil from the source will be carried out carefully, with a bulldozer, excavator with shovel without tines. At the time of excavation, maximum attention will be to minimizing soil compaction and preserving the integrity of the topsoil.

Excavated topsoil will be loaded to the nearest proper place inside the ROW, and at the time of loading maximum attention will be to avoid mixing of topsoil with subsoil. If removed topsoil needs transportation, topsoil material will be loaded on dump trucks using loaders.

At the construction stage of the project, it is expected to generate various types of hazardous and non-hazardous waste, which will be managed according to the pre-agreed waste management and waste management plan.

It should be noted that as a result of the preliminary survey of the project area, the generation of asbestos-containing waste is not expected.

3.4 Final construction works

The final stage of the construction works is the arrangement of the territories and the reclamation of the necessary places. As part of these works, all temporary structures (material storage areas, temporary generators, etc.) will be dismantled, waste will be removed. Damaged areas will be restored during excavation works - trenches, pits will be filled, roads will be repaired. All work areas that are not reclaimed will be topped with pre-removed soil and left in a condition conducive to the re-establishment of natural vegetation, and appropriate drainage and erosion prevention measures will be applied.

Restoration/recultivation of the top soil layer of the project area will be carried out in accordance with the Resolution No. 424 of the Government of Georgia, Technical Regulations - "Removal, storage, use and reclamation of the top soil layer". According to the resolution and the project, it will be agreed with the Ministry of Environment and Natural Resource

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4 Environmental background data

4.1 Pre-construction studies conducted within the territory

Biodiversity survey

The biodiversity pre-construction report given below represents situation as part of the North-South Corridor (Kvesheti-Kobi, Lot 2) road project, of the construction corridor selected for the planned (approximately 5 km long) branch line (road) to Gudauri, which is situated on Plateau territory (surroundings of villages: Zakatkhari, Kaishaurni and Seturebi). For reflecting photo material and location see table N1 below.

Research was done in November month of this year (2023) and it contains field work and relevant review of literature.

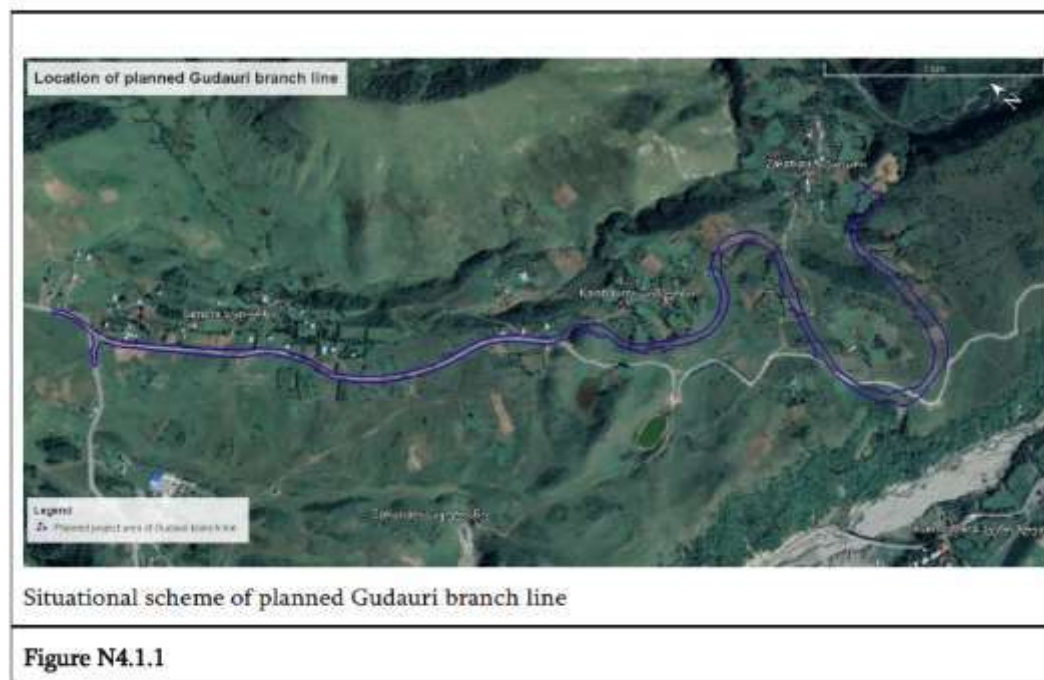
The main aim during field work was to reveal sensitive habitats, identify and inventorize flora, fauna and ornithofauna species.

During the field work it became clear, that selected territory for Gudauri branch line is not sensitive area, there is not any regional red list plant species growing here.



Some views of planned Gudauri branch line project area

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Field work results

Review of literature and field work has shown that planned Gudauri branch line project area is crossing following habitats, which according from EUNIS classification is:

- E5.1 Anthropogenic herb stands + F2.3 Subalpine deciduous scrub (see reflecting photo material in table N2)
- J – Constructed, industrial and other artificial habitats
- G – Broadleaf forest

This mentioned habitats is characterizing as follows:

E5.1 Anthropogenic herb stands – Stands of herbs developing on abandoned urban or agricultural land, on land that has been reclaimed, on transport networks, or on land used for waste disposal.

F2.3 Subalpine deciduous scrub – Subalpine scrubs of [Alnus], [Betula], [Salix] and Rosaceae ([Amelanchier], [Potentilla], [Rubus], [Sorbus]), less than 5 m tall, often accompanied by tall herbs that in the absence of scrub would be classified as E5.5. Excludes dwarf [Salix] scrub (F2.1), which is composed of species that rarely exceed 1.5 m in height, and scrub on waterlogged soils (F9.2).

J constructed, industrial and other artificial habitats – according to project zone this habitat is mainly represented with secondary roads, village surroundings and its ruderal vegetation

G Broadleaf forest – mainly represented with: European ash, Caucasus apple, European hornbeam, common hazel, common medlar and etc. See taxation description below:

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მათ შორის ჯიშების მიხედვით	საქმისი მერქანი (ლიკვიდი) სულ	შემა ვარჯიდან სულ	I ხარისხი სულ	II ხარისხი სულ	სულ		
ალვის ხე - <i>Populus pyramidalis</i>	4.51	0.451		4.961	4.961		
არყი - <i>Betula litwinowii</i>	0.24	0.024		0.264	0.264		
ბალი - <i>Prunus avium</i>	1.84	0.184		2.024	2.024		
ვაშლი - <i>Malus domestica</i>	10.41	1.041		11.451	11.451		

მათ შორის ჯიშების მიხედვით	საქმისი მერქანი (ლიკვიდი) სულ	შემა ვარჯიდან სულ	I ხარისხი სულ	II ხარისხი სულ	სულ		
ალვის ხე - <i>Populus pyramidalis</i>	4.51	0.451		4.961	4.961		
არყი - <i>Betula litwinowii</i>	0.24	0.024		0.264	0.264		
ბალი - <i>Prunus avium</i>	1.84	0.184		2.024	2.024		
ვაშლი - <i>Malus domestica</i>	10.41	1.041		11.451	11.451		
ვერხვი - <i>Populus hybrida</i>	48.91	4.891		53.801	53.801		
თხილი - <i>Corylus avellana</i>	0.02	0.002		0.022	0.022		
თხმელა - <i>Alnus barbat</i>	0.66	0		0.66	0.66		
იფანი - <i>Fraxinus excelsior</i>	0.31	0.031		0.341	0.341		
მდგნალი - <i>Salix caprea</i>	14.18	1.418		15.598	15.598		
მუხა ქართული - <i>Quercus iberica</i>	2.9	0.29		3.19	3.19		
პანტა - <i>Pyrus caucasica</i>	13.14	1.314		14.454	14.454		
რეხილა - <i>Carpinus caucasica</i>	0.94	0.094		1.034	1.034		
ტირიფი - <i>Salix caprea</i>	0.75	0.075		0.825	0.825		
ტყემალი - <i>Prunus cerasifera</i>	1.16	0.116		1.276	1.276		

Plant species on state land

მათ შორის ჯიშის (სახეობა) მიხედვით	ხეობა რაოდენობა	ხის ღეროს მოცულობა- კბ. მ	შემა ვარჯიდან- კბ. მ	სულ ხის მოცულობა- კბ. მ	შენიშვნა
ვაშლი - <i>Malus domestica</i>	7	0.29	0.029	0.319	
იფანი - <i>Fraxinus excelsior</i>	2	0.08	0.008	0.088	
რეხილა - <i>Carpinus caucasica</i>	9	0.37	0.037	0.407	
ვერხვი - <i>Populus hybrida</i>	1	0.03	0.003	0.033	

N	სახეობა (ჯიში)	ხეობა რაოდენობა	გასაღებში მერქანი
1	ზღმარტლი - <i>Mespilus germanica</i>	10	0.01
2	თხილი - <i>Corylus avellana</i>	100	0.1
3	ვაშლი - <i>Malus domestica</i>	10	0.01
4	მუხა ქართული - <i>Quercus iberica</i>	25	0.025

Plant species in forest fond

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In case of tree inventory there has been prepared taxation materials and has been send to relevant agency. Mainly at Gudauri access road there is state land territories and small part of forest fond area (See appendix N1).

Below in tables are given each habitats plant consistence.

Table N4.1.1

Habitat type: E5.1 Anthropogenic herb stands + F2.3 Subalpine deciduous scrub Whole vegetation coverage in the selected area: 20%			
Scientific name of species	Species coverag e (%)	Red list of Georgia status	IUCN red list status
<i>Salix caprea</i>	1	-	LC
<i>Malus orientalis</i>	2	-	DD
<i>Pyrus caucasica</i>	2	-	-
<i>Corylus avellana</i>	1	-	LC
<i>Cerasus sylvestris</i>	+	-	-
<i>Pimpinella rhodantha</i>	1	-	-
<i>Crataegus kyrtostylla</i>	+	-	-
<i>Prunus divaricata</i>	1	-	LC

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<i>Sorbus caucasigena</i>	+	-	-
<i>Centaurea sp.</i>	1	-	-
<i>Daucus sp.</i>	1	-	-
<i>Rosa canina</i>	1	-	LC
<i>Urtica dioica</i>	2	-	LC
<i>Euphorbia sp.</i>	2	-	-
<i>Leucanthemum vulgare</i>	3	-	-
<i>Scabiosa sp.</i>	2	-	-
<i>Lotus corniculatus</i>	3	-	-
<i>Cichorium intybus</i>	2	-	LC
<i>Carex sp.</i>	3	-	-
<i>Ranunculus repens</i>	2	-	LC
<i>Trifolium pratense</i>	2	-	LC
IUCN – International Union for Conservation of Nature			
LC – Least concern			
DD – Data deficient			

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Table N 4.1.2

Habitat type: J constructed, industrial and other artificial habitats <u>Whole vegetation coverage in the selected area:</u> 5%			
Scientific name of species	Species coverag e (%)	Red list of Georgia status	IUCN red list status
<i>Pyrus caucasica</i>	2	-	-
<i>Corylus avellana</i>	1	-	LC
<i>Crataegus kyrtostylla</i>	+	-	-
<i>Prunus divaricata</i>	1	-	LC
<i>Urtica dioica</i>	2	-	LC
<i>Euphorbia sp.</i>	2	-	-
<i>Leucanthemu m vulgare</i>	3	-	-
<i>Scabiosa sp.</i>	2	-	-
<i>Lotus corniculatus</i>	3	-	-
<i>Cichorium intybus</i>	2	-	LC

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<i>Carex sp.</i>	3	-	-
IUCN – International Union for Conservation of Nature			
LC – Least concern			
DD – Data deficient			

Table N 4.1.3

<u>Habitat type:</u> G Broadleaf forest <u>Whole vegetation coverage in the selected area:</u> 20%			
Scientific name of species	Species coverage (%)	Red list of Georgia status	IUCN red list status
<i>Salix caprea</i>	1	-	LC
<i>Fraxinus excelsior</i>	1	-	NT
<i>Carpinus betulus</i>	1	-	LC
<i>Quercus iberica</i>	1	-	-
<i>Populus pyramidalis</i>	2	-	DD
<i>Populus hybridae</i>	1	-	-
<i>Betula litwinowii</i>	1	-	-

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<i>Malus orientalis</i>	2	-	DD
<i>Pyrus caucasica</i>	2	-	-
<i>Corylus avellana</i>	1	-	LC
<i>Prunus divaricata</i>	1	-	LC
<i>Urtica dioica</i>	2	-	LC
IUCN – International Union for Conservation of Nature			
LC – Least concern			
DD – Data deficient			

More than 35 species of mammals, up to 20 bats, up to 180 birds, 10 reptiles, 6 amphibians, mollusks and various invertebrates (more than 500 specie) have been identified in and around the whole project corridor.

Mammals

According to the available sources and the characteristics of the habitats, the list of mammal species in the project area is given below in table N4.1.4

Table N4.1.4. Mammal species for selected area.

Scientific name of species	Protection status	
	IUCN red list status	Red list of Georgia status
<i>Apodemus mystacinus</i>	LC	-
<i>Canis aureus</i>	LC	-
<i>Canis lupus</i>	-	-
<i>Capreolus capreolus</i>	LC	-
<i>Chionomys roberti</i>	LC	-
<i>Crocidura gueldenstaedti</i>	LC	-
<i>Crocidura leucodon</i>	LC	-

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<i>Dryomys nitedula</i>	LC	-
<i>Erinaceus concolor</i>	LC	-
<i>Felis silvestris</i>	-	-
<i>Glis glis</i>	LC	LC
<i>Lepus europeus</i>	LC	-
<i>Lynx lynx</i>	LC	CR
<i>Martes martes</i>	LC	-
<i>Meles meles</i>	LC	-
<i>Microtus arvalis</i>	LC	-
<i>Microtus socialis</i>	LC	-
<i>Mus musculus</i>	LC	-
<i>Mustela nivalis</i>	LC	-
<i>Rattus norvegicus</i>	LC	-
<i>Rattus rattus</i>	LC	-
<i>Sciurus anomalus</i>	LC	VU
<i>Sciurus vulgaris</i>	LC	-
<i>Sorex satunini</i>	LC	-
<i>Sorex volnuchini</i>	LC	-
<i>Sus scopa</i>	LC	-
<i>Sylvaemus uralensis</i>	LC	-
<i>Talpa caucasica</i>	LC	-
<i>Talpa levantis</i>	LC	-
<i>Terricola majori</i>	LC	-
<i>Ursus arctos</i>	LC	EN
<i>Vulpes vulpes</i>	LC	-

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IUCN – International Union for Conservation of Nature

LC – Least concern

DD – Data deficient

EN – Endangered

VU – Vulnerable

CR – Critically endangered

As its visible from table N4.1.4 in the area is spread 4 specie protected of Regional red list of Georgia, although it doesn't mean that this species are living here and they have constant living places here. Listed species (*Glis glis*, *Lynx lynx*, *Sciurus anomalus*, *Ursus arctos*) are using selected area as place for migration.

Bats

According to the literature sources and according to a previous field study, 17 species of bats are found in the study corridor and surrounding areas. All of these species may be appear in the project area over a period of time.

The list of possible bat species in and around the project area is given below in table N4.1.5

Table N4.1.5. Bats

Scientific name of species	Protection status	
	IUCN red list status	Red list of Georgia status
<i>Eptesicus nilssonii</i>	LC	-
<i>Eptesicus serotinus</i>	LC	-
<i>Hypsugo savii</i>	LC	-
<i>Myotis blythii</i>	LC (global)/NT (europe)	-
<i>Myotis mystacinus</i>	LC	-
<i>Myotis nattereri</i>	LC	-
<i>Nyctalus lasiopterus</i>	VU	-
<i>Nyctalus leisleri</i>	LC	-
<i>Nyctalus noctula</i>	LC	-
<i>Pipistrellus kuhlii</i>	LC	-

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<i>Pipistrellus nathusii</i>	LC	-
<i>Pipistrellus pipistrellus</i>	LC	-
<i>Pipistrellus pygmaeus</i>	LC	-
<i>Plecotus auratus</i>	LC	-
<i>Rhinolophus ferrumequinum</i>	LC	-
<i>Rhinolophus hipposideros</i>	LC	-
<i>Vespertilio murinus</i>	LC	-
IUCN – International Union for Conservation of Nature LC – Least concern NT – Near threatened Note: All species of bats listed here are included in Annex II to the Bonn Convention and are protected by the EUROBATS Agreement. According to this agreement, Georgia is obliged to protect all species observed in and near the project area.		

Reptiles

The study area is not rich by the diversity of reptiles and the level of endemism. In the project area or near it can exist/appear of 10 species of reptiles.

The list of reptile species in and around the project area is given below in table N4.1.6

Table N4.1.6 Reptiles

Scientific name of species	Protection status	
	IUCN red list status	Red list of Georgia status
<i>Anguis colchica</i>	LC	-
<i>Coronella austriaca</i>	LC	-
<i>Darevskia caucasica</i>	-	-
<i>Darevskia derjugini</i>	NT	-
<i>Darevskia rudis</i>	LC	-
<i>Lacerta media</i>	LC	-

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<i>Lacerta strigata</i>	LC	-
<i>Natrix natrix</i>	LC	-
<i>Natrix tessellata</i>	LC	-
<i>Vipera dinniki</i>	EN	EN
IUCN – International Union for Conservation of Nature LC – Least concern EN – Endangered		

Only one of the listed species is protected by the Regional (Georgian) red list. It should be noted that although habitat in the project area is acceptable for this specie, its arrival (*Vipera dinniki*) at work site is not expected as it normally avoids areas under anthropogenic load.

Aves

According to various sources, out of 403 species of birds in Georgia, about 180 species of birds is spread in the project area. Out of this, 35 species were also observed during the field survey. Most of the recorded birds are species related to shrubs, rocks, fields and water. This applies to both resident and nesting birds.

It's notable that the project area is not an important bird area (IBA) and / or a special bird protected area (SPA) whose function is to protect and monitor bird nesting populations in Georgia. Also, its important that no nests were observed in the selected project area.

The list of aves species in and around the project area is given below in table N4.1.7

Table N4.1.7 Aves

Scientific name of species	Seasonality of migration	Protection status	
		IUCN red list status	Red list of Georgia status
<i>Accipiter brevipes</i>	BB,M	LC	VU
<i>Accipiter gentilis</i>	M	LC	-
<i>Accipiter nisus</i>	YR-R	LC	-
<i>Aegithalos caudatus</i>	YR-R	LC	-
<i>Alauda arvensis</i>	M	LC	-
<i>Anthus cervinus</i>	M	LC	-

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<i>Anthus trivialis</i>	BB	LC	-
<i>Apus apus</i>	BB	LC	-
<i>Aquila nipalensis</i>	M	EN	-
<i>Buteo buteo</i>	YR-R, M	LC	-
<i>Buteo rufinus</i>	YR-R, M	LC	VU
<i>Carduelis carduelis</i>	YR-R	LC	-
<i>Carduelis chloris</i>	YR-R	LC	-
<i>Carpodacus erythrinus</i>	BB	LC	-
<i>Certhia familiaris</i>	M	LC	-
<i>Clanga clanga</i>	WV, M	VU	VU
<i>Clanga pomarina</i>	BB,M	LC	
<i>Columba livia</i>	YR-V	LC	-
<i>Columba oenas</i>	M	LC	-
<i>Columba palumbus</i>	M	LC	-
<i>Corvus corax</i>	YR-V	LC	-
<i>Corvus corone</i>	YR-R	LC	-
<i>Crex crex</i>	BB	LC	-
<i>Cuculus canorus</i>	BB	LC	-
<i>Delichon urbicum</i>	YR-V	LC	-
<i>Dendrocopos leucotos</i>	YR-R	LC	-
<i>Dendrocopos major</i>	YR-R	LC	-
<i>Dryobates minor</i>	YR-R	LC	-
<i>Emberiza cia</i>	YR-R	LC	-
<i>Erithacus rubecula</i>	YR-R	LC	-
<i>Falco columbarius</i>	M	LC	-

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<i>Falco peregrinus</i>	YR-R, M	LC	-
<i>Falco tinnunculus</i>	M	LC	-
<i>Fringilla coelebs</i>	YR-R	LC	-
<i>Fringilla montifringilla</i>	WV	LC	-
<i>Galerida cristata</i>	M	LC	-
<i>Garrulus glandarius</i>	YR-R	LC	-
<i>Grus grus</i>	BB, M	LC	EN
<i>Haliaeetus albicilla</i>	YR-R	LC	EN
<i>Hippolais caligata</i>	M	LC	-
<i>Hirundo rustica</i>	BB,M	LC	-
<i>Ixobrychus minutus</i>	BB, M	LC	-
<i>Jynx torquilla</i>	BB	LC	-
<i>Lanius collurio</i>	BB,M	LC	-
<i>Lanius minor</i>	M	LC	-
<i>Leopipicus medius</i>	YR-R	LC	-
<i>Luscinia luscinia</i>	BB,M	LC	-
<i>Luscinia megarhynchos</i>	BB	LC	-
<i>Miliaria calandra</i>	BB	LC	-
<i>Milvus migrans</i>	M	LC	-
<i>Monticola saxatilis</i>	BB	LC	-
<i>Motacilla alba</i>	YR-R	LC	-
<i>Motacilla cinerea</i>	M	LC	-
<i>Motacilla flava</i>	M	LC	-
<i>Muscicapa striata</i>	BB, M	LC	-
<i>Neophron percnopterus</i>	BB,M	EN	VU

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<i>Oenanthe oenanthe</i>	BB, M	LC	-
<i>Oriolus oriolus</i>	M	LC	-
<i>Otus scops</i>	BB	LC	-
<i>Parus ater</i>	YR-R	LC	-
<i>Parus caeruleus</i>	YR-R	LC	-
<i>Parus major</i>	YR-R	LC	-
<i>Passer domesticus</i>	YR-R	LC	-
<i>Passer montanus</i>	M	LC	-
<i>Pernis apivorus</i>	BB,M	LC	-
<i>Petronia petronia</i>	BB, M	LC	-
<i>Phoenicurus ochruros</i>	BB	LC	-
<i>Phoenicurus phoenicurus</i>	BB,M	LC	-
<i>Phylloscopus collybita</i>	BB	LC	-
<i>Phylloscopus trochilus</i>	BB	LC	-
<i>Pica pica</i>	YR-R	LC	-
<i>Porzana porzana</i>	YR-R, M	LC	-
<i>Prunella modularis</i>	BB	LC	-
<i>Pyrhacorax graculus</i>	YR-R	LC	-
<i>Pyrhacorax pyrrhacorax</i>	YR-R	LC	-
<i>Saxicola torquatus</i>	BB	LC	-
<i>Saxicola rubetra</i>	BB	LC	-
<i>Sylvia atricapilla</i>	BB	LC	-
<i>Sylvia communis</i>	BB,M	LC	-
<i>Sylvia nisoria</i>	BB	LC	-
<i>Troglodytes troglodytes</i>	YR-R	LC	-

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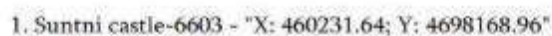
<i>Turdus merula</i>	YR-R	LC	-
<i>Turdus philomelos</i>	M	LC	-
<i>Turdus pilaris</i>	WV,M	LC	-
<i>Turdus viscivorus</i>	M	LC	-
<i>Upupa epops</i>	M	LC	-
IUCN – International Union for Conservation of Nature LC – Least concern EN – Endangered Seasonal period of species life in a given area: YR-R = It nests here in Georgia all year round and multiplies; YR-V = Is a visitor to these areas; Does not multiply, but is here all year round; BB = Enters the area only for breeding; M = Migrant; During migration (autumn and spring) may reach this area			

Cultural heritage survey

There has been conducted surface surveys in case of Gudauri access road.

The bypass construction area passes close to the following cultural heritage objects:

- Suntni castle
- Ruins of backed tower
- Settlement-site in Murghulebi district
- Sameba tower
- Niche of the Virgin and site of former church.



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worked. The tower is preserved only at the level of the first, deaf floor (height - 5.5 m.). Later (17th - 18th centuries) a small chapel built of broken stone, with irregular piles, was built on top of it.

2. Ruins of backed tower-11557 - "X: 460150.20; Y: 4698007.86"



The ruins of the tower and the settlement are located on the Didveli plateau, in the territory of today's Kaishaurni village, in the place "Suntidzebi", to the southwest of the Suntni (Sunti) tower. The building is a dry piled tower of well-lit basalt stones. The tower is preserved as ruins. Only its first, deaf floor has survived. The maximum height of the best preserved wall of the tower is about 1.20-1.50 meters.

3. Settlement-site in Murghulebi district-35073 - "X: 460048.71; Y: 4698599.73"



The remains of the buildings are located in the southeast of Kaishaurni, 20-30 meters to the northeast of the Murghuls' house. Stacks of large stones are fixed on a slightly elevated hill. To the

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south and east of it, the remains of the building wall have been preserved. Flat stones of various sizes of raw rock and in some places large stone boulders were used in the construction. The pile is dry.

4. Sameba tower-11655_Field ID (19) - "X: 460205.31; Y: 4698844.57"



The Tower of the Trinity is located 300 meters east of Kaishaurni Castle, overlooking Zakatkar village and Didveli plateau. The surviving dimensions of the tower of the Trinity are 7.2x4.2 m. It is built with crushed stone, roughly worked basalt, megalithic stones are used for flat walls and corners. The tower is destroyed - only the first floor level remains. The tower is surrounded by settlements on three sides - one terrace on the north and south sides, and three terraces on the east side. The tower must be an early medieval building, which was repaired in later centuries.

5. Niche of the Virgin and site of former church-35074 - "X: 459984.10; Y: 4698649.41"



The building is located 70 meters northwest of the Murghuli house, in the territory of the old Murghuli cemetery. An iron cross with a broken arm is erected in the central part of the cemetery.

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A small niche is arranged with it, the locals refer to it as the niche of the Virgin Mariam. To the north of it, the remains of a rectangular building have been preserved. The walls are built of large, rough-hewn stone boulders, dry piled. The wall thickness is about 0.90 centimeters.

In addition to the cultural heritage objects mentioned above, the survey revealed several suspicious and sensitive places that require special attention during earthworks (photo: 1). During surface survey, ceramic fragments were collected in suspicious places (GPS coordinates: 1- X - 460114; Y- 4698767; 2- X-460037; Y-4697981.) (photo: 2-4), as for the sensitive area (GPS coordinates: 1. X-459683; Y-4698654; 2. X-459802; Y-4698654; 3. X-459953; Y-4698792.). It is notable for its location and terrain, which includes an elevated and specially groomed area. (Photo: 5-7)



1



2

3

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Due to the abundance of cultural heritage objects in the construction area of the said bypass road, it is necessary to be supervised by a cultural heritage expert during earthworks, in case of the appearance of a cultural layer immediately stop the works and start the procedures stipulated by the law. In addition, when using heavy machinery during soil removal, it is necessary to use a toothless, bladed basket in the excavator, so as not to damage the cultural layers during soil removal, and for the supervisor to easily distinguish the normal layer from the cultural one.

Social environment/grievance and dispute resolution

CR23BGC has developed a Grievance Policy which sets out the objectives and process for establishing an effective means by which all primary and secondary stakeholders have recourse to the project for the resolution of a dispute, grievance or complaint.

CR23BGC is committed to ensuring that any dispute, grievance or complaint is dealt with in a fair and objective manner providing in the chapter 8 of SEMP and in the Employee Grievance Redress Mechanism (see below).

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CR23BGC has developed following method for the grievance mechanisms:

When any public grievances are received, these will be managed through a series of steps. In summary, requests for information/complaints will be acknowledged within 5-10 days and, where possible, the information requested will be provided within 10-20 days depending on the complexity of information requested/complaints received.

All grievances will be reflected in a grievance log (see grievance forms bellow) to ensure that each grievance is assigned an individual number and that consistent tracking and corrective actions are carried out. The log will be used to analyse the frequency, as well as for prevailing subjects and any recurrent trend of grievances. The log contains:

- Date when the grievance was received;
- The reference number;
- Content of the grievance;
- Identification of parties responsible for the resolution;
- Dates when the investigation was initiated and completed;
- Findings of the investigation;
- Information on proposed corrective action sent to the person who lodged the grievance (unless it was anonymous) and the date of the response sent; the date when the grievance was closed out;
- Statement of satisfaction of the person who lodged the grievance, or a reason for non-resolution of the grievance.
- Any outstanding actions for non-closed grievances.

All complaint documentation will be kept on a file for a period of two years and then archived. Levels and types of complaints will be monitored by relevant responsible staff from the company.

Where a resolution to the grievance cannot be provided within the timescales specified above, relevant responsible staff from the company will inform complainant about that and once investigations have been completed, contact the person making the grievance to discuss and agree on the resolution. relevant responsible staff from the company may undertake follow-up monitoring to check that the problem does not recur.

CR23BGC 's management and resolution of any grievances will be subject to monitoring by the lender.

Persons lodging grievances will have an opportunity to maintain their confidentiality. CR23BGC will ensure that the name and contact details of the person are not disclosed without their consent and only the team directly working on the investigation of the grievance will be aware of them. In cases when an investigation necessitates passing some of the information on to third parties for the purposes of resolving the situation (e.g. when it is ascertained that the grievance resulted from certain actions by a contractor company), the complainant's agreement will be sought in a due manner. If it is not possible for the team to fully investigate the grievance without revealing the person's identity (for example if they are required to give evidence in court), the investigation team will discuss with the complainant

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how they wish to proceed. The procedure also allows for anonymous complaints to be lodged. In this case the grievance will still be investigated, although CR23BGC will not be able to provide feedback to a complainant.

The procedure is shown graphically in the flow diagram below.



Grievance procedure

(The complainant will be informed if it has been decided to extend the complaint investigation period)

Detail information about local content please refer to Local content management plan.

5 Main conclusions

- The activities discussed in this document provides for the construction and operation of the new Gudauri access road in the Dusheti municipality;
- The construction works will mainly be carried out with the help of existing infrastructure and other resources of CRCC.
- No active geodynamic processes were detected within the project area, however, the contractor company will continuously monitor the geological environment.
- Monitoring principles and detailed information required in the construction process are provided in the form of independent plans. (see item 6 of the same paragraph, list)
- The implementation of the project does not take into account the additional agreement with the Ministry of Environment and Agriculture;
- The following specific plans were prepared before the construction of the project:
 - Topsoil Management Plan
 - Waste Management Plan
 - Air Quality Monitoring Plan
 - Noise Control/ Monitoring Plan
 - Traffic Management Plan
 - Occupational and Community Health and Safety Plan
 - Emergency Response Plan
 - Re-cultivation/Land Restoration Plan
 - Construction Vibration Management/ Monitoring Plan
 - Cultural Heritage Management Plan
 - Local Content Management Plan

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- Ground water management plan
- Spoil disposal plan
- Pre-construction ecological audit
- According to the initial environmental assessment report for the project APR and on the basis of additional studies conducted on the site, it can be said that during implementation of the activities, the most important receptors of the expected impacts are: top soil layer and socio-economic environment;
- According to the results of the study and the analysis based on it, under the conditions of taking appropriate mitigation measures, no significant irreversible negative impact on any of the environmental receptors is expected. The project does not require significant/expensive mitigation/compensation measures;
- At any stage of the development of the project, the operator ensures the implementation of measures prescribed by the legislation of Georgia and international normative documents, as well as the environmental management plan presented in this document.

Annex 9: Tree cutting permit for Gudauri Access Road and correspondence regarding to re-cultivation plan



**სსიპ სახელმწიფო ქონების
ეროვნული სააგენტო**

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22 / იანვარი / 2024 წ.



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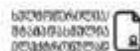
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საქართველოს სააგენტოშილო გმტის
ფეარტამენტს

ასლი: სსიპ - ერთეულ სატყვო სააგენტოს

სსიპ - სახელმწიფო ქონების ეროვნული სააგენტოს შიდა ქართლითა და მცხეთა-მთიანეთის რეგიონულ სამსახურში შემოსული, თქვენი 06.12.2023წ. № 2-08/19396 წერილის პასუხად, რომელიც ეხება განსაკუთრებულ სახელმწიფოებრივი და საზოგადოებრივი მნიშვნელობის, გუდაურის მისასვლელი საავტომობილო გზის შენეების პრევენციის ღონისძიებებზე განხორციელების მიზნით, საავტომობილო გზის განთავსების ზოლში მდებარე 14.2 პა მიწის ფართობზე არსებული ხე-მცენარეების ბუნებრივი გარემოდან ამოღების (მოჭრის) შესახებ თანხმობის გაცემის საკითხს, გაცნობით, რომ სსიპ - სახელმწიფო ქონების ეროვნული სააგენტო არ არის წინააღმდეგი ზემოაღნიშნული საკითხი განხორციელდეს მოქმედი კანონმდებლობის შესაბამისად, იმ პირობით, თუ აღნიშნული მერქნული რესურსი არ წარმოადგენს საქართველოს „წითელი წიგნით“ დაცულ მცენარეთა სახეობას, ხე-მცენარეების გარემოდან ამოღება (მოჭრა) განხორციელდება უსაფრთხოების წესების სრული დაცვით, ხოლო მოჭრილი მერქნული რესურსი „სახელმწიფო ქონების შესახებ“ საქართველოს კანონის 29¹ მუხლის მიხედვით, სახელმწიფო საკუთრებაში არსებულ მიწის ნაკვეთ(ებ)ზე მოჭრილი მერქნული რესურსი კანონმდებლობით დადგენილი წესით ჩაბარდება სსიპ - ეროვნულ სატყვო სააგენტოს, ამასთან, განხორციელებული ქმედებით სახელმწიფოს არ უნდა წარმოუშვას რაიმე სახის ვალდებულება.

მიმღა ქართლითა და მცხეთა-მთიანეთის
რეგიონული სამსახურის ეფროში



მამუკა ჩანჩაძე

გთხოვთ, აღნიშნული შენიშვნები გაითვალისწინოთ შემდგომი მონიტორინგის წარმოებას.

დანართის ელ. ვერსია გადგზავნის სხდ გარემოსდაცვითი ზედამხედველობის დეპარტამენტს

პატივისცემით,
ვასილ გუგუნიშვილი

სააგენტოს უფროსი

სსიპ გარემოს ეროვნული სააგენტო





SSA ROADS DEPARTMENT OF GEORGIA

12 Al. Kazbegi Ave
0160, Tbilisi, Georgia
+995 32 2 370 508
info@georoad.ge

12 April 2024

MRDI ID: N 2-08/5040

To: Mr. Yuan Yi
Acting Project Manager of
China Railway 23rd Bureau Group Co., Ltd.
E-mail: crcc23bkrp@gmail.com;
yhcrcc23@163.com
benkats@kiasuri5@gmail.com

CC: Mr. Krishna S. Chakraborty
Team Leader
UHM Uluslararası Birleşmiş Müşavirlik Hizmetleri A.Ş.

E-mail: decubm.ge.joshi@ubm.com.tr;
kchakraborty@ubm.com.tr;
sozer@ubm.com.tr;
hashir.kashif@gmail.com

Dear Mr. Yuan Yi,

This refers to the Contract NKKRP/CW/CP-02 (hereinafter "the Contract") dated 15.08.2019, concluded between the Roads Department of Georgia under the Ministry of Regional Development and Infrastructure of Georgia (hereinafter - "the Employer") and China Railway 23RD Bureau Group Co. Ltd (hereinafter "the Contractor") for the Construction of Kvesheti-Kobi Road Project (Lot 2).

Please, be informed that the Ministry of Environmental Protection and Agriculture of Georgia has approved the topsoil re-cultivation plan for the Gudauri Access Road project prepared by the Lot 2 Contractor.

The Employer underlines that according to Sub-Clause 4.1 of the General Conditions of the Contract (hereinafter "the GCC") the Contractor is responsible for the adequacy, stability and safety of all Site operations and of all methods of construction.

In addition to the above, please, consider that under Sub-Clause 4.18 of the GCC it is the Contractor's responsibility to "ensure that emissions, surface discharges and effluent from the Contractor's activities shall not exceed the values stated in the Specification or prescribed by applicable Laws."

Taking into consideration the above-mentioned conditions of the Contract, the Employer reminds the Contractor that complying with the conditions of an approved document is the contractual obligation of the Contractor and the Contractor will be the only one who is fully responsible for the proper implementation of the relevant document. The Employer underlines that the violation of the Contractor's obligation in this matter entitles the Employer to raise a claim according to Sub-clause 2.5 of the GCC.

Moreover, the Employer instructs the Engineer to ensure the full implementation of the approved Report of topsoil re-cultivation plan by the Contractor and control all the actions required by this document.

The Employer hereby expressly reserves all of its rights under the Contract and under the laws of Georgia in case of the failure of the Contractor to fulfill the obligations under the Contract and the presented document.

Attachment: Letter N 2834/91 of MoSPA dated 11/04/2024;
Topsoil re-cultivation plan Softcopy.

Sincerely,

Salome Tsirtsumia

Deputy Chairperson





SSA ROADS DEPARTMENT OF GEORGIA

12 Al. Kazbegi Ave
0180, Tbilisi, Georgia
+995 32 2 370 508
info@georoad.ge

23 January 2024



MRDI-RD N 2-08/664

To: Mr. Yuan Yi
Acting Project Manager of
China Railway 23rd Bureau Group Co., Ltd.
E-mail: crc23.bgrp@gmail.com
jkcrc23@163.com

CC: Mr. Krishna S. Chakhan
Team Leader
UBM Uluslararası Birleşmiş Müşavirlik Hizmetleri A.Ş.
E-mail: dec.ubm.ge.kolbi@ubm.com.tr
kchakhan@ubm.com.tr
asozer@ubm.com.tr
hushir.kashif@gmail.com

Dear Mr. Yuan Yi,

We would like to inform you that on January 22, 2024, the Roads Department of Georgia (hereinafter - RD) received the letter N°11/2901 from the LEPL National Agency of State Property (hereinafter Agency), with the no objection for tree felling for the Gudauri access road project.

Please, see the attached file and follow the recommendations of the Agency.

Attachment: The letter N°11/2901 from the Agency.

Sincerely,

Salome Tsurtsumia

Deputy Chairperson

სსიპ გროვებელი
საბუნებო საპროექტო

ელაფორა წითლანახაძის შესახებ N1
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03 აპრილი 2024



GOV N 11/2906

საქართველოს გარემოს დაცვისა და სოფლის მეურნეობის სამინისტროს
მდგრადი განვითარებისა და მიწის მართვის დეპარტამენტის
პირდაპირი სტრუქტურული ერთეულის
ხელმძღვანელის ბატონ გიორგი კელიძის

ბატონო გიორგი,

სსიპ საავტომობილო გზების დეპარტამენტის 2024 წლის 28 მარტის NMRDI-RD N2-08/4370 წერილის
დახმარა, შპს-გაილის სახით წარმოდგენილი დღეულის მუნიციპალიტეტის მდგრადი განვითარების
ბატონის საკუთრებად სახელმწიფო ტყის ფონდის სახელობის დადგენის შესახებ საქართველოს მთავრობის
2011 წლის 4 დეკემბრის N299 დადგენილებით დამტკიცებული სახელმწიფო ტყის ფონდის სახელობის
მიხედვით, 208 კვ.მ წარმოადგენს სსიპ ერთეული სატყეო სააგენტოს მართვის დაქვემდებარებულ
სახელმწიფო ტყეს.

როგორც თქვენთვის ცნობილია, სახელმწიფო ტყის ტერიტორიაზე „ტყეოსარგებლობის წესის შესახებ“
დებულების დამტკიცების თაობაზე საქართველოს მთავრობის 2021 წლის 18 მაისის N221 დადგენილებით
(თბილ. VII-XIV) განსაზღვრული საკმაოდ, ამ მხრივ განკარგვა საჭიროებს შეთანხმებას სახელმწიფო ტყის
მართვის უფლების მქონე ორგანიზაციას.

დამართი წარმოდგენილი მასალები

მატუვისკვით,

კახა ტყეშელაშვილი

სააგენტოს უფროსი

სსიპ - ერთეული სატყეო სააგენტო



