

Semi-annual Environmental Monitoring Report

#4 Semestral Report

Reporting period: January-June 2023

June 2023

Batumi Bypass Road Project— Construction of Poti Bridge and Access Roads

(Financed by the Asian Development Bank)

Loan No GEO 3520-GEO

Prepared by the Roads Department of the Ministry of Regional Development and Infrastructure of Georgia for the Asian Development Bank.

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ACRONYMS & ABBREVIATIONS

ADB	Asian Development Bank
CAREC	Central Asia Regional Economic Cooperation
CC	Construction Contractor
CLO	Community Liaison Officer
CPR	Cardiopulmonary Resuscitation
EHS	Environment, Health and Safety
EIA	Environmental Impact assessment
EMP	Environmental Management Plan
EMR	Environmental Monitoring Report
GRM	Grievance Redress Mechanism
H&S	Health and Safety
IFC	International Finance Corporation
km	Kilometer
MAC	Maximum Allowable Concentration
Ministry	Ministry of National Development and Infrastructure
MoEPA	Ministry of the Environmental Protection and Agriculture
NCR	Non-Conformance Report
PAM	Project Administration Manual
PIU	Project Implementation Unit
PMCS	Project Management Consultancy Services
PPE	Personal Protective Equipment

RD	Roads Department
SAEMR	Semi-annual Environmental Monitoring Report
SC	Supervision Consultant
SSEMP	Site Specific Environmental Management Plan
TEM	Trans-European North-South Motorway
ToR	Terms of Reference
WWF	World Wildlife Fund

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Supplementary Document 1: EMP

Supplementary Document 2: Biodiversity Monitoring Plan

Supplementary Document 3: Site Photo Log

Supplementary Document 4: Observations Logbook

Supplementary Document 5: Environmental Monitoring Repots (April 2023 – May 2023)

Supplementary Document 6: Training Attendance Sheet Sample

Supplementary Document 7: Training, Logbook

1. INTRODUCTION

1.1 Preamble

1. Batumi Bypass Road Project: Major Change in the Project (Change in Scope, Amount, and Implementation Arrangements) was conducted in September 2019. The significant change is an increase in project scope through the addition of a fourth output under the project comprising two additional construction subprojects: a new bridge and approach roads over the Rioni River in Poti and a new bypass road from Bakurtsikhe to Tsnori. Reallocation of existing savings can be utilized to fund the new output, reinforcing the project's impact of improving regional connectivity in Georgia. The change is significant because it fundamentally affects the approved project scope and outcome by doubling the length of roads and/or bridges to be built.
2. The project, managed by the Roads Department under the Ministry of Regional Development and Infrastructure, aims at the Construction of the Poti Bridge and Access Roads, financed by the Asian Development Bank (ADB)
3. This report is the fourth Semi-Annual Environmental Monitoring Report (SAEMR/EMR) for constructing the Poti Bridge and Access Roads Project and covers the period of January-June 2023.
4. The Contract for Project Management Consultancy Services (PMCS) between Roads Department (RD) and "Joint Venture ULUSLARARASI BİRLEŞMİŞ MÜŞAVİRLER MÜŞAVİRLİK HİZMETLERİ A.Ş-IRD Engineering SRL" was signed on 11 June 2021. The Contract for the Construction of the Poti Bridge and Access Roads between RD and Joint Venture MIRBUD-CS (Poland, Georgia) was signed on 29 November 2021. Work is expected to be completed in 2 years. Awarded contracts included Environmental Management Plans (EMP) cleared by ADB and conditions of national Environmental Impact Assessment (EIA) clearance.

2. PROJECT DESCRIPTION AND CURRENT ACTIVITIES

2.1 Project Description

5. The Poti-Grigoleti-Kobuleti bypass section is part of the E-60 and E-70 highways and the larger East-West road corridor in Georgia, which is an integral part of one of the six key Central Asia Regional Economic Cooperation (CAREC) corridors (Corridor 2) providing the shortest transit link to connect Central Asia with Europe and East Asia. The Project is located along the Black Sea coastal area within the Samegrelo-Zemo Svaneti Region and on the border between Khobi Municipality and the Poti administrative center.
6. The details of the proposed road project are as follows: The 2.5 km road Project consists of a 2-lane (one lane in each direction) multi-span bridge over the Rioni River and its connection with the existing highway on both sides of the river. The starting point is located on the E-60 highway to Senaki at the right riverbank of the Rioni River on the northern outskirts of the city of Poti. The new section of road will pass next to a residential area (Patara Poti Village) using the exact alignment and parallel to the existing railway bridge over the river. In addition, a small section (approximately 1 km) of an existing secondary road that runs to the Kulevi Oil Terminal from Patara Poti and parallels the river will also be upgraded with a modified alignment to accommodate the new bridge and road approaches.
7. The Project's geometric design standards have been selected based on traffic flow, road category, and relief to ensure safe and unimpeded traffic flow (see Table 1). The road design is based on Georgian National Standard SST 72: 2009 "Standard on Geometrical and Structural Requirements for the Public Motor Roads of Georgia" and Trans-European North-South Motorway (TEM) Standards.

Table 1. Design Parameters

Parameter	Main Alignment	Interchanges: Ramps and Loops
Design speed	100 km/h	40 km/h, 60 km/h, 80 km/h or 100 km/h
Speed limit	90 km/h	90 km/h
Spiral Transition Curves	As per TEM Standards	As per TEM Standards
Bend (Superelevation)	As per Georgian Standards	As per Georgian Standards
Min. crossfall and min. bend	2,50%	2.50%
Max. superelevation	7,00%	7.00%
Expansion width in curves	No necessary widening (each lane is 3,75 m	As per Georgian Standards

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	wide)	
Min. Vertical Gradient	0.30%	0.30%
Max. Vertical Gradient	4.00%	5% (100 km/h) and 6% (<100 km/h)
Convex Vertical Curves	22.600	10,000 (100 km/h), 5,000 (80 km/h), 1,800 (60 km/h), 400 (40 km/h)
Concave Vertical Curves	7.700	4,900 (100 km/h), 3,200 (80 km/h), 1,700 (60 km/h), 850 (40 km/h)
Acceleration Lane	-	150 m acceleration lane + 80 m taper
Deceleration Lane	-	100 m deceleration lane + 80 m taper

8. The map of the project road is given in Figure 1 below.

Figure 1. Map of Project Road



9. The Project is classified as category A for the environment under ADB’s Safeguard Policy Statement (2009). Project implementation periods: 2021-2025.

10. The Roads Department of Georgia, under the Ministry of Regional Development and Infrastructure of Georgia, submitted the EIA to the Ministry of the Environmental Protection and Agriculture of Georgia (MoEPA) on 26.02.2018 for approval. Based on the submitted documentation, Environmental Decision was issued by the MoEPA on 26.04.2018 (order N2-284).

2.2 Project Contracts and Management

11. Following the EIA and the Project Administration Manuel (PAM) requirements, the Project Management Consultancy Services Company and Construction Contractor have mobilized national and international Environmental, Health and Safety (EHS) specialists (Supervision Consultant's (SC) and Construction Contractor's (CC) staff contact details are presented in Table 2).

12. The Terms of References (ToR) for the Project Management Consultancy Services Company contains the following tasks for the Environmental Specialists:

- a. Ensure that the provisions of the approved Environmental Management Plan are reflected in the Contractor's contract site-specific environmental management plan (SSEMP) before its acceptance by the Engineer, the Employer, and ADB after that, ensure that the Contractor complies in every respect with the provisions of the SSEMP;
- b. Develop an environmental auditing protocol for the construction period, regularly supervise the environmental monitoring, and submit periodic reports based on the monitoring data and laboratory analysis reports. These reports will be included as an annex to the Consultant's Monthly Report;
- c. Develop a program for hands-on training of Contractor's staff in implementing the SSEMP.
- d. Conduct Post-Construction Environmental Audit and prepare a post-construction environmental audit report with a filled environmental audit checklist.

13. Contact details of ADB, SC, CC, and RD representatives are given in Table 2 below.

Table 2. Main Environmental Staff of ADB, CC, SC, and RD.

Organization	Position	Name
ADB	Head Office, Environmental Specialist, Portfolio, Results, Safeguards and Gender Unit (PSG), CWRD	Name: Ninette Pajarillaga Cell: E-mail: npajarillaga@adb.org
	ADB National Environmental Safeguards Consultant	Name: Giorgi Kobaladze

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		Cell: +995599689834 e-mail: gkobaladze.consultant@adb.org
	Associate Safeguards Officer Georgia Resident Mission	Name: Nino Nadashvili Cell: +995 595 070442 e-mail: nnadashvili@adb.org
RD	Environmental Specialist	Name: Tamar Nasuashvili Cell:+995 595 598281 e-mail: tamara2903@gmail.com tamar.nasuashvili@yahoo.com
	Head of Environmental Unit	Name: Gia Sopadze Cell: +10599939209 e-mail: sopia@gmail.com
SC	International Environmental Specialist	Emre Duran Cell:+905325258556 e-mail: duran.emre.tr@gmail.com
	Environmental Expert	David Gagoshidze Cell:+995574069922 e-mail: datoeko@gmail.com
CC	Project Manager	Name: Nino Gabunia Cell: +995577600660 e-mail: ninogabunia@cs@ge
	Environmental Specialist	Name: Ana Kvaratskhelia Cell: +995 558 65 83 86 e-mail: ana.kvaratskhelia.em@gmail.com

2.3 Project Activities During the Current Reporting Period for Construction of Poti Bridge

and Access Roads

14. While the main civil works for bridge and access road construction have not yet commenced, the Contractor has completed the mobilization process and initiated certain auxiliary civil works, including land preparation and material transportation. These activities are listed in the table provided below as Table 3.

Table 3. Project Activities Carried Out during the Reporting Period

Activity	Location
Transportation sand-gravel materials from borrow pit	Axe 17, km 0+800; Axe 17, km 1+300
Installation of temporary barrier	Axe 17, km 0+100 - 0+350; Axe 16, km 0+700
Transportation of crushed aggregate 15-40mm	Axe 17, km 0+800; Axe 17, km 1+400
Preparation of platform for pile drilling at the abutment N1	Axe 14 at km 0+060, Axe 49 km 0+374
Excavation of trench for installation of casing pipes	Axe 17, km 0+600 - km 0+700
711.2×10.3 Gas pipe routing in casing with support-guide rings	Axe 17 Km 0+600 - 0+700
711.2×10.3 welding of factory-insulated pipes of the gas pipeline to the track	Axe 17 Km 0+600 - 0+700
Excavation of trench for installation of electric cable	Axe 49 km 0+300 - 0+360, Axe 14 at km 0+060
Laying of 711.2×10.3 insulated pipes in a trench	Axe 17 Km 0+600 - 0+700
Conducting electric cable in a pipe	Axe 49 km 0+300 - 0+360, Axe 14 at km 0+060
Backfilling of tranche	Axe 49 km 0+300 - 0+360, Axe 14 at km 0+060
Installation of traverses	Axe 49 km 0+300 - 0+360, Axe 14 at km 0+060
Installation of reinforced concrete legs	Axe 49 km 0+300 - 0+360, Axe 14 at km 0+060
Installation of insulators	Axe 49 km 0+300 - 0+360, Axe 14 at km 0+060
Installation of the hood candle	Axe 17, km 0+600 - km 0+700
Flushing the cavity of the 711.2×10.3 gas pipeline with water	Axe 17, km 0+600 - km 0+700
Preliminary hydraulic test of the gas pipeline for strength (8.1 MPa) before passing through the casing	Axe 17, km 0+600 - km 0+700
Blowdown of the gas line with air by passing two pistons	Axe 17, km 0+600 - km 0+700
Preparation of platform for pile drilling at the abutment N2	Axe 14 at km 0+060
Boring of Cast in situ piles d1500mm with steel casing pipes, including pile cut off (Pile N1-2-3)	Axe 49 km 0+374
Boring of Cast in situ piles d1500mm with steel casing pipes, including pile cut off (Pile N1-2-3-4-5-6-7-8-9)	Axe 14 at km 0+060
Reinforcement steel B500C	Axe 49 km 0+374
Concrete for piles, C30	Axe 49 km 0+374

Connecting the power line to a new network	Axe 49 km 0+300 - 0+360, Axe 14 at km 0+060
Reinforcement steel B500C	Axe 14 at km 0+060
Concrete for piles, C30	Axe 14 at km 0+060

2.4 Information on Personnel Working at the Construction Site

15. Overall, the Contractor has hired a total of 68 personnel as of June 2023. The details of these personnel can be found in Table 4. Furthermore, Table 5 provides information on the monthly changes in staff hiring. It is important to note that all of the hired personnel are local.

Table 4. Information of Personnel Working at Site as of June 2023

#	Human Resources	Total
1	Project manager	1
2	Deputy project manager	1
3	Assistant project manager	1
4	Drilling manager	1
5	Warehouse manager	1
6	Environmental specialist	1
7	Health and safety manager	1
8	Site manager	1
9	Transport manager	1
10	Site engineers	1
11	Surveyors	1
12	Operators	26
13	Skilled workers	11
14	Unskilled workers	7
15	Security	11
16	Janitor	2
TOTAL		68
HSE Staff (breakdown of 2 personnel)		
1	Akaki Jguburia	H&S Officer
2	Ana Kvaratskhelia	Environmental officer

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Table 5. The Monthly Change of the Personnel

	Jan 2023	Feb 2023	Mar 2023	Apr 2023	May 2023	June 2023
Personnel	39	38	38	42	68	68

16. The Project organization chart for key management staff is provided in Figure 2.

Figure 2. The Key Staff Organization Chart of CC



2.4 Description of Any Changes to Project Design Period for Construction of Poti Bridge and Access Roads

17. The Contractor has proposed several changes to Project design and construction method, which are listed below:

- Redesign (correction) of the main axis Axe 17. Along with recalculation of stone columns
- Temporary adjustment of the horizontal and vertical profile, along with the recalculation of road construction for the temporary connection axis (Axe 6)
- Designing a bridge over the amelioration canal, specifically the design and connection of axis AXE 14 at km 0+060 to the main Axis (Axe 17).
- Designing a bridge over the amelioration canal for Axis 49 at km 0+374
- Redesigning the Axe 49 axis and the Axe 80 Roundabout node, along with other

connecting axes, in accordance with the main axis Axe 17

- Redesigning the Axe 22 PATARA POTI axis and connecting it to the existing bridge
- Designing the access road to the railway

18. The only approved change is the conversion of box culverts into bridges over the amelioration canal. However, the Engineer and the Employer have not yet approved the other proposed changes. In cases where there are method changes that could have significant environmental impacts, the Engineer will request a screening report. This report will include an assessment of the environmental impacts and the necessary mitigation measures to minimize any potential impact caused by the Contractor.

2.5 Description of Any Changes to Agreed Construction methods Period for Construction of Poti Bridge and Access Roads

19. During this monitoring period, there is only one change in construction methods. The change involves constructing bridges over the amelioration canal channel instead of using box culverts.

3. ENVIRONMENTAL SAFEGUARD ACTIVITIES"

3.1 General Description of Environmental Safeguard Activities

20. The Engineer has employed a local environmental specialist since the commencement of the Project. Additionally, Emre Duran was appointed as the International Environmental Specialist in June 2022. On the other hand, the Contractor hired an environmental specialist at the beginning of October 2022. The environmental specialists from both the Engineer and Contractor teams are working together to assess the environmental impacts caused by the construction activities and ensure compliance with the requirements of the Environmental Impact Assessment (EIA), Site-Specific Environmental Management Plan (SSEMP), and topic-specific Environmental Management Plans (EMPs). Please refer to Supplementary Documents 1 and 2 for the EMP and biodiversity monitoring plan.
21. Although the main civil works have yet to commence, both environmental teams conduct regular site visits to monitor SSEMP compliance. Additionally, both the Contractor and Engineer have dedicated Health and Safety (H&S) teams, which also conduct regular site visits to ensure compliance with Personal Protective Equipment (PPE), traffic safety, and other safety-related issues. Detailed information about the environmental site visits can be found in Section 3.2, 'Site Audits'.
22. The Contractor hired a Community Liaison Officer (CLO), Demur Chichinadze, on 14th November 2022. The CLO is responsible for managing the Grievance Redress Mechanism (GRM) and maintaining the Grievance log book. Furthermore, the CLO engages with the community, resolves community issues (if there are), and conducts community outreach, if required. During the reporting period, the primary focus of the CLO has been engaging with the workers during onboarding and checking for possible grievances from the community around the work site. To date, no grievances have been received or recorded.
23. During the monitoring period, the Environmental consultants of CC developed a SSEMP and topic-specific Environmental Management Plans. The Engineer has approved the majority of these plans, but the final approval is pending for the remaining plans, as the Engineer is awaiting the inclusion of construction method and design changes in the updated EIA and other management plans. Section 5.1, specifically Table 15, provides all the Environmental Management Plans that have been prepared.

3.2 Site Audits

24. Mr. David Gagoshidze, the local environmental specialist of the Engineer, conducted daily and weekly site visits, which included the following locations

- Office site,
- Auxiliary civil work locations,

25. The specialist conducts visual investigations of the site, and a comprehensive photo log for these site audits can be found in Supplementary Document 3.

3.3 Issues Tracking (Based on Non-Conformance Notices)

Environmental Issues

26. The Engineer's environmental team conducts daily walkthroughs and site visits to observe various environmental issues on the site. During these visits, they closely observed various environmental issues, including hazardous material management with a particular focus on fuel and hazardous material containers. They also observed waste and hazardous waste management practices, fuel and oil spills, and dust generation at the working site, and topsoil management.

Health and Safety Issues

27. The H&S teams of both the Engineer and the Contractor are individually tracking H&S issues, and the key points are provided below. The observations logbook, Supplementary Document 4, contains detailed information.

- Suspended Load/Lifting,
- Personnel Protective Equipment,
- Working at height equipment,
- Working at height,
- Power tools/equipment
- Lifting gear,
- Housekeeping,
- Electricity / Energy,
- Excavation safety,
- Hazardous material,
- Workplace barricading/segregation

28. During this monitoring period, a total of 30 H&S issues were recorded. Among them, two (2) were positive observations, two (2) were related to environmental issues, and the remaining twenty-six (26) were identified as unsafe conditions or behaviors.

29. There were no Non-Conformance Reports (NCRs) for both Environmental and H&S aspects during this reporting period

3.4 Trends

30. The environmental issues encountered in the previous and the current periods are similar and involve the storage of hazardous chemicals, as well as oil and fuel spills. Although the frequency of these occurrences is not high, it is necessary to provide trainings that emphasize the sensitivity of these matters and the importance of giving them proper attention to prevent them.
31. Similarly, observations were made regarding the use of lifting equipment and personal protective equipment, as was done in the previous reporting period, in terms of occupational health and safety. Additionally, it remains crucial to ensure proper protection during excavation works and in excavation areas, which are key occupational health and safety considerations. The Contractor will be informed about these issues, and efforts will be made to ensure that relevant trainings are provided and precautions are increased in the operations.
32. Regarding community health and safety, no issues have been observed in the field with the public on the shared road, and signs and boards have been placed in appropriate locations. However, in terms of traffic safety, it is recommended to enhance the training and increase the number of flagmen.

3.5 Unanticipated Environmental Impacts or Risks

33. There are no unanticipated environmental impacts or risks.

4. RESULTS OF ENVIRONMENTAL MONITORING

4.1 Overview of Monitoring Conducted during Current Period

34. In March 2023, the CC hired a consultant firm named "Environmental and Occupational Safety Education and Consultation Center - Ecometer Ltd." to conduct instrumental environmental monitoring, which includes assessing air and water quality, as well as measuring vibration and noise levels. The results of this monitoring study are presented in the sections below. The reports for this environmental monitoring can also be found as Supplementary Document 5.
35. The frequency of environmental monitoring parameters is currently being discussed among the Employee, the Construction Contractor, and the Engineer. The objective is to review and update the monitoring frequency and locations based on the outcomes of the ongoing discussion. These revisions will be implemented in the upcoming reporting period.

Surface Water Quality

36. Throughout the reporting period (January - June 2023), two monthly sampling sessions were conducted for surface water quality analysis. The surface water samples were collected from both downstream and upstream sampling locations in River Rioni. The coordinates of these sampling locations are provided in Table 6, and their positions are depicted in Figure 3.

Table 6. Surface Water Quality Monitoring Locations

Location	Coordinates	
	X	Y
River Rioni downstream	722788	4674713
River Rioni upstream	723505	4674040

Figure 3. Water Quality Sampling Locations on the Rioni River



37. The results of water quality monitoring for the upstream and downstream sections of the River Rioni are presented in Table 7 and Table 8 respectively. Among the monitored parameters, the levels of ammonia/ammonium ion and chloride ion exceeded the national Maximum Allowable Concentration (MAC) levels during the April monitoring season. There are several possible reasons for these elevated ammonium levels, including the excessive use of fertilizers containing nitrogen in upstream agricultural activities along the river, as well as the decomposition of organic matter such as animal manure and the runoff of human wastewater into the river.
38. The Contractor is obligated to comply with all the EIA requirements during the construction works carried out in the Rioni River and near the amelioration canal, as these areas are the closest receiving environments in terms of water sources. It is crucial for the Contractor to prevent any oil/fuel spills from occurring in the nearby water bodies and to never discharge untreated sewage water into these receiving environments.

Table 7. Surface Water Quality Monitoring Result for Upstream of River Rioni

Parameters	Unit	EIA Standards (National MAC)	Baseline results (Apr 2023)	Baseline results (May 2023)
pH	-	6.5-8.5	8,20	7,70
Saltiness	-	-	0,10	0,10
TDS	-	-	106,00	166,30
Electr. Conductivity	-	-	212,00	234,00
Turbidity	-	-	429,00	452,00
Ammonia/ammonium ion NH ₃	mg/L	0,39	0,41	0,25
Chlorides Cl	mg/L	300,00	147,00	35,90
Weighted particles TSS	mg/L	Increase no more than 0.75 mg/L	212,00	240,20
Total nitrogen N	mg/L	-	8,83	1,53
Total iron Fe	mg/L	0,30	0,05	0,17
Arsenic (total) As	mg/L	0,05	<0,001	<0,001
Total Coliforms	MPN	300,00	-	-

Table 8. Surface Water Quality Monitoring Result for Downstream of River Rioni

Parameters	Unit	EIA Standards (National MAC)	Baseline results (Apr 2023)	Baseline results (May 2023)
pH	-	6.5-8.5	8,30	7,70
Saltiness	-	-	0,10	0,10
TDS	-	-	107,00	116,80
Electr. Conductivity	-	-	214,00	236,00
Turbidity	-	-	435,00	457,00
Ammonia/ammonium ion NH ₃	mg/L	0,39	0,42	0,25
Chlorides Cl	mg/L	300,00	140,00	35,00
Weighted particles TSS	mg/L	Increase no more than 0.75 mg/L	210,00	239,80
Total nitrogen N	mg/L	-	8,72	1,52
Total iron Fe	mg/L	0,30	0,05	0,16
Arsenic (total) As	mg/L	0,05	<0,001	<0,001
Total Coliforms	MPN	300,00	-	-

Noise and Vibration Monitoring

39. The Contractor and the Engineer have identified two points for the monitoring of noise and vibration. The coordinates of these monitoring locations are provided in Table 9, and their positions are illustrated in Figure 3.

Table 9. Noise and Vibration Monitoring Locations

Location	Coordinates	
	X	Y
Axis 49	723230	4674705
Axis 17	722690	4674127

Figure 4. Noise, Vibration and Air Quality Sampling Locations



40. The results of the noise monitoring are presented in Table 10. During the measurement period in May, the noise level exceeded the International Finance Corporation (IFC) standards. However, it is important to consider that, according to the Federal Highway Administration US Department of Transportation's "Noise Measurement Handbook (FHWA-HEP-18-065)", outdoor-indoor noise reduction (OINR) can reduce interior noise levels by up to 25 dB(A) when windows are closed in a building with a masonry structure and single glazed windows. Conversely, with open windows, the reduction is 10 dB(A). The nearest noise-receiving environment for the project is the Nikora Meat Production factory, which is less sensitive than residential areas.

Table 10. Measured Noise Levels

Location/Month	Average Equivalent Noise level (LAeq) Measurement dB(A)		IFC Standard for industrial and commercial areas
	Axis 49	Axis 17	
Apr-23	68,1	70,0	70,0
May-23	63,5	54,1	

41. The vibration monitoring results indicate that there is no observable vibration effect at the monitoring location compared to the baseline levels (refer to Table 11). It is important to continue this monitoring specifically during the pile driving operations to ensure effective control over the vibration impact of the piling activities on the nearest receiving environment."

Table 11. Measured Vibration Levels

Location/Session	Month	Vibration Speed		Vibration Acceleration		*MPC for Vibration Speed (dB)	*MPC for Vibration acceleration (dB)
		mm/sc	dB	mm ² /sc	dB		
Axis 49	Apr	<0.1	<66	<0.1	<100	112	126
	May	<0.1	<66	<0.1	<100	112	126
Axis 17	Apr	<0.1	<66	<0.1	<100	112	126
	May	<0.1	<66	<0.1	<100	112	126

Air Quality

42. Air quality monitoring locations are the same locations for vibration and noise monitoring. This locations will be selected to evaluate the impact of the construction activities on the nearest sensitive receptors after the construction works starts. Table 12 shows the measurement locations for passive NO_x and SO_x samplings and dust measurements (which are same with the noise and vibration measurements as shown in Figure 4).

Table 12. Air Quality Monitoring Locations

Location	Coordinates	
	X	Y
Axis 49	723230	4674705
Axis 17	722690	4674127

43. The air quality test results are presented in Table 13 and Table 14. Based on the measurements, the levels of PM (Particulate Matter), SO_x (Sulfur Oxides), and NO_x (Nitrogen Oxides) are found to be within the national limits set for air quality in Georgia, which is 150 micrograms/m³.

Table 13. Passive NO_x SO_x Measurement Results

Location	Month	Exposure time (h)	SO _x mg/m ³	NO _x mg/m ³	CO mg/m ³	*MPC for SO _x mg/m ³	MPC for NO _x mg/m ³	MPC for CO mg/m ³
Axis 49	Apr	-	<0,01	0,003	0,17	0,05	0,04	-
	May	-	<0,01	0,011	0,17	0,05	0,04	-
Axis 17	Apr	-	<0,01	0,005	0,19	0,05	0,04	-
	May	-	<0,01	0,009	0,32	0,05	0,04	-

Table 14. PM Measurement Results

Location	Sesion	PM2.5 (µg/m3)	PM10 (µg/m3)	PMTotal (µg/m3)
Axis 49	Apr	44	52	113
	May	74	98	146
Axis 17	Apr	27	61	88
	May	36	53	104

44. The sturgeon monitoring studies, which are a requirement of the biodiversity action plan, have not yet commenced due to overlapping schedules and methodologies with similar studies conducted by the Georgian office of the World Wildlife Fund (WWF). In order to address this, the Employer has initiated discussions with the Georgian office of the World Wildlife Fund (WWF), which has actively been involved in ongoing sturgeon monitoring studies, particularly in the Rioni River. These discussions with the WWF will harness their expertise and insights in shaping the methodology for the Project's sturgeon study. The study will begin once the methodology and the involvement of experts have been decided.

4.2 Trends

45. During this reporting period, environmental monitoring has just commenced, and there is insufficient data to identify specific trends at this stage.

4.3 Summary of Monitoring Outcomes

46. The CC hired a consultant firm called 'Environmental and Occupational Safety Education and Consultation Center - Ecometer Ltd.' in March 2023 to conduct instrumental environmental monitoring, which includes air and water quality, as well as vibration and noise measurements

47. Based on the water quality monitoring conducted, only parameters that exceeded the national maximum allowable limits during the April monitoring session were ammonia/ammonium ion and chloride ion. The higher levels of these parameters could be attributed to increased agricultural activities and the inclusion of wastewater and animal manure into the river.
48. The noise levels recorded during the May measurement period exceeded the IFC standards for industrial and commercial areas. However, as the nearest receptor for these noise levels is the Nikora Meat Production factory, the levels can be considered acceptable. Nevertheless, precautions should be taken during piling works to minimize the noise impact of the project on the nearest receiving environment
49. No vibration levels were measured during the monitoring session. However, it is possible that the vibration effect during piling works could exceed the national maximum allowable limits.
50. Based on the measurements of air quality parameters, the levels of PM (Particulate Matter), SO_x (Sulfur Oxides), and NO_x (Nitrogen Oxides) are within the national limits.

4.4 Material Resources Utilization

51. The materials transported to the project site include; 54,278 m³ of gravel, 5,243 m³ of crushed aggregate 15-40 mm, 32,400.00 m² of separation geotextile, 165,200.00 m of prefabricated vertical drains, and 45 tons of steel sheet piles.

4.5 Waste Management

52. The Contractor has developed a waste management plan that outlines the requirements for establishing and implementing proper waste management practices. The plan addresses the handling, storage, and management of waste to minimize environmental risks. It has been shared with the Engineer for review and comments. As there will be some changes in the project design and construction methods, the plan is not yet finalized.
53. The Contractor has reached an agreement with "Black Sea Waste Management" for the collection and transportation of domestic waste.
54. Another agreement has been signed with Khobi municipality for the storage and transportation of domestic waste. As per this agreement, one large and two small garbage bins have been placed at the camp area, and two small bins have been placed at the Nikora factory side.
55. During the reporting period, the Contractor estimates that the amount of municipal waste generated is 10 m³. The septic tank on the site has a capacity of 3 tons, and there has been no need for the removal of wastewater since the beginning of the project. The Contractor has not transported any domestic wastewater. Additionally, around 264 m³ of cut trees were transported to the POTI Storage area, as per agreement with the local forestry department.

56. The Contractor has signed a contract with Gocha Tsaava, a local individual who will provide appropriate equipment and services for toilet cleaning and sanitation.
57. The Contractor does not weigh the municipal waste removed from the site. Additionally, a minimal quantity of hazardous waste has been collected and stored in a special container. Due to these reasons, a waste log book has not yet been established.

4.5.1 Current Period

58. The primary source that generates a large amount of waste is still earthworks, specifically: the excavation of the topsoil and subsoil materials. The estimated volume for spoil generation is given below: The primary source generating a large amount of waste is earthworks, specifically the excavation of topsoil and subsoil materials. The estimated volumes for spoil generation are as follows:

- Estimated spoil volume: 90 m³
- Estimated topsoil volume: 420 m³

4.6 Health and Safety

59. The H&S Team is responsible for daily implementation, supervision, and monitoring of on-site construction activities to ensure occupational and community health and safety.
60. No incidents involving community members or traffic incidents were reported during the reporting period.

4.6.1 Worker Safety and Health

61. H&S representatives conduct regular safety inspections on the site, and H&S specialists provide mandatory H&S and Environmental induction for new employees. They also provide specialized safety training to enhance safety culture, covering topics such as working at heights, driving safety, requirements for earthwork activities, and lifting operations. Moreover, H&S specialists prepare training documentation, conduct risk assessments for special works, and establish work procedures.

62. No major or minor accidents or incidents were reported during the reporting period.

4.6.2 Training

63. The Contractor continues the training program aimed at fostering a lasting culture of responsible behavior and activities among employees, which positively impact environmental, social, and safety performance. The program includes mandatory induction training as well as job-specific training.

64. During the reporting period, the training program covered the following topics:

- Induction training,
- Tree cutting,
- Tops soil stripping and storage,
- Hazardous non-hazardous waste handling storage,
- Driving safety,
- Lifting operations Refueling process,
- Refueling Process,
- Earthwork activities,

65. Throughout the reporting period, twenty (20) toolbox talks were conducted for the employees of both the contractors and subcontractors, addressing the following subjects:

- Suspended loads and lifting;
- Working at height;
- Moving vehicles;
- Usage of power tools (angle grinder, chain saw);
- Fire safety;
- Use of paints and solvents;
- Excavation;
- Lifting of gas pipes;
- Hazards related to the excavator and controls;
- Handling/storage of fuel;
- The hazards and controls, related to the diesel truck.

66. The Contractor organized comprehensive Health & Safety, Environmental, and Social training sessions for 60 personnel from the Contractor's staff. The training covered various topics, including basic knowledge of environmental legislation, topsoil preservation, dust and air quality, waste management, land contamination, spill prevention, biodiversity, noise, resource management, chemical management, community safety, grievance redressal mechanisms, cultural heritage, code of conduct, rules for working with concrete, emergency response, working at heights, lifting, and incident reporting. A sample attendance sheet is included in Supplementary Document 6.

67. The Contractor maintains logbooks to record the training activities, which are provided in Supplementary Document 7.

5. FUNCTIONING OF THE SEMP

5.1 SEMP Review

68. The Contractor has developed Site-Specific and Topic-Specific Environmental Management Plans (EMPs) in accordance with the guidance of the Supervision Consultant. These plans were endorsed by the Supervision Consultant (SC) and approved by the Project Implementation Unit/Resident Department (PIU/RD), and, if necessary, by the Asian Development Bank (ADB), prior to the commencement of civil works. During the preparation of the Site Specific Environmental Management Plans (SSEMPs), the existing EMP serves as a baseline document for the Contractor (Supplementary Document 1).

69. Following evaluation, most of the plans have been approved by the Engineer. However, the Engineer is awaiting the inclusion of construction method and design changes in the updated Environmental Impact Assessment (EIA) and other management plans in order to approve the remaining plans. The current status of the plans is provided in Table 15.

Table 15. Reviewed Site Specific Environmental Management Plans

No	Plan / Method Statement	Status
1	Site Specific Environmental Management Plan	Approved
2	Environmental Management Plan	Waiting for Approval
3	Waste Management Plan (Construction Phase)	Waiting for Approval
4	Emergency Response Plan	Approved
5	Spill Management Plan	Approved
6	Wastewater Management Plan	Waiting for Approval
7	Chance Find Procedure	Approved
8	Labor Management Procedures	Approved
9	Clearance Cultivation Restoration Plan	Approved
10	Aggregate and Borrow Pit Management Plan	Approved
11	Asphalt Rock Crushing Batching Plant Management Plan	Approved
12	Topsoil Disposal and Erosion Management Plan	Waiting for Approval
13	Air Quality Management Plan	Approved
14	Bridge Construction Management Plan	Approved
15	Laydown Area and Camp Management Plan	Approved
16	Spoil Disposal Management Plan	Approved
17	Biodiversity Action Plan	Waiting for Approval
18	Tree compensation plan	Will be Prepared

6. GOOD PRACTICE AND OPPORTUNITY FOR IMPROVEMENT

6.1 Good Practice

70. The Contractor has shown a strong commitment to prioritizing health and safety (H&S) and implementing effective environmental practices on the project site, as identified during site inspections. The following are noteworthy examples of good practices observed:

- Safety meetings are conducted regularly to promote communication and provide updates on safety protocols, ensuring that all workers are informed and engaged in maintaining a safe working environment
- The safety signs are regularly inspected and maintained to ensure their visibility and effectiveness. Faded or damaged signs are promptly replaced, ensuring that workers have accurate and up-to-date information about potential hazards and safety precautions.
- Waste management practices have been implemented effectively, with waste bins strategically placed in the camps and working areas.
- The Contractor has implemented a waste reduction program that emphasizes the importance of minimizing waste generation. Through training, workers are encouraged, reducing packaging waste, and avoiding unnecessary single-use items.

6.2 Opportunities for Improvement

71. The following key areas require improvement in terms of health and safety and environmental practices.

- Enhanced topsoil management: Implementing improved practices for topsoil management, such as erosion control measures, sedimentation prevention, and proper storage and re-application of topsoil, to preserve soil quality and minimize environmental impact.
- Enhanced handling and storage of hazardous materials: Establishing stricter protocols for the safe handling, storage, and disposal of hazardous materials on site, including proper labeling, appropriate containment measures, and adherence to legal regulations. This ensures the safety of workers and prevents any potential harm to the environment.
- Enhanced dust control measures: Implementing more effective strategies for controlling dust emissions on the construction site, such as the use of water sprayers, dust barriers, and dust suppression additives. This helps minimize airborne dust particles, ensuring better air quality for workers and nearby communities.

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- Strengthened community engagement: Enhancing community engagement efforts by establishing regular communication channels, conducting community meetings, and addressing community concerns in a timely and transparent manner.
- Improved waste reduction initiatives: Expanding waste reduction initiatives by implementing recycling programs for various types of waste materials, encouraging workers to segregate waste properly,
- The Contractor should prioritize enhancing safety measures during excavation works and in excavation areas to ensure proper protection. The Contractor should also consider installing clear signage and effective barriers around excavation areas to demarcate boundaries and restrict unauthorized access. Adequate lighting in and around excavation areas should be ensured, especially during low-light conditions.
- The Contractor should focus on improving traffic safety measures to minimize potential hazards and enhance community health. This can be achieved by installing appropriate traffic signs, signals, and speed limit indicators is crucial to inform drivers about construction zones and any changes in road conditions. Trained flagmen should also be assigned at critical points to guide and control traffic flow, ensuring the safety of both workers and the public.

7. SUMMARY AND RECOMMENDATIONS

7.1 Summary

72. Although the main civil works for bridge and access road construction have not yet commenced, the Contractor has completed the mobilization process and initiated certain auxiliary civil works. The activities conducted at various locations can be summarized as follows: Transportation of sand-gravel materials and crushed aggregate, installation of temporary barriers, preparation of platforms for pile drilling, excavation of trenches for casing pipes and electric cables, laying of insulated pipes, conducting electric cables, backfilling of trenches.
73. The hired consultant firm conducted instrumental environmental monitoring, including air and water quality, vibration, and noise measurements. Water quality monitoring revealed higher levels of certain parameters, highlighting the need to address factors such as agricultural activities and waste runoff. Noise levels exceeded standards in certain periods, necessitating measures to minimize noise effects on the nearest receiving environment. Vibration levels were monitored during the reporting period, and plans should be implemented to control vibrations during specific construction activities. Continued monitoring and improvement in these areas will contribute to the project's environmental sustainability and ensure the health and safety of workers and the community.
74. The Contractor has demonstrated a strong commitment to health and safety (H&S) and effective environmental practices on the project site. Noteworthy good practices include regular safety meetings to promote communication and keep workers informed, well-maintained safety signs to ensure visibility and accurate hazard information, strategic placement of waste bins and effective waste management practices, and a waste reduction program to minimize waste generation through worker training and conscious consumption. These practices contribute to maintaining a safe working environment and promoting environmental sustainability on the project site.
75. Several key areas require improvement in terms of health and safety and environmental practices. These include enhanced topsoil management practices to preserve soil quality and minimize environmental impact through erosion control and proper storage, as well as stricter protocols for the handling and storage of hazardous materials to ensure worker safety and prevent environmental harm. Additionally, implementing more effective dust control measures, strengthening community engagement efforts, expanding waste reduction initiatives, prioritizing safety measures during excavation works, and improving traffic safety measures are crucial areas for improvement. These actions will enhance overall safety, minimize environmental impact, and promote the well-being of workers and the community.

7.2 Recommendations

76. The following activities are planned for the next reporting period:

- Environmental measurements should be carried out at the determined frequency and locations for the relevant parameters after the discussion
- The storage areas for topsoil and subsoil should be secured by the Contractor
- A tree compensation plan is to be prepared by the Contractor.
- Appropriate trainings regarding the mentioned areas for improvement should be conducted.
- First Aid Training, including Cardiopulmonary Resuscitation (CPR), should be given to employees

Supplementary Document 1 – Environmental Management Plan

Environmental Management Plan for Pre-Construction Phase

Affected Aspect	Potential Impact/ Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/ Implementation	Control
Pre-Construction Stage					
No Net Loss / Net Gain Approach	Impacts on sturgeon species in the Rioni River	<ul style="list-style-type: none"> Measure to achieve no net loss / net gains: Implement high standard monitoring program for sturgeon. 	Project Cost	RD, ADB	N/A
EMP contractual obligations	Implementation of Project EMP and Specific Environmental Management Plan (SEMP)	<ul style="list-style-type: none"> Before the commencement of civil works, the Contractor shall prepare a Specific EMP (SEMP) for Engineer endorsement and RD approval. ADB shall also review the SEMP. The SEMP will present a detailed implementation plan based on the Contractor's actual construction methodologies, work schedule, type/specifications, and number of construction plants to be used The SEMP shall be (a) consistent with the SEMP template included in the EIA (see), (b) consistent with the project EMP, and (c) prepared based on the Contractor's activities and corresponding locations. The SEMP will provide the following: <ol style="list-style-type: none"> i. The Contractor's organizational structure shows the implementation, supervision and 	Contractor Cost	Contractor to Implement Mitigation	Engineer, RD, ADB

		<p>reporting, and responsibilities of key personnel</p> <p>ii. The Project program and work activities</p> <p>iii. The Contractor's topic and site-specific plans are as follows:</p> <ul style="list-style-type: none"> ○ Waste Management Plan <ul style="list-style-type: none"> ▪ Wastewater Management Plan ▪ Spoil Disposal Management Plan ○ Soil Erosion Management Plan ○ Traffic Management Plan ○ Method Statement for Temporary Roads ○ Aggregate and Borrow Pits Management Plan ○ Employment and Procurement Procedure ○ Occupational and Community Health and Safety Management Plan ○ Emergency Response Plan ○ Waterway Safety Plan ○ Method Statement for River Crossings ○ Air Quality Plan ○ Spill Management Plan ○ Clearance, Revegetation, and Restoration Management Plan ○ Noise Management Plan ○ Biodiversity Management Plan ○ Laydown Area and Construction Camp Management Plan ○ Asphalt, Rock Crushing, and Concrete Batching Plant Management Plans ○ Bridge Construction Plan <p>• The Occupational and Community Health and Safety Management Plan shall be consistent with the template provided in the EIA.</p>			
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		<ul style="list-style-type: none"> • The Soil Disposal Management Plan shall utilize the assessment template included in the EIA. • The Contractor will retain the expertise of a qualified Environment and Social Officer (ESO) and Community Liaison Officer (CLO). • The Contractor will obtain all necessary permits and approvals before commencing construction activities. 			
Training	The Contractor's training and awareness-raising programs	<ul style="list-style-type: none"> • All personnel shall undergo a Project site induction that includes the Project's environmental requirements. 	Contractor Cost	Contractor to Implement Mitigation	RD, ADB
Climate Change	Future climate changes may cause damage to the bridge and approach roads	<ul style="list-style-type: none"> • The Project road will be constructed based on an embankment height (road centerline level) which accommodates the historic P1% (1 in 100 years) flood event. • Further climate change studies must be carried out as necessary to ensure that climate change considerations have been incorporated in the design of the bridge and approach roads. 	Project Cost	Detailed Design Consultant	RD
Noise/Vibration	Vibration emissions resulting from the use of machinery and equipment and vehicle circulation	<ul style="list-style-type: none"> • The Contractor will survey the status of the buildings nearest to the project site. The surveys will cover the following aspects: <ul style="list-style-type: none"> ○ Overall condition of the structures, both exterior and interior. ○ Document defects and preexisting cracks observed in the structure using digital imagery, notes, measurements, and sketches. 	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer

		<ul style="list-style-type: none"> ○ The survey findings shall be agreed upon by the property owner, who shall attend the survey and sign official documentation agreeing to the survey findings. ● Conduct additional pre-construction noise surveys to confirm site conditions. Incorporate findings of such investigations in the updated EIA and EMP if necessary. 			
Flora and Fauna Habitat, Distribution, and Species	Rehabilitation of the secondary road from Patara Poti to the oil terminal may extend into a proposed extension of the National Park (close to where the gas line crosses the Rioni River).	<ul style="list-style-type: none"> ● Consult with the MoEPA to determine the extent of the proposed extension of the National Park (currently being considered by parliament), which will cover the Rioni River and may extend as far east as the railway bridge neighboring the Project. ● Ensure that the rehabilitation of the secondary road does not extend into the proposed extension of the National Park. 	Project Cost	Detailed Design Consultant	RD
	Cumulative impacts from the multiple developments in the region.	<ul style="list-style-type: none"> ● The Consultation will be taken with IFI's, donors, and implementing units on other projects that are likely to contribute to cumulative impacts to reduce uncertainty and, where necessary, take appropriate action to minimize environmental harm. 	Project Cost	RD	N/A
Aquatic Fauna Habitat, Distribution,	Modification and fragmentation of habitat,	<ul style="list-style-type: none"> ● Ensure that all guidance on sand and gravel abstraction sites is followed as outlined in the Site Preparation, Construction, and Worksite Closure (i.e., project closure) Phases EMP table below are followed. 	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer

and Species	including loss of spawning grounds for wild sturgeon species				
	Displacement of species due to noise, presence of machinery, and equipment and of staff	<ul style="list-style-type: none"> • Before starting any in-the-water construction activities, conduct underwater noise measurements using hydrophones to establish in the water background noise levels. • The Contractor shall predict planned impact pile-driving noise levels in the water utilizing interim good practice guidelines before starting to pile. Where planned impact pile-driving appears likely to exceed Project thresholds, alternative pile-driving methods or mitigation will be selected. 	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
	Reduction of sturgeon abundance in the Rioni River from Project activities	<ul style="list-style-type: none"> • Sturgeon abundance surveys annually, from before the preparation phase until the end of the defect liability period. • To understand the potential for longer-term impacts, it would be necessary for sturgeon abundance monitoring to continue into the Project's operational phase annually until the third year of operation after defect liability and then twice more at five-year intervals. It is recommended that the RD identify parties best placed to undertake such surveys and report the findings to ADB and other relevant stakeholders. 	Project Cost	Ecological Contractor to Implement Mitigation	RD, Engineer
	Mortality of individuals from the operation of equipment and	<ul style="list-style-type: none"> • The Contractor will ensure that in-river construction activities are staged in periods least likely to affect the sturgeon fish spawning period. 	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer

	construction activities	<ul style="list-style-type: none"> All in-river activities will be avoided from March to September inclusive. Where possible, in-river activities will also be avoided in October and November. 			
	Mortality of sturgeon from illegal fishing activities using the bridge structures.	<ul style="list-style-type: none"> Institutional arrangements will be decided for monitoring the bridge piers by CCTV throughout the operation period to prevent poaching of the sturgeon by using fishing gear on bridge structures. 	Project Cost	RD	ADB
Flora species	Mortality of individuals	<ul style="list-style-type: none"> The Contractor shall survey construction to identify natural and modified habitats to ensure that natural habitats can be rehabilitated and compensated for where they will be permanently lost. The Contractor shall identify through a site survey if any Georgian Red-listed tree species are located within five meters of the site boundary. This survey will form part of the Contractor's Clearance, Revegetation, and Restoration Management Plan. In addition, in case walkover surveys pre-construction reveal any protected plant species in the area, the latter will be removed from the environment [and translocated] following subparagraph (v), Article 24, the first paragraph of the law of Georgia on 'Red List and Red Book.' Relocation of any specimens found during the surveys, where practical, will be provided with the help of biodiversity experts to ensure proper handling. Proper handling is crucial for species of conservation importance (e.g., Colchis Water-Chestnut (<i>Trapa colchica</i>) and spring snowflake (<i>Leucojum vernum</i>)). The practice 	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer

		will provide the best possible chance of survival for wildlife. The Contractor must develop a plan and schedule before implementing this task.			
Change of Land Use and Livelihoods	Land acquisition and livelihood loss to affected persons	<ul style="list-style-type: none"> Before the commencement of the construction works of the Project, the RD must finalize and implement the Land Acquisition and Resettlement Plan (the LARP) designed in compliance with the ADB Safeguards Policy Statement 2009. 	LARP Cost / Project Cost	RD to finalize the LARP and implement the Plan.	ADB to approve the LARP
	Barrier effect (impacts on mobility and access of locals to areas such as farmlands, aquaculture ponds, etc., across the Project road)	<ul style="list-style-type: none"> Ensure designs retain a strip of riparian habitat along the edge of the river to reduce the impact on species (keep connectivity and possibility for free movement along the river edge). 	Project Cost	Detailed Design Consultant	RD
Services Demand	The disruption of services, including energy, to surrounding communities due to the relocation of utilities.	<ul style="list-style-type: none"> All telephone and electrical poles/wires and underground cables should be shifted before the start of construction. Necessary permission and payments should be made to relevant utility service agencies to allow quick shifting and restoration of utility services. Local people must be informed through appropriate means about the time of shifting of utility structures and potential disruption of services, if any. 	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
Grievance Redress	Complaints due to project	<ul style="list-style-type: none"> Before the commencement of site works, the Contractor will develop a grievance redress mechanism (GRM) or system that will allow for 	Contractor Cost	Contractor to Implement	RD, Engineer

	implementation	<p>receiving/recording and immediate response to and resolution of construction-related complaints. The GRM shall be consistent with the GRM described in this EIA.</p> <ul style="list-style-type: none"> • The Contractor will inform the communities along the alignment and other stakeholders affected by the Project about the GRM in place to handle complaints and concerns about the Project. • The Contractor will also install notice boards at the construction sites to publicize the name and telephone numbers of the representatives of the Contractor and the RD. 		Mitigation	
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Environmental Management Plan - for Site Preparation, Construction, and Worksite Closure Phases

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/ Implementation	Control
Site Preparation, Construction, and Worksite Closure (i.e., project closure) Phases					
Air Quality	Localized dust emissions resulted from the use of machinery and equipment and the circulation of vehicles.	<ul style="list-style-type: none"> • Dust-generating areas will be controlled by water spraying, particularly under dry weather conditions. • Stockpiles will be planned and sited to minimize the potential for dust generation by taking into account prevailing wind directions and the locations of sensitive receptors. • The drop height of potentially dust-generating materials will be kept as low as possible. • Where practicable, stockpiles will be located away from sensitive receptors. • If the crushing of construction materials is required, crushers will be located away from sensitive receptors. Keeping at least a 300 m distance from residences windward to concrete production plants should be ensured. • The Contractor will obtain an environmental impact permit for an asphalt plant (if planned to run its facility) before operation. • Onsite speed limits will be applied and enforced for trucks traveling on unpaved surfaces (20 km/h). • Trucks transporting spoil or dusty materials off-site will be covered before leaving the sites. • Wheel-washing facilities will be available and used so that trucks leaving the Site do not spread dust onto neighboring roads. • Public roads used by site traffic will be swept regularly to prevent the accumulation of dirt. • Conveyor belts (e.g., at batching plants and rock-crushing plants) shall be fitted with wind-boards, 	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/Implementation	Control
		and conveyor transfer points and hopper discharge areas shall be enclosed to minimize dust emission.			
	Localized and long-term combustion gas emissions result from the use of machinery and equipment and the circulation of vehicles.	<ul style="list-style-type: none"> • Machines and construction plant items (e.g., trucks) in intermittent use will be shut down or throttled between work periods. • The burning of waste or vegetation on Site is prohibited. • Special attention will be given to the storage and handling of petrochemicals to avoid environmental hazards and risks. • Maintenance procedures will be implemented to keep equipment in good working condition to minimize exhaust emissions caused by poor performance. • Wherever possible, use electrically-powered equipment rather than gas or diesel-powered equipment. • Training will be provided for the operators of equipment and truck drivers regarding the air pollution potential of their activities. 	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
Noise	Noise and vibration emissions resulting from the use of machinery and equipment and vehicle circulation	<ul style="list-style-type: none"> • Work hours will be restricted between 07:00 to 20:00 hours within 500 m of the settlements. • The Contractor will establish the optimum travel speed during off-site travel. • Install temporary noise barriers made of plywood or acoustical blankets around noisy operations where necessary to comply with project noise limits. • Use newer equipment with improved noise muffling and ensure that all equipment items have the 	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/Implementation	Control
		<p>manufacturers' recommended noise abatement measures, such as mufflers, engine covers, and engine vibration isolators, intact and operational. Newer equipment will generally be quieter in operation than older equipment. All construction equipment should be inspected at periodic intervals to ensure proper maintenance and the presence of noise control devices (e.g., mufflers and shrouding, etc.).</p> <ul style="list-style-type: none"> • The number of equipment operating simultaneously will be reduced as far as practicable. • Reduce the number of equipment operating simultaneously as far as practicable. • Orientate equipment is known to emit noise strongly in one direction so that the noise is directed away from receptors as far as practicable. • Locate noisy plants as far away from receptors as practicable. • Avoid transportation of materials on- and off-site through existing community areas during nighttime hours. • Use material stockpiles and other structures to screen noise-sensitive receptors from onsite construction activities where practicable. • Record and respond to complaints according to the established grievance redress mechanism. • Keep nearby residences informed in advance about noisy activities during various construction phases. 			

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/Implementation	Control
		<ul style="list-style-type: none"> • Perform independent periodic noise and vibration monitoring to demonstrate compliance with Project noise and vibration limits. • When there is a possibility of human annoyance from construction activities, conduct such activity only during weekday daytime hours when the ambient background noise and the vibration are higher, and many residents are away from their homes at work. 			
Soil Quality	Land pollution due to improper management of solid waste, as well as possible dripping of hydrocarbons from machinery and equipment, and improper storage of oil and fuel.	<ul style="list-style-type: none"> • Temporary fuel tanks will be located at least 50 m from any watercourse, drain, or channel leading to a water course. The tank will be placed in covered areas with berms or dikes installed to intercept any spills. Any fall will be immediately localized and cleaned up with absorbent materials. The bund will be able to accommodate 110% of the volume of the tank. • Onsite repairs /maintenance and fueling activities will be limited to the extent possible. • Onsite vehicles and equipment shall be inspected regularly for leaks, and all leaks shall be immediately repaired. Leaking vehicles/equipment will not be allowed onsite. • Secondary containment devices (drop cloths, drain pans) shall be used to catch leaks or spills while removing or changing oils from vehicles or equipment. For minor spills, absorbent materials will be used. • Tire washing units will be equipped with drainage settling facilities. The washout pit will be cleaned immediately upon 75% filling. • No washing of vehicles in the river will be allowed. 	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/Implementation	Control
		<ul style="list-style-type: none"> • Usage of off-site vehicle wash racks or commercial washing facilities will be used whenever feasible. In addition, bermed wash areas for cleaning activities will be established if onsite cleaning is required. • The Contractor will implement a training program to familiarize staff with emergency procedures and practices related to contamination events. Operating personnel will be trained to visually inspect discharged water quality for oil and grease traces (that will be visible on the surface) periodically and take appropriate corrective actions. 			
Soil Structure	Land erosion due to loss of vegetation coverage and changes in its structure	<ul style="list-style-type: none"> • Materials and waste will be stockpiled so as to avoid erosion (in stockpiles less than 2 m in height and with a slope gradient of less than 25%) and washing off into the river. In addition, drainage trenches will be established to divert surface runoff from the Site. • Under no circumstances shall the following habitats be used for spoil disposal sites: (i) Kolkheti National Park and the Wetlands of Central Kolkheti Ramsar Site; (ii) Kolheti Important Bird Area; (iii) low grass marsh areas; and (iv) within 50 meters of the Rioni River. • To avoid loss of the productive soil layer, all suitable topsoil and other material shall be saved and stockpiled separately for the future recultivation of the area. • Stockpiles of removed topsoil will be designed appropriately/shaped, and managed. • Sand and aggregates will be stored in a hopper or bunker, shielding materials from winds. The bunker 	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/Implementation	Control
		<p>should enclose the stockpile on three sides. The walls should extend one meter above the height of the maximum quantity of raw material kept on Site and two meters above the front of the stockpile. The hopper or bunker will be fitted with water sprays that dampen the stored material.</p> <ul style="list-style-type: none"> • Store cement in sealed, dust-tight storage silos. All hatches, inspection points, and ductwork will be dust-tight. • Temporary detention ponds or containment to control silt runoff will be provided. • Construct intercepting ditches and drains to prevent runoff from entering construction sites • Soil compaction may be reduced by strictly keeping to temporary road boundaries. • Slopes of the embankment will be protected from erosion by vegetation and slope drainage. The design considers the selection of a reasonable embankment height, establishing temporary berms, slope drains, temporary pipes, contour ditches, ditch checks, diversions, and sediment traps. • Disturbed vegetation must be replanted immediately after the construction/disturbance stops. • Appropriately set up temporary construction camps (if determined needed) and storage areas to minimize the land area required and impact soil erosion. 			
Relief	Modification of geological	<ul style="list-style-type: none"> • The Contractor will carry out the operation of quarries and borrow pits, as well as extraction of gravel from river terraces (if utilized), in strict 	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/Implementation	Control
	formations - Quarries	<p>accordance with the conditions of a license issued by the Ministry of Economic Development (MoED) and cleared by the Ministry of Environment Protection and Agriculture (MoEPA); and</p> <ul style="list-style-type: none"> • The Contractor will be responsible for developing, agreeing, and strictly adhering to the quarry/borrow pit operation and re-cultivation plan (if the Contractor owns or establishes a new quarry site). • Borrowing from the river [at the Project site] will be prohibited. • Sourcing construction materials (e.g., sand, gravel) will avoid using licensed or unlicensed sites in the Rioni River or on its banks. • Borrow areas for materials, other than dredged sand fill, shall not be located in productive land, forested areas, and near water courses such as rivers, streams, etc. 			
Water Quality	Pollution of nearby water bodies due to poor storage and management of construction materials	<ul style="list-style-type: none"> • Discharge of any untreated water into the surface water body will be strictly prohibited. • Discharge of cement /concrete contaminated water will be prohibited unless settled and neutralized first to avoid pollution from water with high alkalinity, which can be toxic to aquatic life. • To prevent runoff contamination, paving will be performed only in dry weather. • Compacted straw (straw bales), silt fences, fiber rolls, gravel bags, or other approved sediment control must be ensured in disturbed soil areas. At a minimum, all bare soil (whether it's an abutment slope or a stockpile) must be protected before it rains. 	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/Implementation	Control
		<ul style="list-style-type: none"> • Drainage systems, erosion control, and silt removal facilities will be regularly inspected and maintained to ensure proper and efficient operation. • Vegetation will be preserved where feasible, particularly in areas near the river bank, to avoid erosion/sedimentation. Sites will be promptly revegetated where practicable and appropriate. • The construction camp (if needed), permanent or temporary, will not be located within 500 m of any river or irrigation channel. • Wastewater Management Plan and proper sewage collection and disposal system will be available to prevent pollution of watercourses (if discharge in the surface water is planned). • Stormwater drainage and wastewater will be treated according to the applicable World Bank/IFC guidelines. • Where applicable (i.e., to the irrigation canal in Patara Poti), the Project will, as much as possible, control the effluent and runoff discharged to the irrigation channel to below the "Severe" restriction on use according to the FAO Guidelines for Interpretations of Water Quality for Irrigation. 			
	Impact on surface water contamination from inappropriate waste management	<ul style="list-style-type: none"> • Construction materials and wastes will be stored appropriately to minimize the potential damage or contamination of the materials. • A construction materials inventory management system will be implemented to minimize the over-supply of construction materials, which may lead to the disposal of surplus materials at the end of the construction period. 	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/Implementation	Control
		<ul style="list-style-type: none"> • Hazardous and non-hazardous waste will be segregated, and appropriate containers for the type of waste will be provided. • Waste will be stored systematically to allow inspection between containers to monitor leaks or spills. • Waste will be disposed of systematically by licensed contractors. • Stormwater drainage and wastewater will be treated according to the applicable World Bank/IFC guidelines. 			
	Impacts on surface water due to contamination from accidental releases of hazardous substances	<ul style="list-style-type: none"> • Implementation of the specific mitigation measures outlined under Contamination of Soils above. 	Contractor Cost	Contractor Implement Mitigation	to RD, Engineer
	Water pollution from bridge construction	<ul style="list-style-type: none"> • Cofferdams, silt fences, sediment barriers, or other devices to prevent the migration of silt during construction within the river will be provided. • Dewatering and cleaning cofferdams to prevent siltation by pumping from cofferdams to a settling basin or a containment unit will be performed. • Ensure no waste materials are dumped in the river, including reinforced concrete debris. • Generators will be placed more than 20 m from the river. • No concrete waste from concrete mixers will be dumped in the river. 	Contractor Cost	Contractor Implement Mitigation	to RD, Engineer

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/Implementation	Control
		<ul style="list-style-type: none"> • Areas where concrete mixers can wash out leftover concrete without polluting the environment, will be provided. This may be in the form of a lined settling pond. The Contractor will inform drivers of these locations and the requirements to use these settling ponds on a routine basis. • Dried waste from the settling ponds can be used as backfill for culverts, etc. (as long as not contaminated). 			
	Surface water contamination from accidentally spilled fuel/oil and road surface runoff.	<ul style="list-style-type: none"> • Construction of two retention chambers (one on each side of the bridge) to protect water quality from contaminated roadway surface runoff and in the event hazardous substances are accidentally spilled during the operation phase. • Development of detailed terms of reference on the maintenance requirements for the retention chambers based on a final design and technical specifications. The TOR should include the following information with regards to maintenance and servicing of the retention chambers: (i) timing and frequency; (ii) training requirements; (iii) necessary equipment; (iv) procedures; and (v) locations where contents of the chambers can be treated/processed. 	Contractor Cost	Contractor Implement Mitigation	to RD, Engineer
Vegetative Coverage	Loss of vegetation coverage in specific areas of the Project	<ul style="list-style-type: none"> • Delimitation of areas to be cleared will be made before the beginning of the construction activities to limit as much as possible the surface of vegetation to be removed. • Boundaries of ROW and operation area will be strictly kept to - avoid impact on the adjacent vegetation; Strict keeping to traffic routes during the 	Contractor Cost	Contractor Implement Mitigation	to RD, Engineer

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/Implementation	Control
		construction will be ensured to prevent impact on vegetation. <ul style="list-style-type: none"> • The planned clearance area for the construction works shall be identified and marked to avoid accidental clearing. • Fencing of critical root zones of the trees at the boundary with the project area or on the way will be carried out. • The Project will utilize or upgrade existing roads to minimize unnecessary clearing requirements. • Training the staff in environmental and safety issues, including the protection of vegetation outside the boundaries of the project corridor. • Care will be taken to avoid the introduction of new invasive species to, and spread of existing invasive species within, the Project area through the washing of vehicles, equipment, and supplies before entry to the Project area; monitoring for invasive species; and control/eradication of invasive species where found. • Implement Clearance, Revegetation, and Restoration Management Plan. • Dispersion of fine dust and aerosol will be limited to the narrowest area possible through protective revegetation activities on both sides of the road. • All efforts will be made to minimize the removal of mature/significant trees and maintain connectivity between areas of forest habitats. 			
	Planting of vegetation on the Site after rehabilitating	<ul style="list-style-type: none"> • Disturbed sites will be recultivated after the completion of work. 	Contractor Cost	Contractor to Implement Mitigation	Engineer to Monitor Success Rate (RD to

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/Implementation	Control
	disturbed areas	<ul style="list-style-type: none"> Any reseeding or replanting of selected areas to be restored will use locally collected seed mixes and saplings. A local source of indigenous saplings suitable for replanting programs will be identified to facilitate restoration. The Clearance, Revegetation, and Restoration Management Plan prepared before construction will be followed (see section). No net loss of natural habitat will be ensured based on the site survey conducted during the Pre-Construction Stage. 			determine success rate criteria)
	Tree cutting	<ul style="list-style-type: none"> Plant maintenance will be carried out for at least two years. The Contractor shall be responsible for replanting any trees cut in these areas on a 1:3 basis using species native to the Site. 	Contractor Cost	Contractor and RD to Implement Mitigation	RD, Engineer
Terrestrial and Aquatic Fauna Habitat	Modification, fragmentation, and degradation of habitat	<ul style="list-style-type: none"> Air, water, soil, and noise impact mitigation measures will be implemented. Waste management – regular cleanup of the areas and management of waste according to the type and category. Refueling all plants, vehicles, and machinery will not be allowed within 50 m of any watercourse, drain, or channel leading to a water course. Construction materials and chemicals will be appropriately secured during flood season to avoid accidental release into the natural environment. Oil, chemical, and solid waste will be stored, handled, and disposed of by appropriately licensed waste management contractors. 	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/Implementation	Control
		<ul style="list-style-type: none"> • Dropping structures into rivers/streams will be avoided [construction will instead take place from the river bank or pontoons]. • Construction camp waste areas will be managed appropriately, so animals are not attracted that could be injured or ingest inappropriate food. 			
	Introduction of invasive alien species	<ul style="list-style-type: none"> • Care will be taken to avoid the introduction of new invasive species to, and spread of existing invasive species within, the Project area through the washing of vehicles, equipment, and supplies before entry to the Project area; monitoring for invasive species; and control/eradication of invasive species where found. 	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
Terrestrial Fauna Species	Fauna mortality	<ul style="list-style-type: none"> • Speed limits to a maximum of 20 km/hr for construction vehicles will be enforced to minimize the potential for fauna strike. • Commitment will be made to raise awareness of the values of natural habitat areas to the construction workforce, and arrangements will be made to restrict poaching and forest product collection. • Hunting wild animals will be strictly prohibited to apply for all staff. • Excavations left open at night will be covered. • Any excavations will include slopes or boards to ensure species can self-rescue should they fall in. • Leaving water-filled excavations will be avoided. • Where possible, vegetation will be removed outside the core breeding season from spring to early summer to allow species to find alternative breeding sites or to disperse after breeding. 	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/Implementation	Control
Terrestrial Fauna Distribution	Displacement of species due to noise, machinery and equipment, and staff presence.	<ul style="list-style-type: none"> Adherence to the no-horn policy will be enforced. All vehicles, equipment, and machinery used for construction will be regularly maintained and inspected/certificated to ensure that the noise levels conform to the standards prescribed. Works will not be lit except in exceptional circumstances or required for safety reasons. If lights are installed on the road or bridge in the future, ensure that lower-wattage lamps are used in street lights which direct light downwards to reduce glare. 	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
Aquatic Fauna Distribution	Displacement of species due to noise, presence of machinery, equipment, and of staff.	<ul style="list-style-type: none"> Movement of machines inside rivers, streams, or on their banks will be prevented except when it is unavoidable due to the construction of a structure. All in-river activities will be avoided during March-September inclusive to prevent disturbance to sturgeon during their overall spawning season. Where possible, in-river activities will also be avoided in October and November. The central bridge pier and adjoining two piers will be constructed (referring specifically to construction using coffer dams in the river) at two different times. Implement a build-up of activity that slowly increases construction activities within the Rioni River to allow aquatic fauna to exhibit avoidance responses. 	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
Aquatic Fauna Species	Mortality of individuals, from the operation of equipment and	<ul style="list-style-type: none"> The use of propeller-driven boats will be minimized during construction. Warning signs and CCTV cameras will be installed on both sides of the bridge to deter and detect illegal fishing activities. 	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/Implementation	Control
	construction activities or poaching by construction workers.	<ul style="list-style-type: none"> Poaching animals will be strictly prohibited to apply for all staff. Fishing and use of illegal fishing gear anywhere along the river will be prohibited. 			
	Reduction of sturgeon abundance in the Rioni River from Project activities	<ul style="list-style-type: none"> Sturgeon abundance surveys annually, from before the preparation phase until the end of the defect liability period. To understand the potential for longer-term impacts, it would be necessary for sturgeon abundance monitoring to continue into the Project's operational phase annually until the third year of operation after defect liability and then twice more at five-year intervals. It is recommended that the RD identify parties best placed to undertake such surveys and report the findings to ADB and other relevant stakeholders. 	Project Cost	Ecological Contractor Implement Mitigation	to RD, Engineer
	Cumulative impacts from the multiple developments in the region.	<ul style="list-style-type: none"> The Consultation will be taken with IFI's, donors, and implementing units on other projects that are likely to contribute to cumulative impacts to reduce uncertainty and, where necessary, take appropriate action to minimize environmental harm. 	Project Cost	Contractor Implement Mitigation	to RD, Engineer
	Pile driving for in-river construction	<ul style="list-style-type: none"> Noise from pile-driving will be kept below current international interim good practice guidelines. Ensure compliance with construction specifications that envisage the arrangement of cofferdams to protect water quality during construction and minimize the impacts on aquatic fauna during pile driving in the Rioni River. In addition, noise from pile driving will be kept below current international interim good practice guidelines. 	Contractor Cost	Contractor Implement Mitigation	to RD, Engineer

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/Implementation	Control
		<ul style="list-style-type: none"> The Contractor will model planned pile-driving and assess alignment with international interim good practice guidelines <i>before</i> starting to pile. 			
Landscape Quality	Change to existing landscape and character	<ul style="list-style-type: none"> Implementation of mitigation measures defined for soil, vegetation, and waste management. The visual impact of construction works will be mitigated by keeping to the boundaries of the worksites and traffic routes; preservation of vegetation; cleanup and good management of construction sites and camps; timely removal of waste from the area; material stock control (to avoid the accumulation of surplus material on the Site) An approved recultivation plan will be implemented. After completion of works, the worksite will be cleaned up; surplus materials, temporary structures, and machinery will be removed. Site compounds within the landform will be carefully placed. Existing woodland, land features, and other key elements will be retained and protected within the proposed development corridor. Commitment to high-quality design, materials, and specifications for the road and Rioni crossing. 	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
Change of Land Use and Livelihoods	Land acquisition and livelihood loss to affected persons	<ul style="list-style-type: none"> Impacts of physical and economic displacement will be addressed through the resettlement plans designed in compliance with the ADB Safeguards Policy Statement 2009. Written agreements with local landowners for temporary use of the property will be required, and sites must be restored to a level acceptable to the owner within a predetermined time period. 	Project Cost	RD to Implement the Plan / Corrective Action Plan	ADB to Approve the LARP / Corrective Action Plan

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/Implementation	Control
Jobs	Impacts on employment and economy	<ul style="list-style-type: none"> An Employment and Procurement Procedure should be established. In addition, the plan's development should involve Consultation with relevant stakeholders, including government authorities and local villagers. Opportunities to establish a skills training program with the aim of training interested local villagers to contribute to the Project should be reviewed. Local villagers should be informed of job opportunities promptly. Local businesses should be informed of contracting opportunities on time. 	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
Services Demand	Impacts on community infrastructure and services	<ul style="list-style-type: none"> Traffic advisory signs (to minimize traffic build-up) will be posted in coordination with local authorities. Accidentally damaged private property and/or infrastructure should be promptly restored. The community will be kept informed about the schedule of works which could cause temporary restriction of services and the potential duration of the 'impact' in advance. 	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
Community Health and Safety	Impacts on social cohesion	<ul style="list-style-type: none"> Construction camps (if established) will be located away from communities to avoid social conflict in competition for resources and basic amenities such as water supply. Local residents should be given priority in the hiring of construction workers. Employment of women will be encouraged. Goods and services will be sourced from local commercial enterprises to the extent possible. 	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer
	Risks to community health and	<ul style="list-style-type: none"> Air, water, soil, waste, and noise impact mitigation measures will be implemented. 	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/Implementation	Control
	safety due to increased traffic; the transport, storage, and use and/or disposal of materials (e.g., fuel and chemicals); and access to structural elements or components of the Project by members of the community.	<ul style="list-style-type: none"> • The Contractor shall provide appropriate safety barriers with hazard warning signs attached around all exposed openings and excavations. • Noise, vibration, and emission impact mitigation measures will be implemented. • Signs advising road users that construction is in progress will be provided, specifically at the points where the new road connects with the E-60. • Flag persons will control traffic when construction equipment enters or leaves the work area. • Strictly impose speed limits on construction vehicles along residential areas and where other sensitive receptors such as schools, hospitals, and other populated places are located. 			
Occupational Health and Safety	Workers' exposure to various physical hazards may result in minor, disabling, catastrophic, or fatal injuries.	<ul style="list-style-type: none"> • Measures will be implemented to reduce the likelihood and consequence of the potential hazards. This shall include (but not be limited to) the following risks: <ul style="list-style-type: none"> ○ Falling from height; ○ Falling into the water; ○ Entanglement with machinery; ○ Tripping over permanent obstacles or temporary obstructions; ○ Slipping on greasy walkways; ○ Falling objects; ○ Contact with dangerous substances; ○ Electric shock; ○ Variable weather conditions; ○ Lifting excessive weights; and ○ Traffic operations. 	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/Implementation	Control
		<ul style="list-style-type: none"> • Conduct orientation for construction workers regarding health and safety measures, emergency response in case of accidents, fire, etc., and prevention of HIV/AIDS and other related diseases. • Competent and adequately resourced Subcontractors will be used where construction activities are to be subcontracted. • Provisions will be incorporated into all sub-contracts to ensure compliance with the SEMP at all tiers of the sub-contracting. • All persons working on the Site will be provided information about risks on the Site, and arrangements will be made for workers to discuss health and safety with the Contractor. • The Contractor will prepare and implement an Occupational and Community Health and Safety Management Plan before commencing work. This plan will include provisions on clean water, sewage and wastewater, solid waste, liquid chemical waste, personal protection, emergency preparedness and response, records management, safety communication, and training and awareness. • All workers will be adequately informed, consulted, and trained on health and safety issues. • The areas where the risk of injuries from falling objects exists will be marked with rope or flagging to minimize risks and damages. • Flag persons will control traffic when construction equipment enters or leaves the work area. • The approved traffic management plan Error! Reference source not found.will provide road signs. 			

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/Implementation	Control
		<ul style="list-style-type: none"> • Personal Protective Equipment (PPE) shall be worn at all times on the Site. This shall include appropriate safety shoes, safety eyewear, and hard hats. In addition, Non-slip or studded boots will be worn to minimize the risk of slips. • Before starting work, all the appropriate safety equipment and first-aid kits will be assembled and checked as being in working order. • All lifting equipment and cranes will be tested and inspected regularly. • All scaffolding will be erected and inspected, and the Contractor will maintain the appropriate records. • When there is a risk of drowning, lifebelts shall be provided, and it shall be ensured that personnel wears adequate buoyancy equipment or harness and safety lines and that rescue personnel is present when work is proceeding. • All safety harnesses, lifelines, reviving apparatus, and any other equipment provided for use in or in connection with emergencies will be adequately maintained and thoroughly examined at least once a month and after every occasion on which it has been used. • Drivers will be educated on safe driving practices to minimize accidents and prevent the spill of hazardous substances and other construction materials during transport. • Adequate sanitation facilities will be provided for all workers at the workers'/construction camps. • First aid facilities will be provided that are readily accessible to workers. 			

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/Implementation	Control
		<ul style="list-style-type: none"> • Fire-fighting equipment will be provided at the work areas, as appropriate, and at construction camps where fire hazards and risks are present. • Report all accidents and near misses and collect statistics to identify trends and requirements for further training or 'safety stand-downs' where incident numbers are growing. 			
Cultural Heritage	Risks to built heritage, objects, and sites with archaeological, historical, religious, or other cultural value and significance.	<ul style="list-style-type: none"> • The chance finds procedure for managing cultural heritage will be implemented if any cultural heritage is discovered during construction. 	Contractor Cost	Contractor and RD to implement mitigation	RD, Engineer
Grievance Redress	Complaints due to Project implementation	<ul style="list-style-type: none"> • The Contractor will be responsible for nominating a Community Liaison Officer (CLO) and implementing the grievance procedure. • Workers will not be restricted from joining or forming workers' organizations or from bargaining collectively. The Contractor will not discriminate or retaliate against workers who create or join collectives or bargain collectively. • Working relationships and work conditions are also to be managed and monitored in implementing the Project. • Continuous monitoring and review of complaints from neighboring communities around the Project activity areas per the grievance redress mechanism. 	Contractor Cost	Contractor and RD to implement mitigation	RD, Engineer

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/ Implementation	Control
Waste	Pollution of land, water, or air from poor waste management	<ul style="list-style-type: none"> • The Contractor will classify waste streams (hazardous, non-hazardous, or a waste that requires a full assessment to determine classification – so-called 'mirror entry' waste) and manage them according to international best practice and Georgian law. • Construction and work sites will be equipped with sanitary latrines that do not pollute surface waters and are connected to septic tanks or wastewater treatment facilities. • The Contractor will agree with Poti municipality, and solid non-hazardous, and inert waste will be removed to the Poti municipal waste dump. • Domestic and Inert Waste <ul style="list-style-type: none"> ○ Provide garbage bins and facilities within the Project site to temporarily store domestic solid waste and construction waste. ○ Waste storage containers shall be covered, tip-proof, weatherproof, and scavenger-proof. ○ Ensure that wastes are not haphazardly dumped within the project site and adjacent areas. • Hazardous waste <ul style="list-style-type: none"> ○ On the Site allocated for the temporary, short-term keeping of hazardous wastes, ensure compliance with the following safety measures: <ul style="list-style-type: none"> ▪ Use containers suitable for each type of waste; ▪ Prohibit the use of damaged containers. Check the integrity of containers regularly. ▪ Mark containers adequately; ▪ Provide secondary containment; ▪ Refrain from mixing various waste streams. 	Contractor Cost	Contractor to Implement Mitigation	RD, Engineer

Affected Aspect	Potential Impact / Issue	Mitigation/Enhancement Measures (all that apply)	Estimated Cost	Responsibility	
				Development/Implementation	Control
		<ul style="list-style-type: none"> ○ Hire an authorized Contractor for hazardous waste removal and Keep agreements with hazardous waste management companies active. ○ Keep copies of waste manifests on Site. Keep a record of waste onsite and waste removed. ○ In case of large-scale spills of hazardous liquids, follow the Spill Management Plan. 			

Supplementary Document 2: Biodiversity Monitoring Plan (taken from Biodiversity Action Plan)

Environmental Component	Aspect	Project phase	Issue/Impact	Mitigation action	What parameter is to be monitored?	Where is the parameter to be monitored?	How is the parameter to be monitored?	When is the parameter to be monitored (frequency)?	Institutional responsibility
Kolkheti National Park, Ramsar Site and Important Bird Area; White-headed Duck (<i>Oxyura leucocephala</i>); Stellate, Russian and Beluga Sturgeon (<i>Acipenser stellatus</i> , <i>A. gueldenstaedtii</i> and <i>Huso huso</i>); Grusian Scaper (<i>Capoeta ekmekciae</i>)	Habitat	P, C	IP 11: Introduction of invasive alien species.	Care will be taken to avoid the introduction of new invasive species to, and spread of existing invasive species within, the Project area through: - washing of vehicles, equipment, and supplies before entry to the Project area; - monitoring for invasive species; and - control/eradication of invasive species where found.	Washing of vehicles, equipment, and supplies before entry to the Project area	Transit site outside Project Area of Influence	Inspections	Unannounced inspections at least quarterly during preparation, construction, and worksite closure phases	RD, Construction Supervision (referred to as the "Engineer" in the ADB EIA)
					Abundance/spread of invasive alien species in Project area	Project Area of Influence	Surveys by specialist sub-contractor	Annually, in summer, during preparation, construction, and worksite closure phases.	Construction Contractor ecological sub-contractor
					Control of new/spreading areas of invasive alien species in the Project area	Project Area of Influence	Records of invasive species control; inspections	Quarterly, during preparation, construction, and worksite closure phases	Construction Supervision Construction Contractor ecological sub-contractor
Kolkheti National Park, Ramsar Site, and Important Bird Area	Vegetation coverage	P	IP 9: Loss of vegetation coverage in specific areas of the Project.	Ensure that the rehabilitation of the secondary road [from Patara Poti to the oil terminal] does not extend into the proposed extension of the National Park.	Rehabilitation of secondary road within NP extension	Worksite	Comparison of maps of proposed NP extension with those of secondary road rehabilitation	Before the finalization of Project work plans	RD
Kolkheti National Park, Ramsar Site, and Important Bird Area	Vegetation coverage	P	IP 9: Loss of vegetation coverage in specific areas of the Project.	Boundaries of ROW and operation area will be strictly kept to - avoid impact on the adjacent vegetation; Strict keeping to traffic routes during the construction will be ensured to prevent impact on vegetation.	Vegetation disturbance by Project vehicles and contractors; mortality of priority birds and plants	Project Area of Influence	Review of Project incident logbook; visual inspection	Unannounced inspections at least quarterly during preparation, construction, and worksite closure phases	RD, Construction Supervision
Colchis Water-Chestnut (<i>Trapa colchica</i>) and <i>Hibiscus ponticus</i>	Mortality	P, C	IP, IC 10: Mortality of individuals.						

Environmental Component	Aspect	Project phase	Issue/Impact	Mitigation action	What parameter is to be monitored?	Where is the parameter to be monitored?	How is the parameter to be monitored?	When is the parameter to be monitored (frequency)?	Institutional responsibility
White-headed Duck (<i>Oxyura leucocephala</i>)	Habitat	P	IP 12: Modification and habitat fragmentation due to vegetation coverage loss.						
	Mortality	P	IP 13: Mortality of individuals due to equipment operation.						
Colchis Water-Chestnut (<i>Trapa colchica</i>) and <i>Hibiscus ponticus</i>	Mortality	P, C	IP, IC 10: Mortality of individuals.	Vegetation will be preserved where feasible, particularly in areas near the river bank, to avoid erosion/sedimentation.	Mortality of individuals	Project Area of Influence	Review of Project incident logbook; visual inspection	Unannounced inspections during preparation, construction, and worksite closure phases	RD, Construction Supervision
				In case taxation [walkover surveys pre-construction] reveals any protected plant species in the area, the latter will be removed from the environment [and translocated] following subparagraph (v), Article 24, the first paragraph of the law of Georgia on 'Red List and Red Book.' Relocation of any specimens found during the surveys, where practical, will be provided with the help of biodiversity experts to ensure proper handling. The Contractor must develop a plan and schedule before implementing this task.	Number of plants requiring translocation	Within the Project area, where ground/water disturbance may take place	Surveys by specialist sub-contractor	During walkover surveys, pre-construction	Construction Contractor ecological sub-contractor

Environmental Component	Aspect	Project phase	Issue/Impact	Mitigation action	What parameter is to be monitored?	Where is the parameter to be monitored?	How is the parameter to be monitored?	When is the parameter to be monitored (frequency)?	Institutional responsibility
White-headed Duck (<i>Oxyura leucocephala</i>); Stellate, Russian and Beluga Sturgeon (<i>Acipenser stellatus</i> , <i>A. gueldenstaedtii</i> and <i>Huso huso</i>); Grusinian Scraper (<i>Capoeta ekmekciae</i>)	Distribution	P, C	IP 13, IC 11: Displacement of species due to noise, presence of machinery and equipment, and presence of staff.	All vehicles, equipment, and machinery used for construction will be regularly maintained and inspected/certificated to ensure that the noise levels conform to the standards prescribed.	Noise levels of Project vehicles, equipment, and machinery against prescribed standards	Worksite	Review of certificates; inspections	Unannounced inspections quarterly during preparation and construction phases	RD, Construction Supervision
Colchis Water-Chestnut (<i>Trapa colchica</i>) and <i>Hibiscus ponticus</i>	Mortality	P, C	IP, IC 10: Mortality of individuals.	Training the staff in environmental and safety issues, including the protection of vegetation outside the boundaries of the project corridor.	Staff adherence to best practice	Worksite	Review of training records; review of Project incident logbook; inspections	Unannounced inspections quarterly during preparation and construction phases	RD, Construction Supervision
Stellate, Russian and Beluga Sturgeon (<i>Acipenser stellatus</i> , <i>A. gueldenstaedtii</i> and <i>Huso huso</i>); Grusinian Scraper (<i>Capoeta ekmekciae</i>)	Habitat	C	IC 12: Modification and fragmentation of habitat, including loss of spawning grounds for wild sturgeon species.						
Colchis Water-Chestnut (<i>Trapa colchica</i>) and <i>Hibiscus ponticus</i>	Mortality	P, C	IP, IC 10: Mortality of individuals.	Disturbed vegetation must be replanted immediately after the construction/disturbance stops.	Physical restoration of the sites to their original state	At all Project-disturbed areas	Inspections	Before the end of the worksite closure phase	RD, Construction Supervision
					The successful progress of revegetation and the need for any additional	At all Project revegetation sites	Surveys by specialist sub-contractor	Annually, in summer, from the last year of the worksite closure	MoEPA, Construction Contractor ecological sub-

Environmental Component	Aspect	Project phase	Issue/Impact	Mitigation action	What parameter is to be monitored?	Where is the parameter to be monitored?	How is the parameter to be monitored?	When is the parameter to be monitored (frequency)?	Institutional responsibility
					revegetation			phase until the fifth year of the operations phase, inclusive.	contractor
Stellate, Russian and Beluga Sturgeon (<i>Acipenser stellatus</i> , <i>A. gueldenstaedtii</i> and <i>Huso huso</i>); Grusinian Scraper (<i>Capoeta ekmekciae</i>)	Habitat	C	IC 12: Modification and fragmentation of habitat, including loss of spawning grounds for wild sturgeon species.	Slopes of the embankment will be protected from erosion by vegetation and slope drainage.	Adherence to approved Project plans for soil and erosion, storage of fuels and chemicals, sewage management, and fueling and maintenance.	Project Area of Influence	Inspections	Unannounced inspections at least monthly during preparation, construction, and worksite closure phases	RD, Construction Supervision
				Dewatering and cleaning cofferdams to prevent siltation by pumping from cofferdams to a settling basin or a containment unit will be performed.					
				Construction materials and chemicals will be appropriately secured during flood season to avoid accidental release into the natural environment.					
				Materials and waste will be stockpiled so as to avoid erosion and wash off into the river. In addition, drainage trenches will be established to divert surface runoff from the Site.					
				Ensure no waste materials are dumped in the river, including reinforced concrete debris.	Aquatic macroinvertebrate diversity and abundance	Close downstream of the Project site	Surveys by specialist sub-contractor using driftnets.	Quarterly, during preparation, construction, and worksite closure phases, and the first two years of the operations phase.	EPA, Construction Contractor ecological sub-contractor
				Compacted straw (straw bales), silt fences, fibber rolls, gravel bags, or other approved sediment control must be ensured in disturbed soil areas. At a minimum, all bare soil (whether it's an abutment slope or a stockpile) must be protected before it rains.					
				No concrete waste from					

Environmental Component	Aspect	Project phase	Issue/Impact	Mitigation action	What parameter is to be monitored?	Where is the parameter to be monitored?	How is the parameter to be monitored?	When is the parameter to be monitored (frequency)?	Institutional responsibility
				<p>concrete mixers will be dumped in the river.</p> <p>Temporary fuel tanks will be located at least 50 m from any watercourse, drain, or channel leading to a water course. The tank will be placed in covered areas with berms or dikes installed to intercept any spills. Any spill will be immediately localized and cleaned up with absorbent materials. The bund will be able to accommodate 110% of the volume of the tank.</p> <p>Refueling all vehicles and machinery will not be allowed within 50 m of any watercourse, drain, or channel leading to a water course.</p> <p>Oil, chemical, and solid waste will be stored, handled, and disposed of by appropriately licensed waste management contractors.</p>					
				<p>Borrowing from the stream [at the project site] will be prohibited. In addition, dropping structures into rivers/streams will be avoided [construction will instead take place from the river bank or pontoons].</p> <p>Discharge of sediment-laden construction water (e.g., from areas containing dredged soil) directly into surface watercourses will be forbidden. Instead, sediment-laden construction water will be discharged into settling lagoons</p>	<p>Absence of borrowing from; movement of machines or dropping structures in; and discharge of sediment-laden water to the Rioni River at the project site</p>	<p>Project Area of Influence</p>	<p>Visual inspection</p>	<p>Unannounced inspections monthly during preparation, construction, and worksite closure phases.</p>	<p>RD, Construction Supervision</p>

Environmental Component	Aspect	Project phase	Issue/Impact	Mitigation action	What parameter is to be monitored?	Where is the parameter to be monitored?	How is the parameter to be monitored?	When is the parameter to be monitored (frequency)?	Institutional responsibility
				or tanks before final discharge.					
Stellate, Russian and Beluga Sturgeon (<i>Acipenser stellatus</i> , <i>A. gueldenstaedtii</i> and <i>Huso huso</i>); Grusinian Scraper (<i>Capoeta ekmekciae</i>)	Habitat	C	IC 12: Modification and fragmentation of habitat, including loss of spawning grounds for wild sturgeon species.	Movement of machines inside rivers, streams, or on their banks will be prevented except when it is unavoidable due to the construction of a structure. No washing of vehicles etc., in the river, will be allowed.	Absence of movement of machines in the Rioni River	Project Area of Influence	Visual inspection	Unannounced inspections monthly during preparation, construction, and worksite closure phases.	RD, Construction Supervision
	Distribution	C	IC 13: Displacement of species due to noise, presence of machinery, equipment, and of staff.						
	Mortality	C	IC 14: Mortality of individuals from the operation of equipment and construction activities or poaching by construction workers.						
Stellate, Russian and Beluga Sturgeon (<i>Acipenser stellatus</i> , <i>A. gueldenstaedtii</i> and <i>Huso huso</i>); Grusinian Scraper (<i>Capoeta ekmekciae</i>)	Habitat	C	IC 12: Modification and fragmentation of habitat, including loss of spawning grounds for wild sturgeon species.	Sourcing construction materials (e.g., sand, gravel) will avoid using any licensed or unlicensed sites in the Rioni River or on its banks.	Sourcing of materials	n/a	Review of records for sourcing of materials; inspections	Unannounced inspections quarterly during preparation, construction, and worksite closure phases	RD, Construction Supervision

Environmental Component	Aspect	Project phase	Issue/Impact	Mitigation action	What parameter is to be monitored?	Where is the parameter to be monitored?	How is the parameter to be monitored?	When is the parameter to be monitored (frequency)?	Institutional responsibility
Stellate, Russian and Beluga Sturgeon (<i>Acipenser stellatus</i> , <i>A. gueldenstaedtii</i> and <i>Huso huso</i>); Grusinian Scraper (<i>Capoeta ekmekciae</i>)	Distribution	C	IC 13: Displacement of species due to noise, presence of machinery, equipment, and of staff.	Coffer dams, silt fences, sediment barriers, or other devices to prevent the migration of silt during construction within the river will be provided. [Coffer dams will also significantly reduce pile-driving noise.]	Use of silt migration barriers	Worksite	Visual inspection	Unannounced inspections, twice-yearly in March-September during the preparation and construction phases	RD, Construction Supervision
				Ensure compliance with construction specifications that envisage the arrangement of cofferdams to protect water quality during construction and minimize the impacts on aquatic fauna during pile driving in the Rioni River. In addition, noise from pile driving will be kept below current international interim good practice guidelines.	Use of sheet pile cofferdams for in-river construction	Worksite	Visual inspection	Unannounced inspections, twice-yearly in March-September during the preparation and construction phases	RD, Construction Supervision
				The Contractor will model planned pile-driving and assess alignment with international interim good practice guidelines before starting to pile. Where planned pile-driving appears likely to exceed such thresholds, alternative pile-driving methods or mitigation will be selected.	Noise levels from pile-driving against good practice guidelines	Worksite	Inspections	Unannounced inspections quarterly during preparation and construction phases	RD, Construction Supervision
				Implement a build-up of activity that slowly increases construction activities within the Rioni River to allow aquatic fauna to exhibit avoidance responses.	Appropriate construction build-up	Worksite	Inspections	Unannounced inspections quarterly during preparation and construction phases	RD, Construction Supervision
				All in-river activities will be avoided during March-September inclusive to prevent disturbance to sturgeon during	Absence of in-river activities	Worksite	Visual inspection	At least monthly from March-September inclusive, during	RD, Construction Supervision

Environmental Component	Aspect	Project phase	Issue/Impact	Mitigation action	What parameter is to be monitored?	Where is the parameter to be monitored?	How is the parameter to be monitored?	When is the parameter to be monitored (frequency)?	Institutional responsibility
				their overall spawning season. Where possible, in-river activities will also be avoided in October and November.				the preparation, construction, and worksite closure phases	
				The central bridge pier and adjoining two piers will be constructed (referring specifically to construction using coffer dams in the river) at two different times.	Appropriate construction sequencing	Worksite	Visual inspection	At least monthly from March-September inclusive, during the preparation, construction, and worksite closure phases	RD, Construction Supervision
Stellate, Russian and Beluga Sturgeon (<i>Acipenser stellatus</i> , <i>A. gueldenstaedtii</i> and <i>Huso huso</i>); Grusinian Scraper (<i>Capoeta ekmekciae</i>)	Mortality	C	IC 14: Mortality of individuals from equipment and construction activities or poaching by construction workers.	Fishing and using illegal fishing gear [by construction workers] anywhere along the river will be prohibited.	Absence of fishing	Worksite	Visual inspection	Unannounced inspections, quarterly during the preparation, construction, and worksite closure phases	RD, Construction Supervision
				The use of propeller-driven boats will be minimized during construction.	Absence of propeller-driven boats except during set-up and removal of pontoons	Worksite	Visual inspection	Unannounced inspections, quarterly during the preparation, construction, and worksite closure phases	RD, Construction Supervision
Stellate, Russian and Beluga Sturgeon (<i>Acipenser stellatus</i> , <i>A. gueldenstaedtii</i> and <i>Huso huso</i>); Grusinian Scraper (<i>Capoeta ekmekciae</i>)	Habitat	O	IO 8: Degradation of aquatic habitat from accidentally spilled fuel/oil or surface runoff from	the bridge. The built drainage structures and runoff and spill containment chambers will handle runoff water from the bridge structures. The Terms of Reference for the Road Maintenance Contractor for the operations phase will include regular monitoring of retention structures and safe disposal of contents after spills.	Drainage/retention infrastructure in good technical condition and cleaned regularly	Project site	Inspection	Recurrent [as needed for the operational life of the Project]	RD, Maintenance Contractor

Environmental Component	Aspect	Project phase	Issue/Impact	Mitigation action	What parameter is to be monitored?	Where is the parameter to be monitored?	How is the parameter to be monitored?	When is the parameter to be monitored (frequency)?	Institutional responsibility
Stellate, Russian and Beluga Sturgeon (<i>Acipenser stellatus</i> , <i>A. gueldenstaedtii</i> and <i>Huso huso</i>); Grusinian Scraper (<i>Capoeta ekmekciae</i>)	Mortality	O	IO 9: Mortality of sturgeon from illegal fishing activities using the bridge structures.	Warning signs and CCTV cameras will be installed on both sides of the bridge to deter and detect illegal fishing activities.	Installation of warning signs and CCTV cameras	Project site	Inspection	Before the end of the worksite closure phase	RD, Construction Supervision
				Monitoring of the bridge piers by CCTV will be ensured throughout the operation period to prevent poaching of the sturgeon by using fishing gear on bridge structures.	Illegal fishing using the bridge	Project site	Inspection of CCTV camera footage	At least weekly from March-September inclusive, for the operational life of the Project	RD, Maintenance Contractor
					Sturgeon abundance in the river	Project site	Surveys by specialist Contractor	Annually, from before the preparation phase until the end of the defect liability period.*	RD, ecological Contractor

Supplementary Document 3. Site Photo Log



The Project view from the southeast corner (looking northeast)



The Project view from the bridge pier location near the Rioni river



Panoramic view of the southeast corner of the Project



Panoramic view of the bridge pier location near the Rioni river (looking southeast)



Improperly stored accumulators



Improperly stored hazardous material containers



Panoramic view from the gas relocation works and amelioration canal



Improperly stored hazardous material containers



Dust generated during heavy construction machinery movement



Bridge construction works above the amelioration canal



Poor soil embankment management near the amelioration canal



Poor soil embankment management near the amelioration canal



Water pumping from the small ponds in the eastern part of the project





Improperly stored hazardous material containers



Full waste bin

Supplementary Document 4: Observations Logbook

 ჯანმრთელობის, შრომითი უსაფრთხოების და გარემოს დაცვის დაკვირვების ანგარიში Health, Safety, & Environmental Observation Report												
No	ფოტო Photo	ტიპი Type	თემა Topic	თარიღი Date	დრო Time	ადგილი Place	აღწერა Description	გამოსასწორებელი ქმედება Remedial Action	პასუხისმგებელი Responsible	ვა-და Deadline	სტატუსი Status	დასაბუთება/კომენტარი Justification/Comment
1		საბიუჯეტო ქვევა Unsafe Behaviour	დაკიდული ტვირთი / სააშენი სამშაოები Suspended Load / lifting	11.01.2023	10:22	სამშენებლო უბანი (დასავლეთის მხარე)	ქვეკონტრაქტორი კომპანიის თანამშრომლები სააშენი სამშაოების (მიწდინარობდა მიწის საბურღი მანქანა-დანადგარის აწეობა) ასრულებდნენ ძლიერი ქარის (22 მ/წმ) პირობებში. ფაქტი ვერცხა პრივეტის ხელმძღვანელს და სამშაოების მწარმოებლებს მიუცაოთ მოითხოვა სამშაოების დაუყოვნებლივ შეჩერების შესახებ, რაც მყისიერად შესრულდა. ასევე, სამშაოებში მოწოდებებს ჩატარდათ ინსტრუქტაჟი სააშენი სამშაოების შესახებ.	ა.შ	ა.შ	ა.შ	დახურული Closed	
2		საბიუჯეტო ქვევა Unsafe Behaviour	პერსონალური დაცვის სამაგლეები (იღს) Personal Protective Equipment (PPE)	11.01.2023	10:30	სამშენებლო უბანი (დასავლეთის მხარე)	ქვეკონტრაქტორი კომპანიის თანამშრომლები მიწის საბურღი მანქანა-დანადგარის აწეობას აწარმოებდნენ მყარ ჩაფხულების გარეშე. ასევე ურთ-ურთ არ ეცა დამცავი დენსაემული. მიუხედავად მოწოდებების ძლიერი ქარის გამო სამშაოები შეჩერდა, თუმცა ქვეკონტრაქტორებს მიუცაოთ მოითხოვა იღს ტარების შესახებ.	ა.შ	ა.შ	ა.შ	დახურული Closed	ორგანული კანონი შრომის უსაფრთხოების შესახებ - მუხლი 11, პუნქტი „ზ“.
3		საბიუჯეტო მდგომარეობა Unsafe Condition	სიმაღლეზე სამუშაო აღჭრეულობა Working at height equipment	11.01.2023	10:40	სამშენებლო უბანი (დასავლეთის მხარე)	ქვეკონტრაქტორი კომპანიის თანამშრომლები იყენებდნენ დაზიანებულ, არასრულყოფილად აწყობილ ხარჯოს, მათ მიუცაოთ მოითხოვა ხარჯოს ხმარებიდან ამოღების შესახებ და ჩატარდათ ინსტრუქტაჟი ხარჯოს აგების, გამოცდების და კონსოლიდირებით გათვალისწინებული სტანდარტის შესახებ.	ა.შ	ა.შ	ა.შ	დახურული Closed	ტექნიკური რეგლამენტის სიმაღლეზე მუშაობის მოთხოვნების შესახებ - მუხლი 6.
4		საბიუჯეტო მდგომარეობა Unsafe Condition	უძველესი ხელსაწყოები/მოწყობილობები Power tools/equipment	14.01.2023	11:00	საოფისე ტერიტორია	კუთხსაზე დაზიანი გარსაგნის გარეშე, საშუალო პირობებში მონაწილე პერსონალს მიუცაოთ რეკომენდაცია კუთხსაგნის უსაფრთხო გამოყენებაზე და მოითხოვა დასაყვი გარსაგნის დამონტაჟების შესახებ.	ა.შ	ა.შ	ა.შ	დახურული Closed	მშენებლობის უსაფრთხოების შესახებ ტექნიკური რეგლამენტის დამტკიცების თაობაზე - მუხლი 7.
5		საბიუჯეტო ქვევა Unsafe Behaviour	პერსონალური დაცვის სამაგლეები (იღს) Personal Protective Equipment (PPE)	14.01.2023	11:00	საოფისე ტერიტორია	სამშენებლო სამუშაოებისას დაფიქსირდა ქვემოთ მოცემული მუცხაბრებები: 1. მუცხაბრების მწარმოებელი პირი არ იყო აღჭრეული მუცხაბრების სამსაოთ, რაც მუცხაბრში გამოწორდა. 2. მუცხაბრის ადგილზე არ იყო დენსაემული, თუმცა მოითხოვის შემდეგ დაიდგა.	1. მოხდეს თანამშრომლებზე ინსტრუქტაჟის ჩატარება ინდივიდუალური დაცვის სამაგლეების გამოყენების შესახებ.	ა.შ	17.01.2023	დახურული Closed	მშენებლობის უსაფრთხოების შესახებ ტექნიკური რეგლამენტის დამტკიცების თაობაზე - მუხლი 15.
6		საბიუჯეტო ქვევა Unsafe Behaviour	ტვირთისაგრი აღჭრეულობა Lifting Gear	18.01.2023	11:10	საოფისე ტერიტორია	ტვირთის ბორღურების ჩამოტვირთვა მიწდინარობდა დაზიანებული (გაღმუცლი) სინთეტიკური ფეხით. სამშაოები შეჩერდა და ეცხობა საიდ ინჟინერს. სააშენი სამშაოების წარმოებასთან დაკავშირებით საუბარი ჩატარდა მანიპულატორის პერსონალის და ჩამხმელის. ფულის შევლის შემდეგ სამშაოები განახლდა.		ა.შ	ა.შ	დახურული Closed	პრივეტის ჯანმრთელობის, შრომის უსაფრთხოების და გარემოს დაცვის ეცხობა - თავი 11.19 სააშენი აღჭრეულობა; ჩაბნა-დაჯამარება.
7		საბიუჯეტო ქვევა Unsafe Behaviour	პერსონალური დაცვის სამაგლეები (იღს) Personal Protective Equipment (PPE)	18.01.2023	11:15	საოფისე ტერიტორია	აშენ-მანიპულატორის ოპერატორი სააშენი სამშაოებს (მანიპულატორის მარფას) ასრულებდა ჩაფხულების გარეშე. ოპერატორს მიუცაოთ მუცხაბრის, ჩატარდა საუბარი იღს-ს გამოყენების შესახებ, რის შემდეგაც მდგომარეობა გამოწორდა.		ა.შ	ა.შ	დახურული Closed	საქართველოს ორგანული კანონი შრომის უსაფრთხოების შესახებ - მუხლი 11, პუნქტი „ზ“.

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8		პოზიტიური დაკვირვება Positive Observation	მინამუშევრების Housekeeping	23.01.2023	10:30	საწყობი	საწყობში სხვადასხვა ნივთიერებები, ნედრი ნივთები და საშენი მასალები ერთმანეთისგან გარედაცევა და მოხდა საშენი ადგილის დაზიანება-დასუფთავება.	ა/შ	ა/შ	ა/შ	დახურული Closed	
9		საშიშვლო ქცევა Unsafe Behaviour	პერსონალური დაცვის საშუალებები (იღბ) Personal Protective Equipment (PPE)	16.02.2023	12:05	ოფისების სამშენებლო მოედანი	საბუღალტრო სამშენებლო სამუშაოების დროს დაფიქსირდა შემდეგი დარღვევები: 1. უსაფრთხო მოძრაობისა და მოქმედების კონტროლის გეგმის გარეშე; 2. მოწყობილი განთავსებული იყო თბილისის კოდზე და არა I 8 დამოწმებით; 3. ინჟინერი, აშუ-მანიპულატორის ოპერატორი, და დამხმარე-მენა საშენი არააღნიშნული იმყოფებოდნენ ჩაფრტვების გარეშე. მანიპულატორის ოპერატორს ასევე არ ეცა მადელი მოვადომის ვეჯტი. დასაქმებულებს მოვადომის მუშაობა და არასაფრთხო ქმედება გამოსწორდა ადგილზე.	ა/შ	ა/შ	ა/შ	დახურული Closed	
10		საშიშვლო ქცევა Unsafe Behaviour	სამშენებლო სამუშაოები Working works	16.02.2023	12:00	ოფისების სამშენებლო მოედანი	სამშენებლო სამუშაოების წარმოების ადგილზე არ იყო დაცული უსაფრთხო. შემდეგებულს ჩატარდა საგზაო სასაბჭო უსაფრთხოების და საშიშვლო მოთხოვნების შესახებ.	ა/შ	ა/შ	ა/შ	დახურული Closed	
11		საშიშვლო მდგომარეობა Unsafe Condition	მინამუშევრების Housekeeping	16.02.2023	12:00	ოფისების სამშენებლო მოედანი	საშიშვლო ქვედაპირული საშენი დროს, სადგურის ქვედა) და სხვა სახის სამშენებლო ნარჩენები მოიხრეველია ტერიტორიაზე	1. მოხდა საშიშვლო და არასაშიშვლო ნარჩენებისთვის განკუთვნილი კონტეინერების განთავსება სამშენებლო მოედანზე 2. დასაქმებულებს ჩატარდა გასაუბრება მინამუშევრების და ნარჩენების განთავსების შესახებ.	1. მშენი გაბუნა 2. აკოი ვეჯეტირია	1. 22.02.2023 2. 20.02.2023	დახურული Closed	
12		საშიშვლო ქცევა Unsafe Behaviour	პერსონალური დაცვის საშუალებები (იღბ) Personal Protective Equipment (PPE)	24.02.2023	12:20	ოფისების სამშენებლო მოედანი	ლითონ კონსტრუქციის სამშენებლო/სამონტაჟო სამუშაოების წარმოებისას ერთ-ერთი დასაქმებული ატარებდა რეზინის ჩექმას, ლითონის დამცავი ჩანჩირების გარეშე ჩაგზნის იჭის დაზიანების რისკს.	დასაქმებულზე მოხდა დამცავი ლითონის ჩანჩირების რეზინის ჩექმის მოწოდება.	მშენი გაბუნა	26.02.2023	დახურული Closed	
13		საშიშვლო მდგომარეობა Unsafe Condition	მინამუშევრების Housekeeping	24.02.2023	12:25	ოფისების სამშენებლო მოედანი	საშენი ადგილი დაინიშნებოდა საყოფაცხოვრებო, სამშენებლო და საშიშვლო ნარჩენებით. დასაქმებულებს ჩატარდა მოკლე ინსტრუქციის ნარჩენების სეგრეგაცია/განთავსების შესახებ.	მოხდა საშენი ადგილის დასუფთავება და ნარჩენების განთავსება შესაბამის კონტეინერებში.	მშენი გაბუნა	26.02.2023	დახურული Closed	
14		გარემოს დაზიანება Environmental	მძიმე ტექნიკა Heavy machinery	09.03.2023	14:00	ოფისების სამშენებლო მოედანი	საბურთო ავტომანქანის კალათის აქვების კალათის მოძრაობის შედეგად მოხდა მუქი ნივთების კალათის ზედა მინარეთებით მოძრაობა არ შეატარა, რამაც გამოიწვია აშუკო მუქი ნივთების (ვერის) ბედიან აბიჯარდა და მიღრავლილი ზეთის დაღვა (დაახლოებით 1 ლიტრი). ავტომანქანის მძღოლს მოეცა რეკომენდაცია საბურთო ავტომანქანის უსაფრთხო ადგილზე გადაყვანის, ავტომანქანაზე დადგომა ზეთის დიკონტაინერის, და ზეთის დაინიშნებული ნივთების მოწოდების და შესაბამის ადგილზე განთავსების შესახებ.	1. მოხდა ავტომანქანის ტენიერის მოშორება და მოლოდ პირობების აღმოფხვრის შემდეგ მოხდა მისი უსაფრთხო დაბრუნება. 2. მოხდა დაღვნილი საბურთო სალონიდან სალონიდან საშენი ადგილის დასუფთავება და ნარჩენების განთავსება შესაბამის კონტეინერებში. 3. მოხდა ინჟინერის მოკლე და შესაბამისი კონტროლის დონორების დარღვევა.	1. დონორი ვიდეოდაც 2. მშენი გაბუნა 3. აკოი ვეჯეტირია	20.03.2023 30.03.2023 30.03.2023	დახურული Closed	
15		საშიშვლო მდგომარეობა Unsafe Condition	ელექტრობა / ენერჯია Electricity / Energy	12.03.2023	09:22	ხედიან მისასვლელი გზა- გარეშეების საექსპლუატო სამუშაოები	დაზიანებული ელექტრი დამაგრებული. პერსონალს მოეცა რეკომენდაცია დაზიანებული ნაწილის შეკეთების/შეკეთების თაობაზე, რაც ადგილზე გამოსწორდა.	ა/შ	ა/შ	ა/შ	დახურული Closed	

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24		საბიუჯეტო მდგომარეობა Unsafe Condition	ელექტრული ხელსაწყოები/მოწყობილობები Power tools/equipment	24.03.2023	12:35	ხიდთან მისასვლელი გზა - ხიშინების მშენებლობა	ქუთხსაზენი დაშვები გარსაგმის გარეშე. სამუშაო პროცესში მონაწილე პერსონალს მიეცა რეკომენდაცია ქუთხსაზენის უსაფრთხო გამოყენებაზე და მოითხოვა დამცავი გარსაგმის დამონტაჟების შესახებ, რაც ადგილზე გამოსწორდა.	ა/ს	ა/ს	ა/ს	დაბრუნდა Closed
25		საბიუჯეტო მდგომარეობა Unsafe Condition	ექსკავაცია Excavation	24.03.2023	12:15	ხიდთან მისასვლელი გზა - ხიშინების მშენებლობა	ელექტრო კაბელების ინსტალაციისთვის განკუთვნილი ტრანშეა და მდგომარეობაშია რაც ზრდის მასში მოძრაობა ტენიონის/დებომატების და ადამიანების ჩავარდნის რისკს.	1. ტრანშეა ამოღდება ან მყარი ბარიკადირება, ისევე უსაფრთხოების ნიშნების განთავსება (ღია ტრანშეა)	მაშუკა გაბუნია	25.03.2023	დაბრუნდა Closed
26		საბიუჯეტო მდგომარეობა Unsafe Condition	ექსკავაცია Excavation	24.03.2023	13:10:00 PM	ხიდთან მისასვლელი გზა - გაზსადენის საექსკავაციო საბუნებოები	ქუთხსაზენი ჩამოთვლილი დარღვევები დაფიქსირდა გაზსადენის გარემოს მიღების მონიტორინგის ადგილზე: 1. სამუშაოების ადგილი გადატვირთულია იქვე, ახლოს დაპარკინებული მანქანებით, 2. ქუთხსაზენი არ არის შეზღუდული მყარი ბარიკადებით და არ არის განთავსებული უს ნიშნები, 3. გენერატორი არ არის მოთავსებული დაფერის საწინააღმდეგო ქარქვეშ, 4. პერსონალი ხშირად გადაადგილდება იღის -ს გარეშე, 5. კონსტრუქციის მხრიდან არ ხდება სათანადო ზედამხედველობა, 6. არ არის გამოყოფილი მენიშე, 7. ტრანშეა, სამანქანო გზის მხრიდან არ არის შეზღუდული ზეგონის ბორღურებით, რომ არ მოხდეს მანქანის ჩაფრება/ვარდნა ტრანშეაში.	1. საპარკინგო ადგილის მოწყობა მიღების მონიტორინგის მიხედვით 50 მეტრის მოშორებით. 2. ქუთხსაზენის/ტრანშეას მყარი ბარიკადირება 3. დაფერის საწინააღმდეგო ქარქვეშის დამსადენა. 4. უს. სადგომის ჩატარება პერსონალზე იღის -ს გამოყენების შესახებ. 5. მოხდეს ზედამხედველობის გაძლიერება. 6. მოხდეს მენიშის გამოყოფა სამუშაოების ზონამ მომრავი ავტომანქანების კონტროლის მიზნით. 7. ტრანშეასთან, სამანქანო გზის მხრიდან ზეგონის ბორღურების განთავსება.	1. სოსო კვლამაძილი 2. სოსო კვლამაძილი 3. მამუკა გაბუნია 4. აკაკი კვლამაძილი 5. მამუკა კარლაძე/მამუკა გაბუნია 6. სოსო კვლამაძილი 7. სოსო კვლამაძილი	1. 26.03.2023 2. 25.03.2023 3. 28.03.2023 4. 27.03.2023 5. მუდმივად (სამუშაოების მთავალდობი) 6. მუდმივად 7. 25.03.2023	დაბრუნდა Closed
27		საბიუჯეტო ქვევა Unsafe Behaviour	სიმაღლეზე მუშაობა Working at height	05.04.2023	12:00	ოფისების სამშენებლო მოედანი	მენდგომი დარღვევები დაფიქსირდა ოფისების ლითონ-კონსტრუქციის სამშენებლო სამუშაოების პროცესში: 1. სამშენებლო სამუშაოების ჩართული იყო ახალი თანამშრომელი რომელსაც არ აქვს გათვლილი უსაფრთხოების საწყისი ინსტრუქცია; 2. პერსონალი სამშენებლო სამუშაოების ასრულებდა დასავალი სათვალის და შესაბამისი ხელთათმისის გარეშე, 3. პერსონალი სამშენებლო სამუშაოების დროს, თავისი ხელბაგის ქურჭელთან და გაბნეულობის მოხმარება თამბაქოს, პერსონალს მიეცა შესაბამისი მოთხოვნები;	1. ახალი თანამშრომლის სამუშაოების ჩართვამდე მოხდეს მ.შ. სპეციალისტის ინფორმირება რომ ჩატარდეს საწყისი ინსტრუქცია; 2. ახალი დასაქმებულებისთვის საწყისი ინსტრუქციის ჩატარება. 3. პერსონალის ადგილზეა დამცავი სათვალეებით (ფლის/ღაშის) და ქობლკატხთან სამუშაო დამცავი ხელთათმისებით; 4. დაშვადენს გადასატანი თამბაქოს ნარჩენების განსათავსებელი ღიბონის ნაკეთობა.	1. მამუკა კარლაძე/მამუკა გაბუნია 2. აკაკი კვლამაძილი 3. მამუკა კარლაძე 4. მამუკა გაბუნია	1. მუდმივად 2. 06.04.2023 3. 10.04.2023 4. 10.04.2023	დაბრუნდა Closed
28		პოზიტური დაკვირვება Positive Observation	პერსონალური დაცვის საშუალებები (იღის) Personal Protective Equipment (PPE)	24.04.2023	12:30	ოფისების სამშენებლო მოედანი	ქუთხსაზენის გამოყენებისას, პერსონალი ადგილზე იყო საბის დაცვის ფარით და ხსურისგან დამცავი სადებიო და საცობიო.	ა/ს	ა/ს	ა/ს	დაბრუნდა Closed
29		საბიუჯეტო მდგომარეობა Unsafe Condition	სიმაღლეზე სამუშაო აღჭურვილობა Working at height equipment	27.04.2023	12:10	ოფისების სამშენებლო მოედანი	სახურების მონტაჟის სამუშაოების, ქუთხსაზენი სენდვიჩპანელის დამატებას დასაქმებული აქრობობდა ვარდნის საწინააღმდეგო ხედილის გარეშე, მიეცა რეკომენდაცია სამუშაოების შეწყვეტის და უსაფრთხო გამოყოფის შესახებ, რაც შესრულდა.	ა/ს	ა/ს	ა/ს	დაბრუნდა Closed
30		საბიუჯეტო მდგომარეობა Unsafe Condition	ელექტრული ხელსაწყოები/მოწყობილობები Power tools/equipment	15.05.2023	12:15	ვიბრობურღის განთავსების ადგილი	ფრულდენატორის ექსპლუატაცია ხდება დაფერის საწინააღმდეგო ქარქვეშის (dry tray) გარეშე, ვიბრობურღზე დასაქმებულ პერსონალს მიეცა რეკომენდაცია გერატორის დაფერის საწინააღმდეგო ქარქვეშ განთავსების შესახებ.	მოხდა გერატორის განთავსება დაფერის საწინააღმდეგო ქარქვეშ.	მაშუკა გაბუნია	16.05.2023	დაბრუნდა Closed

Supplementary Document 5: Environmental Monitoring Reports (April 2023 – May 2023)

Batumi bypass road project - Poti-Grigoleti-Kobuleti bypass road

Construction of a bridge crossing and an access road in the territory of Petara Poti

Environmental instrumental monitoring report

Client - „Construction Service” Ltd

Performer:



“Environmental and Occupational Safety Education and Consultation Center – Ecometer” Ltd

Director: Tinatin Zhizhiashvili



Technical manager: Sergey Khatsava



April, 2023

Semi-annual Environmental Monitoring Report (January-June 2023) Construction of Poti Bridge and Access Roads

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1. Introduction

'Construction Service' Ltd, within the framework of the contract signed with the Department of Roads of Georgia, carries out the construction of the section of the E-70 highway of international importance of the Department of Roads of Georgia, the Senaki-Poti (bypass)-Sarfi (border of the Republic of Turkey) road, the Poti-Grigoleti section (stage 1) - the project of construction of a bridge and access roads on the river Rioni.

It should be noted that the government of Georgia is implementing the program of modernization of the country's main roads, which is led by the Roads Department under the Ministry of Regional Development and Infrastructure of Georgia. The goal of the program is to improve the condition of traffic and cargo transportation with neighboring countries, which is due to the significant increase in cargo transportation through Georgia in the last 10-15 years.

Today, Georgia is the main transit country. Almost two-thirds of the cargo transported in Georgia comes via land routes. Transportation operations by local and international shipping companies are visible on the highways of Georgia. However, the condition of the majority of roads is not up to the required standards and is not properly equipped to withstand the volume of traffic and the proportions of large vehicles. Factors such as insufficient number of two-way carriageways, shortage of routes passing through populated areas, inadequate technical services hinder road permeability and increase transportation time. This creates difficulties for transport companies and their customers, truck drivers, Georgian drivers and local residents. The main goal of the above-mentioned program is the modernization of Georgia's largest roads, such as E-60 and E-70. A number of road infrastructure construction/rehabilitation projects have been funded by the World Bank, Japan International Development Bank (JICA) and Asian Development Bank (ADB).

The construction of the Poti-Grigoleti-Kobuleti bypass road section and the Poti-Grigoleti section of the internationally important Senaki-Poti-Sarfi road is underway within the framework of financing allocated by the European Investment Bank.

2. Brief description of the project

The construction project of E-70 highway Senaki-Poti (bypass)-Sarfi (border of the Republic of Turkey) highway, Poti-Grigoleti section (stage 1) - bridge over Rion river and access roads is being carried out in the Black Sea coastline, Samegrelo-Zemo Svaneti and Western Georgia in the regions of Guria. The goal of the project is to build

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a 4-lane Poti-Kobuleti highway in accordance with TEM standards and national standards related to highways. At the design stage, the highway was divided into two parts - Grigoleti Kobuleti bypass (lot 1) and Poti-Grigoleti (lot 2) section.

The starting point of Lot 2 is located on the E-60 highway leading to Senaki on the right bank of the Rioni River in the village of Patara Poti. The road bypasses Poti from the east and connects to the initial section of the Grigoleti-Kobuleti bypass road (lot 1) by the Supsa river.

The section included in Lot 2 is also divided into three steps. This report refers to the E60 from the beginning in the direction of the Rioni river, pk 0+000 - pk 1+500 to the picket mark (the section includes the bridge over the Rioni river and the access road).

The road surface will be elastic (asphalt-concrete). Due to the weak soil, the foundation of embankment requires strengthening. For high embankments reinforcement will be done with gravel columns, for low embankments high-strength geotextiles will be used. In both cases, it is planned to use a separating geotextile between the existing soil and the foundation.

Drainage channels will be arranged on both sides of the highway. The project envisages spreading top soil on the slopes of embankment and sowing grass. The length of the bridge will be 495 m, width 15.54 m.

3. Location of the project area

The section of the Poti bridge crossing and access road is located in Patara Poti, on the Rioni river.

situational map showing the location of the project area is given in Figure #3.1.1.

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Fig. 3.1.1 - Location of the project area

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4. Parameters of conducted monitoring, date of implementation of monitoring, used tools and monitoring points

'Construction Service' Ltd performs monthly environmental instrumental monitoring within the framework of the Poti bridge construction project.

In the month of April, environmental instrumental monitoring was conducted on April 28, 2023, between 11:05 a.m. and 12:55 p.m.

The monitoring was carried out by "Environmental and Occupational Safety Education and Consultation Center – Ecometer" Ltd, based on the order of "Construction Service" Ltd.

Instrumental environmental monitoring included the study of the following parameters:

- The spread of noise in the ambient air;
- The spread of vibration in the ambient air;
- The spread of dust in the ambient air (Pm_{2.5}, Pm₁₀, Pm common);
- The spread of nitrogen and sulfur dioxide and carbon monoxide in the ambient air;
- Surface water monitoring on the following parameters: Ph; saltiness, TDS, Electr. conductivity, turbidity, ammonia/ammonium ion NH₃; chlorides Cl; weighted particles TSS; total nitrogen N, total iron Fe; Arsenic (Total) As; Total coliforms

Weather conditions during monitoring

- Air temperature - 23.3°C;
- Wind speed - 2,7m/sc;
- Wind direction - NW;
- Air humidity - 55%;
- Atmospheric pressure - 998 hPa.

Tools used in research

The instrumental research was carried out by technical manager Sergey Khatsava and the following instruments with the appropriate calibration certificate (certificates are presented as an attachment) were used:

- Pollination - Gasella Mikro Dust Pro 712 (Self-calibration zero and optical filter);
- Vibration- Smart Sensor, AR63B Vibration Meter;
- Noise - Sound Tek ST-109;

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- Surface water - Multiparameter Water Quality Meter; LAQUA Horiba WQ-330; Turbid meter HANNA HI 98703

	
<p>Fig. 4.1.1 - Gasella Mikro Dust Pro 712</p>	<p>Fig. 4.1.2 - AR63B Vibration Meter</p>
	
<p>Fig. 4.1.3 - Mini Sound Level Meter N05CC</p>	<p>Fig. 4.1.4 - Multiparameter Water Quality Meter</p>



Information about monitoring points

Instrumental monitoring of the spread of noise, vibration and dust in the ambient air, as well as the spread of other polluting substances in the ambient air was carried out at pre-selected places, in accordance with the instructions of the client. In addition, surface water was taken for instrumental monitoring at 2 points of the Rioni River, above the project area (upstream) and below the project area (downstream).

GPS coordinates of monitoring points for noise, vibration, dust and other pollutants in ambient air are given in table 4.1.1. while, the coordinates of water sampling points from Rioni River are given in Table 4.1.2. In addition, monitoring points are marked on maps 4.1.7 and 4.1.8.



Fig. 4.1.7 - Location of monitoring points for noise, vibration, dust and other pollutants in ambient air

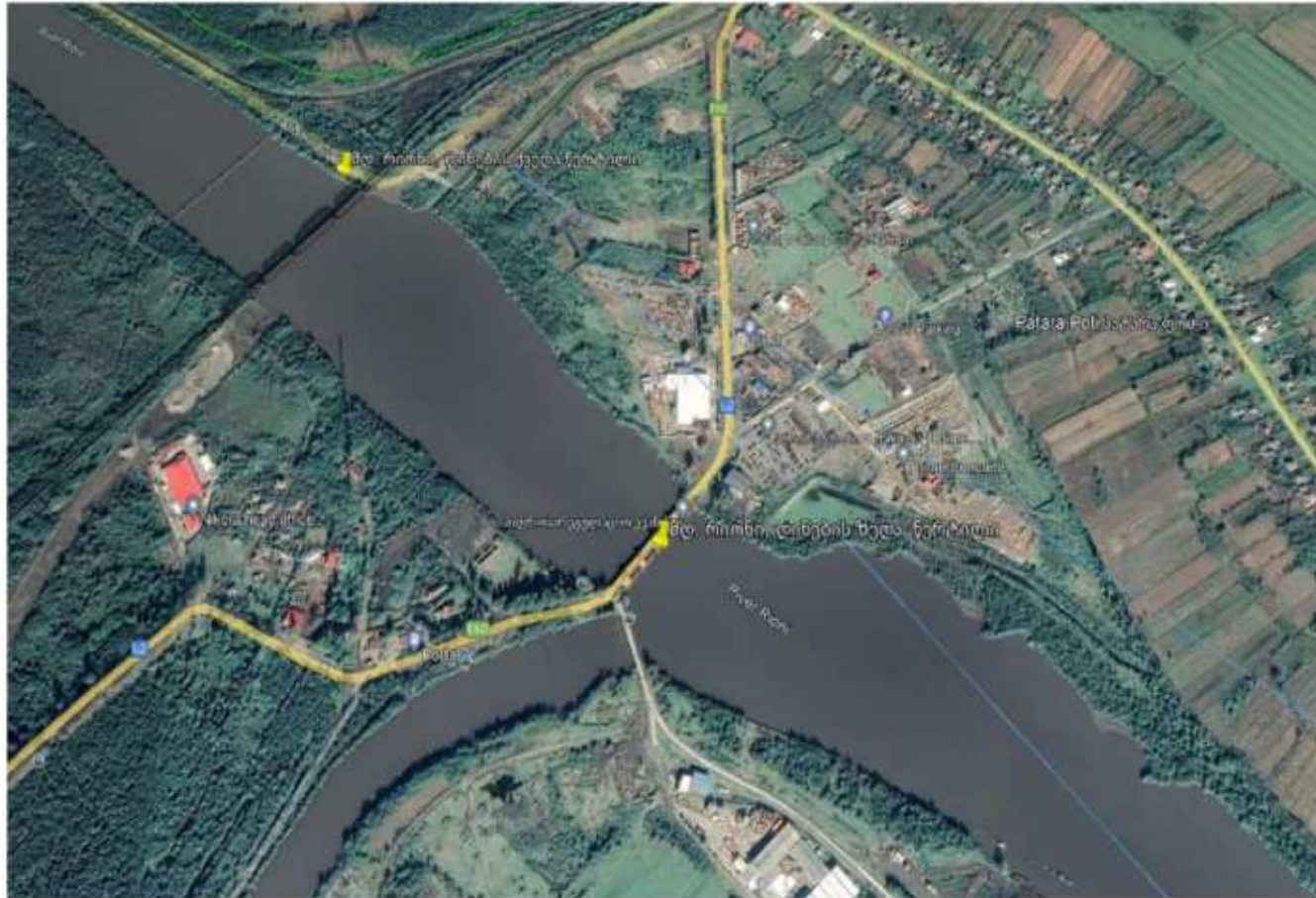


Fig. 4.1.8 - Location of monitoring points of water taken from Rion River

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5. Norms established by legislation and results obtained during measurement

5.1 Norms established by legislation

Norms of the qualitative state of the environment are regulated by the Order No. 297/N of the Minister of Labor, Health and Social Protection of Georgia dated August 16, 2001 'On Approval of the Norms of the Qualitative State of the Environment' and also 'On Acoustic Noise Norms in the Storerooms and Territories of Residential Houses and Public/Public Institutions Buildings' According to the technical regulations approved by the resolution No. 398 of the Government of Georgia on August 15, 2017.

Table 5.1.1 - Noise norms

№	Functionality of the premises and areas	Admissible norms		
		L Day (dbA)		
		Day	Evening	L Night
1	Educational institutions and reading rooms	35	35	35
2	Treatment cabinets of medical institutions	40	40	40
3	Living and sleeping rooms	35	30	30
4	Treatment and rehabilitation wards of a stationary medical institution	35	30	30
5	Hotel/guest house/motel rooms	40	35	35
6	Shopping halls and reception rooms	55	55	55
7	Halls of restaurants, bars, cafes	50	50	50
8	audience/audience halls and sacral rooms	30	30	30
9	Gyms and pools	55	55	55
10	Working rooms of small offices ($\leq 100 \text{ m}^3$) and working rooms without office equipment	40	40	40
11	Working rooms of large offices ($\geq 100 \text{ m}^3$) and working rooms with office equipment	45	45	45
12	Deliberative rooms	35	35	35
13	Areas directly adjacent to low-rise (number of floors ≤ 6) residential houses, medical facilities, children's and social service facilities	50	45	40
14	Areas directly adjacent to multi-storey residential buildings (number of floors > 6), cultural, educational, administrative and scientific institutions	55	50	45
15	Areas directly adjacent to hotels, trade, service, sports and public organizations	60	55	50

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Table 5.1.2 - Norms of vibration and vibroacceleration

#	<i>Admissible norms</i>	
	<i>Vibrospeed</i>	<i>Vibroacceleration</i>
1	112 db	126 db

Table 5.1.3 - Norms of dust and other pollutants

#	<i>Admissible norm of dust mg/m3</i>	<i>Norm of nitrogen dioxide, mg/m3</i>	<i>Norm of sulfur dioxide mg/m3</i>	<i>Carbon monoxide norm, mg/m3</i>	<i>The norm of total hydrocarbons, mg/m3</i>
1	0.5 mg/m ³	0.2	0.5 mg/m ³	5 mg/m ³	1 mg/m ³

Table 5.1.4 - Maximum admissible norms in the surface water body

Nº	<i>Parameter</i>	<i>Admissible norm</i>
1	<i>PH</i>	<i>Unfixed</i>
2	<i>Saltiness</i>	<i>Unfixed</i>
3	<i>TDS/mg.l</i>	<i>Unfixed</i>
4	<i>Elect. conductivity</i>	<i>Unfixed</i>
5	<i>Turbidity</i>	<i>Unfixed</i>
6	<i>Ammonia/ammonium ion NH3</i>	<i>0,39</i>
7	<i>Chlorides Cl</i>	<i>300</i>
8	<i>Weighted particles TSS</i>	<i>Unfixed</i>
9	<i>Total nitrogen N</i>	<i>Unfixed</i>
10	<i>Total iron Fe</i>	<i>0,3</i>
11	<i>Arsenic (total) As</i>	<i>0,05</i>
12	<i>Total coliforms</i>	<i>It should not be found in 300 ml</i>

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5.2 Results of conducted research (monitoring).

Table 5.2.1 - Results of conducted research, noise, vibration, dust

№	Measurement point		Measurement results							
	Location	GPS coordinate	Noise Amax db	Vibro speed		Vibro acceleration		Dust mg/m3		
				mm/sc	db	m/sc2	db	Pm2.5	Pm10	Total
1	Axis 49	X - 723230 Y - 4674705	68,1	<0.1	<66	<0.1	<100	0.044	0.052	0.113
2	Axis 17	X - 722690 Y - 4674127	70,0	<0.1	<66	<0.1	<100	0.027	0.061	0.088

Table 5.2.2 - Other ambient air pollutants

№	Measurement point		Measurement results		
	Location	GPS coordinate	Nitrogen dioxide	Sulfur dioxide	Carbon monoxide
	Axis 49	X - 723230 Y - 4674705	0,003	<0,01	0,17
	Axis 17	X - 722690 Y - 4674127	0,005	<0,01	0,19

Table 5.2.3 - Results of instrumental measurement of physico-chemical parameters of surface water

№	Sampling location	GPS Coordinate	Measured parameters				
			PH	Saltness	TDS/mg.l	Electr. conductivity	Turbidity
	River Rioni, the lower point of a stream	X - 722937 Y - 4674645	8,3	0,10	107	214	435

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River Rioni, the upper point of a stream	X - 723505 Y - 4674040	8,2	0,10	106	212	429
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Table 5.2.4 - Results of measurement of chemical and bacteriological parameters of surface water taken from Rioni river (upstream)

Sampling location	GPS coordinate of sampling	Determining characteristic, name	Unit	Research result	Research method
Rioni River, upstream	X - 723505 Y - 4674040	Ammonia/ammonium ion NH ₃	mg/l	1,70	GOST 33045-2014
		Chlorides Cl	mg/l	640,0	ISO 9297:198/2008
		Weighted particles TSS	mg/l	210,0	ISO 11923-97
		Total nitrogen N	mg/l	8,72	GOST 33045-2014
		Total iron Fe	mg/l	0,05	GOST 4011-72
		Arsenic (total) As	mg/l	<0,001	GOST 4152-89
		Total coliforms	300 ml will not be allowed	Not found	ISO 9308-1:2014

Table 5.2.5 - Results of measurement of chemical and bacteriological parameters of surface water taken from Rioni river (downstream)

Sampling location	GPS coordinate of sampling	Determining characteristic, name	Unit	Research result	Research method
Rioni River, downstream	X - 722937 Y - 4674645	Ammonia/ammonium ion NH ₃	mg/l	1,81	GOST 33045-2014
		Chlorides Cl	mg/l	647,0	ISO 9297:198/2008
		Weighted particles TSS	mg/l	212,0	ISO 11923-97
		Total nitrogen N	mg/l	8,83	GOST 33045-2014
		Total iron Fe	mg/l	0,05	GOST 4011-72
		Arsenic (total) As	mg/l	<0,001	GOST 4152-89

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		Total coliforms	300 ml will not be allowed	No found	ISO 9308-1:2014
--	--	-----------------	----------------------------	----------	-----------------

6. Conclusion

As a result of the conducted environmental instrumental research, there was no exceedance of the established norm in any measurement point, in the case of any parameter. Only in the water sample taken from Rionø River, there was an increase in ammonium concentration. This parameter is high in the project area, both in the upper and lower streams of the river. The high level of the mentioned parameter is due to the background pollution of the river, for example: unclean discharge of sewage water, discharge of polluted drainage water, etc.

7. Mitigation measures

No mitigation measures are required.

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8. Instrument calibration certificates
8.1 Vibration meter calibration certificate

IF 032



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"METROLOGY" LLC

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GAC - CE-087
საქართველო ISO 9001:2015
11.11.2020 - 11.11.2023

საბაღიბრებელი ლაბორატორია
CALIBRATION LABORATORY

დაბალნივთების სერტიფიკატი № 2983
CALIBRATION CERTIFICATE

გაცემის თარიღი Date of issue	30.01.2023
დაკალიბრების იხილება Calibrated item	უმრეცხვის სარქონი ხერხები AR638, SN 02292117 <small>ბრუნვის სარქონის დაკალიბრების მოწყობის სერვისი</small>
კომპანია Customer	უმრეცხვის სარქონი ხერხები, თბილისი, ჭავჭავაძის ქუჩა, 147 <small>დაბალნივთების სერვისი</small>
დაკალიბრების მეთოდი Method of Calibration	CP-062.G; გრაფიკი 30032-W <small>ბრუნვის სარქონის დაკალიბრების მეთოდი</small>
დაკალიბრების შესრულებულია Calibration is performed by using	უმრეცხვის სარქონი ხერხები ABC-034-03 № R113994 სერტიფიკატი № GE/M1/09-02003-21-21-09-21; უმრეცხვის სარქონი ხერხები R3/C-10A <small>საბაღიბრებელი ლაბორატორიის დაკალიბრების მეთოდი</small>
მკვეთი-ფორმა Traceability	GEOSTIM/სერვისის სტანდარტი: BIPMA/MC
დაკალიბრების ადგილი Calibration Site	<input checked="" type="checkbox"/> მკვეთი-ფორმის ლაბორატორია/Supplier's Lab. <input type="checkbox"/> კომპანიის იხილება/Customer's Site
დაკალიბრების პირობები Ambient conditions	+20.4°C; RH: 40%
დაკალიბრების შედეგები იხილება (მ-2, გვერდი 2/2) See Calibration Results on _____ page(s)	
ლაბორატორიის უფროსის ხელმოწერა Chief of laboratory	ლ. სამხარაძე <small>სერვისის უფროსი</small>
სარქონის ხერხების, რომლებზეც ჩატარდა დაკალიბრების ხელმოწერა Signatures of the person who performed calibration	ნ. ცხიტიანი <small>სერვისის უფროსი</small>



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8.2 Noise meter calibration certificate

EP-09.G



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"METROLOGY" LLC

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GAC - GE - 0017
საქართველო D1025.2017.2018
11.11.2021 - 11.11.2025

საკალიბრაციო ლაბორატორია
CALIBRATION LABORATORY
დაკალიბრების სერტიფიკატი № 2982
CALIBRATION CERTIFICATE

დაკალიბრების თარიღი Date of issue:	30.01.2023
დაკალიბრების ობიექტი Calibrated item:	ხმაურმომხი, Sound Level Meter N 0500 <small>კალიბრაციის საბაზისი დასაბუთების დოკუმენტაცია measuring instrument identification</small>
დაკალიბრების მფლობელი Customer:	ფონიკური პირი სერვისი ზედა, თბილისი, ჭავჭავაძის ქუჩა 14/2 <small>დასახლების მისამართი area of customer, address</small>
დაკალიბრების მეთოდი Method of Calibration:	CP-092.G, ციკლ 8 635-2013 <small>პროცედურის დასაბუთების დოკუმენტაცია name of the procedure identification</small>
დაკალიბრების შესრულებულია Calibration is performed by using:	ხმაურის კალიბრატორი Model NI99 SN 922509 სერია №01 660321 11.02.2021 <small>საბაზისი კალიბრაციის საბაზისი დასაბუთების დოკუმენტაცია Identification of the standard measuring instrument identification</small>
ზიდადობა Traceability:	Pront/UMI/BIPM/CMG
დაკალიბრების ადგილი Calibration Site:	<input checked="" type="checkbox"/> მუშაობის ადგილი/Supplier's Lab. <input type="checkbox"/> დაკალიბრების ობიექტის/Customer's Site
დაკალიბრების პირობები Ambient condition:	20.4°C; RH 37%; 98.1kPa
დაკალიბრების შედეგები იხილეთ 2. გვერდებზე See Calibration Results on page(s):	
ლაბორატორიის უფროსის ხელმოწერა Chief of laboratory:	ლ. მანუაშვილი <small>სახელი, გვარი name</small>
პირის ხელმოწერა, რომელმაც ჩაატარა დაკალიბრება Signature of the person who performed calibration:	მ. ცხეტიანი <small>სახელი, გვარი name</small>



21/03/23







გვ. 1 2 ვახ

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8.3 Dust meter calibration certificate



Certificate of Calibration and Conformity

Instrument Type CEL-712 Microdust Pro

Serial Number 022588 **Probe Serial Number** 022575

Process version 2.0



Calibration Principle:
 The readability of the instrument has been determined using a factory reference 'Calibration Inert'. The 'Calibration Inert' utilizes the optical light scattering method.
 The factory reference 'Calibration Inert' has demonstrated readability to generate calibration using Casella's flow curve to generate values using ISO 12103-1:02. The use of a standard ground standard dust, continuously stirred, airborne dust equivalent, Particle size range 0.3 to 10 µm.
 The value of each of the supplied user 'Calibration Inert' is to provide a daily method for the user to return to the instrument sensitivity and back to factory conditions and that structure to return normal operation. Note:
 For calibration and optimum accuracy to user specific dust types and conditions, please refer to the user handbook.

Test Conditions:

Temperature:	21.9	°C
Humidity:	58	%RH
Pressure:	1017	mbars

Equipment used for Calibration of "Reference Inert":

Wind Tunnel:	Casella Wind Tunnel	Serial Number:	0210702
Microbalance:	Cotec C-02	Serial Number:	0210860
Velocity Probe:	Air Velocity Probe	Serial Number:	0211060
Flow Meter:	GLS 1000 S	Serial Number:	0211042

Calibration Results:

Casella Factory Reference "Calibration Inert" >	Serial Number:	0211060	Value:	10.000
Supplied "Calibration Inert" For Probe >	Serial Number:	022575	Value:	100.7

Declaration of conformity:
 This test certificate confirms that the instrument as specified above has been correctly tested and adjusted to comply with the manufacturer's performance specifications.
 This product is certified as being acceptable to the requirements of the UK legislation.

Test Engineer: Mike Schmitt
Date of Issue: 08/05/23

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Batumi bypass road project - Poti-Grigoleti-Kobuleti bypass road

Construction of a bridge crossing and an access road in the territory of Petara Poti

Environmental instrumental monitoring report

Client - „Construction Service” Ltd

Performer:

ეკომეტრი

“Environmental and Occupational Safety Education and Consultation Center – Ecometer” Ltd

Director: Tinatin Zhizhiashvili



Technical manager: Sergey Khatsava



May, 2023

Semi-annual Environmental Monitoring Report (January-June 2023) Construction of Poti Bridge and Access Roads

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1. Introduction

"Construction Service" Ltd, within the framework of the contract signed with the Department of Roads of Georgia, carries out the construction of the section of the E-70 highway of international importance of the Department of Roads of Georgia, the Senaki-Poti (bypass)-Sarfi (border of the Republic of Turkey) road, the Poti-Grigoleti section (stage 1) - the project of construction of a bridge and access roads on the river Rioni.

It should be noted that the government of Georgia is implementing the program of modernization of the country's main roads, which is led by the Roads Department under the Ministry of Regional Development and Infrastructure of Georgia. The goal of the program is to improve the condition of traffic and cargo transportation with neighboring countries, which is due to the significant increase in cargo transportation through Georgia in the last 10-15 years.

Today, Georgia is the main transit country. Almost two-thirds of the cargo transported in Georgia comes via land routes. Transportation operations by local and international shipping companies are visible on the highways of Georgia. However, the condition of the majority of roads is not up to the required standards and is not properly equipped to withstand the volume of traffic and the proportions of large vehicles. Factors such as insufficient number of two-way carriageways, shortage of routes passing through populated areas, inadequate technical services hinder road permeability and increase transportation time. This creates difficulties for transport companies and their customers, truck drivers, Georgian drivers and local residents. The main goal of the above-mentioned program is the modernization of Georgia's largest roads, such as E-60 and E-70. A number of road infrastructure construction/rehabilitation projects have been funded by the World Bank, Japan International Development Bank (JICA) and Asian Development Bank (ADB).

The construction of the Poti-Grigoleti-Kobuleti bypass road section and the Poti-Grigoleti section of the internationally important Senaki-Poti-Sarfi road is underway within the framework of financing allocated by the European Investment Bank.

2. Brief description of the project

The construction project of E-70 highway Senaki-Poti (bypass)-Sarfi (border of the Republic of Turkey) highway, Poti-Grigoleti section (stage 1) - bridge over Rion river and access roads is being carried out in the Black Sea coastline, Samegrelo-Zemo Svaneti and Western Georgia in the regions of Guria. The goal of the project is to build a 4-lane Poti-Kobuleti highway in accordance with TEM standards and national standards related to highways. At the design stage, the highway was divided into two parts - Grigoleti Kobuleti bypass (lot 1) and Poti-Grigoleti (lot 2) section.

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The starting point of Lot 2 is located on the E-60 highway leading to Senaki on the right bank of the Rioni River in the village of Patara Poti. The road bypasses Poti from the east and connects to the initial section of the Grigoleti-Kobuleti bypass road (lot 1) by the Supsa river.

The section included in Lot 2 is also divided into three steps. This report refers to the E60 from the beginning in the direction of the Rioni river, pk 0+000 - pk 1+500 to the picket mark (the section includes the bridge over the Rioni river and the access road).

The road surface will be elastic (asphalt-concrete). Due to the weak soil, the foundation of embankment requires strengthening. For high embankments reinforcement will be done with gravel columns, for low embankments high-strength geotextiles will be used. In both cases, it is planned to use a separating geotextile between the existing soil and the foundation.

Drainage channels will be arranged on both sides of the highway. The project envisages spreading top soil on the slopes of embankment and sowing grass. The length of the bridge will be 495 m, width 15.54 m.

3. Location of the project area

The section of the Poti bridge crossing and access road is located in Patara Poti, on the Rioni river.

situational map showing the location of the project area is given in Figure #3.1.1.

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Fig. 3.1.1 - Location of the project area

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4. Parameters of conducted monitoring, date of implementation of monitoring, used tools and monitoring points

"Construction Service" Ltd performs monthly environmental instrumental monitoring within the framework of the Poti bridge construction project.

In the month of May, environmental instrumental monitoring was conducted on May 18, 2023, between 11:20 a.m. and 12:55 p.m.

The monitoring was carried out by "Environmental and Occupational Safety Education and Consultation Center – Ecometer" Ltd, based on the order of "Construction Service" Ltd.

Instrumental environmental monitoring included the study of the following parameters:

- The spread of noise in the ambient air;
- The spread of vibration in the ambient air;
- The spread of dust in the ambient air (Pm_{2.5}, Pm₁₀, Pm common);
- The spread of nitrogen and sulfur dioxide and carbon monoxide in the ambient air;
- Surface water monitoring on the following parameters: Ph; saltiness, TDS, Electr. conductivity, turbidity, ammonia/ammonium ion NH₃; chlorides Cl; weighted particles TSS; total nitrogen N, total iron Fe; Arsenic (Total) As; Total coliforms

Weather conditions during monitoring

- Air temperature – 22.8^oC;
- Wind speed - 2,3m/sc;
- Wind direction - NW;
- Air humidity - 54%;
- Atmospheric pressure - 1007 hPa.

Tools used in research

The instrumental research was carried out by technical manager Sergey Khatsava and the following instruments with the appropriate calibration certificate (certificates are presented as an attachment) were used:

- Pollination - Gasella Mikro Dust Pro 712 (Self-calibration zero and optical filter);
- Vibration- Smart Sensor, AR63B Vibration Meter;
- Noise - Sound Tek ST-109;
- Surface water - Multiparameter Water Quality Meter; LAQUA Horiba WQ-330; Turbid meter HANNA HI 98703

Semi-annual Environmental Monitoring Report (January-June 2023) Construction of Poti Bridge and Access Roads

	
<p>Fig. 4.1.1 - Gasella Mikro Dust Pro 712</p>	<p>Fig. 4.1.2 - AR63B Vibration Meter</p>
	
<p>Fig. 4.1.3 - Mini Sound Level Meter N05CC</p>	<p>Fig. 4.1.4 - Multiparameter Water Quality Meter</p>



Fig. 4.1.5 - LAQUA Horiba WQ-330

Fig. 4.1.6 - Turbid meter HANNA HI 98703

Information about monitoring points

Instrumental monitoring of the spread of noise, vibration and dust in the ambient air, as well as the spread of other polluting substances in the ambient air was carried out at pre-selected places, in accordance with the instructions of the client. In addition, surface water was taken for instrumental monitoring at 2 points of the Rioni River, above the project area (upstream) and below the project area (downstream).

GPS coordinates of monitoring points for noise, vibration, dust and other pollutants in ambient air are given in table 4.1.1. while, the coordinates of water sampling points from Rioni River are given in Table 4.1.2. In addition, monitoring points are marked on maps 4.1.7 and 4.1.8.

Table 4.1.1 - Location and GPS coordinates of monitoring points for noise, vibration, dust and other pollutants in ambient air

Monitoring point		
#	Location	GPS coordinate
1	Axis 49	X - 723230 Y - 4674705

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2	Axis 17	X - 722690 Y - 4674127
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Table 4.1.2 - Location and GPS coordinates of water sampling points from Rioni River

Monitoring point		
#	Location	GPS coordinate
1	Riv. Rioni downstream point	X - 722788 Y - 4674713
2	Riv. Rioni upstream point	X - 723505 Y - 4674040

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Fig. 4.1.7 - Location of monitoring points for noise, vibration, dust and other pollutants in ambient air

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Fig. 4.1.8 - Location of monitoring points of water taken from Rion River

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5. Norms established by legislation and results obtained during measurement

5.1 Norms established by legislation

Norms of the qualitative state of the environment are regulated by the Order No. 297/N of the Minister of Labor, Health and Social Protection of Georgia dated August 16, 2001 "On Approval of the Norms of the Qualitative State of the Environment" and also "On Acoustic Noise Norms in the Storerooms and Territories of Residential Houses and Public/Public Institutions Buildings" According to the technical regulations approved by the resolution No. 398 of the Government of Georgia on August 15, 2017.

Table 5.1.1 - Noise norms

№	Functionality of the premises and areas	Admissible norms		
		L Day (dbA)		L Night
		Day	Evening	
1	Educational institutions and reading rooms	35	35	35
2	Treatment cabinets of medical institutions	40	40	40
3	Living and sleeping rooms	35	30	30
4	Treatment and rehabilitation wards of a stationary medical institution	35	30	30
5	Hotel/guest house/motel rooms	40	35	35
6	Shopping halls and reception rooms	55	55	55
7	Halls of restaurants, bars, cafes	50	50	50
8	audience/audience halls and sacral rooms	30	30	30
9	Gyms and pools	55	55	55
10	Working rooms of small offices ($\leq 100 \text{ m}^2$) and working rooms without office equipment	40	40	40
11	Working rooms of large offices ($\geq 100 \text{ m}^2$) and working rooms with office equipment	45	45	45
12	Deliberative rooms	35	35	35
13	Areas directly adjacent to low-rise (number of floors ≤ 6) residential houses, medical facilities, children's and social service facilities	50	45	40
14	Areas directly adjacent to multi-storey residential buildings (number of floors > 6), cultural, educational, administrative and scientific institutions	55	50	45
15	Areas directly adjacent to hotels, trade, service, sports and public organizations	60	55	50

Table 5.1.2 - Norms of vibration and vibroacceleration

#	Admissible norms	
	Vibrospeed	Vibroacceleration
1	112 db	126 db

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Table 5.2.2 - Other ambient air pollutants

№	Measurement point		Measurement results		
	Location	GPS coordinate	Nitrogen dioxide	Sulfur dioxide	Carbon monoxide
	Axis 49	X - 723230 Y - 4674705	0,011	<0,01	0,17
	Axis 17	X - 722690 Y - 4674127	0,009	<0,01	0,32

Table 5.2.3 - Results of instrumental measurement of physico-chemical parameters of surface water

№	Sampling location	GPS Coordinate	Measured parameters				
			PH	Saltiness	TDS/mg.l	Electr. conductivity	Turbidity
1	River Rioni, the lower point of a stream	X - 722937 Y - 4674645	7,7	0,10	116,8	236	457
2	River Rioni, the upper point of a stream	X - 723505 Y - 4674040	7,7	0,10	166,3	234	452

Table 5.2.4 - Results of measurement of chemical and bacteriological parameters of surface water taken from Rioni river (upstream)

Sampling location	GPS coordinate of sampling	Determining characteristic, name	Unit	Research result	Research method
Rionn River, upstream	X - 723505 Y - 4674040	Ammonia/ammonium ion NH ₃	mg/l	0,25	GOST 33045-2014
		Chlorides Cl	mg/l	35,0	ISO 9297:198/2008
		Weighted particles TSS	mg/l	239,8	ISO 11923-97
		Total nitrogen N	mg/l	1,52	GOST 33045-2014
		Total iron Fe	mg/l	0,16	GOST 4011-72
		Arsenic (total) As	mg/l	<0,001	GOST 4152-89

Semi-annual Environmental Monitoring Report (January-June 2023) Construction of Poti Bridge and Access Roads

		Total coliforms	300 ml will not be allowed	Not found	ISO 9308-1:2014

Table 5.2.5 - Results of measurement of chemical and bacteriological parameters of surface water taken from Rioni river (downstream)

Sampling location	GPS coordinate of sampling	Determining characteristic, name	Unit	Research result	Research method
Rioni River, downstream	X - 722788 Y - 4674713	Ammonia/ammonium ion NH ₃	mg/l	0,25	GOST 33045-2014
		Chlorides Cl	mg/l	35,9	ISO 9297:198/2008
		Weighted particles TSS	mg/l	240,2	ISO 11923-97
		Total nitrogen N	mg/l	1,53	GOST 33045-2014
		Total iron Fe	mg/l	0,17	GOST 4011-72
		Arsenic (total) As	mg/l	<0,001	GOST 4152-89
		Total coliforms	300 ml will not be allowed	No found	ISO 9308-1:2014

6. Conclusion

As a result of the conducted environmental instrumental research, there was no exceedance of the established norm in any measurement point, in the case of any parameter. There is only noise exceeding the norm, which is due to intensive traffic.

7. Mitigation measures

No mitigation measures are required.

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8. Instrument calibration certificates
8.1 Vibration meter calibration certificate

IF-03.G



შპს "მეტროლოჯი"
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საქსტანდარტი
GAC - CL - 0017
საქართველო GEOSTM-0017/2018
11.11.2018 - 11.11.2025

სტანდარტიზაციის ლაბორატორია
CALIBRATION LABORATORY

დაბალიზაციის სერტიფიკატი № 2983
CALIBRATION CERTIFICATE

გაცემის თარიღი Date of issue	30.01.2023
დაკალიბრების აღნიშვნა Calibrated item	ვიბრაციის სიხშირის ხელსაწყო AR33B, SN 02292117 <small>ვიბრაციის სიხშირის დასაზუსტებელი მოწყობილობის აღნიშვნა</small>
კლიენტი Customer	გორბეგოვი ჯორჯი სერგეი ხაგვა, თბილისი, ჭავჭავაძის გამაშ. 147 <small>კლიენტის, მისამართი</small>
დაკალიბრების მეთოდი Method of Calibration	CP-062.G; გონაკ 30652-99 <small>მეთოდის დასაზუსტებელი მოწყობილობის აღნიშვნა</small>
დაკალიბრების შესრულებულია Calibration is performed by using	ვიბრაციის გამომწვევებელი ABC-034-03 № 8113994 სერტიფიკატი № GE/MI/05-02093-21 21.09.21; ვიბრაციის გამომწვევები K33C-10A <small>დასაზუსტებელი მოწყობილობის აღნიშვნა</small>
მუდმივადობა Traceability	GEOSTM/საერთაშორისო სტანდარტი/BIPM/CMC
დაკალიბრების ადგილი Calibration site	<input checked="" type="checkbox"/> მუშაობის ადგილის დასაზუსტებელი მოწყობილობის ლაბორატორია/Supplier's Lab. <input type="checkbox"/> კლიენტის მოწყობილობა/Customer's Site
დაკალიბრების პირობები Ambient condition	+20.4°C; RH 40%
დაკალიბრების შედეგები იხილეთ See Calibration Results on	მ-2, გვერდი 18/19
ლაბორატორიის უფროსი Chief of laboratory	დ. ნინოძე <small>საბჭოთა</small>
პირის ხელმოწერა, რომელმაც ჩატარა დაკალიბრება Signature of the person who performed calibration	ნ. ცხატარია <small>საბჭოთა</small>





გვ. 1 / 2-დან

Semi-annual Environmental Monitoring Report (January-June 2023) Construction of Poti Bridge and Access Roads

8.2 Noise meter calibration certificate

11-014



შპს "მეტროლოჯი"
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GAC - CL - 0017
სტატუსი 17025:2017:2018
11.11.2021 - 11.11.2023

საკალმბრებელი ლაბორატორია
CALIBRATION LABORATORY
დაკალმბრების სერტიფიკატი № 2982
CALIBRATION CERTIFICATE

გაცემის თარიღი Date of issue	30.01.2023
დაკალმბრების ობიექტი Calibrated item	ხმაურმზომი, Sound Level Meter N 05CC <small>გროუპის სახელის დასტურების ადრესი/სამუშაო თარგმანი/სერტიფიკატი</small>
მომხმარებელი Customer	ფიზიკური პირი სერვის ხელვა, თბილისი, ზენის გზის 142 <small>მისამართი, მისამართი address of customer, address</small>
დაკალმბრების მეთოდი Method of Calibration	CP-092.G, ვისტ 8.635-2013 <small>მეთოდის დასტურების ადრესი/სამუშაო სახელი/სერტიფიკატი</small>
დაკალმბრების შესრულებულია Calibration is performed by using	ხმაურის კალმბრატორი Model ND98-SN 927509 სერტიფიკატი № 01A60821.11.02.2021 <small>სამუშაო სახელის დასტურების ადრესი/სამუშაო სახელი/სერტიფიკატი</small>
მრავალუბრობა Traceability	Prtom/LME/BIPM/CMC
დაკალმბრების ადგილი Calibration site	<input checked="" type="checkbox"/> მუშაობის დასტურების ადრესი/სამუშაო სახელი/სერტიფიკატი/Supplier's Lab. <input type="checkbox"/> მომხმარებლის ობიექტი/Customer's Lab
დაკალმბრების პირობები Ambient condition	20.4°C, RH 37%, 98.1kPa
დაკალმბრების შედეგები ახილეთ See Calibration Results on	პაგე(ებ) _____
ლაბორატორიის უფროსი Chief of laboratory	ლ. ნაბობაშვილი <small>სახელი/სერტიფიკატი Name</small>
პირის ხელმოწერა, რომელმაც ჩატარა დაკალმბრება Signature of the person who performed calibration	ზ. ცხიკვაძე <small>სახელი/სერტიფიკატი Name</small>



21/03/2023







გვ. 1 2-დან

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8.3 Dust meter calibration certificate



Certificate of Calibration and Conformity

Instrument Type: CEL-712 Microdust Pro
Serial Number: 022528
Probe Serial Number: 022529

Calibration Principles:
 The readability of this instrument has been established using a factory reference "Calibration Insert". The "Calibration Insert" utilizes the optical light scattering technique.
 The factory reference "Calibration Insert" has been calibrated traceably to primary reference using Casella's 1000 (hand dust generation system using ISO 12103-1:02) fine wet test (Mist) ground standard dust, previously wetted, against Road Dust equivalent, Particle size range 1.1 to 10 µm.
 The value shown on the supplied user "Calibration Insert" is to provide a value needed for the user to refer to the instrument readings used for the factory conditions and then determine if operational conditions differ.
 For calibration and reference accuracy to user specific dust types and conditions, please refer to the user handbook.

Test Conditions:

Temperature >	21.9	°C
Humidity >	55	%RH
Pressure >	1017	mbars

Equipment used for Calibration of "Reference Insert":

Wet Tarecell:	Casella Mist Tunnel	Serial Number:	0210722
Microbalance:	Camp 0.05	Serial Number:	0210602
Velocity Probe:	Air Velocity Probe	Serial Number:	0211350
Flow Meter:	GI80000 3	Serial Number:	0211010

Calibration Results:

Casella Factory Reference "Calibration Insert" >	Serial Number:	0211062	Value:	10.585
Supplied "Calibrated Insert" For Probe >	Serial Number:	0225278	Value:	100.1

Declaration of conformity:
 This user certificate confirms that the instrument as specified above has been successfully tested and adjusted to comply with the manufacturer's published specifications.
 This product is certified as being compliant to the requirements of the CE Marking.

Test Engineer: Nicola Tommasini
Date of Issue: 20/06/2023



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Firefox http://notary.nsp.gov.ge/Notary/CarvesPage.do?variant=1&acId=2

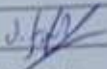






სამოტარო მოქმედების რეგისტრაციის ნომერი	N221498054 
სამოტარო მოქმედების რეგისტრაციის თარიღი	02.11.2022 წ
სამოტარო მოქმედების დასახელება	დოკუმენტის თარგმანზე დასაბუთებულ სტრუქტურის დამოწმება
ნოტარიუსი	მარიკა გოგოლაძე
სამოტარო ბიუროს მისამართი	საქართველო ქ.თბილისი დავით აღმაშენებლის გამზირი N183
სამოტარო ბიუროს ტელეფონი	marikagogoladze@notary.ge
სამოტარო მოქმედების ინდივიდუალური ნომერი	86512612809322 

სამოტარო მოქმედებისა და სამოტარო აქტის შესახებ ინფორმაციის (შემა შექმნის, შეცვლის დასაბუთებულ შესახებ) მიღება-გადამოწმება შეუძლიათ საქართველოს ნოტარიუსთა პალატის ვებ-გვერდზე: www.notary.ge ანდა ზედიზედ გასული ტელეფონზე: +995(32) 2 66 19 18



Supplementary Document 6: Training Attendance Sheet Sample



Training Attendance Sheet უმაღრთობების საუბარზე დასწრების ფორმა				
სტრუქტურა	MIRBUD CS იგობი			
თარიღი	21.03.2023			
სამსახური	სამართლებრივი			
დრო	14:00			
დარსდების ხანგრძლივობა	3			
სამსახური ხელმოწერა				
პროგრამის აღწერა	<ul style="list-style-type: none"> • სამართლებრივი წესის განხილვა • კანონმდებლობის და საერთაშორისო სტანდარტები • მისი დანერგვის და სექტორული დონე • მსჯელობის კონტროლის იერარქია • სამართლებრივი წესის განხილვა • სამართლებრივი კანონის დანერგვა: <ul style="list-style-type: none"> - კანონის მიწვევა - დამკვეთის მოსალოდნე - მართლებრივი წესის დანერგვა, ასევე მისი დანერგვის დამკვეთის მოსალოდნე, მართლებრივი წესის დანერგვის სისტემის - კანონის დანერგვა - კანონის დანერგვის სისტემის სექტორის განხილვა • დანერგვის კონტროლი • მსჯელობის კონტროლი • ინფორმაციის კანონის დანერგვის • სექტორული დონე • კონტროლი • ასევე • სამართლებრივი დანერგვის • კანონის დანერგვის დანერგვის დონეების განხილვა • სამართლებრივი წესის დანერგვის • სამართლებრივი დონეების • მსჯელობის სისტემა 			
Attendances / დასწრეები				
No.	Name, Surname სახელი გვარი	Company კომპანია	Position თანამდებობა	Signature ხელმოწერა
1	გაბრიელ ბერიძე	CS	სამართლებრივი	
2	გიორგი ბერიძე	CS	სამართლებრივი	
3	გიორგი ბერიძე	CS	სამართლებრივი	
4	გიორგი ბერიძე	CS	სამართლებრივი	
5	გიორგი ბერიძე	CS	სამართლებრივი	
6	გიორგი ბერიძე	CS	სამართლებრივი	
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