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# **Semi-annual Environmental Monitoring Report**

Kyrgyz Republic:  
CAREC Transport Corridor 3 (Bishkek-Osh Road)  
Improvement Project, Phase 4

Prepared by Ministry of Transport and Road KR  
in consort with EPTISA Servicios De Ingeniería S.L.  
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## PREFACE

Since construction work involving any sort of environmental impact did not start until mid June 2017, this, the first semi-annual environmental audit covers the period between June and December 2017, roughly 6 months after construction work began.

The Construction Environmental Management Workplan (CEMWP) was prepared by EPTISA in July 2017 since, at that time, the contractor had no technical expertise to complete this work. It is included in this report as Annex 1. Based on comments by several people, it was fully revised in September, focusing more on site-specific items, and two training sessions on its use were provided to the contractor and IPIG. The contractor's environmental monitor has now implemented that plan, and the 2nd monthly Environmental Compliance Monitoring Checklist has been submitted to EPTISA.

Since July 31st, weekly written monitoring reports have been prepared by EPTISA and are on file for review by IPIG and ADB. There are now 8 such reports<sup>1</sup>. As of October 1st this reporting has been reduced to monthly, although the national specialist continues to inspect the site 2-3X/week. Monitoring reports for September, October and November are attached and serve as an excellent record of the work undertaken.

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Dec 15, 2017

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<sup>1</sup> During the three ADB missions since July, these reports were tabled and offered for review to ADB and ADB's consultant, yet none were requested or reviewed.

## 1 INTRODUCTION

1. This is first “semi annual” environmental audit report, reporting on environmental issues, mitigation and monitoring activities by the contractor as well as the construction supervision consultant EPTISA. Since construction, other than preparation of the contractor’s office site, did not start until June 2017 this report focuses on the period from late may through December 2017.

2. This report is based on dozens of field visits between June and December 2017 by the international and national environmental specialist focusing monitoring compliance with the tree cutting operations, noise, vibration, borrow site operations, traffic management, bridge and culvert construction occupation and environmental health and safety and other areas.

3. The contractor, China Railway No. 5 Engineering Group Ltd., began preparing its field office in late April on an abandoned industrial site in Sokuluk at around km 46 of the project road. This has been the only construction activity-taking place, until June 20<sup>th</sup>, when removal of trees from the roadside between Km 45.6 and km 51.6, referred to as Section No. 3, began. Since then, the preparation of the subgrade for the two additional lanes has been largely completed for Section 3.

4. The international environmental specialist (IES) arrived on June 3<sup>rd</sup> and, using the IEEs EMP, prepared the Construction Environmental Management Work Plan (CEMWP)<sup>2</sup> and has provided two briefing/training sessions to the contractor’s, environmental monitoring specialist on its content and use. He also prepared a compliance-monitoring checklist for the contractor to use. Thirdly, ADB requested an update on the air, water and noise quality data, last collected in 2015 and included in the final IEE. That work was also completed and has been added to the updated IEE, which is under preparation until the vibration study is complete.

5. A noise modeling exercise has been complete and the final report was submitted in draft form to IPIG on Nov. 30<sup>th</sup>, 2017. A summary of key findings is included in the body of this report. The official full report was sent to IPIG as a soft and hard copy document on Dec.1<sup>st</sup>.2017.

### 1.1 Project Location and Basic Design

6. The project site is located between Bishkek and Kara-Balta and lies between 15.5 km and 61 km of the Bishkek-Osh road. The existing road is asphalt-concrete; the width of the pavement is between 15-20 m, with a median of 2-4 m. The shoulder widths vary from 1.5 to 3.0 m. The project road section stretches to the west from Km 15.9 to the outskirts of Kara-Balta, passing through several small settlements alternating with agricultural lands. The configuration of the carriageway is four then three-lane, which around km 24 reduce to two-lanes. The pavement width of the two-lane section is between 8-12 m, with shoulders another 1.5-3.0 m. The villages along the road merge into a relatively continuous urban strip. At km 61, at the traffic roundabout, the Bishkek-Osh road turns to south, and marks the end of the project.

7. The terrain across the site can be classified as a foothill plain with a height of 750-800 m above sea level and steadily gaining altitude southward toward the Tian Shan mountain range.

8. The road re-design will be in compliance with KR laws and norms, becoming a 4-lane highway for the entire length to Kara Balta. This design will bring the geometric parameters of the road to the required KR category, increasing the radii of curvatures in the plan and longitudinal profile.

9. In order to improve drainage, the work includes reconstruction of the degraded culvert system and addition of new cross drainage structures. Existing bridges will also be almost

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<sup>2</sup> This is a task usually assigned to the contractor, forcing the staff to familiarize themselves with the IEE and EMP.

totally replaced. Finally, more the 64 km of sidewalks, a number of pedestrian crossings and livestock underpasses, junctions and bus stops will be rehabilitated and/or newly built.

10. As of December 1st 2017 construction is underway start in the following three sections:

- Section 2: km 35.5-40.58 (5.08 km)
- Section 3: km 45.6-51.6 (7 km), and
- Section 4: km 54.20-59.35 (5.15 km)

11. This work has included, tree clearing and preparation of the subgrade surfaces for the additional lanes, replacement of culverts, as well as the start of the set up of the materials processing facility in the Ak Suu 2 borrow site. The bridge across the Dzhelamys River, located in Section 1, is also under construction, with work stopping for the winter on Nov. 30th

## 1.2 The Road Sections

12. Due to serious resettlement issues and the need to address these before commencement of construction the sequence of construction activity was planned such that areas with no or minor resettlement issues would be worked on first. The sequence of work as of Dec. 2017 is Section 3, 4, 1 and 2. Construction on Section 3 began in late June with tree removal followed by the preparation of the subgrade for two new lanes on either side of the existing road plus the replacement of most culverts in that section. The culvert replacement remains ongoing.

13. Further the bridge across the Dzhelamys River, located in Section 1 is being replaced with construction 30% completed (by a subcontractor).

14. In addition a further four sections were delineated and will be worked on after the first set are well underway and resettlement issues have been addressed in Sections 5-8 (Table 1)

Table 1. Bishkek-Kara Balta Road Sections and Sensitive Receptors

<b>Construction 2017 onward</b>	<b>Sensitive Receptor No.</b>
Section 1a Km 15.900 - 21.300	4
Section 2 Km 35.500 - 40.580	11
Section 3 Km 45,600 - 51,600	13
Section 4 Km 54.200 - 59.350	14, 15
<b>Construction 2018-onward</b>	
Section 5 Km 21.300 - 35.500	5,6,7,8,9,10
Section 6 Km 40.580 - 45.600	12
Section 7 Km 51.600 - 54.200	None
Section 8 Km 59.350 - 60.926	16

## 1.3 Sections 1-4

### 1.3.1 Section 1: Km 15-21

15. The section passes through the territory of Gavrilovsky and Shopokovsky districts and reaches the Gavrilovka village, Shopokov town and Romanovka village.

16. From the sensitive receptors (SR) on the section there is SR-04 Gavrilovskiy home and SR-05 the kindergarten (21.5 km) and SR-05.

17. There are 43 culverts crossing the road and all will be replaced. There are 14 1.5m Ø 1.5m units and 29 0.8 Ø units. Sixteen bus stop points, 14 at-grade pedestrian crossings and one underground pedestrian crossing will be built.

18. There is a reinforced-concrete road bridge on the section across the Dzhelamys River located outside the village at chainage 17.9 km. Length of the bridge is 17.95 m. The main design solution for the reconstruction of this bridge is the reconstruction of the existing buried abutment the sides and the reinforced concrete deck sitting on a reinforced concrete skirt (unburied abutment instead of asphalt).

19. To prevent the pollution from the roadway of the bridge, the project provides for the diversion of water beyond the bridge, by means of a drainage device with a sediment basin for cleaning surface runoff (Annex 14 for detailed guidelines). However, this waterway has water for only about 2-3 months of the year and work is planned only when the waterway is dry.

20. Around 762 trees were scheduled to be cut, but due to minor sidewalk realignments 18-20 trees were saved leaving around 742 trees to be removed.

### **1.3.2 Section 2: Km 35-40.5**

21. The section passes through the territory of Sadovoe village and Sadovoe district. There is only one sensitive receptor in this section, namely SR-11 the Miroshnichenko Secondary School and numerous roadside tree plantings.

22. 19 culverts crossing the road will be replaced on the section: Ø - 0.8 m - 15 units; Ø 1.5 m - 4 units, Ø 2.0 m - 1 unit. Twelve new bus stops, 10 pedestrian overpasses and 2 underground pedestrian crossings will be built.

23. The tree count resulted in 621 trees scheduled for cutting and with careful planning of the sidewalks on both the north and south side of the road, around 64 trees were saved bringing the number to be cut to 557.

### **1.3.3 Section 3: Km 45-51**

24. The section passes through Petrovsky District in the Petrovka village. In this section there is the Petrovskaya secondary school, a sensitive receptor-SR-13. This section has a large number of trees scheduled, which will be cut down. The roadside tree count indicated that about 1105 trees were to be cut (Annex 10 for replanting specifications). All trees were marked on a road alignment map. Further, tree cutting for the sidewalk alignment was reduced marginally.

25. Twenty large culverts with diameters of 0.8 m - 14 units; 1.5 m - 6 units; and 2 m - 1 unit; and 38 0.5 m diameter culverts need to be replaced at the side ramp from the road.

26. Fourteen bus stops and 15 at-grade pedestrian crossings consisting of amber lights and road painting will also be installed.

### **1.3.4 Section 4: Km 54-59**

27. This section of the road passes through the villages of Novonikolaevka, Petropavlovka and Poltavka of the At-Bashatsky, Kyzyl-Dyikansky and Poltavsky Districts. In terms of sensitive receptors there is SR-14 and SR-15 the Petropavlovskaya (Km 57.1) and Novo-Nikolaevskaya (Km 59.55) secondary schools respectively. Also, along the entire length of the section, there are about 739 trees to be cut, reduced by 24 trees due to the realignment of the sidewalks. All trees to be cut were marked with a blue X and recorded on a tree alignment map.

28. Twenty-one culverts are to be replaced in the section: Ø - 0.8 m - 11 units; and Ø 1.5 m - 9 units. In addition, 46 culverts Ø 0.5 m at the side ramps from the road are going to be laid.

29. Twelve bus stops, 9 at-grade crossings with amber flashing lights and 2 underground pedestrian crossings are going to be installed.

30. A site for temporary storage of trees being cut and root remains is located in Petropavlovka Village away from the road and is there by permission of the district officials.

## **1.4 Project Objective, Rational and Environmental Classification**

31. The objective of this project is to provide a larger roadway, permitting traffic to flow from Bishkek to Kara Balta and beyond without serious capacity related delays, and achieve this without significant negative environmental and social impacts.



32. The ADB's classification of this project was B, and as such an Initial Environmental Examination was prepared, the first time in 2014, minimally revised in 2015, and with a major revision and updating in 2017.

### **1.5 Project Status**

33. While this project has been around since at least 2013 it was restarted in 2015, stopped in 2016 and reactivated in March 2017 and fully implemented in May of 2017. Preconstruction environmental work involved converting the IEE's Environmental Management Plan (EMP) into a Construction period work program defined as the Construction Environmental Management Workplan (CEMWP) and providing training on CEMWP implementation and monitoring to the contractor and IPIG. Weekly and monthly compliance monitoring has been ongoing since June 2017, with written weekly and monthly reports on file with EPTISA and MOTR (see '09, '10 and '11 monthly monitoring reports in Annex 3 of this report).

34. The project is now considerably delayed due to various issues involving mostly safeguard non-compliance matters and the contractor's inability to implement environmental clauses in the contract specifications and the CEMWP.

35. With the first construction season over, the contractor is approximately one construction season behind, with the major work of replacing the old road surface starting only in April of 2018.

### **1.6 Environmental Mitigation and Monitoring Requirements and Responsibilities**

36. This project involves the upgrading of 45 km of a heavily used national highway and ADB classified it as B, requiring an IEE. This was prepared, approved and is being update. The following additional items were required by ADB. Normally, the standard IEE requires only secondary data assembly. For this project, three years of data have been collected and two more are likely.

### **1.7 The Construction Environmental Management Workplan**

37. The Contractor's contract specifications state that a workplan, based on the IEE's EMP must be prepared and approved by the Construction Supervision Consultant (CSC- or EPTISA) prior to the start of work. This work forms the basis of all mitigation and monitoring activity, taking place during the construction and operating period.

38. The CEMWP is being implemented through actions by the contractor that either prevent serious negative impacts from taking place or mitigating them such that the effects are acceptable, namely within KR national standards, and comply with ADB guidelines.

#### **1.7.1 Topic-Specific Guidelines**

39. In addition to the CEMWP, the IEE and its EMP, the ADB required EPTISA to prepare additional specific guideline, on behalf of the contractor, as follows:

Annex 1 Emergency Management Plan

Annex 2 Grievance Redress Mechanism

Annex 3 Plan For Safety, Health And Hygiene

Annex 4 Management Plan For The Life Of The Construction Camp

Annex 5 Waste Management Plan

Annex 6 Noise Management Plan

Annex 7 Old Asphalt Management Plan

Annex 8 Water Quality Management Plan

Annex 9 Air Quality Management Plan

Annex 10 Tree Management Plan (Separate Report)

Annex 11 Dust Suppression Plan

Annex 12 Land Protection Management Plan

Annex 13 Environmental Protection Plan For The Construction And Reconstruction Of Bridges

Annex 14 Borrow Pit Management Plan

40. These annexes have been cross-referenced to specific CEMWP actions and are to be used as additional guides when issues concerning this topic arise. For example there are existing issues concerning the bridge construction over the Dzhelamys River and at least one major non-compliance issue is that construction is taking place over the river when there is flowing water. This is restricted in the CEMWP and additional guidance is provided in Annex 13 on how to mitigate this. The contractor needs to understand and access these resources as needed.

41. **Tree Cutting and Replanting Plans-** ADB also required that Tree Management Plans<sup>3</sup> (Annex 10) be prepared for each of the four road sections. These included maps showing every tree to be cut, a tree inventory, species identification and a tree replanting schemes for each section (more than 300 pages of material), to be prepared before any work could begin and therefore coming before any knowledge of the landscaping requirements was available (construction had barely started). These plans were completed and have been approved.

### 1.7.2 EPTISA

1. EPTISA's ToR required that the air noise and water quality survey work be updated from 2015 to 2017, focusing on the same locations surveyed in 2015 and 2013, allowing for a better time series of data.
2. EPTISA's 2nd task was to assist the contractor with finding a suitable candidate to take on the work of construction monitoring, as a contractor's staff member;
3. EPTISA's 3rd task was to establishing some environmental credibility of the contractor in order that credible compliance monitoring and enforcement be undertaken. This meant that EPTISA would prepare the construction environmental management workplan (CEMWP), based on the EMP, and defining a step-by-step approach to implementing all significant environmental mitigation and monitoring activities measures defined in the CEMWP.
4. EPTISA's 4th major task was to design and implement a construction period air, noise and water quality monitoring program and report on this regularly; and finally.
5. EPTISA's 5th task is to prepare semi-annual environmental audit reports throughout the construction period; the first one will be submitted to IPIG on or about Dec. 11th- or 12th.
6. EPTISA's 6th task is to oversee all monitoring work and CEMWP implementation required of the contractor, make the contractor aware of non-compliance issues and work with the contractor and MOTR to resolve these deficiencies.

### 1.7.3 The Contractor

1. The contractors primary responsibility is to first review and understand the IEE, its EMP and the CEMWP derived from these documents and secondly to implement all mitigation and monitoring actions listed.
2. As defined in the contract specifications, the contractor is required to retain an environmental monitor for the duration of the construction period and the 1-year 'defect' period, whose duties are to make certain that the mitigation and

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<sup>3</sup> The 2015-17 IEE contained all details for replanting and even provision of tree species.

monitoring actions, as defined in the CEMWP are credibly implemented, and in a timely fashion.

3. The contractor must also retain a OHS specialist to focus on the many safety issues associated with the project
4. The contractor must also submit monthly reports to EPTISA and MOTR

#### **1.7.4 The Ministry of Transport and Road and IPIG**

42. As the proponent, MOTR's role is to oversee the communication between the contractor and EPTISA as well communication with ADB, on all compliance issues, making sure that reports regarding environmental safeguard issues are made known to the CEC and ADB.

43. MOTR's IPIG is also responsible for communication with KR's environmental safeguard agencies and insuring that national requirements such as the Ecological Passports are completed and permits to construct are issued.

## **2 MONITORING WORK COMPLETED TO DATE: DETAILS**

### **2.1 Updating the IEE's background data on air, water and noise quality**

44. In June 2017 EPTISA completed a full round of sampling for pre-construction air and water quality and noise level measurements at the same locations as completed in 2013 - 2015. The analysis and presentation of these data will be provided in an Annex to the updated IEE, the latter to be submitted after the Vibration Study (initiated in December 2017) has been completed. Further, the updated IEE includes a summary of the tree management and addresses the borrow pit operations as well as the sighting and operation of the aggregate processing plant, the concrete batch plant as well as the asphalt batch plant.<sup>4</sup>

45. In compliance with KR law an environmental analysis (referred to as an ecological passport) addressing the sighting and operations of these facilities, leading to permitting has been completed and is being reviewed by the responsible Kyrgyz agency. The Summary of findings of this report will be included in the updated IEE.

### **2.2 Preparation of the Contractor's Construction Environmental Management Workplan (CEMWP)**

46. On arrival in Bishkek in June 2017 the IES received a partially written environmental management plan which was considered non compliant, although containing much useful bits of information and sections prepared by the contractor's environmental monitor. This information was used to prepare the CEMWP. A separate social impact management plan was also prepared, but summarized in the CEMWP.

47. To prepare the CEMWP, the IES used all specifications dealing with environmental measures found in the contract documents as well as the IEE's EMP, then transformed these into a workplan for the contractor. Each mitigation measure has been numbered so that it can be easily referenced and a trail of all actions associated with that measure documented. As indicated earlier the 14 Annexes were also referenced with the relevant CEMWP tasks, such that they could easily be found if needed.

48. This CEMWP, which has been submitted to IPIG and ADB, is included as Annex 1 to this report.

### **2.3 Construction Mitigation and Monitoring**

49. Starting in June 2017, construction monitoring was initiated by EPTISA and the contractor's environmental monitor, by applying the IEE's EMP and addressing each relevant

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<sup>4</sup> As of Dec. 6th, 2017, the contractor has not provided any details on how the old asphalt will be processed and EPTISA is submitting a questionnaire concerning this, since how the processing is to be undertaken could have major environmental implications.

mitigation action. This work has continued with both weekly and monthly reports prepared and filed with MOTR and EPTISA.

50. In July 2017, the contractor also began to implement the mitigation measures defined in the CEMWP.

## 2.4 Capacity Building

51. Since June, EPTISA has provided three training sessions to the contractor IPIG and EPTISA's national environmental specialist on monitoring, the use of the CEMWP, the completion of the compliance monitoring checklist, the preparation of reports, and required responses to non-compliance notices to the contractor. A fourth training and briefing session on monitoring was delivered on Dec.5th, 2017.

## 3 ENVIRONMENTAL MONITORING

### 3.1 Baseline Measurements

52. Baseline measurements were conducted in 2013 and again in 2015. Given the long lag time between the completion of the environmental documents in 2015 and the implementation of the work in 2017 and new round of air, noise and water quality testing was completed in May 2017. A summary of these findings is presented in this audit report and in the updated IEE.

#### 3.1.1 Air quality Measurements

53. Air quality was measured at 16 sites (Table 2)<sup>5</sup> along the route, identified as being sensitive to air pollution, due to the proximity of schools, outdoor markets and other special facilities.

Table 2. Air Quality Sampling Stations, 2015

#	Station No (2013/2015). And Location
1	203/1 – Novopavlovka village (school #2)
2	204/2 – Novopavlovka village (market)
3	205/3 – Voенno-Antonovka village (school, no number)
4	206/4 – Voенno-Antonovka village (mosque)
5	New 5 - Gavrilovka village (kindergarten)
6	207/6- Gavrilovka village (dwelling house, 50, Frunze street)
7	New 7 – Shopocov town (school #2)
8	208/8 – Sokuluk village (market)
9	209 /9– Sokuluk village (school #2)
10	New 10 – Sokuluk village (housing estate)
11	210/11- Alexandrovka village (school #3)
12	211/12 – Belovodskoye village (market)
13	212/13 – Petrovka village (dwelling house)
14	213/14 – Poltavka village (school, no number)
15	214 /15– Petropavlovka village (school, no number)
16	215/16– Novonikolaevka village (school, no number)

54. The results for 2013 (Table 2) showed that KR standards for sulfur dioxide were exceeded in all locations and for carbon monoxide at nine of the 16 sampling sites, suggesting serious air pollution, along the corridor. Given the high level of traffic and commercial activity along the corridor, TSP for both 2013 and 2015 should be much higher than the highest concentration measurement of 0.0028 mg/m<sup>3</sup>. These measurements suggest alpine air in a pristine environment. These data are suspect and as such air quality was measured for the

<sup>5</sup> The sampling station numbers are confusing in that field measurements were taken at 16 sites when in fact on 13 are in the study area. In 2017 the project length was reduced by about 10 km after the air quality-testing plan was adopted, thus eliminating these stations.

3rd time in 2017. Nitrogen oxide levels were within standard requirements for 13 of the 16 monitoring stations.

55. In 2017 four parameters were monitored at the 16 stations sampled in 2015. Samples were taken at the same locations and approximately at the same time as in 2015. A listing of all numerical data collected is presented in Table 3.

56. **Carbon Monoxide (CO)**- Carbon monoxide levels as measured in 2013 exceeded maximum permissible concentrations (MPC) at six of 16 stations, whereas in 2015 (the year EPTISA began monitoring) only the Poltavka School station had a CO concentration of 13 mg/m<sup>3</sup> with a variation of only 0.25 mg/m<sup>3</sup>. The MPC for CO is 5 mg/m<sup>3</sup>, signaling a serious exceedance, especially at a school (Table 3). IPIG was made aware of this reading in the IEE. However, 2017 measurements at the same locations and at approximately the same time resulted in quite different results. All 16 stations had readings well below the 5 mg/m<sup>3</sup> MPC.

57. Since the two source of CO is from vehicle exhausts and from burning coal, and given that that the sensitive receptor >30m from the Edge Of Pavement is most likely that the reading is an anomaly or sampling error, given that the sampling method involves collection in plastic bladder, transport to a lab and then analysis. All of 2017 sample collection was supervised in the field by EPTISA, and none exceeded the MPC level.

Table 3. Existing ambient air quality within 100 meter of impact corridor, measured in 2013, 2015 and 2017 (mg/m<sup>3</sup>)

Station Number	Location**		Chainage From Bishkek (km)	CO			NO2			SO2			TSP		
	Name	Dist. From EOP (m)		2013	2015	2017	2013	2015	2017	2013	2015	2017	2013	2015	2017
1	Novopavlovka village (school)	33	9.9	6.5± 1.6	1.2± 0.24	0,4±0,08	<0.01	0.070  2017 0.018	0,023± 0,0058	3.2± 0.8	0.004± 0.001	0,004± 0,001	<0.1	1.6± 0.4	0,4±0,1
2	Novopavlovka village (market)		11.0	3.8± 0.95	2.3± 0.46	2,9±0,58	<0.01	0.079± 0.020	0,3± 0,075	2.3± 0.6	0.007±± 0.0018	0,009± 0,0023	<0.1	2.2± 0.6	0,5±0,13
3	Voenno-Antonovka village (school)	50	12.86	4.9± 1.2	1.2± 0.24	0,8±0,16	<0.01	0.018± 0.0045	0,22± 0,055	1.2± 0.3	0.002± 0.0005	0,007± 0,0018	<0.1	2.3± 0.6	0,5±0,13
4	Voenno-Antonovka village (mosque)	10	14.2	6.2± 1.6	1.6± 0.32	2,4±0,48	<0.01	0.041± 0.010	0,22± 0,055	1.2± 0.3	0.002± 0.0005	0,006 ±0,001 5	<0.1	0.24± 0.6	0,7±0,18
5	Gavrilovka village (kindergarten)	30	21.5	6.4± 1.6	1.0± 0.2	0,4±0,08	<0.01	0.002± 0.0005	0,037± 0,009	1.5± 0.4	0.002± 0.0005	0,003± 0,0008	<0.1	2.8± 0.7	0,8±0,2
6	Gavrilovka village (dwelling house, 50, Frunze street)	20	20.95		1.6± 0.32	0,4±0,08 0		0.063± 0.016	0,034± 0,0085		0.003± 0.0008	0,003± 0,0008		3.5± 0.9	0,5±0,13
7	Shopokov town (school)	20	22.33		1.6± 0.32	0,5±0,1		0.060± 0.015	0,18±0, 045		0.006± 0.0015	0,004± 0,001		1.6± 0.4	0,5±0,13
8	Sokuluk village (market)	10	27.15	10.4± 2.6	3.6± 0.72	0,9±0,18	<0.01	0.084± 0.021	0,042± 0,011	1.1± 0.3	0.009± 0.002	0,003± 0,0008	<0.1	2.0± 0.5	0,15± 0,038
9	Sokuluk village (school)	15	27.5	5.5± 1.4	2.1± 0.42	0,4±0,08	<0.01	0.057± 0.014	0,039± 0,01	1.1± 0.3	0.004± 0.001	0,004± 0,001	<0.1	2.0± 0.5	0,4±0,1
10	Sokuluk village (housing estate)	10	25.6		1.5± 0.3	0,5±0,1		0.055± 0.014	0,13± 0,033		0.003± 0.0008	0,004± 0,001		1.8± 0.5	0,3± 0,075
11	Alexandrovka village	80	30.5	5.6± 1.4	1.6± 0.32	0,4±0,08	<0.01	0.060± 0.015	0,034± 0,0085	1.6± 0.4	0.003± 0.0008	0,003± 0,0008	<0.1	1.8±0. 5	0,4±0,1
12	Belovodskoye village (market)	10	43.0	9.9± 2.5	4.2± 0.84	1,2±0,24	<0.01	0.081± 0.020	0,12±0, 03	1.1± 0.3	0.003± 0.0008	0,004± 0,001	<0.1	0.8± 0.2	0,3±0,07 5
13	Petrovka village (dwelling house)	10	51.0	2.5± 0.6	1.7± 0.34	0,6±0,12	<0.01	0.042± 0.011	0,042± 0,01	0.8± 0.2	0.002± 0.0005	0,003± 0,0008	<0.1	1.2± 0.3	0,9±0,23
14	Poltavka village (school)	30	55.0	2.6± 0.7	1.3± 0.26	0,3±0,06	<0.01	0.018± 0.005	0,038± 0,01	0.6± 0.2	0.001± 0.0003	0,004± 0,001	<0.1	1.6± 0.4	1,00,25

Station Number	Location**		Chainage From Bishkek (km)	CO			NO2			SO2			TSP		
	Name	Dist. From EOP (m)		2013	2015	2017	2013	2015	2017	2013	2015	2017	2013	2015	2017
15	Petropavlovka village (school)		57.1	2.3±0.6	1.5±0.3	0,1±0,02	<0.01	0.040±0.01	<i>0,032±0,008</i>	<i>0.8±0.2</i>	±0.003	0,003±0,0008	<0.1	1.3±0.3	0,3±0,075
16	Novonikolaevka village (school)		59.53	<i>7.3±1.8</i>	1.1±0.22	1,3±0,26	<0.01	0.030±0.008	<i>0,13±0,033</i>	<i>1.2±0.3</i>	0.002±0.0005	0,003±0,0008	<0.1	1.4±0.4	<i>0,7±0,18</i>
<b>Standard (MPC)</b>				<b>5</b>	<b>5</b>	<b>5</b>	<b>0.085</b>	<b>0.085</b>	<b>0.085</b>	<b>0.5</b>	<b>0.5</b>	<b>0.5</b>	<b>0.5</b>	<b>0.5</b>	<b>0.5</b>

Source: Consultant Measurement via Kyrgyz National Laboratory, 2015, 2017.

Note: numbers in italics indicate KR standard exceeded

58. **Nitrogen Dioxide (NO<sub>2</sub>)-** NO<sub>2</sub> is a by-product of the combustion of petrol from vehicles and any internal combustion engine. Therefore, roadside levels are generally at or exceeding the MPC levels for Kyrgyzstan, which is 0.085 mg/m<sup>3</sup>. The 2013 levels were all recorded as < 0.01 mg/m<sup>3</sup>. The 2015 results showed that none of stations had levels exceeding the MPC.

59. For 2017 seven of the 16 stations had NO<sub>2</sub> levels exceeding the MPC with the Novopavlovka Village market recording a 0.30 mg/m<sup>3</sup> reading. The market sees a great deal of slow moving traffic transporting goods to and from the market and therefore higher NO<sub>2</sub> level would not be unusual.

60. Further there was a direct correlation between distance from the Edge-Of-Pavement and NO<sub>2</sub> levels.

61. **Sulphur Dioxide (SO<sub>2</sub>)-** For 2013 SO<sub>2</sub> levels exceeded the MPC level at all 13 stations, while for 2015 and 2017 levels were all below 0.005 mg/m<sup>3</sup> (Table 3). This very large variation suggests sampling or analytical errors. . Construction period monitoring over a longer time period should provide a better indication of local SO<sub>2</sub> concentrations.

62. **Total Suspended Particulate Matter (TSP)-** TSP levels during the three sampling years varied enormously, with the most consistent being 2015 where all but the Voenno-Antonovka Village mosque site exceeded the MPC level of 0.5 mg/m<sup>3</sup>. These data suggest that background levels of TSP exceed Kyrgyz MPC and that dust control will be an important construction period mitigation measure.

63. Overall, the 2017 data suggest a reduction in emission for these four parameters. However given the wide variation for the three collection years, there is strong chance that sampling and analytical errors may be giving false results. For that reason the sampling will continue through the construction period.

### 3.1.2 Surface Water Quality Measurements

64. Surface water quality measurements were taken in July 2013 and April-May 2015, and again May 2017. In July 2013, the water quality measurements were conducted on only one stream (Table 4) in Belovodskoe village since the rivers and channels in the places of intersection with the road had no flow as the water was taken for irrigation purposes.

65. Sampling was done according to GOST P 51592-2000 «Water. General sampling requirements», WSS 33-5.3.01-85 «Instruction on sampling for wastewater analyses». Legislative requirements were observed.

Table 4. Water quality of the Belovodskoye Village stream

Parameter	Unit of meas.	July 5, 2013 Analysis data	MPC*	Regulatory document
pH		7.71	6.5-8.5	Economic Relations Council, p.1, M.1977
Clarity	cm	0.0	-	Economic Relations Council, p.1, M.1977
Conductivity	µs/cm	383	-	Economic Relations Council, p.1, M.1977
Suspended solids	mg/l	2346	0.2 to 0.75	Economic Relations Council, p.1, M.1977
Oil and grease	mg/l	Not measured	0.3	ERD F 14.1:2:4.128-98
Copper	mg/l	<0.0006	1.0	Methodical Instructions 08-47/091
Zink	mg/l	<0.0005	1.0	Methodical Instructions 08-47/091
Cadmium	mg/l	<0.0002	0.001	Methodical Instructions 08-47/091
Lead	mg/l	<0.0002	0.01	Methodical Instructions 08-47/091

\* NR 2.1.5.1315-03, MPC of chemical substances in water bodies of public and cultural general water use, Ministry of Health Protection, Russia, Moscow, 2003.



66. As with the 2013 data, the 2015 survey (Table 5) showed that the water in the rivers remains relatively clean and meets the KR Minimum Permissible Concentration (MPC) for non-potable water; used for irrigation purposes only.

67. Although these tests indicated that the rivers and canals had non-potable water suited for irrigation, and the flowing water occurred usually for only 2-3 months a year, construction period monitoring at the 3 river crossings will take place, once while construction is not taking place and later when construction is ongoing.

Table 5. Surface water quality monitoring data for Bishkek-Kara-Balta (km.15.9 – km.61), 2015 and 2017

Sampling location	St. No No/Yr./ Rep	Date and time of sampling	Weather conditions	Coordinates	pH	BOD 5, mg /l	Conductivity, (µs/cm )	Suspended solids, mg/l	Oil and grease, mg/l	Copper, mg/l	Zinc, mg/l	Cadmium, mg/l	Transparency, cm
Orto-Suu village, km.55, pond 2015	1-'15	28.04.2015 10.50	sunny	N 42° 42/ 27,5// E 0,75 °50/ 29.8 //	8.72	3.0	564	6.4	0.23	<0.000 6	<0.000 5	<0.0002	
Orto-Suu village, km.55, pond 2015	1-'15-1	22.05.2015 09.40	sunny	same	8.73	2.8	511	10.6	0.03	<0.000 6	<0.000 5	<0.0002	
Orto-Suu village, km.55, pond 2017	1-'17	27.04. 2017 10.50	sunny	same		3.6		12.8	0.014				20
Ak-Suu river* in front of a bridge, km.43+500 - '15	2-'15	28.04.2015 11.15	sunny	N 42° 49 /49,3// E 0,74 °04/ 55,1 //	8.32	0.7	383	52.8	0.04	<0.000 6	<0.000 5	<0.0002	
22.05.15	2-'15-1	22.05.2015 09.57	sunny	same	8.07	1.2	299	1178.0	0.05	<0.000 6	<0.000 5	<0.0002	
27 04-17	2-'17	27.04. 2017 11.25	sunny	Same		2.2		236.0	<0.01 3				4.5
Sokuluk river** in front of a bridge	3-'15	28.04.2015 12.05	sunny	N 42° 51/ 22,3// E 0,74 °16/ 36,2 //	8.43	0.2	325	9.0	0.14	<0.000 6	<0.000 5	<0.0002	
	3-'15-1	22.05.2015 10.44	sunny	Same	7.98	1.0	214	256.8	<0.02	<0.000 6	<0.000 5	<0.0002	
	3-'17	27.04. 2017 11.55	sunny	Same		0.8		59.2	<0.01 3				10
“Krepostnoy” narrow bridge at km.27+150	4-'15	28.04.2015	dry bed	N 42° 50/ 02,0// E 0,74 °07 / 20,2 //	-	-	-	-	-	-	-	-	-
	4-'15-1	22.05.2015	dry bed	same	-	-	-	-	--	-	-	-	-

Sampling location	St. No No/Yr./ Rep	Date and time of sampling	Weather conditions	Coordinates	pH	BOD 5, mg /l	Conductivity, (µs/cm )	Suspended solids, mg/l	Oil and grease, mg/l	Copper, mg/l	Zinc, mg/l	Cadmium, mg/l	Transparency, cm
	4-17	27.04. 2017	Dry bed		-	-	-	-	-	-	-	-	-
"Zhantay" canal* * Vostochnaya street km. 24+110	5-'15	28.04.2015	dry bed	N 42° 51' 52,6// E 0,74 °20' 08,9 //	-	-	-	-	-	-	-	-	-
	5-'15-1	22.05.2015 10.55	sunny	same	7.85	0.2	252	3859.2	0.08	<0.0006	<0.0005	<0.0002	
	5-'17	27.04. 2017	dry bed										
Zhalamysh river * bridge at km.17+850	6-'15	22.05.2015 11.06	sunny	N 42° 52' 10,7// E 0,74 °23' 18,1 //	8.03	0.6	263	809.2	<0.02	<0.0006	<0.0005	<0.0002	
	6-15-1	28.04.2015	dry bed	Same	-	-	-	-	-	-	-	-	
	6-17	27.04. 2017 13.05	sunny	Same		2.2		268.6	0.020				0.0
	<b>* MPC for fishery water ponds category</b>				<b>6.5-8.5</b>	<b>3</b>			<b>0.05</b>	<b>0.001</b>	<b>0.01</b>	<b>0.005</b>	
	<b>** MPC for general use category</b>				<b>6.5-8.5</b>	<b>3</b>			<b>0.3</b>	<b>1</b>	<b>1</b>	<b>0.001</b>	
	Normative legal acts which were complied with while doing measurements				ERC p.1 M. 1977	MP 2-85	ERC p.1 M. 1977	ERC p.1 M. 1977	ERD F 14.1:2: 4.128-98	MI 08-47/09 1	MI 08-47/09 1	MI 08-47/091	

## **3.2 Noise Measurements**

68. Existing ambient noise levels within the road section from Bishkek to Kara-Balta are generally attributable to vehicular traffic and to a lesser extent construction. Measurements taken at 16 sensitive receptor sites exceeded acceptable standards for both day and night at many of the locations. Residential areas located along the road have elevated noise conditions.

### **3.2.1 Noise Test Results**

#### **3.2.2 Noise Between 0800 and 1100 Hours**

69. For 2013 four of the 13 sensitive sites had measurements that exceeded the MPC level. For 2015 14 of the 16 stations had noise readings at or above 70 dBA. In 2017 all but the Voенno-Antonovka Village mosque and Sokuluk city dwelling sites had levels below 70 dBA (Table 6).

#### **3.2.3 Noise Between 1700 and 1900 Hours**

70. For all three years of sampling only the 2013 Petropavlovka Secondary School site measurement had a noise level below the 60 dBA MPC for nighttime in a commercial zone. Existing nighttime noise levels along this roadway are excessive and almost all exceed MPC, reflecting the very high traffic volume stretching into the evening until 2100 hours.

71. The 2015 results for the 16 sampling sites showed that the noise level in the project road section exceeded the MPL for every reading. It is under these conditions that the construction will take place. These high reading in no way reduce the effort needed by the contractor to minimize construction period noise. In fact the contractor must adhere to the requirements set in the CEMWP.

72. For the 2017 field measurements only 3 of the 16 stations had noise levels below 60 dBA, although MOTR considers the area a commercial zone and as such daytime limits are 70 dBA. However given that ADB/IFC standards apply, the concern over excessive noise does not change and mitigative actions are needed!

73. The field measurements (Table 6) showed that the noise level near the residential development areas exceeds the maximum permissible level and do not comply with the requirements of SanPiN (Sanitary Regulations and Standards) 2.1.8.562-96 "Noise at workplaces, in dwelling rooms, in public buildings and at the area of residential development".

Table 6. Existing noise levels determined along the road sections

Noise sensitive sections: Sampling Station No. used on 2013 survey and again in 2015 and 2017		Km from Bish- kek	Distance from carriage -way to receptor (m)	Measured Noise level, dBA.							Day MPL
				2013 Field Measur ement	2015			2017			
					Aver- age	08.00 to 11.00	17.0 0 to 19.0 0	Aver- age	08.00 to 11.00	17.00 to 19.00	
No.											
1	Novopavlovka village, School No. 2	9.9	33	69	70.5	71	70	58.5	61	56	70
1a	Novopavlovka village, Market	11.0	10	62							70
2	Voenno-Antonovka village, school (50 m from the road)	12.86	50	70	61	61	61	64	67	61	70
3	Voenno-Antonovka village, mosque	14.2	10	61	74.2	73.4	75	71	72	70	70
4	Gavrilovka village House along the road,	20.8	30		71	71	71	63	45	81	70
5	Gavrilovka village, Kindergarten	21.5	20		75.5	75	76	66	63	69	70
6	Shopokov city, School No. 2	22.330	20		75	75	75	67	67	67	70
7	Sokuluk city, Dwelling houses (shop "Tatyana")	27.150	10		75	78	72	73	70	76	70
8	Sokuluk city, School No. 2	27.5	15	72	71.5	71	72	64.5	61	68	70
9	Sokuluk city, Multi- storied dwelling buildings	25.6	10		76.15	73.3	79	67	63	71	70
10	Alexandrovka village, School No. 3	30.5	80	72	60.5	61	60	57	54	60	70

Noise sensitive sections: Sampling Station No. used on 2013 survey and again in 2015 and 2017  No.		Km from Bish- kek	Distance from carriage -way to receptor (m)	Measured Noise level, dBA.							Day MPL
				2013	2015			2017			
				Field Measur ement	Aver- age	08.00 to 11.00	17.0 0 to 19.0 0	Aver- age	08.00 to 11.00	17.00 to 19.00	
11	Sadovoye village School, no number,	37.4	10		77.75	74.5	81	62	63	61	<b>70</b>
12	Belovodskoye, Market	43.0	1	72							<b>70</b>
12A	Belovodskoye, Dwelling house (201 Frunze St.)	42.45	10	63	77.25	80.5	74	69	68	70	<b>70</b>
13	Petrovka village, Residential district, 504 Tsentralnaya St	51	8		75	78	72	70	63	77	<b>70</b>
14	Poltavka village, Secondary school, no number	55	30	62	71.5	71	72	69	69	69	<b>70</b>
15	Petropavlovka village, Secondary school	57.1	8	58	73.5	75	72	60	56	64	<b>70</b>
16	Novonikolaevka village, Secondary school	59.5	22	62	71.15	71	71.3	63	63	63	<b>70</b>
Avg.: 0700 to 2300 -70 dB											
Avg.: 2300 to 0700 -- 60 dB											

Sources: Consultant's field measurement, 05/2015; Traffic volume data are consultant's counts and estimates. Note: It is standard practice to add 10dBA as a nighttime annoyance factor due to low ambient noise levels. The data in the table have not been adjusted.

### 3.2.4 Noise Modeling

74. Noise levels were predicted for the area along both sides of the highway between Bishkek and Kara Balta. The numerical data were mapped as noise contours or isopleths, indicating the approximate distance of the <75 dBA to >45 dBA contour lines in 5 dBA intervals on either side of the road. These isopleths were super imposed in a Google map of the area showing all structures and the estimate noise environment they are situated in.

75. Although noise isopleths were prepared for the entire 45 km, the focus was on a set of sensitive receptors identified originally in 2013, and updated in 2015 and 2016.

76. **Baseline-** As expected the estimated baseline noise levels for most of the road exceeded permissible levels. The dashed line shown in Figure 1 indicates the permitted noise levels if one applies the IFC's +3dBA guideline. The B17+3 line represents the 2017 background noise plus 3 dBA.

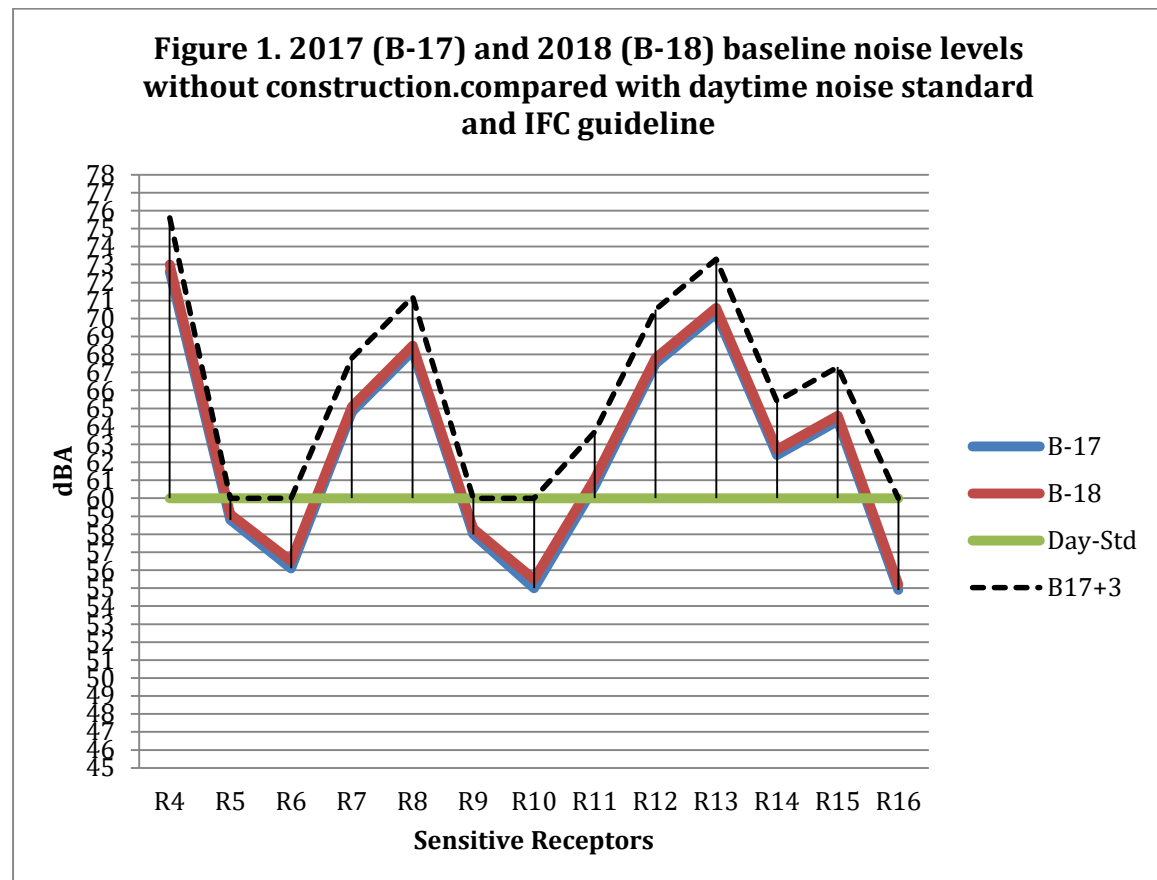


Figure 1. B-17, B=18 =2017 and 2018 baseline noise measurements at each receptor: Day-std = Daytime noise standard of 60 dBA. B17+3=2017 background noise levels +3 dBA.

77. **Construction Period** -The modeling results showed that under a typical construction condition Receptor sites 5,6,9,10,14 and 15 might need temporary noise attenuation, such as noise barriers. The construction work itself generally contributed less than 4 dBA to the estimated noise level without work ongoing.

78. Given that IFC noise standards are for indoors and that the measurement taken were outside and modeled outside at window level, a set of noise measurements inside sensitive structures will be taken while no work is taking place, and then again once it has resumed in front of sensitive sites.

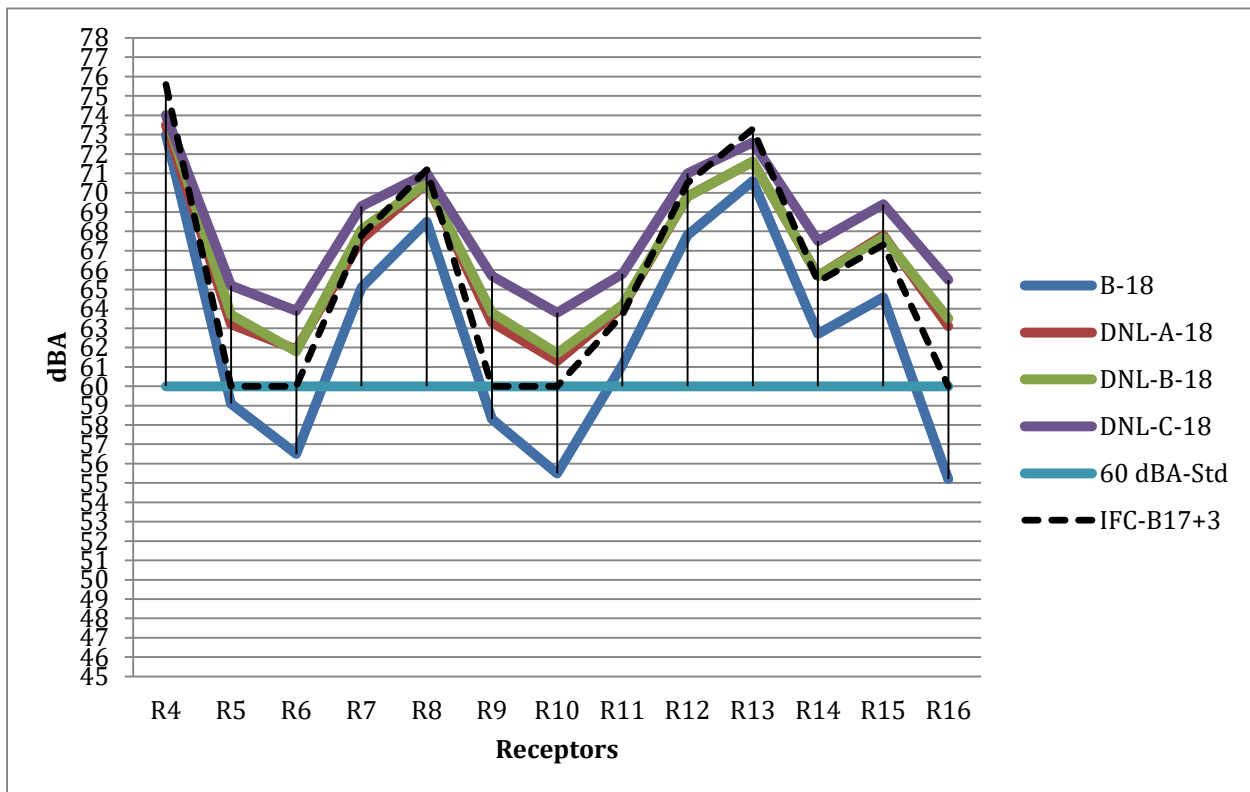


Figure 2. 2018 Daytime predicted baseline noise levels and 2018 construction noise projections for C and D equipment deployment scenarios, as well as IFC +3 dBA guideline.

79. These results combined with the modeled conditions will establish what level of mitigation will be needed.

80. **Operating period** - In this study, 2024, 2029 and 2034 noise scenarios, based totally in future traffic volumes and fleet compositions were modeled. The complete set of results are listed in **Table 26** of the modeling report and presented as isopleth diagrams in Annex 3 of that report.

81. If rehabilitation and expansion work is not undertaken, the road will be so crowded by 2034 that the traffic will be forced to run at a lower speed compared to today and noise levels will drop. Using the results presented in Section 3.3.2 of the noise report the difference could be up to 3 dBA, if the average speed reduces by 10km/h.

82. The additional noise due to this project could be as much as 7 dBA or even more if the impact of reduced speed in 2034 is taken into consideration. The design of abatement measures, shall start with setting of the target noise levels. The target levels could be the IFC or KR absolute noise limits, the 2017 noise levels, or any other value defined by KR.

83. Given the natural traffic volume growth for the three model years ( 2024, 29 and 2034) noise levels without considerable mitigation (Figure 3) will exceed the standards at 13 of the 16 sensitive receptors.



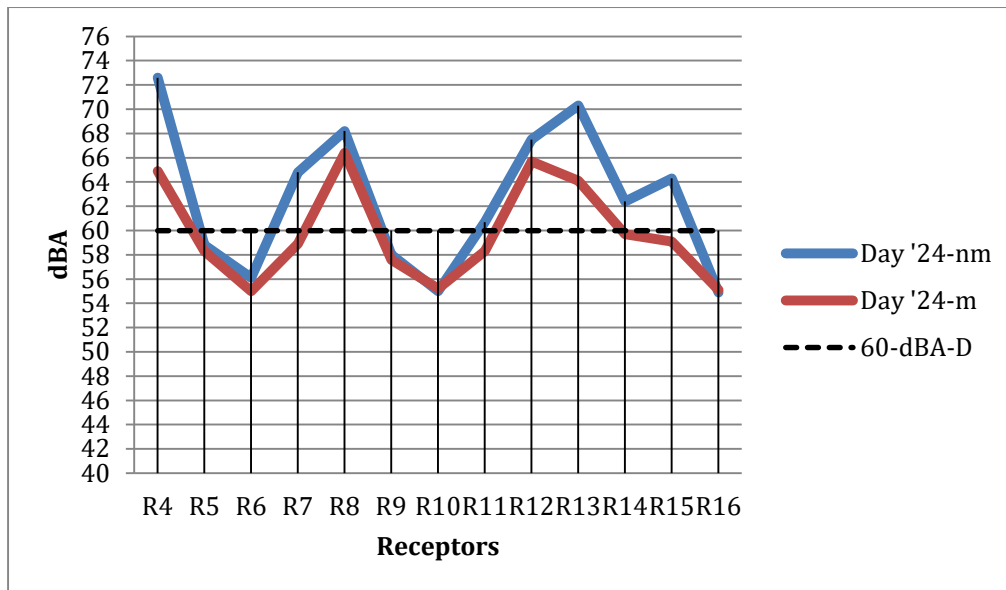


Figure 3. 2024 Daytime noise projections, without and with speed limit and noise barriers, showing 60 dBA standard

84. At night noise levels are predicted to exceed the acceptable standard 100% of the time (Figure 4)

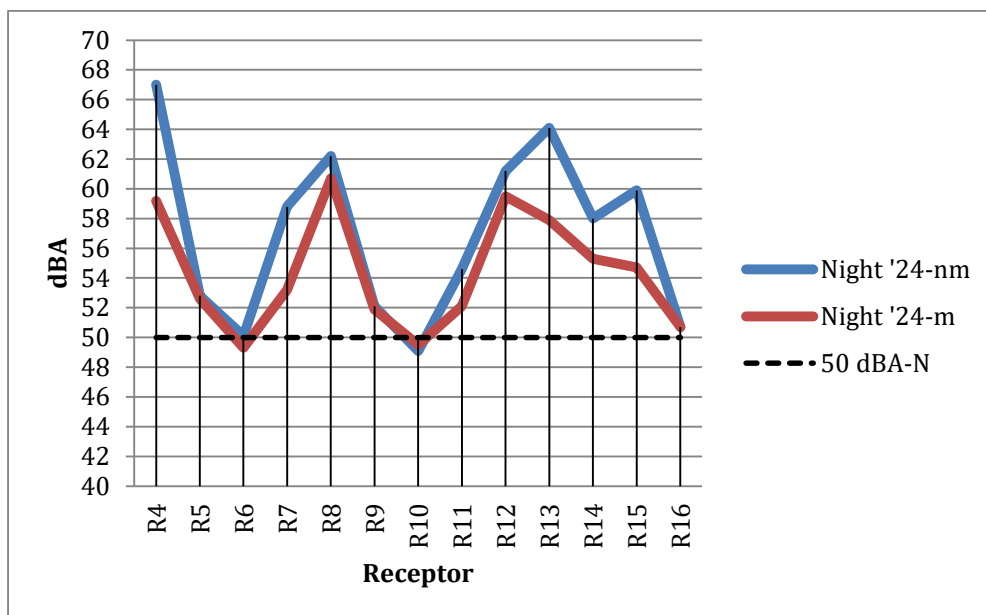


Figure 4. 2024 Nighttime noise projections, without and with speed limit and noise barriers, showing 50 dBA standard

85. By 2034, assuming that internal combustion engines are still in the majority and the traffic composition is more or less the same as in 2017, noise level exceedances will be even greater with both day and night levels considerably above 60 dBA all the time.

86. Adding both noise barriers and speed reduction measures will significantly attenuate noise, however half of the receptors will have a steady noise environment above 60 dBA (Figure 5).

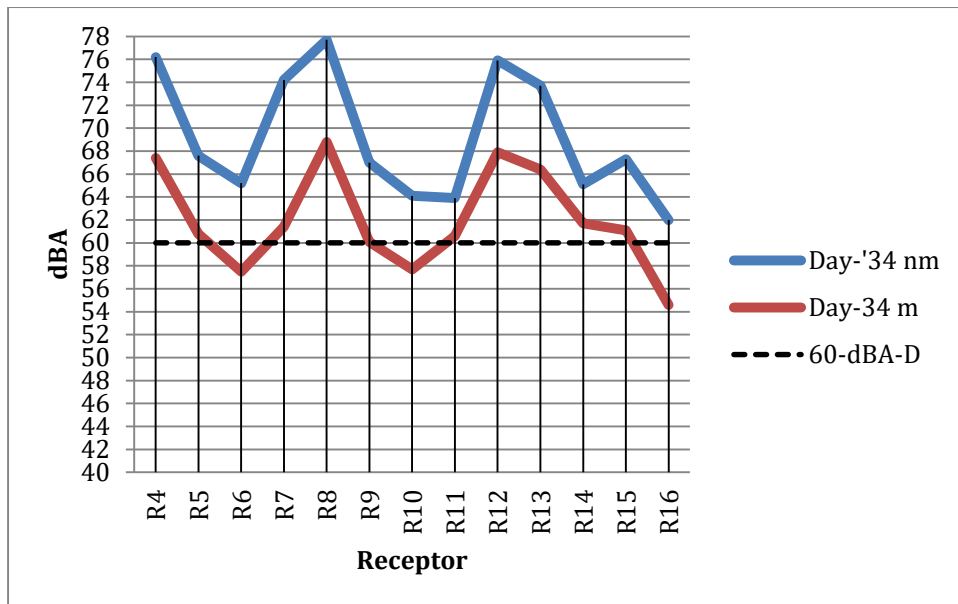


Figure 5 2034 Daytime noise projections without mitigation (nm) and with (m) speed reduction and noise barrier mitigation measures; showing 60 dBA daytime std.

87. Operating period noise attenuation through the installation of noise barriers and implementation of speed reduction measures<sup>6</sup> is the standard mitigation action. At an average price of USD 275/m<sup>2</sup>, although likely less in Kyrgyzstan, noise barriers along the project road would be a multi-million dollar capital cost, not including annual maintenance charges.

88. Having primary schools, kindergartens, residences and other sensitive sites so close to a major highway points to a lack of landuse controls. While little can be done to reverse the existing situation, strict controls over the type of development permitted at roadside within the 60dBA contour (Table 6 and isopleth maps) from the edge-of-pavement should be considered such that in the future the human exposure to high noise levels does not worsen.

### 3.3 Vibration

89. A vibration management study is commencing and will likely be completed by the end of January 2018. The objective will be to devise a process allowing for the identification of structures at risk from ground-vibration damage and the development of practical mitigative measures.

### 3.4 Tree Cutting and Replanting

90. To date, trees have been counted and most of them removed in Sections 2,3 and 4 of the roadway. The total numbers are as follows;

- Section 2: km 35.5-40.58 (5.08 km)- 685 trees.
- Section 3: km 45.6-51.6 (7 km)-1105 trees
- Section 4: km54.20-59.35 (5.15 km)- 1185 trees

91. A before and after photo of part of Section 3 is shown to illustrate the severity of this logging operation, deemed necessary in order to provide a compliant road width.

<sup>6</sup> This recommendation assumes that the electric engine vehicles will not rule the road and a much quieter road noise environmental will be the norm.

92. A number of instructions by the IES in the IEE and repeated in the CEMWP items No. 1.8 and 2.5.3, specifying a re-inventory of trees to be cut and mapping of their locations was not carried out in advance but in parallel with the start of tree cutting in Section 4 around June 20th. The IEE contained considerable details on the tree cutting actions and provided photos showing fully mature trees scheduled for cutting. The action should not have been a surprise to anyone, and yet ADB noted this during their mission in June 2017.



Figure 6 Section 3: Scene Before (left panel) and after (right panel) tree cutting

93. The failure by the contractor to prepare the plan as specified in the IEE led to ADB requiring the contractor to prepare site specific tree management /replanting plans for Sections 1 through 4. However, this work was assigned to EPTISA. A specialist subcontractor was retained to prepare these plans and they are complete and have been approved by ADB, allowing with cutting in these sections to proceed.

94. To insure that only trees needing to be cut were felled, all trees to be cut were marked with a blue X (Figure 7), and within Right-Of-Way boundaries defined by survey stakes in all four sections.



Figure 7. Example of tree marking

95. ADB required that all trees cut be identified and an example for Section three is shown. For Section 3, trees were not only counted but were identified by genus. Table 7 shows that a species assemblage is well suited to the area's dry conditions, and underscored the need to replace these with a similar assemblage when new planting takes place.

Table 7. Section 3 tree count by species

Species	Count on North Side	Count on South side
acacia	25	23
poplar	136	23
elm	386	251
maple	67	17
willow	2	3
mulberry	16	14
apple	3	4
pear	1	0
cherry plum	2	0
apricot	7	3
Juniper	2	0
oak	3	0
misc.	41	73
Total	690	415

96. As shown in the photos (Figure 8) the tree logs were taken to a municipally approved storage area to be distributed at a later time. **Logs were not stacked, as is the standard practice, but rather dumped, resulting in dangerous conditions with logs, sometimes weighing many tons, potentially rolling onto workers or people playing in the area.**



Figure 8. Logs and tree root storage sites along Section 3.

### 3.5 Compliance Issues with Tree Cutting

97. During the field visit by the IES, a number of violations of the CEMWP and EMP specifications were noted and sent to the contractor on July 17th for immediate action (these concerns were also provide informally be email to the contractor on June 26th). The summary table provided in an official letter to the contractor from EPTISA (No. EP-CRS-MKD-66) is reproduced below.

1. Of major concern was the indiscriminate removal of the trees for sidewalk construction using backhoe instead of clean chainsaw cutting
2. Due to poor training with chainsaw maintenance, operators were using dull blades requiring long periods to cut each tree and since too much oil was mixed with the petrol (not according to manufactures specifications), the air around the cutting area has thick blue smoke from the chainsaw exhaust.
3. PPE equipment, most importantly hardhats, eye and ear protection, was not worn by chainsaw operators or most worker in the near vicinity. Proper work boots were also lacking.
4. Tree felling was improperly completed, since large tree felling in confined areas must be from the tree crown down—incrementally—instead of at the base or pushing the tree over with a large backhoe. As a result of inappropriate cutting, large trees were dropped onto the road leading to significant backups. This is easily avoided by proper and widely known tree cutting methods.

98. In response the contractor provided the following table showing the actions taken to correct the issues raised.

Table 8. Mitigation Measures Taken by the Contractor

CEMWP No.	Mitigation Measures Not Addressed, as Defined in CEWP	Mandatory Compliance Date	Deliverable (always include date)
1.3	Earthwork checklist not prepared	21/07/2017	Topsoil from borrow areas was stockpiled in cone shape. Natural grass grows on the cone stockpile quickly, which could prevent loss of soil by water and wind erosion. (See attached picture 1.3-1)
1.4	Describe in detail the borrow sites, asphalt crushing sites and locations for batch plant, inrelation to KR regulations and standards	21/07/2017	<ol style="list-style-type: none"> <li>1. Asphalt, crushing sites and locations for batch plant have not been received yet.</li> <li>2. In accordance with Kyrgyz Republic regulation and standards, we develop borrow pits Ak-Suu only to 2 meters (Max. Depth Allowed 2.3 m).</li> <li>3. We take materials only from areas defined and approved by relevant authority.</li> <li>4. Constant monitoring of water level in the river were carried out. The river Ak-Suu dried up on July 20, 2017. (Pic. 1.4-4)</li> </ol>
1.5	Waste asphalt management plan provided in the CEWP)		<ol style="list-style-type: none"> <li>1. Scarifying of existing asphalt pavement has not been started yet.</li> <li>2. A small part of waste asphalt from demolition of bus stop structures has been reused on secondary village road.</li> </ol>
1.6	Earthworks Haul routes planning indicating discussion with locals to decide on the route		Currently we have only one borrow pit in operation. Our earthworks haul route does not involve any local village road.
1.8	Tree cutting protocol as defined not being implemented		The time for replanting and number of trees to be planted will follow our construction schedule, the technical specification and CEMWP.

2.2.3	Fumes from chainsaw operations, stemming from improper petrol-oil mixture, and poorly maintained (dull) equipment		We have work out a good oil-petrol mixture and maintenance was carried out regularly after notified by the Engineer.
2.5.1	Careless and excessive cutting; not following specifications as defined in CEMWP and IEE.		All the trees cut were in the construction right of way. All responsible parties confirmed the number of trees cut.
2.9.3	OHS protocol not being followed and workers in danger-Tree cutting operation.		We have provided all our workers with safety and protection wear. We have made it mandatory to put them on during operation by imposing punishment.

99. On July 28<sup>th</sup> the contractor responded to all concerns and submitted photographic evidence that is available. Item 1.8 was not understood and clarification will be provided. As well, insufficient details were provided for non-compliance with CEMWP items 1.3, 1.5, 2.5.1 and 2.9.3 as listed in Table 8.

### 3.6 Tree Replanting Plan

100. The government has already committed to preparing such a plan in the IEE and the CEMWP, and IPIG has retained EPTISA to enforce/monitor this action. It is fully understood by the government that this replanting must be done; and further, various KR standards and norms require it. EPTISA's environmental safeguard team is fully committed to enforcing this work with the contractor and will report on this monthly.

101. That being said, tree replanting should not begin until after major construction work in a section is completed so that plantings are not destroyed or damaged by the work, i.e., not until late 2019 or more likely 2020. The roadway will have new signage and other fixtures and trees must be planned to be compatible with landscaping and roadside features<sup>7</sup>. Landscaping is not scheduled until after a road section's major construction is complete. While technically not in synchrony with this schedule, the pressure by ADB to prepare a draft plan ahead of time was acknowledged, and MOTR instructed EPTISA to proceed<sup>8</sup>. To that end EPTISA prepared a ToR and retained a forester on July 25<sup>th</sup> 2017 and four separate plans were prepared and approved. Given the size of the documentation these plans are presented in a separately bound Annex 10 (of 14) of the site-specific guidelines, with the CEMWP.

102. These tree-planting plans will be one component of the roadside revegetation work, and will include a complete landscaping program. The contractor will not be placing topsoil or have the area ready for planting until the fall of 2018 at the earliest.

<sup>7</sup> Final tree species selection should be based in local conditions, and compatibility with other plantings and roadside structures being planned, e.g. pedestrian underpasses.

<sup>8</sup> Technically this was a task defined in the contractor's specifications

### 3.7 Management of Topsoil

103. The area along the shoulders where the trees and trunks were removed was exposed to the elements and all topsoil was removed and stored at secure sites where it was readily available for reuse (Figure 9). The contractor's and EPTISA's national environmental specialists have been carefully documenting this activity.



Figure 9 Topsoil Storage Areas Section 1

104. Permits for the removal of topsoil in the construction corridor are not required. However the contractor has obtained permission to store up to 6,000 m<sup>3</sup> of topsoil at several sites along the Section 3 road alignment. Topsoil mounds are being kept to below 1.5m high and protected, as best as possible, from the elements; mainly wind during the dry construction season. CSC has instructed the contractor to seed the topsoil mounds with natural grass seeds in an effort to reduce erosion.

105. The contractor's environmental monitor as well as EPTISA's environmental specialists are monitoring topsoil management and are reporting on this monthly.





Figure 10. Subgrade preparation and topsoil storage Section 3.

### 3.7.1 Compliance Issues with topsoil management

106. **CEMWP NO. 2.7.1 and Annexes 12 and 13**-The contractor is required to preserve the topsoil protect it from erosion and reuse it when landscaping of the shoulders takes place. During the recent site inspection it was recorded that the topsoil mounds are disappearing and that topsoil storage areas are being graded in preparation for development of local sports fields. It is likely that the contractor has agreed with the Ak Suu municipality to allow them to use the topsoil for their purposes and the topsoil required for landscaping would obtained elsewhere, at the Contractor's cost.

107. For a time topsoil use by local residents as garden soil was considered, but after soil testing by EPTISA found significant levels of lead in these materials, residents were informed that such use was prohibited.

108. ***In effect the contractor has disposed of the topsoil without permission of the CSC or MOTR and now will be required to provide thousands of m<sup>3</sup> when rehabilitation of the shoulders takes place.***



Figure 11 Ak-Suu topsoil storage area, graded for use by local community

### 3.8 Bridges and Culverts

109. The project calls for the full reconstruction of three bridges of natural rivers (Dzelamysh, Sokuluk and Ak-Suu) plus three irrigation canals (Novo-Pavlovka, Zhanatay 2 and Krespostnoy).

110. In addition almost 300 culverts will need replacement given their age and the need for almost doubling their length.

111. The general method being applied is the maintain traffic flow by blocking 1/2 of the road and reconstructing the bridge or culvert then repeating the same process on the other lanes (Figure 12).



Figure 12. Culvert construction site in Section 3 showing standard diversion

### 3.8.1 Bridges

The Zhelhamish Bridge is presently under construction and both EPTISA and the special ADB consultant assisting with safeguards in the region have recorded a number of non-compliance issues. The following are serious and the contractor needs to implement these corrective measures immediately.

***Non Compliance; CEMWP No. 2.4.2 and 2.4.2- and Annexes 7,8 and 12-These mitigative actions require that the contractor completed the majority of the work during the period when the river bed is dry (which is 8-3 months of the year) and refuelling and equipment washing to be done totally away from the river bank (Figure 13).***



A.



B.

Figure 13 Zhelhamish River: A-major work while river is active and B-concrete spill on the bank

### 3.8.2 Culverts

112. Three types of culverts are being installed/replaced at more 395 locations along the road; a) precast round concrete culvert sections about 0.5m in diameter used to

extend existing culverts, round culvert encased in in-situ poured concrete box (and box culverts of several sizes all poured in place.



Figure 14. Two types of poured-in-place culverts under construction

113. After the inspection of 5 of these culvert three serious non-compliance issues were identified, namely a) Safety at the work site, especially after construction has stopped for any reason b) Confirmation that culvert sections left in the ground are unobstructed and that placement allows for ample slope for quick drainage c) adequate design of drainage channels downstream of the culvert discharge

114. **CEMWP No. 2.9.4 and Annex 4- Safety-** While the perennial problem with the use of PPE was evident at all sites, particularly related to footwear and hardhats and secondly the proper securing of the work site to make sure that cave ins are not possible and people accidentally falling into the work site does not occur. At one of the larger sites the roads pavement where the culvert has been excavated was in imminent danger of collapse resulting in a serious vehicle accident. Secondly the failure to secure work areas such that when people come close to the sited, sidewalls cannot collapse easily. ***The safety engineer was informed and action is being taken and further training will be provided the safety engineer.***



Figure 15. Work area left with undercut banks, >1m high a danger of cave in, and lower panel showing where culvert removed and road surface in imminent danger of collapse

115. **CEMWP 2.4.2 and Annexes 8 & 12-Surface drainage and Flooding.** On examining the diameter of the larger culverts and then the conveyance provided for drainage of the runoff two did not match and there would appear to be serious danger of flooding, especially at one location where the drainage from the culvert seemed to go upstream! This same suspicion was noted at several locations, but has not been documented during the weekly inspections.

116. ***To address this, the design and sizing of culverts will be reviewed by the national Environmental Specialist and the contractor's drainage specialist and a results checklist prepared confirming the drainage on the downstream side of each culvert has been properly sized to prevent flooding.***

### **3.9 Borrow Pit Establishment and Operation**

117. The contractor plans to use six borrow pits. These are described in detail in the **CEMWP Annex No. 12 and 13** and are No. 1 Zhelhamish located 11km south of the road at km 18 of the road, No.2 Sokuluk No.1 south about 3.3km from the main road at km 23m, Sokuluk 3 at km272.5 and 7.7 km from the road, Ak-Suu 1 located in the old Ak Suu river bed 2.2km from the road and at Km 44 along the alignment. Ak Suu 2 is the 5th borrow area located further upstream in the old dry riverbed and is 8.6 km from the Project road. The sixth borrow site is Kara Balta, located at Km61 of the road about 4 km from highway, in an industrial factory zone with abandoned as well as operating facilities.

118. With the exception of site No.1 all others are very large (stretching for many km) and decades old aggregate extraction areas where hundreds of thousands of m<sup>3</sup> have been mined. In both Ak Suu 1 and 2 existing small aggregate-processing facilities are in operation.

119. Mitigation for these sites has been addressed in Annex 14 of the CEMWP as well as the CEMWP Activity No. 2,2, 2.7.3, 3.3 and the contractor has been reminded to adhere these requirements.

120. ***The CEMWP also states that the contractor must rehabilitate, including contouring and revegetating site No.1, and deal with this issues in the areas opened in the existing pits but at new extraction 'faces'.***

### **3.10 Dust Control**

**CEMWP Activity No. 2.2.1-2.2.3 and Annex 9** specify that dust must be attenuated at the work sites, along construction roads, the aggregate processing facility and where machinery is operating. To that end the contractor has been instructed to use at least two watering trucks continuously. This is being done. The aggregate processing facility has yet to be built and therefore not in operation so that dust emissions management has not been assessed. . In general the contractor's environmental monitoring must constantly track this situation since non-compliance events have been recorded and the contractor notified.

### **3.11 Materials Processing**

**CEMWP No. 2.7.1, 2.7.3 and Annexes 12,13 and 14-** The contractor has wisely decided to contain all materials processing activities in a large and remote (8 km) area of the Ak Suu 2 borrow site (Figure 16). That area will house the aggregate processing and crushing facility, the concrete batch plant as well as the asphalt production plant.

As a prerequisite to initiating the installation of any equipment the contractor must complete a special environmental assessment, known as an Ecological Passport, of these three facilities. This work has not been completed.

The site is presently under construction and will be fully fenced in and will have its own water supply permitted through the local municipality.



Figure 16 Ak Suu2 site for materials processing operation. Note start of fencing.

### 3.12 Waste Management

121. **CEMWP 2.3, 2.6.2; Annexes 4,5 & CEMWP No. 2.6.2 and Annexes 5 & 7** Waste on this project consists of used or broken construction equipment building materials and paper and cardboard products scattered around the contractor's yard, as well as unsorted garbage namely dry waste, plastic and glass as well as wet food scraps dumped in overflowing bins at the entrance to the contractor's site, attracting flies vermin and dogs.



Figure 17. Garbage at contractor's yard 29,11,'17,not cleared for past weeks



122. Fortunately it is winter and cold temperatures prevent the very strong odour and health hazard that would be present with warmer temperatures.

123. ***Contractor's camp waste needs to be sorted with plastic, glass in one bin, paper in another, hazardous materials in the 3rd and organic waste in another.***

124. During the inspections of Nov. 29 and 31st 2017, large amounts of plastic drink bottles and other wastes were found at the bridge and culvert work sites, materials disposed of mainly by the workers. ***To address a waste collection system such as simple garbage bag placed at each site must be provided at each construction site and removed each day.***

### 3.13 Occupational Health and Safety

125. **CEMWP No. 2.9.3 and Annex 4-** The implementation of occupational health and safety (OHS) specifications is to be delivered by the safety engineer retained by the Contractor<sup>9</sup>. The CEE should be working with the safety engineer to define the necessary steps to prevent accidents and keep the workforce healthy. A detailed list of OHS actions is presented in the CEMWP, and should be implemented principally by the safety engineer. These actions are elaborated and Annexes 4 and 5 of the CEMWP and are summarized as follows:

- develop a Plan of emergency response measures (this plan has already been prepared as Annex 2 of this CEMWP), including emergency situations which can lead to negative environmental impacts/risk to human health associated with the spill of hazardous materials and similar situations;
- provision of first aid equipment and a first aid/nursing station at the contractor's offices, as well as training in how to use it (presumably via the safety engineer);
- ensure staff is aware of safety at the construction site, the emergency work and labor, the use of personal protective equipment such as hard hats shoes, gloves and protective eyewear, to be provided by the contractor.
- ensure that all staff is provided with work wear and individual protective equipment. In addition, construction machinery used on the construction site such as concrete batch plants, aggregate crushing and asphalt plants, must be fitted with appropriate protective devices as specified by KR and International Labour Organization standards;
- provide guidance on personal hygiene, and for staff living on the construction office housing, adequate washing and toilet facilities; and
- deliver initial training and instruction on safety and labor protection.

126. The safety engineer should regularly check condition of all construction equipment and machinery. Any damage must be immediately repaired or replaced.

127. ***Under the present organization and reporting system, the safety engineer not been retained by the contract. The social sector specialist has been given this double duty which is not feasible. The contractor must retain a full-time safety engineer, especially since the resettlement issues in 2018 will be***

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<sup>9</sup> To date there is no safety engineer as these duties have been given to the contractor's social sector specialist, who is 100% occupied by the resettlement issues. A safety engineer is urgently needed.

***enormous and safety issues (other than road safety) have mostly been unaddressed.***

### **3.14 Worker Accommodation Hygiene, Safety and Basic Comforts**

128. Worker accommodations, hygiene and provision of basic services are an integral part of contract specifications and are defined in the project IEE and its EMP. The contractor is responsible for providing at least the basic accommodations as defined in the International Labour Organization's (ILO) guidelines<sup>10</sup>. Even though the accommodations are for less than 120 workers, ***many basic provisions are not provided or there is marginal compliance. Most important being proper lighting, separate toilet and washing facilities and a modicum of privacy in sleeping quarters, It has been observed that there are up to 4 people per room. Correction to these poor conditions must be implemented. I recent inspection highlighted somewhat unsanitary conditions in the kitchen facilities, most important being the presence of cooking oil and oily waste on the floor and around the cooking stoves.***

### **3.15 Road Traffic and Safety Management**

129. **CEMWP NO. 2.9.2 and Annex 4-Road traffic management and worker safety** at the work site while active traffic is passing is the prime responsibility of the safety engineer working with the project chief engineer and site engineer. The Safety Engineer will prepare a traffic control and worker safety protocol, which will be implemented once the work begins. The safety engineer will be required to give a briefing on worksite safety within the first week of construction. The CEE will not be involved in this work. The traffic management protocol discussed in Annex 4 of the CEMWP and in this CEMWP will be detailed by the contractor, working with the safety engineer.

130. ***Within this set of actions there are non-compliance issues, namely***

- 1. Safety protocol has not been established, especially at culvert construction sites with active traffic passing***
- 2. The contractor has not distributed a full set of safety equipment where needed, e.g. safety vests, safety boots and protective ear and eyewear as required for the work and as specified in the contract specifications ( see footnote No.12).***
- 3. The contractor has provided inadequate signage and measures, especially at night to delineate dangerous work areas, soft shoulders, especially where subgrade of the new lanes starts. By placing flagging along these sections and fencing and flashing lighting around the open culvert construction sites.***

131. There has been safety training with field training sessions provided to workers and then to schools to observe traffic rules. The contractor also provided crossing signs for the schools to use

### **3.16 Management of Subcontractors**

132. All subcontractors are bound by the same conditions as the contractor and as such it is the contractor's responsibility to enforce all measures as defined in this CEMWP and the contractor's specifications. It is the duty of the contractor's

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<sup>10</sup> [http://www.ilo.org/wcmsp5/groups/public/---ed\\_emp/---emp\\_ent/---multi/documents/publication/wcms\\_116344.pdf](http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/---multi/documents/publication/wcms_116344.pdf)

environmental monitor to instruct the subcontractors on environmental safeguard matters.

133. ***Two subcontractors were inspected and none are aware of the environmental safeguard requirements, e.g., workers were on site without proper protective gear, operation of heavy equipment in a dangerous manner, indiscriminate dumping of construction waste, failure to secure worksite at then end of the day or when work is not ongoing.***

134. ***Urgent corrective action is needed***

### **3.17 Project Reporting Relationships**

135. in addition to the ADB missions, the two regional environmental specialist and EPTISA, plus having to use 14 volumes of guidelines specified by ADB, the contractor is rightly confused about who to report to and what instructions to follow.

136. To address this it is urged that IPIG be the focal point for any major administrative recommendations or actions regarding environmental safeguards from external sources and that these requests or actions be transmitted to EPTISA allowing us to participate and have input as needed. For all standard issues such as traffic safety, subcontractor non compliance, communication with EPTISA directly is recommended

137. ***The contractor needs to know that for environmental monitoring reporting is to EPTISA's team leader and the International and National Environmental specialists, with copies, if needed to IPIG. Contractually EPTISA should be addressing environmental compliance issues and should be receiving the contractor's notices on how non-compliance is addressed. EPTISA works closely with IPIG and will report and consult on all relevant matters.***

138. Reminding the contractor of this simple relationship will help with lines of communication and management of external instructions.

## **4 CONCLUSIONS AND RECOMMENDATIONS**

### **4.1 Conclusions**

139. Unfortunately the pleas by EPTISA to consider proposals to significantly reduce the number of trees to be cut from the estimate >4000 was not considered. The removal of 4000 healthy and mature trees has resulted in at least 120 tons of CO<sub>2</sub> not being converted to O<sub>2</sub> by these trees annually. Further, the loss of cooling shade provided to roadside communities during the hot summer months is immeasurable.

140. It is unfortunate that the road design, especially the construction RoW width or the sidewalk dimensions could not have been adjusted, since only a 1 m adjustment on either side of the road (reducing the median width) could have saved more than 500 trees.

141. The contractor is not using the CEMWP properly and addressing each if the issues defined in the plan and implementing appropriate actions. This is one reason that ADB's recently appointed safeguards consultant found the issues he did during the Nov. 24th inspection.

142. The CEMWP and the supplemental specific 14 Annexes, cross-referenced in the latter, provide all necessary detail to complete a fully compliant monitoring cycle. all materials have been translated into Russian and two briefings in the CEMWP have been given the contractor.

143. Construction will not start again until late March 2018, although culvert work will continue through Nov. 30th, 2017. Given the cold temperatures and the fact that all culverts are poured In place concrete, and concrete strength can be compromised

without cold temperature formulations, the value of this work during these cold months is questioned.

144. The single most important recommendation is that the contractor's environmental monitor takes the time to carefully review and further familiarize himself with the CEMWP, remembering that health and safety issues are a part of our mandate, to properly complete the monthly checklist, noting specific issues and actions taken.

## **4.2 Bringing Environmental Safeguard Issues Into Compliance**

### **4.2.1 Overview**

145. During the start of the monitoring period the contractor did not been complying with the CEMWP nor any of the mitigation and monitoring actions defined and reviewed with EPTISA during the briefing in June, 2017. Since the contractor was not forced to prepare the CEMWP and ADB demanded that EPTISA prepare it the objective of having the contractor become familiar with and understand the IEE and its EMP was lost, and thus a much slower learning curve took place.

146. To date, the contractor has received 3 official and a number of unofficial of non-compliance notices and has started to comply with requirements.

147. There is an ongoing translation problem in that the construction manager does not speak English or Russian, therefore information must often pass through two translators and focus and emphasis is lost.

148. The contractor does not take environmental safeguards seriously; witness the absence of the construction manager at EPTISA briefings, yet regular attendance during ADB missions. EPTISA will try to address this.

149. EPTISA's national environmental expert is working closely with the contractor's environmental monitor to assist with the implementation of the CEMWP tasks. The contractor's environmental monitor has a very difficult task having to report on non-compliance incidents of his employer.

150. Overall, the contractor remains non-compliant in a number of areas, principally related to safety, and there is an urgent need to hire an OHS specialist and to take environmental safeguards seriously. EPTISA is ready to assist, but the contractor's environmental monitoring must be more pro-active in addressing issues.

### **4.2.2 Non Compliance Notices**

151. To date the contractor has received three official non-compliance notices and has satisfactorily (with some urging) responded. There have also been as many as 3 more informal notices given. A new non-compliance notice will be sent in order to address the issues noted in the special ADB consultant's note.

### **4.2.3 Tree Cutting And Replanting**

152. This work is progressing well with the exception that the storage of large logs must be done with much greater care since as presently done, there is a danger of these large logs, weighing several tons from dislodging and crushing a person or animal.

153. The monthly monitoring reports also show unsafe use of heavy equipment, which needs to be curtailed.

### **4.2.4 Topsoil Storage and Management**

154. At the Petrovka topsoil storage facility, the contractor has arranged with the local municipality to regrade the topsoil so that the municipality can use it to prepare playing fields, etc. Under the contract this is not permitted without MOTR and EPTISA

approval, since this topsoil is to be used in the landscaping work along the road shoulders.

155. With these materials used, the contractor will be required to provide the needed topsoil from MOTR approved sources, and at the contractor's cost. The contractor will not be allowed to take topsoil indiscriminately from the countryside.

#### **4.2.5 Bridges and Culvert Construction**

156. The design and sizing of culverts should be reviewed by the national Environmental Specialist and the contractor's drainage specialist and a results checklist prepared confirming the drainage on the downstream side of each culvert has been properly sized to prevent flooding. Each culvert needs to be identified by GPS and a number.

157. The CEMWP states that work on bridges should be undertaken during the dry months, namely May-October. This requirement is not being adhered to.

158. When a bridge or culvert site is closed for the day or the season, a complete inspection is needed to ensure the safety of the traffic and local residents in relation to excavation cave ins etc., This is not being done and action is needed.

159. Each culvert construction site, especially for the large 1.5m high box culverts with deep excavation needs complete fencing and nighttime lighting and signage must be installed, before a major accident happens.

160. Finally the subcontractors must be instructed to adhere to good housekeeping practices and not dump waste of any kind on the water or work site such as plastic bottles and paper waste. It needs to be collected daily in a garbage bag and taken away daily.

#### **4.2.6 Waste Management**

161. Contractor's yard and camp waste presently is stored in inadequately sized bins at the front of the facility, and allowed to fill and overflow for weeks, before a locally contracted firm removes it. The waste remains unsorted, in contravention of the IEE and the CEMWP. To address this the contract must:

1. Make certain that there are four bins available at all times
2. Bins with waste are removed once a week
3. All waste is sorted such that plastic and glass is in one bin, paper products in the second hazardous waste such as light bulbs and batteries the 3rd and food and organic waste in the 4th, fitted with a lid<sup>11</sup>.
4. With each weekly disposal the service provide must prepare manifest providing the date and quantity taken and the destination of the materials.

162. Secondly, the contractor must provide, at minimum, a garbage bag at each culvert and bridge construction site, and have workers pick up trash at the end of each day and repeat this at the sites, every day.

#### **4.2.7 Occupation Health and Safety and Worker Accommodations**

163. OHS issues seem to be overlooked by the contractor. Worksite safety is not being addressed. For example it was noted that the lighting at the culvert worksites was provided through illegal splicing into the electrical lines and taking a single wire sometimes across water to power the lighting. This most stop<sup>12</sup>.

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<sup>11</sup> The contractor pointed out that waste sorting is not done and even sorted waste is dumped together by the garbage service. EPTISA has recommended sorting and allowing pickers to remove these items weekly.

<sup>12</sup> The contractor has not retained an UHS/Workplace safety specialist. Instead the safety duties are allocated to the social sector specialist who is 100% occupied by the complex resettlement issues.

164. During the day power must be provided by generators, and at night via standard rechargeable battery-operated lighting and reflective signs. The present practice is extremely dangerous and electrocution incidents are highly likely.

165. Under the present organization and reporting system, the safety engineer duties have been allocated to the social sector specialist who is 100% occupied with the complex resettlement issues and therefore safety issues are totally neglected. not technically linked to the environmental safeguards team, and therefore there has been no oversight or interaction. The contractor is required to have a full time safety specialist on staff and this needs to be implemented immediately.

166. Worker accommodations and hygiene of facilities is substandard and the contractor is not complying with CEMWP instructions and with basic international standards. To address this the contractor is required to comply with ILO or IFC standards and review the following summary, then act as specified by the guidelines;

[http://www.ilo.org/wcmsp5/groups/public/---ed\\_emp/---emp\\_ent/---multi/documents/publication/wcms\\_116344.pdf](http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/---multi/documents/publication/wcms_116344.pdf)

or

[http://www.ifc.org/wps/wcm/connect/9839db00488557d1bdfcff6a6515bb18/workers\\_accomodation.pdf?MOD=AJPERES&CACHEID=9839db00488557d1bdfcff6a6515bb18](http://www.ifc.org/wps/wcm/connect/9839db00488557d1bdfcff6a6515bb18/workers_accomodation.pdf?MOD=AJPERES&CACHEID=9839db00488557d1bdfcff6a6515bb18)

#### **4.2.8 Road Traffic And Safety Management**

167. The set of actions defined in the CEMWP have not been fully addressed. This may be because the safety engineer has not been provided proper guidance. The contractor must address the following non-compliance issues:

1. A Safety protocol has not been established, especially at culvert construction sites with active traffic passing
2. The contractor has not distributed a full set of safety equipment where needed, e.g. safety vests, safety boots and protective ear and eyewear as required for the work and as specified in the contract specifications<sup>13</sup>.
3. The contractor has provided inadequate signage and measures, especially at night to delineate dangerous work areas, soft shoulders, especially where subgrade of the new lanes starts. By placing flagging along these sections and fencing and flashing lighting around the open culvert construction sites.
4. The supply of electricity for powering the lighting at bridge and culvert worksites must not come from illegal splices into the overhead power lines, but rather from generators or solar battery-operated flashing lights (allowed to charge during the day).

#### **4.2.9 Subcontractor Management**

168. Two subcontractors were inspected and none are aware of the environmental safeguard requirements, e.g., workers were on site without proper protective gear, operation of heavy equipment in a dangerous manner, indiscriminate dumping of construction waste, failure to secure worksite at then end of the day or when work is not ongoing.

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<sup>13</sup> The contractor's present practice of deducting the cost of PPE equipment from the worker salary is not permitted since these costs have been factored into the contractor's budget. When workers refuse to pay they are threatened with termination. This practice must end and all such deductions must be refunded. EPTISA will monitor this refund.

169. Urgent corrective action is needed as these oversights could lead to serious and even life threatening accidents.

#### **4.2.10 Project Reporting Relationship**

170. Given the ever-increasing number of advisors, monitors inspectors, coupled with a detailed CEMWP and 14 Annex guidelines, requirements and reporting conditions have understandably blurred. The contractor needs to know that for environmental monitoring, reporting is to EPTISA's team leader and the International and National Environmental specialists, with copies, if needed, to IPIG. Contractually EPTISA should be addressing environmental compliance issues and should be receiving the contractor's notices on how non-compliance is addressed. EPTISA works closely with IPIG and will report and consult on all relevant matters.

171. Reminding the contractor of this simple relationship will help with lines of communication and management of external instructions.

### **4.3 Recommendations**

1. The contractor, working with EPTISA and IPIG must implement non-compliance items 4.1.3-4.1.9 and bring these areas into full compliance by the start of the 2018 work season in mid March. Each of the 7 areas must be specifically address and a list of specific actions taken and documented with a written reported to EPTISA by December 22nd, 2017.
2. EPTISA and IPIG will work to further improve lines of communication and reporting requirements such that the contractor received clear environmental safeguard instructions from a single point of contact.

## **5 THE NEXT SIX MONTHS**

172. The focus of the next six months will be to ensure that the non-compliance items defined in Section 4.1 are addressed and sustained.

173. Secondly, the operation of the materials processing plants will begin and monitoring of these facilities will be essential

174. The removal, transport, processing and reuse of thousands of tons of old asphalt will begin and this handling and processing will need to be closely monitored.

175. The construction period field monitoring or air quality, noise and water quality will continue according to the CEMWP specifications.

176. The implementation of the vibration protocol in order to reduce damage to structures at risk will be implemented and its compliance and effects to be monitored.

177. The project's international environmental specialist will be redeployed in early April 2018 or sooner if issues arise.

**ANNEX 1**  
**Construction Environmental Management Workplan (CEMWP)/SEMP;**  
**Mitigation and Monitoring Table**  
**(Seven A-3 Sheets or 13 US Legal Sheets)**



Annex 1  
Mitigation and Monitoring Table

CEE=Contractor Environmental Engineer, MOTR=Ministry of Transportation and Roads, CSC=Construction Supervision Consultant (EPTISA), IPIG-International Project Implementation Group

N°	Environment Issue	Mitigative Measures	Time Frame	Location	Implement By/ Supv. By	Monitoring Action	Timing	The Deliverable	Implementing	Supervising
1	<b>PRECONSTRUCTION PREPARATION PERIOD ( not included as this is meant for the construction period )</b>									
2	<b>CONSTRUCTION PERIOD</b>									
2.2	<b>Dust and Air Quality</b>	<b>MITIGATION</b>				<b>MONITORING</b>				
2.2.1	Dust Generation: Transportation of Material: A small increase in particulate matter (dust) is expected at the location of rehabilitation works and from vehicles hauling materials to the rehabilitation areas. <b>SEE ANNEX 09</b>	I. The Contractor will be required to spray water on uncovered sand and gravel layers in dry periods within villages and near houses located close to the road and to cover the trucks used for transport. II. Watering during dry periods and setting strict speed limits of no more than 30kph across the rehabilitation sections will control dust at the construction site.	Throughout the construction period	Anywhere where there is material moved, earthworks cutting and filling.	Contractor/ CSC	Travel work areas and check for dust—and if found take immediate action with contractor	Anywhere where there is material moved, earthworks cutting and filling.	Written and dated note indicating compliance or issue and action taken	IPIG	CSC
2.2.2	Dust Generation: Quarry and Batching Plant Operation and removal and placement of cut and fill materials respectively, including asphalt. Pavement crushing plant	I. The works will include large concrete works for and shall be carried out without a batching plant. Therefore no mitigation is required. II. Slow and controlled mixing of the cement with aggregate to produce concrete shall minimize dust during manual batching for small concrete structure.	i-iii Throughout the construction period	i-ii Anywhere where there is material moved, earthworks cutting and filling.  iii-all work sites at all times.	Contractor/ CSC	Travel to Quarry and Works site and check for dust—and if found take immediate action with contractor.	I – iii. Throughout the construction period	Written and dated note indicating compliance or issue and action taken	CEE	CSC

N°	Environment Issue	Mitigative Measures	Time Frame	Location	Implement By/ Supv. By	Monitoring Action	Timing	The Deliverable	Implementing	Supervising
	<b>SEE ANNEX 9, AND 13</b>	<p>III. dust during material extraction and movement shall be controlled through transport in batched trucks and watering during dry period.</p> <p>V. The &gt; 1 million m3 of asphalt-concrete wearing course of the existing road will be totally replaced, requiring the excavation, storage, reprocessing and reuse of the granulated material as road sub-base or recycled for use on secondary roads. Pavement milling/scraping, crushing and reprocessing generates large quantities of dust, Therefore, dust suppression equipment, and protective gear for workers, will be required. Dust control via watering and road cleaning will be conducted daily with watering at least 4 hours every day.</p>								
<b>2.2.3</b>	<p>Increase in air pollution from vehicular and machinery exhaust</p> <p><b>SEE ANNEX 9</b></p>	<p>Emissions will be minimized by:</p> <ul style="list-style-type: none"> <li>i. ensuring that the contractor's fleet of vehicles are properly maintained according to manufacturer's specifications;</li> <li>ii. use of appropriate octane fuel and haul loads within specified limits.</li> <li>iii. Vehicle idling time when not in use, limited to no more than 3 minutes,</li> <li>iv. Equipment such as the diesel generator will be included in</li> </ul>	During the Construction period	Construction Site	Contractor/ CSC	Record findings and conduct regular inspections in association with construction supervision	During the Construction period	Inspection Note to file for use in contractor's reporting and in audit reports.	CEE	CSC

N°	Environment Issue	Mitigative Measures	Time Frame	Location	Implement By/ Supv. By	Monitoring Action	Timing	The Deliverable	Implementing	Supervising
		the emission control program and will be and regularly tuned to prevent excessive temporary pollution.								
2.3	Solid waste management at the construction site <b>SEE ANNEX 4 &amp; 5</b>	No open incineration of solid waste (garbage) and construction materials shall be permitted on site. All plastics , paper and useable wood will be recycled. Wood scraps can be burned.	During the Construction period	Construction Site	Contractor/ CSC	Record findings and conduct regular inspections in association with construction supervision	During the Construction period	Inspection Note to file for use in contractor's reporting and in audit reports.	CEE	CSC
2.4	<b>Surface and Groundwater</b>									
2.4.1	<b>Contamination of Water Resources (Surface &amp; Groundwater)</b> Surface water can result from leaking fuel storage, liquid bitumen and other chemicals used in rehabilitation works. <b>SEE ANNEX 7 &amp; 8</b> Groundwater contamination from surface runoff leaking into roadside wells. <b>SEE ANNEX 8</b>	<ul style="list-style-type: none"> <li>i. Fuel and oil storage areas should be at least 500m away from watercourses and repair yards to be equipped with an impervious platform, with interceptor traps so that any fuel leakage is retained within the site.</li> <li>ii. All fuel storage sites must be checked daily for leaks and held in an impervious site where spilled/leaking material can be collected.</li> <li>iii. Wash down water from machinery repair areas to be directed into this system that retains the oil and grease. Refueling not to be permitted within or adjacent to watercourses. Surface water channels crossed by the road will be monitored upstream and downstream of the road before, during and after the work has been completed on</li> </ul>	Throughout the construction period	All construction sites	Contractor / CSC	Regular inspection of work camps, contractors yard, fueling areas , fuel storage Water quality samples to be taken U/S and D/S of bridge construction sites, twice while work is ongoing at one section	Inspection at least monthly throughout the construction period. WQ sampling only 2X at bridge construction site- at start and midway through work; Oil and grease, TSS, pH and BOD 5 if possible	Checklist showing the check of fuel and lubricant handling, waste oil management, machinery was down water control, etc. signed and dated-- filed. Checklist showing the check for lighting and signage signed and date filled Monitoring database	IPIG	Supervision Consultant

N°	Environment Issue	Mitigative Measures	Time Frame	Location	Implement By/ Supv. By	Monitoring Action	Timing	The Deliverable	Implementing	Supervising
		that crossing.								
2.4.2	Interruption / Contamination of Water channels: Movement/drainage of surface water interrupted due to improper culvert construction activities, inadequate diversions and notifications. <b>SEE ANNEX 8 &amp; 12</b>	<ul style="list-style-type: none"> <li>i. Contractor should provide the adequate sized diversion, so that there shall be no disturbance to water flows of canal /watercourse. The placement of temporary culverts must avoid scouring and erosion and water leaves the temporary diversion</li> <li>ii. Protection mechanism should be provided to avoid contamination.</li> <li>iii. The land used for the temporary diversion and the water course shall be restored as far as possible to its initial state once the work has been completed</li> </ul>	Construction period	Culverts and bridges	Contractor Safety Engineer /CSC	Inspection of diversion along the road, check signage, lighting any leakages at the diversions and rectify through contractor. Ensure contractor has adequately restored temporary work areas.	Construction period	Contractor EHS Officer	CEE	CSC
2.5	<b>Flora and Fauna</b>									
2.5.1	Loss of roadside vegetation and trees  <b>SEE ANNEX 10 &amp; 11</b>	The project requires the cutting of around 4,000 mature trees, for which a plan has been prepared as defined Annex 11, a separate volume This must be fully adhered to and implemented completely by the contractor. Only trees marked for cutting will be removed. All cutting required shall be monitored according to the KR Law "General technical rules and regulations for environmental safety in the	Throughout the construction period when tree cutting is planned	At any locations where mature trees will be cut down.	Contractor/ CSC	-Inspect tree planting and maintenance operation and confirm compliance with mitigation item 2.5.1 and Annex Volume 10. Also provide ongoing list of tree planting activity	Throughout the construction period when tree cutting is planned	Compliance Monitoring Checklist filled in	CEE	CSC

N°	Environment Issue	Mitigative Measures	Time Frame	Location	Implement By/ Supv. By	Monitoring Action	Timing	The Deliverable	Implementing	Supervising
		<p>Kyrgyz Republic”, #151, Clause 12 dtd. 08.05.2009. and the Law of KR “On Protection and Use of Flora”, #53 dtd. 20.06.2001. To date tree replanting plans have been prepared for the following sections:</p> <ol style="list-style-type: none"> <li>1. Km 15.9-21.3</li> <li>2. Km 35.5-40.5</li> <li>3. Km 44.5.-51.6</li> <li>4. Km 54.2-59.35</li> </ol> <p>These must be strictly adhered to</p> <p>Due to small design changes of the sidewalks—some trees marked to be cut should now be saved. These trees have a yellow vertical line through the blue X. These are to remain and the sidewalk built around them</p> <p>When work is finished in anyone area, tree replanting should start, i.e. not waiting until the entire road is completed.</p>								
<b>2.6</b>	<b>Spoil and Solid Waste</b>									
<b>2.6.1</b>	<p>Inappropriate use of asphalt layers and base materials removed from the existing road .</p> <p><b>SEE ANNEX 7</b></p>	<p>Demolished asphalt may be re-used in the soft shoulders or as fill for other parts of the rehabilitation works. It may also be used as back-fill for borrow pits and then over-lain with topsoil. Asphalt pieces can be spread on adjacent roads as surface or pothole fill material and compacted.</p>	During Construction	All Construction Sites	Contractor/ CSC	Monitor to check waste handling and disposal procedure of contractor	Throughout construction period	Note to file, signed and dated	IPIG	Supervision Consultant

N°	Environment Issue	Mitigative Measures	Time Frame	Location	Implement By/ Supv. By	Monitoring Action	Timing	The Deliverable	Implementing	Supervising
2.6.2	Unused construction material (sand, crush), empty drums, concrete waste and waste from work camps.  <b>SEE ANNEX 5 &amp; 7</b>	<ul style="list-style-type: none"> <li>i. The contractor will identify dumping locations for construction debris and non-hazardous solid waste with DEP9/Bishkek-Osh and the CSC</li> <li>ii. The contractor shall identify any hazardous waste as part of its health and safety plan and dispose of the material through an approved waste management contractor.</li> <li>iii. The cost of disposal of hazardous (lubricant drums, waste oil, hydraulic fluid, engine filters) and non-hazardous waste shall be included in the Contractors BOQ.</li> </ul>	During Construction	All Construction Sites	Contractor /CSC	Monitor to check waste handling and disposal procedure of contractor	Throughout construction period	Note to file, signed and dated	IPIG	Supervision Consultant
2.7	<b>Quarry/Borrow Materials</b>									
2.7.1	Preservation of Top Soil  <b>SEE ANNEX 12 &amp; 13</b>	<ul style="list-style-type: none"> <li>i. Excavation of earth fill will be limited to an appropriate depth of 20cm.</li> <li>ii. Where deep ditching is carried out, the top half-meter layer will be stripped and stockpiled.</li> <li>iii. The ditch will be filled initially with debris/scrap material from old construction and leveled with stockpiled topsoil later.</li> <li>iv. Where borrow pits cannot be fully rehabilitated, land owners will be compensated as provided in agreements between the</li> </ul>	During Construction	At any locations where borrow pits, quarries will be operated.	Contract /CSC	<ul style="list-style-type: none"> <li>i. Confirm that topsoil has been set aside</li> <li>ii. Check quarry sites for depth.</li> </ul>	During Construction period	Written and dated note indicating compliance or issue and action taken.	CEE/ IPIG	Supervision Consultant



N°	Environment Issue	Mitigative Measures	Time Frame	Location	Implement By/ Supv. By	Monitoring Action	Timing	The Deliverable	Implementing	Supervising
	<b>Vibration</b>									
2.8.1	Noise and Vibrations associated with earthworks and haul roads. <b>SEE ANNEX 6</b>	<ul style="list-style-type: none"> <li>i. Enforcing a speed limit of 30 kph within 500m of any village.</li> <li>ii. Restricting operating hours through roadside villages and settlements to between hours of 0700 and 1800.</li> <li>iii. Large and noisy machinery operations close to urban areas are restricted to daylight hours, and a schedule agreed to between contractor and local communities.</li> <li>iv. CSC to conduct noise monitoring at 12 sensitive sites and during operation of noisy equipment: asphalt breaking and loading, truck haul routes, aggregate crushing, concrete and asphalt production facilities</li> </ul> <p>Application shall be carried out with equipment checked for compliance with the applicable Laws in KR regarding Noise and Vibration at construction sites: SN 2.2.4/2.1.8.562-96 "Noise in working areas, dwelling accommodations, public buildings and on the territory of residential construction". SN 2.2.4/2.1.8.566-96 "Production vibration. Vibration in accommodations, dwelling and public buildings»</p>	During Construction period	At 12 sites and varying distances from noisy machinery	CSC and CEE of Contractor/ IPIG- MOTR	Using a portable noise meter, monitor works conditions , and inspect if work conducted within permitted time period in urban zones. 12 sensitive sites monitored as well as work areas were asphalt breaking and loading, asphalt crushing site, truck haul routes, aggregate crushing, concrete and asphalt production facilities is in operation	During Construction period	Inspection Note to file for use in contractor's reporting with eventual noise measurements.	CSC and CEE	Supervising Consultant



N°	Environment Issue	Mitigative Measures	Time Frame	Location	Implement By/ Supv. By	Monitoring Action	Timing	The Deliverable	Implementing	Supervising
<b>2.9</b>	<b>Health and Safety</b>									
<b>2.9.1</b>	Damage / disturbance to Utilities within RoW <b>SEE ANNEX 3 &amp; 4</b>	Removal and relocation of power, water, and other utilities to make way for construction must be conducted through a consultation-first approach, followed by removal and immediate replacement	-At start of construction for the entire 45.1 km--	Along the entire alignment	Contractor / CSC	i. Inspect construction areas where access is an issue and establish if contractor is managing problem and if local residents are satisfied. ii. Always identify by clear signage according to regulation maintenance activities on the roadway	Throughout construction period	Inspection note with findings, dated and signed	Contractor's CEE, CSSC and IPIG	Supervising Consultant
<b>2.9.2</b>	Traffic Disturbance : Loss of access for roadside residents . <b>SEE ANNEX 4</b>	Contractor shall provide safe and convenient passage for vehicles and pedestrians to and from side roads and properties connecting the project road/area. In case such work occurs, traffic management arrangement shall be submitted for approval by the Supervision Engineer , after consultation with local people and the police, before the work takes place, and according to local regulations.	Construction Period	Town Crossings, roadside businesses and operations	Contractor and Safety Engineer/ CSC	Inspection of construction sites to ensure proper use of OHS gear and contractor enforcement	Throughout construction period	Inspection note with findings, dated and signed	Contractor's CEE, CSSC and IPIG	Supervising Consultant
<b>2.9.3</b>	Health and Safety Concerns: Protecting the workforce and maintaining a safe working environment. <b>SEE ANNEX 3 &amp; 4</b>	i. Contractor must provide safety vests, hard hats and protective footwear for all workers handling heavy machinery, and working with hazardous materials such as concrete, asphalt, paints, and cleaning agents . ii. Contractor must provide protective masks to machine	Construction period	Contractor's Depots and all work areas, including those of sub-contractor	Contractor's Safety Engineer and CEE / CSC	Inspect all operations in the depots including worker housing and all waste management procedures.	Throughout the construction period	Inspection note re findings, dated and signed.	Contractor's CEE, CSSC and IPIG	Supervising Consultant

N°	Environment Issue	Mitigative Measures	Time Frame	Location	Implement By/ Supv. By	Monitoring Action	Timing	The Deliverable	Implementing	Supervising
		<p>operators, where dust can be generated, and to anyone working in the area of the machines, with masks of a micron size, capable of capturing dust down to 2 microns.</p> <p>iii. Any works at night should be adequately lit and high visibility clothing worn and contractor should provide basic training on use of protective clothing and equipment.</p>								
2.9.4	<p>Contractor's work areas and depots not maintained, no proper waste management, environmental health and safety measures.</p> <p><b>SEE ANNEX 4</b></p>	<p>i. All depots shall be provided with septic sanitation facilities and potable water.</p> <p>ii. Monitoring will be required for the solid waste disposal at the depot and to ensure that the health and safety plan based on contract specifications is followed.</p> <p>iii. During operation, the surface of the depot used for storage of construction materials shall be protected against run-off and spills of hazardous materials using impermeable protection covering the ground and a system to collect contaminated run-off.</p>	Throughout the construction period	Contractor's Depots and all work areas, including those of sub-contractor	Contractor's Safety Engineer and CEE / CSC	CEE and Safety Engineer to conduct regular inspections of sites	Weekly , during the construction period	Inspection checklist addressing three items listed here	CEE	CSC
2.10	Lack of contractor's construction period mitigation completion report	Contractor will be required to prepare a safeguards implementation completion checklist at the end of the construction period,	Prior to final payment to contractor	NA	Contractor's CEE and Safety Engineer/ CSC	Inspect and collect report	Prior to final payment to contractor	Copy of report on file	CSC and Contractor	IPIG

N°	Environment Issue	Mitigative Measures	Time Frame	Location	Implement By/ Supv. By	Monitoring Action	Timing	The Deliverable	Implementing	Supervising
		discussing very briefly, each construction period EMP item.								
2.11	Lack of transport and facility for CSC environmental auditor to conduct compliance monitoring.	The MOTR must file a semi-annual environmental monitoring report with ADB. Data for that will be assembled based on quarterly environmental inspections by the CSC's environmental specialist. Twice a year the Int'l Env. Specialist will conduct a due diligence compliance audit. To complete this work the CSC Env. Specialist will be provided with transportation as needed, as well as working space in the field	Conduct inspection of all operations every three months, including contractor yard, file semi annual monitoring report and Annual DD audit.	Across the entire construction area , including all subcontractor facilities	CSC and Contractor's CEE/ IPIG	Conduct inspection of all operations every three months, including contractor yard, file semi annual monitoring report and Annual DD audit.	Every three months	Copy of report	CSC and Contractor	CSC/IPIG
2.12	Failure to protect 13 sensitive site identified in the IEE	The 12-13 sites have been identified in Annex 2 of the IEE and parameter likely impacted identified, plus baseline measurements obtained in 2013 , 2015 and again in 2017. A construction period air, noise and surface water quality testing program will be undertaken quarterly according to the design defined using GPS coordinates as defined in the IEE Annex 2 s.	Throughout the construction period	AT 12 sensitive sites using the sampling design provided in the IEE-and as specified in CEMP Items 2.4.1, 2.8.1 & 2.8.2	Contractor/ CSC	Examine field survey data on noise, air and surface water quality around the sensitive sites	Throughout the construction period	Data tables on file	CEE/CSC	CSC
3	<b>Operating Period Contractors Defect Year</b>									

N°	Environment Issue	Mitigative Measures	Time Frame	Location	Implement By/ Supv. By	Monitoring Action	Timing	The Deliverable	Implementing	Supervising
3.1	Failure to fully decommission and clean up work area including garbage site, sewage, service area fuels and lubricant spills and erosion protection	Buried garbage, latrine pits, fuel and lubricant and construction material such as bitumen left in and around the contractor's work area will be cleaned up and the area restored.	Within first 3 months of the defect period starting	At contractor offices and housing as well as all other work camps	CEE	Photo inspection/record of before and after	To take place before the end of the 8th month of the defect period	Photo record of before and after rehab. conditions	CEE	CSC
3.2	Contractor abandons used borrow sites leading to illegal mining, erosion and land degradation <b>SEE ANNEX 13</b>	Borrow pit restoration according to plan defined in the IEE and earlier in this table, Activity 2.7	Within first 3 months of the defect period starting	At all borrow sites	CEE	CEE to provide photo record of before and after photos	To take place before the end of the 8th month of the defect period	Photo record of before and after rehab. conditions	CEE	CSC
3.3	Haul roads left abandoned not decommissioned leading to inappropriate use, erosion, damage to nearby property. <b>SEE ANNEX 13</b>	Close road as agreed to with local authorities and local land owners				Record of agreement with local authorities and photo of post-construction road use!	To take place before the end of the 8th month of the defect period	Photo record of before and after rehab. conditions	CEE	CSC
3.4	Inadequate maintenance of large roadside tree plantation <b>SEE ANNEX 12,13</b>	Based on MOTR's DEP9 guidance, ensure that trees planted remain healthy, are protected from grazing animals and receive water. Annual tree count will be required and any dead trees will need to be replaced.	At the start of the operating period and every two months for the 1 <sup>st</sup> year and semi annually for the next 2 years.	All areas where tree planting took place during the construction period	MOTR's highway maintenance unit/MOTR	Inspection of tree plantation and replanting dead trees and reestablishing better maintenance program	3 months before end of defect year	Tree inventory and replanting data sheet	Contractor's CEE	CSC

N°	Environment Issue	Mitigative Measures	Time Frame	Location	Implement By/ Supv. By	Monitoring Action	Timing	The Deliverable	Implementing	Supervising
3.5	Contractor agg. crushing facilities, concrete plant and asphalt plant, especially bitumen storage areas are not cleaned up. <b>SEE ANNEX 13</b>	Contractor to clean up and fully rehabilitate the sites	Within first six months of the defect year	Sites used for the activities defined in column 1	Contractor's CEE	Inspect and record clean up	Within first 6 months of start of operations of the rehabilitated roadway	Inspection record and photo evidence	CEE	CSC

**Annex 2**  
**MONTHLY Environmental Compliance Monitoring Checklist**  
**(Six A-3 sheets or 11 US Legal Size Sheets)**  
**TO BE COMPLETED BY CONSTRUCTOR'S ENVIRONMENTAL MONITOR**

Inspector Name:
Inspection Date:
Construction Section:
Chainage:

N°	Environment Issue	Mitigative Measures	Time Frame	Location	Implement By/ Supv. By	Monitoring Action	Timing	The Deliverable	Contractor's CEE & CSC Reporting on Compliance: what as done, where and when
1	<b>PRECONSTRUCTION PREPARATION PERIOD- Not included as this is meant for the construction period</b>								Activities 1.1-1.9 completed by CSC and IPIG
2	<b>CONSTRUCTION PERIOD</b>								
2.2	<b>Dust and Air Quality</b>	<b>MITIGATION</b>				<b>MONITORING</b>			
2.2.1	Dust Generation: Transportation of Material: A small increase in particulate matter (dust) is expected at the location of rehabilitation works and from vehicles hauling materials to the rehabilitation areas. <b>SEE ANNEX 11</b>	I. The Contractor will be required to spray water on uncovered sand and gravel layers in dry periods within villages and near houses located close to the road and to cover the trucks used for transport. II. Watering during dry periods and setting strict speed limits of no more than 30kph across the rehabilitation sections will control dust at the construction site.	Throughout the construction period	Anywhere where there is material moved, earthworks cutting and filling.	Contractor/ CSC	Travel work areas and check for dust—and if found take immediate action with contractor	Anywhere where there is material moved, earthworks cutting and filling.	Written and dated note indicating compliance or issue and action taken	
2.2.2	Dust Generation: Quarry and Batching	I. The works will include large concrete works for and shall	i-iii Throughout	i-ii Anywhere where there is	Contractor/ CSC	Travel to Quarry and Works site and check	I – iii. Throughout	Written and dated note	

N°	Environment Issue	Mitigative Measures	Time Frame	Location	Implement By/ Supv. By	Monitoring Action	Timing	The Deliverable	Contractor's CEE & CSC Reporting on Compliance: what as done, where and when
	Plant Operation and removal and placement of cut and fill materials respectively, including asphalt. Pavement crushing plant <b>SEE ANNEX 9, 11 AND 14</b>	be carried out without a batching plant. Therefore no mitigation is required. II. Slow and controlled mixing of the cement with aggregate to produce concrete shall minimize dust during manual batching for small concrete structure. III. dust during material extraction and movement shall be controlled through transport in batched trucks and watering during dry period. IV. The > 1 million m3 of asphalt-concrete wearing course of the existing road will be totally replaced, requiring the excavation, storage, reprocessing and reuse of the granulated material as road sub-base or recycled for use on secondary roads. Pavement milling/scraping, crushing and reprocessing generates large quantities of dust, which when working with old asphalt-concrete may contain asbestos fibers. Therefore, dust suppression equipment, and protective gear for workers, will be required and at least 10 core samples taken and tested for asbestos fiber content, before any work begins.	the construction period  iv. Collect and analyze core samples prior to start of removal of asphaltic layer if asbestos fibers are detected, provide protective clothing and masks to all workers coming contact with removal and crushing work.	material moved, earthworks cutting and filling.  iii-all work sites at all times.  iv. 12 cores to be taken from all pavement sections and protective gear distributed immediately if asbestos is present.		for dust—and if found take immediate action with contractor.	the construction period  iv. Collect and analyze core samples prior to start of removal of asphaltic layer if asbestos fibers are detected, provide protective clothing and masks to all workers coming contact with removal and crushing work.	indicating compliance or issue and action taken	
2.2.3	Increase in air	Emissions will be minimized by:	During the	Construction	Contractor/	Record findings and	During the	Inspection	

N°	Environment Issue	Mitigative Measures	Time Frame	Location	Implement By/ Supv. By	Monitoring Action	Timing	The Deliverable	Contractor's CEE & CSC Reporting on Compliance: what as done, where and when
	pollution from vehicular and machinery exhaust <b>SEE ANNEX 9 &amp; 11</b>	<ul style="list-style-type: none"> <li>i. ensuring that the contractor's fleet of vehicles are properly maintained according to manufacturer's specifications;</li> <li>ii. use of appropriate octane fuel and haul loads within specified limits.</li> <li>iii. Vehicle idling time when not in use, limited to no more than 3 minutes,</li> <li>iv. Equipment such as the diesel generator will be included in the emission control program and will be and regularly tuned to prevent excessive temporary pollution.</li> </ul>	Construction period	Site	CSC	conduct regular inspections in association with construction supervision	Construction period	Note to file for use in contractor's reporting and in audit reports.	
2.3	Solid waste management at the construction site <b>SEE ANNEX 4 &amp; 5</b>	No open incineration of solid waste (garbage) and construction materials shall be permitted on site. All plastics , paper and useable wood will be recycled. Wood scraps can be burned.	During the Construction period	Construction Site	Contractor/ CSC	Record findings and conduct regular inspections in association with construction supervision	During the Construction period	Inspection Note to file for use in contractor's reporting and in audit reports.	
2.4	<b>Surface and Groundwater</b>								
2.4.1	<b>Contamination of Water Resources (Surface &amp; Groundwater)</b> Surface water can come from leaking fuel storage, liquid bitumen and other chemicals used in rehabilitation works. <b>SEE ANNEX 7 &amp; 8</b>	<ul style="list-style-type: none"> <li>i. Fuel and oil storage areas should be at least 500m away from watercourses and repair yards to be equipped with an impervious platform, with interceptor traps so that any fuel leakage is retained within the site.</li> <li>ii. All fuel storage sites must be checked daily for leaks and held in an impervious site where spilled/leaking material</li> </ul>	Throughout the construction period	All construction sites	Contractor / CSC	Regular inspection of work camps, contractors yard, fueling areas , fuel storage	At least monthly throughout the construction period.	Checklist showing the check of fuel and lubricant handling, waste oil management, machinery was down water control, etc. signed and dated--filed.	



N°	Environment Issue	Mitigative Measures	Time Frame	Location	Implement By/ Supv. By	Monitoring Action	Timing	The Deliverable	Contractor's CEE & CSC Reporting on Compliance: what as done, where and when
	Groundwater contamination from surface runoff leaking into roadside wells. <b>SEE ANNEX 8</b>	can be collected. iii. Wash down water from machinery repair areas to be directed into this system that retains the oil and grease. Refueling not to be permitted within or adjacent to watercourses. Surface water channels crossed by the road will be monitored upstream and downstream of the road before, during and after the work has been completed on that crossing.						Checklist showing the check for lighting and signage signed and date filled .	
2.4.2	Interruption / Contamination of Water channels: Movement/drainage of surface water interrupted due to improper culvert construction activities, inadequate diversions and notifications. <b>SEE ANNEX 8 &amp; 13</b>	i. Contractor should provide the adequate sized diversion, so that there shall be no disturbance to water flows of canal /watercourse. The placement of temporary culverts must avoid scouring and erosion and water leaves the temporary diversion ii. Protection mechanism should be provided to avoid contamination. iii. The land used for the temporary diversion and the water course shall be restored as far as possible to its initial state once the work has been completed	Construction period	Culverts and bridges	Contractor Safety Engineer /CSC	Inspection of diversion along the road, check signage, lighting any leakage etc. at the diversions and rectify through contractor. Ensure contractor has adequately restored temporary work areas.	Construction period	Contractor EHS Officer	
2.5	<b>Flora and Fauna</b>								

N°	Environment Issue	Mitigative Measures	Time Frame	Location	Implement By/ Supv. By	Monitoring Action	Timing	The Deliverable	Contractor's CEE & CSC Reporting on Compliance: what as done, where and when
2.5.1	Loss of roadside vegetation and trees <b>SEE ANNEX 10 &amp; 12</b>	<p>The project requires the cutting of around 4,000 mature trees, for which a plan has been prepared as defined Annex 11, a separate volume This must be fully adhered to and implemented completely by the contractor. Only trees marked for cutting will be removed. All cutting required shall be monitored according to the KR Law “General technical rules and regulations for environmental safety in the Kyrgyz Republic”, #151, Clause 12 dtd. 08.05.2009. and the Law of KR “On Protection and Use of Flora”, #53 dtd. 20.06.2001. To date tre replanting plans have been prepared for the following sections:</p> <ol style="list-style-type: none"> <li>1. Km 15.9-21.3</li> <li>2. Km 35.5-40.5</li> <li>3. Km 445.6-51.6</li> <li>4. Km 54.2-59.35</li> </ol> <p>These must be strictly adhered to</p> <p>When work is finished in anyone area, tree replanting should start, i.e. not waiting until the entire road is completed.</p>	Throughout the construction period when tree cutting is planned	At any locations where mature trees will be cut down.	Contractor/ CSC	-Inspect tree planting and maintenance operation and confirm compliance with mitigation item 2.5.1 and Annex 11 . Also provide ongoing list of tree planting activity	Throughout the construction period when tree cutting is planned	Compliance report, bullet form that mitigation measures are being implemented	
2.6	<b>Spoil and Solid Waste</b>								
2.6.1	Inappropriate use of asphalt layers and base materials removed from the existing road .	Demolished asphalt may be re-used in the soft shoulders or as fill for other parts of the rehabilitation works. It may also be used as back-fill for borrow pits and then over-lain with topsoil. Asphalt	During Construction	All Construction Sites	Contractor/ CSC	Monitor to check waste handling and disposal procedure of contractor	Throughout construction period	Note to file, signed and dated	

N°	Environment Issue	Mitigative Measures	Time Frame	Location	Implement By/ Supv. By	Monitoring Action	Timing	The Deliverable	Contractor's CEE & CSC Reporting on Compliance: what as done, where and when
	<b>SEE ANNEX 7</b>	pieces can be spread on adjacent roads as surface or pothole fill material and compacted.							
2.6.2	Unused construction material (sand, crush), empty drums, concrete waste and waste from work camps. <b>SEE ANNEX 5 &amp; 7</b>	<ul style="list-style-type: none"> <li>i. The contractor will identify dumping locations for construction debris and non-hazardous solid waste with DEP9/Bishkek-Osh and the CSC</li> <li>ii. The contractor shall identify any hazardous waste as part of its health and safety plan and dispose of the material through an approved waste management contractor.</li> <li>iii. The cost of disposal of hazardous (lubricant drums, waste oil, hydraulic fluid, engine filters) and non-hazardous waste shall be included in the Contractors BOQ.</li> </ul>	During Construction	All Construction Sites	Contractor /CSC	Monitor to check waste handling and disposal procedure of contractor	Throughout construction period	Note to file, signed and dated	
<b>2.7</b>	<b>Quarry/Borrow Materials</b>								
2.7.1	Preservation of Top Soil <b>SEE ANNEX 14</b>	<ul style="list-style-type: none"> <li>i. Excavation of earth fill will be limited to an appropriate depth of 20cm.</li> <li>ii. Where deep ditching is carried out, the top half-meter layer will be stripped and stockpiled.</li> <li>iii. The ditch will be filled initially with debris/scrap material from old construction and</li> </ul>	During Construction	At any locations where borrow pits, quarries will be operated.	Contract /CSC	<ul style="list-style-type: none"> <li>ii. Confirm that topsoil has been set aside</li> <li>ii. Check quarry sites for depth.</li> </ul>	During Construction period	Written and dated note indicating compliance or issue and action taken. Photo record	

N°	Environment Issue	Mitigative Measures	Time Frame	Location	Implement By/ Supv. By	Monitoring Action	Timing	The Deliverable	Contractor's CEE & CSC Reporting on Compliance: what as done, where and when
		<p>leveled with stockpiled topsoil later.</p> <p>iv. Where borrow pits cannot be fully rehabilitated, landowners will be compensated as provided in agreements between the landowner and contractor.</p>							
2.7.2	Overloading of trucks, may damage pavement, bridges, and culverts	The Contractor will ensure that loaded trucks do not exceed road, bridge and pavement specifications and are checked by weighbridges. The contractor will be required to monitor the transport of material, recording vehicle movements and weights, to be inspected.	Throughout construction period	Construction sites	Contractor's CEE & Safety Engineer/ CSC	Examine weighbridge records and compare to amount of material moved	Throughout construction period	Inspection Note with findings, dated and signed	
2.7.3	Opening of new borrow pits without permit or management plan. <b>SEE ANNEX 14</b>	If new borrow pit is required contractor will: <b>1.</b> Prepare a sketch map of site to be used, access road and volume to be extracted, then seek approval from CSC. <b>2.</b> Get approval for the site, based in KR regulation and agreement with landowner; <b>3.</b> Open the site by first stockpiling topsoil and securing the area against erosion. <b>4.</b> Decommission the site after work is complete, including landscaping and revegetation: <b>5.</b> Prepare a table showing the 5 actions and notation of what action was taken, sign it and submit to CSC.	Prior to the opening of any new borrow site	At any site where material is take for the road construction, either outside or inside the impact corridor	Contractor/ CSC/IPIG	Confirm documentation prepared as defined in mitigative action No. 2.7.3	Prior to the opening of any new borrow site	Copy of documentation or permit no.	

N°	Environment Issue	Mitigative Measures	Time Frame	Location	Implement By/ Supv. By	Monitoring Action	Timing	The Deliverable	Contractor's CEE & CSC Reporting on Compliance: what as done, where and when
2.7.4	Risk of erosion and destruction of landscape from side borrow operations. <b>SEE ANNEX 14</b>	Side- borrowing along or outside the RoW will not be permitted unless a construction emergency arises, and which will trigger a mandatory consultation with the Environmental Officer of IPIG.	Throughout the construction period	Along all 45.1 km of the project road	CEE	Inspect all side borrow activities and establish what permission given, and if none require immediate closure and restoration of the site.	Throughout construction period	Permit and relevant documentation on file	
<b>2.8</b>	<b>Noise and Vibration</b>								
2.8.1	Noise and Vibrations associated with earthworks and haul roads. <b>SEE ANNEX 6</b>	<ul style="list-style-type: none"> <li>i. Enforcing a speed limit of 30 kph within 500m of any village.</li> <li>ii. Restricting operating hours through roadside villages and settlements to between hours of 0700 and 1800.</li> <li>iii. Large and noisy machinery operations close to urban areas are restricted to daylight hours, and a schedule agreed to between contractor and local communities.</li> <li>iv. CSC to conduct noise monitoring at 12 sensitive sites and during operation of noisy equipment: asphalt breaking and loading, truck haul routes, aggregate crushing, concrete and asphalt production facilities</li> </ul>	During Construction period	At 12 sites and varying distances from noisy machinery	CSC and CEE of Contractor/ IPIG-MOTR	Using a portable noise meter, monitor works conditions , and inspect if work conducted within permitted time period in urban zones	During Construction period	Inspection Note to file for use in contractor's reporting with eventual noise measurements.	
2.8.2	Noise and Vibrations associated with compaction of asphalt and unbound materials <b>SEE ANNEX 6</b>	Application shall be carried out with equipment checked for compliance with the applicable Laws in KR regarding Noise and Vibration at construction sites: SN 2.2.4/2.1.8.562-96 "Noise in working areas, dwelling accommodations, public buildings	During Construction period	At 12 sites and varying distances from noisy machinery	CSC and CEE of Contractor/ IPIG-MOTR	Using a portable noise meter, monitor works conditions , and inspect if work conducted within permitted time period in urban zones	During Construction period	Table of noise measurements at sensitive sites	

N°	Environment Issue	Mitigative Measures	Time Frame	Location	Implement By/ Supv. By	Monitoring Action	Timing	The Deliverable	Contractor's CEE & CSC Reporting on Compliance: what as done, where and when
	<b>AND 7</b>	and on the territory of residential construction". SN 2.2.4/21.8.566-96 "Production vibration. Vibration in accommodations, dwelling and public buildings»							
<b>2.9</b>	<b>Health and Safety</b>								
<b>2.9.1</b>	Damage / disturbance to Utilities within RoW <b>SEE ANNEX 3 &amp; 4</b>	Removal and relocation of power, water, and other utilities to make way for construction must be conducted through a consultation-first approach, followed by removal and immediate replacement	-At start of construction for the entire 45.1 km--	Along the entire alignment	Contractor / CSC	i. Inspect construction areas where access is an issue and establish if contractor is managing problem and if local residents are satisfied. ii. Always identify by clear signage according to regulation maintenance activities on the roadway	Throughout construction period	Inspection note with findings, dated and signed	
<b>2.9.2</b>	Traffic Disturbance : Loss of access for roadside residents <b>SEE ANNEX 4</b>	Contractor shall provide safe and convenient passage for vehicles and pedestrians to and from side roads and properties connecting the project road/area. In case such work occurs, traffic management arrangement shall be submitted for approval by the Supervision Engineer , after consultation with local people and the police, before the work takes place, and according to local regulations.	Construction Period	Town Crossings, roadside businesses and operations	Contractor and Safety Engineer/ CSC	Inspection of construction sites to ensure proper use of OHS gear and contractor enforcement	Throughout construction period	Inspection note with findings, dated and signed	

N°	Environment Issue	Mitigative Measures	Time Frame	Location	Implement By/ Supv. By	Monitoring Action	Timing	The Deliverable	Contractor's CEE & CSC Reporting on Compliance: what as done, where and when
2.9.3	Health and Safety Concerns: Protecting the workforce and maintaining a safe working environment. <b>SEE ANNEX 3 &amp; 4</b>	<ul style="list-style-type: none"> <li>i. Contractor must provide safety vests, hard hats and protective footwear for all workers handling heavy machinery, and working with hazardous materials such as concrete, asphalt, paints, and cleaning agents .</li> <li>ii. Contractor must provide protective masks to machine operators, where dust can be generated, and to anyone working in the area of the machines, with masks of a micron size, capable of capturing dust down to 2 microns.</li> <li>iii. Any works at night should be adequately lit and high visibility clothing worn and contractor should provide basic training on use of protective clothing and equipment.</li> </ul>	Construction period	Contractor's Depots and all work areas, including those of sub-contractor	Contractor's Safety Engineer and CEE / CSC	Inspect all operations in the depots including worker housing and all waste management procedures.	Throughout the construction period	Inspection note re findings, dated and signed.	
2.9.4	Contractor's work areas and depots not maintained, no proper waste management, environmental health and safety measures. <b>SEE ANNEX 4</b>	<ul style="list-style-type: none"> <li>i. All depots shall be provided with septic sanitation facilities and potable water.</li> <li>ii. Monitoring will be required for the solid waste disposal at the depot and to ensure that the health and safety plan based on contract specifications is followed.</li> <li>iii. During operation, the surface of the depot used for storage of construction materials shall be protected against run-off and spills of hazardous materials</li> </ul>	Throughout the construction period	Contractor's Depots and all work areas, including those of sub-contractor	Contractor's Safety Engineer and CEE / CSC	CEE and Safety Engineer to conduct regular inspections of sites	Weekly , during the construction period	Inspection checklist addressing three items listed here	

N°	Environment Issue	Mitigative Measures	Time Frame	Location	Implement By/ Supv. By	Monitoring Action	Timing	The Deliverable	Contractor's CEE & CSC Reporting on Compliance: what as done, where and when
		using impermeable protection covering the ground and a system to collect contaminated run-off.							
2.10	Lack of contractor's construction period mitigation completion report	Contractor will be required to prepare a safeguards implementation completion checklist at the end of the construction period, discussing very briefly, each construction period EMP item.	Prior to final payment to contractor	NA	Contractor's CEE and Safety Engineer/ CSC	Inspect and collect report	Prior to final payment to contractor	Copy of report on file	
2.11	Lack of transport and facility for CSC environmental auditor to conduct compliance monitoring.	MOTR must file a semi-annual environmental monitoring report with ADB. Data for that will be assembled based on quarterly environmental inspections by the CSC's environmental specialist. Twice a year the Int'l Env. Specialist will conduct a due diligence compliance audit. To complete this work the CSC Env. Specialist will be provided with transportation as needed, as well as working space in the field	Conduct inspection of all operations every three months, including contractor yard, file semi annual monitoring report and Annual DD audit.	Across the entire construction area , including all subcontractor facilities	CSC and Contractor's CEE/ IPIG	Conduct inspection of all operations every three months, including contractor yard, file semi annual monitoring report and Annual DD audit.	Every three months	Copy of report	
2.12	Failure to protect 12 sensitive site identified in the IEE	The 12-13 sites have been identified in Annex 2 of the IEE and parameter likely impacted identified, plus baseline measurements obtained in 2013 , 2015 and again in 2017. A construction period air, noise and surface water quality testing program will be undertaken quarterly according to the design	Throughout the construction period	AT 12 sensitive sites using the sampling design provided in the IEE-and as specified in CEMP Items 2.4.1, 2.8.1 & 2.8.2	Contractor/ CSC	Examine field survey data on noise, air and surface water quality at sensitive sites	Throughout the construction period	Data tables on file	



N°	Environment Issue	Mitigative Measures	Time Frame	Location	Implement By/ Supv. By	Monitoring Action	Timing	The Deliverable	Contractor's CEE & CSC Reporting on Compliance: what as done, where and when
		defined using GPS coordinates as defined in the in the IEE Annex 2 s.							
<b>3</b>	<b>Operating Period Contractor's Defect Year</b>								
3.1	Failure to fully decommission and clean up work area including garbage site, sewage, service area fuels and lubricant spills and erosion protection	Buried garbage, latrine pits, fuel and lubricant and construction material such as bitumen left in and around the contractor's work area will be cleaned up and the area restored.	Within first 3 months of the defect period starting	At contractor offices and housing as well as all other work camps	CEE	Photo inspection/record of before and after	To take place before the end of the 8th month of the defect period	Photo record of before and after rehab. Conditions	
3.2	Contractor abandons used borrow sites leading to illegal mining, erosion and land degradation. <b>SEE ANNEX 14</b>	Borrow pit restoration according to plan defined in the IEE and earlier in this table, Activity 2.7	Within first 3 months of the defect period starting	At all borrow sites	CEE	CEE to provide photo record of before and after photos	To take place before the end of the 8th month of the defect period	Photo record of before and after rehab. Conditions	
3.3	Haul roads left abandoned not decommissioned leading to inappropriate use, erosion, damage to nearby property. <b>SEE ANNEX 14</b>	Close road as agreed to with local authorities and local land owners				Record of agreement with local authorities and photo of post-construction road use!	To take place before the end of the 8th month of the defect period	Photo record of before and after rehab. Conditions	
3.4	Inadequate maintenance of large roadside tree plantation <b>SEE ANNEX</b>	Based on MOTR's DEP9 guidance, ensure that trees planted remain healthy, protected from grazing animals and receive water. Annual tree count will be required and any dead trees will	At the start of the operating period and every two months for the 1 <sup>st</sup> year	All areas where tree planting took place during the construction	MOTR's highway maintenance unit/MOTR	Inspection of tree plantation and replanting dead trees and reestablishing better maintenance program	3 months before end of defect year	Tree inventory and replanting data sheet	

N°	Environment Issue	Mitigative Measures	Time Frame	Location	Implement By/ Supv. By	Monitoring Action	Timing	The Deliverable	Contractor's CEE & CSC Reporting on Compliance: what as done, where and when
	<b>11</b>	need to be replaced.	and semi annually for the next 2 years.	period					
<b>3.5</b>	Contractor crushing facilities, concrete plant and asphalt plant, especially bitumen storage areas are not cleaned up <b>SEE ANNEX 14</b>	Contractor to clean up and fully rehabilitate the sites	Within first six months of the defect year	Sites used for the activities defined in column 1	Contractor's CEE	Inspect and record clean up	Within first 6 months of start of operations of the rehabilitated roadway	Inspection record and photo evidence	

## ANNEX 3 MONTHLY MONITORING REPORTS

These and other reports serve as the evidence for notices sent to the contractor concerning non-compliance issues. The process followed is that as issues are identified, official notices are sent from EPTISA to the contractor. There have been a total of 6 notices sent to date. Conditions considered to be non-compliant were immediately brought to the attention of the contractor and the contractor has responded and implemented change quickly. Follow up monitoring is needed.

### **Report National environmental specialist - Volkova Tatyana For the period from 25.08.2017 to 15.09.2017**

Date: 15.09. 2017

Period, covered by this report: from 25.08.2017 to 15.09.2017

#### **CEMWP №1.3, 2.2.1 Earthworks**

At present, earthworks are carried out on the 45.6 -51.6 km section of the road. (site 4) Rolling and compaction of the side slopes of the north side of the road are being carried out.

A section of a rolled and compacted road (km 49 - 51), the northern side





Works are also carried out on the south side of the road.



The installation of culverts continues on the north side of the road



Waterproofing of pipes with bitumen is conducted





Installation of rectangular pipes





Driven out a wedge groundwater causes problem.







In order to ensure the safety of traffic, the site of work is fenced, barriers and signs of traffic safety are installed.





Transformer for providing night-time lighting of problem zones on roads (where pipes are installed).

Installation of new electric poles are carried out on the north side of the road.



**CEMWP № 1.4, 2.2.2, 2.9.3 Borrow pits, concrete and asphalt-concrete plants**  
Works were carried out on the Aksuu 2 borrow pit during the monitoring.





It was found that the excavator works in breach of safety regulations. Explanatory work was carried out with the excavator operator



A warning was made that the maximum loading of machines with inert materials could lead to the destruction of asphalt on the roads. Currently, loading of machines is reduced.

On the territory of the borrow pit two watering machines are constantly on duty, watering the access roads to borrow pits and on borrow pits. Workplace dusting is minimal.



On the road from the Aksu 2 borrow pit, which leads to the village, a partitioning trench is made, so that no cars can cross it.



On the Aksu 1 borrow pit no work was done. All equipment from the borrow pit is taken out.



At present, the site for the construction of an asphalt-concrete plant and a plant for iron-concrete products has been selected and agreed upon.



**CEMWP № 1.5 Asphalt waste management**

No work with the removal of the old asphalt is carried out.

**CEMWP № 1.8 Tree management**









The road is constantly watered.





Areas for storing tree trunks and roots.





### **CEMWP № 2.7.2 Overloading trucks lead to road damage**

On the road section, between 3 and 4 km, leading to a borrow pit, there is a problematic area on which permanent damage to asphalt is noted. At the present, the Contractor is trying to improve situation on this road site.





### **Other**

1. During the reporting period, the requested information was collected and sent to the subcontractor for work on noise modeling.

2. 11/09/2017 ADB mission visited sections 3 and 4 of the road. The houses were inspected, the owners of which wrote complaints about the effect of vibration on the cracks in the houses.

Also, representatives of the ADB visited the site where trees were cut down, looked at the site for the Asphalt Concrete Plant and work in borrow pits. In addition, a meeting was held on which the identified problems and ways of their solution were announced.



## Report of local environmental specialist of EPTISA Volkova Tatyana for the period from 1.10.2017 to 31.10. 2017

Date: 31.10. 2017

Period, covered by this report: from 1.10. to 31.10. 2017

### CEMWP №2.2.1 Earthworks

At present, earthworks are in progress on the 45.6 -51.6 km section of the road. (Section 3). Rolling and compaction of the side slopes of the north and south side of the road are being carried out.





In addition, the removal and disposal of soil layer on the south side of the road was carried out 50 + 20 km (CEMWP № 2.7.1)





At the third section PK 371 + 00 - 431 + 00 (Petrovka village, 45.6-51.6 km), work was also carried out to dismantle the old and install new culverts, to displace and install new electric and telephone poles from the north side of the roadway platform.





For the purposes of traffic safety, the site of work is fenced, barriers and signs of traffic safety are installed.



Driven out a wedge groundwater causes problem.



Existing old pipes are almost completely locked by soil.



Installation of new electric poles are carried out on the north side of the road.



Replacement of electric and telephone poles

At the sites of construction work, for the purpose of dust suppression, regular watering is carried out.



Construction work on dismantling, reconstruction, and grouting of the base from the northern part of the bridge across the Jelamysh River is in progress.



#### **CEMWP № 2.6.2. Construction waste**

Reinforced concrete construction waste formed during the drilling of the road to install new pipes was removed to dedicated sites for storage of old concrete products.



Reinforced concrete waste



A site for storing old concrete products.

Old asphalt waste formed during the drilling of the road to install new pipes was transported for closing up pits on the sections of country roads indicated by local authorities located at the entrance to agricultural fields.



**CEMWP № 2.2.2 Borrow pits, concrete and asphalt-concrete plants**

Work was carried out on excavating, sieving and stockpiling of materials on the Ak-Suu 1 and 2 borrow pits



On the territory of the borrow pit two watering machines are constantly on duty, watering the access roads to borrow pits and on borrow pits. Workplace dusting is minimal. This is seen on photos.

### **Asphalt-concrete plant and iron-concrete products plant**

At present, the construction of an asphalt-concrete plant and a plant for iron-concrete products has been started.







### **CEMWP № 2.5.1 Tree management**

On October 16, after receiving permission from ADB, work began on tree cutting in the 2nd section PK 270 + 00 - 320 + 80 (Sadovoe village, Belovodsk village 35.5-40.5 km).

Since the deadline for permission for the tree cutting in the 2nd section expired on October 16, the Contractor had to reapply for the extension of the work on the tree cutting in this area.

Documents for obtaining permission for tree cutting in the 1 first section PK 74 + 00 - 128 + 00 (village Military-Antonovka, Kyzyl-Tuu village, Gavrilovka 15.9-21.3 km) were prepared and submitted for the approval to Chui-Bishkek territorial department of environmental protection.







*In violation of safety regulations, due to the lack of a lift, workers are working at a height in the loader bucket*



The branches and roots of trees are taken out immediately after cutting into specially designated areas by the local administration



### **CEMWP № 2.12 Laboratory monitoring**

1. The laboratory of the the State Agency on Environment Protection and Forestry in the presence of the environmental specialist EPTISA and the environmental specialist of the Contractor conducted sampling of air and soil.

On October 3, samples of air were taken at the construction site near the houses on the places of work performance, as well as on a vulnerable site in the Petrovka village.



On October 13, soil samples were selected on sections of the road, the work on which is scheduled for 2017.



Air samples were examined for the content of nitrogen dioxide, sulfur dioxide, carbon monoxide, suspended materials. Based on the results of the analyzes, the excess of 1,1 MPC above nitrogen dioxide was noted at one point, and the 1.3 MPC exceeded on suspended materials at one point.

The soil samples were examined for lead and petroleum products. Based on the results of the analyzes, in almost all samples, the MPC was exceeded for lead and the high content of oil products.

Results of analyzes in the Appendix.

Monitoring of water quality in the Jelamysh River was not held in October, due to the lack of water in the river.



2. The Contractor's laboratory regularly conducts research on the quality of the roadway platform.



## Other

### 1. ADB mission visit on October 4

On October 4, a joint visit to the construction sites of representatives of ADB, MOTR, Eptisa specialists and the Contractor was conducted. The main issues were the maximum conservation of trees planned for cutting and a meeting with residents who filed complaints on the cracks. A meeting on the results of the visit was held in the office of the Contractor.





Joint visit to the construction sites



Trees preserved from cutting as a result of moving the sidewalk.





Holding of a meeting in the Contractor's office

## 2. Collaborative work with the sociologist of Eptisa

On October 10-11, a joint visit was held with the sociologist and topographer of Eptisa. The purpose of the trip was to agree with the local residents on the demolition of fruit and ornamental trees and front gardens.





## Report of local environmental specialist of EPTISA Volkova Tatyana for the period from 1.11. to 30.11. 2017

Date: 30.11. 2017

Period, covered by this report: from 1.11. to 30.11. 2017

### CEMWP №2.2.1 Earthworks

At present, earthworks are in progress on the 45.6 -51.6 km section of the road. (Section 3). Rolling and compaction of the side slopes of the north and south side of the road are being carried out.





On the Section 3 in the Petrovka village, 45.6-51.6 km works on dismantling old and installing new culverts, transporting and installing new electric and telephone poles on the north side of the roadway were also being carried out.





The photo shows the ramming of the base under the culvert without vibration mode



The photo shows the tamping of the base under the culvert

Driven out a wedge groundwater causes problem.



Existing old pipes are almost completely plugged with soil



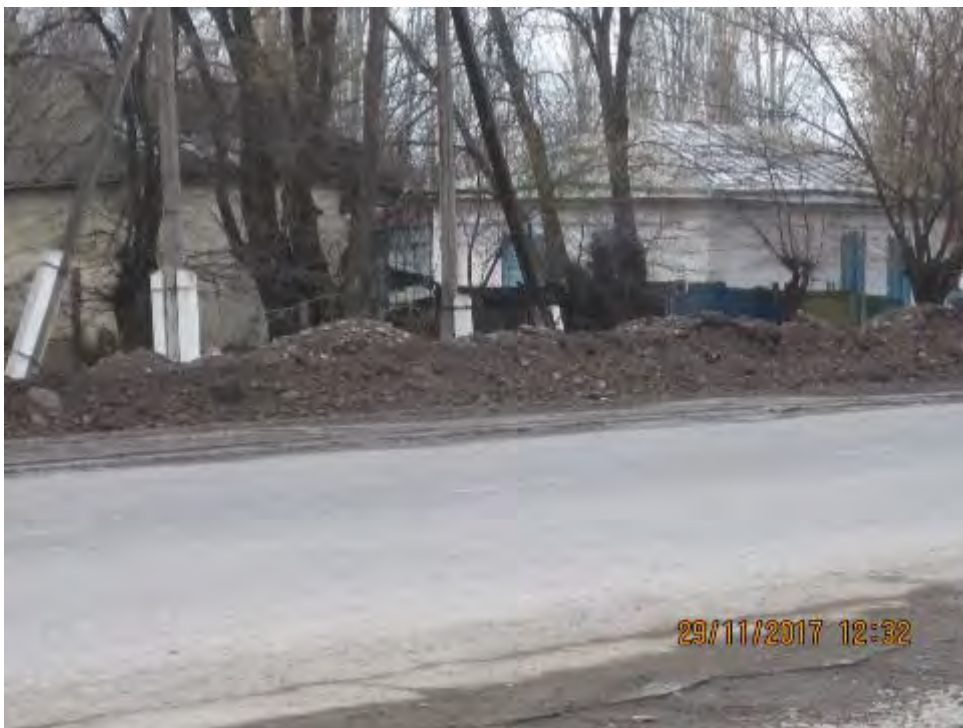
For the purposes of traffic safety, the site of work is fenced, barriers and signs of traffic safety are installed.



Night illumination with the help of lamps and LED strips is organized



On Section 3 in the Petrovka village 45.6-51.6 km in order to ensure the safety of traffic in the winter in areas where had no time to make ramming of the side slopes, barriers are constructed from inert materials for the icy condition of roads.







Construction work from the northern part of the bridge across the Jelamysh river is suspended for the winter period





Water appeared in the Jelamysch river but suspended construction works currently do not have an impact on the water in the river.

Monitoring of water quality in the Jelamysch river was not held in October, due to the lack of water in the river.



**CEMWP № 2.6.2. Construction waste**

Reinforced concrete construction waste formed during the drilling of the road to install new pipes was removed to dedicated sites for storage of old concrete products.



Photo shows reinforced concrete wastes formed during the installation of culverts

**CEMWP № 2.6.1**

The old asphalt removed during the construction of the bridge was not used and stored near the bridge under the construction



**CEMWP № 2.2.2 Borrow pits, concrete and asphalt-concrete plants**

Work was carried out on excavating, sieving and stockpiling of materials on the Ak- 2 borrow pit.



Workplace dusting is minimal. This is seen on photos.



During the monitoring of the construction work, violations in the development of the Aksu 2 borrow pit were revealed, so with the allowed depth of development of 2.3 meters, the development is conducted to a depth of 4 or more meters. And the development is conducted in one small area, while the allocated and approved under the borrow pit area is very large.



At the meeting, the chief engineer of the Contractor explained this by the fact that the material necessary for the construction works on the road is at a depth of more than 2 meters and that they did not know that it is impossible to dig deeper than 2,3 m, since they planned to fill up all unused material .

During the meeting, an explanation was given about the responsibility for compliance with the requirements approved by the State Agency for Geology and Mineral Resources in developing this borrow pit.

In view of the foregoing, in order to avoid conflict with local authorities and penalties from State Inspectorate for Environmental and Technical Safety, an official warning was issued to the Contractor from Eptisa.

In the established timeframe, all the developments made deeper than the established depth, were filled.



At the Aksu 1 borrow pit, the permitted depth of development of 3.5 meters is not exceeded. The development of the borrow pit was not carried out in November



### **Asphalt-concrete plant and plant of iron-concrete products**

In November, the construction of an asphalt-concrete plant, a plant for iron-concrete products and crushing plant for crushing stones were being continued.



Photographs shows the construction of a foundation for a stone crusher



The construction of a concrete plant

### **CEMWP № 2.5.1 Tree management**

In November, work was carried out to cut trees on Section 1 of the PK 74 + 00 - 128 + 00 (15.9 - 21.3 km). The initial number of trees falling under the cutting was 762 pieces. After the sidewalk design was changed, a secondary survey was carried out, as a result of this 16 trees were preserved. As a result, the number of trees falling under the cutting in Section 1 is 746 pieces.



Since the deadline for authorizing the tree cutting on Section 1 has expired, the Contractor had to reapply for the extension of the work on the tree cutting on this site (the village of Military-Antonovka, Kyzyl-Tuu village, Gavrilovka village).





The branches and roots of trees are taken out immediately after cutting into specially designated areas by the local administration





**CEMWP № 2.9.4 Contractor's construction camp. Lack of proper waste management**

On the territory of the Contractor's construction camp on the day of monitoring the following violations were noted



The generator is installed directly on the ground, without a concrete base. The area surrounding the transformer is littered.



Barrels of oil and other wastes are not stored properly.

Household garbage is stored in containers, which are not disposed of in time. The reason is the lack of sufficient transport from the service company.

