Final Environmental Monitoring Report

Loan Number: 2655-GEO (SF)

Reporting period: July-December, 2017

GEORGIA: GEORGIAN SUSTAINABLE URBAN TRANSPORT INVESTMENT PROGRAM, Tranche 1

(Financed by the Asian Development Bank)

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ABBREVIATIONS

ADB	Asian Development Bank
EA	Executing Agency
EARF	Environmental Assessment and Review Framework
EIA	Environmental Impact Assessment
EIP	Environmental Impact Permit
EMP	Environmental Management Plan
EPSM	Engineering Procurement and Construction Management
GoG	Government of Georgia
SUTIP	Georgian Sustainable Urban Transport Investment Program
IA	Implementing Agency
IEE	Initial Environmental Examination
MDF	Municipal Development Fund
MFF	Multi-tranche Financing Facility
MoENRP	Ministry of Environmental and Natural Resources Protection
MoRDI	Ministry of Regional Development & Infrastructure
SSEMP	Site-Specific Environmental Management Plan

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1. PART I. INTRODUCTION

1.1. Preliminary Information

Program Background

1. Upgrading and improvement of local transport and transport-related infrastructure plays a significant role in the development of Georgia infrastructure. To this effect a number of important activities have been implemented and financed from the budget of Georgia and from other sources. Recently several significant programs, financed through state budget, loans and grants, have been implemented with this regard.

2. On 05 August, 2010 MFF - Sustainable Urban Transport Investment Program Tranche 1 Loan and Project agreements were signed between Georgia and Asian Development Bank. MFF-Sustainable Urban Transport Investment Program – Tranche 1 (SUTIP T1) includes (i) Transport Infrastructure Improvement; (ii) Institutional Capacity Development and (iii) Project Management Facility components.

3. The program will provide efficient, reliable and affordable urban transport infrastructure and services, thereby increase economic growth potential and competitiveness of urban communities, and improve livelihoods of over 1.5 million people (approx. 35% of Georgian population). The program will also: (I) improve urban, environment and communities' access to economic opportunities and to public and social services; (II) promote efficient and sustainable urban transportation; and (III) generate income and employment opportunities.

4. The environment classification for Tranche 1 is Environmental Category B, as all subprojects under SUTIP 1 were classified as category B which will not have significant irreversible or permanent negative environmental impacts during or after construction and requires preparation of Initial Environmental Examination (IEE). The environmental categorization of subprojects was conducted using ADB's Safeguard Policy Statement (2009). Required environmental assessments of sub-projects (SPs) are conducted and IEEs are prepared in accordance with Environmental Assessment and Review Framework approved for SUTIP 1 in May, 2010 and updated in April, 2015.

Program Area

5. Sustainable Urban Transport Investment program Tranche 1 includes several projects in the different municipalities of Georgia. Program aims efficient, reliable and affordable urban infrastructure development and service improvement. In effect, urban transport service will be improved, and the level of different types of public and social services will be increased.

6. Among the Sustainable Urban Transport Investment program Tranche 1 subprojects, which are ongoing now, are:

- **Tbilisi Metro Line 2 and Creation of University Station;**
- **Anaklia coastal improvement (Phase 1).**

Tbilisi Metro extension project – overview

7. Tbilisi suffers from traffic congestion and air and noise pollution, loss of green areas and degradation of historical buildings and monuments. Serving 250,000 passengers daily, the Tbilisi Metro is playing a significant role in the urban transport system and can serve as

the backbone of the city's network. Tbilisi Municipality is now exploring options for expanding the network. A first phase is planned to extend the line to the station "University" at Saburtalo district, where there is a large population, significant number of students and high traffic flow. The construction of the "Delisi-University" section of the metro started in 1985 but ceased in 1993 for financial and technical reasons. In 1998 construction resumed and "Vaja Pshavela" station was opened in 2000 with only one way in operation. The remaining tunnel has been bored up to the university station, including the station shell, escalator shaft and the exits. This Project aims to resume and complete the construction of the metro tunnel along Vaja Pshavela Avenue and the "University" subway station, to benefit more than 150,000 people and increase ridership of the metro network. Total length of metro station line is 2.2km.

8. The EPCM consultant (Euroestudios) has been fielded in early August 2012. Geological surveys and investigations of the existing tunnel have been completed and used as a basis for the first draft of detailed design which has been submitted in December 2012.

9. Euroestudios was awarded to date July 11, 2012, the Contract: Engineering, Procurement, Construction Management and Supervision for the Extension of Tbilisi Metro Line 2 and Creation of University Station - SUTIP1/C/QCBS/4, separated into two stages: Stage I - Preparation of Detailed Design and Bidding Documentation, produced by Euroestudios and approved on March 31, 2014. Stage II - Construction Management and Supervision for the Extension of the Tbilisi Metro Line 2 and Creation of University Station Project.

10. The project was divided into two main assignments:
- The 2,6 km long (2600 m) Metro extension from Delisi Station to University Station
- Creation of University Station and a 301 m long tunnel section for cross over and parking tracks.

11. The 2.6 km-long (2600 m) Metro Extension, from Delisi Station to University Station, consisted of the following:

- Delisi Station (total length 131 m, P.K. 56+00);
- Scissor crossing and parking tracks after the platform (total length 285 m);
- 760 m-long twin tunnels between Delisi and Vazha-Pshavela stations;
- Vazha Pshavela Station (total length 205m, P.K. 68+00);
- 760 m-long twin tunnels between Vazha Pshavela and University stations, including ventilation Shaft n.50, the by-pass galleries from the shaft to the main tunnels and a pump sump;
- University Station (total length 162m, P.K. 78+20), with the sub-station and other technical rooms;
- In the University station, it will be designed a 110 meter platform with an access by a hall located at the intersection of Vazha Pshavela Avenue and Sandro Euli Street;
- This hall is located at elevation 535 and the platforms at 487, so that descend 53 meters;
- 315 m-long section after University Station consisting of a crossover Tg 0.11, parking tracks, a service gallery connecting the station and the crossover, the ventilation Shaft n.51 and a pump sump.

12. In addition to Civil Works, the following systems have been installed:
- Permanent way,
- Power supply substation,
- Electromechanical equipment (tunnel ventilation, water-pump, escalators),
- Signaling system,
- Low voltages equipment: communication, SCADA, fare collection.

13. The Construction Works of the Extension of Tbilisi Metro Line 2 and Creation of University Station, Contract No: P42414-SUTIP1-ICB-1.05-1, were awarded to the Contractor: Joint Venture of Cobra Instalaciones y Servicios, S.A., Spain, Lead partner, and Assignia Infraestructuras, S.A. Spain. The agreement was signed on March 26, 2015, between LEPL Municipal Development Fund of Georgia ("the Employer"), and the Joint Venture of Cobra Instalaciones y Servicios, S.A. Spain, Lead partner, with Assignia Infraestructuras, S.A. Spain ("the Contractor"). The total budget for this Contract was: GEL 83,000,670.45 (Eighty three million six hundred seventy and 45/100 Georgian Lari).

14. The Commencement Date of Works was established, on June 20, 2015. Some issues to get the permission to access the site from the authorities delayed the effective access to and possession of the Site. Time for Completion was expected to be 630 days / Defects Notification Period 730 days.

15. The expected Completion Date by the Contract was March 11, 2017. Due to the delay in getting the Right of Access to the Site that prevented the effective Commencement Date of the Works, it was approved an Extension of Time of 33 days until April 13, 2017. However, due to some requests of the Tbilisi Transport Company (TTC), some modifications of the Project and some delays not attributable to the Contractor it was required to extend the Contract several times until the Final Completion Date of the Works that was set as September 05, 2017.

16. The Taking Over of the Works has been signed on September 05, 2017, after confirming that the Contractor has completed all relevant duties and obligations under the Contract, except some minor outstanding works and defects which did not substantially affect the use of the Works for their intended purpose and that have been completed and resolved during the month of September 2017.

17. Post-Construction Environmental Audit has already conducted by the Supervision Consultant and Post-Construction Audit Report was prepared with relevant checklist (Report is attached to this report as a separate **Attachment 1**).

18. Finally, the official Opening Ceremony has been held on October 16, 2017. After that, operations in the metro line have been started successfully.

Anaklia coastal improvement project (Phase 1) - overview

19. Anaklia is a small town and seaside resort in western Georgia. It is located in the Samegrelo-Zemo Svaneti region, at the place where the Enguri River flows into the Black Sea, near the administrative border with Abkhazia. Anaklia is supposed to become a tourism center in Georgia. Anaklia infrastructure development and rehabilitation plan was announced by the Government of Georgia. Erosion processes take place on various pleases at Georgian Black Sea coastal line and Anaklia is one of them. Today this process is seriously destroyed coastline.

20. Government of Georgia developed the captured project for Anaklia shoreline rehabilitation and further protection of the beaches against erosion by means of submerged hydro technical coast protecting structures. The project aimed at Anaklia shoreline rehabilitation, restoration of the full profile of beaches to the possible limits (which is necessary for wave breaking and suppression of its power and assigns to the beach a function of bank protecting structure), selection of the most optimum types and design of hydro-technical coast protecting structures.

21. Infrastructure improvement will support infrastructure investments to rehabilitate, improve and expand the beach of Anaklia and will benefit accrue principally from the protection of

land and infrastructure from erosion and damage, the avoidance of some other costs and increasing number of tourists. For the interventions, benefits arise from the protection of (i) rural land, (ii) houses (iii) roads and other infrastructure. Coast protection measures need to be taken to protect the unique place and landscape. The design of approximately 4 kilometers of coastal line will create a new and attractive tourist destination on the Black Sea Coast, able to be the engine of the development of the region of Zugdidi, Ganmukhuri and Anaklia.

22. Coastal protection structure of underwater breakwaters, according to project design, initially was composed with 6 units (phase 1) constructed from 5 and 10 Ton tetrapods. The space between one to another breakwaters units was 90m. The length of first underwater breakwater (from Enguri river mouth to Tikori river mouth direction) is 200m, the length of the second underwater breakwater is 300m.Therefore, total length of underwater breakwater is 500m. Length of artificial nourishment is 2,300m. Amount of Sand for phase 1 is 50,000 ₥³. Total Width of artificial nourishment is 60m, from beach line to land side is 40m and forward to seaside is 20m. Slope of beach line will be composed with 1:20.

23. Initially the Construction Volume was different, but the Georgian government came to a decision to initiate construction of a deep sea port in Anaklia close to the project site. A risk of potential overlap of the two construction sites was apparent. Therefore the scale or even expediency of the coastal protection project was open to question. In March 2016 the Ministry of Economy and Sustainable Development of Georgia provided MDF with the final coordinates of the deep sea port, which demonstrated that the port was overlapping seven breakwaters (N 3,4,5,6,7,8,and 9) out of ten planned breakwaters (from both phase). As a result MDF took decision to remove four breakwaters (3,4,5,6,) from the scope of work of the present contract (phase 1) and continue the works only for the breakwaters N1 and N 2 and placing of sand on the beach part behind these breakwaters (approximately in front of Hotels and boulevard). The rest of the works under both phases was proposed to be cancelled, through contract amendment, as approved by the MDF Supervisory Board per meeting N66 on 18 April 2016.

24. The construction works under Phase I started on July 24, 2013. Significant delays have been experienced in the project implementation and mitigation measures had been taken and agreed between the Engineer, the Contractor and MDF. The original completion date of civil works for Anaklia Phase I, was on 24 April 2014. Since that the completion date was extended several times. MDF, Engineer and Contractor agreed to extend the contract up to November 18, 2015; after till 30 April 2016, afterwards - up to 30 June 2016, and finally- till August 2017. After expiring official agreed period June 30, 2016, according to the ADB's recommendation letter, the Client and the Engineer have discussed about the possibility to extend the Construction period till 31st of August 2017 with the specific conditions that Contractor has to follow. The works parts were finished on 31 August 2017. The Taking-Over Certificate was signed on 31 August 2017 as well, according to which the total amount of Construction Performed by the Contractor is GEL 9,216,440.84

25. On 1 September 2017 the MDF Committee agreed to terminate the Contract based on mutual agreement.

26. Post-Construction Environmental Audit has conducted by the Supervision Consultant and Post-Construction Audit Report was prepared with relevant checklist (Report is attached to this report as a separate **Attachment 2**).

1.2. Construction activities and projects' progress during the reporting period

Anaklia coastal improvement project (Phase 1) – N/A

Civil works at Tbilisi Metro extension subproject

27. As it was mentioned above, the commencement date of Works was established on June 20th 2015. Contractor was requested to mobilize all necessary equipment on-site. Estimated time for the completion of works was 630 days.

28. Regarding the civil works, these are completed, works have been performed according to the work schedule agreed with MDF. MDF was monitoring construction progress by attending the regular weekly meetings between the Engineer and the Contractor. Minutes of the meetings were prepared and submitted to MDF for approval. MDF was requesting from the Engineer and Contractor strict and unconditional compliance with ADB requirements and Georgian legislation in terms of safety and safeguards.

1.2.1 Civil Works

29. The main executed Civil Works under this Project, completed with 100%, have been the following:

- **Demolition Works**
- **Earthworks**
- **Concrete Structure:**

- Pedestrian Accesses
- Concourse Hall
- Platform
- Pump Sump 2
- Substation
- Technical Rooms
- Emergency Exit
- Unfinished or damaged Tunnel Vaults
- Counter Vaults
- Foundation for Escalators

- **Steel Structure:**

- Structural Beams and Columns
- Canopies of Pedestrian Accesses
- Emergency Exit Stairs

- **Waterproofing and drainage – Civil Works**

- **Landscaping Works**

- Urbanization works in upper station: pavements, road signs and road marking.
- Underground Civil Works:
- Injections
- Lining
- Archorages
- Cleaning and repair of Delisi-Vazha-Pshavela right tunnel

➢ **Superstructure:**
- Sewage Network
- Drinking water network
- Street lighting network
- Electricity network
- Communication network.

➢ **Architecture Works:**
- **Masonry and Cladding**
- Flooring: tile floors, technical floor, epoxy flooring
- Wall Finishes: VITREX panels, gypsum board walls, painted walls
- Ceilings: VITREX panels, false ceilings, painted ceilings
- Carpentry
- Metal Works

30. The two most critical activities related to the Civil Works during the construction period were the injections works, especially in the area of cast-iron segments in both tunnels and the cleaning and treatment of metal segments, where the Contractor faced many problems and that incurred in remarkable delays, thus interfering and delaying subsequent activities, as installations. However, both activities were mainly completed in April 2017.

31. Additionally, another event that is worth to mention is that the Emergency Exit that according to the Project was planned to be executed under Vazha-Pshavela Boulevard has been modified. The new solution for the Emergency Exit that has been executed has used the existing ventilation tunnel and the shaft N51, adapting them for both ventilation and emergency exit.

1.2.2. Installation works

32. The main executed Installation Works under this Project have been the following:

➢ **Electromechanical Installations:**
- Escalators
- Electrical System
- Communication System
- Air Conditioning and Ventilation
- Plumbing System
- Fire Fighting System
- Fire Detection System
- Control and Management of Facilities
- Emergency Signaling

➢ **Waterproofing and Drainage – Installation Works**
- Pump Sump 1 (Dead End Chamber)
- Pump Sump 2 (University Station)
- Pump Sump 3 (Upper Station)
- Pump Sump 4 (Electrical Substation)

➢ **Electric Substation:**
- Electrical Equipment
- Cables and Ducting
- Command and Control
- HV Line

- **Communication and Signaling:**
- Command and Control Panel
- Interlocking and Blocking
- Signals
- Track Circuits and ATP
- Cabins and Connection Boxes
- Track Mechanism
- Cables and Connections
- Power Supply
- Fixed Communications:
    - SDH Communications Equipment
    - Optical Fiber Network
    - Operation Telephony
    - Radio Communications System (TETRA System)
- Chronometry
    - Electrification – Contract Rail.

2. PART II: PROJECT ORGANIZATION AND ENVIRONMENTAL MANAGEMENT TEAM

2.1. Agencies involved in investment program implementation

33. The main institutions involved in IEEs/EMPs/SSEMPs implementation and monitoring, are the executing agency (EA) - MDF, the Supervision Consultants' (SC), the Construction Contractors' and to a lesser extent the Ministry of Environmental and Natural Resources Protection and Municipal Authorities. EA (MDF) and SCs are responsible for ensuring monitoring of the projects' implementation at the construction stage. Ministry of Environmental and Natural Resources Protection has the authority for periodic audits but should not be considered as a party responsible for monitoring according to this IEE and EMPs.

34. The MDF is the projects' executing, implementing and disbursing agency. MDF has overall responsibility for the projects' management - including environmental, planning and supervision. New Executive Director of MDF Galaktion Buadze was assigned on November 30, 2016 by the Georgian Prime Minister's Decree.

35. MDF is responsible for general implementation of all safeguards tasks and guarantee that potential adverse environmental impacts arising from the Projects are minimized by implementing mitigation measures presented in the environmental impact assessment ("EIA") or Initial Environmental Examination (IEE), as applicable.

36. Management of safeguards issues is carried out by the MDF through Environmental and Resettlement Unit, established in October 2014. From that time, number of Environmental and Resettlement team members has increased from 6 to 12 and currently consists of: Head of Unit (Former Head of the Unit - Giga Gvelesiani has left his position in November, 2017 and currently, Elguja Kvantchilashvili is appointed, as an acting Head), 4 environmental safeguards specialists, one social and gender specialist, 4 resettlement specialists. There are also two ADB's individual Consultants – one on environmental safeguards and one on resettlement issues, who are the members of Environmental and Resettlement Unit. Until October 2014, Environmental and resettlement safeguards team was consisting of 3 environmental safeguards and 2 resettlement specialists, one of which

was the ADB's national consultant on resettlement issues. Environmental and Social Safeguards team had a Team Leader who was an advisor to Executive Director of MDF on environmental and social safeguards issues.

37. The Environmental and Resettlement Unit is involved in addressing of environmental and social safeguard issues throughout the entire projects' cycles. The Environmental and Social Specialists of the MDF, are responsible for management of the environmental and social aspects associated with development of all donor funded projects for which MDF is the responsible Executing Agency (EA). Local Environmental Consultant –Nino Nadashvili, was recruited in September 2015 and designated to supervise ADB projects, review the IEEs/EIAs, EMPs, and SSEMPs of projects and carry out supervision of the construction performance based on approved EMPs, EIAs, and environmental standards in accordance with ADB "Safeguard Policy Statement" (2009) requirements' and acting Georgian Legislation.

2.2. Relationship with contractors, owner, lender etc.

Tbilisi Metro extension project

38. As it was mentioned above, MDF is responsible for general implementation of all safeguards tasks. EA (MDF) and SC (Euroestudio) are responsible for ensuring monitoring of the project implementation at the construction stage, while Tbilisi Metro - for monitoring at the metro operation stage.

39. MDF ensures availability of all environmental information and facilitates environmental supervision of the projects. The MDF's local environmental Consultant's responsibilities in respect of implementation of the IEE/EMP, are to: ensure that all relevant IEE/EMP requirements (including environmental designs and mitigation measures) are duly incorporated into the project bidding documents; Assist Contractors to obtain necessary permits and/or clearance, as required, from any relevant government agencies (NEA, etc); Ensure that all necessary regulatory clearances are obtained before commencing any civil work on the project; Ensure, that contractors have access to the EMP and IEE report and understand their responsibilities to mitigate environmental problems associated with their construction activities and facilitate training of their staff in implementation of the EMP; Approve the Site-Specific Environmental Management Plan (SEMP) prepared by the Contractor before he takes possession of construction site; Time-to time monitor the contractor's implementation of the SEMP in accordance with the environmental monitoring plan by conducting site monitoring visits; The MDF through its Local Environmental Consultant (Nino Nadashvili), reports to the ADB in every 6 months on the status of environmental compliance of construction works by preparing semi-annual Environmental Monitoring Reports. In case unpredicted environmental impacts occur during the project implementation, prepares and implements as necessary an environmental emergency program in consultation with relevant government agencies and ADB.

40. The supervisor company (SC) of works commissioned by MDF was responsible to establish strong field presence in the Project area and keep a close eye on the course of works. Along with ensuring consistency with the design and ensuring quality of works, the supervisor was mandated to track implementation of EMP by the contractor and reveal any deviations from the prescribed actions.

41. The SC had a national environmental specialist –Sandro Abzianidze and an international environmental expert – Paula Fernandez to assist the EA supervise and monitor implementation of the EMP during construction activities.

42. A Non-Compliance Notice were issued to the contractor if the SC required action to be taken. The contractor was required to prepare a corrective action plan which needed to be implemented by a date agreed with the SC. Non-compliances were ranked according to the established criteria.

43. Construction Supervision Company was preparing quarterly progress reports, which covered the implementation of the SSEMP, discrepancies from the SSEMP and list all HSE relevant incidents and accidents that occurred during the implementation; Was submitting periodic reports based on the monitoring data and laboratory analysis.

44. Construction contractor was obligated to follow EMP and good construction practice. In order to meet this obligation, a contractor has established environmental management team and procedures. The Contractor has appointed a full time Environmental Manager (EM) – Natia Karkuzaeva which was a senior member of the construction management team based on site for the duration of the contract.

45. Key responsibilities of the Contractor were preparation of the Site-Specific Environmental Management Plan (SEMP) for approval by the Employer (EA) prior to the Contractors taking possession of the construction site; Ensure that the SSEMP is implemented effectively throughout the construction period; Carry out the monitoring and mitigation measures set forth in the IEE/EMP/SSEMP; Establish an operational system for managing environmental impacts; Allocate the budget required to ensure that such measures are carried out. Construction contractor is responsible to prepare monthly progress reports on SSEMP implementation, which should contain information on the main types of activities carried out during the reporting period, status of any clearances/permits/licenses which are required for carrying out such activities, mitigation measures applied, and any environmental issues that have emerged in relations with suppliers, local authorities, affected communities, etc.

46. The contractor was submitting reports of the carrying out of such measures to the employer on a monthly basis; Coordinating community relations issues through acting as the Contractor's community relations focal point (proactive community consultation, complaints investigation and grievance resolution); Establishing and maintaining site records of:

- Weekly site inspections using check-lists based on SEMP;
- Environmental accidents/incidents including resolution activities;
- Environmental monitoring data;
- Non-compliance notifications issued by the SC;
- Corrective action plans issued to the SC in response to non-compliance notices;
- Community relations activities including maintaining complaints register;
- Monitoring reports;
- Routine reporting of SEMP compliance and community liaison activities;
- Adhoc reporting to the Employer's Engineer of environmental incidents/spillages including actions taken to resolve issues.

Anaklia coastal improvement project

47. As it was already mentioned above, Construction Contractor of the project is – Modern Business Group Ltd (Azerbaijan). Construction activities were supervised by the DOHWA Engineering Co., Ltd (Republic of South Korea). Construction Contractor company has one National Environmental Specialist on site (Zurab Revazishvili). Environmental issues at Supervision Company were handled by National Environmental Specialist - Revaz

Gujabidze and International Environmental Consultant Irakli Kaviladze, who were mandated to track implementation of EMP by contractor, reveal any deviations from the prescribed actions, as well as identify any unexpected environmental issues, emerged at any stage of works.

48. Construction Supervision Company was responsible for supervision of all environmental issues during project implementation. Construction contractor was obliged to follow EMP and SSEMP good construction practice during construction activities. All environmental issues, arising from the construction activities were immediately brought to the attention of MDF's environmental safeguards team by the environmental specialists of construction and Supervision Companies' in order to coordinate efforts and ensure immediate mitigation of impacts, protect the environment and safeguard the health and welfare of the local communities. The construction contractor's Environmental specialist responsible for implementation of EMP/SSEMP, daily environmental monitoring and reporting.

49. Construction contractor was responsible to prepare monthly progress reports on SSEMP implementation, which was containing information on the main types of activities carried out during the reporting period, status of any clearances/permits/licenses which were required for carrying out such activities, mitigation measures applied, and any environmental issues that have emerged in relations with suppliers, local authorities, affected communities, etc.

50. Construction Supervision Company was preparing quarterly progress reports, which covered the implementation of the SSEMP, discrepancies from the SSEMP and list all HSE relevant incidents and accidents that occurred during the implementation.

51. MDF ensured availability of all environmental information and facilitates environmental supervision of the projects. The MDF, through its local environmental Consultant – Nino Nadashvili, reports to the ADB every 6 months on the status of environmental compliance of construction works by EMRs.

3. PART II: ENVIRONMENTAL MONITORING

52. With reference to MFF Sustainable Urban Transport Investment Program – Tranche 1 (SUTIP T1) Environmental Assessment and Review Framework (EARF) is stated that an IEE/EMP will be a part of the overall project monitoring and supervision and will be implemented by the Contractor with oversight from the Supervision Consultant (the Engineer) and MDF.

53. IEE/EMP was an integral part of construction contracts. MDF required the Construction and its Supervision Companies to implement construction activities in accordance with the environmental management plan (EMP), which is the part of the initial environmental examination document (IEE).

54. Based on the IEE/EMP requirements, monitoring measures of projects included construction site supervision, verification of permits, monitoring of compliance of the contractors' performance and specific monitoring of environmental impacts like noise, dust, soil contamination, landscape structure, construction waste, radiation, flora and fauna, water pollution, air emissions and etc. conducted by Contractor's and Engineer's environmental management specialists. Frequency of measurements of air, noise, vibration and etc. are given in **Annex 1**.

55. Environmental monitoring started immediately after the commencement of civil works under the SUTIP T1. Environmental safeguard monitoring has been performed as were required by the EMPs. MDF submits to ADB semiannual environmental safeguards monitoring reports, describing progress of implementation of EMPs and any compliance issues and corrective actions, within 1 month after each reporting period. If any unanticipated environmental and/or social risks and impacts will arise during construction, implementation or operation of the Project that were not considered in the IEE/ EMP, MDF ensures to promptly inform ADB of the occurrence of such risks or impacts, with detailed description of the event and proposed corrective action plan.

56. Environmental aspects, provided bellow, where monitored and managed by construction and supervising companies within the projects. It should be noted that for the monitoring of air, noise, water and other parameters, during measurements, standards, provided by the Decree 297/N on "Approval of norms on environmental quality conditions" elaborated by the Minister of Labor, Health and Social Affairs of Georgia (16. 08. 2001) were used, as mentioned decree determines and approves quality norms of environmental conditions, in order to ensure the safe environment for human health.

Tbilisi Metro extension project

57. There were not taken any tests during reporting period, as no construction activities have been implemented since July 2017.

Air quality

58. Operation of heavy machinery, vehicles and other construction equipment result in dust generation and fugitive emissions of carbon monoxide, NOx, SO_2, hydrocarbons, and particulate matter.

59. Impact of the construction activities on air quality was minor and was easily manageable through application of good construction and vehicle/equipment maintenance practices. It is not possible to eliminate the emission of dust from a construction sites entirely. Nevertheless, mitigation measures like water spraying inside and around the construction sites, usage of only such vehicles and equipment that are registered and have necessary permits, storage of construction materials far from residential areas reduce gaseous and dust emission during construction activities, storing material on the surface in places away from where ventilation fresh air intakes could be compromised trough a surface fire or chemical spill, using a ventilation system which is monitored and upgraded to ensure air flows are always provided to the workplace, ensuring bore holes and other penetrations are sealed, monitoring air flows for explosive gases and atmosphere contaminants regularly and etc. could reduce hazards and risks of air pollution.

60. Contractor did visual control, monitored air-flows for explosive gases and specific atmosphere contaminants, Inspected mechanical ventilation system, Inspection moving and diesel machines & vehicles. CC also conducted measurements of noise and atmospheric air chemical parameters (PM, CO, NO2 and SO2) through National Environmental Agency and by own measure device. Contactor was conducting above mentioned measurements in accordance to international and Georgian standards on weekly bases. All measurement data were in compliance with established norms of Georgian legislation and WB standards.

Noise and Vibration

61. The activities inside the tunnel, at the depth of 20 to 50 meters, was not generating any noise or vibration that can be perceived by people above the ground.

62. It is not possible to eliminate the emission of noise (noise produced by various equipment and activities) entirely from a construction sites, however, mitigation measures like usage of vehicles and equipment that are registered and have necessary permits, no noisy construction activities during the nights, usage of silencers, mufflers and acoustic shields on equipment, limitation of the number of machines used one and the same time, using vibration absorbing handles or rubber-type vibration insulating devices between the tool and the hands implemented by the contractor, using hearing protection for workers inside tunnels and shafts, fixing 'out-of-balance' items reduces noise levels to a moderate magnitude.

63. All measurements (underground water, air, noise) were made under subway in different places, where construction works were carried out (Platform, Sub Station, Crossover, Ventilation tunnel, Right tunnel, Left tunnel) and outside the subway tunnel, on surface, at following locations: near subway entrance, near the square, pedestrian passages N2,N4 near the (Market "Fresco", Shops, resident buildings).

64. According to the project design scope, the use of a large tunnel boring machine was not considered because the underground structures, the excavation, the support and lining were almost fully completed and only some minor works needed to be completed.

65. No vibration impacts were occurred on buildings from the demolition areas, because closest buildings are located more than 20 m away from the construction area and activities inside the tunnel were implemented in the depth of 20-50 meters. Thus, no vibration measurements were conducted during reporting period.

Vegetation and soil

66. There was no top soil in the areas where the contractor has to work. These areas were already free of topsoil.

67. 2 ordinary trees (non - red list trees) have been cut according to the official permits from MoENRP. No more trees have been cut since January, 2016. The change about taking advantage of the existing emergency exit, instead constructing a new one, avoided the cutting of 12 trees additionally.

Fauna

68. Fauna values in the project area were very low. Some temporary disturbance to a range of common urban fauna species (mostly birds) occurred, but the impacts were unlikely to be significant.

69. Limitation of the dust and emissions from construction machinery/vehicles especially near street trees and the parkland/green recreation area in the middle of Vaja Pshavela were used to control and reduce risks and hazards.

70. According to the IEE, a wintering colony of the Greater Horseshoe Bat (Rhinolophus ferrumequinum) consisting of up to 500 individuals was found in the tunnel, from the University station side in October 2012. This species is listed as "Least Concern" in the IUCN Global Red List and it is not included in the Red List of Georgia. It is however considered as "Near Threatened" in the European regional assessment.

71. Works were scheduled to start in 2015 and in August 2015 when works did start, no bat colony was seen or detected by CC in the tunnel before and during construction activities. It was unclear as to whether the roost had been permanently abandoned or as it is mentioned in IEE, the roost was only a wintering colony and bats had left the tunnel when

winter has finished. For whichever reason, when construction activities started, there was no bat colony in the tunnel, no direct harm occurred to any bats and no specific mitigation measures were required to protect this species. If the bats had returned during a further winter period, due to the noise, light and human presence, this would have caused the bats to abandon the tunnel and search for an alternative roost site to spend the winter time. However, there is no clear evidence to suggest the man-made structure was a permanent roost site for the bats.

72. Given the historic presence of bats within the project site a walk over survey was undertaken within the tunnel network by zoologist (bat specialist) on December 7, 2017, to identify if any of the other tunnels are being used as a winter roost for bats.

73. No wintering colony was detected during the survey. Taking into consideration the fact that currently there are no favorable conditions for Horseshoe Bats (Rhinolophus Ferrumequinum) colony in the tunnel network – high temperature, noise and vibration caused by operation of metro line – existence of wintering colony in the tunnel is less probable.

Water quality

74. The principal source of construction impacts on ground and water was related to the groundwater. As the project involved only very limited drilling works the main potential impact to these elements was that the underlying ground water and soils might be affected during the construction phase.

75. The contractor conducted the underground water chemical and microbiological tests periodically and was monitoring groundwater inflow if necessary. No underground water quality tests have been done by National Environmental Agency during reporting period.

Social affections

76. The disturbances produced by the transit of heavy vehicles on the works was minimal to the community facilities.

Cultural heritage

77. No cultural affections have been detected.

Hazardous and Non-hazardous Waste and Spoils

78. Constructions works generate different type wastes starting from garbage, recycle waste, house hold waste and construction and demolition debris, including, small quantities of hazardous waste generated mainly from the vehicle maintenance activities (liquid fuels, lubricants, hydraulic oils, chemicals and etc).

79. The most significant solid waste from the project was the construction and demolition debris, followed by spoil from excavations, which was removed from site by an approved waste management contractor.

80. Non-hazardous waste, household and solid waste was disposed to official dump site, particularly Gldani dump area by contractor “Cobra Assignia” and its sub-contractor – “Prime Concrete” Ltd., based on the contract signed by all parties (contractor, sub-contractor and solid waste company). According to the contact signed on 09.11.2015 Solid Waste Company of Georgia is serving contactor in two points (shaft 51 and shaft 50) twice a week.

81. Hazardous waste residuals such as oil, solvent, and materials used in oil spill cleanups and etc. were collected and stored on separate place with appropriate covered skips. Time to time, when it was necessary (approximately once in three month) it was passed to a licensed operator Company “Sarini”, which has the permit on operation of the hazardous waste. Contract N 25022016 with Company “Sarini” was signed in February, 2016.

82. All relevant Contracts with mentioned companies were presented in previous EMRs.

General clearance

83. The general clearance of the places outside the tunnel has been completed. Inside the tunnel, the wastes have been separated and removed.

PPE

84. Personnel wear adequate PPE during the working process as per the project HSE requirements.

Anaklia Coastal Improvement project

85. Monitoring measures for Anaklia Coastal Improvement project included construction site supervision, verification of permits, monitoring of compliance of the contractor performance and specific monitoring of environmental impacts like noise, dust, sea water quality, soil contamination, sea biodiversity, landscape structure, construction waste, radiation, flora and fauna, water pollution and air emissions, etc conducted by Contractor’s and Engineer’s environmental management specialists.

86. As it was mentioned above, during reporting period no construction works have been implemented.

87. There were no protected areas, wetlands, mangroves, or estuaries or archeological/cultural heritage within the project area. There was no land acquisition and resettlement issues involved. The nearest residential house was located in 300-400m distance from the working yard. In order to limit soil disturbance, the access to the site was limited to construction workers and the site was fenced.

88. No adverse environmental impacts related to the construction works were noted or observed within the reporting period under the project.

Air Quality

89. Dust was controlled through watering the access roads where driving could easily generate dust. During the transportation of contraction material, the trucks were covered with special tarpaulins or other cover means to avoid spreading of fine aggregated material in the air and although, the transportation of materials were carried out by initially selected and determined routs and the speed of the trucks are limited. Wheels and undercarriage of haul trucks were clean and washed prior to leaving construction site.

Sea Water quality and sea water turbidity

90. Marine works for excavation and placing stones for leveling bottom of the sea preparing for placing TTP, have been carried out with extreme care from point of view spills, water turbidity, labor safety, taking into consideration EMP and SSEMP requirements and regulations. Vehicles fueling place were located approximately 300 m far from sea shore,

adequate lining of the ground by concrete and confinement of possible operation and emergency spills are provided.

91. Regular check-up and inspection was implementing for monitoring of sea water quality and sea water turbidity.

92. During marine works - dredging, stone filling - works were monitored by the contractor's environmental specialist was visually controlling sea water turbidity level, making test checks in every 4 hours. In case if the turbidity measured during marine works at a distance of 250 meters from the point of works exceeds the background turbidity by more than 250mg/l the Contractor was instructed to take suitable measures to reduce the turbidity. No deviations from the standards have been identified during measuring.

Sea Biodiversity

93. During marine works, loss of Bio ecology was expected (sea plants), but because of insignificant Influence no specific mitigation measures were required. Only permanent visual control, identifying the degree of turbidity through analysis (in every 4 hrs. during the work) during the works were needed. If the degree of the water turbidity was in excess of the admissible limit (25 gr/l), the works had to be stopped and relevant corrective measures must be taken. During the works on underwater breakwater N1 and N2 contractor was taking measurements for turbidity on every day basis, no problems have been detected.

Noise

94. The plan of transportation routes and timing were agreed with local Municipality and patrol police since the project has started. Wheels and undercarriage of haul trucks were checked and fixed to maintain good vehicle condition not to make any noise and not to disturbed residential people, even though there are no residential people within 1km range.

95. Drivers were informed to limit speed to 20-25 km/h to avoid use of horn in the town. Local population was informed about project works. The Contractor was working during night time to catch up schedule but according to supervisor's instruction, materials were transported during the day time. According to the works schedule, not more than 5-6 trucks were working at the same time and the noise created from them were not exceeding the limitation.

Waste

96. At construction site, produced waste was stored at special storing areas designated for hazardous, domestic and construction waste storage. The part of construction waste (inert materials) was used by contactor for secondary meanings. Regarding the hazardous waste, such as oil contaminated towels or oil contaminated soil, Contractor was accumulating them separately in special containers. Hazardous waste was removed from construction site by authorized personal only in accordance with safety regulations.

97. Contractor Company had relevant contracts with licensed companies for proper management and final disposal of waste. Construction company had signed contracts with following companies for waste removal. For hazardous waste: Ltd "Sanitari" (contract N2911-13) and "Sandasuptaveba"; For domestic waste: an agreement with Zugdidi municipality; Construction waste: "Georgian Solid waste management company". All contracts are already provided by previous EMRs.

Soil Contamination

98. Fuel was kept in the covered containers at the impermeable surface area. Taking into consideration the specific characteristics of coastal protection project, there is no soil contamination in the scope of project.

Flora and Fauna

99. The flora and fauna living in Samegrelo region is located out of the project area and thus the project activities had no impact on them.

100. There were no trees, vegetation, bushes, plants, land and sea animals in the project area, as sandy coasts with the hot sun, salty water and wind are not convenient environment for living organisms. Thus, construction activities had no impact on flora and fauna.

Landscape

101. Construction activities caused some impact on the landscape of the territory. A big amount of cast tetrapods (from Phase I and Phase II) are accumulated on surrounding areas. This issue is agreed with local municipality and Contractor got the right to use additional surrounding areas for tetrapods placing.

102. In connection with possible utilization of remaining tetrapods, the “State Construction Company” LTD has applied to the MDF requesting consideration of the issue of transferring the remaining 5-10 tn. tetrapods located in Anaklia to their company for their utilization under Sarpi-Kvariati shoreline (Cape Kalandere section) coast protection structure rehabilitation project. The MDF considered the named issue and by the follow-up letter expressed readiness to transfer the requested tetrapods to the company.

103. In their Aide Memoire of March 2017, the ADB states that they do not object to the suggestion of the Ministry of Regional Development and Infrastructure of Georgia regarding possible utilization of the remaining tetrapods for implementation of coastal protection activities in other erodible sections of the Black Sea coastline.

Social Environment

104. There was no any adverse impact on social environment as the nearest residential house is far from 300-400 m. The intensity of traffic caused by the Contractor’s transporting equipment was increased not much, around 3 trucks in every 2 hours; it means that, not air contamination or noise was caused. Only positive impact can be mentioned as the almost 90% of people employed by the Contractor Company are locals, and their living conditions have been improved.

Ground water contamination

105. The places that could be the source of ground water contamination were fenced with ground and special material. Special filter was arranged around the concrete batching plant for accumulation of contaminated water.

Construction Safety

106. Construction activities were performed in accordance to the construction safety requirements and regulations. Workers were using personal protection equipment. The project area is fenced and warning signs are placed.

Worker Camps

107. The potential impacts related to the construction and operation of the camp could be summarized as potential damage of topsoil, contamination related to fuel storage and fueling operations, waste management, wastewater and sanitation.

108. The construction camp is equipped with a biotoilet and other necessary infrastructure. Monitoring activities were implemented by Environmental Specialists on the daily basis.

109. Buildings existing at the camp site are still on place, as defect liability period is not completed yet. Also, tetrapods are still stored at the camp and its nearby areas and watchmen/guard is permanently on camp site.

4. PART III: ENVIRONMENTAL MANAGEMENT

4.1. The environmental management system, site-specific environmental management plan (SEMP) and work plans

Tbilisi Metro extension project

110. Following the award of the contract and prior to construction commencing the Contractor has reviewed the EMP and developed this into a detailed Site-Specific Environmental Management Plan (SSEMP) that amplifies the conditions established in the EMP that are specific for the project, the tasks involved and schedule of construction activities. The draft version of SSEMP was prepared by the Contractor and sent to Supervision Consultant (SC) for endorsement on 20.06.2015. SSEMP has been further reviewed and commented for improvement by the MDF's Local environmental Consultant and ADB RETA National Environmental Consultant. It was approved by PIU/MDF in September 2015. SSEMP document was sent to ADB as well on October, 23, 2015, according to ADB requirement (Aid Memoire' (8 - 18 September 2015), Chapter IV. Follow-Up Actions, paragraph (xiv)). Table 1 below presents the information on statuses of managements' plans.

Table 1: Status of Management Plans

Management Plans	Status	Date of Submission and/or deadline	Comments
1.SSEMP	Submitted, approved	June 8, 2015	
2. Spoil disposal management plan	Has submitted as part of SSEMP of waste		
3. Emergency Response Plan	Submitted, approved	11/12/2015	
4. Evacuation structure plan	Submitted, approved	11/12/2015	
5. Company Waste Management Plan (according to GEO legislation)	Submitted, approved	First submission on 1 August, 2016,	

		Final submission to the MoEPNR on December 22, 2016.	
6. SSEMP for wastes	Has been prepared by the Contractor and several times revised. Approved.	Last submission of updated document June, 2016	Revision has been implemented by the International Environmental Specialist of Supervision Company, according to provided comments from MDF and RETA's environmental Specialists.
7. Company waste management plan - demanded by the new Waste Management Code of Georgia	Draft document was prepared and submitted by the contractor	22/12/2016	
8. Updated SSEMP	SSEMP was updated by the Supervision Company	October, 2016	Location of emergency exit has been changed and Detailed Design has been prepared and submitted to MDF for approval in September, 2016. International environmental specialist of SC has updated SSEMP in October, 2016 due to changes in the detailed design.

Anaklia Coastal improvement project

111. IEEs, including EMPs, are integral parts of the contracts and their implementation is mandatory for contactors. Contractor Company, as it was mentioned above, submitted monthly progress reports to supervisor Company Dohwa and MDF. Monthly report includes chapter on environmental performance. Consultant Company Dohwa prepares quarterly environmental report and submits to MDF on progress of the environmental management plan.

112. SSEMP for phase I has been prepared by Construction Company and approved by Consultant Company in June, 2014. SSEMP for phase I has been updated by the Consultant Company and updated document was presented to the MDF in June, 2015.

4.2. Site Inspection and audits

113. Site supervision and inspections, as well as monitoring of compliance of construction activities are important aspects to ensure the proper implementation of EMP/SSEMP requirements. Environmental management team of Construction and Supervisor Companies carry out permanent supervision activities and monitoring of the project performance in regular base. Time to time, MDF's environmental specialist - Local Consultant and Regional Environmental Consultant of ADB (under RETA 8663), were performing site monitoring visits as well. Basically, in every two month ADB review missions are conducted also.

Tbilisi Metro extension project

114. In July 2018, post-construction environmental audit was conducted by Supervision Company's International Environmental Specialist Paula Fernandez and Local Environmental Specialist Alexandre Abzianidze.

115. Site inspections, conducted by above mentioned environmental stuff, have been implemented at the following areas: Emergency exit, Shaft 51, Shaft 50, inside the Tunnel (Platform, Cross over) outside the tunnel (Pedestrian passages 1,2,3,4) and the site camp territory as well.

116. Detailed information on conducted post-construction environmental audit and its findings are provided under the separate environmental monitoring report, attached as a separate **Attachment 1.**

117. MDF was monitoring construction progress by attending the regular weekly meetings between the Engineer and the Contractor. MDF's local environmental consultant was attending weekly meetings and requesting from the Engineer and Contractor strict and unconditional compliance with ADB requirements and Georgian legislation in terms of safety and safeguards.

118. MDF's local environmental consultant is ensuring that the Contractors understand what is to be done and how to rectify and address any environmental issues raised during project implementation process.

119. Environmental Specialist of Construction Company – Natia Karkuzaeva was permanently on site and implementing daily inspections of construction activities in regular base. Inspection was

carried out by Environmental Specialist in accordance to check-lists. Completed check-lists were available at camp site.

120. Local environmental specialist Alexandre Abzianidze was recruited by the SC in January, 2016. He was conducting site-monitoring visits 2-3 times per week and supervising and monitoring implementation of the EMP during construction activities. He was preparing monthly reports and submitting to the MDF.

121. The international environmental expert - Paula Fernandez of SC has been implemented site inspection and audit quarterly. She has done quarterly visits and prepares the quarterly reports, the last visit was taken out in July 2017.

Anaklia Coastal improvement project

122. No site visits have been implemented during reporting period, as no construction activities have been implemented.

123. Post-construction environmental monitoring and audit was conducted by SC in December 2017. Environmental audit findings are provided under the separate Post-Construction Environmental Monitoring report and attached as an **Attachment 2** to the present Final EMR.

4.3. Non-compliance notices and corrective actions

124. Identification of problematic issues and non-compliance notices during site inspections is the responsibility of Environmental Specialists of Construction and Supervision Companies. During reporting period the number of site visits has been implemented by environmental specialists of Construction and Supervision Companies in order to check environmental compliance of construction works.

125. In case of any deviations of EMP/SSEMP requirements corrective actions and mitigation measures are applied. All mitigation measures during pre- and construction phases of SPs are implemented by construction contractors according to EMP/ SSEMP.

126. No non-compliances were fixed and issued during reporting period, as no construction activities have been implemented during this period at project sites.

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

127. There were no ADB's Loan Review Mission (the Mission) visits have been implemented during reporting period under the SUTIP 1.

Grievance Redress Mechanism

128. During the projects implementation several issues, related to the environmental and social safeguards and disputes on entitlement processes', might be occur due to the Projects activities. For example, intensive schedule of construction activities, inappropriate timing of construction vehicle flow, waste, noise and air pollution from construction activities, ecological disturbances, cultural conflicts between migrant workers, are some of the environmental and social safeguard issues that are likely to be raised from the Project activities.

129. In order to provide a direct channel to the affected persons for approaching project authorities and have their grievance recorded and redressed in an appropriate time frame, Grievance Redress Mechanism was established with efforts of MDF within the projects.

130. Complaints' registration journal was created and available at construction sites. The copy of journal with mobile numbers of relevant persons is placed at local Municipality as well. Complaints' from the people, regarding the environmental safeguard issues in case of their disturbance and inconvenience, because of improper or inadequate implementation of EMP, could be accepted in both places. Complaints' would be registered in database system, assigning compliant number with date of receipt. Complaints' would be investigated and complainant would be informed about time frame in which the corrective action would be undertaken, in case if the raised problem was realistic.

131. MDF, as EA, facilitates the grievance resolution by implementing a project-specific Grievance Redress Process (GRP). It will deliver grievances to relevant authorities, in case if such grievances are sent to MDF. The official administrative bodies are obliged to respond to the grievances that have been received from population or other interested parties in accordance with the requirements of the Administrative Code of Georgia.

132. According to the existing legal and administrative system in Georgia, there are several entities responsible for addressing environmental complaints of population and interested parties. The administrative bodies directly responsible for environmental protection within the projects area are: MoE, municipal offices (gamgeoba) and Tbilisi City Hall. The affected population and stakeholders may send their grievances, related to the project-induced environmental impacts directly to the mentioned administrative bodies responsible for environmental protection.

133. During the reporting period none of complaints have been raised and registered under the projects.

5. PART IV – ACTION PLAN FOR THE NEXT PERIOD

134. The monitoring of Environmental performance was carried out by Contractor's and Supervising Company's environmental specialists systematically. No Construction activities will be implemented in future as Construction Contracts are completed.

Annexes

Annex 1: Monitoring Data

Tbilisi Metro Extension project

Object of monitoring	Control/Sampling Point	Technique	Frequency/time	Target	Entity responsible for Monitorin
Air pollution inside the tunnel/ underground shafts	- Metro extension tunnel - University station shaft - New tunnel section for -cross over and parking of tracks.	- Visual control - Atmospheric air test (all set general parameters) - Monitoring air-flows for explosive gases and specific atmosphere contaminants -Inspection mechanical ventilation system - Inspection moving and diesel machines & vehicles	- Daily - Baseline and weekly sampling/test - Monthly sampling and testing (specific parameters); - Technical check-up of HVAC equipment - During the transportation operations - During installation and commissioning services for all plants operations	-Ensuring compliance with the established quality norms of ambient air quality; - Minimizing the impact on health for workers operating inside tunnel, stations/shafts - Ensuring the personnel's safety (visitors, machine operators, etc.)	JV "COBRA" and "ASSIGNIA"

		- Technical check-up of permanent plants installed (facilities)	- During installation and commissioning services for all plants		
Air pollution outside the tunnel/ underground shafts	- Delisi Station - University Station - Open sites around new tunnel section for cross over and parking tracks (nearest receptor = Residential houses).	- Visual control - Atmospheric air test (baseline and quarterly basis of general parameters) - Inspection moving and diesel machines/vehicles - Checking for water spraying inside and around (access road) the construction sites (especially at dry season)	- Daily - Baseline and weekly sampling/test - Daily - Daily - Daily - Daily - Daily	- Ensuring compliance with the established quality norms of ambient air quality; - Minimizing the impact on health for residents, commuters and students living around project sites	JV “COBRA” and “ASSIGNIA”

		- Checking for materials transported to site to be covered/ wetted down to reduce dust - Verification of register and permits for all vehicles and plant equipment - Verification on burning sites for wastes generated at the construction sites		- Ensuring the health and safety of personnel operating outside the sites	
Fire prevention	- Metro extension tunnel - University station shaft - New tunnel section for cross over and parking tracks. - Open sites around above sites. - The nearest receptor (residential houses) - Metro extension tunnel - University station shaft	- Visual control - Measuring atmospheric conditions - Firefighting training and procedures incl. emergencies - Technical check-up of firefighting devices - Checking for restriction signals for smoking in all working areas - Checking brake drag	- Daily - Monthly - During pre-construction - Daily (weekly) - Daily (sanctions against smokers at work place to be taken immediately) - Weekly - Weekly - Weekly	-Ensuring compliance with the established quality norms for fire prevention; - Ensuring the health and safety of all personnel and residents in case of fire	JV “COBRA” and “ASSIGNIA”

Surface and underground fueling	- New tunnel section For cross over and parking tracks. - Open sites around above sites	and brake temperature indicators (all machines & moving vehicles) - Checking engine fire walls on loaders - Checking quality of insulating of high current electrical systems (inside tunnel/shafts -Visual control of all fuel storage areas - Developing fuel procedures incl. if necessary fuel underground storage - Designating fueling bays - Technical check-up of fire extinguishers near bays	- Daily - During pre-construction - During pre-construction - Weekly	-Ensuring compliance with the established quality norms for fire prevention; - Ensuring the health and safety of all personnel involved with refueling of plants and vehicles using inside or outside the station shafts and tunnel	JV “COBRA” and “ASSIGNIA”

Erection of plants / installation services inside the stations and tunnels	- Delisi Station - University Station - Open sites around new tunnel section for cross over and parking tracks (nearest receptor residential houses	- Visual control and daily inspection of the works - Inspection of plants in factory and at arrival to site(e.g. plant with automatic cut-off in flammable atmospheres) - Checking if plants at commissioning at operating in safe working environment - Checking of plant levels of emissions e.g. exhaust, noise, vibration and heat (at commissioning) - Verification that plants complies with electrical standards/regulations	- Daily - Factory inspection and inspection at arrival - Commissioning test - Commissioning test - Commissioning test - Commissioning test	Ensuring compliance with standards and regulations of plant operations upon commissioning (electrical compliance, exhaust, noise, vibration, etc.) - Ensuring safety during installation and after commissioning, ensuring all plants operate in safety mode and prevent any incident leading to environmental problems (e.g. oil spell, fire, etc.)	JV “COBRA” and “ASSIGNIA”
Vibration and noise	Metro extension tunnel - University station shaft - New tunnel section for cross over and parking tracks. - Open sites around above sites - The nearest receptor (residential houses	- Noise level measurement at all designated sites - Visual control and inspection of the works (all sites) - Inspection of vibration emission data of tools in use - Inspection of moving machines and vehicles (silencing engines) - Inspection of plants in factory and at arrival to site (e.g. noise insulation of plants)Checking of plant levels of emissions for noise /vibration at commissioning	Monthly - Regular control (particularly during much “noisy” operations) - Inspection at arrival of tools and machineries - Daily - Factory inspection and inspection at arrival - At commissioning of plants - Daily (sanctions against staff not using hearing protection	- Ensuring compliance with health and safety norms - Minimizing the population disturbance; - Ensuring comfortable working conditions for the workforce operating inside underground tunnel and shafts	JV “COBRA” and “ASSIGNIA”

		test) - Checking all workers operating in tunnel/shafts are using hearing protection			
Soil, Flora/fauna, soil/water pollution and construction waste management	- University station construction site - New tunnel section parking tracks site - The nearest receptor (residential houses)	Monitoring of tree cutting and site clearance/top soil - Atmospheric air test for parameters related to biodiversity protection, to verify level of dusts and emissions near parks - Soil and sediment sampling and test Check dewatering system in use (shit piling etc.) - Check hazardous waste storage locations - Checking cleaning of construction area	- During the stripping and storage of the topsoil and during tree cutting' - Baseline and quarterly basis for atmospheric air test - As required, in case of soil and sediment contamination - During dewatering operations - Weekly - Daily	Ensure biodiversity protection at all time - Ensure no surplus/waste soil is accumulated at the site - Avoid soil contamination - Ensure storage of waste including hazardous waste at chosen premises complies with law and good practice; - No storage of fuel, oil or toxic materials at construction sites especially underground	JV "COBRA" and "ASSIGNIA"

Building stability Impacts caused by excavation. Damage to community facilities; Traffic congestion, Protection of cultural heritage; Historical and archeological chance finds during excavation	- Metro extension tunnel - University station shaft - New tunnel section for cross over and parking tracks. -Open sites around above sites. -The nearest receptor (residential houses)	135. -Monitoring of settlements and damages (geotechnical and structural damage assessment of buildings or project facilities) - Inspection of all buildings around construction sites - Inspection of access roads - Inspection of utilities along access roads and near construction sites - Inspection of eventual damages caused to utilities and estimate of costs and scope for repair works - Check signs are install to control traffic to avoid traffic congestion at streets or near sites affected by the works - Check adequate lightening is provided at all sites and at road diversions - Updating traffic management plan as works progresses - Verify protocol for conducting excavation work, to ensure that any chance finds are recognized and measures are taken to ensure they are protected and conserved.	- Weekly - Weekly - Daily - Weekly - Visual inspection upon damages - Daily - Daily - As required -During pre-construction	- Ensure biodiversity protection at all time - Avoid damages to public and private existing buildings and properties - Avoid settlement and damages to new project buildings - Avoid damages to public utilities in access roads or near project facilities - Smooth traffic operations long public roads and access roads to sites	JV “COBRA” and “ASSIGNIA”

Anaklia coastal improvement project

Object of Monitoring	Control/Sampling Point	Technique	Frequency/Time	Target	Entity responsible for Monitoring
1	2	3	4	5	6
Atmospheric air	Business yard, Construction sites	• Visual control • Technical check-up of machinery • Laboratory Checks every tree month.	The monitoring of the Atmospheric Air quality is been carried out by contractor environmental specialist on every day basis and by supervising environmental specialist. During the transportation operations, in dry weather on a periodic basis, technical check-up of machinery before works, during the installation of underwater breakwater. Laboratory test are taken in every three month. Tests were taken on 4.02.2016. During this period no problems has been detected.	• Ensuring compliance with the established quality norms of ambient air quality; • Minimizing the impact on the population health; • Ensuring the personnel's safety.	Construction Contractor
Noise	Business yard Construction sites The nearest receptor (residential houses)	• Control;	Monitoring of the construction process noise level has been carried out by contractor environmental specialist on daily bases and by supervising environmental specialist. Regular control(particularly during with noisy operations);	• Ensuring compliance with health and safety norms; • Minimizing the population disturbance; • Ensuring comfortable working conditions for the workforce.	Construction Contractor

		• Measuring; • Technical check-up of machinery.	Measuring (In case of grievance); Technical check-up of machinery before works. The nearest receptor (residential houses) is approximately 400-500m away from construction site, drivers are maintaining the safe speed limits 30 km/h on main roads and 10 km/h on construction site, there for no noise complains has been detected. During this period no grievance or problems have been detected.		
Soil	Construction camp - Material and waste storage areas;Construction sites	• Visual control • Supervision over the waste management; • laboratory control over the soil quality; • Technical check-up of machinery.	Monitoring of the construction process soil mitigation level has been carried out by contractor environmental specialist on daily basis and by supervising environmental specialist. Laboratory control – as necessary (in case of oil spills). Material and waste storage areas are indicated and isolated. During this period no problems has been detected. Regular check-up; Inspection after completion of works;	• Preserving the soil stability and quality; • Minimizing the impact on other receptors depending on the soil quality (vegetation cover, holiday-makers, etc.).	Construction Contractor
Increased seawater turbidity	Sites in the sea where the sand removed during the seabed treatment and from the seabed is to be placed.	• Visual control; • Turbidity analysis	Monitoring of the Increased seawater turbidity level is been carried out by contractor environmental specialist on daily basis and by supervising environmental specialist. Permanent visual control; Identifying the degree of turbidity	• Maintaining ichthyofauna and microphytes.	Construction Contractor

			through analysis (in every 4 hrs. During the work). Upon intensive commencement of works in the sea, water testing has been conducted together with turbidity control, which should be constantly ongoing.		
Underground water	Construction camp - Material and waste storage areas;Construction sites Gas station	• Visual controlof soil quality; • Laboratory controlof soil quality (in case of spills); • Technical check-up of machinery.	Monitoring of the underground water mitigation level has been carried out by contractor environmental specialist on daily bases basis and by supervising environmental specialist.Regular check-up; Laboratory control as necessary (in case of oil spills). Material and waste storage, Gas station areas are indicated and isolated. During this period no problems or oil spills has been detected	• Guaranteed protection of the underground water quality	Construction Contractor
Surface water: the Black Sea, the rivers Kitori and Enguri	Construction ground Business yard	• Visual control; • Supervision over the waste management and sanitary conditions. • Surface water laboratory control.	Monitoring of the Surface water mitigation level is been carried out by contractor environmental specialist on every day basis and by supervising environmental specialist Regular check-up and inspection; Laboratory control – as necessary (in case of oil spills). Sea water Laboratory test are taken in every three month. Tests were taken on 15.07.2015.During this period no problems has been detected	• Protecting the water quality in the river; • Reducing the impact on the receptors (water biodiversity, etc.) depending on the river water quality.	Construction Contractor

Negative visual impact	Construction camp - Material and wastestorage areas;Construction sites	• Visual control; Supervision over the waste management and sanitary conditions.	Monitoring of the negative visual impact has been carried out by contractor environmental specialist on every day basis and by supervising environmental specialist Regular check-up and inspection; After completion of works. During this period no problems has been detected	• No dissatisfied population; • No dissatisfied pedestrians.	Construction Contractor
Waste	Business yard and/or adjacent area;	• Visual control of the area;] • Control over the waste management.	Monitoring of waste management issues is been carried out by contractor environmental specialist on daily bases and by supervising environmental specialist. Regular check-up and inspection; After completion of works. Construction waste is accumulated on construction site in special isolated areas divided by hazardous, domestic and construction waste. Construction company has signed contract with the companies for waste removal. Waste has been removed from construction site buy authorized personal only in accordance of safety regulations. The waste is removed from construction site by authorized personal only in accordance of safety regulations.	• Protection of soil and water quality; • Reduce the risk of negative visual impact; • No dissatisfied population.	Construction Contractor
Labor safety	Working ground	• Inspection;	Monitoring of the labor safety issues has been carried out by contractor	• Ensuring compliance with health and safety norms;	Construction Contractor

		• Availability of personal protection equipment and periodic control over their good maintenance; • Control over the meeting the requirements for labor safety.	environmental specialist on daily based and by supervising environmental specialist. Before the works;Periodic control during the works.Some of the labors don't have PPE equipment problem detected by supervising environment specialist and corrected	• Avoiding/minimizing traumatism.	

Annex 2: Implementation report on the environmental impact assessment (EIA)/initial environmental examination (IEE)/Site Specific Environmental Management Plan (SEMP) mitigation requirements

Anaklia Coastal improvement Project

Reference	Requirement	Action to date	Action required/comment
Sea water pollution	The construction activities must be accomplished only in dry weather to avoid the pollution of the water currents; The construction activities must be accomplished by observing relevant safety measures; the materials and waste must not be in uncontrolled way over the site, etc. Locating the construction machinery and other equipment at a distance of at least 50 m from surface water bodies (where possible. If this seems impossible, taking permanent control and safety measures to avoid water pollution); Prohibition of washing of vehicles and other machinery near surface water bodies - The vehicles and equipment are recommended to wash by using commercial washing services; Limiting fueling and/or maintaining the vehicles/equipment to the	All works has been accomplished only in dry weather working conditions. All construction materials and machinery has been located 50 M away from surface of the water. All equipment and machinery has been maintained in good working conditions. The construction waste has been accumulated in special designated areas away from the water bodies and removed buy authorized personal only. On site environment specialists are maintaining visual monitoring for oils spills and equipment conditions, no accidents has been detected. Working Personal is being instructed on environment and	Monitoring of the Surface water mitigation level is been carried out by contractor environmental specialist on every day basis and by supervising environmental specialist Regular check-up and inspection; Laboratory control – as necessary (in case of oil spills). During reporting period no problems has been detected

	specially designated places only; The equipment and vehicles should be maintained in good working order to avoid the risk of spills of fuel/lubricants; Expedient materials and waste management; The waste generated during the works will be collected and temporarily stored at the specially designated places, distanced from the water bodies; In case of fuel/oil spills, locating and spilt material and cleaning the polluted area immediately to avoid long soil pollution; Installing drainage systems around the areas with the potential pollutants of surface flows (e.g. along the perimeter of groudn or construction materials storage areas); Instructing the personnel on the environmental and safety issues.	safety issues rules and regulations.	
Pollution of underground waters	Control for the Pollution of underground waters must be maintained in the areas like: Construction camp - Material and waste storage areas;Construction sites,Gas station.	All works has been accomplished only in dry weather working conditions. All construction materials and machinery has been located 50 M	Monitoring of the Surface water mitigation level is been carried out by contractor environmental specialist on every day basis and by supervising environmental specialist Regular check-up and inspection;

	Taking all measures to avoid the deterioration of the seawater quality.	away from surface of the water. All equipment and machinery has been maintained in good working conditions. The construction waste has been accumulated in special areas away from the water bodies and removed buy authorized personal only. On site environment specialists are maintaining visual monitoring for oils spills and equipment conditions, no accidents has been detected. Personal is being instructed on environment and safety issues rules and regulations.	Laboratory control – as necessary (in case of oil spills). During this period noproblems has been detected
Noise	The equipment and vehicles should be maintained in good working order; Driving the vehicles at optimal speeds; Instructing the personnel (particularly, the drivers of vehicles and techniques); Registering and responding to grievances (if any); Driving the vehicles along optimal routes and at optimal speeds; Switching off the vehicle drives or running at minimal speed when the vehicles are not used;	On site Environmental specialists are conducting visual control (on regular basis) of soil quality, laboratory controlof soil quality (in case of spills) no oil spills has been detected, technical check-up of machinery.	Regular monitoring has been carried out to provide guaranteed protection of the underground water quality.

	Carry out noisy operations during day time; Reaching preliminary agreement with the population living near the road about particularly noisy works.		
Dust	Watering of the non-asphalted ground or bare ground surfaces once in four hours on working days and in dry or windy weather; Observing the rules for storing the fill construction material to avoid their dusting in windy weather; Covering the lorries with tarpaulin when transporting loose materials, when there is probability of dusting; Taking necessary precautions (e.g. avoiding throwing the materials from heights when unloading them) to avoid excess dust emission during the earthworks and loading and unloading the materials; Driving the vehicles at optimal speeds; Washing the vehicle tires (recommended to use commercial services for this purpose); Instructing the personnel (particularly, the drivers of vehicles and techniques);	All vehicles are maintained in good working conditions. Drivers are instructed to follow the limitations of driving speed (On construction site 10 km/h, 30 km/h on main roads). All noisy operations have been carried out during day time. No grievance has been detected concerning noisy works.	Monitoring of the construction process noise level has been carried out by contractor environmental specialist on every day basis and by supervising environmental specialist. Regular control(particularly during much “noisy” operations); Measuring (In case of grievance); During this period no grievance or problems has been detected. Technical check-up of machinery before works. The nearest receptor (residential houses) is approximately 400-500 m away from construction site, drivers are maintaining the safe speed limits 30 km/h on main roads and 10 km/h on construction site, there for no noise complains has been detected.

	Registering and responding to grievances (if any); Driving the vehicles along optimal routes and at optimal speeds; Switching off the vehicle drives or running at minimal speed when the vehicles are not used.		
Waste	Visual control of the area; Control over the waste management. Protecting soil and water quality; Reducing the risk of negative visual impact; No dissatisfied population.	Monitoring of waste management issues is being carried out by contractor environmental specialist on every day basis and by supervising environmental specialist. Regular check-up and inspection; Construction waste is accumulated on construction site in special isolated areas divided by hazardous, domestic and construction waste. Construction company has signed contract with the companies for waste removal. The waste is being removed from construction site buy authorized personal only in accordance of safety regulations.	
Vibration	The equipment and vehicles should be maintained in good working order; Driving the vehicles at optimal speeds, particularly in the settled areas;	Watering of the roads has been carried out by the contractor on every day basis. All lorries have been covered buy tarpaulin to avoid dusting. Drivers are instructed to follow the limitations of driving	Monitoring of the construction process soil mitigation level (including dusting problems) is been carried out by contractor environmental specialist on every day basis and by supervising environmental specialist.

	Instructing the personnel (particularly, the drivers of vehicles and techniques); Registering and responding to grievances (if any); Driving the vehicles along optimal routes and at optimal speeds; Switching off the vehicle drives or running at minimal speed when the vehicles are not used; Carry out noisy operations during day time;	speed (On construction site 10 km/h, 30 km/h on main roads). No grievance has been detected.	Regular check-up; Inspection after completion of works; Laboratory control – as necessary (in case of oil spills). Material and waste storage areas are indicated and isolated. During this period no problems has been detected.
Air Pollution of emissions	The equipment and vehicles should be maintained in good working order; Driving the vehicles along optimal routes and at optimal speeds; Switching off the vehicle drives or running at minimal speed when the vehicles are not used. Instructing the personnel before the start-up of the works.	All vehicles are maintained in good working conditions. Drivers are instructed to follow the limitations of driving speed (On construction site 10 km/h, 30 km/h on main roads). All noisy operations have been carried out during day time. No grievance has been detected concerning vibration.	Monitoring of the construction process noise level is been carried out by contractor environmental specialist on every day basis and by supervising environmental specialist. Regular control(particularly during much “noisy” operations); Measuring (In case of grievance); During this period no grievance or problems has been detected. Technical check-up of machinery before works. The nearest receptor (residential houses) is approximately 400-500 m away from construction site, drivers are maintaining the safe speed limits 30 kph

			on main roads and 10 km/h on construction site, there for no noise complains has been detected.
Disturbance of the seawater during installation of tetrapods	During the works to level the seabed, permanent seawater analyses are needed to identify the degree of the water turbidity; If the degree of the water turbidity is in excess of the admissible limit (25 gr/l), the works must be stopped and relevant corrective measures must be taken.	Monitoring of the Increased seawater turbidity level is been carried out by contractor environmental specialist on every day basis and by supervising environmental specialist. Permanent visual control; Identifying the degree of turbidity through analysis (in every 4 hrs. During the work). Upon intensive commencement of works in the sea, water testing has been conducted together with turbidity control, no problems has been detected.	During installation of TTP units environmental specialists are conducting visual control, taking turbidity analysis. No increased seawater turbidity has been detected.
Labor safety	Site -Inspections; Availability of personal protection equipment and periodic control over their good maintenance; Control over the meeting the requirements for labor safety. Ensuring compliance with health and safety norms; Avoiding/minimizing traumatism.	Monitoring of the labor safety issuesis being carried out by contractor's environmental specialist on every day basis and by supervising environmental specialist. Before the works; Periodic control during the works. Some of the labors don't have PPE equipment.	

Tbilisi metro extension project

Reference	Requirement	Action to date	Frequency	Action required/comment
Air quality impacts due to gaseous and dust emissions	a) Use only vehicles and equipment that are registered and have necessary permits. b) Burning of wastes generated at the construction sites, work camps and other project-related activities shall be strictly prohibited. c)Construction equipment and vehicles shall be well-maintained so that their noise and emissions do not cause nuisance to workers or local people. d) All vehicles will be checked and repaired in case of need to eliminate increased emission due to damaged parts. e) Protective equipment will be provided to workers as necessary. f) Keep stockpiles moist and cover vehicles with tarpaulin sheets or other suitable materials to minimize dust emission and prevent spillage of materials (e.g., soil, cement, stone, sand, aggregates, etc.).	Visual controlling is being performed used a ventilation system which is: monitored and upgraded to ensure air flows are always provided to the workplace, monitoring air flows for explosive gases and atmosphere contaminants regularly, Materials transported to site covered/ wetted down to reduce dust.	Daily Daily Daily Daily	Monthly progress report

	h) Provide truck-washing facilities to prevent truck-out of mud and dust onto city streets. i) All construction equipment and machinery shall be fitted with emission control equipment in full compliance with the national regulations. j) Ensure water spreading to suppress dust particularly during dry and windy weather. k) Impose speed limits on construction vehicles to minimize road dust.	Monitoring by Georgia National Environmental Agency include on a quarterly basis air testing at each underground site or confined space		
Noise and vibration impacts due to operation of construction equipment/ vehicles and various construction activities	To control noise impacts the following mitigation actions are recommended: a) Truck drivers and equipment operators shall minimize the use of horns. b) Position any stationary equipment that produce high noise levels as far as is practical from sensitive receptors; c) All construction equipment and vehicles shall be well maintained, regularly inspected for noise emissions, and shall be fitted with appropriate noise suppression equipment consistent with applicable national and local regulations. d) Use only vehicles and equipment that are registered and have necessary permits. e) No noisy construction-related activities will be carried out during the	Noise level measurement at all sites, Visual control and inspection (all sites), used hearing protection (inside tunnels and shafts), silenced engines to achieve a noise level not exceeding LAeq 85 dbA, Monitoring by Georgia National Environmental Agency include on a quarterly basis Noise testing.	Monthly Daily Daily	Contractor will take 7 points until the end of the project as per BoQ

	night. f) Impose speed limits on construction vehicles to minimize noise			
Spoils generation from excavation works (5.247,99 m3) at underground station sites	Contractor will submit a spoil disposal plan (as a part of the SEMP) to the MDF and MoEP for approval. The spoil plan should show the location of proposed sites (landfill or borrow pits) to be used and the measures to be taken to rehabilitate these pits upon finalization of the Project. The capacity of disposal sites shall be adequate to accept the quantity of spoils without alienating areas outside the site boundaries.	Contractor submitted the transfer notes that spoil amount 630m3 was transported and disposed by "prime Concrete" to Tbilisi Gldani district landfill		Updated Spoil disposal plan was submitted
Generation of solid wastes (construction waste and domestic waste), including 4,250.00 m3 of different types of materials will be generated as a	Regarding the generation of solid waste, the waste procedures included in SEMP prepared by the contractor should contain, at least, the following mitigation actions: a) Provide garbage bins and facilities within the project site for temporary storage of construction waste and domestic solid waste. b) Separate solid waste into hazardous, non-hazardous and reusable waste streams and store temporarily on site in secure facilities with weatherproof flooring, security fencing and access	Contractor provided several waste bins and containers on the office and shafts 51,50 territories as well non-hazardous, hazardous and solid wastes are separated.	Daily checking of segregation	Contractor submitted Waste Management Plan. Submittal N S 044

result of the demolition activities	c) Ensure that wastes are not haphazardly dumped within the project site and adjacent areas d) Undertake regular collection and disposal of wastes to sites approved by local authorities or contract municipal waste operators for disposing household waste, garbage and small			
Generation of hazardous waste	Constructing Contractor shall collect all hazardous waste residuals, such as oil, solvent, material used in oil spill cleanups… and store them within appropriate covered skips, and pass it to a licensed operator, having environmental permit on operation of the hazardous wastes. Regarding the generation of hazardous waste, the waste management procedures included in SEMP prepared by the Contractor should contain, at least, the following mitigation actions: a) Store fuel and hazardous substances in paved areas. If spills or leaks do occur, undertake immediate clean up. b) Ensure availability of spill clean-up materials (e.g., absorbent pads, etc.) specifically designed for petroleum products and other hazardous substances where such materials are being	All personnel was trained and instructed in waste management practices and procedures as a component of the environmental induction process, maintained all construction sites in a cleaner, tidy and safe condition, Separated hazardous wastes and stored temporarily on site in secure facilities with weather proof flooring, security fencing.	Before stating the construction works Daily	

	d) Ensure all storage containers are in good condition with proper labeling. e) Regularly check containers for leakage and undertake necessary repair or replacement f) Store waste oil, used lubricant and other hazardous wastes in tightly sealed containers to avoid contamination of soil and water resources. g) Transport and off-site disposal of such wastes shall be consistent with national and local regulations	Proper labeling is provided.	Daily	
Topsoil losses due to improper storage and handling	Top soil protection: The storage of topsoil in stockpiles, no more than 2 m high with side slopes at a maximum angle of 45º. Dedicate storage locations that prevent the stockpiles being compacted by vehicle movements or contaminated by other materials. Top soil collection: 100 m3 x 3.98 €/m3 = 398 € Reinstatement of Topsoil Topsoil removed from University station will be used for reinstatement of the topsoil in adjacent zones affected by the project activities or other zones designed by the municipality. Top soil replacement: 100 m3 x 1.40 €/m3 = 140 €	N/A	N/A	There is no need to take these measures, because the top soil had been taken in previous work stages.

Trees that are directly (need to be cut) or indirectly (need to be protected) affected by the project	As a result of construction activities, 21 trees along the project area will be destroyed and 46 will need protection. Compensatory planting of the species should be facilitated with a proportion bigger than 1:3, so that 63 trees will be planted. - Removal of trees: 3.751,80 GEL - Ripping and scarifying: 218,50 GEL - Hidroseeding: 851,00 GEL - Tree planting, including stakes: 4.444,09 GEL - Protection of trees: 741,24 GEL	Cutting of trees and site clearance was monitored		The trees that are not going to be cut should be protected
Traffic congestion and access problems	To avoid traffic congestion and access problems the following mitigation actions are recommended: a) Provide signs advising road users that construction is in progress b) Employ flag persons to control traffic at the station sites for safety reasons when construction equipment is entering or leaving the work area. c) Provide sufficient lighting at night within and in the vicinity of construction sites. d) As much as possible, schedule delivery of construction materials and	Checked signs which are installed to control traffic to avoid traffic congestion at streets or near sites, Checked adequate lightening is provided at all sites and at road diversions.	Daily Daily	

	equipment as well as transport of spoils during non-peak hours. e) Avoid movements of noisy vehicles during night time in vicinity of sensitive receivers. f) Implement suitable safety measures to minimize risk of adverse interactions between construction works and traffic flows through provision of temporary signals or flag controls, adequate lighting, fencing, signage and road diversions.			
Hazards to health and safety of workers and the public due to construction works	Training in special skills, environment, emergency and safety regulation will be provided for workers before hiring, especially for those that will work underground. The underground section construction process needs to be supervised and monitored much more carefully in order to be able to detect the early sign of subsidence. To avoid this impact the following mitigation actions are recommended: a) Provide first aid facilities that are readily accessible by workers. b) Provide firefighting equipment at the work areas, as appropriate, and at construction camps. c) Provide separate hygienic sanitation facilities/toilets for male and female workers d) Ensure proper collection and disposal of solid wastes within the	Contractor provided the first aid facilities and fire fighting equipment at the work areas, Contractor provided separate hygienic sanitation facilities/toilets for male and female workers on the camp.	Daily Daily	Manpower are trained on daily bases, tool box talks are filled accordingly

	construction camps consistent with local regulations. e) Provide appropriate personnel safety equipment such as safety boots, helmets, gloves, protective clothes, breathing mask, goggles, and ear protection f) Ensure reversing signals are installed on all construction vehicles. g) Implement precautions to ensure that objects (e.g., equipment, tool, debris, etc.) do not fall onto or hit construction workers. h) Implement fall prevention and protection measures whenever a worker is exposed to the hazard of falling more than two meters, falling into operating machinery or through an opening in a work surface, etc. i) People from outside will be restricted from entering the construction sites in order to avoid accidents. j) Construction sites shall be cleaned regularly and provided with adequate sanitary equipment in order to reduce risk of spreading diseases.	Contractor provided appropriate personnel safety equipment safety boots, helmets, gloves, protective clothes, breathing mask, goggles, and ear protection. The reversing signals are installed on all construction vehicles. Construction sites is being cleaned regularly. People from outside are restricted from entering the construction sites in order to avoid accidents.	Daily Daily Daily Daily	
Cultural and archaeological sites protection;	Construction Contractor should engage an archaeologist (archaeological supervisor) for conducting daily supervision activities during excavation activities. Permanent monitoring by the archaeologist during excavation activities. Chance Finds Procedure included in section 5.2.11 of the IEE should be	Verified protocol for conducted excavation work, to ensure that any chance finds were recognized and measures were taken to ensure they are protected and conserved.	During pre-construction	N/A

	implemented, including: stoppage and suspension of construction activities in case of archaeological findings; Completion of required archaeological works before restarting construction activities; Conservation of remnants.		