Environmental Monitoring Report

Bi-annual Report
July 2017

KAZ: CAREC Corridor 2 (Mangystau Oblast Section) Investment Program – Tranche 2

Prepared by SMEC International Pty Ltd., Austratia for Ministry of Investment and Development and for the Asian Development Bank.

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CAREC 3

To: **PMC Zhol Sapa**

Attn: **Mr. Ibraikhanov Sabit**
Team Leader

Date: July 24, 2016
Our ref: 5017016/CT/1479

Reference: *Loan 2967-KAZ: MFF CAREC Corridor 2 (sections in Mangistau region), Investment program, Project 2, Shepte-Aktau section of Aktau-Beineu road - Works Contract 001-ADB/CW-2014 from Km 632.3 to Km 719 n& Works Contract 002-ADB/CW-2014 from Km 719 to Km 802.3*

Subject: **5th Bi-annual Environmental Monitoring Report, January-June 2017**

Dear Sir,

In accordance with the Contract for Consultant's, Appendix A- Term of Reference (TOR), Sub Clause 5.1, we are hereby sending English version of the 5th Bi-annual Environmental Monitoring Report, January-June 2017. Russian version will be submitted after completion of translation.

Sincerely,

A Hossain

Amir Hossain P. Eng
Team Leader
SMEC International Pty in association with Sapa-SZ LLP

Enclosure: 5th Bi-annual Environmental Monitoring Report, January-June 2017 (English version)

Cc.: Mr. Ablaliyev Satzhan, Deputy Chairman Committee for Roads MID RoK
Mr. Demesin Sain, General Manager RSE Mangystau Zhol Laboratory
Mr. Muratbek tegi B., Deputy Team Leader PMC Zhol Sapa

SMEC International Pty Ltd. – Australia
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САПА СЗ

Дата: 24 июля 2016
Исх номер: 5017016/CT/1479

Кому: **КУП Жол Сапа**

Вним: **Господин Ибрайханов Сабит**
Руководитель проекта

Ссылка: *Заем 2967-KAZ: ФМФ Коридор ЦАРЭС 2 (участки в Мангистауской области), Инвестиционная программа, Проект 2, участок Шетпе-Актау автодороги Актау-Бейнеу Контракт 001-ADB / CW-2014 км 632.3 - км 719 и Контракт 002-ADB / CW-2014 от км 719 - км 802*

Тема: **5-й Полугодовой отчет по экологическому мониторингу, Январь-Июнь 2017**

Уважаемый господин,

В соответствии с Контрактом для Консультанта, Приложение А – Техническое задание (ТЗ), подпункт 5.1, направляем Вам английскую версию 5-го Полугодового отчета по экологическому мониторингу, Январь-Июнь 2017. Русская версия будет представлена после завершения перевода.

С уважением,

Амир,Хоссейн, Проф. Инженер
Руководитель проекта
SMEC International Pty в ассоциации с ТОО Сапа СЗ

Приложения: 5-й Полугодовой Отчет по экологическому мониторингу, Январь-Июнь 2017 (английская версия)

Копия: Г-н Аблалиев Сатжан, Зам.председателя Комитета автодорог МИР РК
Г-н Демесин Саин, Руководитель РГУ Мангыстау Жол Лаборатория
Г-н Муратбек теги Б., Зам. Руководителя проекта КУП Жол Сапа

COMMITTEE FOR ROADS
MINISTRY OF INVESTMENT AND DEVELOPMENT
REPUBLIC OF KAZAKHSTAN

LOAN NUMBER 2967-KAZ

CENTRAL ASIA REGIONAL ECONOMIC COOPERATION (CAREC)
TRANSPORT CORRIDOR 2

INVESTMENT PROGRAM – MAGYSTAU OBLAST, PROJECT 2

RECONSTRUCTION
OF
SHETPE-AKTAU SECTION OF AKTAU – BEINEU ROAD

Fifth Bi-annual Environmental Monitoring Report

(Period: January - June 2017)

July 2017

CONSTRUCTION SUPERVISION CONSULTANT

SMEC International Pty Ltd., Australia
In association with Sapa SZ, Kazakhstan

Fifth Bi-annual Environmental Monitoring Report

Period: January - June 2017

July 2017

Republic of Kazakhstan: MFF CAREC Transport Corridor-2: INVESTMENT PROGRAM-PROJECT-2

Financed by the Asian Development Bank

Prepared by

SMEC International Pty Ltd., Australia
In association with Sapa SZ, Kazakhstan

For Ministry of Investment and Development, Kazakhstan
Committee for Roads,

Asian Development Bank

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ABBREVIATIONS

ADB	Asian Development Bank
AOI	Area of Influence
ARE	Assistant Resident Engineer
CAREC	Central Asia Regional Economic Cooperation
CR	Committee for Roads
CSC	Construction Supervision Consultant
EHS	Environment Health and Safety
EIA	Environmental Impact Assessment
EMMP	Environmental Management and Monitoring Plan
EMP	Environmental Management Plan
EHS	Environment, Health and Safety
FGD	Focus Group Discussion
FIDIC	Federation International Des Ingenieurs Conseils (the French acronym for International Federation of Consulting Engineers)
GRM	Grievance Redress Mechanism
GPS	Global Positioning System
IEC	Important Environmental Components
IUCN	International Union for Conservation of Nature
KKSGR	Karagie-Karakol State Game Reserve
MoTC	Ministry of Transport and Communications
MoID	Ministry of Investment and Development
MFF	Multi-tranche Financing Facility
MPD	Maximum Permissible Discharge
MPE	Maximum Permissible Emission
O&M	Operation and Maintenance
PMC	Project Management Consultant
PPE	Personnel Protective Equipment
RK	Republic of Kazakhstan
RoW	Right of Way
SMEC	Snowy Mountain Engineering Corporation
SPS	Safeguard Policy Statement
SSEMP	Site Specific Environmental Management Plan
TOR	Terms of Reference
TS	Technical Specification

PART I: INTRODUCTION

1 PRILIMINARY INFORMATION

1.1 Background

This report is the fifth Bi-annual Environmental Monitoring Compliance Report of the project construction supervision contract 1 and 2 (km 632 – km 719 and km 719 – km 802) by the Environmental Specialist. It covers the period from January to June 2017 in compliance with the environmental scope of the construction supervision. This Bi-annual Environmental Monitoring Report is produced as a report to the requirements of the Contract for the provision of Construction Supervision Services to the Ministry of Investment and Development, Committee for Roads of the Republic of Kazakhstan for the CAREC 2 Corridor (Mangistau – Oblast Section) Investment Program Project 2 under the Asian Development Bank, Loan Number 2967- KAZ.

The environmental safeguards of the project are being implemented in compliance with the loan covenants, project agreement and contractor is complying with the proposed mitigation measures described in the Environmental Management Plan (EMP); Safety, Health and Environment (SHE) Manual and the contract specifications. The implementation of environmental safeguards is being monitored at Project Management and General Consultant (GC) level. With exception of few issues the project is being implemented in compliance with project requirements.

The purpose is to recognize environmental impacts and to assess competence of accepted mitigation measures during the reporting period and offer recommendations improving environmental performance. The report includes environmental monitoring activities undertaken, details of monitoring data collected, analysis of monitoring results, recommended mitigation measures, environmental training conducted, stakeholder consultation and environmental regulatory violations. The findings and recommendations of this report are based on field inspections and observations carried out from environmental inspections to construction site by the environmental specialist and project staff.

The Asian Development Bank (the “ADB”) has provided its support to the Government of Kazakhstan to contribute to the development of the national road network through the MFF CAREC Transport Corridor 2 (Mangystau Oblast Section) Investment Program, Project 2. The main objective of the Project is to support the country’s inclusive and environmentally sustainable economic growth and poverty reduction by gradual reduction of road transport costs for goods and services as well as improve access, road operational conditions, ease of transit, road safety, and regional cooperation and integration along Kazakhstan’s road network through reconstruction of 170km roads of Shetpe – Aktau road of Mangystau Oblast sections in accordance with the ADB’s 3 Strategic Agendas for inclusive growth, regional integration, and environmentally sustainable growth.

As per the environmental impact assessment (EIA) report, the project has been classified as category “A” based on the cumulative Environmental Impacts. The Environmental impacts of the project during implementation are assessed by measuring various performance indicators. The collection and collation of the baseline data for various environmental impacts for the project helped in assessing the impacts as per implementation schedule

given in the contract. Construction supervision is being undertaken under FIDIC with environmental supervision and monitoring scopes. The Contractor is obligated to obtain regular parameter measurements of air quality, water quality, noise & vibration, the results of which are submitted regularly to the Engineer. Environmental monitoring of the Engineer is done primarily by the Environmental Specialist / consultant engineers with field coordination with contractor environmental specialist.

As mentioned in the Terms of Reference of the Construction Supervision, the environmental aspects entail environmental monitoring and management of project implementation and assistance in ensuring the implementation of environmental management practices at each stage of the construction. In addition, the environmental specialist has been developed an environmental auditing protocol for the construction period, formulate a detailed environment monitoring and management plan (EMMP), regularly supervise the environmental monitoring, and submit periodic reports based on the monitoring data and laboratory analysis reports.

1.2 Objectives

The objective of environmental monitoring is to allow ADB and the Committee for Roads gather information to: i) evaluate the environmental management plan (EMP) progress by establishing compliance status, ii) detect and correct non-conformances, iii) identify unanticipated impacts and implement necessary mitigation measures, and iv) provide evidence to support enforcement of penalty provisions of the civil works contract to deter non-compliance. The purpose of the Bi-annual Environmental Monitoring Report is to provide a summary of the key issues relating to environmental management on environmental impacts and mitigation measures over the past six months (January to June 2017). The summary includes an update on overall project progress, the status of EMP implementation, any progress made with environmental management, environmental monitoring results, and other relevant issues such as non-compliance and corrective actions, and monitoring of the Grievance Redress Mechanism (GRM). The report is prepared by SMEC International Pty Ltd. and is intended to inform ADB and any other interested parties of the status of environmental management of the project. The report is summaries; more detailed information has been included in the monthly and quarterly report prepared by the Contractors and the Engineer.

The objective of this report is to comply with environmental security requirements of the Republic of Kazakhstan in accordance with ADB's Safeguard Policy Statement (SPS) 2009, as well as to fulfill the loan covenants as described in the loan and project agreement signed by the Government and ADB and to ensure that all environmental mitigation measures is given in EIA and EMP incorporating all the Environmental concerns of the project. The principle objectives of the project with respect to Environment are:

- to ensure environmentally compatible project implementation by avoiding and mitigation of negative impacts that are likely to arise from the project;
- to ensure that EMP recommendations are adequately followed and to meet the Environmental compliance of statutory requirements.

The report is based on findings during the field visits, the monthly and bi-annual environmental protection progress reports submitted by Contractor, information and

discussions with consultant staffs, contractor representatives and other relevant stakeholders.

1.3 Methodology

This fifth Bi-annual Environmental Monitoring Report is prepared by reviewing and extracting key information from a number of sources, as follows:

- Contractors' Monthly and Bi-annual Environmental Protection Report (from January to June 2017);
- Contractors' and Consultants Grievance Registers Book;
- Engineer's Monthly and Quarterly Progress Reports;
- Engineer's Environmental Specialist's Field Reports and regular site visits;
- Contractors' Monthly instrumented monitoring results on air quality, water quality, soil quality and noise & vibration;
- *Ad Hoc* reports from the Contractors / consultants on training and stakeholder consultations;
- Correspondence between Engineer and Contractors relating to environmental issues;
- Consultations with several stakeholders.

In addition, some information and opinion in the report results from site visits, technical meetings and public meetings and interviews over the preceding six months.

1.4 The Project Area

The project involves reconstruction of the road between Shetpe & Aktau and construction of two new bypasses around Shetpe and around Zhetibay. The project is located within Mangystau Oblast bordering Caspian Sea. The end point of this road project is the city of Aktau, an important economic hub and port for export goods, including terminal for pipelines delivering the regional oil products as far as Western Europe. The project will comprise upgrading and reconstruction of a 170 km section of the national highway A-380 between Aktau and Shetpe. The project consists of two sub-sections, contracted separately. Location of the Project in terms of contracts is shown in Figure 1.1.

- **Sub-Section 1: km 632 - km 719 (Shetpe Village – Beki Village – Zhetybai village):**

This sub section includes upgrading of the road from Category III to category II with a total length of 85.44 Km and construction of two Bypasses, Bypass Shetpe village (PK 1+60 to PK 92+58) and Zhetibay village (PK 719+60 to PK 796+80) are expected to pass in new alignment. Other parts of this section, projected traffic flow direction coincides with the existing embankment sub grade with partial deviations from embankment in the areas of rectification and curvature designs (length of sections from 120 up to 920m).

In this sub section project provides construction of bridge 1x18m on PK 33+24, construction of overpass 3x24m on PK 72+30, and construction of round type transport interchange in one level on PK 92+58.

It is also planned to construct Pipe Culverts 54 Nos, ramps and 8 Nos Box Culverts and Cattle Passes (4x2.5 m).

Lightening of the road will be done on the sections PK34+00- PK45+00, PK68-PK109, a total length of 10.6 Km and on sections PK90+60-PK817+60 with a length of 7.5 Km.

- **Sub-Section 2: km 719 - km 802 (Zhetybai village – Ashyagar village-Aktau):**

This Sub-Section involves reconstruction of 67 km section of the existing road between Zhetibay and Aktau, from Category III to category I-B, and repair of 16 km section in existing parameters, category III.

The length of the project is 83.896 km. The reconstruction project provides:

- PK 0+ 00 to PK 682+96 reconstruction of existing road in the parameters I-B technical category with four lanes carriageway and widening the roadway to 27.5m at the top.
- Construction of Interchanges in two levels at the intersection of highways “Aktau-Zhanaozen and Shetpe-Kuryk with the passage of four-lane highways on top (of the overpass 6x24m) across the road "Shetpe - Kuryk".
- From PK 698+96 to PK 838+96 of the section within urban area, provided the average repair of the city road.
- At PK 43+37 Construction of railway overpass(13.5m+2x18m+13.5m) and at PK 376+74 reconstruction of bridge over Arshyagar river (3X18m)
- Construction of 48 nos of pipe culverts and 4 nos of cattle passes (4x2.5m)
- Lightening of transport interchange on km 720 with the length 7.8 km and on km 785.7 with the length 5.5 km.

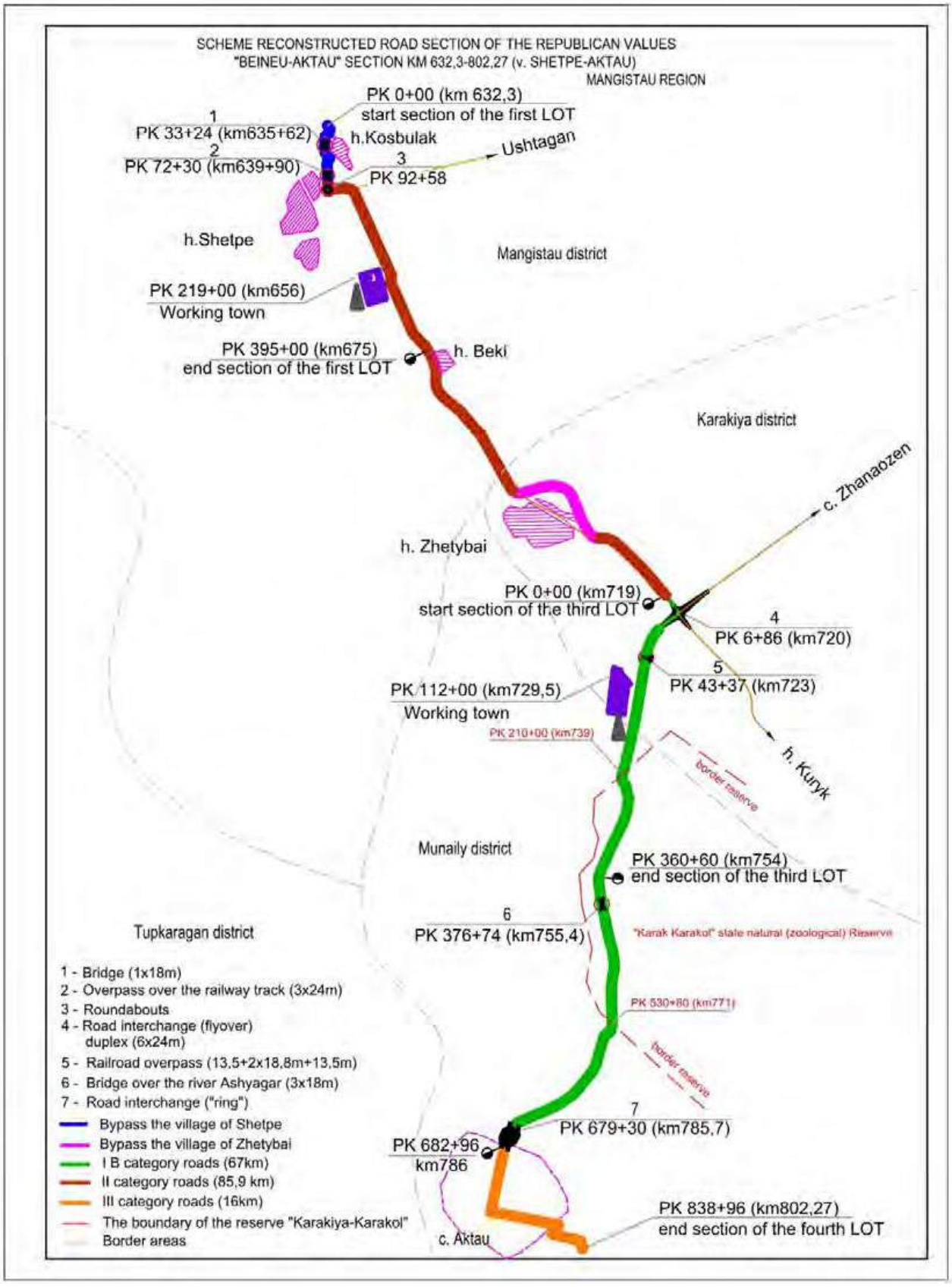


Figure 1.1: Location of the Project Road

1.5 Technical Description of the Road Project

The scope of works mainly consists of:

- building a new carriageway along the existing one at 67 kilometer road section to increase the road width to Type I B standards (4 lanes) and reconstruction of the pavement of the existing carriageway together with geometric improvements of vertical and horizontal alignment,
- reconstruction of the pavement at 87 km section together with geometric improvements of vertical and horizontal alignment by keeping existing Type II standards (2 lanes),
- rehabilitation of the pavement by milling and overlays at the last 16 km section of the road to Aktau Port.
- structural works involving construction / reconstruction / repair of Bridges and construction / extension / repair / reconstruction of existing culverts,
- drainage works consisting of pavement edge gutters and road side drainages,
- relocation of existing utilities,
- Construction of bus shelters, rest areas and areas for momentary stops,
- Improvement of road safety by provision of guardrails, road signs and marking

The project road sections and upgrading standards is given in below

Contract 001	Lot 1	42.7 km	Km 632.3 to Km 675	42.7 km	Type II	2 Lanes
	Lot 2	44 km	Km 675 to Km 719	44 km	Type II	2 Lanes
Contract 002	Lot 3	35 km	Km 719 to Km 754	35 km	Type IB	4 Lanes
	Lot 4	48.3 km	Km 754 to Km 802.3	32.3 km	Type IB	4 Lanes
				16 km	Type III	2 Lanes

1.6 Environmental Characteristics of the Project Area

Typical for vast desert and semi-desert zones, the main climatic features are (moderately) cold winters and hot summer periods. The amount of precipitation in the Project Area usually does not exceed 150mm per year. Precipitation mainly falls as rain, and during winter, less pronounced, as snowfall. Complete snow cover of large areas is usually lasting only for few weeks during winter time (January to March). Thus driving conditions in this road sections are, from climatic point of view, relatively good throughout the entire year. However, during the winter months some locations with steep ascends pose considerable problems for drivers as road surface becomes icy and difficult to manoeuvre.

Within the urban areas of Zhetibay and Shetpe dust is a common problem that results from the soil and climatic conditions of the region. During the EIA preparation, consultations with villagers in Zhetibay revealed that they did not feel that dust from construction activities which would impact upon them significantly. The fact is that the existing naturally induced dust issues were considerably more of a problem than construction impacts would be. They also noted that construction would be occurring in bypass locations outside of the village which will be reducing further dust impacts to villagers. In addition, more than 90% of the road is uninhabited steppe. Dust impacts and air quality issues will not play any significant role in these uninhabited areas.

Although geological mapping shows two tectonic lines converging South-East of the town of Shetpe the seismic zoning but expertise quoted by the EIA denominates the entire area as *'seismically inactive'*. The Projects Technical Design experts also believe that seismicity is not a significant concern for this road construction project, stating that the only locations for bridges are far away from the above identified tectonic faults.

Along the entire road corridor only one perennial surface water course can be observed; the Ashyagar Creek (km 755). A bridge, approximately 30 meters in length crosses the river, which dries out during extreme hot summer months. Current plans envisage that the river will not be used as a source of technical water for the Project. Groundwater is generally available only from medium to deep aquifers, which is exploitable at certain locations throughout the Road Corridor. This groundwater is often saline and there are currently no plans to extract ground water for Project use. Technical water will be sourced from piped potable supplies from Aktau and Zhetibay. Tanker trucks will deliver water from the pipelines to the relevant construction sites. Potable water will be provided by five litre bottles of spring/mineral water. Other potable water supplies exist but it is unlikely that they will be used as drinking water. The Contractor is responsible for locating sites for other non-technical water and obtaining permits for extraction.

According to the Archaeological Expertise published in the EIA there are few, rather insignificant archaeological/historical assets located near the Right of Way (RoW). Due to their distance to the road shoulder, none of these items is likely to be damaged or otherwise affected by the foreseen project works.

The Karagie-Karakol State Game Reserve (KKSGR), is a game reserve (IUCN Category 4), located in Karakiyanskiy and Munaylinsky Districts of Mangystau Oblast. The Reserve occupies the whole area of the Karagiye depression, the Aschy River valley, as well as maritime costal zones south of the city of Aktau. For about 36 km its Northern boundaries run parallel to the Project Road running from Aktau in direction of Zhetibay. It is important to note that the A380 does not enter the KKSGR boundaries at any point, but is within 100 meters of the northern boundary of the KKSGR. Within the KKSGR there are a large number of plant (20) and animal (300) species, of which 4 plant species and 24 animal species are included in the Red Book of Kazakhstan. Most of the rare and endangered animals are large predatory birds and rare shore birds near the Caspian seashore areas, which is not in close proximity to the Project. The existing KKSGR is currently not well recognizable for road users passing by this area. Specific signboards and markings are absent, and at the pass section km 755 the Reserve is in a poor condition as portions of the roadside slopes are littered with rubbish.

1.7 Scope of Works

The present report is the fifth Bi-annual Environmental Monitoring Report covering the period from January to June 2017. The report reviews the compliances of environmental activities set in EMP during the period and processes practices/innovation leading to improved and sustainable environment in the future. The scope of works includes identification of environmental impacts during construction stage and implementation of environmental mitigation measures for various environmental components as given in technical specification in the contract. In addition, the construction supervision consultant has to undertake specific environmental safeguard measures during the execution of work.

The following activities are considered for effective Environmental Safeguard Monitoring through periodic inspection and supervision during execution of works as per the General Requirement of the Technical Specification for construction of whole the work under clause 105 (Health and Safety) and clause 106 (Protection of the Environment).

- Loss of top soil
- Soil erosion
- Contamination of soil by fuel and lubricants and wastewater.
- Quarry and hot mix plant operations
- Siltation into water bodies
- Alteration of drainage
- Dust Control-haulage road and work sites
- Pollution from crusher, hot mix plant and batching plant
- Noise from plant and equipment
- Safety and accidental risks
- Medical facilities
- Traffic safety and control

The environmental management and monitoring plan (EMMP) signifies the environmental action to be undertaken under Mangistau - Oblast section in Project 2, delineating various mitigation measures/avoidance of negative impacts. The EMP also incorporates various environmental enhancement measures required for protecting the cultural properties in both contract packages.

1.8 Construction Activities and Project Progress during Previous Six Months

The mobilization of personnel, material and technical resources for the project has been completed (Table 1.1, Table 1.2, and Table 1.3). Contractor provided offices and accommodation for the Engineer on a territory of Zhetybay camp. 4 nos houses provided in Aktau and 20 nos houses on a territory of “Zhetybay” base camp. Out of 24 Nos vehicles, 22 units have been provided by the contractor. The details are available in the consultant monthly progress report.

Table 1.1: List of Present Machineries and Equipment at the Project Site

No	Equipment	Quantity					
		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17
1	Dozer	18	18	13	12	12	12
2	Excavator	25	25	33	23	22	23
3	Loader	29	29	27	5	5	6
4	Grader	18	18	15	12	12	12
5	Rollers	31	31	39	32	31	31
6	Trucks	173	173	198	163	141	163
7	Water truck	20	20	42	35	36	36

No	Equipment	Quantity					
		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17
8	Fuel tanker	2	2	4	4	4	4
9	Asphalt paver	6	6	8	8	7	7
10	Asphalt trimmer	1	1	1	2	2	1
11	Auto crane	5	5	9	7	6	5
12	Asphalt plant	2	2	2	2	2	2
13	Concrete plant	1	1	1	1	1	1
14	Emulsion plant	1	1	1	1	1	1
15	Crushing plant	2	2	2	1	1	1
16	Mobile crusher	2	2	2	2	2	2
17	Piling machine	0	0	0	0	0	3
18	Drilling machine	2	2	3	3	3	4
19	Low-back trailer	5	5	6	5	4	4
20	Mixer	4	4	4	4	4	4
21	Distributor	2	2	2	2	2	2
22	Bitumen truck	4	4	4	4	4	4
23	Concrete paver	0	0	0	1	1	1
24	Cars	84	84	114	114	114	114
25	Dead-end	0	0	0	0	0	0
26	Others	10	10	10	10	10	10
Total:		**447**	**447**	**540**	**453**	**427**	**453**

Workforce's hiring is mostly finished. Total number of employees has determined as 2057 employees for this reporting period (see Table 1.2).

Table 1.2: Personnel Mobilization

№ п/п	Position	Total	Including					
			Expats	Kazakhstan's personnel	local personnel	Gengiz Insaat	Subcontractors	Hired employees
1	Project Director	1	1	0	0	1	0	0
2	Project Manager	2	2	0	0	2	0	0
3	Site Manager	0	0	0	0	0	0	0
4	Engineers	15	4	9	2	12	1	2
5	Formen	41	7	31	3	33	8	0
6	Administrative and managerial personnel	107	7	77	23	92	2	13
7	Geodetic service	56	6	44	6	16	40	0
8	Quality service and laboratory	49	0	38	11	24	25	0
9	locksmiths	141	0	140	1	75	54	12
10	Mechanics	76	2	74	0	76	0	0
11	Equipment Operator	138	0	135	3	2	128	8
12	Crusher Operators	14	1	9	4	14	0	0
13	Asphalt Plant Operators	21	0	21	0	21	0	0
14	Concrete Plant Operators	2	0	2	0	2	0	0
15	Mounters and welders	57	0	50	7	32	24	1
16	Skilled workers	152	0	145	7	0	117	35
17	Unskilled workers	315	2	218	95	232	81	2
18	Technical personnel	29	0	18	11	0	1	28
19	Medical staff	4	0	0	4	0	0	4
20	Cooks	11	0	11	0	0	0	11
21	Cleaning ladies	36	0	1	35	36	0	0
22	laundry personnel	1	0	0	1	0	1	0
23	Security	116	0	109	7	116	0	0
24	Procurement personnel	9	1	5	3	9	0	0
25	Electricians	18	5	12	1	10	8	0
26	Store keeper	33	0	33	0	25	7	1
27	Truck Drivers	456	0	442	14	8	373	75
28	Car Drivers	131	0	92	39	1	0	130
29	Mechanic	26	8	18	0	21	2	3
	Total on project	**2057**	**46**	**1734**	**277**	**860**	**872**	**325**

Table 1.3: Project Management Personnel

Position	Name	Nation	Contract		Date	
			I	II	mobilization	demobilization
Project Director	Mustafa DARUGA	Turkey	1		02.05.2015	28.07.2015
Project Director	Mehmet Ertugrul BOSTANCI	Turkey	1		28.08.2014	21.03.2015
Project Manager	Ali Riza EVIN	Turkey		1	10.09.2014	13.06.2015
Project Manager	Erhan KARADAG	Turkey	1		25.09.2014	13.06.2015
Project Manager	Atakan YILMAZER	Turkey		1	16.11.2014	21.03.2015
Project Manager	Hasan CAN	Turkey	1		01.07.2015	16.03.2016
Project Manager	Cherepkov Alexey	Russia	1		16.03.2016	27.08.2016
Project Manager	Zakusilo Andrey	Russia	1		27.08.2016	18.11.2016
Project Manager	Talant Kaliyev	Kirgizstan	1		15.06.2017	
Project Manager	Volkan OZUS	Turkey		1	10.06.2015	26.12.2015
Project Manager	Musavat Kamil ONOL	Turkey		1	05.01.2016	
Material Production Manager	Engın CETINKAYA	Turkey	1		22.02.2015	21.03.2015
Technical Office Manager	Ali BAYDAR	Turkey	1		15.06.2017	
Production Technical Department Chief	Natalya Ovcharenko	Kazakhstan	1		15.06.2017	
Senior Surveyor	Isa Evren ADANALI	Turkey	1		02.10.2014	26.06.2015
Senior Surveyor	Ozcan TOKLU	Turkey	1		23.10.2014	
Laboratory Chief	Ender GUVEN	Turkey	1		31.10.2014	26.06.2015
Laboratory Chief	Orhan Zekai OKTAS	Turkey	2		16.07.2015	
Laboratory Chief	Alibek Omirzak	Kazakhstan	1		20.05.2016	
Head section of bridge construction	Talap Imangaliyev	Kazakhstan	1		08.05.2015	26.12.2015
Head section of bridge construction	Bolat Geydarov	Kazakhstan	1		08.01.2016	

In accordance with the requirements of the Technical Specifications, the contractor purchased and delivered to site complete construction laboratory and received the Certificate №15 «on the assessment of the measurements in the laboratory, performing tests on quality control of physical and mechanical properties of raw materials and construction materials for construction and repair of roads".

The overall progress achieved by June 2017 for Contract-001 is 80.27% and Contract-002 is 79.98% and details description of works executed for the Contract 001 and Contract 002 are given in Table 1.4 and Table 1.5.

Table 1.4: Description of Works Executed for the Contract-001-ADB/CW-2014 by June 2017

Sl. No	Work description	Unit	Total as per contract	Planned for 2017	Achieved in June 2017	Cumulat. to date	Achieved (%)
1	Earthworks	thousand m^3	2 387.76	400.72	390.16	2 298.48	97.4
2	Sub-base h-21	km	85.4	3.49	3.49	85.4	100
3	Base h-15	km	85.4	5.23	5.06	84.40	98.16
4	High Porous course asphalt Concrete h-12cm	km	85.4	7.79	6.74	84.39	96.70
5	Porous Asphaltic concrete base course h-10cm	km	85.4	8.07	6.62	83.99	96.45
6	Wearing course h-5 cm	km	85.4	85.4	39.27	39.27	45.96

Table 1.5: Description of Works Executed for the Contract-002-ADB/CW-2014 by June 2017

Sl No.	Work description	Unit	Total as per contract	Planned for 2017	Achieved in June 17	Cumulative to date	Achieved (%)
1	Earthworks	thousand m^3	3 798.651	13,34	0	3 788,253	99,73
	NEW CARRIAGEWAY SIDE OF AXIS						
2	Sub-base h-20cm	km	68.3	5,02	4,98		99,2
3	Base h-20cm	km	68.3	6,1	5,68		93,11
4	High Porous asphalt concrete h-12cm	km	68.3	7,1	7,1		100,0
5	Porous Asphaltic concrete base course h-10cm	km	68.3	7,21	7,21		100,0
6	Wearing course SMA h-5 cm	km	68,3	68,3	34,90		51,1
	EXISTING CARRIAGEWAY SIDE of Axıs						
7	Sub-base h-20cm	km	68.3	5,02	4,52		90,03
8	Base h-20cm	km	68.3	6,5	6,36		97,8
9	Porous course asphalt mixture h-12cm	km	68.3	7,0	6,2		75,14
10	Asphaltic concrete base course h-10cm	km	68.3	7,25	6,49		89,0
11	Wearing course h-5 cm	km	68,3	68,3	44,4		90,0
	Repair of existent pavement 786-802 km, Aktau						
12	Asphaltic concrete base course h-7cm	km	15.6	15.6	15,48		99.8
12.1	Wearing course h-5 cm	km	16.0	16.0	-	-	
13	Bridges & overpasses	Units	3	0,27	0,14		51,85
14	Culverts	Units	58	22	18		81,81

1.9 Relationships with Contractor's, Owners, Lender, etc.

The relationships between Contractor, Engineer, Owner, and Lender are considered normal working relationships. At the working level, coordination of environmental issues is good; the specialists mentioned in article 1.6 above are from frequent communication and consultation.

While developing and implementing this MFF CAREC Corridor II (Mangistau Oblast Section) Investment Program, Project 2 road construction project in Mangistau Oblast, the Contractor (Cengiz Insaat), and Owner/Lenders are required to contract with and successfully manage a wide range of consultants, service providers, and equipment and materials suppliers. All of these parties are specialists in their respective trades, and as with any business enterprise, they operate with their own best interests in mind. For these professional contractors, "best interest" should include providing the Owner / Lender with the highest quality construction and performance possible in the most cost effective manner as indicated in Technical Proposals. However, the Construction Supervision Consultant (CSC), Owners and/or Lenders have the experience or knowledge to adequately evaluate some of the more specialized requirements of the project, or the resources to effectively manage it.

1.10 Construction Supervision Contract (Cengiz Insaat Sanyive Ticaret A.S)

SMEC International Pty Ltd. in association with Sapa SZ LLP (the Consultant/Engineer) has been entrusted by the Employer to provide consultancy services for the contract administration and construction supervision works. The SMEC Consultant is responsible for the Construction Supervision of two Construction Contracts. Other duties include environmental and social monitoring in accordance with ADB requirements.

1.11 Establishing the Construction Camp

The Contractor has established a dedicated construction main camp at Zhetibay (Photograph 1.1) and the area covered 5,600 sqm, to accommodate 544 personnel; satellite camp at Shetpe will cover area of 1,070 sqm, to accommodate 160 personnel. Engineer office and accommodation facilities have located in Zhetibay camp. The contractors' field office, storage facilities and construction camps are not located near by the water bodies (e.g. lakes, ponds, stream, river, etc.). The sites for the construction camps are selected in consultation with the respective authority.

The Contractor has been mobilized all the required equipment to site. The camp includes a work shop engineering laboratory and fuel store. A crushing plant, asphalt plant and precast yard are sited close-by. Freshwater is available and the camp has a dedicated sewerage system directed to a septic tank. Septic tank and solid waste are regularly collected for disposal at an approved site. The camp comprises site offices for Contractor and Consultant and accommodation for staff working on the Project. There are mobile connections available at the camp. Provision of 3G broadband is being investigated. The medical facilities are employed fulltime at the camp and have access to an equipped medical competence.

Photograph 1.1: Construction Camp and Consultant Office at Zhetibay (Chainage: 730KM)

PART II: ENVIRONMENTAL MONITORING

2 ENVIRONMENTAL MONITORING FRAMEWORK

The environmental monitoring framework was based on the construction supervision ToR, Technical specifications, project EIA for Category A and ADB safeguard policy statement 2009.

2.1 Methodology for Environmental Monitoring in Construction Supervision

Construction environmental monitoring is a function of supervision, and the essential purpose is to ensure adherence to the EMP. The monitoring is a day to day process, which ensures that departures from the EMP are avoided or quickly rectified, or that any unforeseen impacts are quickly discovered and remedied. Specific actions in the EMP that are to be monitored included in the Monitoring Plan. During construction, environmental monitoring attempts to ensure the protection of landslide, borrow pits management, side slopes, and embankment from potential soil erosion, borrow pits restoration, quarry activities, siting of work sites and material storages, siting of batch, concrete and asphalt plants especially close to the settlements and nature reserve, preservation of religiously sensitive locations, graveyards or burials, community relations, and safety provisions.

As stipulated in the Contract for the project, the Contractor will adhere to the requirements of the environmental aspects of the contract document particularly in the General Conditions of Contract (FIDIC) as follows: 4.8: Safety Procedure; 4.18: Protection of Environment;4.15: Access Route; 4.24: Fossils; and 6.7: Health & Safety.

In addition, detailed requirements are found in the Technical Specifications particularly the following:

Section 106: Protection of Environment

A. General
B. Fuel & Chemical Storage
C. Water Quality
D. Air Quality
E. Noise
F. Earthworks
G. Preservation of Antiquities
H. Environmental Enhancement
I. Special Conditions

Section 113: Diversion and Traffic Control Measures – mainly the B. Traffic Management Plan

The initial obligation of the Contractor is to formulate a project Environmental Management Plan (EMP) based on the findings contained in the January 2013 Environmental Impact Assessment (EIA) Report. The Contractor submitted a detailed site/project specific Environmental Management Plan based on the EIA that was provided, and conforming to the Contract documents. As the work progresses, the Consultant shall monitor the

Contractor's compliance with the Environmental Management Plan and report upon impacts encountered and mitigation measures are employed and make further recommendations as deemed necessary.

In general, as stipulated in the ToR for the Construction Supervision on the environmental aspect the Consultant shall "carry out the following duties related to environmental mitigation measures during construction (a) to ensure that all the environmental mitigation measures required to be implemented are incorporated in the contract documents; (b) supervise and monitor the implementation of environmental (management)/mitigation plan (EMP); and (c) in case of unexpected environmental impacts, coordinate with the project management consultant (PMC) to recommend necessary measures to the Committee for Roads and ADB for Implementation". Based on this the Environmental specialist shall establish coordinative work with relevant staff of the Consultant and the Contractor to ensure that environmental issues are recognized prior to or discovered during work implementation. The EMP for the project shall be the basis of the monitoring and accordingly, the Contractor has submitted contractor EMP (Contracts 1 and 2) to the Engineer. Coordinative communication channels shall be established according to the following work coordination chart (Figure 2.1):

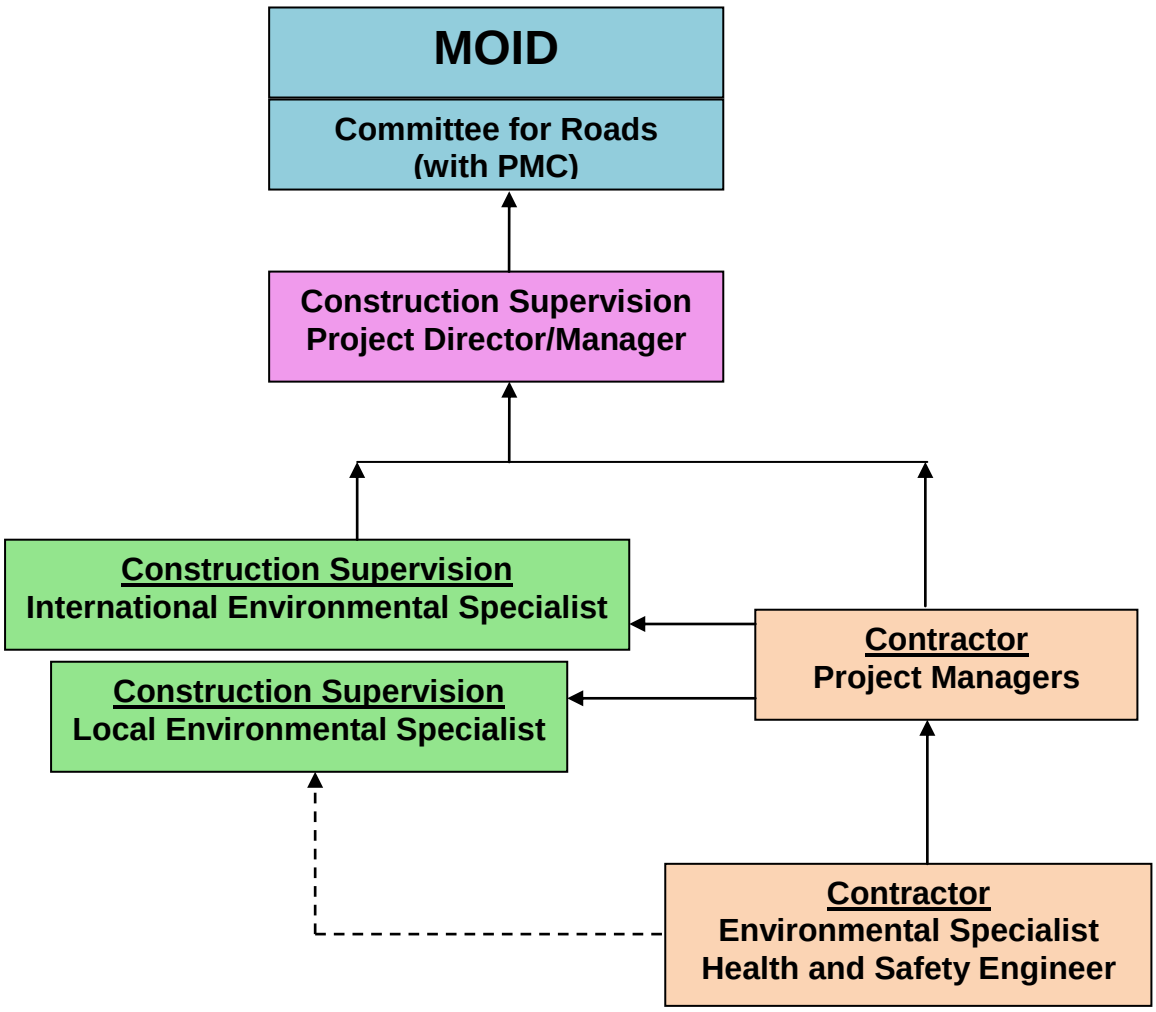


Figure 2.1: Work Coordination Arrangement

Specific tasks shall be undertaken by the International Environmental Specialist as follows:

- Review EIA and EMP and Technical Specification and set up internal monitoring system on the project's environmental issues and project requirements;
- Monitor, control of the compliance with the requirements of the Contract (EIA EMP, TS) stipulations and national environmental legislation;
- Closely monitor project sites against any unexpected environmental impacts;
- Work in close coordination with PMC's Environmental Engineer and coordinate with other relevant parties on environment requirements of the Project;
- Conduct inspections to Contractor's objects and building sites, recording and reporting;
- Advise the Team Leader on environment problems and / or requirements, and recommend mitigation measures and potential risks;
- Prepare report on EMP implementation and Contractor's compliance;
- Participate in the preparation of the proposed letters to Contractor and in preparation of Monthly and quarterly reports, drafting Engineer's site Instructions when needed;
- Follow up with the Contractor submission of the Environmental Management Plan in English and review its compliance to Technical Specification, EIA and EMP;
- Review the CV of the Candidate proposed by the Contractor for the position of the Environment Engineer and conduct an interview with his/her in the presence of the Team Leader and provide your comments on his/her suitability for the position;
- Control the Contractor's work in the vicinity of Prokhlada spring and report any affects and risks on the environment;
- Review the concerns raised by PMC and comment / advise the measures for elimination thereof;
- Inspect the Contractor's documentation with respect to borrow pit and quarry approvals and reinstatement plans, and monitor / control borrow pit excavations' compliance to the conditions given in approvals and reinstatement plans;
- Determine the locations for initial measurements of air and water quality and noise and vibration monitoring and initiate the pre-construction measurements together with Contractor;
- Involve the Engineer's local Environmental Social Development Specialist at every stage of review / monitoring during the assignment and provide him/her the technical knowhow and support so that he/she can follow up the issues at the times when the International Environmental Specialist is off site.

The next salient steps will be to operationalize these objectives and tasks to enable an efficient and effective environmental monitoring. Corresponding to delineation of roles and responsibilities, reporting procedure shall be set-up. Coordinative meetings shall be done to be abreast with the fulfillment of requirements of Government of Kazakhstan and ADB.

In addition, the following laws, regulations and standards are also considered and used as guidelines related to road construction activities of the Contractor:

Table 2.1: Relevant Laws, Policies and Regulation on Environmental Protection as per Government of Kazakhstan[1]

Name of Legislation	Date and Number of registration
Methodology for Determining Emissions Standards to the Environment	Approved by the Order of the Minister of Environment (MEP), 21 May 2007, No. 158-p".
"Instruction on Conducting Environmental Impact Assessment of Planned Economic Activity when Developing Pre-planning, Planning, Initial project and Project documentation,	Approved by the Order of the Minister of MEP, 28 June 2007, No. 204-p".
The Amendments to the Order of the Minister of Environment Protection of Republic of Kazakhstan on Approval of "Instruction on Conducting Environmental Impact Assessment of Planned Economic Activity when Developing Pre-planning, Planning, Initial project and Project documentation"	Approved by the Order of the Minister of MEP, 20 March 2008, No. 62-p".
Regulations on Conducting State Ecological Expertise.	Approved by the Order of the Minister of MEP, 28 June 2007, No. 207-p".
The Amendments to the Order of the Minister of Environment Protection of Republic of Kazakhstan on Approval of Regulations on Conducting State Ecological Expertise	Approved by the Order of the Minister of MEP, 9 October 2007, No. 296-p".
Rules for Conducting Public Hearings	Approved by the Order of the Minister of MEP, 7 May 2007, No. 135-p".
Instructions for Qualifying Requirements to Licensed Activity on Environmental Design, Regulation and Development of Environmental Impact Assessment	Approved by the Order of the Minister of MEP, 21 October 2003, No. 239-p".
Methodological Guidelines to the Licensed Activity on Environmental Design, Regulation and Development of Environmental Impact Assessment	Approved by the Order of the Minister of MEP, 10 February 2005, No. 51-p".
Final Environmental Supervision Experts Opinion on Definite Types of Licensed Works and Services	Approved by the Order of the Minister of MEP, 1 July 2004, No. 192-p".
Instructions on Negotiation and Permissions to Special Water Use in the Republic of Kazakhstan	Joint order of the Minister of Health of the Republic of Kazakhstan dated 24 November 2004 № 824, Minister of Environment of the Republic of Kazakhstan of 1 December 2004 number 309-p, Acting Chairman of the Committee on Water Resources, Ministry of Agriculture of the Republic of Kazakhstan dated 11 November 2004 number 236-S, Chairman of the Committee of Geology and Mining Ministry of Energy and Mineral Resources of the Republic of Kazakhstan on 2 December 2004 number 161-p. Joined by the Ministry of Justice of the

[1] Environmental Impact Assessment, MFF CAREC Corridor 2 (Mangystau Oblast Sections), Tranche 2

Name of Legislation	Date and Number of registration
	Republic of Kazakhstan 13 December, 2004 N 3263
The Rules for Licensing and Qualification Requirements to Work Implementation and Delivery of Services in the Field of Environmental Protection	Approved by the Order of the Government of Republic of Kazakhstan, MEP, 5 June 2007, No. 457-p".
Environmental Code of the Republic of Kazakhstan	MEP, 9 January 2007, No. 212-p".
The normative base of requiring an environmental impact assessment	Instruction on conducting environmental impact assessment of planned economic activity when developing pre-planning, planning, initial project and project documentation, approved by the Order of the Minister of MEP, 28 June 2007, No. 207-p".
Law of the Republic of Kazakhstan «On Amendments and Additions to Some Legislative Acts of Kazakhstan on Environmental Issues»	MEP, 9 January 2007, No. 213-p".
Law of the Republic of Kazakhstan «On Ratification of the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade»	MEP, 20 March 2007, No. 239-p".
Law of the Republic of Kazakhstan «On Ratification of the Stockholm Convention on Persistent Organic Pollutants»	7 June 2007, No. 259-p".
The Concept of Transition to Sustainable Development for 2007–2009 (Action Plan)	The Order of the President of RK, 14 November 2006, No. 216-p".
The Concept of Environmental Security of the Republic of Kazakhstan for 2004–2015	The Order of the President of RK, 3 December 2003, No. 1241

The monitoring program will include regular monitoring of construction activities for their compliance with the environmental requirements as per relevant laws, policies and regulations, standards, specifications and EMP. During construction, environmental monitoring will ensure the protection of side slopes, and embankment from potential soil erosion, borrow pits restoration, quarry activities, sitting of work sites and material storages, sitting of batch, concrete and asphalt plants especially close to the nature reserve, preservation of religiously sensitive locations, community relations, and safety provisions.

2.2 Construction Supervision Consultant (The Engineer) Environmental Monitoring Work Protocol

Under the guidance of the International Environment Specialist, inspectors of the Engineer regularly conduct environmental monitoring started from April 2015 for the project. The regular site inspections on environmental issues were done by the consultant engineers / local environmental specialist (intermittently) with assistance by the contractor environmental specialist while the international environmental specialist was not present at the project site. The International Environmental Specialist has conducted meeting with the contractor representatives several times for details discussion on the environmental requirements.

Findings and results of their monitoring activities are incorporated in the consultant monthly report, quarterly environmental monitoring report, first Bi-annual Environmental Monitoring Report, second Bi-annual Environmental Monitoring Report, third Bi-annual Environmental Monitoring Report, fourth Bi-annual Environmental Monitoring Report and also incorporating in the fifth Bi-annual Environmental Monitoring Report for the Project.

The environmental specialist / consultant engineers regularly visit the construction sites and report to their Team Leader about issues related to the environmental issues and non-compliances of measures as given in EMP. Necessary direction, in case of non-compliances, are being given to the contractor on the site and through the writing about the procedures to resolve the issues or requirements. During site visits of the Environment Specialist / consultant engineers, on-the-spot field inspections to various impact sites such as borrow pits; asphalt plant, quarry areas as well as contractor's campsite along the project road have been conducted. Environmental issues are noted down and presented to the Contractor as part of the consultation process, whereby issues will be resolved. The effectiveness of the mitigation measures is assessed after site implementation to determine if such measures were effective. The Contractor's measures are deemed acceptable with the environmental requirements for this initial stage of the project but there will be more improvements needed for the environmental safeguard activities. The contractor committed to take the action for all environmental issues for further improvements.

Pursuant to the construction supervision as per the ToR, that the "environmental specialist will develop an environmental auditing protocol for the construction period, formulate a detailed environmental monitoring and management plan (EMMP)", a work-process arrangement was conceptualized to be undertaken by the project engineers as well as the international environmental specialist. The monitoring and management scope can be divided into the following:

- **Field Supervision**
  - ✓ ***Field visits:*** The environmental specialists should be conducting constant field visits to observe and identify any environmental issues that violate the EMP and any prevailing regulations.
  - ✓ ***Inspection photo documentation:*** During field inspections, photos should always be taken of any field situation as part of the documentation.
  - ✓ ***Inquiry with field people:*** Background information should be gathered pertaining to the issues observed and this can be obtained from field workers, inspectors, and the community.
  - ✓ ***Witnessing Parameter Measurement:*** Whenever any field measurements should be done by the Contractor, the environmental specialist (local)/Engineers should always be present to observe the process and to note down observations.
- **Meetings and Discussions**
  - ✓ ***Consult with TL/Engineers:*** The environmental specialist should consult with the Team Leader and engineers on any environmental issues. He should advice TL and Engineers on the physical and legal implications of the situations and consider these items in the drafting "Non–conformance Letters" to the Contractor.

- ✓ ***Discuss with Contractor's Environmental Specialist:*** Any environmental issues should be discussed with the Contractor's Environmental Specialist in order to determine their commitment in undertaking environmental mitigation measures.
- ✓ ***Training:*** Part of the effective work of the environmental specialist is to develop a training program of Contractor's staff and consultant staffs in implementing the EMMP. Hence, the training was conducted by the International Environmental Specialist for the consultant staffs at the Zhetibay camp site on 23rd April 2015, 20 December 2016 & 17 July 2017 and the another training for the contractor staffs was conducted in consultant office at the Zhetibay camp site on 3rd July 2015, 19 December 2016 & 18 May 2017. The regular meeting with the contractor environmental representatives has organized during this period for further improvements.

- **Document Checking**
  - ✓ ***EMP / Supplemental Plans & Method Statements:*** The environmental specialists should check the documents submitted by the Contractor and comment on their appropriateness and completeness as prescribed in the Technical Specifications and Contract Documents.
  - ✓ ***Checking Parameter Measurement Results:*** The environmental specialist should inspect in detail the results of the parametric Measurements in order to determine any indication of any situation different from normal conditions. When this is discovered, the environmental specialist should alert the Contractor for immediate action. A re-confirmation of the data will serve as secondary check if everything is within the acceptable limits.
  - ✓ ***Contractor's Report and Monitoring Data:*** The environmental specialist should also verify reports submitted by the Contractor' especially on the evaluation of results of the parametric measurement for air, noise, and water quality.
  - ✓ ***Checking of Legal Documents:*** Permits and all legal documents with relevance to environmental items should be thoroughly checked by the environmental specialist for legislative compliance. This pertains to quarry and borrow pit permits, site approval for campsite, asphalt plant, and crusher.

- **Report Writing**
  - ✓ ***Monthly Reports:*** Environmental issues should be reported regularly in the monthly reports by the Contractor and to be commented on by the environmental specialist. Results of parametric measurements for air quality, noise measurement, water quality and dust should be reported by the Contractor on a monthly basis as mentioned in the environmental monitoring plan. These results should be assessed by the environmental specialist for appropriate mitigation measures. Environmental issues should be reported regularly in the monthly reports by the environmental specialist for the Client and ADB.
  - ✓ ***Bi-Annual Environmental Monitoring Reports:*** As mentioned in the Particular Conditions of Contracts, the Contractor should come up with a bi-annual

environmental monitoring report. Upon submission, the environmental specialist should evaluate the environmental report and come up with general comments. As part of the Engineer's reporting obligation a Bi-annual Environmental Monitoring report should be compiled by the environmental specialist and to be submitted to the Client and ADB after every six month of monitoring.

2.3 Contractor's Environmental Monitoring Procedures

The Contractor started monitoring on the environmental safeguard issues at the vicinity of the project road from March 2015 and it is continuing regularly at the project sites. The parameters being monitored are (i) noise and vibration, (ii) water quality, (iii) air quality (iv) soil quality and (v) flora and fauna monitoring. These indicators form the baseline monitoring parameters for the project road which can be referred to in the course of the construction of the project as well as during its operation. In addition, a number of pertinent sites are also monitored by the Contractor for any impacts of the construction activities such as quarries and borrow areas, bypass roads, bridge sites, contractor camp subcontractors temporary camps, concrete plant, crusher plant, asphalt plant, the villages (along the bypass) and crossing roads. Impacts will be recorded and mitigated in accordance to the EMP. The basic procedures are described below:

- **Air quality:** Air quality is controlled along the whole road construction sections, contractor camps, concrete plant, crusher plant, asphalt plant by obtaining readings in around 27 selected stations. Readings on atmospheric air quality is compliant with standards and do not exceed maximum permissible concentration.
- **Noise and vibration:** Measurement for noise and vibration is performed monthly along the project road construction (Camp, villages, etc.) in around 14 selected stations where active construction and impacts are expected to be felt. The Norms on protection of the environment from noise and vibration are in accordance with the established standards.
- **Water quality:** There is a River (Asyagar River) that crosses the road construction site. Accordingly, bridge is being constructed as required by the project. Since April 2015, water quality readings were done in this river. Aschyagar River is low water, water movement occurs during the spring flood. In this reporting period, it was selected and analyzed 8 surface water samples. In January and February 2017, sampling were not carried out due to heavy snowfall at that time but in March, April, May and June 2017, were selected 8 samples before and after the bridge over the River Aschyagar.
- **Soil quality:** Soil quality test is performed monthly along the whole road construction sections by obtaining readings in around 27 selected stations. Readings on soil quality is compliant with standards and do not exceed maximum permissible concentration.
- **Monitoring of fauna and flora:** Monitoring of fauna and flora is carried out by direct observation. The habitats of rare animals and birds are not disturbed, as the construction progresses along the project section. Flora along the vicinity of the road is largely affected by dust and traffic emissions.

In March 2015, Contractor submitted Environmental Mitigation Plan (EMP) to Engineer. CSC's Environmental Specialist has given comments on contractor EMP to contractor for revise the EMP and submits to engineer for approval. The EMP identifies the mitigation and compliance monitoring requirements, including specifying how, when, where and by whom,

the mitigation and monitoring is to be carried out during construction period. During construction, mitigative measures will focus in assuring that contractor undertake all his work in an environmentally responsible manner, properly disposing of wastes, controlling the use of fuels and lubricants, revegetating any sites cleared during construction, carefully managing the use of water and being aware that construction dust must be managed as it can travel long distance. A staff (Umirbekova Natalya, Contractor Environmental Specialist) was designated from May 2015 to till date as an environmental representative for the project with duties to deal with environmental activities for the project.

In accordance with the EMP, and the accompanying Environmental Monitoring Plan, the Contractor is required to undertake parametric measurements and observations on air quality, soil and water quality, noise and socio-cultural resources. Locations for the measurements were initially identified. Accordingly, the monitoring guidelines were set as shown below:

Table 2.2: Parametric Measurement Guidelines

Sampling Locations	Points Numbers	Determined parameters	Monthly Measurements Periodicity
Chemical Analysis of Air			
Along the road (Km): 645,654,664,674,684,694,704,714,724,73, 744,754,764,774,784	15	Inorganic dust, carbon monoxide, nitrogen dioxide, sulfur dioxide	1 sample
On a border of Zhetybay village	2		1 sample
Shetpe camp (657 km), Zhetybay (730 km)	8		1 sample
Sanctuary border 739 km, 771 km	2		1 sample
Chemical Analysis of Soil			
Along the road: 645,654,664,674,684,694,704,714,724,73, 744,754,764,774,784 km	15	pH, oil, cadmium, lead, zinc	1 sample
On a border of Zhetybay village	2		1 sample
Shetpecamp (657 km), Zhetybay (730 km)	8		1 sample
Sanctuary border 739 km,771 km	2		1 sample
Measurement of Noise, Vibration			
On a border of Shetpe village (km636,645), Zhetybay village (km 707,713)	4	Noise, vibration	1 sample
Shetpecamp (657 km), Zhetybay (730 km)	8		1 sample
Sanctuary border 739 km,771 km	2		1 sample
Chemical Analysis of Surface Water			
Bridge Asyagar River	1	dry residue, nitrates, sulfates, chlorides, petroleum, iron	1 sample

2.4 Contractor's Health and Safety Management and Monitoring

As provided in Clause 105 – Health and Safety of the General Specifications the Contractor has the following responsibilities:

- To ensure that all subcontractors and their personnel participate fully in the actions prescribed in this Clause for the health and safety of workers.
- To take all reasonable precautions to prevent unauthorized entry to the Site and to protect members of the public from any activity under his control.
- To notify the Engineer immediately of any unsafe incidents or accidents which result in death, serious bodily injury or are likely to lead to incapacity to persons for more than three days.
- To provide, and ensure the utilization of, appropriate safety equipment for all Contractors' Personnel.
- To take all measures necessary to safeguard the health, including Sexually Transmitted Infection (STI) and HIV/AIDS, safety and welfare of Contractor's Personnel.
- To establish a Health and Safety Unit, and shall appoint one responsible member of his / her staff to act full-time as Safety Officer, and he/she shall notify the Engineer of such appointment. The Safety Officer shall organize, and all Contractors' Personnel shall be required to attend, an orientation/safety induction course within their first week on Site.
- To have regular meetings, at least monthly, with local health authorities/facilities.
- To maintain such records and make such reports concerning safety, health, including Sexually Transmitted Infection (STI) and HIV/AIDS, and welfare of persons as the Engineer may from time to time prescribe and as required by the statutory authorities.
- To provide adequate lighting (including sufficient back-up facilities in the event of failure) wherever any work is to be carried out at night to ensure that the works can be carried out safely.
- To provide an adequate number of latrines and other sanitary arrangements at areas of the Site where work is in progress.
- To ensure that the Works are left in a safe condition, in the event that the Contractor temporarily closes down site operations seasonally or for any other reason.

In addition the following safety issues need to be monitored:

- **Use of PPE (including replacement, according to climatic conditions):** summer and winter personal protective equipment (PPE) has been provided. Chiefs must control and strictly watch the worker's security with certified special clothes and PPE, which includes the usage, and wear-out date of clothes. Violations on PPE non-usage, alcohol and drug intoxication would result to immediate dismissal of worker.
- **Dust and Noise Exposure:** The additional water-carriers were engaged to reduce the dust in summer months. Prolonged exposure to harmful conditions should be minimized consisting of poor air quality, mechanical vibrations (noise, vibration, ultra-sound and others) and emissions (ionizing, electromagnetic, laser, ultra-violate and others) on work places.

- **Operations of Equipment and Trucks:** All equipment of the site should have necessary copies of documents and testing certificates. Working dump trucks should have their vehicle registration certificate and drivers should have driving license. Every day drivers are to be checked on alcohol drinking and blood pressure levels. The Contractor checks technical status of vehicles that transport people and carries out systematic trainings to drivers for Road traffic regulations and safety road.
- **Construction Hazards (heights, electric shocks, etc.):** The subcontractor's chief should be given instructions or orders on safety compliance. Protection to workers should be provided such as for electrical protection, electric tool, gas protection, harnesses and safety belts.
- **Emergency Procedures / Coordination with Outside Medical Facilities:** During emergency an action plan for first aid and delivery of injured person to Aktau City Hospital has been established. A medical facility has been arranged in contractor camp site from early June 2015 which was fully opertionalized from July 2015. In case of fire the evacuation action plan is to be carried out. Telephone numbers of the Emergency department and ambulance service has been available in the camp site.

2.5 Required Environmental Reporting

As mentioned in the technical specification item 106: protection of the environment of the section 100: general requirement document, the Contractor's Environmental Management Plan should provide description and explanation communication procedures between construction personnel and environmental protection including (i) Communication facilities and Routine communication and reporting systems.

It is also mentioned in 106: protection of the environment, that Initial Environmental Baseline Report should be submitted in accordance with Section 106. Based on this Section, a Baseline monitoring program should be presented consisting of Environmental Baseline Survey on (i) air quality; (ii) water quality; (iii) soil quality and (iv) noise measurement. In addition, Environmental activities Reports should be submitted which summarizes weekly updates and compiled for monthly reporting to the Engineer. The contractor will submit the Bi-annual environmental monitoring report to the consultant as per requirements. The Engineer should also be notified promptly of any environmental activities of EMP and effective communication should be established with all subcontractors. Summaries of these items should be part of the Contractor's Monthly Progress Reports.

As stated in the TOR, the consultant should submit Bi-annual Environmental Monitoring report for the project, which is a compilation of monthly report with appropriate summaries of the issues, activities and measures undertaken within the period. Therefore, this is the fifth Bi-annual Environmental Monitoring Report for the project. In addition, the consultant environmental specialist / Engineers will monitor frequently the environmental activities of the contractor as per the EMP and will prepare regularly the monthly environmental monitoring report for the project.

3 PERFORMED ENVIRONMENTAL MONITORING ACTIVITIES

Within the six month period (January - June 2017) the Contractor undertook monthly monitoring of air quality, noise & vibration, water quality and soil quality at specified locations from March to June 2017. The Engineer likewise, as part of tasks, monitors the environmental aspects of the project as well as reviews the environmental mitigating performance of the Contractor. Within the period, the environmental specialists of the Engineer visited the site in May 2017 as part of Consultant's periodic monitoring. During this reporting period, joint inspection was done by the specialists (Local Environmental Specialist and Contractor Environmental Specialist) with the environment and health & safety staff of the Contractor. Construction sites, material sites, construction camp, and plants were also inspected.

From January to June 2017, the environmental specialists and engineers were responsible to the site to undertake audit into the sites and further improvements for the Contractor's and consultant's staff. The results of the monthly monitoring were incorporated in the environmental section of the monthly report of the Engineer. Correspondingly, the regular monthly Environmental Monitoring Report was prepared for consultant monthly progress report and submitted to the Employer and this is the fifth Bi-annual environmental monitoring report for the Employer and the ADB.

During the last 6 months, monitoring works provided and measured monthly on the basis of monitoring schedule of revised EMP. The Contractor is obligated to perform the necessary measures to mitigate environmental issues as part of implementation activities. In addition, instrumental measurements are to be done in accordance with agreed schedule and locations in compliance with the EIA/EMP particularly the Environmental Monitoring Plan. The parameters being monitored are (i) air quality, (ii) noise and vibration and (iii) soil quality and (iv) surface water quality. All the monitoring works was carried out on contract to render services from renowned environmental laboratory of "Aktobe Plant of Chromium Compound" JSC (Accreditation certificate № KZ.I.05.0916 dd 27.07.2015 valid until 27.07.2020) for along the project road.

3.1 Compliance status with Environmental Management and Monitoring Plans

The project management consultant (PMC) through its professional will closely monitor the implementation of environmental management and monitoring plan (EMMP) for 04 lots (contract 01 and contract 02) through meetings with the environmental specialist of the supervision consultants and by physical verification at the construction sites. For the effective management, implementation of the EMMP, the supervision consultants have designated their existing site staff for environmental coordination. Contractor for the respective contract have designated environmental representatives for the sound implementation of EMP.

The supervision consultants submitted monthly environmental monitoring report to the PMC that includes information on implementation of EMMP. The information shared in this Bi-annual environmental monitoring report includes environmental monitoring status at construction sites, measures for workers safety at construction site and camp site, and control measures being adopted etc. Implementation of EMMP during the reporting period was found to be satisfactory and needs to be strengthened in the areas such as monitoring

of environmental quality, debris disposal, borrow pits management, safety arrangements and usage of personal protective equipment's by the workers.

3.2 Environmental Monitoring Procedures of the Contractor

The Contractor started monitoring the physical environment at the vicinity of the project road from March 2015 and it is continuing regular basis. The parameters being monitored is air quality & soil quality and noise & vibration and surface water quality. These indicators from the baseline monitoring parameters of the project road can be referred to in the course of the construction of the project as well as during its operation. However, the international environmental specialist advised the Contractor to measure at locations where impacts to people are more appreciable. The basic procedures are described below:

Air quality: Air quality is controlled at relevant sites and along the road construction sections by obtaining readings monthly basis during this period (March to June 2017) at the different locations as shown in the Table 3.1.

Noise and vibration: Measurements of noise and vibration has monitored during this period (March to June 2017) at the different locations as shown in Table 3.2.

Water quality: Surface water quality testing has completed during this period (March to June 2017) at the different locations as shown in Table 3.3.

Soil quality: Soil quality is controlled at relevant sites and along the road construction sections by obtaining readings monthly basis during this period (March to June 2017) at the different locations as shown in the Table 3.4.

Monitoring of fauna and flora: Monitoring of fauna and flora has carried out by contractor environmental specialist, so that the habitats of rare animals and birds will not be disturbed during project construction along the project road.

In addition, a number of pertinent sites also are monitored by the Contractor for any impacts of the construction activities. Such impacts has been recorded and mitigated in accordance to the EMP. Such sites are as follows:

- Quarries and Borrow areas: These areas are located far from populated places and do not pose any impact. The contractor environmental specialist will monitor regularly with records for the monthly reports.
- Bypass Roads: Bypass road monitoring is carried out constantly and frequent watering is being done to minimize dust production. In this reporting period to improve watering activities, the Contractor advised water truck owners to report their watering activities.
- Contractor Camp & Subcontractors temporary camps: The conditions of these camps inspected regularly.
- Concrete plant, crusher plant, asphalt plant: Concrete and crusher plants have inspected twice revealing that noise and vibration are within acceptable limits.
- The villages (along the bypass): Some villages are located along the bypass through which vehicles transports construction materials 24 hours a day and thus aggravating the dusty conditions. Dust mitigation will be constantly carried out. It is important to note that the receptors such as schools, administrative buildings and hospitals are far from the bypass roads.

3.3 Environmental Monitoring Activities of the Contractor

The Contractor, "Cengiz Insaat Sanayi ve Ticaret A.S.", mobilized their environmental specialist from May 2015 and health & safety staff from March 2015 for the supervision of construction activities. More active monitoring in the form obtaining parameter readings on air quality, noise and vibration, soil quality, water quality and observations on flora and fauna were done during this period (March to June 2017). Monthly parameter readings and observation with summary report were compiled. In this period, the Contractor (Cengiz Insaat Sanayi ve Ticaret A.S.) had performed instrumental monitoring as prescribed in the EMP and Section 100 - General Requirements of Technical Specification. For this period the Contractor did the following measurements:

- Air Quality Measurements – March to June 2017
- Soil Quality Measurement – March to June 2017
- Noise Measurements – March to June 2017
- Water Quality Measurements – March to June 2017

Monthly monitoring data has been collected from March through June 2017 for:

- Air quality at twenty seven sites (Along the road (Km): 645,654,664,674,684,694,704,714,724,734,744,754,764,774,784; On a border of Zhetybay village; Shetpe camp (657 km), Zhetybay (730 km); Sanctuary border 739 km,771 km)
- Noise and vibration at fourteen sites in key locations along or close to the road alignment (On a border of Shetpe village, km636,645; Zhetybay village, km 707,713; Shetpe camp (657 km); Zhetybay (730 km); Sanctuary border 739 km,771 km); and
- Surface water quality in one site at Bridge on Asyagar River; and
- Soil quality at twenty seven sites (Along the road (Km): 645,654,664,674,684,694,704,714,724,734,744,754,764,774,784; On a border of Zhetybay village; Shetpe camp (657 km), Zhetybay (730 km); Sanctuary border 739 km,771 km).

All the monitoring works was carried out based on contract to render services from renowned environmental laboratory of "Aktobe Plant of Chromium Compound" JSC (Accreditation certificate № KZ.I.05.0916 dd 27.07.2015 valid until 27.07.2020). The sampling methods for the environmental quality test (air, soil, water and noise) are available in the contractor semi-annual environmental protection report (Annexure D).

During this reporting period (March to June 2017), the Contractor (Cengiz Insaat Sanayi ve Ticaret A.S) undertook monthly parameter readings and observation with compiled semi-an annual environmental protection report (Annexure D) and submitted to the engineer on 01 July 2017. The results of the previous six months monitoring activities are shown below:

3.3.1 Air Quality Analysis

Measurements were done monthly at 27 sampling stations (**Error! Reference source not ound.**) along the project road, villages, and camp sites. The results show that air quality is below the limit (MPC - Maximum Permissible Concentration) as observed in the Table 3.1, indicating that the project is not impacting the air quality of the immediate vicinity. Summary of the Table 3.1 presents, a comparative analysis of the measurement results for the

reporting months from March to June 2017 and maximum permissible concentrations of pollutants. The results confirm that there have not been any measured extremes during the monitoring period. The results of monitoring show that the content of contaminators does not exceed MPC in accordance with ecological requirements of Republic of Kazakhstan. It is noted that emission concentrations will vary in accordance with meteorological conditions, (wind speed and direction and relative humidity), number and mechanical condition of construction machinery and volume, vehicle type, travel direction and mechanical condition of passing traffic.

	
Air sampling at AK-17 (694 km) of PK587 on 28.03.2017	Air sampling at AK-34 (784 km) of PK63 on 28.04. 2017
	
Air sampling at AK-19 (707 km) of PK715 on 15.05.2017	Air sampling at AK-32 (771 km) of PK-553 on 08.06. 2017

Photograph 3.1: Air Quality Monitoring for the project site

Comparison of the average base results with the last period (March to June 2017) for the entire observation period showed that all parameters results for each month has been changed due to the project activities. Although the concentrations are within the limit, but the contractors has to continue the same work and increase frequency of the road watering in order to minimize dust generation from the road traffic along the road sections which are not paved by asphalt.

Monitoring of air pollution involves determining the concentration of pollutants in the zone of active influence. The most accurate estimate of the effect on atmospheric air is direct measurements of pollutants. For this purpose under a contract with the Contractor specialized accredited environmental protection laboratory of JSC "Aktobe plant of

chromium compounds" during March to June 2017 carried out air monitoring sampling points and frequency are defined in the monitoring program, which is a must-have app for EMMP. Total for the period in the 27 control points were selected 108 samples. In January and February of 2017 samples were not selected because of the reduced volume of works at this month's due to heavy snow fall.

Table 3.1: Air Quality Monitoring Results

Sampling Locations	Sampling Date	The concentration of harmful substances, mg/m^3			
		Dust	Oxide Carbon	Nitrogen dioxide	Sulfur dioxide
Maximum Permissible Concentration		**0,5**	**5**	**0,2**	**0.5**
ROAD					
AK-8 (645 km)	28.03.2017	0,32	<1,5	<0,02	<0,025
	19.04.2017	0,4	<1,5	<0,02	<0,03
	15.05.2017	0,1	<1,5	<0,02	<0,03
	07.06.2017	0,25	<1,5	<0,02	<0,03
AK-9 (654 km)	28.03.2017	0,31	<1,5	<0,02	<0,025
	19.04.2017	0,35	<1,5	<0,02	<0,03
	15.05.2017	0,12	<1,5	<0,02	<0,03
	07.06.2017	0,27	<1,5	<0,02	<0,03
AK-14 (664 km)	28.03.2017	0,31	<1,5	<0,02	<0,025
	19.04.2017	0,12	<1,5	<0,02	<0,03
	15.05.2017	0,11	<1,5	<0,02	<0,03
	07.06.2017	0,41	<1,5	<0,02	<0,03
AK-15 (674 km)	28.03.2017	0,32	1,72	<0,02	<0,025
	19.04.2017	0,13	<1,5	<0,02	<0,03
	15.05.2017	0,1	<1,5	<0,02	<0,03
	07.06.2017	0,23	<1,5	<0,02	<0,03
AK-16 (684 km)	28.03.2017	0,30	<1,5	<0,02	<0,025
	19.04.2017	0,16	<1,5	<0,02	<0,03
	15.05.2017	0,11	<1,5	<0,02	<0,03
	07.06.2017	0,4	<1,5	<0,02	<0,03
AK-17 (694 km)	28.03.2017	0,30	1,99	<0,02	<0,025
	19.04.2017	0,19	<1,5	<0,02	<0,03
	15.05.2017	0,13	<1,5	<0,02	<0,03
	07.06.2017	0,35	<1,5	<0,02	<0,03
AK-18 (704 km)	28.03.2017	0,32	<1,5	<0,02	<0,025
	19.04.2017	0,26	<1,5	<0,02	<0,03
	15.05.2017	0,11	<1,5	<0,02	<0,03
	07.06.2017	0,38	<1,5	<0,02	<0,03
AK-21 (714 km)	28.03.2017	0,30	<1,5	<0,02	<0,025
	19.04.2017	0,26	<1,5	<0,02	<0,03
	15.05.2017	0,11	<1,5	<0,02	<0,03
	07.06.2017	0,43	<1,5	<0,02	<0,03
AK-22 (724 km)	28.03.2017	0,32	1,58	<0,02	<0,025
	19.04.2017	0,14	<1,5	<0,02	<0,03
	15.05.2017	0,17	<1,5	<0,02	<0,03
	07.06.2017	0,44	<1,5	<0,02	<0,03

Sampling Locations	Sampling Date	The concentration of harmful substances, mg/m^3			
		Dust	Oxide Carbon	Nitrogen dioxide	Sulfur dioxide
Maximum Permissible Concentration		**0,5**	**5**	**0,2**	**0.5**
AK-27 (734 km)	29.03.2017	0,31	<1,5	<0,02	<0,025
	20.04.2017	0,29	<1,5	<0,02	<0,03
	15.05.2017	0,19	<1,5	<0,02	<0,03
	08.06.2017	0,31	<1,5	<0,02	<0,03
AK-29 (744 km)	29.03.2017	0,30	1,78	<0,02	<0,025
	20.04.2017	0,14	1,50	<0,02	<0,03
	15.05.2017	0,2	<1,5	<0,02	<0,03
	08.06.2017	0,04	<1,5	<0,02	<0,03
AK-30 (754 km)	29.03.2017	0,34	2,01	<0,02	<0,025
	20.04.2017	0,16	1,93	<0,02	<0,03
	15.05.2017	0,11	<1,5	<0,02	<0,03
	08.06.2017	0,08	<1,5	<0,02	<0,03
AK-31 (764 km)	29.03.2017	0,31	1,97	<0,02	<0,025
	20.04.2017	0,21	1,8	<0,02	<0,03
	15.05.2017	0,21	<1,5	<0,02	<0,03
	08.06.2017	0,36	<1,5	<0,02	<0,03
AK-33 (774 км)	29.03.2017	0,31	2,48	<0,02	<0,025
	20.04.2017	0,45	1,91	<0,02	<0,03
	15.05.2017	0,19	<1,5	<0,02	<0,03
	08.06.2017	0,34	<1,5	<0,02	<0,03
AK-34 (784 км)	29.03.2017	0,35	2,48	<0,02	<0,025
	20.04.2017	0,31	1,96	<0,02	<0,03
	15.05.2017	0,15	<1,5	<0,02	<0,03
	08.06.2017	0,35	<1,5	<0,02	<0,03
SHETPE CAMP (657 KM)					
AK-10	28.03.2017	0,30	<1,5	<0,02	<0,025
	19.04.2017	0,28	<1,5	<0,02	<0,03
	15.05.2017	0,24	<1,5	<0,02	<0,03
	07.06.2017	0,29	<1,5	<0,02	<0,03
AK-11	28.03.2017	0,30	<1,5	<0,02	<0,025
	19.04.2017	0,12	<1,5	<0,02	<0,03
	15.05.2017	0,09	<1,5	<0,02	<0,03
	07.06.2017	0,33	<1,5	<0,02	<0,03
AK-12	28.03.2017	0,29	2,03	<0,02	<0,025
	19.04.2017	0,44	<1,5	<0,02	<0,03
	15.05.2017	0,22	<1,5	<0,02	<0,03
	07.06.2017	0,41	<1,5	<0,02	<0,03
AK-13	28.03.2017	0,31	1,86	<0,02	<0,025
	19.04.2017	0,26	<1,5	<0,02	<0,03
	15.05.2017	0,09	<1,5	<0,02	<0,03
	07.06.2017	0,43	<1,5	<0,02	<0,03
ZHETYBAY VILLAGE (ENTRANCE ANF EXIT)					
AK-19 (707 км)	28.03.2017	0,30	<1,5	<0,02	<0,025
	19.04.2017	0,23	<1,5	<0,02	<0,03
	15.05.2017	0,13	<1,5	<0,02	<0,03

Sampling Locations	Sampling Date	The concentration of harmful substances, mg/m^3			
		Dust	Oxide Carbon	Nitrogen dioxide	Sulfur dioxide
Maximum Permissible Concentration		**0,5**	**5**	**0,2**	**0.5**
	07.06.2017	0,14	<1,5	<0,02	<0,03
АК-20 (713 км)	28.03.2017	0,33	1,56	<0,02	<0,025
	19.04.2017	0,12	<1,5	<0,02	<0,03
	15.05.2017	0,17	<1,5	<0,02	<0,03
	07.06.2017	0,26	<1,5	<0,02	<0,03
ZHETYBAY CAMP (713 KM)					
АК-23	29.03.2017	0,32	1,93	<0,02	<0,025
	20.04.2017	0,16	<1,5	<0,02	<0,03
	15.05.2017	0,22	<1,5	<0,02	<0,03
	08.06.2017	0,35	<1,5	<0,02	<0,03
АК-24	29.03.2017	0,30	2,01	<0,02	<0,025
	20.04.2017	0,12	<1,5	<0,02	<0,03
	15.05.2017	0,14	<1,5	<0,02	<0,03
	08.06.2017	0,24	<1,5	<0,02	<0,03
АК-25	29.03.2017	0,31	1,62	<0,02	<0,025
	20.04.2017	0,16	1,7	<0,02	<0,03
	15.05.2017	0,16	<1,5	<0,02	<0,03
	08.06.2017	0,27	<1,5	<0,02	<0,03
АК-26	29.03.2017	0,30	<1,5	<0,02	<0,025
	20.04.2017	0,17	<1,5	<0,02	<0,03
	15.05.2017	0,23	<1,5	<0,02	<0,03
	08.06.2017	0,4	<1,5	<0,02	<0,03
SANCTUARY BOUNDARIES (ENTRANCE AND EXIT)					
АК-28 (739 км)	29.03.2017	0,32	<1,5	<0,02	<0,025
	20.04.2017	0,39	<1,5	<0,02	<0,03
	15.05.2017	0,13	<1,5	<0,02	<0,03
	08.06.2017	0,41	<1,5	<0,02	<0,03
АК-32 (771 км)	29.03.2017	0,35	2,76	<0,02	<0,025
	20.04.2017	0,4	1,7	<0,02	<0,03
	15.05.2017	0,14	<1,5	<0,02	<0,03
	08.06.2017	0,13	<1,5	<0,02	<0,03

Source: Contractor Semi-annual Environmental Protection Report, See Annexure D

3.3.2 Noise and Vibration Level Measurement

Regarding noise and vibration, the contractor is obliged to undertake monthly noise and vibration measurement along the project road. Accordingly, Noise and vibration monitoring has been carried out at fourteen locations (Photograph 3.2) along or close to the road alignment at sensitive locations within the project road (Table 3.2 & Table 3.3). Measurements of noise and vibration are carried out monthly: at the entrance and exit in the Shetpe and Zhetybay village, in camps Shetpe (657 km) and Zhetybay (707 km), on the borders of the sanctuary (protocol #4 dd 25.02.2016).

Noise level measurements were below the established level of 80 decibels. The highest registered noise level was 78 dBA in AK-25 (730 km, Zhetybay camp) on 29 March 2017.

Noise measured at the sites is below the limit which indicates that noise had been effectively controlled by the Contractor. The Contractor is hereby instructed to minimize any noise producing equipment and machinery and to maintain them properly to bring down the level of noise. Nevertheless, no complaint was lodged regarding noise.

Noise measurement at AK-10 (657 km) of PK220 on 19.04.2017

Noise measurement at AK-32 (771 km) of PK-533 on 08.06.2017

Vibration measurement at AK-8 (645 km) of PK100 on 28.03.2017

Vibration measurement at AK-10 (657 km) of PK-220 on 07.06.2017

Photograph 3.2: Measurement of Noise & Vibration

The Table 3.2 is for the vibration monitoring results in the different locations along the project road, Shetpe and Zhetybay camp sites, entrance to and exit from Zhetybay village, and sanctuary boundaries for the period of March to June 2017. Vibration monitoring was below the established level of 100 decibels. The highest registered Vibration level was 92 dBA at AK-32 (771 km, sanctuary border) on 29 March 2017. Vibration results at the sites are below the limit which indicates that vibration had been effectively controlled by the Contractor. Nevertheless, no complaint was lodged regarding vibration.

Table 3.2: Noise and Vibration Monitoring Results

Sampling Locations	Sampling Date	Noise, dBA		Vibration, dB	
		Maximum	Minimum	Maximum	Minimum
		Maximum concentration limits (80dBA)		Maximum concentration limits (100dB)	
AK-2 (636 km,	28.03.2017	66	48	85	64

Sampling Locations	Sampling Date	Noise, dBA		Vibration, dB	
		Maximum	Minimum	Maximum	Minimum
		Maximum concentration limits (80dBA)		Maximum concentration limits (100dB)	
entrance to Shetpe village)	19.04.2017	56	36	66	54
	15.05.2017	60	40	68	56
	07.06.2017	64	44	72	60
AK-8 (645 km, exit from Shetpe village)	28.03.2017	66	46	70	58
	19.04.2017	58	38	62	52
	15.05.2017	60	40	64	54
	07.06.2017	66	46	72	62
AK-10 (657 km, Shetpe camp)	28.03.2017	70	50	76	62
	19.04.2017	62	44	72	58
	15.05.2017	60	40	70	54
	07.06.2017	64	44	80	64
AK-11 (657 km, Shetpe camp)	28.03.2017	68	48	78	64
	19.04.2017	64	46	70	56
	15.05.2017	60	42	64	52
	07.06.2017	68	50	70	60
AK-12 (657 km, Shetpe camp)	28.03.2017	66	44	76	62
	19.04.2017	68	50	74	60
	15.05.2017	70	52	72	58
	07.06.2017	74	56	74	60
AK-13 (657 km, Shetpe camp)	28.03.2017	64	42	74	60
	19.04.2017	66	46	68	56
	15.05.2017	68	48	70	58
	07.06.2017	72	52	74	62
AK-19 (707 km, entrance to Zhetybay village)	28.03.2017	74	54	82	60
	19.04.2017	70	50	84	62
	15.05.2017	68	50	74	58
	07.06.2017	70	52	78	64
AK-20 (713 km, exit from Zhetybay village)	28.03.2017	76	54	90	66
	19.04.2017	72	50	80	60
	15.05.2017	70	58	88	72
	07.06.2017	68	50	74	60
AK-23 (730 km, Zhetybay camp)	29.03.2017	74	50	84	64
	20.04.2017	70	48	80	60
	15.05.2017	66	50	78	60
	08.06.2017	52	40	68	52

Sampling Locations	Sampling Date	Noise, dBA		Vibration, dB	
		Maximum	Minimum	Maximum	Minimum
		Maximum concentration limits (80dBA)		Maximum concentration limits (100dB)	
AK-24 (730 km, Zhetybay camp)	29.03.2017	74	54	88	72
	20.04.2017	72	48	80	60
	15.05.2017	70	54	82	66
	08.06.2017	66	44	76	60
AK-25 (730 km, Zhetybay camp)	29.03.2017	78	68	86	72
	20.04.2017	74	64	84	70
	15.05.2017	72	60	86	70
	08.06.2017	74	50	78	62
AK-26 (730 km, Zhetybay camp)	29.03.2017	74	62	84	74
	20.04.2017	72	60	82	70
	15.05.2017	70	58	82	68
	08.06.2017	76	54	80	64
AK-28 (739 km, sanctuary border)	29.03.2017	64	50	86	70
	20.04.2017	62	48	84	68
	15.05.2017	64	50	86	70
	08.06.2017	70	46	76	60
AK-32 (771 km, sanctuary border)	29.03.2017	76	60	92	72
	20.04.2017	74	58	80	70
	15.05.2017	72	56	80	68
	08.06.2017	68	54	88	72

Source: Contractor Semi-annual Environmental Protection Report, See Annexure D

3.3.3 Water Quality Monitoring

In the project road alignment, there is a one water body, the Aschyyagar River at Km755. Water quality, in terms of Dry residue, Nitrates, Sulfates, Chloride, Petrolium products and Total Iron are tested from March to June 2017 at one location to detect environmental impacts from the road construction activities. The river belongs to the water, in connection with the sampling carried out in March, April, May and June 2017 due to ongoing heavy snow water samples were taken. Accredited laboratory analyzed samples with determination of: dry residue nitrates, sulfates, chlorides, petroleum products, iron. The monitoring results are presented in a Table 3.3. Measurements results for water quality are generally acceptable with the six (06) parameters for the sample from the water sampling station at the Aschyyagar River. The results are below the ACL (Allowable Concentration Level) values indicating that the project is not impacting the water quality of the immediate vicinity. The actual values for the analysis of surface water do not exceed the norms of maximum permissible concentrations established by regulatory requirements of the Republic of Kazakhstan**.**

Table 3.3: Water Quality Monitoring Result

Sampling point	Sampling date	К The harmful substances concentration					
		dry residues, mg/dm3	Nitrates mg/dm3	Sulphates mg/dm3	Chlorides mg/dm3	Petro chemicals mg/dm3	Ferrum common mg/dm3
		MPC values					
		-	not more 40	not more 100	not more 300	not more 0,05	not more 0,1
Ashyagar r., before the bridge	29.03.2017	975	2,24	90,12	253,97	0,022	0,08
Ashyagar r., after the bridge	29.03.2017	978,5	1,81	88,5	264,4	0,02	0,1
Ashyagar r., before the bridge	19.04.2017	967,5	2,03	90,94	249,76	0,02	0,085
Ashyagar r., after the bridge	19.04.2017	970	2,13	90,12	253,23	0,02	0,089
Ashyagar r., before the bridge	15.05.2017	922,5	1,87	84,77	266	0,015	0,077
Ashyagar r., after the bridge	15.05.2017	927,5	1,95	88,88	259	0,015	0,08
Ashyagar r., before the bridge	08.06.2017	935	1,84	82,3	253,75	0,02	0,07
Ashyagar r., after the bridge	08.06.2017	937,5	1,8	83,12	255,5	0,011	0,0725

Source: Contractor Semi-annual Environmental Protection Report, See Annexure D

3.3.4 Soil Quality Monitoring

Monitoring of soil involves determining the concentration of pollutants in the zone of active influence. The most accurate estimate of the effect on soil is direct measurements of pollutants. To do this, under a contract with the Contractor specialized accredited laboratory of environment protection JSC "Aktobe plant of chromium compounds" carried out soil monitoring within this period from March to June 2017. Sampling points and frequency are defined in the monitoring program, which is a mandatory attachment to Environmental management plan. Total for the period in the 27 control points (Photograph 3.3) were selected 108 samples. In January and February of 2017 samples were not selected because of the reduced volume of works in this section due to heavy snowfall.

Soil quality test were done monthly at 27 sampling stations (Photograph 3.3) along the project road, villages, and camp sites. In the table 3.4 below, the observations within this period from March to June 2017 grouped as follows: road every 10 km - 15 control points, Shetpe camp - 4 control points, Zhetybay camp - 4 control points, boundaries of Zhetybay village - 2 control points, the boundaries of the state reserve - 2 control points.

Soil sampling at AK-25 (730 km) of PK190 on 28.03.2017

Soil sampling at AK-27 (734 км) of PK163 on 20.04.2017

Soil sampling at AK-15 (674 km) of PK390 on 15.05.2017

Soil sampling at AK-34 (784 km) of PK-663 on 08.06.2017

Photograph 3.3: Soil Sample Collection

The results show that soil quality is below the limit (MCL - Maximum Concentration Limits) as observed in the Table 3.4, indicating that the project is not impacting the soil quality of the immediate vicinity. Summary of the Table 3.4 presents, a comparative analysis of: the measurement results for the reporting months from January to June 2017 and maximum concentrations limits of soil quality. The results confirm that there have not been any measured extremes during the monitoring period. The results of monitoring show that the content of contaminators does not exceed MCL in accordance with ecological requirements of Republic of Kazakhstan. Although the concentrations are within the limit, but the contractors has to continue the same work in order to check soil quality regularly.

Table 3.4: Soil Quality Test Results

Sampling Locations	Sampling Date	The Concentration of Harmful Substances				
		pH	Petroleum products, mg/g	Cadmium, mg/kg	Plumbum, mg/kg	Zinc, mg/kg
Maximum Concentration Limits		**-**	**-**	**0.5**	**32**	**23**
ROAD						
AK-8 (645 km)	28.03.2017	8,4	0,007	0,07	6,0	17,22
	19.04.2017	8,3	0,008	0,05	4,21	18,5
	15.05.2017	8,4	0,006	0,048	4,28	17,98
	07.06.2017	8,2	< 0,005	0,055	4,32	18,2
AK-9 (654 km)	28.03.2017	8,4	0,024	0,06	7,05	18,55
	19.04.2017	8,3	0,013	0,08	5,01	18,03
	15.05.2017	8,3	0,011	0,07	4,81	17,54
	07.06.2017	8,4	0,014	0,075	4,67	17,95
AK-14 (664 km)	28.03.2017	8,5	0,018	0,17	8,06	18,49
	19.04.2017	8,4	0,012	0,23	7,84	18,22
	15.05.2017	8,4	0,011	0,11	5,2	18,55
	07.06.2017	8,2	0,009	0,18	4,8	18,1
AK-15 (674 km)	28.03.2017	8,5	0,04	0,18	4,21	18,03
	19.04.2017	8,5	0,032	0,12	3,41	17,95
	15.05.2017	8,4	0,022	0,13	3,89	18,4
	07.06.2017	8	0,015	0,17	4,01	18,5
AK-16 (684 km)	28.03.2017	8,4	0,10	0,11	7,11	18,08
	19.04.2017	8,5	0,086	0,12	7,55	17,64
	15.05.2017	8,3	0,08	0,07	6,52	17,66
	07.06.2017	8,5	0,095	0,1	8,63	18,11
AK-17 (694 km)	28.03.2017	8,6	0,011	0,14	8,5	18,19
	19.04.2017	8,5	0,012	0,12	5,88	17,89
	15.05.2017	8,3	0,02	0,34	7,24	17,46
	07.06.2017	8	0,018	0,3	5,57	18,1
AK-18 (704 km)	28.03.2017	8,5	0,019	0,15	8,30	19,97
	19.04.2017	8,5	0,017	0,11	5,61	18,94
	15.05.2017	8,4	0,019	0,1	2,87	20,19
	07.06.2017	8	0,01	0,18	2,44	19,54
AK-21 (714 km)	28.03.2017	8,5	0,016	0,09	8,22	17,69
	19.04.2017	8,4	0,011	0,012	6,1	17,38
	15.05.2017	8,5	0,01	0,1	4,67	18,02
	07.06.2017	8,5	0,013	0,09	7,71	17,55
AK-22 (724 km)	28.03.2017	8,4	0,008	0,20	6,00	18,15
	19.04.2017	8,4	0,009	0,21	6,98	18,65
	15.05.2017	8,4	0,011	0,23	5	17,25
	07.06.2017	8	0,01	0,16	3,35	18,2
AK-27 (734 km)	29.03.2017	8,5	0,009	0,12	5,0	17,84
	20.04.2017	8,4	<0,005	0,15	6,65	17,87
	15.05.2017	8,4	<0,005	0,11	6,08	18,59
	08.06.2017	8,4	0,005	0,16	6,12	18,11
AK-29 (744 km)	29.03.2017	8,3	0,01	0,16	5,03	17,58
	20.04.2017	8,3	<0,005	0,19	4,01	18,01

Sampling Locations	Sampling Date	The Concentration of Harmful Substances				
		pH	Petroleum products, mg/g	Cadmium, mg/kg	Plumbum, mg/kg	Zinc, mg/kg
Maximum Concentration Limits		**-**	**-**	**0.5**	**32**	**23**
	15.05.2017	8,4	<0,005	0,25	5,36	17,87
	08.06.2017	8,2	0,007	0,15	4,68	17,2
AK-30 (754 km)	29.03.2017	8,1	0,12	0,26	9,87	18,72
	20.04.2017	8	0,1	0,22	6,81	18,02
	15.05.2017	8,1	0,08	0,18	6	17,41
	08.06.2017	7,9	0,19	0,29	8,4	17,99
AK-31 (764 km)	29.03.2017	8,4	0,012	0,20	9,0	18,05
	20.04.2017	8,2	0,009	0,38	5,99	17,32
	15.05.2017	8,2	0,012	0,29	5,02	18,74
	08.06.2017	8,2	0,012	0,22	5,21	18,1
AK-33 (774 km)	29.03.2017	8,5	0,015	0,25	8,51	17,35
	20.04.2017	8,4	0,017	0,22	7,41	17,18
	15.05.2017	8,3	0,012	0,18	6,35	17,77
	08.06.2017	8,3	0,013	0,24	5,15	17,5
AK-34 (784 km)	29.03.2017	8,4	0,010	0,22	8,09	17,67
	20.04.2017	8,4	0,011	0,15	7	18,07
	15.05.2017	8,3	0,009	0,19	6,31	17,58
	08.06.2017	8,4	0,011	0,23	6,35	17,2
SHETPE CAMP (657 KM)						
AK-10 (657 km)	28.03.2017	8,5	0,01	0,17	5,15	18,91
	19.04.2017	8,5	0,012	0,23	3,05	18,15
	15.05.2017	8,4	0,011	0,21	2,95	18,01
	07.06.2017	8,1	0,015	0,22	3,37	18,34
AK-11 (657 km)	28.03.2017	8,4	0,015	0,13	7,23	18,33
	19.04.2017	8,4	0,014	0,15	5,7	16,48
	15.05.2017	8,4	0,01	0,11	4,72	15,54
	07.06.2017	8,4	0,01	0,12	7,4	16,95
AK-12 (657 km)	28.03.2017	8,5	0,011	0,10	6,82	18,56
	19.04.2017	8,4	0,013	0,12	5,01	17,84
	15.05.2017	8,5	0,006	0,11	6,24	17,22
	07.06.2017	8,4	< 0,005	0,12	6,01	17,95
AK-13 (657 km)	28.03.2017	8,5	0,012	0,25	7,00	19,61
	19.04.2017	8,3	0,016	0,24	6,56	18,64
	15.05.2017	8,5	0,006	0,22	4,81	17,55
	07.06.2017	8,6	0,005	0,26	5,57	18,01
ZHETYBAY VILLAGE (ENTRANCE AND EXIT)						
AK-19 (707 km)	28.03.2017	8,4	0,015	0,15	6,01	17,05
	19.04.2017	8,3	0,011	0,18	4,91	17,69
	15.05.2017	8,3	0,006	0,175	4,76	17,95
	07.06.2017	8,1	< 0,005	0,16	5,5	17,31
AK-20 (713 km)	28.03.2017	8,5	0,015	0,15	9,18	19,69
	19.04.2017	8,3	0,012	0,17	7,88	17,41
	15.05.2017	8,5	0,015	0,2	6,31	17,9
	07.06.2017	8,7	0,021	0,19	10,71	18,5

Sampling Locations	Sampling Date	The Concentration of Harmful Substances				
		pH	Petroleum products, mg/g	Cadmium, mg/kg	Plumbum, mg/kg	Zinc, mg/kg
Maximum Concentration Limits		**-**	**-**	**0.5**	**32**	**23**
ZHETYBAY CAMP (730 KM)						
AK-23	29.03.2017	8,3	0,011	0,17	8,02	17,08
	20.04.2017	8,3	< 0,005	0,16	5,46	17,65
	15.05.2017	8,3	< 0,005	0,19	6,38	18
	08.06.2017	8,1	< 0,005	0,18	4,25	17,9
AK-24	29.03.2017	8,5	0,009	0,10	4,73	17,39
	20.04.2017	8,3	<0,005	0,11	6,65	18,54
	15.05.2017	8,4	0,007	0,15	6,95	18,88
	08.06.2017	8,2	< 0,005	0,12	4,08	18,2
AK-25	29.03.2017	8,3	0,011	0,11	7,0	17,06
	20.04.2017	8,4	0,01	0,14	5,05	17,65
	15.05.2017	8,2	0,012	0,17	4,36	17,6
	08.06.2017	8,4	0,01	0,12	5,02	17,22
AK-26	29.03.2017	8,4	0,015	0,15	6,91	17,65
	20.04.2017	8,4	0,006	0,17	4,67	17,22
	15.05.2017	8,4	0,005	0,11	6,38	18,09
	08.06.2017	8,2	0,007	0,44	5,19	18,78
SANCTUARY BOUNDARIES (ENTRANCE AND EXIT)						
AK-28 (739 km)	29.03.2017	8,3	0,012	0,15	5,99	17,54
	20.04.2017	8,4	0,009	0,14	6,68	17,66
	15.05.2017	8,4	0,015	0,19	5,97	18,47
	08.06.2017	8,1	< 0,005	0,1	4,14	17,2
AK-32 (771 km)	29.03.2017	8,3	0,010	0,21	7,81	17,35
	20.04.2017	8,2	<0,005	0,26	5,02	17,07
	15.05.2017	8,3	<0,005	0,32	4,55	17,91
	08.06.2017	8	0,006	0,28	5,65	17,2

Source: Contractor Semi-annual Environmental Protection Report, See Annexure D

3.4 Environmental Audit of the Engineer

Environmental Monitoring is among the major tasks of the construction supervision team. Likewise, under the construction contract, the Contractor is obligated to ensure that construction has no or minimal adverse impact to the environment and the communities. The Consultants and the Contractor should have a close collaborative coordination in performing environmental monitoring of activities to be effective in the minimization and avoidance of impacts.

The CSC Environmental Specialist / engineers undertook inspection intermittently at the project site within this period from January to June 2017 and came up with a number of observable situations where the Contractor can improve in providing added environmental mitigation measures and precautionary measures to improve safety at the workplace. In addition, these identified issues were presented to the Contractor concerned staffs and weekly observations were discussed in the weekly meetings between contractor and

consultant. The output of the environmental inspection of the environmental specialist and consultant engineers is included in the Table below entitled “Observed Issues during the Environmental Inspections” Table 4.1.

The Environmental Specialist of the Engineer conducted audit on the required documents from the Contractor. During the reporting period, the Environmental Specialist forwarded consultant comments on monthly environmental protection report and semi-annual environmental protection report to the contractor for the modification which was submitted by the contractor. The specialist also requested to the contractor for submitting the additional management plans (Borrow Pit Management & Re-instatement Plan; Campsite/s Management Plan; Solid Waste Management Plan; Hazardous Waste Management Plan; Dust Management Plan; Soil Management Plan; Water Quality Management Plan; and Noise Management Plan) for the project and those were submitted by contractor in June 2015.

It is a requirement of the project EIA that a Site Specific Environmental Management Plan (SSEMP) with separate management plan are produced by the Contractor to provide a guidance document for staff on the site of their requirements and responsibilities. This document has been prepared by the Contractor. The SSEMP is the primary environmental document for the implementation phase of the Project that is supported by other environmental plans identified in the EIA and indicated in the above list which has been submitted to engineer in June 2015.

The bases of contractor formulation of the Supplemental Plan are the EIA document (with focus on the EMP), the Technical Specifications, and prevailing Kazakhstan laws, norms and regulations. These supplemental plans shall serve as guides in the Contractor’s overall execution of works in the environmental aspects as well as in the environmental self-monitoring reports.”

PART III: ENVIRONMENTAL MANAGEMENT

4 ENVIRONMENTAL MANAGEMENT PLAN (EMP)

4.1 Overview

The main objective of the Environmental Management Plan (EMP) during the implementation and operation of the project to avoid, reduce, or at least minimize the adverse environmental impacts that could result from the activities. Accordingly, the EMP considers all phases of the Project cycle, namely the detailed design, construction and operational phases of the Project. It consists of various mitigation measures needed to be undertaken in the course of the Project cycle.

During the construction phase, certain situations can arise which may not have been anticipated by the Contractor. It is for this reason that the project EMP is considered as a dynamic document which need to be revised by the Contractor as the need arises. The EMP will be continuously updated to include issues unforeseen during the formulation of the EIA. In relation to this MFF CAREC CORRIDOR II Project, efforts have been made to avoid and reduce adverse environmental impacts in the Project Design, and additional recommendations to further avoid or reduce impacts are provided to Contractors which should reflect in the EMP upgraded by the Contractors. Additionally, the Safeguard Policy Statement (ADB-SPS 2009) goes on to state that in regard to mitigation and compensation, the EMP should address “the following key components: Mitigation, Monitoring, Implementation, and Performance Indicators” through defined plans. As such, the Contractors should reflect the level of detail and complexity of the environmental planning documents and the priority of the identified measures and actions that commensurate with the project’s impacts and risks. Key considerations include monitoring and mitigation of potential adverse impacts to the level of “no significant harm to nature and humans”; the polluter pays principle, the precautionary approach, and adaptive management, etc.

4.2 Implementation of the EMMP

The Contractor is responsible for implementation of EMMP during construction works and Construction Supervision Consultant (CSC) is primarily responsible for supervision of monitoring of the implementation of the EMMP. The committee for roads (CR) engaged PMC as an external monitoring consultant’ to monitor implementation and supervision of EMMP. As such, the PMC-ADB, CSC monitors and measures the progress of implementation of the EMP on behalf of the borrower/client.

Site inspections were conducted on various environmental aspects of the project and these were audited to form part of the monthly & quarterly progress reports and bi-annual environmental monitoring reports. The consultant engineers went to assess various sites along the Project Road as well as other locations that might pose some environmental concerns in the vicinity of the road such as Contractor’s campsite, asphalt and crushing plant, equipment maintenance sites, borrow pits, etc. During the inspection, a number of environmental and safety issues were observed and noted. These issues were subsequently brought to the attention of the personnel concerned on the CSC side as well as discussed

with the Contractor's side. The issues observed were generally concerning with the active borrow pit/quarry operations and rehabilitation, potential contamination in proposed material plants, noise and dust generation at soil hauling areas, and contractor's work camp housekeeping. Following CSC' direction and advice, the Contractors should implement these corrective actions and follow up on these actions to ensure their effectiveness.

Site Specific Environmental Management Plan: It is a requirement of the project EIA that a Site Specific Environmental Management Plan (SSEMP) is produced by the Contractor to provide a guidance document for staff on the site of their requirements and responsibilities. The Site Specific EMP document has been prepared by the Contractor. The SSEMP is the primary environmental document for the implementation phase of the Project that is supported by other environmental plans identified in the EIA and indicated in Figure 4.1.

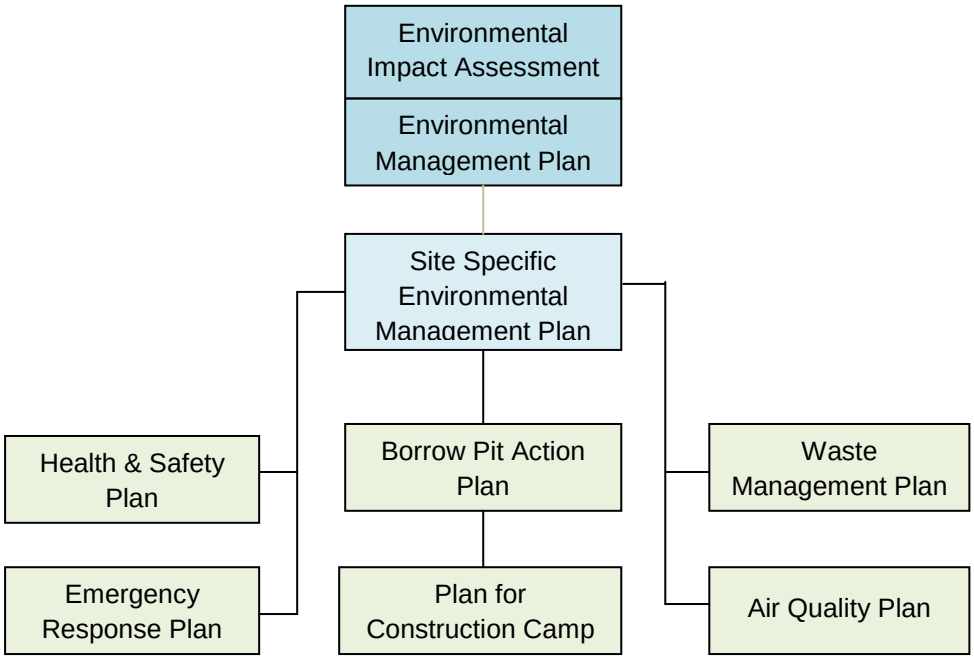


Figure 4.1: The SSEMP and its supporting documents

4.3 Observed Environmental Impacts and Mitigation Measures

During the periodic field mobilization and inspection of the local environmental specialist short visit in May 2017 and regular monitoring by the consultant engineers as part of the Construction Supervision Consultant Team, the work scope undertaken in coordination with Contractor (Cengiz Insaat Sanayi ve Ticaret A.S) for the project road. The observed environmental issues were noted and discussed with the Contractor's representatives for clarification within the framework of the EIA, Contractual provisions and technical specifications. Photos were taken on a number of them and shown in Annexure A but some observations are given in Table 4.1. The details activities are given in below:

- Field inspection of the worksites including facilities and ancillary work areas. Field investigation included worksites along the project road sections, borrow pit areas, access roads, bridges and culverts, sanctuary boundaries, canals, and Contractor's work camp.

- Detailed inspection was done on the environmental and safety issues set-up along the project road, camp sites and especially different culvert sites.
- Detailed Discussion with the contractor representatives on status of the required Contractor's monthly progress reports, bi-annual environmental monitoring reports, environmental monitoring checklist and other required documents.

Environmental monitoring has been continuing with the deployment of local environmental specialist in May 2017, whose main duties was to oversee the impacts generated and monitors the measures being implemented. It is observed that there was no serious environmental impact in the project area according to site investigation during this period. Presented below are the some environmental, health and safety issues observed at the vicinity of project worksites during the monitoring of the CSC personnel, field reconnaissance of the CSC Environmental Consultant and consultant engineers (Table 4.1).

Table 4.1: Observed Issues during the Environmental Inspections

Description of Environmental Issues	Description of Proposed Measures
Dust pollution occurs in certain limited areas of base repair and maintenance. Water truck was used to minimize the consequences	To reduce dust during construction through watering. It is recommended that Environmental specialist of Contractor to schedule watering of the road, where it is necessary to prevent the effects of dust on the local residents.

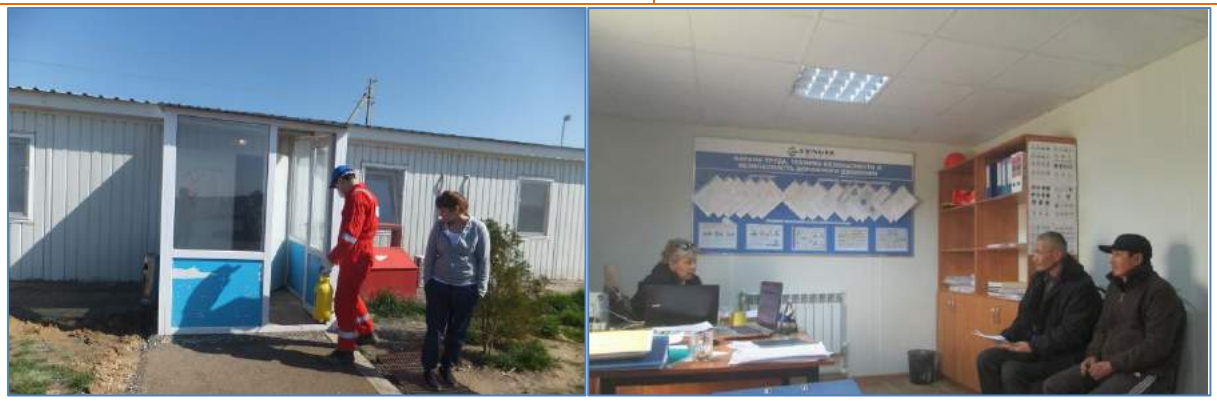
Photograph 4.1: Dust Pollution from Maintenance of Temporary Bypass Road

Description of Environmental Issues	Description of Proposed Measures
 Photograph 4.2: Dust Control by Spray Truck Watering at Zhetybay Camp Site	
<u>Wearing of protective clothing and safety gear and safety shoes</u> Workers are provided with PPEs like helmets, reflective clothing, and signs to alert during traffic, there are controllers to give a signal to road users. It was observed that some workers are not provided with PPEs on production workshops	The Contractor instructs each employee in the area of the need to wear the prescribed helmet, reflective clothing and safety shoes. Workers necessarily wear safety shoes during working hours. Road Safety Engineer provides workers with overalls. Strict adherence to the policy of protective measures on all construction sites. It was suggested that safety policy should be reinforced in all construction sites.
 Photograph 4.3: Workers were with PPEs at project site	
<u>Equipment: Mobilization of equipment could have air and noise pollution impacts in nearby settlement</u> Since construction works is going on which needs careful control to avoid dust pollution especially at this	During consultation with local peoples at Beki Village, Zhetybay Village and Batyr were very concern about dust pollution due to project works. It is at acceptable level of noise during the

Description of Environmental Issues	Description of Proposed Measures
windy season. Contractor keeps low speed when moving heavy vehicle/equipment during road maintenance.	construction according to discussion with local peoples in Beki and Zhetybai Villages and Batyr Akimat office.
Air and noise pollution for any nearby settlements From the consultation meeting with local authority, however, it was suggested that watering the road before cleaning or blowing the road should be carefully as it is very much disturb to local people especially close to the villages.	Air quality is at acceptable level for daily livelihood as per air quality data (March to June 2017). The noise and vibration measurement was within the standard limit as per noise and vibration data from March to June 2017.
The Contractor uses a traffic control methods to limit the interference to traffic and ensure the safety of traffic and pedestrians.	Service of road safety related traffic signs are installed to ensure the security and control of movement. Produced patching repair of the existing road to prevent traffic accidents.
 Photograph 4.4: Bypass Road at PK110	
Possible impacts on road user safety Primarily the safety precautions were introduced to all the employees of the Contractor. The traffic controller is used to control the movement of traffic, control schemes provided	The Contractor periodically instructs its subcontractors and workers that they must wear personal protective equipment in the workplace, in order to minimize accidents and health hazards. Traffic accidents are recorded. All of accidents recorded in the corresponding journal of traffic safety service.
 Photograph 4.5: Organization of temporary road marking and Installation of necessary road signs on the diversion	

Description of Environmental Issues	Description of Proposed Measures
Pollution caused by domestic sewage and solid waste Environmental safeguard checklist was distributed for the purpose of checking during work implementation and tries to mitigate if there is any environmental issue. The proper sanitation facilities were observed during this period.	It is observed that there is no waste water pollution till now which is caused by the road construction.
 Photograph 4.6: Toilet Facilities for Workers at Shetpe Camp	
Mandatory quarry recovery plan - the project uses a lot of quarries for pavement. Excavation without a plan leads to difficulties in the rehabilitation of areas	Contractor developed and submitted a plan for the restoration of quarries. Implementation of the plan should be made before the demobilization.
 Photograph 4.7: Quarry Development Site	
Technique - numerous amounts of Contractor's trucks equipped with a canopy.	The Contractor daily checks the equipping of all trucks with canopy cover, in order to avoid accidents along the road and to prevent the fall of any materials from trucks.
Compliance with sanitary-hygienic standards on the	Perform daily clean-upof facilities, timely

Description of Environmental Issues	Description of Proposed Measures
territory of the camp. Measures on protection of personnel from insects and rodents, and reducing risks for health coming from them.	provision of workers with household goods, carry out timely repair of living rooms and offices (roof leak, cranes, etc.) Conclusion of contracts for carrying out preventive disinfection. Pest control is carried out pest control is carried out in the industrial and residential areas against bedbugs, ticks, mosquitoes, rodents, scorpions and spiders



Photograph 4.8: Carrying out of Preventive Disinfection on the Territory of Zhetibay Camp and Health and Safety Engineer Ms.Kabdolova S.K. is holding Induction Briefing

Medical Equipment An ambulance with a doctor is available from June 2015. Trainings are conducted for informing workers about preventive measures of transmission of sexually transmitted diseases (HIV, AIDS, etc.).	The Contractor has mobilized a medical room with first aid resources.

Photograph 4.9: Medical Facilities at Zhetybay Camp Site

4.4 Site Inspection and Audits

Periodic audits of the work camps, construction sites and different related project work sites have been conducted during the construction period (January to June 2017) and have resulted in improved conditions at the camps and project work sites. Camps and project work sites will be regularly monitored throughout the construction season and particular focus will be given to works along the entire project alignment.

According to the observations during the site inspections by local environmental specialist in May 2017 and consultant engineer's further improvements were done at the different project sites within this period. Joint inspections of the consultant environmental specialist / engineers with the Contractor, Joint inspections with Road Safety Engineers, and frequently meetings have helped to sort out some of the problems at the site. The following **Error! eference source not found.** presents the summary of site visits in last six months from January to June 2017.

Table 4.2: Summary of the Number and Type of Site Visits

Date	Contract		Notes
	Contract 1 (Shetpe and Zhetybay)	Contract 2 (Zhetybay and Aktau)	
02.01.2017	@	@	Joint site visit of Consultant and Contractor Environmental Specialists
05.01.2017	@	@	Joint site visit of Consultant and Contractor Environmental Specialists
10.01.2017	@	@	Joint site visit of Consultant and Contractor Environmental Specialists
12.01.2017	@	@	Joint site visit of Consultant and Contractor Environmental Specialists
11.05.2017	@	@	Joint site visit of Consultant and Contractor Environmental Specialists
15.05.2017	@	@	Joint site visit of Consultant and Contractor Environmental Specialists
05.06.2017	@	@	Site visit of Consultant Engineer
07.06.2017	@	@	Joint site visit of Consultant and Contractor Environmental Specialists
13.06.2017	@	@	Site visit of Consultant Engineer
17.06.2017	@	@	Joint site visit of Consultant and Contractor Environmental Specialists
20.06.2017	@	@	Site visit of Consultant Engineer
23.06.2017	@	@	Joint site visit of Consultant and Contractor Environmental Specialists
26.06.2017	@	@	Site visit of Consultant Engineer
30.06.2017	@	@	Joint site visit of Consultant and Contractor Environmental Specialists

@ Indicates Number Cases
Sources: Compiled

4.5 Complains and Consultations

Grievance redress mechanism to address the complaints/suggestions of communities on excessive dust, noise, improper waste dumping and on other environmental issues is established. The grievance redress mechanism is additional to the existing channels of petitions in the form of letters and personal appeals established by local governments.

Contractor provided the Complaints Register book which is kept at the project work sites and is open accessed to community members. Ms. Umirbekova Natalya, the Contractor's

Environmental Specialist, is responsible for collecting concerns about project activity. No complains and/or suggestions on environmental issues are registered within this period.

The Environmental Specialist conducted several stakeholder consultations with local communities and Akimats in July and August 2016 to keep them informed about construction progress and upcoming activities. Construction works are located in rural areas that have limited access to electronic media such as the internet. Local communities were informed at meetings with consultants' staff and by local authorities (village Akimat) who were briefed directly by Environmental Specialist. The details outcome of stakeholder consultation has been given in last bi-annual environmental monitoring report (July to December 2016)

During implementation of the Project, there might be several issues related to environmental hazards and disputes on entitlement processes may occur due to the Project activities. For example, intensive schedule of construction activities; inappropriate timing of construction vehicle flow; waste; noise and air pollution from construction activities; ecological disturbances; cultural conflicts between migrant workers, are some of the environmental issues that are likely to arise from the Project activities.

Photograph 4.10: Stakeholder Consultation with several stakeholders at different places

4.6 Training and Meetings

One of the functional responsibilities of the environmental specialist is the development of programs for environmental protection training of Staff of the Consultant Engineers and Contractor staffs. The aim of the environmental protection training program was the environmental inspection and monitoring of their compliance with environmental reporting, which was done in conjunction with the assistance of international experts for environmental protection. The International Environmental Specialist is to develop a program for hands on

training of Consultant's and Contractor's staff in implementing the EMMP. Hence, the International Environmental Specialist organized a training workshop entitled "Implementation of Environmental Management Plan" at the Consultants office in Zhetibay on April 2015, December 2016 and May 2017 for consultant staffs and the training program for the contractor staff has been organized on July 2015, December 2016 and May 2017 for contractor staffs. The main purpose of the training was environmental inspections to dealing with environmental compliance monitoring and reporting to be conducted with the assistance of environmental specialist. The training was helpful in clarifying issues and facilitating the implementation of needed measures. A photograph of the training session is provided in below (

Photograph 4.11) and the attendance sheet is given in annexure C.

Photograph 4.11: Training program for Consultant & Contractor Staffs at Zhetibay Camp Site

Several meetings were held with the participation of the Contractor, Engineer, ADB representative and PMC representatives during this reporting period. These meetings were basically focused on the initial activities of the Contractor for the EMP implementation and further action. Weekly meetings between the Contractor's Project management staff and the Consultant are held to discuss the Project activities, including environmental issues, road and other safety issues and camp cleanliness. There is positive responsiveness to the concerns raised at meetings resulting in improved environmental performance. The

Consultant will continue to audit construction sites and camps to ensure that issues are resolved in a timely and appropriate manner.

4.7 Notices and Letters

During the previous six-month period, the Construction Supervision Consultant has been actively monitored the Contractor's performance in the environmental aspects. Issues were identified and communicated formally to the Contractor in the form of official letters. A listing of such letters on the environmental aspects and their status is shown below:

Table 4.3: Letters on Environmental Issues

Letter Ref.	Dated	From	To	Subjects
AKT-CGZ-SS-2017-08	06.02.2017	Cengiz Insaat	SMEC-Sapa SZ	Environment protection report January 2017
AKT-CGZ-SS-2017-30	03.03.2017	Cengiz Insaat	SMEC-Sapa SZ	Environment protection report February 2017
AKT-CGZ-SS-2017-44	15.03.2017	Cengiz Insaat	SMEC-Sapa SZ	Failure to comply with EMP requirements
AKT-CGZ-SS-2017-45	16.03.2017	Cengiz Insaat	SMEC-Sapa SZ	Samling of air, soil and water
AKT-CGZ-SS-2017-46	16.03.2017	Cengiz Insaat	SMEC-Sapa SZ	Environmental Monitoring Cheklist
AKT-CGZ-SS-2017-59	24.03.2017	Cengiz Insaat	SMEC-Sapa SZ	Environmental Monitoring Checklist
AKT-CGZ-SS-2017-76	04.04.2017	Cengiz Insaat	SMEC-Sapa SZ	Environmental Monitoring Checklist
AKT-CGZ-SS-2017-81	07.04.2017	Cengiz Insaat	SMEC-Sapa SZ	EMP for March 2017
AKT-CGZ-SS-2017-87	12.04.2017	Cengiz Insaat	SMEC-Sapa SZ	Environmental Monitoring Checklist
AKT-CGZ-SS-2017-89	13.04.2017	Cengiz Insaat	SMEC-Sapa SZ	Environmental sampling of air, soil, water
AKT-CGZ-SS-2017-96	17.04.2017	Cengiz Insaat	SMEC-Sapa SZ	Environmental Monitoring Checklist
AKT-CGZ-SS-2017-106	24.04.2017	Cengiz Insaat	SMEC-Sapa SZ	Environmental Monitoring Checklist
AKT-CGZ-SS-2017-127	03.05.2017	Cengiz Insaat	SMEC-Sapa SZ	Environment Protection Report for April 2017
AKT-CGZ-SS-2017-129	03.05.2017	Cengiz Insaat	SMEC-Sapa SZ	Environmental Monitoring checklist
AKT-CGZ-SS-2017-135	04.05.2017	Cengiz Insaat	SMEC-Sapa SZ	Sampling of air, soil and water
PMC-SMEC-170517-162	17.05.2017	PMC	SMEC-Sapa SZ	Violations of environmental requirements
AKT-CGZ-SS-2017-193	03.06.2017	Cengiz Insaat	SMEC-Sapa SZ	Environment Protection Report for May 2017
AKT-CGZ-SS-2017-197	05.06.2017	Cengiz Insaat	SMEC-Sapa SZ	Sampling of air, soil and water
AKT-CGZ-SS-2017-198	05.06.2017	Cengiz Insaat	SMEC-Sapa SZ	Environmental Monitoring Checklist
AKT-CGZ-SS-2017-216	05.06.2017	Cengiz Insaat	SMEC-Sapa SZ	Environmental sampling of air, soil, water
AKT-CGZ-SS-2017-249	01.07.2017	Cengiz Insaat	SMEC-Sapa SZ	Environment Protection Report for June 2016
AKT-CGZ-	01.07.2017	Cengiz Insaat	SMEC-Sapa SZ	Semi-annual Environmental

Letter Ref.	Dated	From	To	Subjects
SS-2017-250				Protection Report (6 months)
AKT-CGZ-SS-2017-256	03.07.2017	Cengiz Insaat	SMEC-Sapa SZ	Environmental Monitoring Checklist
AKT-CGZ-SS-2017-287	15.07.2017	Cengiz Insaat	SMEC-Sapa SZ	Sampling of air, soil and water
5017016/CT/1110	09.01.2017	SMEC-Sapa SZ	CoR	4th Bi-Annual Environmental Monitoring Report, July-December 2016
5017016/CT/1175	15.03.2017	SMEC-Sapa SZ	Cengiz Insaat	Failure to comply with EMP requirements
5017016/CT/1194	27.03.2017	SMEC-Sapa SZ	PMC	Failure to comply with EMP requirements
5017016/CT/1453	27.03.2017	SMEC-Sapa SZ	CoR	5th Bi-annual report on traffic management plan and road safety measures

4.8 Corrective Action Plans

Within January–June 2017 environmental monitoring was performed on the road under construction contract of SMEC International Pty Ltd., for the Mangystau Oblast Sections Connecting Shetpe-Aktau Road. This yielded a number of observable issues which the Contractor had to mitigate. In a number of occasions, the Contractor was able to mitigate some of the issues discovered at the sites. This report also presents recommended mitigation measures which can be implemented by the Contractor to mitigate the observed situation and should be inspected by CSC engineers. The issues encountered in this periodic inspection were in the aspect of site safety, asphalt plant arrangement, and dust management; borrow pits management, hindrance on normal traffic and waste water management. Work related to environmental, health and safety concerns were raised during the period.

Most of the issues encountered in this periodic inspection were in the aspect of Culvert construction, safety issues, environmental documentary issues, and dust pollution issues, etc. The measures to mitigate impacts were recommended accordingly and discussed within this report. Intensive inspection was undertaken by contractor Environmental Specialist and consultant engineers during this period and the result was presented and discussed in the weekly meeting at the Engineer's office (Zhetibay). The site observations of environmental impacts and proposed mitigation measures have been included in Table 4.1. Observed Issues during the Environmental Inspections has to be compiling with by the Contractor in the monthly and bi-annual environmental protection report. The CSC engineers will include these items in their scope of regular supervision of the site. The issues identified above need to be responded by the Contractor in a timely manner. Some of the issues are easy to resolve and few were indeed corrected promptly by the Contractor. In addition, a format for the Procedure on Environmental Monitoring Checklist was provided by the Environmental Specialist earlier to Contractor environmental specialist as a guide to facilitate regular EHS inspections and monitoring. Accordingly, the environmental monitoring checklist has been completed by consultant and contractor regularly within this period during site visit for records & further improvements. The regular environmental monitoring checklists have been incorporated into the contractor monthly environmental protection reports and also a sample fill-up checklist is attached in Annexure B.

In May 2017 and July 2017, CSC Environmental Specialist to undertake environmental inspection and audit as outlined in the TOR and preparation of fifth bi-annual environmental monitoring report (January to June 2017) for the construction supervision. The entire field engagement was in coordination with the PMC Officials, Contractor's and Local Road Safety Engineer, and the Project Engineer's. The activities carried out by the Environmental Specialist and consultant engineers for environmental issues are summarized below:

- Obtain monthly/quarterly/bi-annual environmental progress reports and other pertinent documents on EHS.
- Review monthly environmental protection reports and environmental parameter measurements, and EHS records maintained by Contractor and deliver consultant comments/suggestion to contractor for further improvements.
- Discussion with Team Leader on assignments responsibilities and expectations.
- Attended meeting with PMC officials, Engineers and Contractor's representatives.
- Meeting with Contractor's Representatives regarding environmental monitoring procedure and monthly & Bi-annual environmental monitoring reports.
- Meeting with consultant engineers regarding the Rehabilitation works for quarry, borrow pit areas and blasting operation performed by the Contractor.
- Regular environmental inspection and audits in Contract 1 and Contract 2 area of the project.
- Meeting with Team Leader along with consultant engineers to discuss contractor's environment monitoring reports.
- Follow up inspections to document actions being implemented to address environmental issues identified.

In addition, the contractor's environmental protection reports were also to be revised. Guidance was already provided by the International Environmental Specialist and CSC engineers and contractor environmental specialist have initiated the revision. Also the Contractor's monthly environmental reports require technical discussions for more clarity in presenting how the issues were resolved by the Contractor. The international specialist has given comments and suggestions to the contractor for further improvements.

4.9 Compliance with National and ADB Safeguards

In the reporting period it was managed that construction complies with all national pertinent environmental laws and regulations. Contractor regularly provides monthly and semi-annual environmental reports in accordance with Kazakhstan legislation. Contractor ensures all necessary communication with local administrative authorities to comply with Kazakhstan legislation during construction and obtains permits and approvals.

In order to ensure the environmental performance, it is supervised that the implementation of construction activities meets EMP requirements which is prepared in accordance with ADB Safeguard Policy Statement 2009. Contractor is guided by the EIA and EMP as a part of the Bid and Contract documents, Site-specific Environmental Management plans, as well as by the Contractor's Environmental Management Plans which is prepared by the contractor that detail on site environmental management requirements implementation and management, particularly construction impacts mitigation, monitoring and reporting requirements in order

to ensure the environmental performance. Compliance with EMP is being regularly monitored and reported (see Part III Environmental Monitoring).

4.10 Conclusions and Recommendations

4.10.1 Conclusions

This fifth Bi-annual Environmental Monitoring Report (January to June 2017) is produced as a report to the requirements of the Contract for the provision of Construction Supervision Services to the Ministry of Investment and Development, Committee for Roads of the Republic of Kazakhstan for the CAREC 2 Corridor (Mangistau – Oblast Section) Investment Program Project 2 under the Asian Development Bank, Loan Number 2967- KAZ. This report is being developed by the Environmental Specialist of CSC based on the feedback from and in consultation with Supervision Engineers, review of pertinent environmental documents (EIA and EMP of the project, monthly/Bi-annual reports prepared by the contractors); site visits, incorporating the results of the required environmental sampling, laboratory analysis and measurements.

During this current monitoring period, a number of environmental and safety issues were observed by the monitoring team and brought to the attention of the Contractor for corrective measures. An inspection audit was done by the environmental specialist and consultant Engineer's in last six months, which became the basis for the writing of the fifth Bi-annual Environmental Monitoring Report for the Employer (CR) and Financier (ADB). The environmental issues observed within the period are generally concerning with the active borrow pit/quarry operations and rehabilitation, dust generation in crushing plant, soil contamination due to wastewater & oil spills, Contractor's campsite septic tank aspects, general safety, monitoring program, etc. A consistent follow through inspection is necessary in order to improve the environmental performance of the project to the satisfaction of the CR (Employer) and ADB (Financier).

During the reporting period from January to June 2017, the contractor has conducted monitoring of ambient air, soil, noise and water samples for different sampling locations as per the EMP. The monitoring results of all the parameters are within the standard of Republic of Kazakhstan except few locations.

During the environmental monitoring the followings were identified:

- Monitoring activities and checklists as indicated in EMP implemented and conducted regularly as required.
- Contractor is taking necessary steps in implementation of EMP requirements. Required permits from local authorities are being obtained.
- No serious environmental issues were identified during this construction period. Accommodation, office facilities, medical facilities and other facilities has been organized in compliance with environmental requirements.
- Grievance Redress Mechanism elaborated by the Contractor on the project site level and nominated contact people have to be designated. The complaint box has been set-up at the project sites for getting complain from the stakeholders on the environmental and safety issues for further improvements.

- Training of Engineer's technical staff and Contractor's staffs on dealing with environmental compliance monitoring and reporting has to be conducted with the assistance of Team Leader and it will be continue during the project period.
- Weekly meetings are organizing to discuss on several environmental issues for further improvements.

In addition, a checklist for the Procedure on Environmental Inspection Monitoring was provided by the International Environmental Specialist to consultant engineers and contractor environmental specialist as a guide to facilitate regular environmental inspections and monitoring. Accordingly, the environmental monitoring checklist has been completed by consultant and contractor regularly within this period during site visit for records & further improvements. The regular environmental monitoring checklists have been incorporated into the contractor monthly environmental protection reports and also a sample fill-up checklist is attached in Annexure B.

The next project completion report for environmental safeguard aspect will be submitted to CR, MOTC and ADB in October or November 2017.

4.10.2 Recommendations

The several visit to the project sites by the Environmental Specialist and consultant engineers identified a number of potential environmental issues. These issues were discussed with the Contractor who promptly remedied several of the identified items. However, some issues remain outstanding, and should be corrected soon by the Contractor. In addition, it is noted that some issues, such as borrow pits management, waste and wastewater management, application of PPE, storage of hazardous materials will require continuous monitoring to ensure the requirements of the Contractors EMP (and its supplemental plans) are maintained. The monitoring should also focus on construction activities such as blasting/rock excavation, soil excavation, embankment filling and compaction, unsuitable excavation, removal and back filling, sub-base, base course and pavement works, slope protection, and drainage to minimize negative impacts on the environment.

The Contractor is also obliged to complete and submit environmental checklists (daily/weekly monitoring checklist) and monthly reports, bi-annual environmental monitoring report and to date the contractor has submitted environmental monitoring checklists, monthly reports regularly during this period and also semi-annual environmental monitoring report (January to June 2017). The Contractor has been reminded that the checklists and reports are a contractual obligation and that these reports / checklists should be completed on a daily basis and submits regularly monthly report and Bi-annual Environmental Monitoring Report to the Engineer for review.

ANNEXURES

Annexure A: Environmental Monitoring Photos

Photograph 1: ADB representatives has visited the site on 14th May 2017

Photograph 2: Workshop at Zhetybay Camp

Photograph 3: Filling of slopes at Pk 3+00

Photograph 4: High embamkment slope protection by geocell at Pk 4+60

Photograph 5: Interchange (Installation of barrier railings) at Contract 002 Lot 3 Pk6+86

Photograph 6: Embankment slope planning at Pk 346+20

Photograph 7: Tack coat of PA at Pk 458+80

Photograph 8: Base course construction at Pk 805+00

Photograph 9: Approach slabs installation, Support 1 at Pk 6+86

Photograph 10: Contract 001, Lot 1, Bridge deck waterproofing

Photograph 11: Contract 002, Lot 3, CH 3+00 Geotextile placement

Photograph 12: Contract 002, Lot 4, Prime coat, roundabout

Photograph 13: Paving and compaction of SMA layer at Contract 002, Lot 4, Pk 436+40

Photograph 14: Base course placement at PK 5+60

Photograph 15: Fine-graded asphalt paving PK 6+19 (Ramp)

Photograph 16: Stone-Mastic Asphalt paving PK 433+60

Annexure B: Environmental Monitoring Checklist

Environmental Monitoring Checklist

Site Walkover Checklist		
Date of Walkover: 15.05.2017 Time: 09:40	**Engineer's Representative** **Environmental Protection Specialist** **Zeynullina A.** **Contractor Representative** **Engineer – Ecologist** **Umirbekova N.**	Engineer's Reference Number Contractor Reference Number
Weather Conditions: +18 C⁰, occasional rain 84%, south-west wind – 12-15 m/c, 765 mm of mercury.		
Work in progress:	Rock excavation, shoulders protection and etc.	

Environmental Problems	**Possible Causes**	**Proposed Mitigations**
Violation of environmental requirements on the area of pit No. 7. Unauthorized flow of oil products.	Neglectful attitude to the environmental requirements.	Clean the area of pit No.7 from fuel oil. Submit documents for export of oiled soil to "Landfil" LLP.
Construction waste was not removed at construction of bridge on the area of Ashyagar River.	Human factor	Clean the area from waste and concrete products

Environmental Audit carried out by: **Zeynullina A.A.**	Representative of Contractor: **Umirbekova N.**

No.	**Environmental Protection Measures**	**Implemented**		**Functioning**		**Comments**
		Yes	**No**	**Yes**	**No**	
Contractor's Camp						
1	Septic tanks installed and emptied according to approved procedures	✓		✓		Septic tanks are cleaned daily.
2	All waste water is directed to septic tanks or technical water tanks	✓				

No.	Environmental Protection Measures	Implemented		Functioning		Comments
		Yes	No	Yes	No	
3	All hazardous liquids stored in the designated area on an impervious base with runoff collection		✓	✓		In order to avoid environmental problems it is necessary to eliminate comments such as fuel oil flow and storage of used oil on the special place, organize storage platform for used oils up to the end of the current month.
4	Solid hazardous materials stored at the designated secure area at the workshops	✓				
5	Sit run-off collected in the drainage system and disposed of by the third party contractor	✓		✓		Run-off is cleaned as needed.
6	All vehicles entering and leaving the construction camp are subject to controls, and pass through a wheel washer	✓				
7	Local communities and organizations informed of the construction schedule and any noisy activities on a regular basis via workshops and other liaison activities.	✓				
8	Open storage containers provided with cover nets or similar	V				
9	All open burning is prohibited	✓				
10	Adequate firefighting equipment ▪ Buckets of sand & Spades ▪ Foam Extinguishers ▪ Fire blanket in kitchen area	✓				Check firefighting equipment on construction sites. Equip the firefighting equipment.
11	Public access is prohibited using fencing and security	✓				
12	All staff provided with personal protective equipment's (PPE)	✓				
13	Smoking prohibited except in smoking rooms	✓				On the territory of the industrial zone established place for

No.	Environmental Protection Measures	Implemented		Functioning		Comments
		Yes	No	Yes	No	
						smoking. Remaining are under consideration
14	Adequate traffic signs and warning notices provided on site and dangerous areas	✓				
15	Potable water provided to all staff obtained from commercial and licensed sources.	✓				
16	All worker's uniforms are laundered on a daily basis		v			Complete equipment for washhouse. At the moment washing machine – 1 unit (Shetpe camp)
17	All employees are provided with three meals per day	✓				
	Hygienic canteen facility at camp sites	✓		✓		
19	Emergency medical facilities and first aid box at camp site and work sites	✓				Medical center works 24 hours per day at the camp. First aid boxes are replenished as needed.
20	All employees under the control of the Camp doctor and provide appropriate services and monthly health checks	✓				
21	All areas are clean and tidy, with no liter or waste present except in designated areas	✓				
22	Provision of recreational facilities at camp sites	✓				
23	Children below 15 employment for works		v			
Plant Area						
1	The bitumen and chemical storage area is located away from any watercourse and the base and bund walls are impermeable and sufficient capacity to contain 110% of the volume of tanks	v				
2	Liquid waste from the Asphalt plant is stored in the designated tank and					

No.	Environmental Protection Measures	Implemented		Functioning		Comments
		Yes	No	Yes	No	
	emptied by specialized suction vehicles of ≤MTTSTH≥ of Liman					
3	Bitumen is stored in the designated area and bended in concrete to a volume of 110%	v				
4	Solid waste from Asphalt plant is stored in the designated area and disposed of in accordance to approved procedures	v				
5	The plant area is graveled for reduction of dust emission	v				
6	The plant area is watered for reduction of dust emission	v				
7	No plant may discharge effluent water to any watercourse; impervious concrete basins will be constructed for receiving such waters	v				Plant doesn't discharge effluent water
8	All staffs at Asphalt, Concrete and Crusher Plants are wearing their dust masks and ear defenders.	v		v		
9	All sands and aggregate for concrete and asphalt batching kept damp or covered	v				
10	The Asphalt, Concrete and Crushing plants are provided with adequate firefighting equipment	v				
11	Plant or equipment causing high vibration levels are of appropriate design, well maintained and correctly operated	v				Equipment causing high vibration levels is taken under control
12	Fencing is erected to protect the river / canal	v				
Fuel Station						
1	Oil filling and refueling will be strictly controlled and is permitted only at the fuel filling station and workshops area	v				
2	Fuel tanks storage area is bunded and impervious bottom and roof is closed	v				
3	Fuel station provided with adequate firefighting equipment checked weekly	v				

No.	Environmental Protection Measures	Implemented		Functioning		Comments
		Yes	No	Yes	No	
4	Fuel station provided with safety ribbon and warning signs	v				
5	Fuel station provided with wastebasket	v				
Contractor's Workshop and Car Wash						
1	Liquid hazardous materials stored in the designated secure area at the workshops	✓				Arrange in sections special concrete platforms for storage of hazardous substances, install fencing.
2	Solid hazardous materials stored in the designated secure area at the workshops	✓				
3	Containers for waste oils and hydraulic fluids provided			✓		The application for the purchase of containers.
4	Used oil collected in used oil tank bunded in concrete to a volume of 110% and emptied according to approved procedures	v		✓		
5	Workshop provided with drainage	✓				
6	Every vehicle inspected and maintained on a regular basis	✓				
7	All construction vehicles meet Euro standards and fitted with modern noise suppression equipment					
8	Silencing equipment of all vehicles maintained and checked accordance with approved procedures		✓			
9	All workers of workshop provided with adequate welding equipment and PPE	✓				
10	All technical water is collected in concrete tank and emptied according to approved procedures	v				Cleaned as needed
Project Road						
1	All roads impacted by construction activities watered by sprinkler trucks	✓				
2	The project road is provided with flags at appropriate places for passage of cattle, sheep and other animals		✓			It is recommended to install warning signs in

No.	Environmental Protection Measures	Implemented		Functioning		Comments
		Yes	No	Yes	No	
						frequently used areas for cattle pass
3	Culvert and bridge construction areas provided with safety ribbons and wringing signs	v				
4	Fencing and access control installed at all work sites where practicable	v				
5	The storage of waste of any kind as well as parking machinery or vehicles is not permitted within a distance of 100m of any stream (including drainage or irrigation facilities)	✓				
6	Adequate traffic signs and warning notices provided on site and dangerous areas	✓				Road signs are checked daily by the Road safety department
7	Construction vehicle and plants maintained properly to reduce emissions	✓				
8	Noise control measures at sensitive sites	✓				
Borrow Areas						
1	Temporary drainage provided at borrow pits and quarries		v			
2	Within 200m of the nearest habitation construction work is stopped between 22.00 and 6.00 hours	v				
3	Aggregates only obtained from approved borrow areas	v				
4	Aggregate extraction is not taking place within 100m of a river or watercourse	v				
5	Stockpiles do not exceed 3m in height		v			
6	All vehicles with an open load-carrying area used for transporting potentially dust producing material properly fitting side and tail boards	v				It is required to provide vehicles with tarpaulins for transporting of granular materials.
7	During construction all noise volume restricted to the national standards	v				

No.	Environmental Protection Measures	Implemented		Functioning		Comments
		Yes	No	Yes	No	
8	Materials having the potential to produce dust is not loaded to a level higher than the side and tail boards and covered with clean tarpaulin	v				
9	All vehicles, machinery, and plant meet Euro standards for exhaust emissions	v				
10	All temporary acquired land is rehabilitated	v		v		All temporary acquired land will be rehabilitated after project completion
11	All spilled materials and contaminated earth collected and disposed accordance with approved procedures		v		v	The requirements for handling wastes of production and consumption have been violated, the rules for carrying out subsoil use operations have also been violated, that leads to damage to the land.Immediately clear the territory of the pit from industrial waste, provide the acceptance certificate of industrial waste for further disposal from specialized organization, and begin the process of technical recultivation of this section.
12	During the delivery and handling of materials provided effected water sprays	v				
13	Any adjacent areas disturbed due to spoil restored to its original state	v				All areas will be restored to its original state
14	River banks protected from materials deposited or temporary contractor stockpiles	v				
15	Nuisances or disturbance arising from the execution of the works controlled to tolerable level according to standards		v	v		Submit full information on pits, also give full explanation on the issue

No.	Environmental Protection Measures	Implemented		Functioning		Comments
		Yes	No	Yes	No	
						of industrial waste on the area of the pit.
16	Access roads to quarry, borrow pits, stock pile areas and traffic operations maintained to approved standards	v				
17	Discharging and diverting water, avoiding flooding or damaging other works or service causing erosion					
Flora and Fauna						
1	Trees and bushes outside the construction width but within the road reserve generally preserved from damages					
2	No ancient trees cut down or impacted by the construction or operation					
3	Cutting down has not taken place without the prior approval of the relevant local authorities		v			
4	Trees or shrubs only felled or removed if they impinge directly on the permanent works or necessary temporary works		v			
5	Construction avoided on bridge sites during spawning seasons (indicate yes or no to construction activities on going, providing date)		✓			Construction of bridges does not influence on growth and gathering of crop, as they are located in remote locations
6	Construction on rivers only take place during period of low flow to minimize pollution	✓				

Annexure C: Attendance Sheet for Training Program

LOAN 2967-KAZ: MFF CAREC CORRIDOR II (MANGISTAU OBLAST SECTION) INVESTMENT PROGRAM, PROJECT 2 / ЗАЕМ 2967-KAZ: ММФ ЦАРЭС КОРИДОР II (УЧАСТОК В МАНГИСТАУСКОЙ ОБЛАСТИ) ИНВЕСТИЦИОННАЯ ПРОГРАММА, ПРОЕКТ 2

Training Program
On
Implementation of Environmental Management Plan /
Программа Тренинга по Выполнению Плана Управления Окружающей Средой

Venue: Construction Camp at Zhetibay / **Место проведения:** Вахтовый городок в п. Жетыбай

Date: 17 may 2017 / **Дата:** 17 мая 2017

Attendance List / Список Присутствующих

SL.	Name / Ф.И.О.	Designation and Organization / Должность и Организация	Mobile No. & Email / Тел. и эл. адрес	Signature / Подпись
1	Турумлов Н.Г	инженер по объемам	8775545263	
2	Урнокбаев. А.Е	инженер по качеству	8702 438 9564	
3	Насанбергенулы НУРБОЛ	Инженер-геодезист	87753223440	
4	Камойбаев Ж	инженер геодезист	8-775-000-42-62	
5	Мерлайбекович Б	инженер - геодезист	—	
6	Утегожиев М	инженер по переводу коммуникаций	87010275245	
7	Чередников Ю	инженер по объему L3	8-701-365-40-22	
8	Сейдуванов Ж	ЗРИ - ARE - 1	8 701 522 5514	
9	Шакирбаев Ж.А.	инженер по материалам	87010281946	
10	DR. RUHUL AMIN	CONTRACT SPECIALIST SMEC INTERNATIONAL	87751819287 ruhul1966@yahoo.com	
11	JOVICA VRACAR	SMEC	87010344714	
12	Сулумова Т.Н	инженер по материалам	87014117042	
13	Джуренгалиев К.С	ЗРИ - 3	8701028 1950	
14	Гододенный Ю	Инженер по ПТО	8701 7733667	
15	Зейтуллина А.	геодезист, зона С3	8 701 582 66 57	
16	Сисенгалиева Ж.	переводчик	8 7475 923 408	
17				
18				

Training Program on Implementation of Environmental Management Plan / Программа Тренинга по Выполнению Плана Управления Окружающей Средой

LOAN 2967-KAZ: MFF CAREC CORRIDOR II (MANGISTAU OBLAST SECTION) INVESTMENT PROGRAM, PROJECT 2 / ЗАЕМ 2967-KAZ: ММФ ЦАРЭС КОРИДОР II (УЧАСТОК В МАНГИСТАУСКОЙ ОБЛАСТИ) ИНВЕСТИЦИОННАЯ ПРОГРАММА, ПРОЕКТ 2

Training Program
On
Implementation of Environmental Management Plan /
Программа Тренинга по Выполнению Плана Управления Окружающей Средой

Venue: Construction Camp at Zhetibay / **Место проведения:** Вахтовый городок в п. Жетыбай

Date: 18 May 2017 / **Дата**: 18 мая 2017

Attendance List / Список Присутствующих

SL.	Name / Ф.И.О.	Designation and Organization / Должность и Организация	Mobile No. & Email / Тел. и эл. адрес	Signature / Подпись
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Annexure D: Contractor Semi-annual Environmental Protection Report

(January to June 2017)

MINISTRY OF INVESTMENT AND DEVELOPMENT
REPUBLIC OF KAZAKHSTAN

Loan 2967-KAZ: MMF CAREC Transport corridor II
(Sections in Mangystau oblast)
Investment program, Project 2

Financed by:

Asian Development Bank (ADB)

ENVIRONMENT PROTECTION REPORT FOR 1 HALF OF 2017

Section km 632,3 – km 802«Shetpe-Aktau» of the road «Beineu - Aktau»

Prepared by: Andrey Ivlev

JUNE 2017

СОДЕРЖАНИЕ

1. Описание проекта

The «Beineu-Aktau» road is part of a corridor linking Russia and Central Asia, and the shortest route connecting Russia and Eastern Europe with Central Asian countries. This road is the national significance and great importance road in ensuring the local and regional, and especially the interstate transport of goods and passengers, providing transport links of the Republic of Kazakhstan and the Russian Federation.

The «Beineu-Aktau» road is also the only highway in the country, which connects the regions with seaport.

This project is a reconstruction of the road in two sections:

1 section km 632,3 – km 719 (Shetpe – Beki – Zhetybay):

The length of designed section of the road reconstruction **km 632,3 – km 719 (Shetpe – Beki – Zhetybay)** is 85,9km. Sections «Bypass of Shetpe (PK1+60÷72+80) » and «Bypass of Zhetybay (PK717+60÷796+80) » go in a new direction. On other sections, the projected direction coincides with the existing embankment of the roadbed with partial descent from embankment in the sections of rectification and breakdown curves (sections length from 120 to 920 m).

Bridge construction planned by the scheme of 1x18m, on PK33+24, Overpass construction by the scheme of 3x24, on PK72+30, and traffic circle construction on PK92+58.

Also planned the construction of 54pcs of round tubes on a road and exits and 8pcs of rectangular tubes and animal underpass (4x2,5)m.

Road lightning with a total length of 10,6 km arranged in the sections PK34+00-PK45+00, PK68-PK109, and with a total length of 7,5 km in the section PK790+60 - PK817+60.

2 section km 719 – km 802,27 (Zhetybay – Ashyagar – Aktau):

The length of the projected section of the route is 83.9 km. The reconstruction project provides:

- from km719 to km786 reconstruction of the existing road by the parameters of technical category I-b with four-lane road way, dividing strip and widening of the roadway up to 27,5 m on top.

- construction of transport junction in two levels at the intersection of highways «Aktau – Zhanaozen» and «Shetpe – Kuryk» on km720 with the passage of four-lane road on top (on a ramp of 6x24m) via highway «Shetpe – Kuryk» and lightning with a length of 5,08 km.

- from km786 to km802,27 in the section, passing within the urban areas, arranged medium repair the roadway and sidewalks.

- on km723 reconstruction of railroad overpass and on km755+393 reconstruction of the bridge via Ashyagar river (3x18m).

- construction of 48pcs of round tubes on a road and exits and 5pcs animal underpass (4x2,5)m.

- lightning of traffic circle on km785,7 with a net length of 3,8km.

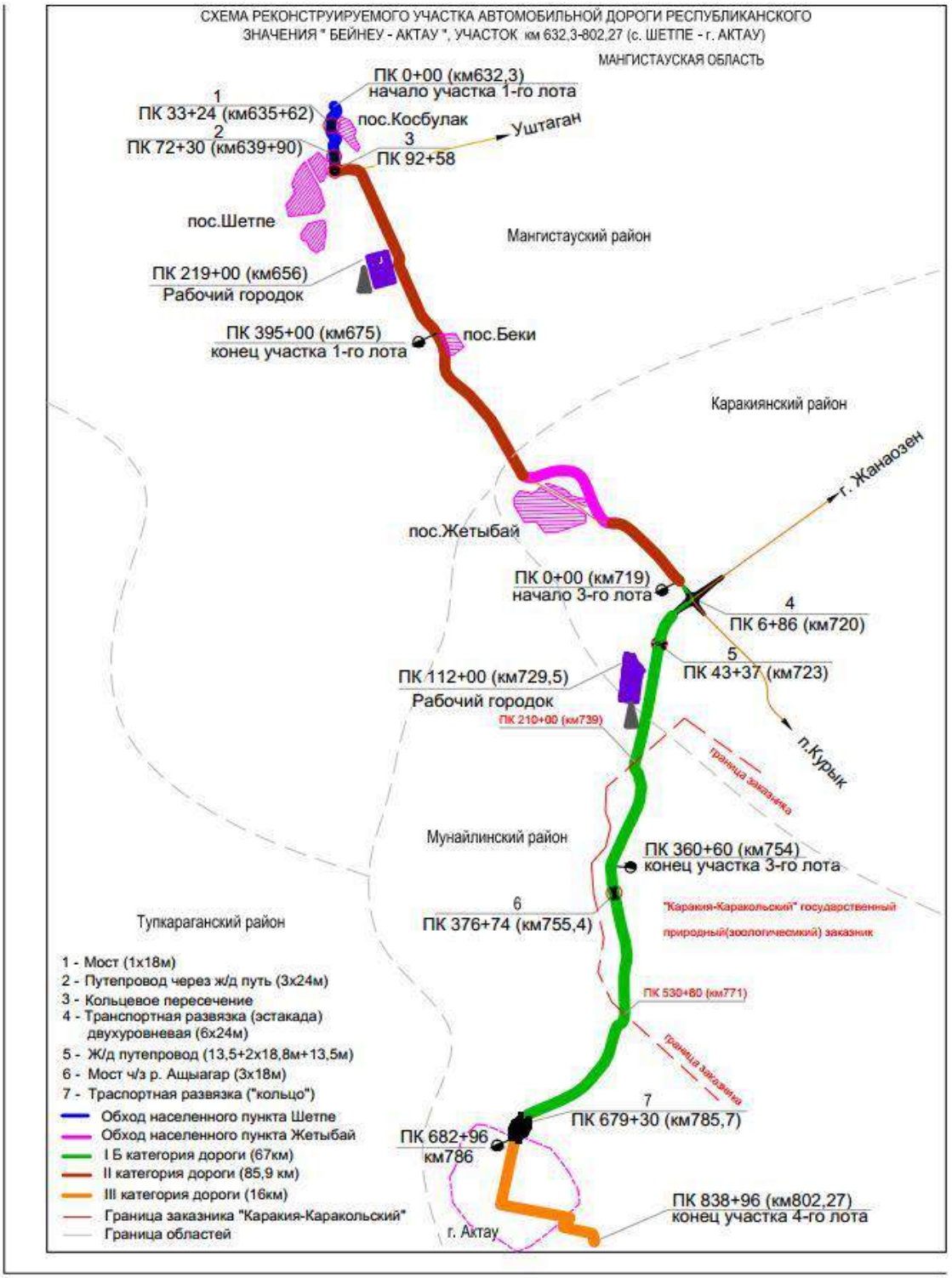
СХЕМА РЕКОНСТРУИРУЕМОГО УЧАСТКА АВТОМОБИЛЬНОЙ ДОРОГИ РЕСПУБЛИКАНСКОГО ЗНАЧЕНИЯ " БЕЙНЕУ - АКТАУ ", УЧАСТОК км 632,3-802,27 (с. ШЕТПЕ - г. АКТАУ)
МАНГИСТАУСКАЯ ОБЛАСТЬ
ПК 0+00 (км632,3)
начало участка 1-го лота
1
ПК 33+24 (км635+62)
пос.Косбулак
Уштаган
2
ПК 72+30 (км639+90)
3
ПК 92+58
пос.Шетпе
Мангистауский район
ПК 219+00 (км656)
Рабочий городок
ПК 395+00 (км675)
конец участка 1-го лота
пос.Беки
Каракиянский район
г. Жанаозен
пос.Жетыбай
ПК 0+00 (км719)
начало 3-го лота
4
ПК 6+86 (км720)
5
ПК 43+37 (км723)
ПК 112+00 (км729,5)
Рабочий городок
ПК 210+00 (км739)
п.Курык
граница заказника
Мунайлинский район
ПК 360+60 (км754)
конец участка 3-го лота
6
ПК 376+74 (км755,4)
"Каракия-Каракольский" государственный природный(зоологичесикий) заказник
Тупкараганский район
ПК 530+80 (км771)
граница заказника
7
ПК 679+30 (км785,7)
ПК 682+96
км786
ПК 838+96 (км802,27)
конец участка 4-го лота
г. Актау
1 - Мост (1х18м)
2 - Путепровод через ж/д путь (3х24м)
3 - Кольцевое пересечение
4 - Транспортная развязка (эстакада) двухуровневая (6х24м)
5 - Ж/д путепровод (13,5+2х18,8м+13,5м)
6 - Мост ч/з р. Ащыагар (3х18м)
7 - Траспортная развязка ("кольцо")
Обход населенного пункта Шетпе
Обход населенного пункта Жетыбай
I Б категория дороги (67км)
II категория дороги (85,9 км)
III категория дороги (16км)
Граница заказника "Каракия-Каракольский"
Граница областей

2. Environment management plan performance report

The Environmental Management Plan is designed to determine the impact of planned economic and other activity on the environment, including human health and safety, air, water sources, flora and fauna, minerals, soil, landscape, cultural and historical monuments and other material objects, interrelation between these factors and the development of recommendations to improve the environment, prevent destruction, degradation, damage of ecosystems and natural resources.

In accordance with the Conditions of Contract for construction (FIDIC) before starting work on the site by the Contractor it has been developed and submitted for approval to the Consultant for construction supervision (CCS) Plan for Environmental Protection Management (PEPM). After the observations and recommendations of the CCS plan of environmental management has been finalized and in addition to the Contractor were developed and submitted for approval:

- Water quality management plan
- Dust prevention measures management plan
- Quarries restoration management plan
- Soil condition management plan
- Fuel and chemicals management plan
- Construction site management plan
- Solid wastes management plan
- Noise minimization management plan.

The Contractor has been submitting monthly reports on the implementation of the MPEP as well as an additional report for 2015, for the first half of 2016 and for 2016 since the beginning of the work, March 2015, taking into account the requirements of the Construction Contract Terms.

This report is a work report carried out by the Contractor for first half of 2017.

To control the execution of the management plan, environmental specialist ecologist of the Contractor constantly monitors the entire section of the road. In accordance with the recommendations given by the international expert in environmental protection CCS in the report for the first half of 2015 by the Contractor during the inspection of the construction site is filled with a checklist of environmental monitoring. In addition, it was accepted and fulfilled other recommendations included in the report of the CCS for the first half 2015. Also, the recommendations that were given in the report for the first half 2016 were taken to implement. The checklists are attached to the monthly reports.

The information on the environmental management plan implementation, monitoring results for 2016, the list of permits obtained by the Contractor to perform the work in accordance with the legislation of RK and photos are presented in tabular form of this report.

2.1 Progress report on the measures required in Annex A to the contract documents

Influence/problem related to environmental	Measures for impact reduction	Measures taken by the Contractor
A.2.1 The Contractor has not hired an ecologist for the environmental monitoring program preparation during construction and to implement all measures for impact reduction and control as specified in the Environmental Management Plan.	1. As stated by law, the Contractor will be required to hire an expert licensed for the environmental monitoring program preparation during the construction works and obtaining all relevant permits. The contractor is not allowed to mobilize workers without an approved environmental monitoring program during construction and appropriate permissions in situ. 2. The Contractor and his ecologist are provided with a training conducted by an international expert in the ecology field.	The Contractor has hired an ecologist that has a higher professional education and work experience in the automobile roads construction companies.
A.2.2 Resources	1. Resources are prohibited on the protected areas. 2. If the resources required out of long time laid mining, then the following measures should be taken for the impact reduction on the potential areas: - avoid the areas with known and/or erosion problems; - avoid the scarp slope formation; - provide a suitable location for the excavated material storage, ensuring that the drainage at the site will not be interfered and excessive mud accumulation does not happen; - set the appropriate restrictions to prevent unwarranted access and inbreaking of livestock; - avoid harming to adjoining lands during the haulage roadway installation; - the topsoil storage, protection and re-using for back-filling. The slopes formation and compaction prior to the topsoil previous level application; - develop the quarries activities management plan including all planned activities, quantity, transportation measures and precautionary and safety measurements. The plan should provide full details of measurements for environmental protection, especially taking into account the protection of local water resources and proper sites decommissioning.	In accordance with the current legislation, the Contractor has developed the quarries activities management plan that was submitted to the Engineer for approval. An industrial soil excavation plan was developed (clay rocks and sand) on 1-28 sections for the reconstruction of the Aktau-Beineu road on the Shetpe-Aktau road section in the Mangystau region of the Republic of Kazakhstan which provides the 28 areas soil mining stocks that are on the State Register of Reserves. The plan has been consistent in all the authorized state bodies. Resolution №0000026 dated August 14, 2015 for license block title on commonly occurring mineral resources used in construction (reconstruction) and public roads, railways and hydraulic structures repair works was received. Resolution for environmental emissions for production period was received.

	- this management plan should also specify re-using and pit arrangement. The recovery variations may include a land recultivation as it specified by Mangystau committee of forest and hunting management, using the local herbage plants and bushes that discharge function of soil fixing and prevent further washing out and erosions; choose the right season and methods to ensure the proper land recultivation and the bioengineering decisions using where it is necessary.	The working plan for the lands recultivation churning up during the soil excavation (clay rock and sand) on the specified areas. The quarries are located on the not prohibited areas. Soil mining is being carrying out as per the approved project solutions. The supervision results are represented in the checklists. The land recultivation implementation is planning to be done in accordance with the developed working project in 2017.
A.2.3 Soil erosion	1. All rehabilitation and correcting works on the embankments, as well as the longitudinal profiles and cross-sectional profiles, described in technical drawings, should be strictly adhered during the removing and backfilling operations. 2. The Contractor will be responsible for ensuring the material choice is less susceptible to erosion for allocation it around bridges and culverts. In addition, he should ensure the territory recultivation including exposed; (I) range of fast-growing and resistant to eating animal species native grasses and shrubs; (II) the immediate recultivation of all slopes and embankments are not covered by gabions network; (III) the allocation fibrous substrate to accelerate plant growth.	All works on the embankments and profiles are being carried out in strict accordance with the approved drawings. The land recultivation plans are developed and approved in the established procedure.
A.2.4 The plumbum contaminated roadside soil improper handling	1. If during a testing of the preparatory construction works the soil contamination will be found in harmful concentrations and a soil excavation will be needed to make, the Contractor shall treat this soil as a hazardous material, to seek permission for proper disposal and receive expert advice how and where to recycle or clean up this soil.	The soil samplings were taken in 10km intervals prior to the construction work start. Plumbum contaminated soil have not been recorded. Monthly soil sampling does not confirm the plumbum contamination.
A.2.6 Withdrawal of water may lead to the conflicts with local water users	1. The Contractor has to take the following measures to prevent the spills on the all production areas:	The Contractor has taken the following:

	- all refueling should be made on the concrete surface with a leakage collecting reservoir tank that can be cleaned, and all spilled fuel should be recovered and retreated on the base of agreement with the fuel supplier. - all repair works and technical maintenance should be carried out on the concrete surface with dirt collector for spilled oil or oil trapping pan, they should be provided on all service places and a training should be conducted for all mechanics/operators. - wherever the fuel used and there is possibility of spills and leaks, for example, in the generators, the oil sump tanks should be installed to prevent leakage. All secondary raw material should be refined. - the refueling points should be equipped with appropriate fuel injectors and the means to prevent accidental spills. - it should be stored in dark, dry safe place, where it is not possible leak in the water or on land during all the works. Barrels should be recycled, at least once a year. - any spills should be cleaned as per rules and standards of Government of Republic of Kazakhstan. The protocols should be submitted to PMC immediately.	- the lubricant materials storage is being carried out in leak-proof closed tanks have a fence and fire extinguishing equipment. - the road construction vehicles fueling is being carried out with a fueler «just in time system». Repair works and vehicles maintenance are being carried out in the repair zone on the construction site of the Zhetybay village area. Potential contaminated areas with petrochemicals are being found during the ecological monitoring and shown in the checklists. The areas polluted with petrochemicals are removed, the soil saturated with petrochemicals are removed as per to the concluded contract. The facts of some areas pollution with petrochemicals were revealed during environmental monitoring in the first half of 2017. For all the revealed facts, instructions were issued to eliminate violations. Photographs of the execution of regulations and the bringing of contaminated sites in the proper form were given in monthly reports.
A.2.6 Withdrawal of water may lead to the conflicts with local water users	1. The Contractor should get all necessary permissions and approval for withdrawal of water.	The Contractor does not carry out the water intake out of water resources. All necessary water (drinking and technical) is being provided on the contractual base.
A.2. 7 The external drainage changing during a culvert and bridge relocation, as well as the horizontal road layout elevation	1. The Contractor should provide the following: - all construction materials into the running water channel should be removed to not pose an obstacle.	The Contractor fulfils all necessary planned measurements excepting the external drainage changing. The planned measurement fulfilment control is being taken during the ecological

without repairing and restoration after construction.	- the culvert removing or relocating should be carrying out during warm and dry months - demolition should be done in such a way as to prevent the ingress of large debris in the. - the cross-over dug up embankments protection should be as a part of construction works and include a filter fabric, gabion and bioengineering methods as it specified in the projecty.	monitoring conducting. The Monitoring results are shown in the checklists. This point implementation reports (photos) are attached in the monthly reports.
A.2.8 Impact on the air quality	1. The Contractor should include all following necessary measures to reduce the air pollution and dusting that may have an impact on the residents' health: - provide the production staff with dust respirators, - regular water pouring on bypass and approach ways to the quarries, - provide the concrete mixing plant with filter material and/or humid scrapers to reduce the dust emission level, - the exposure covers fixing on the all dump trucks transporting the material that may cause to dusting, - the bypass and approach ways construction for relevant distance from the residential districts, especially from the schools and hospitals, - not burn the wastes and other materials on the construction site without PMC permission, - construction heavy vehicle should be in good technical condition, maintained regularly, engines should be switched off if the vehicle not used, - the vehicles with an open loading of transporting the materials potentially dust-forming should be properly side panels and tailboard, as well as should be covered with a canvas cloth, - during a strong wind, it is not allowed to work with the formation of dust in the 200 m from residential areas. Special precautions should be applied about areas that require special attention, such as schools, kindergartens and hospitals. - an unauthorized burning of the construction wastes material subject to the penalties and withholding of payment for the Contractor.	The Contractor fulfils the following measures to reduce the impact on environment: - dedusting is performed by the using of distributing tanks equipped with spreading devices during earth works. Dedusting is carried out on the bypass roads, the approach roads to the construction site, - the transportation of the soil and other mixes, prepared in mixing plants, is carrying out with special vehicles properly covered preventing erosion and spilling of the transported material to the work site, - used the serviceable vehicle with selection of the type of fuel, the type of engine and its mode of operation and the load, - the works production technology cycle is held, - the loading and unloading of dusting materials (cement and etc.) is being done mechanically, manual operating with these materials are allowed only as an exception in taking appropriate action against spraying (protection from wind, loose and etc.). -installed signs restricting speed,

		- performs the atmospheric air monitoring under the agreement with the accredited laboratory, - technical maintenance and repair of road construction vehicle and transports are organized in the special zone of construction camp, -vehicle traffic is carried out on the existing temporary service roads to reduce the impact of ongoing work on the composition of air, - the vehicle refueling is carried out in the special places, - the operations are stopped when the weather conditions are not relevant. Despite on the difficult weather conditions the Contractor took additional measures to increase the frequency of the work areas watering.
A.2.9 The Contractor performs excessive, unnecessary or unauthorized removal of vegetation or damaging the vegetation on the construction site	1. The Contractor has to develop the map-scheme of the quantity, location and sorts of trees that he is planning to remove. This plan should be submitted to the PMS. 2. The Contractor has to develop the replacement plan of any removed tree or important plant and involve the committee of forest and hunting management in the specified scheme of transplantation with description: choice of varieties, the minimum size, the number of young trees for the required period of service within the required period, the replacement planting got along.	The vegetation is desert type on the projected area. The topsoil removing is within the boundaries of design provisions is not required. The additional activities (plans) development is not providedv
A.2.10 Impact on Karagiye-Karakol State Natural Reserve and Kyzylsai National Natural Park	1. The Contractor should provide the following: - the environment management plan will be reviewed by PMC and State Nature Conservation Zone administration, - not allowed to arrange the temporary or permanent construction camps on the State Nature Conservation Zone territory.	The Contractor has developed the environment management plan including the measurements directed on the impact mitigation on the Karagiye-Karakol State Natural Reserve.

	- the objects connected with the project such as asphalt mixing plants, bitumen mixing plants or the storage areas should not be located on the State Nature Conservation Zone territory. - explosion works are prohibited. - impact of noise, dust and vibration onto the State Conservation Zone territory should be minimal. - to place the construction waste near to or on the State Conservation Zone territory is prohibited. - all spills should be cleaned immediately. - to install the road signs for informing the worker and operators about the prohibition to enter into the State Conservation Zone territory along its border. - to install the information boards and road signs for the drivers and pedestrians about the special protected nature territory and behavior rules inside it. - the construction period reduction in the areas. - the road construction vehicles using with minimal values of the wastes and noise level. - the construction site for the equipment based road construction and road construction materials storage shall be located outside protected areas. - the dust suppression during the paving works and preparation of basic paving layers made of crushed stone and gravel. - temporary bypasses should be located out of the protected territories. - collecting and utilizing of wastes out of asphalt-concrete mixes used for paving should be out of the protected territories. - to perform the maintenance of manufacturing operations with bitumen materials strictly in the project area within the road.	The Contractor's ecologist provided the requirements for the construction works performance on the State Conservation area territory. The supervision of following requirements is being performed during the road section observation: - crossover road and short-terms rest areas are provided in place of the existing facilities - the information boards and road signs installation - the construction period reduction in the areas. - the construction areas and the vehicles placing relocation out of the protected area territory - the dust suppression measures performance - the wastes collecting to be performed out of the protected area territory. The impact monitoring on the protected territory border to be performed monthly.
A.2.11 Interference for the residents due to the bypass of transport	1. The Contractor shall prepare a specific traffic control plan for the construction site including precautionary measures, such as signs, working hours, public awareness, and preparation of action plans for emergencies and proper decommissioning of such temporary roads.	The Contractor has developed the traffic control plan that provides the Contractor's responsibility to the Customer, the bypass roads maintenance, traffic control, traffic

	2. Communication with the railway authorities.	management measures, wintertime maintenance. To inform the public through the media in advance during the bypass roads construction, develop and agree the scheme fencing places of work and placement of road signs with APD DIA of Mangystau region. The daily traffic signalmen work on difficult road sections. The dangerous places (tranches, pits, reserve pits) are fenced with reflective tape and equipped with the relevant signs for traffic accident precaution. The dust suppression work of bypass roads is organized, and road workers carry out the old roads patch works on which the traffic moves. The official investigations are carried out to identify the causes and conditions conducive to it and the perpetrators in each traffic accident case.
A.2.12 Potential impact connected with asphalt works	1. The Contractor should provide the following: - all the time to avoid the contact of asphalt with water and dust, - asphalt and solvents should not be spilled on the ground, into the channels or water ponds. If this happens, spills must be removed immediately and disposed of in a safe place, protected from public access. - not burn the wastes together with hot asphalt mix. - to use special protection cloth (shoes and gloves) during the manual activities. - asphalt works should not be performed during wintertime, rainfalls or thunderous weather. Dump trucks used for transportation of asphalt mix should be equipped by relevant order. Paving works should not place more than one lane of traffic simultaneously.	The Contractor performs all planned measurements. No spills during the working with asphalt and solvents. The Contactor's workers are provided with all necessary personal protection equipment. The asphalt mix transportation is being performed in dump trucks with covered canopy.

A.2.13 Potential impact connected with concrete works	1. The Contractor should provide the following: - avoid the concrete works performing during the windy, cold or hot weather conditions. - attempt to make quick decisions. - contend with dusting by using the relevant covers (tarpaulin cover) and/or water spreading on the construction site. - to utilize the cofferdams during the concrete structures works - to use water sprays for slow curing and fulfil all precautions to avoid the adjoining surface or underground waters contaminations. To cover fresh concrete surface with waterproofing film or sand to prevent moisture loss and accelerate the curing process by the using of radiator heater - during the working with admixtures it is necessary to use special tools for cure as per main and specific assigned notices described in the safety guidance of the Contractor.	The concrete production installation is erected on the Zhetybay construction site as per working project. The measurement taken against environmental pollution during the concrete production. The measurement performance control is performed during the ecological monitoring; the results are shown in the checklists.
A.2.14 Impact of noise and vibration caused by construction activities potentially having an effect on the health and destroying the structures.	1. The Contractor should make all steps for providing the following: - choice of modern and properly serviceable equipment and plants with reduced noise level and provided relevant on-board technologies and appropriate deafening devices. - limit excessive noisy operations and heavy vehicles running within specified working hours (especially for stone crushers and impact hammers). - working hours should be accounted in accordance with the limits near residential and sensitive areas. - providing the construction workers with special ear protection equipment (earplugs). - avoid the vehicle runnings on no-operation mode. - timely declare to public about future works.	All construction works are being performed in strict accordance with the Working Plan. The physical factors noise and vibration impact is carried out during the working on the road section reconstruction. The exposure sources are: operation of a crusher, concrete mixing and asphalt plants, as well as machinery and vehicles. The Contractor has taken the following measures to reduce the noise and vibration impact: - using of the facilities, equipment and technology with noise impact as per relevant sanitary standards, - the heavy vehicle working time is limited, - the construction sites that the crushers, asphalt and concrete facilities are placed on are

		located away from the residential places (more than 3 km), - vehicle runnings on no-operation mode are not allowed, - to reduce the noise impact, the rubber spacers are used in the crushing facilities, a rubber-lip is used as sound insulation material; the equipment service staff uses personal protective equipment such as earplugs type. - road construction vehicle is equipped with protectıon cover. The technological process equipment may occur the vibration during the works, the following is provided for its reduction: -fixing of flexible links, resilient spacers and springs; - the reduction of period of stay in the conditions of vibration; - personal protection equipment using. The noise and vibration samplings are being performed on the entrance to and exit from Shetpe and Zhetybay villages, in the Shetpe (657km) and Zhetybay (707km) camps, as well as on reservation borders to control the impact level.
A.2.15 Non-compliance of good housekeeping, including solid and domestic wastes related to construction works	1. The Contractor shall hold the standard norms of housekeeping including the following: - removal and decontamination of the construction wastes and water. - fuel and lubricants for equipment, including the useless oil and fuel removal and collecting related to refueling, diesel generator service areas. - canalization and toilets should be fully cleaned after the construction end.	The production and consumption wastes are collected in separate containers and due to accumulation transported to disposal sites or landfill during the work performance. The containers are fixed on the special concrete areas and covered with sheet metal lids.

	- the wastes will be collected and removed in relevant order as per the environmental legislation standards. - the Contractor should inform all construction workers about the main issues of sanitary, health protection, safety and special hazardous items in their activities and it is necessary to ensure the fact in the construction period starting. - the Contractor should completely amortise the site as soon as it will be necessary no longer, with an emphasis on the debris removal/clean up any contamination or harmful materials, plus the necessary revegetation.	The waste certificates are approved with Department of ecology of Mangystau Oblast. The Contractor signed a contract with "Landfil" LLP № 71-2017 dated 15.02.2017 and "CASPI OPERATING" № AO-58/17 dated 27.02.2017 for waste disposal as following: used oil filters, the soil saturated with petrochemicals, construction wastes. The Contractor has concluded an agreement with "Mangystau Disinfection" LLP, whose members regularly held treatment of rodents and insects of the camp territory. During the environmental monitoring, the facts of unauthorized waste disposal were identified. For all the facts issued orders. In monthly reports, photographs of the elimination of identified violations are presented.
A.2.16 Loss of cultural or archaeological heritage, including cemeteries and roadside graves / refer accident victims.	1. Wherever roadside accident victims designations are located along the road sections, removal of graves requires a consultation process with the local akim, as well as the victim's family to be able to move the grave to another appropriate. 2. Any accidental finds should be reported to the PMC, the regional department of cultural heritage and all construction work should be suspended until the authorities will not give permission to continue.	No natural and architectural monuments were found. However, the Contractor's employees and subcontractors are informed that, if during the work performance any finding would be revealed they should report to the Regional Department for Cultural Heritage, and the construction work must stop until relevant conclusion.
A.2.17 Impact on communal services, access and services	1.The Contractor is responsible for arrangement and confirmation of details for all public services and could potentially be affected by the works 2. All communication utilities that subject to removal should be completely relocated prior to the existing utilities switching off. 3. Any damage or hindrance/inconvenience to local enterprises caused by premature removal or insufficient replacement of communication	The all utilities relocation are being carried out as per the approved project decisions and accepted technical requirements.

	utilities/networks subject to full compensation, all of this is under the Contractor's responsibility who caused to the problems. 4. The Contractor should provide the using without hindrance and access to the social, cultural and religious subjects. 5. In case of damaging a private property, including livestock and farmlands, the Contractor should be responsible for the payment and recovery of damages.	
A.2.18 The workers' health protection and safety	1. The Contractor should prepare an approved measurements plan for construction that among others should include all safety aspects he intends to use during the work performance. The plan will concern the means, types and quantities of protective clothing, the site-specific work safety, first aid, rescue plans, hours of work and all planned measures to eliminate or proper discharge of hazardous substances, including filling operations, transportation and handling of hazardous materials and explosives, ensuring measures. The plan will contribute to the further explanation of the methods and scope of any local resource using, and to manage the common risks associated with public safety, crime, prostitution and venereal diseases.	The Contractor has developed a "Policy and regulations regarding the safety, job safety and environmental protection", the organizational measures plan for safe operation and prevention of injuries and accidents at work. All employees, irrespective of their length of service and qualification, are instructed once every six months, and persons performing safety work (welders, etc.) - once every three months. When inspecting the state of security at production sites, the qualification certificates of working personnel, the fulfillment of measures aimed at creating healthy and safe working conditions, the fulfillment of the requirements of legislative and other regulatory legal acts on labor protection, the availability of instructions for labor protection, the bringing to the attention of employees and trainees New legislative and other legal acts on labor protection, compliance with the established procedure for the content of workplaces for Conditions of labor of medical premises, places of residence and catering, timely carrying out

		of necessary tests and technical inspections of equipment, machines and mechanisms, the efficiency of ventilation systems, the condition of safety devices and protective devices on working equipment, provision, storage, washing, and the correct use of overalls, And other personal protective equipment; The correct expenditure of funds allocated for the implementation of labor protection measures, on the basis of checks, official memos and applications for the elimination of violations identified. Training of employees who have not received training and expired terms of validity in specialized training centers. For 5 months of the current year 35 employees were trained with the issue of certificates of the established sample. In accordance with the schedule, there are briefings on safety precautions, testing of knowledge with working personnel, as well as with the drivers of contracting transport organizations. Premedical medical examination is organized, individuals are identified in a state of intoxication, who are brought to strict disciplinary responsibility. During the reporting period, medical workers and the Security Service identified 7 facts on

		the appearance of alcohol state in the workplace. For the functional work of the medical posts, calibrations of alcohol testers are carried out in a timely manner, mouthpieces are replaced, necessary medications are purchased, and operative help is provided to persons with chronic and acute manifestations of diseases. Medical company LLP "Vital-prestige" is working on the provision of medical services to staff, counseling, classes to promote healthy lifestyles. 24-hour ambulance service is organized. Directions are given in time for further treatment by medical specialists and undergoing in-patient treatment. Those responsible for road safety monitor the proper maintenance of the existing road. Work is underway to clean the road of debris, timely installation of road signs and fences, as well as the placement of traffic controllers in hazardous areas of the highway, watering on bypass roads. The knowledge of fire safety in the volume of fire and technical is checked. HIV/AIDS prevention seminars were held. The constant health workers duty is organized and pre-shift medical examination conducting is carried out. Daily control of providing the cars, machines and mechanisms to the line (work objects). Daily the workers of asphalt team, crushing-screening plant, concrete mixing plant, asphalt

		and bitumen plant and welders get cultured milk foods. The measures taken for explosion hazardous facility batching with emergency fire-fighting equipment and safety signs. Coverall scale issue is approved. Constantly monitoring is conducted at the facility for compliance with safety rules and the use of personal protective equipment staff.
A.2.19 The construction sites decommissioning	1. The Contractor should provide complete decommissioning of all temporary and permanent construction of settlements as it satisfied PMC, including the removal of any contaminants.	All temporary structures will be dismantled; disturbed land sections will be recultivated, as specified in the design solutions as soon as the road section reconstruction will be over.
A.2.20 Harmful and hazardous explosive material	1. The Contractor should develop a management plan for the transportation, loading and unloading activities and storage of hazardous materials and emergency plan in case of accidents with explosive materials. This emergency plan should be approved and coordinated with local health authorities. 2. The explosive materials require special handling and arrangement of limited use and safety measures. The Contractor is responsible for the asset management plan of the hazardous materials using and it should be subject to detailed checkout.	The Contractor has not used the hazardous explosive materials during the construction, so the management plan was not developed.

2.3 Report on monitoring plan performance on environmental protection (construction period), in accordance with Annex B to the contract documents

Monitoring plan	Monitoring activity / details / results	Information of the plan performed by the Contractor
B.2.1 Quality of water, air and noise	Instrumental monitoring of the water, air and noise quality.	The first air and soil sampling and noise and vibration measurements were taken in March 2015 which later became the base for the evaluation of the Contractor's impact on air and soil. The monitoring results were compared with the norms of maximum permissible

		concentrations established by regulatory requirements of the Republic of Kazakhstan. Further monitoring was carried out on a monthly basis.
B.2.2 The environmental expertise availability for the environmental protection actions plan preparation	Make sure that the Contractor has environmental expertise in the beginning of construction project.	The Contractor received all necessary approvals, permissions from authored state bodies are necessary for the activity performance in accordance with the legislation of Republic of Kazakhstan. The detailed list is attached in Annexes.
B.2.3 Absence of cleanliness and order in both parts of a field base and the workplace, including proper control of sanitary waste	To confirm that the items listed in the action plan and in the technical specifications are performed fully using of an agreed monitoring list.	The Contractor implement the environmental monitoring on the construction site in accordance with the supposed checklist by the Engineer. The monitoring results are shown in checklists. The assignment are being issued for revealed violations. The main violations are shown in the monthly reports, given evidence violations eliminate.
B.2.4 The trees management program that removes old trees and protective belts planting along the road to bringing to an absolute minimum	The plan inspection for reduction and approval. Consultation with the Committee of forest management and hunting farm.	No trees on the construction site to remove. The trees planting is not provided.
B.2.5 Earth works and the materials processing workflow which includes the united sections, approach roads to the quarries and processing areas.	Confirm the following: 1. an approach road is updated 2. speed limitation is 30 km/h within 500 m of any village and using the chemical suppressive means for dust at least on the road from 500 meters by both sides of the village. 3. the united sections work legally and the contractors specified the borders, work within the borders and completely restore the section as a part of decommissioning area.	The temporary and approach roads are arranged in accordance with project decisions of the asphalt milled. Traffic on the road sections is limited with the fixed road signs. The Contractor has received all necessary permission documents for land sections of temporary and approach roads.
B.2.6 Actions on the works activities adjacent to the embankment that could potentially lead to the erosion of land and landscape destruction	For an inspection for the excavation type determination. The Contractor should submit an application and confirms that the roadside	All earth works are implementing as per the confirmation with Engineering service in accordance with project

	excavation works are not carried out, and is always out of sight from the road.	solutions. The taken decisions compliance control is fulfilling during the environmental monitoring.
B.2.7 Earth works – transportation and storage; dedusting works, noise reduction, drainage during the materials relocation	Undertake as a part of building inspection the regular confirmation that the earth works are being carried out in an environmentally acceptable manner and control of dust is carried out at all times, including the trucks use of tarpaulin covers transporting materials as irrigation along the road sections passing around/through the villages, and strict compliance with speed limits of 30 km/h. Transportation through roadside villages and places of residence shall be limited at between 7:30 and 17:30.	The soil transportation is carried out in the dump trucks with closed body. Dedusting actions are being taken on the roads. The vehicle moving speed is limited. The activities are performed in the working time
B.2.8 The use of erosion control and stabilization of slopes to prevent landslides and erosion in the recesses of time and the places where the water passes	Undertake the regular inspection to confirm that the Contractor performs the stabilization of slopes, a standard method of erosion protection on all cleaning works of earth foundation, excavation and embankment.	The planned measurements ate performed, control is held during the environmental monitoring.
B.2.9 Earth works and the roadside plumbum contented soil removal	The earth works of roadside soil between Aktau and Zhetybay should be suit to reasonable evidence in the sample selected places that the materials are not contaminated with plumbum significantly, and is contamination exists, to check the correctness of the processing, use and final disposal of the material.	The Contractor on a monthly basis carries out the soil sampling and monitoring by an accredited laboratory during the earth works at the construction site. Soil contamination with plumbum is not found.
B.2.10 Potential spill and contamination with bitumen/asphalt and concrete products	Make sure that the asphalt and concrete plants technical requirements meet the standards and acts, as they are located far from the settlements as defined in Table reduce the impact on the environment. Storage and use of bitumen should be carried out without the spill.	Installation of crushing, asphalt, concrete facilities performed in accordance with the work projects that were agreed with the concerned government authorities. Camp in which there are asphalt and concrete plants are located on the 73 km of the "Aktau-Zhetybai" road and refers to the administrative area Karakiya district of Mangistau

		region. Distance to the nearest town - the Zhetybay and Munaishy villages - about 12 km. The production site on which mobile asphalt and concrete plants are located at a distance of 100 meters north of the road. The area section on which there are asphalt and crushing plants approximately 200 m west of the road, on the highway of Shetpe station – Zhetybay village. The distance from the site to the nearest residential zones – Shetpe station is 15 km, distance to the Zhetybay village - 62 km.составляет 15 км, расстояние до пос. Жетыбай - 62 км.
B.2.11 Control that the working with POL such as fuel, lubricants and bitumen, is being performed by contractors and subcontractors without spillage and pollution	Using the control list of the spillage control and measures taken to prevent contamination. Any non-compliance will be eliminated immediately.	The Contractor has developed the Fuel and Chemical Products Management Plan. The control of measurements specified in the Plan is being implemented by the Contractor's specialists and shown in the checklists of environmental monitoring.
B.2.12 Потенциальные недостатки поверхностного водоотвода на участках строительства	The Contractor will check and confirm that relevant consideration and drainage works to be done. Mitigation measures fully have been taken on time.	The Environmental Management Plan developed by the Contractor provided the relevant activities. The control of measurements specified in the Plan is being implemented by the Contractor's specialists and shown in the checklists of environmental monitoring.
B.2.13 Air pollution related to the construction	Confirm the mitigation actions are being held by using the monitoring list.	The Contractor fulfil the atmospheric air monitoring on the construction site every 10km on the monthly contract basis, around construction sites, on the reservation border. A total amount is 27 sampling points. Sampling is carried out on the inorganic dust, carbon monoxide, nitrogen dioxide, sulfur dioxide. The results of air monitoring are compared with the standards of maximum permissible concentrations established by regulatory requirements of the Republic of Kazakhstan

B.2.14 Confirmation or removing of cultural or archaeological sites, including cemeteries and roadside graves / monuments to the victims of accidents.	Confirm that all roadside burial places (based on the inventory plots) are officially considerated and consultated with the akims and members of the families and the implementation of processes for the transfer of the relics when available.	The cultural, archaeological sites including cemeteries and roadside graves / monuments to the victims of accidents are not found during the construction works.

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2.3 Report on complaint investigation of local residents and representatives interested:

The complaints investigation procedure related to the project is to ensure the projects effective and systematic mechanism for answers to questions, the feedback providing and complaints investigation from those whose interests are affected, other persons interested and the public.

Anyone, who has been suffered or being disturbed with the project activity impact, has the right to appeal in written form to the Contractor. The applicants or interested parties may visit, call or send a letter in hard or soft copies, and fax to the project office located on the construction site territory in the Zhetybay village area or in the company office located in Aktau. Complaints receiving by personal delivery, by phone, by letter in hard or soft copies, or by fax will be confirmed.

Requests and complaints, in respect of which an explanation and a decision were given, at the admission moment are being closed immediately. The cases requiring further assessment and actions are being considered by the Contractor's specialists within ten working days and then a reply in written form is being sent to the applicant. CCI coordinator distributes the relevant information at the regional level among the CCI members, prepares the CCI minutes of meetings and construction progress reports and ensure that the actions and decisions were documented properly.

The Contractor registers the received complaints and the submitted responses. Received complaints and responses information is represented in the environmental protection report of the Contractor.

The Contractor's contact details:
Address: Zhetybay construction site
e-mail: cengiz_aktau@mail.ru

The Contractor's contact details in Aktau:
Address: 130000 the Republic of Kazakhstan,
Mangystau region, Aktau,
Micro district 29A, building 135, business center ABK, 4 floor
t/f 8(7292) 20-48-91, 20-48-92
e-mail: cengiz_aktau@mail.ru

No complaints were received during 1 half of 2017.

2.4 Report on meetings conducting with a Consultant and other representants interested

Representatives of the Contractor, the Engineer, PMC have visited the Contracts construction sites during 1 half of 2017.

The consultations and trainings were held between the Contractor and Environmental Protection international specialist during 1 half of 2017.

2.5 Conducting of social and ecological monitoring

As was suggested by the International Environmental Expert, the Contractor's specialists carried out environmental monitoring during the first half of 2017 with the filling of the established form - a checklist. Exceptions were January, February 2017 in these months monitoring was not carried out due to the conservation of work on weather conditions.

Based on the results of the monitoring, the implementation of the environmental management program, compliance with legislative requirements was recorded. In the control sheets violations were recorded, according to the results of monitoring, prescriptions were issued. Control letters were included in the Environmental Protection monthly reports.

2.6 Correspondence between Contractor and ConsultantЖ

№	Date	Contractor's № letter	Construction Supervision Consultant's № letter	Subject of the letter
1	15.03.2017		5017016/CR/1175	Not meeting the requirements of EMP
2	03.03.2017	AKT-CGZ-SS-2017-30		Environmental Protection Report for February 2017
3	15.03.2017	AKT-CGZ-SS-2017-44		Not meeting the requirements of EMP
4	16.03.2017	AKT-CGZ-SS-2017-45		Environmental sampling
5	16.03.2017	AKT-CGZ-SS-2017-46		Ecological monitoring checklist
6	24.03.2017	AKT-CGZ-SS-2017-59		Ecological monitoring checklist
7	04.04.2017	AKT-CGZ-SS-2017-76		Ecological monitoring checklist
8	07.04.2017	AKT-CGZ-SS-2017-81		Environmental Protection Report for March 2017
9	13.04.2017	AKT-CGZ-SS-2017-84		Environmental sampling
10	17.04.2017	AKT-CGZ-SS-2017-96		Ecological monitoring checklist
11	24.04.2017	AKT-CGZ-SS-2017-106		Ecological monitoring checklist
12	03.05.2017	AKT-CGZ-SS-2017-127		Environmental Protection Report for April 2017
13	03.05.2017	AKT-CGZ-SS-2017-129		Ecological monitoring checklist
14	04.05.2017	AKT-CGZ-SS-2017-135		Environmental sampling
15	17.05.2017		PMC-SMEC-170517-162	Violation of ecological requirements
16	17.05.2017		5017016/CR/1307	Environment Protection issues training program
17	20.05.2017	AKT-CGZ-SS-2017-165		Unauthorized disposal of industrial waste at quarries
18	29.05.2017	AKT-CGZ-SS-2017-181		Ecological monitoring checklist
19	02.06.2017	AKT-CGZ-SS-2017-190		Pollution of quarries
20	03.06.2017	AKT-CGZ-SS-2017-193		Environmental Protection Report for May 2017
21	05.06.2017	AKT-CGZ-SS-2017-197		Environmental sampling
22	14.06.2017	AKT-CGZ-SS-2017-216		Ecological monitoring checklist
23	19.06.2017	AKT-CGZ-SS-2017-228		Ecological monitoring checklist

3. Environment monitoring results during reconstruction of the «Shetpe- Aktau» (632-802 km) section of the «Aktau-Beyneu» road for 1 half of 2017

Based on the contract of rendering services, the specialists of the "Aktobe plant of chromium compounds" JSC environment laboratory conducted laboratory analyzes during the reconstruction of the "Shetpe-Aktau" (632-802) km section of the "Aktau-Beineu" road during 1 half of 2017. The customer of works is **branch of «CENGIZ INSAAT SANAYI VE TICARET ANONIM SIRKETI» JSC in Aktau.**

Environmental monitoring is an integrated system of observations, the results of which should be:

- confirm (or disprove) the assessment and forecast of anthropogenic changes in the state of environmental components;

- together with measures for the implementation of environmental monitoring to determine compliance with existing activities norms and requirements of the Republic of Kazakhstan;

- enter as an integral part to the system of state environmental monitoring, providing an assessment and forecast of the state of the ecosystem in the regional context.

The focus of the forecast and its methodological support largely have to define the structure and composition of the observation.

The aims of environmental monitoring are:

- obtaining information for decision-making on environmental policy of the Contractor, the targets of environmental quality and regulatory instruments of production processes, potentially affecting the environment;

- ensuring compliance with the environmental legislation of the Republic of Kazakhstan;

- minimizing the impact of manufacturing processes on the customer's environment and human health;

- more efficient use of natural and energy resources;

- prompt preemptive incident response;

- the formation of a high level of environmental awareness and responsibility of managers and employees and all interested parties.

- informing the public about the environmental activities of enterprises and public health risks;
- improving compliance with environmental requirements;

- increase production and environmental effectiveness of the system of environmental management;

- consideration of environmental risks when investing and lending.

3.1. Environment monitoring procedure

Environmental monitoring was being conducted in accordance with the normative acts.

Sampling, storage, transportation and preparation for the analysis were carried out in accordance with approved standards:

The air monitoring organization and carrying out

1. ST RK 1957-2010 "Environment protection. Atmosphere. Method for determination inorganic dust"

2. ST RK 2.302-2014 Methods of measurements. "Determination of the mass concentration of pollutants in the ambient air in the working area, in industrial emissions by a gas analyzer"

In March 2015 was selected the first samples of ambient air, which later became the base for assessing the impact of the Contractor on the air. The results of air monitoring were compared with the norms of maximum permissible concentrations established by regulatory requirements of the Republic of Kazakhstan.

Sampling of ambient air was carried out in the following areas:

- road every 10 km - 15 control points,
- Shetpe camp - 4 control points,
- Zhetybay camp - 4 control points,

- borders of Zhetybay settlement - 2 control points,
- nature-sanctuary borders - 2 control points.

Environmental sampling for monitoring was carrying out from March to June 2017 (the samples were not taken due to the reduction of scope of work in January and February 2017).

Total is 27 monitoring points for road section, over the specified period of 2017 total amount was 108 samples of atmospheric air were taken and analyzed.

The soil monitoring organization and carrying out

1. The Nature Conservancy. Soils. General requirements for sampling. GOST 17.4.3.01-83.

2. The Nature Conservancy. Soils. Classification of chemical substances for pollution control. GOST 17.4.102-83.

2. Soils. Methods of sampling and sample preparation for chemical and bacteriological analysis helminthological. GOST 14.4.4.02-84.

4. Hygienic standards for safety of the environment (soil), approved by order of the minister of the national economy of Kazakhstan dated 25.06.2015 № 452.

In March 2015 was selected the first samples of the soil, which later became the base for assessing the impact of the Contractor on the ground. The results of monitoring of soil compared with the norms of maximum permissible concentrations established by regulatory requirements of the Republic of Kazakhstan.

Sampling of the soil was carried out in the following areas:

- road every 10 km - 15 control points,
- Shetpe camp - 4 control points,
- Zhetybay camp - 4 control points,
- borders of Zhetybay settlement - 2 control points,
- borders of the state reserve - 2 control points.

Total is 27 monitoring points for road section, over the period from March to June 2017 total amount was 108 samples of the soil were taken and analyzed. The samples were not taken due to the reduction of scope of work in January and February 2017.

Water

The generalized list of maximum permissible concentration (MPC) and the approximately safe impact levels (ASIL) of harmful substances for fishery water bodies.

The surface waters monitoring organization and carrying out

The Ashiagar river is low watered, water movement occurs during the spring flood. 8 samples of surface water were taken and analyzed during 1 half of 2017.

Noise and vibration

Noise and vibration measurements were being carried out from March to June 2017, in January and February 2017 measurements were not being carried out due to the reduction of scope of work on the construction site.

Points of measurement of noise and vibration:

- Shetpe camp - 4 control points,
- Zhetybay camp - 4 control points,
- borders of Zhetybay settlement - 2 control points,
- borders of the state reservation - 2 control points.

Upon the recommendations of an EP international specialist of the environmental protection, starting from July 2015 the noise and vibration measurements are being carried out in three poles: minimum, maximum and equivalent.

The objects of environmental research and analysis are:

- chemical analysis of atmospheric air;
- chemical analysis of the soil;
- noise and vibration measurement;
- chemical analysis of surface water.

Table 3.1

The parameters list monitored during the environmental monitoring process

№	Item of monitored parameter
Atmospheric air analysis	
1	Inorganic dust
2	Carbonic oxide
3	Nitrogen dioxide
4	Sulphurous anhydride
Soil chemical analysis	
1	pH
2	Zinc
3	Petrochemicals
4	Cadmium
5	Plumbum
Noise and vibration measurements	
1	Noise
2	Vibration
Surface water chemical analysis	
1	Dry residues
2	Nitrates
3	Sulphates
4	Chlorides
5	Petrochemicals
6	Ferrum

The methods used information of the environment monitoring

To perform instrumental measurements made for the use of methods and means of measurements included in the "Register of the state system of ensuring the uniformity of measurements", as reflected in its sections: "The approved types of measuring devices," "Approved types of standard samples," "Methods of measurement."

When tested using acting in the Republic of Kazakhstan regulations:

Atmospheric air:

2. ST RK 1957-2010 "Environment protection. Atmosphere. Method for determination inorganic dust"

2. ST RK 2.302-2014 Methods of measurements. "Determination of the mass concentration of pollutants in the ambient air in the working area, in industrial emissions by a gas analyzer"

Soil

1. Soils. Methods for determination of the composition of cationic-anionic aqueous extract GOST 26423-85 item 4.3.
2. Quantitative chemical analysis of soil. Methods of measuring the mass fraction of oil in the samples of soil and ground fluorimetric method on the liquid analyzer "Fluorat-2" registered in Kazakhstan at number KZ.07.00.01668-2013 of February 06, 2013, valid until 06.02.2018.
3. Methods of mass fraction of vanadium, cadmium, cobalt, manganese, copper, arsenic, nickel, mercury, lead, chromium and zinc in the soil samples, soil, sediment, sewage sludge by Atomic Absorption Spectrometry with electrothermal atomization using atomic absorption spectrometer modification of the MGA-915 registered in the Republic of Kazakhstan at No. KZ.07.00.03044-2014 of December 30, 2014, unlimited.

Noise and vibration

1. GOST 12.1.050-86 methods of measuring noise in the workplace.
2. GOST ISO 8041-2006 Vibration. Exposure to vibration to a human. Means of measuring

Water

1. GOST 26449.1-85 Units for distillation desalting stationary. Methods for chemical analysis of salt water.
2. GOST 18826-73 Methods for determination of nitrates.
3. KZ.07.00.01667-2013 M 01-05-2012 Methods for determination of mass of oil product concentration in the samples of natural, drinking, waste waters by fluorimetric method on the analyzer of fluid "Fluorat-02".

Sampling and analysis of the laboratory of Environmental Protection of "AZHS" JSC has accreditation certificate № KZ.I.05.0916 on 27.07.2010 valid until 27.09.2020.

In the sampling of and analysis of the samples, the following measuring tools using:

Table 3.2

Atmospheric air

Наименование прибора	Номер приборов	Сведения о поверке
Aspirator PU-ZE/12	fact. № 807	Calibration certificate № BA-07-01-01930 dated 17.02.2017 till 16.02.2018
Gas analyzer GANK-4	fact. № 609	Manufacturer calibration label № 093583814 dated 22.06.2016 till 21.06.2017
	fact. № 2700	Manufacturer calibration label № 16000303727 dated 11.04.2017 till

		10.04.2018
Scales electronic laboratory MettlerToledoXS205DU	fact. № B141330205	Calibration certificate №BB-02-10000015860 dated 14.11.2016 till 14.11.2017

Soil

Device item	Device №	Verification data
Scales electronic laboratory MettlerToledoXS205DU	fact.№B141330205	Calibration certificate №BB-02-10000003091 dated 14.11.2016 till 13.11.2017
Combined measuring instrument SevenEasy pH	fact.№ 1231405267	Calibration certificate №BB-09-10000020154/№BB-09-10000020155 dated 07.09.2016 till 07.09.2017
Atomic Absorption Spectrometer MGA-915M	fact.№ 394	Calibration certificate №BB-17-0000000017 dated 13.01.2017 till 12.01.2018
Liquid analyzer "Fluorat"-02-3M	fact.№ 5593	Calibration certificate №BB-11-10000008213 dated 19.05.2015 till 18.05.2017 Calibration certificate № BB-11-24385 dated 19.05.2017 till 18.05.2018

Noise and vibration

Device item	Device №	Verification data
Noise and vibration analyzer «Assistant»	fact. № 162613	Calibration certificate № BA-12-05 743 dated 21.02.2017 till 20.02.2018

Water

Device item	Device №	Verification data
Photoelectric photometer KFK 3-01 ZOMS	fact.№0900775	Calibration certificate №BB-11-9654785695 dated 06.11.2015
Fluid analyzer "Fluorat" -02-3M	fact.№ 5593	Calibration certificate №BB-11-10000008213 dated 19.05.2015 till 18.05.2017 Calibration certificate № BB-11-24385 dated 19.05.2017 till 18.05.2018
Scales laboratory VL-210	fact.№ A 073	Calibration certificate № BB-02-4561 dated 07.02.2017 till 06.02.2018

All received from monitoring measurement results are compared to the standards established by the state regulatory document:

- Hygienic standards for atmospheric air in urban and rural settlements, approved by the Minister of National Economy of the Republic of Kazakhstan dated 28.02.2015, № 168.

- Sanitary regulations "Sanitary-epidemiological requirements to air quality in urban and rural areas, soils and their safety, content areas of urban and rural settlements, the conditions of work with sources of physical factors affecting human", approved by the Government Resolution of RK dd 25.01.2012, # 168.

- Hygienic standards for safety of the environment (soil), approved by order of the minister of the national economy of Kazakhstan dated 25.06.2015 № 452.

- Generalized list of maximum allowable concentrations and approximately safe levels of exposure to harmful substances for fishery water bodies.

Sampling points and places of measurement.

To address the objectives are necessary environmental studies, containing the preparatory period, field and laboratory analytical work, laboratory processing of materials.

The preparatory period includes the study of library materials in the district work, the technological cycle of production, preliminary zoning of the extent of natural and anthropogenic pollution of the landscape. This will determine the points scheme and the procedure for sampling, the number of each object of study.

The Customer determines the sampling points.

Fieldwork includes sampling of environmental components. Laboratory and analytical work carried out in part in the field using a gas analyzer and stationary laboratory. Office work includes cameral processing of the results of analyzes of samples and report on the results of environmental monitoring.

Table 3.3

List of control points indicating coordinates and pickets

Points names indicating km, picket and coordinates	Date of atmospheric air sampling	Date of soil sampling	Date of noise and vibration measurement
Road			
AK-8 (645 km) PK 100 (N44°07.119' E052°10.363')	28.03.2017 19.04.2017 15.05.2017 07.06.2017	28.03.2017 19.04.2017 15.05.2017 07.06.2017	28.03.2017 19.04.2017 15.05.2017 07.06.2017
AK-9 (654 km) PK 190 (N44°03.121' E052°11.429')			
Shetpe Camp			
AK-10 (657 km) PK 220 (N44°01.950' E052°09.973')	28.03.2017 19.04.2017 15.05.2017 07.06.2017	28.03.2017 19.04.2017 15.05.2017 07.06.2017	28.03.2017 19.04.2017 15.05.2017 07.06.2017
AK-11(657 km) PK 220 (N44°02.018' E052°09.847')			
AK-12(657 km) PK 220 (N44°02.151' E052°10.040')			

AK-13 (657 km) PK 220 (N44°02.091' E052°10.144')			
Road			
AK-14 (664 km) PK 290 (N43°58.654' E052°07.510')	28.03.2017 19.04.2017 15.05.2017 07.06.2017	28.03.2017 19.04.2017 15.05.2017 07.06.2017	28.03.2017 19.04.2017 15.05.2017 07.06.2017
AK-15 (674 km) PK 390 (N43°54.290' E052°04.632')			
AK-16 (684 km) PK 490 (N43°49.187' E052°02.406')			
AK-17 (694 km) PK 587 (N43°43.670' E052°03.724')			
AK-18 (704 km) PK 686 (N43°38.586' E052°05.051')			
Zhetybay village borders (entrance and road out)			
AK-19 (707 km) PK 715 (N43°36.831' E052°05.681')	28.03.2017 19.04.2017 14-15.05.2017 07.06.2017	28.03.2017 19.04.2017 14-15.05.2017 07.06.2017	28.03.2017 19.04.2017 14-15.05.2017 07.06.2017
AK-20 (713 km) PK 790 (N43°34.035' E052°06.954')			
Road			
AK-21 (714 km) PK 800 (N43°33.503' E052°07.302')	28.03.2017 19.04.2017 14.05.2017 07.06.2017	28.03.2017 19.04.2017 14.05.2017 07.06.2017	28.03.2017 19.04.2017 14.05.2017 07.06.2017
AK-22 (724 km) PK 63 (N43°31.886' E052°01.347')			
Zhetybay Camp			
AK-23 (730 km) PK 120 (N43°32.644' E051°58.296')	29.03.2017 20.04.2017 14.05.2017 08.06.2017	29.03.2017 20.04.2017 14.05.2017 08.06.2017	29.03.2017 20.04.2017 14.05.2017 08.06.2017
AK-24 (730 km) PK 120 (N43°32.555' E051°58.660')			
AK-25 (730 km) PK 120 (N43°32.646' E051°58.764')			
AK-26(730 km) PK 120 (N43°32.757' E051°58.351')			
Road			
AK-27 (734 km) PK 163 (N43°33.286' E051°55.202')	29.03.2017 20.04.2017 14.05.2017 08.06.2017	29.03.2017 20.04.2017 14.05.2017 08.06.2017	29.03.2017 20.04.2017 14.05.2017 08.06.2017
AK-29 (744 km) PK 263 (N43°34.157' E051°47.642')			
AK-30 (754 km) PK 363 (N43°35.618' E051°40.479')			
AK-31 (764 km) PK 463 (N43°35.365' E051°33.610')			
AK-33 (774 km) PK 563 (N43°36.466' E051°26.915')			
AK-34 (784 km) PK 663 (N43°39.045' E051°20.212')			
Nature-sanctuary border			
AK-28 (739 km) PK 207 (N43°34.056' E051°51.826')	29.03.2017 20.04.2017	29.03.2017 20.04.2017	29.03.2017 20.04.2017

AK-32 (771 km) PK 533 (N43°36.026' E051°28.595')	14.05.2017 08.06.2017	14.05.2017 08.06.2017	14.05.2017 08.06.2017

3.2 Sampling method

Atmospheric air

Rules of air sampling are installed in the Guidelines on Air Pollution Monitoring RD 52.04.186-89. Observations of the level of air pollution is carried out at the posts. Sampling site is located on an open area, ventilated from all sides. Since the effect of the road found only in the immediate vicinity of it, the points of selection of air are located at a distance of 50-100 meters from the road. When determining the surface impurity concentration in the atmosphere sampling and measurement of concentrations of contaminants are held at a height of 1.5-3.5 m above the ground. Determination of the concentration of many harmful pollutants in the atmosphere is produced by laboratory methods.

Sampling of air for dust content is performed by aspirating a certain amount of air through the aerosol filter to retain airborne particles. Determined impurity from a large volume of air is concentrated in a small volume of the filter. Sampling options, such as the air flow rate and the duration of its aspiration through the absorption device, absorption type device or filter, set depending on substance to be determined. In the package in which filter nested, record the date and time of sampling. After removing filter holder from the filter to be folded in half, to be put in a bag. Packet with filter to put in the bag for sending to the chemical laboratory.

Sampling for air content of carbon monoxide, nitrogen dioxide, sulfur dioxide is carried out using a gas analyzer GANK-4. Analyzer work is carried out automatically. The pump delivers analyzed air via the inlet nozzle of the gas analyzer to sensor or to the tape of chemical cassette. When measuring the concentration of the analyzed air enters through the inlet fitting on the sensor or chemical cassette. After 20-30 seconds, the signal is supplied to the computing device that converts and outputs it to the screen in the form of values of the mean concentration.

Soil

In the laboratory, to prepare the necessary materials for soil sampling depending on carried out tests to exclude the possibility of secondary pollution.

Spot samples of soil for determining heavy metal to be selected with tool containing no metal. Before the selection of spot samples small trench wall *(soil small trench - shallow soil profiles (50-75 cm), exposes only the upper horizons of the soil profile)* or the surface of the core should be cleaned with a knife made of polyethylene or polystyrene or plastic spatula.

Spot soil samples for determining oil, should be placed in glass jars with ground glass stoppers or cloth bags. Coming to the place of sampling the soil, lay at least one test area size 10x10 m.

Spot samples are taken on the trial site by the envelope method. Spot samples are taken from a knife or spatula from small trench or soil borer. The combined sample to be composed by mixing spot samples taken at one trial site.

For chemical analysis, the combined sample composing from not less than five spot samples taken from one test site. Weight of combined sample should be at least 1 kg.

Each sample must be completed with act of sampling, in which is fixed:

1)Combined sample number; 2) Date and time of sampling; 3) Sampling point name; 4) Sampling depth; 5) Sampling person name; 6) If necessary: the nature of the meteorological conditions on the day of sampling, features detected during sampling (illuminated by the sun, the use of chemicals, the presence of landfills, sewage treatment plants, etc.) and other features.

In the process of transportation and storage of the soil samples should be taken measures to prevent the possibility of secondary pollution.

On arrival at the laboratory, all samples are recorded in the combined log of soil samples.

To determine the chemical soil sample in the laboratory mash spread on paper pestle large lumps. Then discarded inclusion - roots of plants, insects, rocks, glass and other. Soil samples for chemical analysis is dried to the air-dry state. Air-dry samples stored in cloth bags in cardboard boxes or glass containers.

Sample preparation consists of mixing, grinding and reduction to a certain weight. In order to reduce the sample using the method of quartering. The shredded material is poured onto a sheet of paper, thoroughly mixed, cast roots, stones and other hard objects. Then the soil is distributed evenly on the spot with a thin layer (0.5 cm) in the shape of a square, divided into four quadrants, the contents of the two opposite sectors are discarded, and the remaining two - combined and mixed again. Soil divide until there around 300g. Soil grounded in a mortar and pestle and sieved through a sieve with a whole diameter of 1 mm. If necessary triturated attrition.

Then pour the soil into a clean container or envelope and number, sign it. From the obtained sample taken samples for analysis.

Noise and vibration

Noise and vibration measurements are made on noise and vibration analyzer ASSISTANT. The results of measurements of noise and vibrations (maximum, minimum, equivalent) are reflected on the screen of the device at the end of measurement.

Water

Sampling of surface water made into the tank from a chemically resistant material (a polymeric material or glass). Tank capacity is 0.5 - 2 dm3. Sample of surface water collected manually by special device or sampler. Spot samples characterizing the composition and properties of the water in this water body location at a given time is obtained by selecting a single desired total amount of water. Before sampling container rinse at least twice with water to be tested and fill it to the top of the container. Before closing the container with cap, the top layer of water is poured so that under the stopper remains the air layer and when transporting stopper is not wetted.

3.3. Сведения о лаборатории

Laboratory studies were carried out in environment laboratory of "Aktobe plant of chromium compounds" JSC.

Information about the laboratory are given in the table below:

Table 3.4

№	Name of the accredited testing laboratory	Number and duration of test laboratory accreditation certificate	Testing field of laboratory accreditation
1	2	3	4
1	Environment laboratory of "Aktobe plant of chromium compounds" JSC	Accreditation certificate № KZ.I.05.0916 dated 27.07.2015 valid until 27.07.2020	**Sanitary protection zone:** inorganic dust, carbon monoxide, nitrogen dioxide, sulfur dioxide **SOIL, GROUND, BOTTOM SEDIMENTS, SLUDGE AND INDUSTRIAL WASTES:** pH, oil, cadmium, lead, zinc.

			Production environment factors: Noise, vibration. **Water:** dry residue, nitrates, sulfates, chlorides, petrochemicals, iron.

3.4 Environment monitoring results

Air quality monitoring

Monitoring of air pollution involves determining the concentration of pollutants in the zone of active influence. The most accurate estimate of the impact on air quality are direct measurements of pollutants. For this purpose, under the contract with the Contractor specialized accredited environmental laboratory JSC "Aktobe plant of chromium compounds" for 1 half of 2017 monitored the ambient air. The sampling points and frequency have been defined in the monitoring program, which is a mandatory attachment to PEPM. Total for reporting period 108 samplings were selected in 27 sampling points. The samples were not taken due to reduction of scope of work on construction site during January and February 2017.

In March 2015, conducted the basic measurements ambient air samples (Protocol № 3 dd March 13, 2015). All samples are compared with the normative values - MPC maximum permissible concentrations established by regulatory requirements of the Republic of Kazakhstan.

In the table below, observations of 2015 are grouped as follows: road every 10 km - 15 control points, Shetpe camp - 4 control points, Zhetybay camp - 4 control points, borders of Zhetybay village - 2 control points, borders of state reserve - 2 control points. In addition, in the table for comparison presented average, minimum and maximum values for basic measurements (March 2015) and the average, minimum and maximum values for the entire observation period (March-June 2017).

ROAD. Averages baseline measurement (March 2015) of this section are as follows: 0,56MPC for dust (maximum one-time maximum allowable concentration), 0,45MPC for carbon monoxide, 0MPC for nitrogen dioxide, 0,0004MPC for sulfur dioxide. The maximum basic measurements are 0,68MPC for dust, 0,57MPC for carbon monoxide, 0MPC for nitrogen dioxide, 0,0014MPC for sulfur dioxide.

The values are 0,5MPC for dust, 0,52MPC for carbon monoxide, less than 0,1MPC for nitrogen dioxide, less than 0,05MPC for sulfur dioxide due to the monitoring results for 1 half of 2017. The maximum measurements are 0,9MPC for dust, 0,84MPC for carbon monoxide, less than 0,1MPC for nitrogen dioxide, less than 0,05MPC for sulfur dioxide.

Comparison of average basis results with average data for whole observation period showed the slight increase of dust and carbon monoxide. The MPC exceeding were not found of any controlled substances in this area.

SHETPE CAMP (657 KM). Averages baseline measurement (March 2015) of this section are as follows: 0,52MPC for dust (maximum one-time maximum allowable concentration), 0,348MPC for carbon monoxide, 0MPC for nitrogen dioxide, 0,0008MPC for sulfur dioxide. The maximum basic measurements are 0,58MPC for dust, 0,396MPC for carbon monoxide, 0MPC for nitrogen dioxide, 0,0022MPC for sulfur dioxide.

The values are 0,56MPC for dust, 0,39MPC for carbon monoxide, less than 0,1MPC for nitrogen dioxide, less than 0,05MPC for sulfur dioxide due to the monitoring results for 1 half of 2017. The maximum measurements are 0,88MPC for dust, 0,41MPC for carbon monoxide, less than 0,1MPC for nitrogen dioxide, less than 0,05MPC for sulfur dioxide.

Comparison of average basis results with average data for whole observation period showed the slight increase of dust and carbon monoxide. The MPC exceeding were not found of any controlled substances in this area.

ZHETYBAY VILLAGE (ENTRANCE AND ROAD OUT). Averages baseline measurement (March 2015) of this section are as follows: 0,52MPC for dust (maximum one-time maximum allowable concentration), 0,45MPC for carbon monoxide, 0MPC for nitrogen dioxide, 0,00138MPC for sulfur dioxide. The maximum basic measurements are 0,54MPC for dust, 0,47MPC for carbon monoxide, 0MPC for nitrogen dioxide, 0,0017MPC for sulfur dioxide.

The values are 0,42MPC for dust, 0,31MPC for carbon monoxide, less than 0,1MPC for nitrogen dioxide, less than 0,05MPC for sulfur dioxide due to the monitoring results for 1 half of 2017. The maximum measurements are 0,66MPC for dust, 0,31MPC for carbon monoxide, less than 0,1MPC for nitrogen dioxide, less than 0,05MPC for sulfur dioxide.

Comparison of average basis results with average data for whole observation period showed the slight increase of dust and carbon monoxide. The MPC exceeding were not found of any controlled substances in this area.

ZHETYBAY CAMP (730 KM). Averages baseline measurement (March 2015) of this section are as follows: 0,57MPC for dust (maximum one-time maximum allowable concentration), 0,51MPC for carbon monoxide, 0MPC for nitrogen dioxide, 0,00MPC for sulfur dioxide. The maximum basic measurements are 0,62MPC for dust, 0,544MPC for carbon monoxide, 0MPC for nitrogen dioxide, 0,0008MPC for sulfur dioxide.

The values are 0,48MPC for dust, 0,36MPC for carbon monoxide, less than 0,1MPC for nitrogen dioxide, less than 0,05MPC for sulfur dioxide due to the monitoring results for 1 half of 2017. The maximum measurements are 0,8MPC for dust, 0,4MPC for carbon monoxide, less than 0,1MPC for nitrogen dioxide, less than 0,05MPC for sulfur dioxide.

Comparison of average basis results with average data for whole observation period showed the slight increase of dust. The MPC exceeding were not found of any controlled substances in this area.

NATURE-SANCTUARY BORDER (ENTRANCE AND ROAD OUT). Averages baseline measurement (March 2015) of this section are as follows: 0,58MPC for dust (maximum one-time maximum allowable concentration), 0,48MPC for carbon monoxide, less than 0,1MPC for nitrogen dioxide, less than 0.05 MPC for sulfur dioxide. The maximum basic measurements are 0,66MPC for dust, 0,5MPC for carbon monoxide, less than 0,1MPC for nitrogen dioxide, less than 0,05MPC for sulfur dioxide.

The values are 0,6MPC for dust, 0,45MPC for carbon monoxide, less than 0,1MPC for nitrogen dioxide, less than 0,05MPC for sulfur dioxide due to the monitoring results for 1 half of 2017. The maximum measurements are 0,96MPC for dust, 0,6MPC for carbon monoxide, less than 0,1MPC for nitrogen dioxide, less than 0,05MPC for sulfur dioxide.

Comparison of average basis results with average data for whole observation period showed the slight increase of carbon monoxide. The MPC exceeding were not found of any controlled substances in this area.

Proceeding from the control measurements results, imply that the Contractor's actions during the works performance on the construction site provided the permissible impact on the environment. The measures taken by the Contractor within PEPM performance are effective.

Table 3.5

The measurement results of the concentration of pollutants substances in the air for 1 half of 2017

Sampling points characteristics		The harmful substances concentration, mg/m^3			
Description	Sampling date	Dust	Carbon monoxide	Nitrogen dioxide	Sulfur dioxide
		MPC values			
		Not more 0,5	Not more 5	Not more 0,2	Not more 0,5
ROAD					
AK-8 (645 km)	28.03.2017	0,32	<1,5	<0,02	<0,025
AK-8 (645 km)	19.04.2017	0,4	<1,5	<0,02	<0,03
AK-8 (645 km)	15.05.2017	0,1	<1,5	<0,02	<0,03
AK-8 (645 km)	07.06.2017	0,25	<1,5	<0,02	<0,03
AK-9 (654 km)	28.03.2017	0,31	<1,5	<0,02	<0,025
AK-9 (654 km)	19.04.2017	0,35	<1,5	<0,02	<0,03
AK-9 (654 km)	15.05.2017	0,12	<1,5	<0,02	<0,03
AK-9 (654 km)	07.06.2017	0,27	<1,5	<0,02	<0,03
AK-14 (664 km)	28.03.2017	0,31	<1,5	<0,02	<0,025
AK-14 (664 km)	19.04.2017	0,12	<1,5	<0,02	<0,03
AK-14 (664 km)	15.05.2017	0,11	<1,5	<0,02	<0,03
AK-14 (664 km)	07.06.2017	0,41	<1,5	<0,02	<0,03
AK-15 (674 km)	28.03.2017	0,32	1,72	<0,02	<0,025
AK-15 (674 km)	19.04.2017	0,13	<1,5	<0,02	<0,03
AK-15 (674 km)	15.05.2017	0,1	<1,5	<0,02	<0,03
AK-15 (674 km)	07.06.2017	0,23	<1,5	<0,02	<0,03
AK-16 (684 km)	28.03.2017	0,30	<1,5	<0,02	<0,025
AK-16 (684 km)	19.04.2017	0,16	<1,5	<0,02	<0,03
AK-16 (684 km)	15.05.2017	0,11	<1,5	<0,02	<0,03
AK-16 (684 km)	07.06.2017	0,4	<1,5	<0,02	<0,03
AK-17 (694 km)	28.03.2017	0,30	1,99	<0,02	<0,025
AK-17 (694 km)	19.04.2017	0,19	<1,5	<0,02	<0,03
AK-17 (694 km)	15.05.2017	0,13	<1,5	<0,02	<0,03
AK-17 (694 km)	07.06.2017	0,35	<1,5	<0,02	<0,03
AK-18 (704 km)	28.03.2017	0,32	<1,5	<0,02	<0,025
AK-18 (704 km)	19.04.2017	0,26	<1,5	<0,02	<0,03
AK-18 (704 km)	15.05.2017	0,11	<1,5	<0,02	<0,03
AK-18 (704 km)	07.06.2017	0,38	<1,5	<0,02	<0,03
AK-21 (714 km)	28.03.2017	0,30	<1,5	<0,02	<0,025
AK-21 (714 km)	19.04.2017	0,26	<1,5	<0,02	<0,03
AK-21 (714 km)	15.05.2017	0,11	<1,5	<0,02	<0,03
AK-21 (714 km)	07.06.2017	0,43	<1,5	<0,02	<0,03

AK-22 (724 km)	28.03.2017	0,32	1,58	<0,02	<0,025
AK-22 (724 km)	19.04.2017	0,14	<1,5	<0,02	<0,03
AK-22 (724 km)	15.05.2017	0,17	<1,5	<0,02	<0,03
AK-22 (724 km)	07.06.2017	0,44	<1,5	<0,02	<0,03
AK-27 (734 km)	29.03.2017	0,31	<1,5	<0,02	<0,025
AK-27 (734 km)	20.04.2017	0,29	<1,5	<0,02	<0,03
AK-27 (734 km)	15.05.2017	0,19	<1,5	<0,02	<0,03
AK-27 (734 km)	08.06.2017	0,31	<1,5	<0,02	<0,03
AK-29 (744 km)	29.03.2017	0,30	1,78	<0,02	<0,025
AK-29 (744 km)	20.04.2017	0,14	1,50	<0,02	<0,03
AK-29 (744 km)	15.05.2017	0,2	<1,5	<0,02	<0,03
AK-29 (744 km)	08.06.2017	0,04	<1,5	<0,02	<0,03
AK-30 (754 km)	29.03.2017	0,34	2,01	<0,02	<0,025
AK-30 (754 km)	20.04.2017	0,16	1,93	<0,02	<0,03
AK-30 (754 km)	15.05.2017	0,11	<1,5	<0,02	<0,03
AK-30 (754 km)	08.06.2017	0,08	<1,5	<0,02	<0,03
AK-31 (764 km)	29.03.2017	0,31	1,97	<0,02	<0,025
AK-31 (764 km)	20.04.2017	0,21	1,8	<0,02	<0,03
AK-31 (764 km)	15.05.2017	0,21	<1,5	<0,02	<0,03
AK-31 (764 km)	08.06.2017	0,36	<1,5	<0,02	<0,03
AK-33 (774 km)	29.03.2017	0,31	2,48	<0,02	<0,025
AK-33 (774 km)	20.04.2017	0,45	1,91	<0,02	<0,03
AK-33 (774 km)	15.05.2017	0,19	<1,5	<0,02	<0,03
AK-33 (774 km)	08.06.2017	0,34	<1,5	<0,02	<0,03
AK-34 (784 km)	29.03.2017	0,35	2,48	<0,02	<0,025
AK-34 (784 km)	20.04.2017	0,31	1,96	<0,02	<0,03
AK-34 (784 km)	15.05.2017	0,15	<1,5	<0,02	<0,03
AK-34 (784 km)	08.06.2017	0,35	<1,5	<0,02	<0,03
Basis values	**Average**	**0,28**	**1,93**	**0**	**0,0002**
	Minimum	**0,24**	**1,5**	**0**	**0**
	Maximum	0,34	2,48	0	0,00071
For 1 half of 2017	**Average**	**0,25**	**2,6**	**< 0,02**	*
	Minimum	**0,04**	**< 1,5**	**< 0,02**	**< 0,025**
	Maximum	**0,45**	**4,2**	**< 0,02**	**< 0,03**

SHETPE CAMP (657 KM)					
AK-10	28.03.2017	0,30	<1,5	<0,02	<0,025
AK-10	19.04.2017	0,28	<1,5	<0,02	<0,03
AK-10	15.05.2017	0,24	<1,5	<0,02	<0,03
AK-10	07.06.2017	0,29	<1,5	<0,02	<0,03

AK-11	28.03.2017	0,30	<1,5	<0,02	<0,025
AK-11	19.04.2017	0,12	<1,5	<0,02	<0,03
AK-11	15.05.2017	0,09	<1,5	<0,02	<0,03
AK-11	07.06.2017	0,33	<1,5	<0,02	<0,03
AK-12	28.03.2017	0,29	2,03	<0,02	<0,025
AK-12	19.04.2017	0,44	<1,5	<0,02	<0,03
AK-12	15.05.2017	0,22	<1,5	<0,02	<0,03
AK-12	07.06.2017	0,41	<1,5	<0,02	<0,03
AK-13	28.03.2017	0,31	1,86	<0,02	<0,025
AK-13	19.04.2017	0,26	<1,5	<0,02	<0,03
AK-13	15.05.2017	0,09	<1,5	<0,02	<0,03
AK-13	07.06.2017	0,43	<1,5	<0,02	<0,03
Basis values	**Average**	**0,26**	**1,74**	**0**	**0,0004**
	Minimum	**0,24**	**1,58**	**0**	**0**
	Maximum	**0,29**	**1,98**	**0**	**0,0011**
For 1 half of 2017	**Average**	**0,28**	**1,94**	**< 0,02**	*
	Minimum	**0,09**	**< 1,5**	**< 0,02**	**< 0,025**
	Maximum	**0,44**	**2,03**	**< 0,02**	**< 0,03**

ZHETYBAY CAMP (ENTRANCE AND ROAD OUT)					
AK-19 (707 km)	28.03.2017	0,30	<1,5	<0,02	<0,025
AK-19 (707 km)	19.04.2017	0,23	<1,5	<0,02	<0,03
AK-19 (707 km)	15.05.2017	0,13	<1,5	<0,02	<0,03
AK-19 (707 km)	07.06.2017	0,14	<1,5	<0,02	<0,03
AK-20 (713 km)	28.03.2017	0,33	1,56	<0,02	<0,025
AK-20 (713 km)	19.04.2017	0,12	<1,5	<0,02	<0,03
AK-20 (713 km)	15.05.2017	0,17	<1,5	<0,02	<0,03
AK-20 (713 km)	07.06.2017	0,26	<1,5	<0,02	<0,03
Basis values	**Average**	**0,26**	**2,27**	**0**	**0,00063**
	Minimum	**0,25**	**2,2**	**0**	**0,00042**
	Maximum	**0,27**	**2,34**	**0**	**0,00084**
For 1 half of 2017	**Average**	**0,21**	**1,56**	**< 0,02**	*
	Minimum	**0,12**	**< 1,5**	**< 0,02**	**< 0,025**
	Maximum	**0,33**	**1,56**	**< 0,02**	**< 0,03**

ZHETYBAY CAMP (713 KM)					
AK-23	29.03.2017	0,32	1,93	<0,02	<0,025
AK-23	20.04.2017	0,16	<1,5	<0,02	<0,03
AK-23	15.05.2017	0,22	<1,5	<0,02	<0,03
AK-23	08.06.2017	0,35	<1,5	<0,02	<0,03
AK-24	29.03.2017	0,30	2,01	<0,02	<0,025
AK-24	20.04.2017	0,12	<1,5	<0,02	<0,03

АК-24	15.05.2017	0,14	<1,5	<0,02	<0,03
АК-24	08.06.2017	0,24	<1,5	<0,02	<0,03
АК-25	29.03.2017	0,31	1,62	<0,02	<0,025
АК-25	20.04.2017	0,16	1,7	<0,02	<0,03
АК-25	15.05.2017	0,16	<1,5	<0,02	<0,03
АК-25	08.06.2017	0,27	<1,5	<0,02	<0,03
АК-26	29.03.2017	0,30	<1,5	<0,02	<0,025
АК-26	20.04.2017	0,17	<1,5	<0,02	<0,03
АК-26	15.05.2017	0,23	<1,5	<0,02	<0,03
АК-26	08.06.2017	0,4	<1,5	<0,02	<0,03
Basis values	**Average**	**0,285**	**2,53**	**0**	**0**
	Minimum	**0,26**	**2,42**	**0**	**0**
	Maximum	**0,31**	**2,72**	**0**	**0,00042**
For 1 half of 2017	**Average**	**0,24**	**1,81**	**< 0,02**	*
	Minimum	**0,12**	**<1,5**	**< 0,02**	**< 0,025**
	Maximum	**0,4**	**2,01**	**< 0,02**	**< 0,03**

NATURE-SANCTUARY BORDER (ENTRANCE AND ROAD OUT)					
АК-28 (739 km)	29.03.2017	0,32	<1,5	<0,02	<0,025
АК-28 (739 km)	20.04.2017	0,39	<1,5	<0,02	<0,03
АК-28 (739 km)	15.05.2017	0,13	<1,5	<0,02	<0,03
АК-28 (739 km)	08.06.2017	0,41	<1,5	<0,02	<0,03
АК-32 (771 km)	29.03.2017	0,35	2,76	<0,02	<0,025
АК-32 (771 km)	20.04.2017	0,4	1,7	<0,02	<0,03
АК-32 (771 km)	15.05.2017	0,14	<1,5	<0,02	<0,03
АК-32 (771 km)	08.06.2017	0,13	<1,5	<0,02	<0,03
Basis values	**Average**	0,29	2,42	< 0,02	< 0,025
	Minimum	0,25	2,33	< 0,02	< 0,025
	Maximum	0,33	2,51	< 0,02	< 0,025
For 1 half of 2017	**Average**	0,28	2,23	< 0,02	*
	Minimum	0,13	<1,5	< 0,02	< 0,025
	Maximum	0,41	2,76	< 0,02	< 0,03

Soil quality monitoring

Monitoring of the soil involves determining the concentration of pollutants in the zone of active influence. The most accurate estimate of the impact on soil quality are direct measurements of pollutants. For this purpose, under the contract with the Contractor specialized accredited environmental laboratory JSC "Aktobe plant of chromium compounds" for first half of 2017 monitored the construction site soil. Sampling points and frequency defined in the monitoring program, which is a mandatory attachment to PEMP. Total for reporting period 108 samplings were selected in 27 sampling points. The samples were not taken due to reduction of scope of work on construction site during January and February 2017.

In March 2015, conducted the basic measurements of soil samples (Minutes № 3 of March 13, 2015). The samples were compared: for plumbum with normative values - MPC maximum permissible

concentrations established by regulatory requirements of the Republic of Kazakhstan. In the absence of regulations in the Republic of Kazakhstan standards values for other substances, to assess the impact adopted common values of zinc 23 mg / kg for cadmium 0.5 - the average content in soils of the world, for oil products standards have not been established, so the comparison was carried out between the average values of the base values in samples collected in March, with average values obtained during the observation period March-November 2015.

In the table below, the observations for 1 half of 2017 are grouped as follows: road every 10 km - 15 control points, Shetpe camp - 4 control points, Zhetybay camp - 4 control points, border of village Zhetybay - 2 control points, border of state reserve - 2 control points. Also in the table for comparison presented average, minimum and maximum values for basic measurements (March 2015) and the average, minimum and maximum values for the entire observation period (March-November 2015).

ROAD. Averages baseline measurement (March 2015) of this section are as follows: 0,017mg/kg for petrochemicals; 0,43 for cadmium of average content in the soils of the world; 0,37MPC for plumbum; 0,73MPC for zinc.

Maximum basic measurements are as follows: 0,052 mg/kg for petrochemicals; 0,905 for cadmium in the normal range of the average content in soils of the world; 0,905MPC for plumbum; 0,85MPC for zinc.

The values are 0,027mg/kg for petrochemicals; 0,32 for cadmium on average content in the soils of the world; 0,19MPC for plumbum; 0,78MPC for zinc due to the monitoring results for 1 half of 2017. Maximum values for 1 half of 2017 are 0,019mg/kg for petrochemicals; for cadmium in the normal range of the average content in soils of the world; 0,31MPC for plumbum; 0,88MPC for zinc.

Comparison of the average baseline results with the average for the entire observation period showed a slight increase in zinc. The exceeding of any controlled substances was not found in this area.

SHETPE CAMP (657 KM). Averages baseline measurement (March 2015) of this section are as follows: 0,0007mg/kg for petrochemicals; 0,423 for cadmium of average content in the soils of the world; 0,25MPC for plumbum; 0,77MPC for zinc.

Maximum basic measurements are as follows: 0,009 mg/kg for petrochemicals; 0,62 for cadmium in the normal range of the average content in soils of the world; 0,3MPC for plumbum; 0,86MPC for zinc.

The values are 0,01mg/kg for petrochemicals; 0,34 for cadmium on average content in the soils of the world; 0,17MPC for plumbum; 0,56MPC for zinc due to the monitoring results for 1 half of 2017. Maximum values for 1 half of 2017 are 0,016mg/kg for petrochemicals; 0,52 for cadmium in the normal range of the average content in soils of the world; 0,32MPC for plumbum; 0,85MPC for zinc.

Comparison of the average baseline results with the average data for the entire observation period did not differ from each other. The exceeding of any controlled substances was not found in this area.

ZHETYBAY VILLAGE (ENTRANCE AND ROAD OUT). Averages baseline measurement (March 2015) of this section are as follows: 0,0022mg/kg for petrochemicals; 0,4 for cadmium of average content in the soils of the world; 0,34MPC for plumbum; 0,74MPC for zinc.

Maximum basic measurements are as follows: 0,032 mg/kg for petrochemicals; 0,4 for cadmium in the normal range of the average content in soils of the world; 0,36MPC for plumbum; 0,84 MPC for zinc.

The values are 0,013mg/kg for petrochemicals; 0,34 for cadmium on average content in the soils of the world; 0,223MPC for plumbum; 0,78MPC for zinc due to the monitoring results for 1 half of 2017. Maximum values for 1 half of 2017 are 0,021mg/kg for petrochemicals; 0,4 for cadmium in the normal range of the average content in soils of the world; 0,33MPC for plumbum; 0,86MPC for zinc.

Comparison of the average baseline results with the average data for the entire observation period did not differ from each other. The exceeding of any controlled substances was not found in this area.

ZHETYBAY CAMP (730 KM). Averages baseline measurement (March 2015) of this section are as follows: 0,0065mg/kg for petrochemicals; 0,37 for cadmium of average content in the soils of the world; 0,35MPC for plumbum; 0,72MPC for zinc.

Maximum basic measurements are as follows: 0,011 mg/kg for petrochemicals; 0,54 for cadmium in the normal range of the average content in soils of the world; 0,67MPC for plumbum; 0,85 MPC for zinc.

The values are 0,009mg/kg for petrochemicals; 0,32 for cadmium on average content in the soils of the world; 0,18MPC for plumbum; 0,77MPC for zinc due to the monitoring results for 1 half of 2017. Maximum values for 1 half of 2017 are 0,015mg/kg for petrochemicals; 0,88 for cadmium in the normal range of the average content in soils of the world; 0,25MPC for plumbum; 0,82MPC for zinc.

Comparison of average basis results with average data for whole observation period showed the slight increase of petrochemicals. The exceeding of any controlled substances was not found in this area.

NATURE-SANCTUARY (ENTRANCE AND ROAD OUT). Averages baseline measurement (March 2015) of this section are as follows: 0,0012mg/kg for petrochemicals; 0,81 for cadmium of average content in the soils of the world; 0,61MPC for plumbum; 0,83MPC for zinc.

Maximum basic measurements are as follows: 0,013 mg/kg for petrochemicals; 0,98 for cadmium in the normal range of the average content in soils of the world; 0,91MPC for plumbum; 0,87 MPC for zinc.

The values are 0,01mg/kg for petrochemicals; 0,41 for cadmium on average content in the soils of the world; 0,18MPC for plumbum; 0,76MPC for zinc due to the monitoring results for 1 half of 2017. Maximum values for 1 half of 2017 are 0,015mg/kg for petrochemicals; 0,64 for cadmium in the normal range of the average content in soils of the world; 0,24MPC for plumbum; 0,80MPC for zinc.

Comparison of average basis results with average data for whole observation period showed the slight increase of petrochemicals. The exceeding of any controlled substances was not found in this area.

Table 3.6

Sampling points characteristics		The harmful substances concentration				
Description	Sampling date	pH	Petrochemicals, mg/g	Cadmium, mg/kg	Plumbum, mg/kg	Zinc, mg/kg
		MPC values				
		-	-	0,5	32	23
ROAD						
AK-8 (645 km)	28.03.2017	8,4	0,007	0,07	6,0	17,22
AK-8 (645 km)	19.04.2017	8,3	0,008	0,05	4,21	18,5
AK-8 (645 km)	15.05.2017	8,4	0,006	0,048	4,28	17,98
AK-8 (645 km)	07.06.2017	8,2	< 0,005	0,055	4,32	18,2
AK-9 (654 km)	28.03.2017	8,4	0,024	0,06	7,05	18,55
AK-9 (654 km)	19.04.2017	8,3	0,013	0,08	5,01	18,03
AK-9 (654 km)	15.05.2017	8,3	0,011	0,07	4,81	17,54
AK-9 (654 km)	07.06.2017	8,4	0,014	0,075	4,67	17,95
AK-14 (664 km)	28.03.2017	8,5	0,018	0,17	8,06	18,49
AK-14 (664 km)	19.04.2017	8,4	0,012	0,23	7,84	18,22

AK-14 (664 km)	15.05.2017	8,4	0,011	0,11	5,2	18,55
AK-14 (664 km)	07.06.2017	8,2	0,009	0,18	4,8	18,1
AK-15 (674 km)	28.03.2017	8,5	0,04	0,18	4,21	18,03
AK-15 (674 km)	19.04.2017	8,5	0,032	0,12	3,41	17,95
AK-15 (674 km)	15.05.2017	8,4	0,022	0,13	3,89	18,4
AK-15 (674 km)	07.06.2017	8	0,015	0,17	4,01	18,5
AK-16 (684 km)	28.03.2017	8,4	0,10	0,11	7,11	18,08
AK-16 (684 km)	19.04.2017	8,5	0,086	0,12	7,55	17,64
AK-16 (684 km)	15.05.2017	8,3	0,08	0,07	6,52	17,66
AK-16 (684 km)	07.06.2017	8,5	0,095	0,1	8,63	18,11
AK-17 (694 km)	28.03.2017	8,6	0,011	0,14	8,5	18,19
AK-17 (694 km)	19.04.2017	8,5	0,012	0,12	5,88	17,89
AK-17 (694 km)	15.05.2017	8,3	0,02	0,34	7,24	17,46
AK-17 (694 km)	07.06.2017	8	0,018	0,3	5,57	18,1
AK-18 (704 km)	28.03.2017	8,5	0,019	0,15	8,30	19,97
AK-18 (704 km)	19.04.2017	8,5	0,017	0,11	5,61	18,94
AK-18 (704 km)	15.05.2017	8,4	0,019	0,1	2,87	20,19
AK-18 (704 km)	07.06.2017	8	0,01	0,18	2,44	19,54
AK-21 (714 km)	28.03.2017	8,5	0,016	0,09	8,22	17,69
AK-21 (714 km)	19.04.2017	8,4	0,011	0,012	6,1	17,38
AK-21 (714 km)	15.05.2017	8,5	0,01	0,1	4,67	18,02
AK-21 (714 km)	07.06.2017	8,5	0,013	0,09	7,71	17,55
AK-22 (724 km)	28.03.2017	8,4	0,008	0,20	6,00	18,15
AK-22 (724 km)	19.04.2017	8,4	0,009	0,21	6,98	18,65
AK-22 (724 km)	15.05.2017	8,4	0,011	0,23	5	17,25
AK-22 (724 km)	07.06.2017	8	0,01	0,16	3,35	18,2
AK-27 (734 km)	29.03.2017	8,5	0,009	0,12	5,0	17,84
AK-27 (734 km)	20.04.2017	8,4	<0,005	0,15	6,65	17,87
AK-27 (734 km)	15.05.2017	8,4	<0,005	0,11	6,08	18,59
AK-27 (734 km)	08.06.2017	8,4	0,005	0,16	6,12	18,11
AK-29 (744 km)	29.03.2017	8,3	0,01	0,16	5,03	17,58
AK-29 (744 km)	20.04.2017	8,3	<0,005	0,19	4,01	18,01
AK-29 (744 km)	15.05.2017	8,4	<0,005	0,25	5,36	17,87
AK-29 (744 km)	08.06.2017	8,2	0,007	0,15	4,68	17,2
AK-30 (754 km)	29.03.2017	8,1	0,12	0,26	9,87	18,72
AK-30 (754 km)	20.04.2017	8	0,1	0,22	6,81	18,02
AK-30 (754 km)	15.05.2017	8,1	0,08	0,18	6	17,41
AK-30 (754 km)	08.06.2017	7,9	0,19	0,29	8,4	17,99
AK-31 (764 km)	29.03.2017	8,4	0,012	0,20	9,0	18,05
AK-31 (764 km)	20.04.2017	8,2	0,009	0,38	5,99	17,32

AK-31 (764 km)	15.05.2017	8,2	0,012	0,29	5,02	18,74
AK-31 (764 km)	08.06.2017	8,2	0,012	0,22	5,21	18,1
AK-33 (774 km)	29.03.2017	8,5	0,015	0,25	8,51	17,35
AK-33 (774 km)	20.04.2017	8,4	0,017	0,22	7,41	17,18
AK-33 (774 km)	15.05.2017	8,3	0,012	0,18	6,35	17,77
AK-33 (774 km)	08.06.2017	8,3	0,013	0,24	5,15	17,5
AK-34 (784 km)	29.03.2017	8,4	0,010	0,22	8,09	17,67
AK-34 (784 km)	20.04.2017	8,4	0,011	0,15	7	18,07
AK-34 (784 km)	15.05.2017	8,3	0,009	0,19	6,31	17,58
AK-34 (784 km)	08.06.2017	8,4	0,011	0,23	6,35	17,2
Basis values	**Average**	**8,29**	**0,017**	**0,214**	**11,8**	**16,9**
	Minimum	**7,9**	**0,003**	**0,1**	**7,54**	**11,54**
	Maximum	**8,9**	**0,052**	**0,5**	**28,97**	**19,48**
For 1 half of 2017	**Average**	**8,3**	**0,027**	**0,16**	**6**	**18,04**
	Minimum	**7,9**	**<0,005**	**0,012**	**2,44**	**17,18**
	Average	**8,6**	**0,19**	**0,38**	**9,87**	**20,19**

Sampling points characteristics		**The harmful substances concentration**				
Description	**Sampling date**	**pH**	**Petrochemicals, mg/g**	**Cadmium, mg/kg**	**Plumbum, mg/kg**	**Zinc, mg/kg**
		MPC values				
		-	**-**	**0,5**	**32**	**23**
SHETPE CAMP (657 KM)						
AK-10	28.03.2017	8,5	0,01	0,17	5,15	18,91
AK-10	19.04.2017	8,5	0,012	0,23	3,05	18,15
AK-10	15.05.2017	8,4	0,011	0,21	2,95	18,01
AK-10	07.06.2017	8,1	0,015	0,22	3,37	18,34
AK-11	28.03.2017	8,4	0,015	0,13	7,23	18,33
AK-11	19.04.2017	8,4	0,014	0,15	5,7	16,48
AK-11	15.05.2017	8,4	0,01	0,11	4,72	15,54
AK-11	07.06.2017	8,4	0,01	0,12	7,4	16,95
AK-12	28.03.2017	8,5	0,011	0,10	6,82	18,56
AK-12	19.04.2017	8,4	0,013	0,12	5,01	17,84
AK-12	15.05.2017	8,5	0,006	0,11	6,24	17,22
AK-12	07.06.2017	8,4	< 0,005	0,12	6,01	17,95
AK-13	28.03.2017	8,5	0,012	0,25	7,00	19,61
AK-13	19.04.2017	8,3	0,016	0,24	6,56	18,64
AK-13	15.05.2017	8,5	0,006	0,22	4,81	17,55
AK-13	07.06.2017	8,6	0,005	0,26	5,57	18,01
Basis values	**Average**	**8,2**	**0,007**	**0,212**	**8,04**	**17,7**

	Minimum	**8,2**	**0,006**	**0,16**	**7,09**	**15,01**
	Maximum	**8,2**	**0,009**	**0,31**	**9,47**	**19,82**
For 1 half of 2017	**Average**	**8,42**	**0,01**	**0,17**	**5,47**	**17,88**
	Minimum	**8,1**	**< 0,005**	**0,1**	**2,94**	**15,54**
	Maximum	**8,6**	**0,016**	**0,26**	**7,4**	**19,61**

Sampling points characteristics		**The harmful substances concentration**				
Description	**Sampling date**	**pH**	**Petrochemicals, mg/g**	**Cadmium, mg/kg**	**Plumbum, mg/kg**	**Zinc, mg/kg**
		MPC values				
		-	**-**	**0,5**	**32**	**23**
ZHETYBAY VILLAGE (ENTRANCE AND ROAD OUT)						
АК-19 (707 km)	28.03.2017	8,4	0,015	0,15	6,01	17,05
АК-19	19.04.2017	8,3	0,011	0,18	4,91	17,69
АК-19 (707 km)	15.05.2017	8,3	0,006	0,175	4,76	17,95
АК-19 (707 km)	07.06.2017	8,1	< 0,005	0,16	5,5	17,31
АК-20 (713 km)	28.03.2017	8,5	0,015	0,15	9,18	19,69
АК-20	19.04.2017	8,3	0,012	0,17	7,88	17,41
АК-20 (713 km)	15.05.2017	8,5	0,015	0,2	6,31	17,9
АК-20 (713 km)	07.06.2017	8,7	0,021	0,19	10,71	18,5
Basis values	**Average**	**8,15**	**0,022**	**0,2**	**10,72**	**17,03**
	Minimum	**8,1**	**0,012**	**0,19**	**9,89**	**14,63**
	Maximum	**8,2**	**0,032**	**0,21**	**11,55**	**19,42**
For 1 half of 2017	**Average**	**8,38**	**0,013**	**0,17**	**6,9**	**17,93**
	Minimum	**8,1**	**< 0,005**	**0,15**	**4,76**	**17,05**
	Maximum	**8,7**	**0,021**	**0,2**	**10,71**	**19,69**

Sampling points characteristics		**The harmful substances concentration**				
Description	**Sampling date**	**pH**	**Petrochemicals, mg/g**	**Cadmium, mg/kg**	**Plumbum, mg/kg**	**Zinc, mg/kg**
		MPC values				
		-	**-**	**0,5**	**32**	**23**
ZHETYBAY CAMP (730 KM)						
АК-23	29.03.2017	8,3	0,011	0,17	8,02	17,08
АК-23	20.04.2017	8,3	< 0,005	0,16	5,46	17,65
АК-23	15.05.2017	8,3	< 0,005	0,19	6,38	18
АК-23	08.06.2017	8,1	< 0,005	0,18	4,25	17,9
АК-24	29.03.2017	8,5	0,009	0,10	4,73	17,39
АК-24	20.04.2017	8,3	<0,005	0,11	6,65	18,54
АК-24	15.05.2017	8,4	0,007	0,15	6,95	18,88

AK-24	08.06.2017	8,2	< 0,005	0,12	4,08	18,2
AK-25	29.03.2017	8,3	0,011	0,11	7,0	17,06
AK-25	20.04.2017	8,4	0,01	0,14	5,05	17,65
AK-25	15.05.2017	8,2	0,012	0,17	4,36	17,6
AK-25	08.06.2017	8,4	0,01	0,12	5,02	17,22
AK-26	29.03.2017	8,4	0,015	0,15	6,91	17,65
AK-26	20.04.2017	8,4	0,006	0,17	4,67	17,22
AK-26	15.05.2017	8,4	0,005	0,11	6,38	18,09
AK-26	08.06.2017	8,2	0,007	0,44	5,19	18,78
Basis values	**Average**	**8,22**	**0,0065**	**0,185**	**11,2**	**16,6**
	Minimum	**8,1**	**0,004**	**0,08**	**7,13**	**13,4**
	Maximum	**8,4**	**0,011**	**0,25**	**21,45**	**19,61**
For 1 half of 2017	**Average**	**8,31**	**0,009**	**0,16**	**5,69**	**17,8**
	Minimum	**8,1**	**< 0,005**	**0,1**	**4,08**	**17,06**
	Maximum	**8,5**	**0,015**	**0,44**	**8,02**	**18,88**

Sampling points characteristics		**The harmful substances concentration**				
Description	**Sampling date**	**pH**	**Petrochemicals, mg/g**	**Cadmium, mg/kg**	**Plumbum, mg/kg**	**Zinc, mg/kg**
		MPC values				
		-	**-**	**0,5**	**32**	**23**
NATURE-SANCTUARY BORDER (EENTRANCE AND ROAD OUT)						
AK-28	29.03.2017	8,3	0,012	0,15	5,99	17,54
AK-28	20.04.2017	8,4	0,009	0,14	6,68	17,66
AK-28 (739 km)	15.05.2017	8,4	0,015	0,19	5,97	18,47
AK-28 (739 km)	08.06.2017	8,1	< 0,005	0,1	4,14	17,2
AK-32	29.03.2017	8,3	0,010	0,21	7,81	17,35
AK-32	20.04.2017	8,2	<0,005	0,26	5,02	17,07
AK-32 (771 km)	15.05.2017	8,3	<0,005	0,32	4,55	17,91
AK-32 (771 km)	08.06.2017	8	0,006	0,28	5,65	17,2
Basis values	**Average**	**8**	**0,012**	**0,405**	**19,5**	**19,03**
	Minimum	**7,9**	**0,011**	**0,32**	**9,96**	**18,06**
	Maximum	**8,1**	**0,013**	**0,49**	**29,03**	**20**
For 1 half of 2017	**Average**	**8,25**	**0,01**	**0,206**	**5,72**	**17,55**
	Minimum	**8**	**<0,005**	**0,1**	**4,14**	**17,07**
	Maximum	**8,4**	**0,015**	**0,32**	**7,81**	**18,47**

Noise and vibration

The noise and vibration samplings were being taken monthly: on entrance to and exit from Shetpe village, on Shetpe Camp, on entrance to and exit from Zhetybay village, on Zhetybay Camp, on reservation borders.

The noise and vibration sampling were being taken in March 2015 to control the impact level (protocol №102 dated 24.11.2015). Since July 2015 by the recommendation of an international specialist of Environmental Protection CCS the noise and vibration samplings were being taken in three poles: minimum, maximum and equivalent.

NOISE

ENTRANCE TO AND ROAD OUT SHETPE VILLAGE. Averages baseline noise measurement (April 2015) of this section are as follows: 61dBa; the maximum basic measurements were 68dBa at the rate of 80dBa.

The obtained average equivalent value was 53dBa, the maximum equivalent value at the average data was 58dBa due to the monitoring results for 1 half of 2017.

The noise increasing was not found on this area.

SHETPE CAMP (657 KM). Averages baseline noise measurement (April 2015) of this section are as follows: 66dBa; the maximum basic measurements were 70dBa at the rate of 80dBa.

The obtained average equivalent value was 58dBa, the maximum equivalent value at the average data was 66dBa due to the monitoring results for 1 half of 2017.

The noise increasing was not found on this area.

ENTRANCE TO AND ROAD OUT ZHETYBAY VILLAGE. Averages baseline noise measurement (April 2015) of this section are as follows: 66dBa; the maximum basic measurements were 70dBa at the rate of 80dBa.

The obtained average equivalent value was 60dBa, the maximum equivalent value at the average data was 64dBa due to the monitoring results for 1 half of 2017.

The noise increasing was not found on this area.

ZHETYBAY CAMP (730 KM). Averages baseline noise measurement (April 2015) of this section are as follows: 66dBa; the maximum basic measurements were 72dBa at the rate of 80dBa.

The obtained average equivalent value was 61dBa, the maximum equivalent value at the average data was 72dBa due to the monitoring results for 1 half of 2017.

The noise increasing was not found on this area.

NATURE-SANCTUARY BORDER. Averages baseline noise measurement (April 2015) of this section are as follows: 59dBa; the maximum basic measurements were 60dBa at the rate of 80dBa.

The obtained average equivalent value was 57dBa, the maximum equivalent value at the average data was 62dBa due to the monitoring results for 1 half of 2017.

The noise increasing was not found on this area.

Table 3.7

NOISE

Sampling point	Sampling date	Noise, dBa		
		Equivalent	Maximum	Minimum
		Standard value, 80		
ENTRANCE TO AND ROAD OUT SHETPE VILLAGE				

AK-2 (636 km, entrance to Shetpe village)	28.03.2017	56	66	48
AK-2 (636 km, entrance to Shetpe village)	19.04.2017	48	56	36
AK-2 (636 km, entrance to Shetpe village)	15.05.2017	50	60	40
AK-2 (636 km, entrance to Shetpe village)	07.06.2017	54	64	44
AK-8 (645 km, road out Shetpe village)	28.03.2017	56	66	46
AK-8 (645 km, road out Shetpe village)	19.04.2017	50	58	38
AK-8 (645 km, road out Shetpe village)	15.05.2017	52	60	40
AK-8 (645 km, road out Shetpe village)	07.06.2017	58	66	46
Basis values	**Average**	**61**	*	*
	Minimum	**54**	*	*
	Maximum	**68**	*	*
For 1 half of 2017	**Average**	**53**	**62**	**42**
	Minimum	**48**	**56**	**36**
	Maximum	**58**	**66**	**48**

SHETPE CAMP (657 KM)				
AK-10	28.03.2017	60	70	50
AK-10	19.04.2017	56	62	44
AK-10	15.05.2017	52	60	40
AK-10	07.06.2017	56	64	44
AK-11	28.03.2017	58	68	48
AK-11	19.04.2017	58	64	46
AK-11	15.05.2017	54	60	42
AK-11	07.06.2017	62	68	50
AK-12	28.03.2017	54	66	44
AK-12	19.04.2017	60	68	50
AK-12	15.05.2017	62	70	52
AK-12	07.06.2017	66	74	56
AK-13	28.03.2017	50	64	42
AK-13	19.04.2017	58	66	46
AK-13	15.05.2017	60	68	48
AK-13	07.06.2017	64	72	52
Basis values	**Average**	66	*	*
	Minimum	62	*	*
	Maximum	70	*	*

For 1 half of 2017	**Average**	58	66	47
	Minimum	50	60	40
	Maximum	66	74	56
ENTRANCE TO AND ROAD OUT ZHETYBAY VILLAGE				
AK-19 (707 km, entrance to Zhetybay village)	28.03.2017	60	74	54
AK-19 (707 km, entrance to Zhetybay village)	19.04.2017	56	70	50
AK-19 (707 km, entrance to Zhetybay village)	15.05.2017	60	68	50
AK-19 (707 km, entrance to Zhetybay village)	07.06.2017	62	70	52
AK-20 (713 km, entrance to Zhetybay village)	28.03.2017	60	76	54
AK-20 (713 km, entrance to Zhetybay village)	19.04.2017	58	72	50
AK-20 (713 km, entrance to Zhetybay village)	15.05.2017	64	70	58
AK-20 (713 km, entrance to Zhetybay village)	07.06.2017	58	68	50
Basis values	**Average**	**69**	*	*
	Minimum	**68**	*	*
	Maximum	**70**	*	*
For 1 half of 2017	**Average**	**60**	**71**	**52**
	Minimum	**56**	**68**	**50**
	Maximum	**64**	**76**	**58**

ZHETYBAY CAMP (730 KM)				
AK-23	29.03.2017	56	74	50
AK-23	20.04.2017	54	70	48
AK-23	15.05.2017	60	66	50
AK-23	08.06.2017	50	52	40
AK-24	29.03.2017	58	74	54
AK-24	20.04.2017	54	72	48
AK-24	15.05.2017	64	70	54
AK-24	08.06.2017	54	66	44
AK-25	29.03.2017	72	78	68
AK-25	20.04.2017	68	74	64
AK-25	15.05.2017	66	72	60
AK-25	08.06.2017	60	74	50
AK-26	29.03.2017	66	74	62

AK-26	20.04.2017	64	72	60
AK-26	15.05.2017	62	70	58
AK-26	08.06.2017	62	76	54
Basis values	**Average**	**66**	*	*
	Minimum	**58**	*	*
	Maximum	**72**	*	*
For 1 half of 2017	**Average**	**61**	**71**	**54**
	Minimum	**50**	**52**	**40**
	Maximum	**72**	**78**	**68**

NATURE-SANCTUARY BORDER				
AK-28 (739 km, nature-sanctuary border)	29.03.2017	54	64	50
AK-28 (739 km, nature-sanctuary border)	20.04.2017	52	62	48
AK-28 (739 km, nature-sanctuary border)	15.05.2017	54	64	50
AK-28 (739 km, nature-sanctuary border)	08.06.2017	56	70	46
AK-32 (771 km, nature-sanctuary border)	29.03.2017	62	76	60
AK-32 (771 km, nature-sanctuary border)	20.04.2017	60	74	58
AK-32 (771 km, nature-sanctuary border)	15.05.2017	58	72	56
AK-32 (771 km, nature-sanctuary border)	08.06.2017	58	68	54
Basis values	**Average**	59	*	*
	Minimum	58	*	*
	Maximum	60	*	*
For 1 half of 2017	**Average**	57	69	53
	Minimum	52	62	46
	Maximum	62	76	60

VIBRATION

ENTRANCE TO AND ROAD OUT SHETPE VILLAGE. Averages baseline vibration measurement (April 2015) of this section are as follows: 59dBa; the maximum basic measurements were 60dBa at the rate of 100dBa.

The obtained average equivalent value was 62 dB, the maximum equivalent value at the average data was 66 dB due to the monitoring results for 1 half of 2017.

The vibration increasing was not found on this area.

SHETPE CAMP (657 KM). Averages baseline vibration measurement (April 2015) of this section are as follows: 63 dB; the maximum basic measurements were 65 dB at the rate of 100dBa.

The obtained average equivalent value was 66 dB, the maximum equivalent value at the average data was 72 dB due to the monitoring results for 1 half of 2017.

The vibration increasing was not found on this area.

ENTRANCE TO AND ROAD OUT ZHETYBAY VILLAGE. Averages baseline vibration measurement (April 2015) of this section are as follows: 67 dB; the maximum basic measurements were 68 dB at the rate of 100dBa.

The obtained average equivalent value was 71 dB, the maximum equivalent value at the average data was 80 dB due to the monitoring results for 1 half of 2017.

The vibration increasing was not found on this area.

ZHETYBAY CAMP (730 KM). Averages baseline vibration measurement (April 2015) of this section are as follows: 66 dB; the maximum basic measurements were 70 dB at the rate of 100dBa.

The obtained average equivalent value was 72 dB, the maximum equivalent value at the average data was 80 dB due to the monitoring results for 1 half of 2017.

The vibration increasing was not found on this area.

NATURE-SANCTUARY BORDER. Averages baseline vibration measurement (April 2015) of this section are as follows: 53 dB; the maximum basic measurements were 54 dB at the rate of 100dBa.

The obtained average equivalent value was 73 dB, the maximum equivalent value at the average data was 76 dB due to the monitoring results for 1 half of 2017.

The vibration increasing was not found on this area.

Таблица 3.8

Sampling point	Sampling date	Vibration, dB		
		Equivalent	Maximum	Minimum
		Standard value, 100		
ENTRANCE TO AND ROAD OUT SHETPE VILLAGE				
AK-2 (636 km, entrance to Shetpe)	28.03.2017	66	85	64
AK-2 (636 km, entrance to Shetpe)	19.04.2017	60	66	54
AK-2 (636 km, entrance to Shetpe)	15.05.2017	62	68	56
AK-2 (636 km, entrance to Shetpe)	07.06.2017	66	72	60
AK-8 (645 km, road to Shetpe)	28.03.2017	64	70	58
AK-8 (645 km, road to Shetpe)	19.04.2017	56	62	52
AK-8 (645 km, road to Shetpe)	15.05.2017	58	64	54
AK-8 (645 km, road to Shetpe)	07.06.2017	66	72	62
Basis values	**Average**	59	*	*

	Minimum	58	*	*
	Maximum	60	*	*
For 1 half of 2017	**Average**	62	70	57
	Minimum	56	62	52
	Maximum	66	85	64

SHETPE CAMP (657 KM)				
AK-10	28.03.2017	68	76	62
AK-10	19.04.2017	64	72	58
AK-10	15.05.2017	62	70	54
AK-10	07.06.2017	72	80	64
AK-11	28.03.2017	70	78	64
AK-11	19.04.2017	62	70	56
AK-11	15.05.2017	60	64	52
AK-11	07.06.2017	66	70	60
AK-12	28.03.2017	68	76	62
AK-12	19.04.2017	66	74	60
AK-12	15.05.2017	64	72	58
AK-12	07.06.2017	66	74	60
AK-13	28.03.2017	66	74	60
AK-13	19.04.2017	62	68	56
AK-13	15.05.2017	64	70	58
AK-13	07.06.2017	69	74	62
Basis values	**Average**	63	*	*
	Minimum	60	*	*
	Maximum	65	*	*
For 1 half of 2017	**Average**	66	73	59
	Minimum	60	64	52
	Maximum	72	80	64

ENTRANCE TO AND ROAD OUT ZHETYBAY VILLAGE				
AK-19 (707 km, entrance to Zhetybay Camp)	28.03.2017	70	82	60
AK-19 (707 km, entrance to Zhetybay Camp)	19.04.2017	72	84	62
AK-19 (707 km, entrance to Zhetybay Camp)	15.05.2017	66	74	58
AK-19 (707 km, entrance to Zhetybay Camp)	07.06.2017	70	78	64

AK-20 (713 km, entrance to Zhetybay Camp)	28.03.2017	76	90	66
AK-20 (713 km, entrance to Zhetybay Camp)	19.04.2017	72	80	60
AK-20 (713 km, entrance to Zhetybay Camp)	15.05.2017	80	88	72
AK-20 (713 km, entrance to Zhetybay Camp)	07.06.2017	66	74	60
Basis values	**Average**	67	*	*
	Minimum	66	*	*
	Maximum	68	*	*
For 1 half of 2017	**Average**	71	81	63
	Minimum	66	74	58
	Maximum	80	90	72

ZHETYBAY CAMP (730 KM)				
AK-23	29.03.2017	70	84	64
AK-23	20.04.2017	68	80	60
AK-23	15.05.2017	70	78	60
AK-23	08.06.2017	60	68	52
AK-24	29.03.2017	76	88	72
AK-24	20.04.2017	68	80	60
AK-24	15.05.2017	74	82	66
AK-24	08.06.2017	68	76	60
AK-25	29.03.2017	74	86	72
AK-25	20.04.2017	72	84	70
AK-25	15.05.2017	78	86	70
AK-25	08.06.2017	70	78	62
AK-26	29.03.2017	80	84	74
AK-26	20.04.2017	78	82	70
AK-26	15.05.2017	76	82	68
AK-26	08.06.2017	72	80	64
Basis values	**Average**	**66**	*	*
	Minimum	**60**	*	*
	Maximum	**70**	*	*
For 1 half of 2017	**Average**	**72**	81	65
	Minimum	**60**	68	52
	Maximum	**80**	88	74

NATURE-SANCTUARY BORDER

AK-28 (739 km, nature-sanctuary border)	29.03.2017	74	86	70
AK-28 (739 km, nature-sanctuary border)	20.04.2017	72	84	68
AK-28 (739 km, nature-sanctuary border)	15.05.2017	74	86	70
AK-28 (739 km, nature-sanctuary border)	08.06.2017	68	76	60
AK-32 (771 km, nature-sanctuary border)	29.03.2017	76	92	72
AK-32 (771 km, nature-sanctuary border)	20.04.2017	74	80	70
AK-32 (771 km, nature-sanctuary border)	15.05.2017	72	80	68
AK-32 (771 km, nature-sanctuary border)	08.06.2017	76	88	72
Basis values	**Average**	**53**	*	*
	Minimum	**52**	*	*
	Maximum	**54**	*	*
For 1 half of 2017	**Average**	**73**	**84**	**69**
	Minimum	**68**	**76**	**60**
	Maximum	**76**	**92**	**72**

Water quality monitoring.

There is Ashyagar river on the works performance area on 755km. The river is relating to low water, due to it the sampling was being taken during flood period – April, May and the water sampling was taken in November cause of lasting rainfalls. An accredited laboratory carried out the sampling analysis with determination of: dry residues, nitrates, sulphates, chlorides, petrochemicals, Ferrum.

The monitoring results are shown in Table 3.9.

The actual values of the surface waters analysis results did not exceeded the maximum permissible concentration norms specified by the requirement of Republic of Kazakhstan**.**

Table 3.9

Sampling point	Sampling date	К The harmful substances concentration					
		dry residues, mg/dm3	Nitrates mg/dm3	Sulphates mg/dm3	Chlorides mg/dm3	Petrochemicals mg/dm3	Ferrum common mg/dm3
		MPC values					
		-	not more 40	not more 100	not more 300	not more 0,05	not more 0,1
Ashyagar r., before the bridge	29.03.2017	975	2,24	90,12	253,97	0,022	0,08
Ashyagar r., after the bridge	29.03.2017	978,5	1,81	88,5	264,4	0,02	0,1
Ashyagar r., before the bridge	19.04.2017	967,5	2,03	90,94	249,76	0,02	0,085
Ashyagar r., after the bridge	19.04.2017	970	2,13	90,12	253,23	0,02	0,089
Ashyagar r., before the bridge	15.05.2017	922,5	1,87	84,77	266	0,015	0,077
Ashyagar r., after the bridge	15.05.2017	927,5	1,95	88,88	259	0,015	0,08
Ashyagar r., before the bridge	08.06.2017	935	1,84	82,3	253,75	0,02	0,07
Ashyagar r., after the bridge	08.06.2017	937,5	1,8	83,12	255,5	0,011	0,0725

SUMMARY AND CONCLUSIONS

1. The Contractor by the due date submitted for approval the environmental management plan to Consultant on construction supervision. On the recommendations of CCS plan was finalized, in addition developed and submitted for approval another 8 additional plans: water quality management plan, management plan of measures to prevent dust, restoration of quarries management plan, ground conditions (soil) management plan, fuels and chemicals management plan, management plan for the site construction site, management plan for solid waste, management plan to minimize noise. The Contractor shall submit a monthly report on the implementation of PEPM including the monitoring checklists.

2. In accordance with the requirements of the specification Contractor basic measurements of ambient air, soil, noise, vibration, surface water on the construction site. Further sampling was carried out on a monthly basis. As a result of reporting on environmental monitoring activities of the Contractor during reconstruction of section 632-802 km "Shetpe-Aktau" of the road "Beineu-Aktau" has a allowed environmental impact. Ongoing activities are effective.

3. The Contractor has issued and received in state bodies of Manghystau region permits for land plots, for the location and operation of construction sites, Zhetybay and Shetpe camps. Issued and obtained permits for mineral extraction (loam). While obtaining permits the Contractor held public hearings on the environmental impact and the implementation of measures aimed at reducing the impact on the environment.

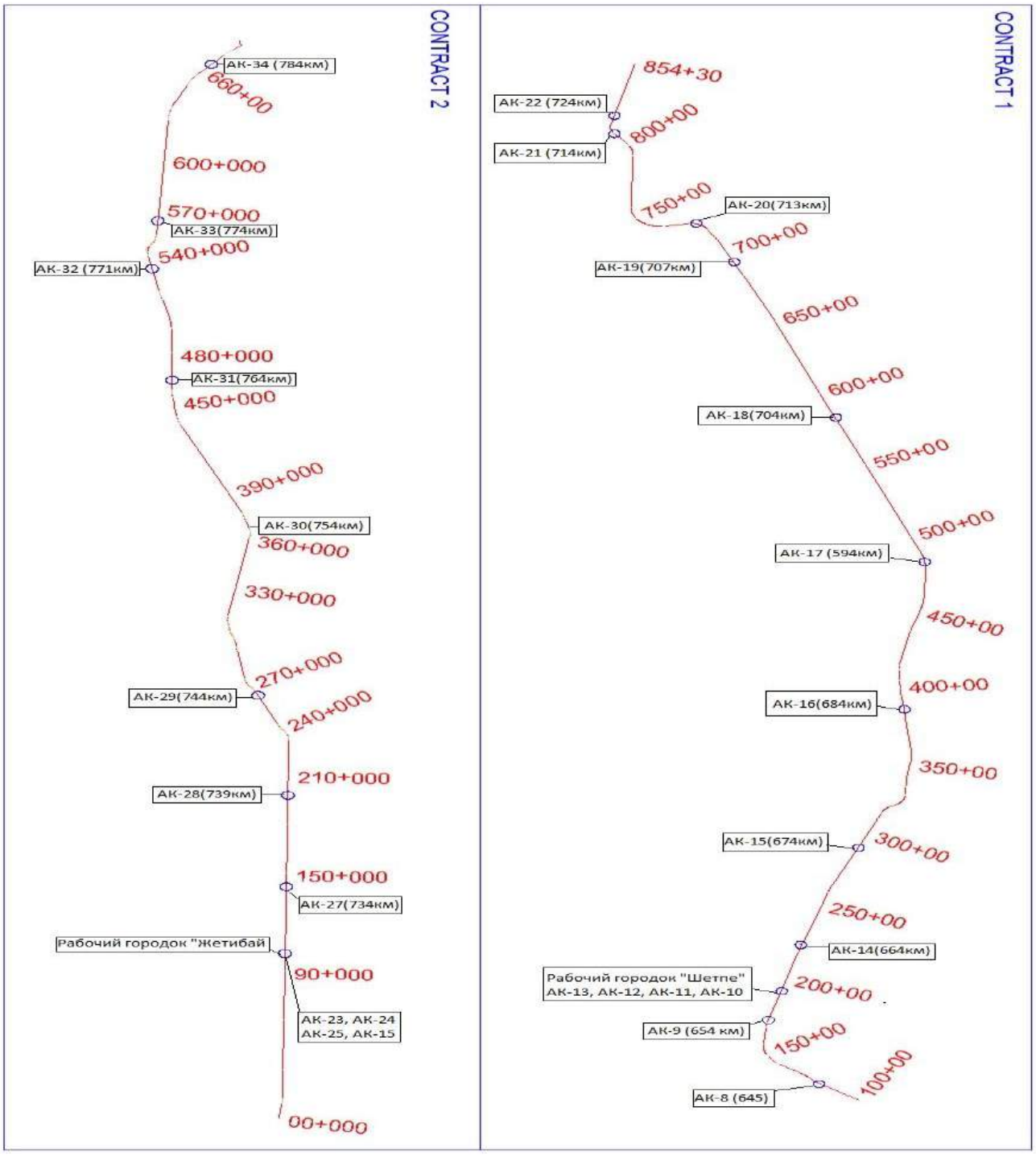
4. On the recommendations of the international expert for environmental protection of CCS, Contractor performs environmental monitoring in accordance with a checklist.

5. Concluded contracts and obtained permits for the removal and disposal of waste from construction sites, including household and fecal waste.

ANNEXES

1. Map of the environment components supervision points
2. Photographs
3. List of permits and government authorities' approvals for works performance period

КАРТА ТОЧЕК КОНТРОЛЯ КОМПОНЕНТОВ ОКРУЖАЮЩЕЙ СРЕДЫ



Air sampling at AK-12 (657 km) PK190 on 28.03.2017

Air sampling at AK-17 (694 km) PK587 on 28.03.2017

Air sampling at AK-27 (734 km) PK163 on 20.04.2017

Air sampling at AK-34 (784 km) PK63 on 28.04.2017

Air sampling at AK-19 (707 km) PK715 on 15.05.2017

Air sampling at AK-17 (694 km) PK587 on 15.05.2017

Soil sampling at AK-25 (730 km) PK190 on 28.03.2017

Soil sampling at AK-31 (764 km) PK63 on 28.03.2017

Soil sampling at AK-16(684 km) PK490 on 19.04.2017

Soil sampling at AK-27 (734 km) PK163 on 20.04.2017

Soil sampling at AK-9 (654 km) PK190 on 15.05.2017

Soil sampling at AK-15 (674 km) PK390 on 15.05.2017

Noise measurements at AK-8 (645 km) PK100 on 28.03.2017

Noise measurements at AK-12 (657 km) PK220 on 28.03.2017

Noise measurements at AK-10 (657 km) PK220 on 19.04.2017

Noise measurements at AK-23 (730 km) PK120 on 20.04.2017

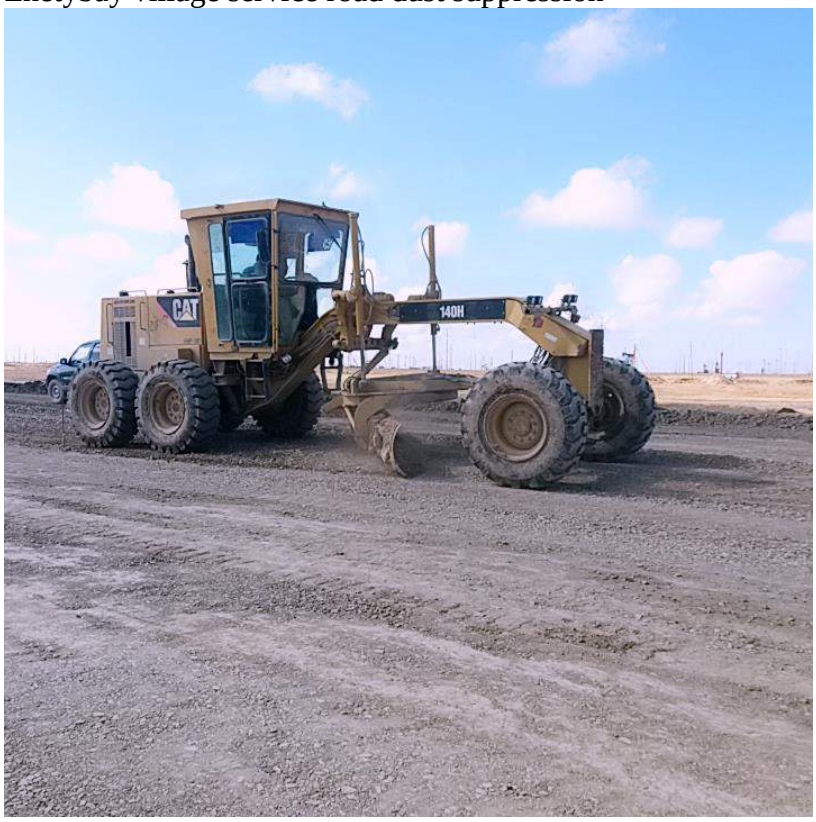
Road works

Road works

Dust suppression

Road water pouring

Zhetybay village service road dust suppression



Sand-gravel mixture subbase laying at PK795+80

Territory pollution

The territory state after a comment elimination

Repair zone territory pollution

Repair zone territory after cleaning

Territory pollution

The territory state after a comment elimination

Temporary storage of wastes at Shetpe construction site

Soil contamination at the Shetpe Camp area

Shetpe Camp territory cleaning

Water pouring of service road at PK546

Shoulders construction at PK545

Shetpe Camp ACMP area

Zhetybay Camp repair zone area

Construction wastes removing from the territory. Turkish shelter (equipment repair zone)

Repair zone

Barrier guardrail installation at PK556

Zhetybay Camp dust suppression

Preparation works for SMA laying at PK655+10, PK660+30

The list of the permits and approvals of state authorities for the work performance period

I. Land resources

- the akimats of Mangystau, Karakiyan and Munaylin regions and all relevant authorities provided the permits and approvals for the temporary land acquisition for the materials storage, soil and ballast quarries, temporary service road construction on the reconstruction section km632,3 – km802, temporary services roads for the utilities relocation possibility, approaches to the soil and ballast quarries, and for camps.

- the akimats of Mangystau region and other relevant authorities provided the approval for the temporary land acquisition for the camp construction, the asphalt and bitumen plant and crushing-and-screening plant installation 10ha in area. The contract for the rent of land section 10ha in area was concluded due to the order of the Akim of Mangystau region.

- the Akim of Karakiyan region Order provided the temporary land acquisition for the asphalt and bitumen plant area and the utilities arrangement (gas supply pipeline, water supply pipeline, electrical power supply) for Zhetybay Camp, contract for the land section rent was concluded. The land sections were formed for the utilities installation and the projects for the electrical power supply, gas supply and water supply of Zhetybay Camp 16ha in area were approved. The decision of Akim of Karakiyan region was received, the contract for the 23,4648ha in area land section rent was concluded.

II. Soil quarries

1. The prospecting and evaluation works project developed with the approval of 28 quarries reserves and approved by the competent authorities. The Interregional Department "Zapkaznedra" Geology and Mining Committee in Aktobe prepared a cartogram, approved the coordinates and obtained geological retraction for 28 quarries.

Approval to the prospecting and evaluation works project below are:

- the approval from Akim of Mangystau Oblast for an exploration of the soil quarries resources and sand-gravel mixture quarries.

- the West-Kazakhstan Interregional Department of Geology and Subsoil Use approved the «Project for prospecting and evaluation works on the №№1-28 areas of soil rocks (sandy loam, loam, sand) are suitable for reconstruction of the Aktau-Beineu-Aktau road on the Aktau-Shetpe section in Mangistau region».

2. The industrial soil excavation project (clay rock and sand) developed on the 1-28 areas for the reconstruction of the Aktau-Beineu road on the Aktau-Shetpe road section of Mangystau Oblast of Republic of Kazakhstan and provided for the soil resources development of 28 areas that are on the State Register of Reserves and their quantity on 01.05.2015 is **28354,0 thousand meters of C_1 category.** The Cartogram with 5809832m^2 or 581,0ha in total area was issued for the above mention items excavation.

Approval for the industrial excavation project below is:

- From Munaylin region administration for consumer protection №1317 dated 13.07.2015,

- Sanitary and epidemiological inspection report №34 dated 08.07.2015 issued by the consumer protection authority of Mangystau region,

- The Mangystau regional inspection geology and subsoil use report №27-9-7-4-423 dated 02.07.2015,

- The Mangystau Oblast Department of the industrial development and safety committee report dated from 21.08.2015.

- The industrial excavation project was considered on public hearing on 01.07.2015.
- conclusion of the State Environmental Expert Evaluation for the industrial soil excavation project (clay rock and sand) on the 1-28 sections for the reconstruction of the Aktau-Beineu road on the Shetpe-Aktau

road section in the Mangistau region of the Republic of Kazakhstan issued by the management of natural resources and regulation of wildlife in Mangistau region (№KZ08VDC00038921 dated 04.08.2015).

- Resolution for license block title on commonly occurring mineral resources used in construction (reconstruction) and public roads, railways and hydraulic structures repair works №0000026 dated August 14, 2015.

- Public hearings for environmental protection plan for the mineral resources production period of the 1-28 areas.

- Resolution for the environmental emission (№KZ61VDD00040796 dated 19.10.2015 with validity period from 11.09.2015 till 26.08.2017).

3. The working plan developed for the lands recultivation are churning up during the soil excavation (clay rock and sand) on the 1-28 areas for the reconstruction of the Aktau-Beineu road of the Aktau-Shetpe road section in Mangistau region of the Republic of Kazakhstan.

Approval for the recultivation of the industrial excavation project below is:

- The letters from Munaylin regional administration of consumer protection № 1316 dated 13.07.2015 and Mangystau regional administration of consumer protection № 422 dated 21.08.2015.

- conclusion of the State Environmental Expert Evaluation for the lands recultivation are churning up during the soil excavation (clay rock and sand) on the 1-28 sections for the reconstruction of the Aktau-Beineu road on the Shetpe-Aktau road section in the Mangistau region of the Republic of Kazakhstan issued by the management of natural resources and regulation of wildlife in Mangistau region (№KZ13VDC00039025 dated 06.08.2015).

III. Camps, construction areas (crushing, concrete and asphalt plants)

1. Section, km632-719

1.1. The working project developed «Reconstruction of the Beineu-Aktau road, km632-719» (Shetpe village – Zhetybay village). Correction in the part of the relocatable «asphalt and crushing plants» installation with the «Environmental protection» paragraph.

The following approvals for the working project have been received:

- sanitary and epidemiological inspection report № 39 dated 06.03.2015 issued by the consumer protection authority of Mangystau region,

- conclusion of the State Environmental Expert Evaluation № 04-08/1376 dated 23.04.2015 issued by the management of natural resources and regulation of wildlife in Mangystau region.

- public hearings for the working project « Reconstruction of the Beineu-Aktau road, km632-719» (Shetpe village – Zhetybay village. Correction in the part of the relocatable «asphalt and crushing plants» installation with the «Environmental protection» paragraph».

- resolution for the environmental emission № 0002170 dated 30.04.2015, validity period from 01.05.2015 till 31.08.2017.

1.2. The project of the Shetpe Camp location developed:

Approvals for the working project received:

-letter from Mangystau regional administration of consumer rights protection of the Department of consumer protection of Mangystau oblast № 385 dated 29.06.2015.

-letter from the Department of the industrial development and safety committee of Mangystau Oblast № 25-20-13-2/859 dated 14.07.2015,

-conclusion of the State Environmental Expert Evaluation issued the management of natural resources and regulation of wildlife in Mangystau region № KZ37VDC00040339 dated 17.09.2015.

2. Section km719-802

2.1 The working project developed «Reconstruction of the Beineu-Aktau road, km719-802» (Zhetybay village - Aktau). Correction in the part of the relocatable «asphalt and crushing plants» installation with the «Environmental protection» paragraph.

The following approvals for the working project have been received:

- sanitary and epidemiological inspection report № 10 dated 02.02.2015 2015 issued by the consumer protection authority of Mangystau region.

- conclusion of the State Environmental Expert Evaluation № № 04-08/535 dated 27.02.2015 issued by the management of natural resources and regulation of wildlife in Mangistau region.

- resolution for the environmental emission № 0002135 dated 10.03.2015, validity period from 10.03.2015 till 10.03.2017.

- public hearings for the working project Reconstruction of the Beineu-Aktau road, km719-802» (Zhetybay village - Aktau). Correction in the part of the relocatable «asphalt and crushing plants» installation with the «Environmental protection» paragraph.

2.2 The project of the Zhetybay Camp location developed.

Approvals for the working project received:

- letter from Karakiyan regional administration of consumer rights protection of the Department of consumer protection of Mangystau oblast № 79 dated 03.09.2015.

- conclusion of the State Environmental Expert Evaluation issued the management of natural resources and regulation of wildlife in Mangystau region dated 30.09.2015.

- resolution for the environmental emission in Zhetybay Camp № KZ07VDD00033426 dated 05.10.2015.