Bi-annual Environmental Monitoring Report

BI-ANNUAL ENVIRONMENTAL MONITORING REPORT

Project Number: 41122-023

January – June 2015

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July 2015

Georgia: Road Corridor Investment Program

(Financed by the Asian Development Bank)

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For: The Ministry of Regional Development and Infrastructure of Georgia and the Asian Development Bank

Endorsed by: Irakli Litanishvili, Deputy Chairman

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ABBREVIATIONS

ADB	Asian Development Bank
DC	Design Consultant
DREP	Division of Resettlement and Environmental Protection
EA	Executing Agency
EARF	Environmental Assessment and Review Framework
EHS	Environmental Health & Safety
EIA	Environmental Impact Assessment
EIP	Environmental Impact Permit
EMP/ SSEMP	Environnemental Management Plan/ Site-Specific Environmental Management Plan
ES/ SES	Environmental Specialist/ Senior Environmental Specialist
GoG	Government of Georgia
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
RCIP	Road Corridor Investment Program
IA	Implementing Agency
IEE	Initial Environmental Examination
MFF	Multi-tranche Financing Facility
MoENRP	Ministry of Environment and Natural Resources Protection
MoRDI	Ministry of Regional Development & Infrastructure
NEA	National Environmental Agency
SC	Supervision Consultant

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PART I. INTRODUCTION

1.1 Project Background and Objective of the Environmental Monitoring Activity

The Republic of Georgia, with its 4.5 million people, is bounded on the north by Russia and the Caucasus mountain range, to the south by Armenia and Turkey, to the west by the Black Sea and the east by Azerbaijan. With reference to ADB's Project Data Sheet (PDS)[1], the Government of Georgia is intending to develop the sub-regional multi-corridor to make the most of the country's locational advantage as a transit hub for the Caucasus and for Euro-Asia road transport, particularly by providing a more efficient route for Turkey and Armenia related traffic. This sub-regional multi-corridor will also ensure Government's new strategic vision of the transport network security. The PDS identifies important of development objectives for an efficiently functioning multi-corridors such as (i) reduction of the cost of sub-regional and international transport, benefiting both the local economy and the economy of the subregion, and thereby stimulating the development of Euro-Asia trade links; (ii) the sub-regional multi-corridors also serve as principal domestic corridors linking the major cities, ports and tourist centers; (ii) and their development will enhance economic growth through more efficient passenger and freight transport, while enhancing safety.

In the ADB's Report Recommendation to the President (RRP, September 2009)[2] the development potentials of the East-West Highway between Azerbaijan and Georgia have been highlighted, with the ports of Poti and Batumi as the exit points in the Black Sea. These ports also serve the same function to the Agrak–Kapan–Yerevan–Bavra road in Armenia with two southern sections in Georgia. A major segment of this trade and tourist route is the 81 km Poti – Batumi – Sarpi road along the western coast of the country. This road segment, mostly located in the Adjara Autonomous Republic, is a key highway for international transit route in Georgia and a major link to beach resorts in Batumi and Kobuleti. During the tourist season, this road experiences a high volume of traffic and significant increase of accidents.

Because of these aforementioned issues and features, the Government of Georgia has decided with ADB's assistance, to construct the so-called Adjara Bypass Project along the Black Sea in Adjara region. The Project was determined to be a Category A environmental project for which an EIA was processed. The Project will construct a 2-lane new road (45km), except along a 1-km stretch near Makhinjauri tunnel, where it will merge with the existing 4-lane road. In addition, the Project will have a number of new bridges, culverts, retaining walls, and tunnels. The entire project road is packaged into 2 contracts[3] for preparation of detailed designs and implementation as follows:

- Contract 1 – Km 0 to Km 12.4 bypassing Kobuleti Town – a new alignment; widening of existing road from Km 31.3 to Km 32.3 near Makhinjauri tunnel
- Contract 2 – Km 12.4 to Km 31.3 bypassing Kobuleti Town – a new alignment

[1] ADB-PDS for 41122-023: Loan 2560-GEO: Road Corridor Investment Program - Project 1 (from http://www.adb.org /projects/41122-023/main)

[2] ADB. September 2009. RRP - Proposed Multitranche Financing Facility Georgia: Road Corridor Investment Program

[3] Government of Georgia. MORDI-Roads Department. February 2012. Environmental Impact Assessment

For the implementation phase of the project, construction supervision scope has been tendered with the following objectives of ensuring that (i) high quality construction is achieved; (ii) designs are carried out to the appropriate engineering standards; (iii) all work associated with the project are carried out in full compliance with the designs and specifications; (iv) the EA's engineers and domestic consultants receive in-country and international training in selected areas of tunnel design and construction and pavement design; (v) resettlement, social, environmental, road safety, and monitoring are implemented in accordance with the recommendations of various studies, plans, analysis of the project.[4] Contracts 1, 2, and 3 are covered in Tranche 1 while Contract 4 will be covered in Tranche 2.

1.2 The Project Area

The Kobuleti Bypass section is part of the so-called Adjara Bypass Project along the E-70 Poti – Batumi – Sarpi road located the western Black Sea coast of Georgia. The project road also forms part of the main road corridor East-West Highway between Azerbaijan and Georgia. Its connection with the Black Sea ports of Batumi and Poti and the tourist beaches in Kobuleti makes this road an important trade and tourism road for Georgia. Information and data on the Project Road has been extensively elaborated in the EIA documents for the project.

Focusing on the entire 32 km project road, the first 16 km and the last 4 km of the project road alignment traverses flat terrains of coastal plain with elevations ranging from 0 to 30 m. The rest of the project road runs through a rolling and hilly terrain with elevations ranging from 20 to 192m. In terms of geology, the project area shows manifestation of several tectonical features such as synclines and anticlines, folds and faults. It is underlain by bedrocks which are volcanogenic sedimentary rocks represented mostly by basalts with tuffa, gravellites and marls. The rocks show signs of intense weathering and disintegration due to the wet subtropical climate. As a result the surface strata generally consist of thick deposits of delluvial (loams and clay) and laterites (loam).

In terms of climate, the project area falls within the classification of seaside humid subtropical climatic zone with an average rainfall of 2000mm to 2800mm evenly distributed throughout the year, peaking in September and dipping in May. The average monthly temperature ranges from 5^0C in winter to 22.5^0C in summer; and the average monthly humidity ranges from 73 to 84%, with dominant northeasterly wind direction. The Project road traverses over four (4) major rivers of length more than 15 km, namely Natanebi, Choloki, Kintrishi, and Chakvistskali; five (5) smaller rivers of lengths between 10 and 15 km, viz. Ochkhamuri, Achkva, Kinkishi, Dehkva, and Korolistskali; and 16 streams.

The recognized protected areas near the vicinity of the construction site is the Ispani mire, which is also a RAMSAR wetland site (number 894) located around 350 meters away from the Project road between Km 6 to 12 of Section 1. This wetland has an area of 770 ha and contains two parts – Kobuleti State Nature Reserve (Ispani II, the northern area – 331.25 ha) and Kobuleti Managed Reserve (Ispani I, the south west area- 438.75 ha). The Contractor is aware of this site and special attention is paid to avoid any direct impacts to this protected area.

[4] ADB. 12 March 2010. Outline Terms of Reference for Consultants for Construction Supervision of Tranche I and Tranche II

The project's ecosystem is generally characterized by pastureland with cornfields, rolling lands, and wetlands. There are 55 species of mammals in the area with the bats considered as the vulnerable terrestrial mammal. The area is considered also as one of the important sites for Western Palaearctic birds' migration, such as eagle, vulture, falcon, and owl; other fowl species found are duck, crane, grebe, pelican, etc. Out of the 54 species of reptiles recorded in Georgia, about 16 reptiles can be found along the Project alignment. Out of 12 species of amphibians that thrive in Georgia, 10 of them exist in the Project area. In terms of fisheries, there are 47 freshwater and anadromus fish species occur in rivers, and streams of Adjara. The Black Sea salmon (*Salmo labrax*) is an endemic and anadromus species that migrates up the rivers of Kintrishi, Chakvistskali, Charkha during the spawning season.

The baseline environmental information gathered during the drafting of the EIA for the project are as follows:

Table 1: Baseline Information for the Project Road

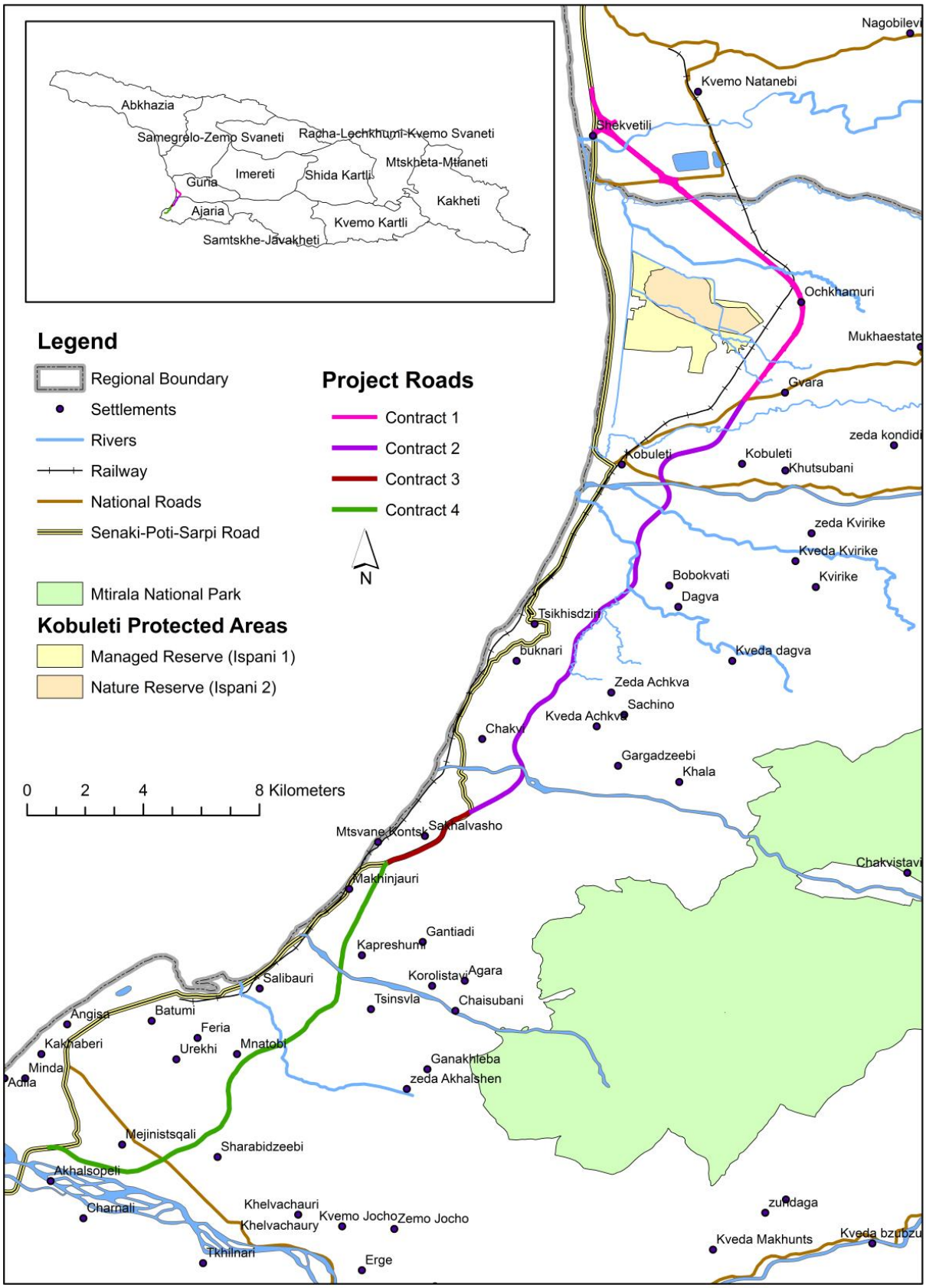
Environmental Aspect	Parameter	Value
Surface Water Quality	Total dissolved solids (TDS)	44 to 164
	Dissolved Oxygen (DO) concentration	7.6 to 10
	Nitrate content	0.18 to 2.16 mg/l
	Hydrocarbons content	less than 0.2 mg/l
Groundwater Quality	TDS	less than 300 mg/l.
	TDS of spring water near Makhinjauri tunnel	75 mg/l.
	Bicarbonate as the major anion	36 to 246 mg/l
	Calcium as the major cation	5 to 56 mg/l
	Total coliform content in the groundwater wells	1,000 to 2,000
	Total coliform in spring water	50,000
Noise Quality	Background noise levels	27-32dBA
	Noise levels at a distance of 25m from the centre of the existing Poti – Sarpi road	74dBA
Air Quality	Concentrations of dust (PM)	0.025 to 0.89 mg/m^3
	CO	0.11 to 2.04 mg/m^3
	No_2	0.03 to 0.042 mg/m^3
Soil Quality	Lead content	8 to 19 mg/kg,

Environmental Aspect	Parameter	Value
	Zinc content	58 to 84 mg/kg
	Cobalt content	10 to 21 mg/kg
	Copper content	13 to 66 mg/kg
	Nickel content	17 to 59 mg/kg.

The estimated population in 2014 in Adjara Region is around 396,600, consisting of 51% living in urban areas and 49% in rural areas[6]. The ethnic groups are Georgian (97%), Armenian (2%), Russian (0.25%), Greeks, Abkhaz, etc. The most populated city is Batumi, with a population of 161,200. In 2012, the Gross Domestic Product (GDP) of Adjara was estimated to be GEL 1675 million, contributing to 7.4% of the GDP of Georgia[5]. The main industries in Adjara are manufacturing, agriculture and tourism. There are around 41 archeological sites identified near the Project area. A number of cultural monuments were discovered during the archeological expeditions in the ravines of Rivers Choloki, Ochkhamuri, Achkva, Kintrishi, Kinkishi, Chakvistskhali, Korolistskhali and Chorokhi. A map of the Project road with active construction is shown in **Figure 1** below.

[5] GEOSTAT – National Statistics Office of Georgia (http://www.geostat.ge)

Figure 1: Location Map of the Project



1.3 CONSTRUCTION ACTIVITIES AND PROJECT PROGRESS DURING THE PREVIOUS 6 MONTHS

Physical Progress of Works

Cumulative value of total executed work since commencement of the project till the end of June is equal to 47.49% of the total Contract amount.

Construction activities performed during the reporting period
The following works have been executed for the Construction of Kobuleti Bypass Road Lot 2 Project from January 2015 to the end of June 2015. Right of access to KM. 17+000 ~ KM. 17+950 was handed over to the Contractor on 16 June 2015. The actual progress of works executed by the Contractor from January 2015 to June 2015 has been amounted to 7.94% of the Contract Price against the Cash flow Programmed of 17.51% for Lot 2.

2.1 Setting-out of control points and site cleaning:

- Setting out of control points at section KM. 0+000 to KM. 6+500 has been completed.
- Clarification of the right-of-way coordinates at several points of section km.6+500 - km.12+800.
- Setting-out of control points at section km.12+370 - km.12+665 for strengthening of Tunnel #1's portal slope is in progress.

2.2 Earthworks:

- Removal of Top Soil at Section KM. 16+660 – KM. 16+960 is in progress.
- Filling, Spreading and Compaction of roadbed at sections KM. 1+100, KM. 3+600, KM. 10+800, KM. 16+700 is in progress.
- Excavation (Cut) at section km16+580 – km16+615 is in progress
- Grading at several sections of CL 600 is in progress.
- At section KM. 9 – KM. 12 remedy work of embankment will be resumed after obtaining new quarry site and good weather.
- Slope Protection by Gabion box at KM. 6+500 ~ KM. 6+644, KM. 14+606 ~ KM. 14+706 is in progress.
- Excavation for construction of gabion boxes, including loosening and breaking of material up material during excavation and disposal has been started.
- Cast In-Situ Reinforced Concrete retaining wall at CL500 has been started.

2.3 Culverts and Drainage:

- A total of 8 pcs of culverts in various sizes was completed.
- 3 culverts in various sizes are still under construction.
- Pre-Casting of Pipe Culvert (Ø1.5 m) is in progress.
- Excavation for repairing damaged Culvert No. 11 (2.5m X 2.5m) is in progress. Contractor performed Geological Test on 8 April 2015 and the report was reviewed by the Consultant Specialist and the conclusion shall be reported to the Employer soon.
- Culvert #32 shall be changed to Corrugated Pipe Structure.

2.4 Bridges and Tunnel:

- Pre-Fabrication of bridge sidewalks at Camp #4 (Bobokvati) is in progress.

- Bridge #1 – Bridge #6

- All sub-structures (bored piles, piers, abutments, etc.), Installation of I-Beams, Concrete Pouring of Deck Slab, Concrete Crash Barriers and Sidewalks have been completed.

- Bridge #7
  - Pouring of Concrete for double T-Beam superstructures has been completed on April 30, 2015. A total of 10,987.90 m^3 of concrete has been used to complete the 450 meters length (10 spans) of double T-beam Superstructures. Pouring of concrete commenced on October 29, 2014. It takes 6 months to complete pouring of concrete for double T-Beam Superstructures.
  - Post Tensioning for the Superstructure slab has been completed.
  - Installation of Bridge Sidewalk was completely installed.
  - Construction of Cast In-Situ Concrete Barrier is in Progress.

- Bridge #8
  - Pouring of Concrete for the last span (10^{th} span) of Cast In-Situ double T-Beam Superstructures has been completed on February 15, 2015. A total of approximately 11,117.50 m^3 of concrete have been poured for a 480 meters length (10 spans) of double T-Girder superstructure. Pouring of concrete commenced on July 17, 2014. Seven (7) months was needed to complete pouring of concrete for double T-Beam Superstructure.
  - Installation of bridge sidewalk and construction of rebar works for Cast In-Situ Concrete Barriers is in progress.

- Bridge #8A
  - Construction of RC Cross Beam, Back and Wing Walls for Abutment 1 and 2 has been completed.

- Bridge #9
  - Abutment 2 (A-2) foundation work including board pile was completed on December 2014.
  - Construction activity was temporarily postponed due to LARP problem and the Employer filed the compensation to the court.
  - Expropriation has been initiated by the Road Department.

- Bridge #10
  - Construction of cross beams for all the piers was completed.
  - Construction of Abutment 2 (A2) was completed.
  - Concrete Pouring for Span Nos.: 7, 8, 9 and 10 of double T-Beam superstructure was completed. Pouring of concrete for double T-Beam superstructures was commenced on 1 May 2015 at A2 to pier P9 (span #10).
  - Slope Stability by Wooden Piles and ground hardening for span 1 to 3 is in progress.
  - Installation of bearings for P1 to P5 is in progress.
  - Installation of Steel Structure Bracket at P5 is in progress.
  - Installation of bridge scaffolding (Full Staging Method) and re-bar works for the remaining spans of double T-Beam Superstructures are in progress.

- Bridge #11
  - Installation of Bridge Staging (Movable Scaffolding System) is in progress.
  - Pouring of concrete by MSS Method for Span #2 (P1 ~ P2) was commenced on 11 May 2015. A total of 609 m^3 of concrete has been used. A total of three (3) span (from P1 ~ P4) of double T-Beam Superstructures were completed.

- Preparation for the Gas Pipeline relocation was started on 6 June 2015 between P16 and P17.

- Tunnel #1
  - Reinforcing of the Tunnel Portal by Grid Block was completed on January.
  - Tunnel office is opened on 20 January, 2015.
  - Manufacturing of H-Shaped Steel Rib (Double T-Frame) is in progress.
  - Installation of Permanent Steel Frame work of every 1.0 meter of NATM Tunnel section is in progress.
  - Installation of Wire Mesh Ø4.8mm X 100mm X 100mm is in progress.
  - Applying of Sprayed Concrete is in progress (shotcrete).
  - Face Mapping is under investigation on each phase of excavation.
  - Installation of Steel Pipe Reinforced Grouting is in progress.
  - Total excavated tunnel length is 68.0 meters.

- Tunnel #2
  - Excavation of Open tunnel location was started.
  - Replacing the Original Design of Reinforced Concrete Structure to Corrugated steel Structure is under final stage of decision. The Contractor submitted updated structural calculation and the Engineer is reviewing it.

2.5 Pavement:

- A total of 35,165.98 m^2 has been paved for Bituminous Base Course and 23,744.48 m^2 for Binder Course.

1.4 CHANGES IN PROJECT ORGANIZATION AND ENVIRONMENTAL MANAGEMENT TEAM

During reporting period following changes took place:

(i) Mr. Nodar Javakhishvili was appointed as a Minister of Regional Development and Infrastructure of Georgia;

(ii) Chairman of the Roads Department of Georgia Mr. Vazha Panchulidze left his position

No changes has taken place on the Middle and Low management team of the Roads Department and/or under the Ministry of Regional Development and Infrastructure of Georgia.

PART II: ENVIRONMENTAL MONITORING

Within the reporting period from January to June 2015, the Engineer's two (2) domestic environmentalists have been performing environmental monitoring as outlined in the EIA Report. The results of the monthly monitoring were incorporated in the Environmental Chapter of the monthly report of the Engineer.

Primarily the environmental monitoring activities at various locations at the worksites focused on (i) the quality of atmospheric air; (ii) the quality of drinking water and river water; (iii) the condition of soil; (iv) flora and fauna; (v) the condition of construction equipment and transport; (vi) waste management; and (vii) worker safety, general hygiene and sanitation.

The Contractor carried out instrumental measurements for air quality and noise from January to June 2015. Measurement of surface water and groundwater quality was carried out during reporting period. Water quality measurements should be carried out on a quarterly basis, especially for groundwater in camp sites as this has direct impact on the health of the work personnel. The monthly environmental parameter measurements and observations are summarized below.

(i) Air quality – Particulate matter only (PM); no measurements conducted for Sulphur Dioxide, Nitrogen Oxide, and Carbon Monoxide. Apart from PM, the latter parameters should be monitored on a quarterly basis, as specified in Table 7-2 of EIA/EMP.

The average PM measurements for each of the six months in Lot 1 and Lot 2 (Table 2a & 2b) monitored during the reporting period indicates that the concentrations are below the threshold levels.

Table 2a: PM Measurements (average values in mg/ m^3) at selected sites in Lot 1 for January-June 2015

Location	MAC	Jan	Feb	Mar	Apr	May	June
Choloki Camp Site 1	0.5	0.005	0.005	0.004	0.003	0.002	0.003
PK 86 / Ochkhamuri Camp site 2	0.5	0.017	0.014	0.015	0.015	0.014	0.015

Note – Lot 1 measurements made only in campsites, as road construction work is complete.

Table 2b: PM Measurements (average values in mg/m^3) at selected sites in Lot 2 for January-June 2015

Location	MAC	Jan	Feb	Mar	Apr	May	June
BR1 (PK5+20)	0.5	0.027	0.026	0.008	0.008	0.008	0.007
BR2 (PK16+82)	0.5	0.025	0.026	0.010	0.011	0.014	0.014
BR3 (PK43+73)	0.5	0.021	0.024	0.013	0.014	0.014	0.013
BR4 (PK44+84)	0.5	0.022	0.023	0.012	0.012	0.014	0.014
BR5 (PK54+21)	0.5	0.025	0.022	0.008	0.009	0.012	0.013
BR6 (PK59+05)	0.5	0.024	0.023	0.012	0.012	0.014	0.014
BR7 (PK68+60)	0.5	0.025	0.024	0.015	0.015	0.014	0.015
BR8 (PK81+73)	0.5	0.019	0.020	0.013	0.012	0.013	0.015
BR8A	0.5	0.018	0.016	0.026	0.024	0.020	0.021
Bobokvati Camp site #4	0.5	0.020	0.016	0.012	0.011	0.011	0.012
BR9 (PK)	0.5	0.021	0.020	0.017	0.017	0.011	0.011
BR10(PK)	0.5	0.022	0.022	0.017	0.017	0.017	0.018
BR11 (PK)	0.5	0.023	0.024	0.014	0.015	0.016	0.017
BR11.1(PK)	0.5	0.018	0.023	0.016	0.016	0.015	0.013
BR11.2(PK)	0.5	0.023	0.022	0.015	0.015	0.016	0.016
Chakvi Campsite #5	0.5	0.023	0.024	0.017	0.015	0.014	0.015

Table 3a: Noise Measurements (Average dB) at selected sites in Lot 1 for Jan-June 2015

Location	Allowable Limit	Jan	Feb	Mar	Apr	May	June
Choloki Camp Site 1	75-80	51.0	52.0	52.6	52.5	52.5	52.7
PK 86 / Ochkhamuri Camp site 2	75-80	52.9	52.4	53.5	53.8	54.5	55.4

Note – Lot 1 measurements made only in campsites, as road construction work is complete;

Table 3b: Noise Measurements (Average dB) at selected sites in Lot 2 for Jan-June 2015

Location	Allowable Limit	Jan	Feb	Mar	Apr	May	June
BR1 (PK5+20)	75-80	55.3	54.8	55.8	56.3	58.4	58.4
BR2 (PK16+82)	75-80	56.1	55.5	57.5	57.1	55.7	55.7
BR3 (PK43+73)	75-80	57.2	57.1	57.3	57.2	56.5	57.5
BR4 (PK44+84)	75-80	59.4	57.4	56.8	56.9	56.7	56.9
BR5 (PK54+21)	75-80	56.4	58.5	56.8	57.4	56.9	56.8
BR6 (PK59+05)	75-80	56.2	57.5	57.8	56.4	58.0	58.0
BR7 (PK68+60)	75-80	62.6	66.7	65.1	68.2	64.7	62.5
BR8 (PK81+73)	75-80	63.2	64.7	58.5	58.4	57.9	57.7
BR8A	75-80	59.5	58.0	62.3	61.3	59.4	57.5
Bobokvati Campsite #4	75-80	55.7	57.4	56.6	56.3	55.3	56.3
BR9 (PK)	75-80	52.6	52.6	57.3	57.6	57.4	55.2
BR10(PK)	75-80	57.2	56.6	54.9	56.1	58.1	61.6
BR11 (PK)	75-80	53.7	64.9	63.0	63.6	64.8	64.3
BR11.1	75-80	62.2	57.3	57.4	57.6	58.0	57.4
BR11.2	75-80	63.0	56.8	55.8	56.4	57.3	57.2
Chakvi Campsite #5	75-80	51.7	53.0	53.5	54.6	55.1	56.2

(ii) Ground Water Quality - Ground water samples were obtained from the five campsites and tested for potable water quality parameters in 01.07.15.

The results are summarized in Table 4. The water quality measurements made in 01.07.2015 indicate that all physical and chemical parameters were within acceptable

limits. However, the mesophylic aerobic and facultative anaerobic microorganism counts in potable water samples collected from Choloki, Ochkhamuri, Laituri, and Bobokvati campsites were higher than the acceptable limits. Total coliforms and *Escherichia coli* were detected in water samples from Laituri and Bobokvati Campsites, indicating potential fecal contamination from human and/or animal excreta. It should be noted that the water is only used as technical water.

Table 4: Potable / Ground Water Quality Measurements in Campsites 01.07.15

Parameter	Acceptable Limits	Standard	Choloki	Chakvi	Ochkhamuri	Laituri	Bobokvati
Odor	2 units	ISO6658	0	0	0	0	0
Taste	2 units	ISO6658	0	0	0	0	0
Color	15°	ISO7887	15°	15°	15°	15°	15°
Turbidity	3.5 units	ISO7027	3	1.8	2.0	1.8	3.8
pH	6.0-9.0	ISO10523	7.74	7.60	7.47	7.51	7.43
Chloride	250 mg/l	ISO9297	24.9mg/l	10.78mg/l	26.46mg/l	14.7mg/l	21.56mg/l
Ammonia NH3	2.0 mg/l	ISO11905.1	0.8mg/l	<0.05	<0.05	<0.05	<0.05
Nitrite (NO2-)	0.2 mg/l	GOST4192	<0.003	<0.003	<0.003	<0.003	<0.01
Nitrate (NO3-)	50.0 mg/l	GOST18826	<0.1	0.2mg/l	0.2	<0.5mg/l	4.0mg/l
Total Iron (Fe)	0.3mg/l	ISO6332	<0.15mg/l	<0.04mg/l	<0.05mg/l	<0.06mg/l	<0.04mg/l
Total Copper (Cu)	2.0 mg/l	ISO8288	<0.03mg/l	<0.04mg/l	<0.03mg/l	<0.03mg/l	<0.04mg/l
Arsenic (As)	0.01mg/l	GOST4152	<0.005	<0.005	<0.005	<0.005	<0.005
Lead (Pb)	0.01mg/l	ISO8288	0.002	0.005	0.001	0.003	0.002
Dry residue (TDS)	1000-1500mg/l	GOST18164	200mg/l	80mg/l	120.0mg/l	80.0mg/l	80mg/l
Permangan	3.0	ISO8467	0.71	1.06	0.71mg/O_2	0.71	0.43mg/O_2

ate index	mg/O_2/l		mg/O_2/l	mg/O_2/l	/l	mg/O_2/l	/l
Mesophylic aerobic and facultative anaerobic microorganism	37°- ≤20 CFU 22°- ≤100 CFU (in100ml)	ISO6222	100 120	10 15	80 100	130 150	70 110
Coliforms	in 300ml	ISO9308	No	No	No	Yes	Yes
E.coli	In 300ml	ISO9308	No	No	No	No	Yes
St.faecalis	In 250ml	ISO7899-2	No	No	No	No	No
Salmonella	In 100ml	ISO6340	No	No	No	No	No

Analysis for Potable and Surface water quality has been conducted on 23 January, 2015 and 1 July, 2015. Therefore tables #4 and #5 are provided based on analysis conducted on July 1st, 2015.

(iii) Surface Water Quality - Surface water samples were obtained from six locations in five rivers crossing the Lot 2 area and tested for selected surface water quality parameters in October 2014. Water from one location along the Kintrishi, Kinkishi, Achkva, Dekhva, Chakvistkali and Shuagele Rivers was monitored. The analytical results of the samples collected in 01.07.2015 (see Table 5) indicate that the water quality parameters were within the regulated limits for all five rivers.

Table 5: Surface Water Quality in Lot 2 Rivers (01.07.2015)

Parameter	Acceptable limits[1]	Standard	Kintrishi, Bridge #4	Kinkishi Bridge #5	Achkva	Dekhva Bridge #7	Chakvistkali Br#11	Shuagele
Odor	1 unit	ISO 6658	0 (none)	0 (none)	0 (none)	0 (none)	0 (none)	0 (none)
Color	25°	ISO 7887	35°	35°	30°	25°	2°	35°
Turbidity	3.5 units	ISO 7027	4.5mg/l	4.5mg/l	4.5mg/l	3.8mg/l	4.0mg/l	4.5mg/l
pH	6.5-8.5	ISO	8.38	8.70	8.55	9.79	8.38	8.12

		10523						
Dry residue (TDS)	1000mg/l	GOST 18164	80mg/l	70mg/l	80mg/l	80mg/l	80mg/l	80mg/l
Permanganate Index (COD)	4-6mg/O_2/l	ISO 8467	2.96mg/O_2/l	2.27mg/O_2/l	2.88mg/O_2/l	1.88mg/O_2/l	2.16mg/O_2/l	2.35mg/O_2/l
Chloride Cl-	300mg/l	ISO 9297	9.8mg/l	12.74mg/l	15.68mg/l	14.7mg/l	9.8mg/l	19.6mg/l
Sulfide SO_4^{-2}	250mg/l	ISO 9280	8.0mg/l	11.0mg/l	3.5mg/l	3.0mg/l	4.0mg/l	9.0mg/l
Nitrite NO_2-	0.08-3.3mg/l	GOST 4192	<0.003g/l	0.004	0.01	0.004	0.004	0.004
Nitrate NO_3-	40-45mg/l	GOST 18826	<0.2mg/l	<0.5mg/l	1.0mg/l	<0.35mg/l	<0.004 mg/l	0.14mg/l
Total Iron (Fe)	0.3mg/l	ISO 6332	0.13mg/l	0.1mg/l	0.26mg/l	0.13mg/l	<0.35mg/l	0.07mg/l
Arsenic (As)	0.05mg/l	GOST 4152	NA	NA	NA	NA	NA	NA

[1]Source for Acceptable Limits: Georgian Regulations and Guidelines for Protection of Surface Water from Contamination – Ministry of Environment of Georgia, September 17, 1996 (#130).

PART III: ENVIRONMENTAL MANAGEMENT

3.1 ENVIRONMENTAL MANAGEMENT PLAN (EMP)

The Environmental Management Plan (EMP) was designed to avoid, reduce, or at least minimize the adverse environmental impacts that could result from the activities during the implementation and operation of the project. As per the Technical Specification 3001.1 ENVIRONMENTAL MANAGEMENT PLANNING, “The Contractor shall provide a detailed site-specific (or section-specific) Environmental Management Plan (EMP) which will be based on: (1) Generic/standard EMP structure and mitigation measures for the road construction; (2) Site/section-specific EMP requirements provided by the Employer in his EIAs. Hence, one major requirement is that the Contractor should produce his own EMP appropriate for the project and to be checked by the Engineer’s environmental specialist. Two separate EIA reports, including detailed EMPs have been prepared for Lot 1 and Lot 2 areas.

For the drafting of the EMP, the Contractor was advised to adopt the provisions in the EIA Technical Specifications and to undertake monitoring of important parameters found in the Lot 1 EIA Report Table 7-2, and Lot 2 EIA Report Table 9-2: Environmental Monitoring Plan during Construction and Operation. Parametric measurements should be done on a quarterly basis for air quality, noise, surface and groundwater quality and corresponding reports prepared and submitted to the Engineer.

As a matter of protocol, site inspections were conducted on various environmental aspects of the project and form part of the Monthly Progress Report. Regular inspections were undertaken by local environmental specialists. During the inspections, several environmental health and safety issues were observed and noted. These issues were subsequently brought to the attention of the personnel concerned on the Engineer's side as well as discussed with the Contractor's side following the "Auditing Protocol" and EMMP. The main EHS issues observed were generally concerning with the improper storage of material in camp sites, accumulation of scrap material in campsites, soil contamination issues, dust emissions, water quality of potable water systems, as well as worker safety issues.

3.2 STATUS OF IMPLEMENTATION OF THE PREVIOUS RECOMMENDATIONS

Table 6 shows status of Implementation of the Recommendations given by the International Environmental specialist under the Bi-Annual Environmental Monitoring Report for July-December 2014.

3.3 SITE INSPECTIONS AND REVIEW AUDIT

During the field investigation, a number of E&Hs issues were noted and brought to the attention of the Contractor. A review audit was performed by the local Environmental Specialist in early June 2015. Based on this review audit, an Environmental Action Plan was drafted and mitigation measures were proposed accordingly. A summary of the identified issues is presented in the Table 7.

Chart # 6: Status of Implementation of the Recommendations under the previous Bi - Annual Environmental Monitoring Report.

A. Lot 2 - road section km12.4– km28

Environment, safety and healthcare issues	Recommended mitigatiion measures	Determined time for implementation	Progress
Absence of safety nets on the bridges above the present roads	Safety nets must be installed on the bridges above the roads	3-4 weeks	COMPLETED (Safety nets installed at every bridge construction)
Some steep slopes aren't guarded against erosion.	Slope must be stabilized by methods like: Geogrid, Biolayer, re-seeding the slope, berms and etc.	1.5 Months	Partially Completed (In order to ensure the reinforcement of slopes, building of gabions, planting of trees and etc. have been started.)
Worker's don't wear fall-safe protective gear at the bridge construction.	Workers will be directed to wear fall-safe protective gear and the supervisor will be demanded to strictly ensure it on everyday basis.	Starts immediately	COMPLETED (Strict monitoring is being done on this issue)

B. Choloki Campsite

Environment, safety and healthcare issues	Recommended mitigating measures	Determined time for implementation	Progress
General Sanitary Issues			
Water doesn't freely move through drainage channels due to the	Drainage channels must be cleaned on	Starts immediately	COMPLETED

obstructions like weeds, sedimentation and waste.	a monthly basis to avoid standing water		(Drainage channels and clogged culverts have been cleaned)
Building scrap materials are scattered throughout the campsite	ECP-16 Building camp management should be implemented. Heaps of scrap scattered around the camp site must be gathered and sold/distributed to the scrap metal processing and gathering plants/individuals.	1 month	In Progress Gatherers have started the gathering of scrap metal (As it is a cycle, it needs a continuous resolve until the completion of works.)
Issue of managing the waste			
Waste is scattered around the campsite	Waste removal and management from the campsite must be regulated	Immediately and than on a weekly basis	COMPLETED (Waste removal is managed by the contractor on a weekly basis)

C. Ochkhamuri Campsite

Environment, safety and healthcare issues	Recommended mitigating measures	Determined time for implementation	Progress
Soil contamination issues			

Open barrels with wasted oil products A large oil stain near the Bitumen storage pool	Open barrels must be sealed and stored on a concrete pillow so the collection of rain water and spill on soil is prevented. Oil stain must be cleaned.	1 week	COMPLETED (Site is free of oil products)
Power safety issues			
Power lines in water pools	Water pools must be filled and power lines must be separated from them.	2-3 weeks	COMPLETED (Power cables have been wrapped with special plastic protector)
Bad management of waste			
Household waste on an open landfill	Waste removal and management from the campsite must be regulated	Immediately and than on a weekly basis	COMPLETED (Waste removal is managed by the contractor on a weekly basis)

D. Bobokhvati campsite (Lot 2 territory)

Environment, safety and healthcare issues	Recommended mitigating measures	Determined time for implementation	Progress
General Sanitary Issues			
Coliform bacteria has been found in drinking water, which is an indication of possible fecal pollution	Main reservoir must be washed and chlorinated. Boiled water must be used for drinking	Water reservoir must be washed and chlorinated immediately and every	In Progress (Contractor is ready to install new water

	and kitchen. Sewer system must be checked for leakage. Drainage system in and off the camp must be cleaned. Water samples must be retaken 2 weeks after the cleaning of water.		reservoirs.)
Flushers don't flush/are broken in the WC	Flushers must be fixed	1-2 weeks	COMPLETED (Mentioned problems have been resolved)
Water pools	Water pools must be filled with gravel	1 week	COMPLETED (Campsite is leveled and filled with gravel)
Used building materials (scrap, metal, wood, cables and etc.) aren't stored accordingly on the campsite.	Heaps of scrap scattered around the camp site must be gathered and sold to the scrap metal processing or gathering plant. Usable items must be stored according to the type of material.	2-3 weeks	In Progress (Problem has been resolved in some areas, while some still remain)

E. Chakvi Campsite

Environment, safety and healthcare issues	Recommended mitigating measures	Determined time for implementation	Progress
General Sanitary Issues			
Open barrels with wasted oil products A large oil stain near the Bitumen storage pool Left over bitumen sacks on campsite	Open barrels must be sealed and stored on a concrete pillow so the collection of rain water and spill on soil is prevented. Oil stain must be cleaned. Soil surface must be cleared of the bitumen	1 week	COMPLETED Spilled bitumen is cleared up and open barrels are stored on concrete pillow. (Closed)
Construction scrap material at the campsite			
Construction scrap material is scattered at the campsite	ECP-16 Building camp management should be implemented. Heaps of scrap scattered around the camp site must be gathered and sold/distributed to the scrap metal processing and gathering plants/individuals.	2-3 weeks	In Progress Gatherers have started the gathering of scrap metal (As it is a cycle, it needs a continuous resolve until the completion of works.)
General Sanitary Issues			
Coliform bacteria has been found in drinking water, which is an indication of	Main reservoir must be washed and	Water reservoir must be washed and chlorinated	In Progress

possible fecal pollution	chlorinated. Boiled water must be used for drinking and kitchen. Sewer system must be checked for leakage. Drainage system in and off the camp must be cleaned. Water samples must be retaken 2 weeks after the cleaning of water.	immediately and every	(Contractor is ready to install new water reservoirs.)

F. Laituri stone shattering factory

Environment, safety and healthcare issues	Recommended mitigating measures	Determined time for implementation	Progress
Household waste management and General Sanitary Issues			
Coliform bacteria has been found in drinking water, which is an indication of possible fecal pollution	Main reservoir must be washed and chlorinated. Boiled water must be used for drinking and kitchen. Sewer system must be checked for leakage. Drainage system in and off the camp must be cleaned. Water samples must be retaken 2	Water reservoir must be washed and chlorinated immediately and every	In Progress (Contractor is ready to install new water reservoirs.)

	weeks after the cleaning of water. Sedimentation must be cleared off and dumped away appropriately so the water filtration improves.		
Used water carries sediments to the river due to absence of the sedimentation filter pool maintenance/management	Sediments must be cleared from the pool every 2 days	Immediately and once every 2 days after	COMPLETED (Sedimentation pool has been deepened and cleaned)

Table 7: EHS Issues and Recommendations of the Environmental Specialist

1. **Lot 2 road section km12+400 – km31+259**

Environment, safety and healthcare issues	Recommended mitigating measures	Determined time for implementation	Progress
Construction vehicles produce dust in dry weather	Spraying of water during dry seasons.	Always (when needed)	Done
Household waste is scattered around the bridges, road sections and tunnel	Garbage containers must be installed at every mentioned location	2-3 weeks	Installation of the garbage containers Initiated
WC and Sedimentation channel for maintenance water due to the constructional works aren't complete at the Tunnel #1. Waste Containers must be installed for household waste.	WC installation must be finished. 3 sections of sedimentation with a concrete base must be installed for maintenance water coming out of the tunnel. Waste Containers must be installed.	2-3 weeks	Yet to initiate

2. #1 Choloki construction camp

Environment, safety and healthcare issues	Recommended mitigating measures	Determined time for implementation	Progress
Scrap on camp site			
Heaps of scrap, wooden materials and useless machinery are scattered around the campsite.	Heaps of scrap scattered around the camp site must be gathered and sold to the scrap metal processing or gathering plant. Wooden materials and machinery must be gathered and inventoried in order to be fixed or sold as a scrap.	1 month	Yet to initiate
Removal of household waste from the camp			
Overfilled containers of household waste have been noted at the campsite.	Waste must be removed from the campsite in a timely manner.	Regularly (4 times per month)	Done
Coliform bacteria has been found in drinking water, which is an indication of possible fecal pollution	Main reservoir must be washed and chlorinated. Boiled water must be used for drinking and kitchen. Sewer system must be checked for leakage. Drainage system in and off the camp must be cleaned.	Water reservoir must be washed and chlorinated immediately and every week	Initiated (Contractor is ready to install new water reservoirs.)

	Water samples must be retaken 2 weeks after the cleaning of water.		

3.

4. #2 Ochkhamuri Construction Camp

Environment, safety and healthcare issues	Recommended mitigating measures	Determined time for implementation	Progress
Soil contamination issues			
Due to the disassembly of the asphalt factory, some oil products have been spilled, forming oil pools	Oil pools must be cleaned up on the campsite.	1 week	Done
Material storage issue			
Used building materials (scrap, metal, wood, cables and etc.) aren't stored accordingly on the campsite.	Heaps of scrap scattered around the camp site must be gathered and sold to the scrap metal processing or gathering plant.	2-3 weeks	In Progress

5. #3 Laituri construction camp (Rock shattering workshop)

Environment, safety and healthcare issues	Recommended mitigating measures	Determined time for implementation	Progress
Removal of household waste from the camp			
Overfilled containers of household waste	Waste must be removed from the	Regularly (4 times per	Done

have been noted at the campsite.	campsite in a timely manner.	month)	

6. **#4 Bobokhvati construction campsite**

Environment, safety and healthcare issues	Recommended mitigating measures	Determined time for implementation	Progress
General Sanitary Issues			
Water heater is not working, WC doors don't lock, Flusher doesn't flush and Light bulbs have gone out	All mentioned items should be fixed/replaced	1 week	Done
Coliform bacteria has been found in drinking water, which is an indication of possible fecal pollution	Main reservoir must be washed and chlorinated. Boiled water must be used for drinking and kitchen. Sewer system must be checked for leakage. Drainage system in and off the camp must be cleaned. Water samples must be retaken 2 weeks after the cleaning of water.	Water reservoir must be washed and chlorinated immediately and every week	Initiated (Contractor is ready to install new water reservoirs.)
There are water pools that need to be leveled and filled with gravel on the campsite	Water pools need to be leveled and filled with gravel	2 weeks	Yet to initiate

Used building materials (scrap, metal, wood, cables and etc.) aren't stored accordingly on the campsite.	Heaps of scrap scattered around the camp site must be gathered and sold to the scrap metal processing or gathering plant. Usable items must be stored according to the type of material.	2-3 weeks	Yet to initiate

7. #5 Chakvi construction campsite

Environment, safety and healthcare issues	Recommended mitigating measures	Determined time for implementation	Progress
General Sanitary Issues			
There's a garbage container near the auto workshop on the campsite, but the replaced oil filters are dumped in the nearby ditch which endangers the pollution of water with oil.	Garbage containers must be situated near every workshop and replaced oil filters shouldn't be disposed in a ditch, openly or in any inappropriate manner. Sedimentation must be cleared off and dumped away appropriately so the water filtration improves.	2-3 weeks	Yet to initiate
Scrap on camp site			
Heaps of scrap, wooden materials and useless machinery are scattered around the campsite.	Heaps of scrap scattered around the camp site must be gathered and sold. Used and usable items must be stored according to the type of	2-3 weeks	In Progress

	material.		

C. Summary of EHS (Environmental, Health and Safety Observations at Specific Locations)

Based on the EHS review audit, and inspections of the local and international environmental specialist, the main aspects related EHS in specific locations of the Project area are summarized below (Note: critical EHS issues are highlighted in red font).

1.1 Lot 1 Road Section (km0+000-km12+400)

The construction of the Lot 1 road stretch (0.0 – 12.4 km) was completed and officially handed over to the Roads Department in late October 2013.

Observed Positive Tendencies	Main EHS Issues
Rehabilitation of new road embankment with top soil. New vegetative growth visible. Guard rails have been elongated near the bridges, which prevents domestic animals from entering the road.	

1.2 Lot 2, Section 1 and Section 2 Road Stretch (12.4 – 25 Km)

The earthworks, bridge, culvert, embankment construction work and tunneling works are currently in progress.

Observed Positive Tendencies	Main EHS Issues
Topsoil spread on slopes of the road being built	Exposed slopes vulnerable to landslides.
River embankments reinforced with concrete.	Reinforcement of slopes of the excavated sections must be hastened
3 step sedimentation pond has been set up at Tunnel #1, in order to clean the discharged water from the tunnel. Sedimentation ponds are cleaned regularly. Building of WC and other storage rooms have been finished near the Tunnel portal. Bridge lighting and ventilations systems are	Sedimentation from sediment ponds must be placed in designated debris zone and utilized in road construction process

working normally. Rock taken out of the tunnel is being used appropriately. Workers are provided with appropriate individual safety gear. Excavated section and embankment slopes have been reinforced with gabions near the Bridge #1 (km0+637) road under construction km 6+500-km6+644 section and by the end of Bridge # 8.	

1.3 Choloki Camp Site

Observed Positive Interventions	Main EHS Issues
Tire piles and other scrap material stored in orderly fashion around rear perimeter of the facility, delineating a border.	There is a ditch clogged with utilized tires and scrap material near the camp entrance.
Area is maintained clean.	
New mobile fire extinguishers kept near storage room.	

1.4 Ochkhamuri Camp Site (Under conservation at this time)

This camp used to host an asphalt factory.

Observed Positive Interventions	Main EHS Issues
After disassembly of the factory, area contaminated with oil has been cleaned.	Poor sanitary conditions – stagnant water, scattered garbage/used material/debris etc.

1.5 Bobokvati Camp Site

This campsite has been established to facilitate construction work in the Lot 2 area, and consists of a steel fabrication unit, concrete mixing plant, welding unit, offices, food serving area, and workers quarters. The Dekhva River flows behind the campsite.

Observed Positive Interventions	Main EHS Issues
Stray dogs and domestic animals have been removed from the area.	Garbage/trash scattered at the campsite.
Campsite is leveled with gravel.	Used scrap material, and timber/wood planks scattered at the campsite.

1.6 Chakvi Camp Site

This campsite has been established to facilitate work in the Lot 2 area, and was opened during first quarter of 2014. It includes offices, workers quarters, cafeteria, storage facilities, concrete works plant, metal fabrication station and welding stations. The Chakvistskali River flows behind the facility.

Observed Positive Tendencies	Main EHS Issues
Good buffer zone present between camp and Chakvistskali River.	Accumulation of large amount of scrap material at the campsite.
Most of the area is leveled with gravel and has improved drainage system.	
Ditch near the campsite has been cleared of household waste.	
HSE Posters displayed on campsite.	

1.7 Laituri campsite and Crushing Factory

Wire mesh production factory has been established in the Laituri Quarry, in order to provide wire mesh for Gabion construction.

Positive Tendencies Observed	Main EHS Issues Observed
Sedimentation net has been installed under the crashing factory in order to prevent sedimentation getting into the river Natanebi.	Accumulation of scrap and other materials at the campsite.
Oil products are stored in closed containers.	
Sedimentation pond is cleaned regularly.	

1.8 Rivers and Streams along the Road

According to the lab test analysis on 25th of January and 1st of July 2015, conclusion has been made that ecological situation for rivers Kintrishi, Kinkishi, Achyva, Dexva, Chaqvi and Shuaghele are satisfactory.

Specific works left to be done at the bridges shouldn't have any negative impact on the quality of water in the rivers.

Positive Tendencies Observed	Main EHS Issues Observed
Water flow of rivers and streams crossing Lot 2 road has been facilitated with temporary culverts.	Construction debris in river banks beneath bridge construction locations
River/stream banks in Lot 2 rivers stabilized to prevent erosion.	
Quarterly measurement of surface water quality in Lot 2 rivers.	

1.9 Evaluation of EHS Documentation and Record Keeping

The Contractor has shown a significant improvement in EHS documentation and record keeping during the reporting period.

Positive Interventions Observed	Main Issues Observed
Maintenance of an organized systems of HSE documentation and record keeping, to include the following: • Environmental quality parameter measurement reports of January - June 2015, with laboratory analysis; • Due diligence documents (e.g., EMP, Method statements, specific EHS management plans, permits and licenses); • Employee health and safety training records (held every 6 months); • Employee injury/accident logs including January-June 2015 • Progress reports; • Construction vehicle accident records and incident investigations; • Quarry Restoration Plan(s).	Lack of the following documentation/records: - Log of used material (tires, scrap metal etc.) hauled offsite for reuse/recycling; - Construction vehicle service logs;

1.10 Evaluation of Environmental Quality Parameter Measurements

Positive Interventions Observed	Main EHS Issues Observed
Noise levels and particulate matter (PM) in air is being tested on a regular basis at predetermined locations.	No measurements made for Sulphur Dioxide, Nitrogen Oxide, and Carbon Monoxide in air.
Baseline noise and PM measurements have been established for Lot 2 area.	No vibration readings have been recorded to date.
Surface and drinking water quality have been tested in January and 1st of July 2015 in rivers crossing Lot 2, section I.	Drinking water sampling (300mm Test Tubes) in October 2014 indicates Coliform bacterial contamination of drinking water in Bobokvati and Laituri due to the unclean reservoir condition. (hasn't been cleaned throughout the year)
Drinking water quality in campsites have been tested and documented in June and October 2014	

1.11 Inert Material Quarry

Contractor didn't have the sand-gravel manufacturing quarry in the first half of the year 2015, which prevented the construction process of the road. Ministry of Environment and Natural resources of Georgia is discussing the issue of providing the quarry on Kobuleti municipality territory.

Contractor is obligated to rehabilitate a quarry near the village Shuaghele, works on which have been completed 14th of November, 2014, even though the volume hasn't been mastered as provided in license. According to the contractor, re-cultivation works will be completed when the remaining raw materials will be extracted from the above mentioned quarry.

1.12 Evaluation of General Occupational Health and Safety Practices

Two (10) non-fatal accidents were recorded for the period of January-December 2015. The Contractor has investigated each of these incidents, and has taken suitable measures.

Positive Interventions Observed	Main EHS Issues Observed
Warning signs posted at relevant locations (e.g., campsites, road work sites).	Gaps in guard rails allow cattle to cross into road section, leading to accidents.
On-site clinic with first aid medications and a doctor (Chakvi Campsite). First aid medications also available at Bobokvati campsite.	When working high above the ground, workers wear fall protection gear (PPE).
Restroom sanitary conditions have been improved by addition of the liquid soap.	No on-site clinic established at Bobokvati Campsite yet. Though first aid medicaments are available.
PPE given to workers to be used during work. Significant improvements regarding workers wearing PPE especially in camp work sites.	Some workers refuse to wear PPE during work.
Safety meetings held on a regular basis to discuss safety issues	
Recordkeeping improvement.	
Training on PPE use held for workers.	

1.13 General surveillance of biodiversity and restoration of damaged habitats

It must be noted, that no cases of poaching have been recorded during the period of Contractor's work.

Only the trees considered in road construction project are being cut down and are temporarily saved at Chakvi and Bobokvati campsites until other decision has been made by the government representatives.

1.14 Health and Safety issues Reported through the Grievance Redress Mechanism (GRM) Process

During the construction of Lot 2 Bridge #10 Contractor has disassembled terraces made by the resident in the leased area, due to which, heavy rainfall water has entered into the private crop fields of residents from construction area and has damaged them, resulting in dried crops. Works are currently in process regarding this issue.

1.15 EHS Issues Raised by Local Authorities

During the month of May 18th 2015, the Environmental Safety Supervision Service of Adjara identified unauthorized gathering of sand-gravel materials on river Dekhva. Protocol has been issued and the Contractor has been fined.

3.3 NON-COMPLIANCE NOTICES

During the course of the construction supervision in the previous six months of the works, a number of "Non-Compliance Notices" were written by the Engineer to the Contractor. Among them are as follows:

Table 8: Some of the Non-Compliance Notices

Date	Ref. Number	Subject	Content/Issues
January 30th, 2015	DHK2-SHC-1501-055	Regarding ecological, sanitary and hygienic problems	Ecological, sanitary and hygienic problems in Bobokhvati campsite
January 30th, 2015	DHK2-SHC-1501-057	Regarding strict sanctions for polluting environment with waste	- Management of waste
March 2nd, 2015	DHK2-SHC-1503-072	Regarding EHS	- Regarding working plan for elimination of problems at hand -
March 26th, 2015	DHK2-SHC-1503-098	Regarding ecological monitoring results	- Cleaning of nearby area from household and other waste -
April 20th, 2015	DHK2-SHC-1504-0144	Regarding planting of grass	- Planting of grass must be done according to the conditions of the Technical Specifications Book 3000 series -
April 22nd, 2015	DHK2-SHC-1504-0150	Regarding the grass type to be planted on the embankments	- Confirming the suitability of Loliumperenne grass -
April 22nd, 2015	DHK2-SHC-1504-0151	Regarding Sanitary and Hygienic problems	- Regarding the necessity of sanitary and hygienic improvements that have to be made at the #1 Tunnel and Bobokhvati building camp

Date	Ref. Number	Subject	Content/Issues
April 24th, 2015	DHK2-SHC-1504-0160	Regarding the tress that have been and will be cut down	- Trees that have been cut, must be stored at the campsite temporarily
May 28th, 2015	DHK2-SHC-1505-0204	Regarding the pollution of atmospheric air	- Watering intensity must be increased from Bridge #7 to Bridge #8 -
May 28th, 2015	DHK2-SHC-1505-0206	Regarding the water quality	- Water reservoirs must be washed and disinfected

4.4 CORRECTIVE ACTION PLANS

The Contractor is currently in the process of implementing corrective actions for EHS issues pointed out by the local environmental specialists January - June 2015. The corrective actions taken against specific EHS issues identified between January - June 2015 are summarized in the Table 9 below:

Table 9: Actions Taken Against Identified EHS Issues (January-June 2015)

Location	Environmental Health and Safety Issues	Action Taken
Lot 2 main road	– Exposed slopes vulnerable to landslides. – Reinforcement of slopes of the excavated sections must be hastened – Sedimentation from sediment ponds must be placed in designated debris zone and utilized in road construction process	➢ Construction of gabion walls has been initiated ➢ sediment pounds are cleaned permanently needs more attention
Choloki Campsite	– Drains/ditches clogged, and stagnant water	Partially cleared.

Location	Environmental Health and Safety Issues	Action Taken
Laituri Crushing Plant	– Garbage and rubbish found in a number of places in the premises. – Presence of scrap metal scattered in camp – Open drums with waste oil. – Sediment pond filled with sediment.	➢ cleaned ➢ cleaned. ➢ stored in closed containers ➢ Sediment cleared.
Bobokvati Camp Site	– Garbage/trash management issues – Presence of scrap metal scattered in camp	➢ Cleaned. ➢ Progress made.
Ochkhamuri Camp Site	– Poor sanitary conditions – stagnant water, scattered garbage/used material/debris etc	partially cleaned (
Chakvi Camp Site	– Accumulation of large amount of scrap material at the campsite.	➢ Initiated
	– Removal of used oil filters	➢ Cleaned

For the pending EHS issues further recommendations are as follows:

Table 14: Recommendations to address remaining EHS Issues

F. Actions taken to reflect the findings of ADB mission during the reporting period

Mission Note	Due Date	Status
▪ Obtaining of licenses for 2 new quarry sites. (The Mission requested that Quarry Management Plan consisting of site selection, environmental assessment, technical design and restoration activities, should be part of the SEMPs for CSC endorsement and RD approval prior to physical works).	June, 2015	Under Progress
▪ **Monitoring data:** The Mission requested that the EMRs provide evaluation of monitoring data against the national standards and with regard to the impacts of project activities.	June, 2015	Done
▪ **Corrective Action Plan** (CAP) for non-compliance issues to be prepared by CC, agreed with CSC.	15 June, 2015	A draft CAP was submitted to RD on 8 May for review and the final CAP signed by CC and CSC submitted on 15th of May 2015.

▪ Implementation of corrective activities by CC. ▪ CAP implementation to be reflected in Bi-annual EMR	Due in mid June, 2015. To be submitted before 31 July, 2015.	Corrective activities have been already implemented/addressed See table 14 above

PART IV – ACTION PLAN FOR THE NEXT PERIOD

The table below shows actions to be taken during next 6 months period:

Recommendations	**Responsible Party**
Main Road (Lot 1 & Lot 2)	
Stabilize steep cut slopes with berms, biomats and/or vegetation cover.	Contractor to implement physical interventions. Engineer to monitor progress.
Camp Sites (Choloki, Ochkhamuri, Laituri, Bobokvati and Chakvi)	
Drainage should be improved by regular maintenance of drains, ditches in campsite, paving of roads inside camps and spreading sand/gravel to eliminate ponding/puddling of water.	Contractor; Engineer to perform weekly inspections
Regular management of waste, in accordance with the EMP ECP # 1 (Waste Management). The practice of burning waste in campsites should be stopped, in accordance with the EMP.	Contractor; Engineer to perform weekly inspections
Proper storage of material (used and unused), with special attention to storage of oil drums and compressed cylinders.	Contractor; Engineer to perform weekly inspections
Used material (scrap metal, tires etc.) should be hauled offsite for recycle/beneficial reuse on a regular basis. Records of material hauled offsite for recycling and/or beneficial reuse should be maintained.	Contractor; Engineer to perform monthly inspections
Clean oil spills, waste oil drums should be closed, and placed in a concrete pad.	Contractor; Engineer to perform weekly inspections

The drinking water storage tanks should be replaced. Drinking water in all campsites should be sampled within 2 weeks after flushing and cleaning and tested for total coliforms, and E.coli.	Contractor; Engineer to perform weekly inspections
Rivers and Streams Along Main Road	
Establish traps/sediment ponds along the river banks subjected to tunnel construction activities in Lot 2, in accordance with Lot 2 EMP ECP 3 (Water Resource Management) and ECP 6 (Erosion and Sediment Control).	Contractor; Engineer to perform monthly inspections.
HSE Documentation and Recordkeeping	
The following documentation/records should be initiated and maintained on site: - Log of used material (tires, scrap metal etc.) hauled offsite for reuse/recycling. - Vehicle maintenance and accident records (already initiated but must be maintained).	Contractor; Engineer to perform monthly reviews.

ANNEXES

I. EHS PHOTO CATALOG

№1 Choloki building grounds

Main Office

Sports corner

Chinese leader's residence

Worker's residence

Trees planted near the office

Water reservoir for drinking, cleaning and household

Stored topsoil taken for reinforcement of the embankment

Embankment reinforced by the topsoil

Reinforced road embankment and concrete drainage

Gabion constructed for stabilization of soil under bridge #1

Building the bridge #11 with the new technology

Overall view of the bridge in construction

Chakvi concrete factory

Sedimentation filters for concrete factory

Concrete carrier-mixers

Overall view of Chakvi office

Graveled and leveled office territory

Work offices for Georgian supervisors

Disposed household waste, empty waste containers

#10 Bridge building process

Top view of building process of bridge # 10

Trees planted for stabilization of excavated slope

Overall view of Tunnel #1

Ventilation system installed at the tunnel. Concrete slabs placed on top and sides of the tunnel in order to ensure soil stability.

Office of Engineers and personnel involved in Tunnel works

Completed WC and installed waste basket

Safety signs for bridge in construction

Ongoing process of building gabion for reinforcement of the excavated slope

Completed gabion

Gabion made by backfilling

Used water from tunnels draining in the ditch without proper filtration

Tunnel waters draining through 2-step sediment pond

3rd step of sediment pond

WC and storage rooms being almost complete

Usage of rock boulders for reinforcement of the banks

Clean sediment pond

Area clean from used oil filters and plastic bottles