

Bi-annual Environmental Monitoring Report

Project Number: 42145-043

March 2020

ARM: North–South Road Corridor Investment Program – Tranche 3)

Prepared by the “Transport Project Implementation Organization” State Non-Commercial Organization of the Ministry of Territorial Administration and Infrastructure of the Republic of Armenia for the Asian Development Bank.

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Semi-annual Environmental Monitoring Report

Project Number: 42145
July - December 2019

Armenia: North-South Road Corridor Investment Program, Tranche 3
(Financed by the ADB)

Prepared by
Transport Project Implementation Organization
Yerevan, Armenia

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Abbreviations

ADB	Asian Development Bank
CEMP	Contractor's Environmental Management Plan
EMP	Environmental Management Plan
EIA	Environmental Impact Assessment
IEE	Initial Environmental Evaluation
ES	Environmental Specialist
MFF	Multi-tranche Financing Facility
MNP	Ministry of Nature Protection
MOTCIT	Ministry of Transport, Communication and Information Technologies
MoC	Ministry of Culture
SEMP	Site Specific Environmental Management Plan
TMP	Traffic Management Plan
TPIO	Transport Project Implementation Organization" SNCO
EMR	Environmental Monitoring Report

1 INTRODUCTION

1.1 Preamble

This Bi-annual Environmental Monitoring Report covers the time period from July to December of 2019 (Number 7).

The Report was prepared with close cooperation with Supervision Consultant, which is the joint venture of SPEA Engineering & IRD Engineering companies.

1.2 Headline Information

Sinohydro Corporation Ltd was hired for reconstruction and improvement of the road section and JV SPEA Engineering & IRD Engineering was recruited for providing supervision consulting services.

Construction works were implemented by Sinohydro Corporation Ltd and its subcontractor S&A mining LLC.

The following construction activities were implemented: soil excavation, clearing and grubbing works, construction of culverts and underpass, embankment. Traffic regulating signs/signals have been installed for safety/security purposes and maintenance of road has been implemented.

In order to ensure the environmental performance, supervision was provided to ensure that the implementation of construction activities meets EMP requirements which is prepared in accordance with ADB Environmental Policy and RA legislation.

Contractor is guided by the EIA and EMP for Tranche 3 as a part of the Bid and Contract documents, Site-specific Environmental Management plans, as well as by the Contractor's Environmental Management Plan prepared by the Contractor that detail on site environmental management requirements implementation and management, particularly construction impacts mitigation, monitoring and reporting requirements in order to ensure the environmental performance. Compliance with EMP is being regularly monitored and reported.

2 PROJECT DESCRIPTION AND CURRENT ACTIVITIES

2.1 Project Description

1. The RA has selected the Bavra-Yerevan-Agarak route as the North-South Road Corridor to be rehabilitated, reconstructed and expanded and has appointed “Transport Project Implementation Organization” SNCO (TPIO) of the Ministry of Transport, Communication and Information Technologies (MOTCIT) to co-ordinate the work.
2. The Multi-tranche Financing Facility (MFF) is designed to rehabilitate and upgrade national north-south roads to form a new, upgraded and expanded North-South highway. The main objective is to widen the existing 2-lane roads (often in poor condition) to become 4-lane divided roads along existing alignments wherever possible or to construct new alternate 2-lane roads where a single 4-lane road would not be feasible.
3. The Asian Development Bank has provided a loan in the framework of the MFF for the North-South Road Corridor Investment Program to the Government of Armenia to cover the cost of Reconstruction and Improvement of Talin—Lanjik road Section (Km 71+500 to Km 90+200) of M1 Talin—Gyumri Road.
4. The Tranche 3 Project starts at km 71+500 in Talin community and end at km 90+200 close to Lanjik community – about 18.7km. This road is currently a 2nd category and has 2 opposite traffic lanes. After reconstruction this road section is expected to be 1st category with cement concrete pavement.
5. The reconstruction of 9 overpasses on M2 Yerevan-Artashat and M1 Yerevan-Ashtarak is financed from cost savings from Tranche 3. These works are being carried out by local contractors and are supervised by the Supervising Consultant/Engineer for Tranche 3.

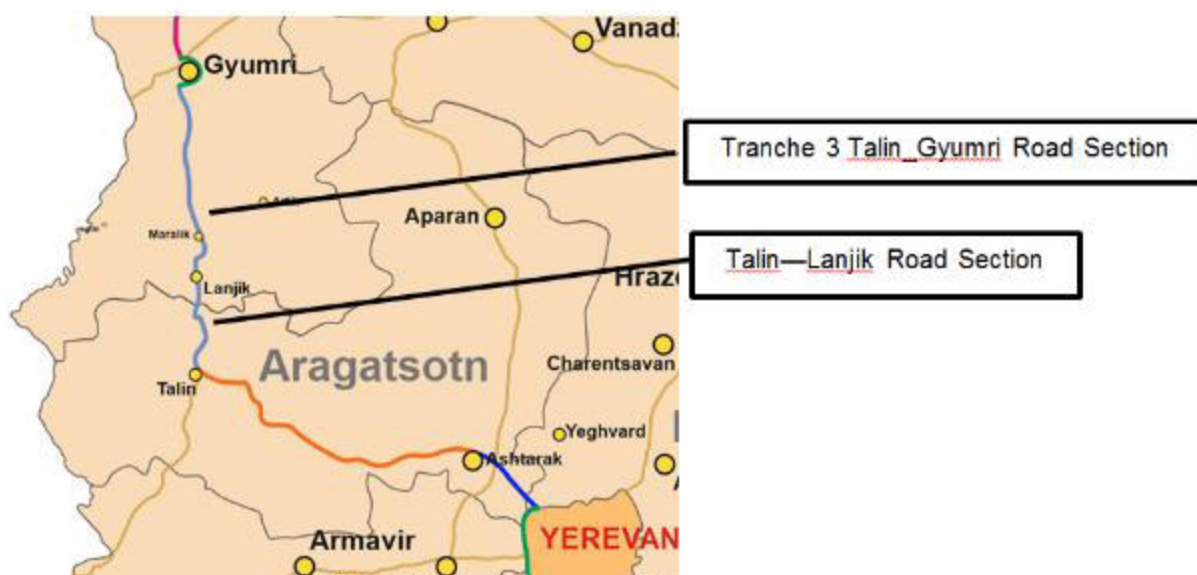


Figure 1. Tranche 3 of North-South Road Corridor

2.2 Project Contracts and Management

ADB carry out periodic Project reviews, inspections of the Project throughout the Project cycle in conformity with the principles and requirements embodied in the SPS 2009. ADB will provide assistance to the TPIO in managing the social and environmental impacts and risks, thus contributing to the promotion of the long-term sustainability of investments.

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Transport Project Implementation Organization is implementing day-to-day management of project execution. The TPIO includes a Social and Environmental staff whose responsibilities include the management of all environmental aspects of the project.

Contact information:

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Email: info@tpio.am

www.tpio.am

The Supervision Consultant/Engineer carries out all construction supervision activities and reporting of the project. Environmental Safeguards Unit of the Consultant is responsible for supervising the construction works in relation to environmental and archaeological impact and, in particular, for supervising and reporting on the Contractor's performance in the implementation of the EMP.

Contact information:

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Contractors are implementing construction works. Contractor's Environmental Unit is responsible for preparation and implementation of Contractors' EMPs, SSEMPs, monitoring of the construction activities and reporting.

Contact information:

Email: sinohydro_am_tl@163.com

TPIO Environmental and Social Staff

The Project Impact Management activities are undertaken by Head of Environmental Impact Management Service; and Environmental and archaeological Specialist:

Mr. Gevorg Afyan - Head of Environmental Impact Management Service is responsible for Environmental management of the project and compliance with the national environmental legislation of the RA and safeguard policies of financing Donors during the preparation and implementation of the Projects, including design, construction and supervision.

Mr. Mikael Tevosyan - Environmental and Archaeological Specialist is responsible for the compliance of the projects to safeguard policies of financing Donors and RA legislation.

Consultant Environmental Safeguards Unit

Presently the Consultant Environmental Safeguard Unit consists of:

Ms. Edita Vardgesyan - Environmental Specialist (ES), is responsible for the overall management of the environmental safeguards. She employed on a contractual basis. During the reporting period her inputs were: 6 days per month.

Mr. Boris Gasparyan - Archaeological Specialist (AS), responsible for the consultancy on archaeological issues in the road section, compliance of the construction activities to the Armenian archaeological related legislation and inspection visits to the borrow pit, dumping and concrete plant sites with archaeological evaluation purposes. During the reporting period his inputs were: 6 days per month.

Contractor's Health and Safety, Environmental, Archaeological and Social Unit

The Unit is staffed by five people:

Mr. Zhong Zhen Min, the HSE Director, is responsible for the overall management of the Unit;

Mr. Hovhannes Tovmasyan - Environmental Specialist, to assist the HSE director on the environmental management plan implementation;

Mr. Martin Asatryan - Social Impact Specialist, is responsible for the compliance of the Contractor's activities to social part of the ADB Safeguard Policy Statement;

Mr. Ashot Revazyan - Security and Health Specialist is responsible for the compliance of the Contractor's activities to health and safety part of the ADB Safeguard Policy Statement.

Mr. Artur Petrosyan - Archaeologist, is responsible for protection of historical, cultural and archaeological monuments from negative impacts of the construction activities within framework of the EMP implementation;

2.3 Project Activities During Current Reporting Period

During reporting period, the following works were continued by the Contractor, i.e. earthworks (clearing and grubbing; common, unsuitable and rock excavation; embankment; subgrade), drainage works (water culverts and syphons), concrete works (underpasses and agricultural underpasses), asphalt works, works on base, subbase and concrete pavement, and works on utilities.

Photos form construction process





The total number of staffs of the Contractor and Sub Contractor through during the current period was 199. The workforce consisted of 41 Chinese Nationals and 158 Armenian Nationals. The total number of Sub Contractor's staff was 36.

2.4 Description of Any Changes to Project Design

No changes with regards to the design took place during the reporting period.

2.5 Description of Any Changes to Agreed Construction methods

No changes with regards to agreed construction methods took place during the reporting period.

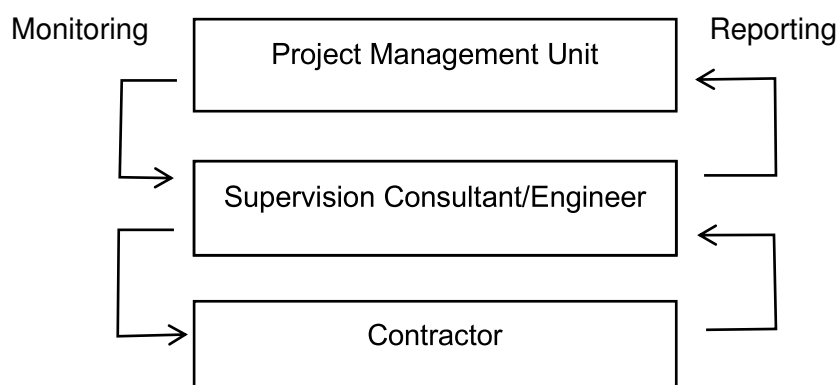
3 ENVIRONMENTAL SAFEGUARD ACTIVITIES

3.1 General Description of Environmental Safeguard Activities

Transport Project Implementation Organization is implementing day-to-day management of project execution. The TPIO includes a Social and Environmental staff whose responsibilities include the management of all environmental aspects of the project

The Supervision Consultant/Engineer carries out all construction supervision activities and reporting of the project. Environmental Safeguards Unit of the Consultant is responsible for supervising the construction works in relation to environmental and archaeological impact and, in particular, for supervising and reporting on the Contractor's performance in the implementation of the EMP.

Contractors are implementing construction works. Contractor's Environmental Unit is responsible for preparation and implementation of Contractors' EMPs, SSEMPs, monitoring of the construction activities and reporting.



3.2 Site Audits

During the reporting period site audits were carried out according to the Monitoring program developed based on the ADB Safeguards and EMP requirements. Unscheduled audit visits were carried out when needed. The following site audits were undertaken:

- Regular audit site visits on weekly basis by contractors' environmental specialists. The audits have been done according to the approved checklist template.
- Regular audit site visits on monthly basis by engineer's environmental specialist. The audits have been done according to the approved checklist template.

- The TPIO environmental specialists participated in some of the audit site visits of the engineer's environmental specialist, but not less than once in a quarter.

During the reporting period monitoring conducted by the Engineer's ES on a monthly basis. Periodically monitoring visits also conducted by the TPIO based on the necessity, but at least once in a quarter as well as TPIO participated in the ADB mission.

An ADB mission visit took place on July and October, 2019. Participants of the visit were: from ADB – Mr. Duncan Lang and Mrs. Armine Yedigaryan; from the TPIO - Mr. Gevorg Afyan; from the Engineer - Mrs. Edita Vardgesyan, ES; from the Contractor - Mr. Hovhannes Tovmasyan, Environmental Specialist, Mr. Ashot Revazyan, Security and Health Specialist and Mr. Martin Asatryan, Social Impact Specialist. The mission visited construction sites, topsoil and dump sites, borrow pit site, concrete plant area as well as archaeological sites of Tranche 3, Talin-Lanjik Section.

Details of the site audits are presented in Annex C. No significant trends were observed. Non-compliances observed during the reporting period was mainly corrected. Some actions still need to be done by the Contractor to meet the Project requirements fully.

All the details presented in the Engineer's Monthly and Quarterly reports.

3.3 Issues Tracking (Based on Non-Conformance Notices)

Two definitions are used to describe issues that have occurred and need to be addressed: (i) Minor Non-compliances are issues that are registered in checklists during monitoring visits and provided to the Contractor for corrective action. In this case issues are relatively insignificant or corrective action can be completed quickly. (ii) Major Non-compliances are major issues or repeated non-conformances that Engineer requests corrective action through official letter.

Major Non-compliances

Based on ADB mission recorded that the defects detected during the previous site visits are not corrected fully and properly. Based on the afore-mentioned Contractor was notified that serious environmental non-compliance was recorded and was requested undertake immediate actions. Correction Action Plan prepared by the Contractor and submitted to the Engineer on September.

Summary of Minor Non-compliances presented in annex C.

Table 3-1 Summary of Issues Tracking Activity for Current Period

Summary Table	
Total Number of Issues for Project	12
Number of Open Issues	1
Number of Closed Issues	11
Percentage Closed	92%

Issues Opened This Reporting Period	1
Issues Closed This Reporting Period	0

3.4 Trends

Due to the fact that for previous period trends has not been considered information only regarding the current period is presented below taking into account the Non-Compliance Notices;

Quarterly Report No	Total No of Issues	% issues Closed	% issues closed late
3, 2018	0	0	0
4, 2018	1	1	0
1, 2019	1	0	0
2, 2019	0	0	0
3, 2019	0	0	0
4, 2019	0	0	0

3.5 Unanticipated Environmental Impacts or Risks

There is no unanticipated environmental impacts or risks occurred during the reporting period.

4 RESULTS OF ENVIRONMENTAL MONITORING

4.1 Overview of Monitoring Conducted during Current Period

Instrumented measurements and monitoring of environmental parameters (dust, noise, water and vibration) during the reporting period has been implemented at the following points: N 1 (Dust, Noise, Vibration, PK 87+300) N 2 (Dust, PK 86+400), N 4 (Dust, Noise, Vibration, PK 78+500) and N 8 (Dust, PK 80+000). The measurement points are selected based on going construction works criteria. The Contractors hired qualified company to hold DNVV measurements: ATMS Solutions LLC.

According to the monitoring reports noise actual levels at measurement point exceed the Threshold Limit Values (TLV) set by Sanitary norms in some cases, the Contractor should follow up the instructions from Engineer to minimize the construction activities in that locations. The main noise and vibration sources at all noise measurement points are operation of construction equipment and movement of cars and vehicles along the highway. The dust actual concentrations in all measurement points in different daytime periods don't exceed the daily average and maximum permissible concentrations set by the RoA Government Decree No160-N "Norms of maximum permissible concentrations of atmospheric air pollutants in residential areas", as well as norms set by IFC Performance Guidelines. At measurement points the actual levels of transport-technological (2nd category) vibration were below the 109 dB TLV.

Water quality monitoring has not been implemented during the reporting period by a reason that the Contractor has not been working in the areas where the water resources exist.

Details of the instrumental measurements presented in Annex D with the summary of the results.

4.2 Waste Management

Currently Contractor has occupied totally 6 sites for permanent disposal of excavated unsuitable subsoil and waste, approved by the Engineer.

No asphalt was removed during the reporting period.

Liquid waste. Liquid concrete wastewater was properly managed during the reporting period: collected in the Maralik CP pool.

Garbage. The garbage collection bins are installed near the construction sites, Maralik Concrete plant area and near the sub-contractors mobile houses. All the garbage was removed to the Maralik landfill based on the contract with the community.

Issues registered during the reporting period presented in the Annex C

Semi-annual environmental monitoring report Armenia: North-South Road Corridor Investment Program, Tranche 3 Talin-Lanjik Section



Մասնագիտացված անհատներ կամ օրգանիզմներ, որոնք կատարում են միջավայրի մոնիթինգի աշխատանքները

Գործարարի (կամ օրգանիզմի) անունը	Հասցե, ՀՀ-ի մարզ, քաղաք	Կապի անձի անունը	Հեռախոսի համար	Էլ. փոստ
ՀՀ-ի միջավայրի պաշտպանության նախարարություն	Երևան, ՀՀ	Մարտիրոս Գևորգյան	010 555 55 55	info@minram.am
ՀՀ-ի միջավայրի պաշտպանության նախարարության տնօրենի օգնական	Երևան, ՀՀ	Լիլիթ Գևորգյան	010 555 55 55	lilit.gevorgyan@minram.am
ՀՀ-ի միջավայրի պաշտպանության նախարարության տնօրենի օգնական	Երևան, ՀՀ	Լիլիթ Գևորգյան	010 555 55 55	lilit.gevorgyan@minram.am

Միջավայրի մոնիթինգի աշխատանքների արդյունքների մանրամասնումները

Դիտարկման օր	Դիտարկման վայր	Դիտարկման արդյունքներ	Դիտարկման արդյունքների մանրամասնումներ
1	Երևան, ՀՀ	Դիտարկման արդյունքներ	Դիտարկման արդյունքների մանրամասնումներ
2	Երևան, ՀՀ	Դիտարկման արդյունքներ	Դիտարկման արդյունքների մանրամասնումներ
3	Երևան, ՀՀ	Դիտարկման արդյունքներ	Դիտարկման արդյունքների մանրամասնումներ
4	Երևան, ՀՀ	Դիտարկման արդյունքներ	Դիտարկման արդյունքների մանրամասնումներ
5	Երևան, ՀՀ	Դիտարկման արդյունքներ	Դիտարկման արդյունքների մանրամասնումներ
6	Երևան, ՀՀ	Դիտարկման արդյունքներ	Դիտարկման արդյունքների մանրամասնումներ
7	Երևան, ՀՀ	Դիտարկման արդյունքներ	Դիտարկման արդյունքների մանրամասնումներ
8	Երևան, ՀՀ	Դիտարկման արդյունքներ	Դիտարկման արդյունքների մանրամասնումներ
9	Երևան, ՀՀ	Դիտարկման արդյունքներ	Դիտարկման արդյունքների մանրամասնումներ
10	Երևան, ՀՀ	Դիտարկման արդյունքներ	Դիտարկման արդյունքների մանրամասնումներ
11	Երևան, ՀՀ	Դիտարկման արդյունքներ	Դիտարկման արդյունքների մանրամասնումներ
12	Երևան, ՀՀ	Դիտարկման արդյունքներ	Դիտարկման արդյունքների մանրամասնումներ
13	Երևան, ՀՀ	Դիտարկման արդյունքներ	Դիտարկման արդյունքների մանրամասնումներ
14	Երևան, ՀՀ	Դիտարկման արդյունքներ	Դիտարկման արդյունքների մանրամասնումներ
15	Երևան, ՀՀ	Դիտարկման արդյունքներ	Դիտարկման արդյունքների մանրամասնումներ



5 FUNCTIONING OF THE SEMP

5.1 SEMP Review

The Contractor has mainly complied with all the requirements set in SEMP's/CEMP. Effectiveness of the SEMP's/CEMP considered as high level, changes are not needed.

No new SEMP's prepared during the reporting period;

Detailed information about the SEMP's is presented in the Annex B.

6 GOOD PRACTICE AND OPPORTUNITY FOR IMPROVEMENT

6.1 Good Practice

Nothing to report for the current period.

6.2 Opportunities for Improvement

New Manual provided by the ADB might be one of the necessary tools to improve the overall safeguard management of the Project. Contractor and Engineer staff should be trained accordingly to comply with the new requirements of reporting. If possible, the involvement of the international specialist could be a very important thing for having the anticipated result.

7 GRIEVANCE REDRESS MECHANISM

7.1 Grievances

6 complaints lodged during the reporting period. 2 of them was land damage issues during the construction activities that has been compensated and the land plot restored up to the initial state. 2 access issues recorded and 1 land alienation request received that is under revision.

Status of the complaints lodged by APs during the reporting period

No.	Community	AP name	Date issue raised	Description of the issue	Status of the issue
1	Mastara	Karine Malkhasyan	July 17, 2019	Land damage Contractor corrected the damaged land	CLOSED Satisfaction letter available
2	Mastara	Susanna Manukyan	July 17, 2019	Land damage Initially an agreement was achieved that contractor will restore the land but afterwards the AP changed her mind and didn't allow contractor to conduct corrective actions	UNDER REVISION
3	Mastara	Hermine Gabrielyan	August 28, 2019	Access Issue AP complains that she has lost an access to her private land plot and requested either provide the permanent access or alienate her land	UNDER REVISION
4	Mastara	Mukuch Torosyan	August 13, 2019	Land alienation AP claimed that his land is alienated partially and the use of the remaining part is not possible. He requests to alienate the rest of the land	UNDER REVISION
5	Lanjik	David Minasyan	September, 2019	Access Issue The Head of Lanjik community logged a complaint that any access road to the underpass for agricultural machinery at KM 87+	UNDER REVISION

No.	Community	AP name	Date issue raised	Description of the issue	Status of the issue
				325 is not provided and requested provide an access road.	
6	Mastara	Harutyun Sargsyan	November 12, 2019	<u>Land damage issue</u> AP complaint that his land plot was damaged by the construction activities and requested compensate and restore	CLOSED The damage was compensated and the land plot restored up to the initial state. Satisfaction letter is available

8 SUMMARY AND RECOMMENDATIONS

- During the reporting period the program has ensured the compliance of Project activities to the national legislation such as Contractor's regular environmental reports submitted to RA MNP in accordance with Armenian legislation: 4th quarter of 2018, 1st quarter of 2019 and annual statistic report for 2018; all necessary communication with local (communities) and territorial administrative authorities (marzes) took place, as well as permits and approvals obtained for any use of territories and roads outside of RoW.
- Also, the compliance with the requirements of ADB environmental safeguard was ensured such as Contractor's environmental management plans, approval of Site-specific Environmental Management Plans containing the identification of site-specific environmental impacts, risk assessment and mitigation measures by the Project in pursuance of ADB SPS (2009) requirements on information disclosure and public participation, ADB conducted review missions to check compliance of the Program activities
- Environmental safeguard reviews were conducted within ADB audit mission. All recommendations were taken into account.
- Grievance redress mechanism has been established in all communities where construction works have been implemented. Preconstruction public consultation and other regular communication with impacted communities took place and the proper functioning of grievance redress mechanism in all communities regularly checked.
- Project related issues were regularly communicated with the environmental specialists of TPIO and Engineer, as well as Contractor's management and environmental team.
- All generated suitable subsoil was re-used for embankment. Asphalt waste is not generated during the reporting period.
- Currently 11 of topsoil and dump sites are in use (see Annex B). New quarries or borrow sites for material were not opened.
- During the reporting period only one borrow pit site has been used at km 86+400. The Contractor submitted revised version of site reinstatement plan that is under revision of Engineer.
- Ambient measurements of dust, noise and vibration were performed during the reporting period except November and December months, because of bad weather conditions and because construction activities have not been conducted near sensitive receptors.

ANNEX A: Photos of construction process









ANNEX B: Status of SEMP's for Tranche 3, Talin-Lanjik Section and operation of the sites as of December 31, 2019

No	Name of site	Pk Km	SMP approved (Y/N)	Status of operation		
				Temporarily stopped	Currently being operated	Operation not started
Topsoil sites (TSS)						
1	Mastara-7 TSS	76+600	Y/ SEMP is approved on November 6, 2017			
2	Mastara-4 TSS	80+800	Y/ SEMP is approved on October 12, 2017	The site is closed		

3	Mastara-1 TSS	81+200	Y/ SEMP is approved on October 12, 2017			
4	Mastara-5 TSS	85+200	Y/ SEMP is approved on October 12, 2017			
5	Lanjik-4 TSS	87+000	Y/ approved on January 13, 2017			
6	Lanjik- 1TSS	87+300	Y/ approved on January 13, 2017			
Excavated subsoil dump sites (DS)						
7	Talin -3 DS	72+750	Y/ approved on March 13, 2018			
8	Mastara-6 DS	79+500	Y/ approved on July 27, 2018			
9	Mastara-3 DS	80+800	Y/SEMP is approved on October 24, 2017			
10	Mastara-2 DS	82+300	Y/ SEMP is approved on October 24, 2017			
11	Mastara-9 DS	83+000	Y/ approved on July 27, 2018			
12	Lanjik-5 DS	87+200	N/ rejected			
13	Lanjik-2 DS	88+500	Y/ approved on March 9, 2017			
Sites for borrowing subsoil for embankment (BP)						

14	Mastara-BP-1	86+400	Y/ approved on March 13, 2018			
15	Lanjik	87+500	No			
Temporary storage of subsoil						
16	Mastara	79+600	Yes/ approved on Nov 30, 2018			
17	Mastara	80+000	No	removed		
18	Maralik	next to CP	Yes/ approved on Dec 17, 2018 Approval is withdrawn	removed		
Concrete and Asphalt plants						
19	Maralik CP		Y/conditional approved on March 9, 2017/ update requested			
20	Maralik AP		No/ SEMP requested			
Crasher machine area (CM)						
21	Mastara	79+500	Y/ approved on May 4, 2018	Site closure report is not provided		
Construction camp (CC)						
22	Maralik		Y/ approved on March 9, 2017			

ANNEX C: Minor Non-compliances Detected During Monitoring Visits in Reporting Period

	Reference	Requirement	Action to date	Action required/comment
1.	Insufficient condition at the workshop of Maralik Construction Camp	The proper maintenance should be organised at the workshop of Maralik camp. Clean and undertake pollution preventive maintenance of trucks, especially the concrete covered surface.	Improved partially	Some improvement still needs to be done.
2.	Some of the trucks were overloaded and not covered entering public roads	Trucks entering the public road loaded with earth or bulked material shall be covered	Partially improved	The Contractor shall follow the instruction otherwise non-compliance shall be issued
3.	Insufficient sanitary conditions for workers in the construction sites	Adequate toilets, water as well as proper lunch facilities need to be provided	Partially improved	The Contractor shall follow the instruction otherwise non-compliance shall be issued
4.	Leakages of oil and fuel	Ensure Leakage managed immediately in accordance with SEMP	Partially improved	The workshop area in the construction camp was cleaned. The Contractor shall follow the instruction otherwise non-compliance shall be issued
5.	Insufficient water spraying as a dust control measure	Ensure proper dust control increasing frequency of water sprinkling	Partially improved	The Contractor shall follow the instruction otherwise non-compliance shall be issued
6.	The stones scattering into the private areas, as well as on the road	Ensure community safety and compensate the damage to the land	Partially improved	Contractor periodically clean the areas where the collapse is unavoidable. Compensations were

		owners after land restoration		provided to the affected persons. The Contractor shall follow the instruction otherwise non-compliance shall be issued
7.	Topsoil mixed with unsuitable material at the dump and topsoil stockpiling sites	Place material separately at the relevant sites. Remove all the not properly placed waste and topsoil, train the drivers accordingly on the topsoil and waste management	Partially improved	Contractor has removed some of the material, but some improvement still needs to be done.

ANNEX D: Summary of Noise, Dust and Vibration Measurement Results

Measurement results

Measuring results for each measurement point are presented in testing protocols and summarized in Tables for noise, dust and vibration accordingly.

Noise, vibration and dust assessment report data

Table 1: Results of noise measurements made at sensitive points during the reporting period compared with baseline noise measurements made on 2016.

Measurement results

Measuring results for each measurement point are presented in testing protocols and summarized in Tables for noise, dust and vibration accordingly.

Noise, vibration and dust assessment report data

Table 1: Results of noise measurements made at sensitive points during the reporting period compared with baseline noise measurements.

Measurement time (from - till)	Sound level (equivalent to sound level), LAeq, dBA		Maximum sound level, LAmax, dBA		Threshold limit value (equivalent sound level), dBA	Threshold limit value (maximum sound level), dBA
	operational (31.08.18)	baseline ¹ (30.11.16)	operational (31.08.18)	baseline ³ (30.11.16)		
Km 71+150 - 90+200 (Talin-Lanjik section)						
№1 (Km 87+300)						
July, 2019						
Average value	65.2	58.9	84	76.6	55	70
№1 (Km 87+300)						
August, 2019						
Average value	68.2	58.9	82.6	76.6	55	70
Km 71+150 - 90+200 (Talin-Lanjik section)						
№4 (Km 78+500)						
July, 2019						
Average value	69.2	57.6	86.6	70.9	55	70
September, 2019						
Average value	59.7	57.6	74	70.9	55	70

Table 2: Results of dust measurements made at sensitive points during the reporting period compared with baseline noise measurements.

Measurement time (from- till)	Dust actual concentration, mg/m ³		Maximum permissible concentration (MPC) for dust, mg/m ³	
	operational	baseline	Daily average (IFC norm is 0.025 for PM 2.5 and 0.05 for PM 10)	Maximum value
Km 71+150 - 90+200 (Talin-Lanjik section)				
№1 (Km 87+300), PM2.5				
July, 2019				
Average value	0.018	0.005	0.035(0.025)	0.16
August, 2019				
Average value	0.02	0.005	0.035(0.025)	0.16
№1 (Km 87+300), PM10				
July, 2019				
Average value	0.047	0.012	0.06(0.05)	0.3
August, 2019				
Average value	0.041	0.012	0.06(0.05)	0.3
№2 (Km 85+000), PM2.5				
July, 2019				
Average value	0.018	0.007	0.035(0.025)	0.16
August, 2019				
Average value	0.019	0.007	0.035(0.025)	0.16
September, 2019				
Average value	0.003	0.007	0.035(0.025)	0.16
October, 2019				
Average value	0.03	0.015	0.035(0.025)	0.16
№2 (Km 85+000), PM10				
July, 2019				
Average value	0.036	0.015	0.06(0.05)	0.3
August, 2019				
Average value	0.042	0.015	0.06(0.05)	0.3
September, 2019				
Average value	0.003	0.015	0.06(0.05)	0.3
October, 2019				
Average value	0.017	0.005	0.06(0.05)	0.3
№4 (Km 78+500), PM2.5				
July, 2019				
Average value	0.027	0.015	0.035(0.025)	0.16
September, 2019				
Average value	0.005	0.015	0.035(0.025)	0.16
№4 (Km 78+500), PM10				
July, 2019				
Average value	0.048	0.031	0.06(0.05)	0.3
September, 2019				
Average value	0.005	0.031	0.06(0.05)	0.3

№8 (Km 80+000), PM2.5				
July, 2019				
Average value	0.023	0.005	0.035(0.025)	0.16
August, 2019				
Average value	0.02	0.005	0.035(0.025)	0.16
September, 2019				
Average value	0.003	0.005	0.035(0.025)	0.16
№8 (Km 80+000), PM10				
July, 2019				
Average value	0.046	0.011	0.06(0.05)	0.3
August, 2019				
Average value	0.04	0.011	0.06(0.05)	0.3
September, 2019				
Average value	0.003	0.011	0.06(0.05)	0.3
October, 2019				
Average value	0.017	0.011	0.06(0.05)	0.3

Table 3: Results of vibration measurements made at sensitive points during reporting period
(baseline vibration measurements)

Measurement time (from - till)	Vibration category	Corrected and equivalent corrected values, dB				TLV* for corrected and equivalent corrected values, dB
		operational		baseline		
Km 90+200 - 117+670 (Lanjik-Gyumri section)						
№1 (Km 87+300)						
Average value	transport- technological (2nd category)	30.07.19		30.11.16		109
			76.3	Ave	0	
№1 (Km 87+300)						
Average value	transport- technological (2nd category)	30.08.19		30.11.16		109
			75.4	Ave	0	
№4 (Km 78+600)						
Average value	transport- technological (2nd category)	30.07.19		30.11.16		109
			71.8	Ave	0	
№4 (Km 78+600)						
Average value	transport- technological (2nd category)	30.09.19		30.11.16		109
			68	Ave	0	

Conclusion

- 1) The main noise source in all measurement points is operation of construction equipment (excavator, bulldozer) and movement of heavy vehicles along the highway.
- 2) PM2.5 and PM10 (dust particles of 2.5um and 10um accordingly) actual concentrations in all dust measurement points (№1, №2, №4 and №8 of Talin-Lanjik section) don't exceed the daily average and maximum permissible concentrations (MPC) for residential areas set by the RoA Government Decree №160-N "Norms of maximum permissible concentrations of atmospheric air pollutants in residential areas".
- 3) According to the results of vibration instrumental measurements, no significant vibration exposures were detected near the all vibration measurement points (№1 and №4 of Talin-Lanjik section).

Table 4: Comparison of the local standards with international (IFC performance guidelines)

• **Dust**

№	Name of substance	Maximum Permissible Concentration (mg/m ³)		
		National Max	National Daily average	IFC 24 hour
1	PM2.5	0.16	0.035	0.025
2	PM10	0.3	0.06	0.05

•

• **Noise**

№	Premises and territories	National	IFC
		Norms (equivalent to sound level), dBA	TLV (equivalent, one hour), dBA
1	Workplace	80	85
2	Shops trading halls, airport and railway stations waiting rooms, drop-off points of public service providers	60	70
3	Territories adjacent to residential buildings, clinics, ambulatories, rest houses, care homes, disabled persons homes, libraries, kinder gardens, schools and other educational facilities	55	55

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• **Vibration**

No	Whole-body vibration	National norms for corrected and equivalent corrected values, dB(A)	IFC Maximum LA _{max} , fast, dB(A)	IFC, Equivalent level LA _{eq} , 8h, dB(A)
1	Transport-technological (2nd category)	109		
2	Heavy Industry (no demand for oral communication)		110	85

Map of measurement points and locations



ANNEX E: Correction Action Plans

Status of CAP for the ADB Mission note for the site visit on July 31, 2019

N	ADB Mission remarks	ADB Mission request	Contractor's corrective action status	Engineer's action
1	<p>Contractor rented a new private area near crushing plant near Mastara community for the temporary accumulation of construction materials. The Contractor has removed the topsoil from that site and accumulated around the rented land plot. However, the buffer zone between accumulated topsoil and construction material not kept, Now gravel and topsoil were mixed, which will result in deterioration of topsoil quality.</p>	<p>Immediate action should be taken by the Contractor to clean topsoil from crushed material and proper establishment of borders between topsoil accumulation site and construction material storage site.</p>	<p>Corrected partly</p> <p>Contractor has removed the topsoil from one side of the storage and stockpiled in another place</p>	<p>Contractor is requested remove also from the opposite side of the storage and preserve keeping safe buffer zone between the storage of material and the topsoil.</p> <p>Contractor started to remove topsoil; the process is ongoing.</p>
2	<p>Occupational safety issues observed at the construction site, in particularly workers working in the overpass are not following safety requirements. They were working on a high wall of the overpass</p>	<p>Correct the safety situation</p>	<p>Not corrected</p>	<p>Repeated request on correction</p>

	and did not use scaffolding, ladders, proper personal protective equipment, etc.			
3.1	In Mastara borrow pit site there is a vast pit and it is not understandable if the Contractor has excavated the exact volume indicated in the SEMP.	The monitoring of excavated material should be appropriately implemented and registered.	Contractor has submitted the revised version of Site- restoration plan that is under revision of Engineer.	Excavated volumes are requested from Contractor
3.2	At the same time, there were mentioned rolled stones from the site on surrounded land plots	Those should be cleaned by the Contractor.	Corrected partially	Contractor has compensated the damage of one of impacted land plots
3.3	Also, from the site was leakage of mud to the nearby wheat field and the harvest was damaged, The Contractor is going to compensate the owner.	Protection measures should be implemented beforehand instead of seeking post-situation solutions	Corrected partly One of the impacted land plots was compensated and satisfaction letter received from owner Another owner was offered a compensation but he refused because disagree with the offered money compensation sum.	Repeated request on correction

			Protection measures are not implemented but are discussed with Contractor's engineer's	
4	The established information board in the tree planted area in Talin community is indicating only the name of sub-contractor (Armenian tree project) as a party who established the park	As the tree planting implemented under the NSRCIP project, it is advisable to add also information regarding project and titles of implementing agencies on the information board	Corrected	N/A
5	Carriageway near Mastara community should be cleaned from stones, Otherwise, it will create a dangerous situation for traffic	Clean from the stones	Corrected The carriage way next to Mastara community was cleaned from the stones immediately	N/A
6	Removed contaminated soil layer deposited in a pile in the Maralik construction campsite. The Contractor should adequately deal with it following ADB's recommendations	wrap in a thin layer and mix from time to time	Corrected The contaminated soil is removed to remediation area, layed in a thin layer, mixed from time to time and after drying is removed to machinery workshop area to use as an absorbent material	All the contractor's actions were under the Engineer's control. Correction was checked during the site visits.

7	All trucks should use covers during transportation of construction materials by the road.	Correct	Not corrected	Repeated request on correction
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CAP implementation photos

Area for treatment of contaminated soil



Contaminated soils is cleaned to remediation area



Contaminated soil removed to temporary treatment site



Contaminated soil treated



	
<p><i>Secondary container</i></p>  	<p><i>Lanjik Borrow Pit fencing</i></p> 
<p><i>Re-fuelling area covered with gravel</i></p> 	<p><i>Trees area cleared from material</i></p> 

Damage compensated



Damage compensated



Topsoil removal



Topsoil removal

