

Environmental Monitoring Report

2nd Bi-Annual Report (July–December 2015)
January 2016

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

Prepared by SMEC International Pty Ltd., Australia for the Ministry of Investment and Development, Committee of Roads for the Republic of Kazakhstan and the Asian Development Bank.

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**REPUBLIC of KAZAKHSTAN
MINISTRY OF INVESTMENT AND DEVELOPMENT
COMMITTEE OF ROADS**



LOAN NUMBER 2967-KAZ

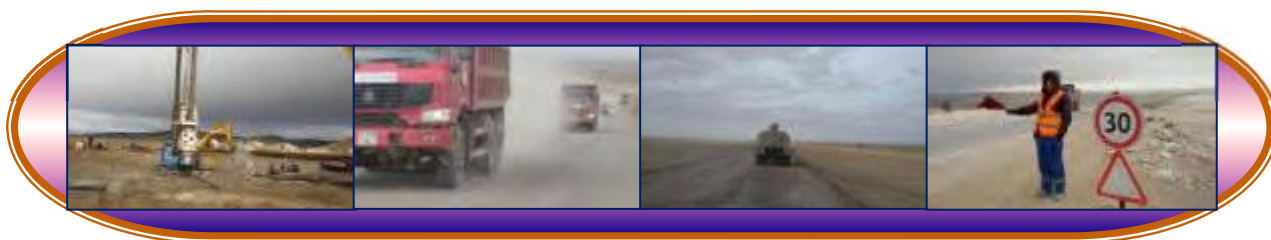
MFF CAREC Transport Corridor 2: INVESTMENT PROGRAM-PROJECT 2

(Mangystau Oblast Road Sections Connecting Shetpe - Aktau)

Second Bi-annual Environmental Monitoring Report

(Period: July - December 2015)

January 2016



CONSTRUCTION SUPERVISION CONSULTANT

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





Bi-annual Environmental Monitoring Report

Period: July - December 2015

January 2016

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 Transport and Communications, Kazakhstan
Committee for Roads,

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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
MID	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 PRELIMINARY INFORMATION

1.1 Background

This report is the second Bi-annual Environmental Monitoring Report by the Engineer for the Project. This Bi-annual Environmental Monitoring Report of the project construction supervision contract 1 and 2 (km 632 – km 719 and km 719 – km 802) by the International Environmental Specialist covers the period from July 2015 to December 2015 in compliance with the environmental scope of the construction supervision. The main purpose of this monitoring is to ensure the implementation of environmental mitigation measures during construction through supervision by the Engineer during the construction phase. Environmental issues also are anticipated to be identified in advance for avoidance and to ensure timely completion of the project. 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 (MID), 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 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 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 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 international 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 purpose of the Bi-annual Environmental Monitoring Report is to provide a summary of the key issues relating to environmental management over the past six months (July 2015 to December 2015). 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 is included in the monthly and quarterly report prepared by the Engineer and the Contractor.

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 was based on findings during the field visits, the monthly and bi-annual environmental protection progress reports (July 2015 and December 2015) submitted by Contractor, information and discussions with consultant staffs, contractor representatives and other relevant stakeholders.

1.3 Methodology

The second 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 Reports (July 2015 to December 2015);
- Contractors' and Consultants Grievance Registers;
- Engineer's Monthly and Quarterly Progress Reports;
- Contractors Environmental Specialist's Field Reports and regular site visits;
- Consultant Engineers 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 public consultation;
- 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 and 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 72+80) and Zhetibay village (PK 17+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 subgrade 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 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 upgrading of 67 km section of the existing road between Zhetibay and Aktau, from Category II to category IB, and repair of 16 km section as Type 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" and lightening length of 5.08 km.
- From PK 698+96 to PK 838+96 of the section within urban area, provided the average repair of the road and sidewalks
- 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 pipe culverts and 5 nos of cattle passes(4x2.5m)
- Lightening of traffic round about at PK 679+30 with 3.8 km of length.

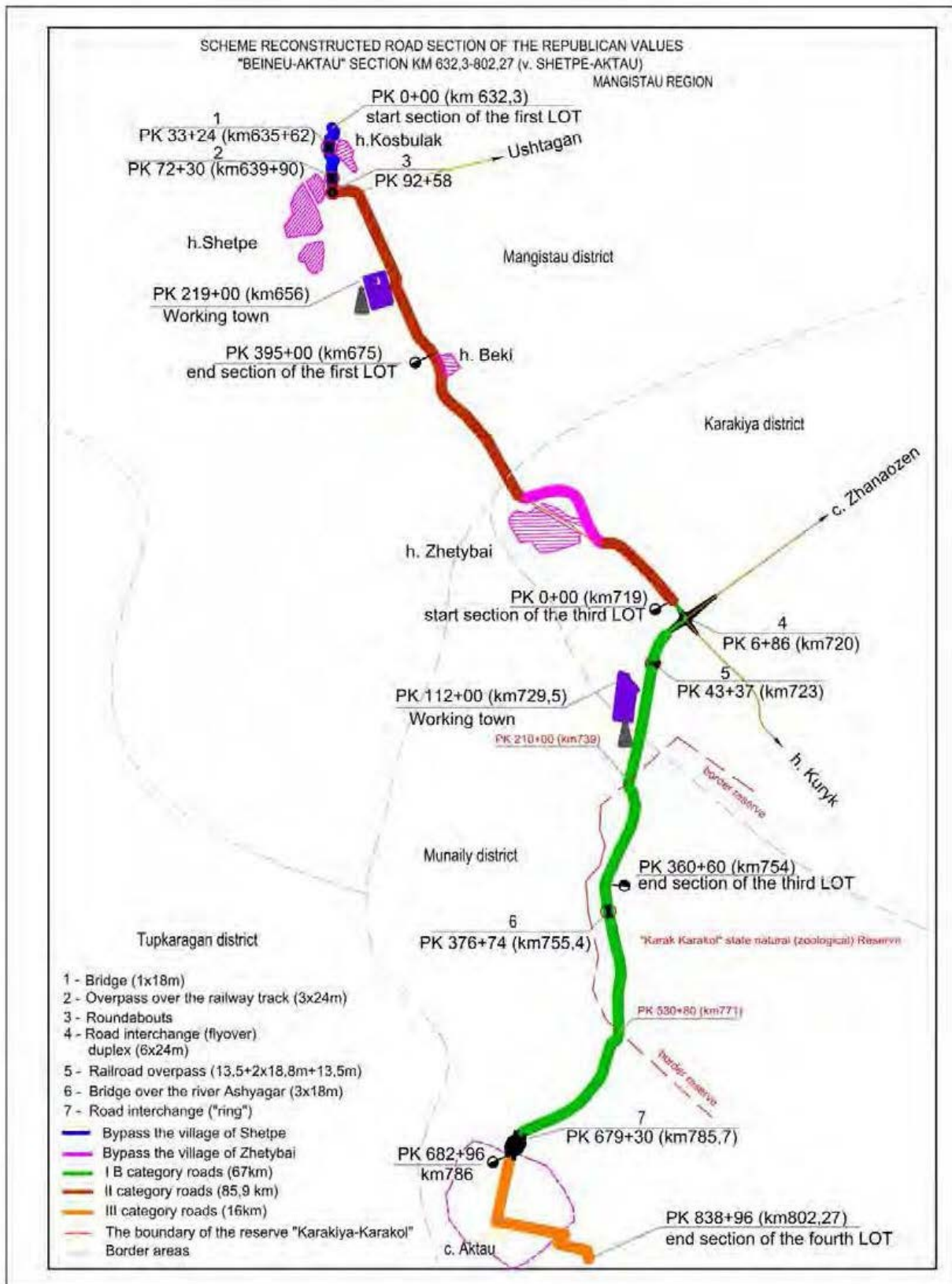


Figure 1.1: Location of the Project Road

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 coastal 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 second Bi-annual Environmental Monitoring Report covering the period from July 2015 to December 2015. 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 supervision consultant has to undertake specific environmental safeguard measures during the execution of work.

The following activities are considered for effective Environmental 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
- 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
- Traffic safety and control

The 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 report.

Table 1.1: List of Main Purchased Material

No.	Description	Unit	Total project requirements			Plan for 2015			Purchased at the end of the reporting period, Total	
			Total	Including:		Total	Including:		Quantity	%
				Lot 1-2	Lot 3-4		Lot 1-2	Lot 3-4		
1	Sand and Gravel Mixtures	m3	806 690	355 303	451 387	458 803	218 063	240 740	313535	68.3
2	Crushed stone	m3	1 005 608	397 984	607 624	687 731	279 536	408 195	350236	50.9
3	Sifting(0-5)	m3	391 327	168 713	222 614	267 627	108 780	158 847	106010	39.6
4	Bitumen	t	66 809	26 876	39 933	27 398	10 393	17 005	15699	57.3
5	Reinforced concrete elements	m3	16 964	7 937	9 027	8 784	2 964	5 820	7968	111.5
6	Geotextile	m2	32 165	-	32165	0	-	-		

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7	Geogrid	m2	630 254	247 892	382 362	0	-	-		
8	Barrier fence	m	202 158	48 023	154 135	0	-	-		
9	Filler	t	32 530	12 943	19 587	3 781	-	3781		
10	Stabilizing additive	t	1 137	452	685	132	-	132		

Table 1.2: Personnel Mobilization

SI No.	Position	Number								
		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	Project Coordinator	0	1	1	0	0	0	0	0	0
2	Project Manager	1	2	1	0	0	2	2	2	2
3	Site Manager	0	2	2	0	0	0	4	0	0
4	Engineers	42	42	53	46	69	77	81	73	81
5	Foremen	11	15	16	18	23	29	28	24	22
6	Administrative and managerial personnel	51	52	61	83	91	92	93	77	50
7	Geodetic service	36	45	45	43	52	56	55	51	53
8	Quality service and laboratory	14	17	21	27	49	50	50	28	27
9	locksmiths	50	53	55	72	121	124	117	68	72
10	Mechanics	156	173	188	169	192	199	206	221	201
11	Equipment Operator	0	0	0	0	0	0	0	1	1
12	Crusher Operators	10	11	11	11	25	25	25	12	12
13	Asphalt Plant Operators	0	0	0	0	7	7	7	14	14
14	Concrete Plant Operators	1	1	0	0	0	0	0	0	0
15	Mounters and welders	30	31	34	36	38	41	41	41	41
16	Skilled workers	6	2	2	6	16	16	16	18	18
17	Unskilled workers	111	152	171	185	213	250	272	242	242
18	Technica lpersonnel	0	0	0	0	0	0	0	0	0
19	Medical staff	2	3	2	0	0	0	2	2	2
20	Cooks	6	8	8	6	6	6	6	12	13
21	Cleaning ladies	26	26	25	38	55	59	62	54	62
22	Laundry personnel	0	0	0	0	0	0	0	0	0
23	Security	50	50	50	114	127	142	139	125	139
24	Procurement personnel	9	10	10	10	11	11	11	11	11
25	Electricians	5	7	9	10	13	16	17	13	17
26	Storekeeper	15	21	19	24	23	21	17	26	17
27	Truck Drivers	276	338	338	398	483	555	545	550	545
28	Car Drivers	136	136	136	136	136	136	155	161	155
	Total for Project	1044	1198	1258	1432	1753	1914	1949	1824	1797

Table 1.3: The list of present Machineries and Plants at the site

Sl. No	Equipment	Number								
		April	May	June	July	August	Sep	Oct	Nov	Dec
1	Bulldozer	25	24	18	18	19	17	18	18	18
2	Excavator	29	32	30	28	28	26	27	27	27
3	Loader	29	32	29	38	40	36	36	38	26
4	Motor grader	26	30	19	24	24	25	19	15	15
5	Rollers	44	59	42	47	47	37	34	32	32
6	Tippe rtrucks	209	255	177	209	222	200	190	196	196
7	Water sprayer truck	26	29	30	34	36	41	45	45	45
8	Fuel Tanker	2	2	2	2	2	2	2	2	2
9	Asphalt paver	6	6	6	6	6	6	6	6	6
10	Asphalt Trimmer	1	1	1	1	1	1	1	1	1
11	Crane	7	6	2	3	3	5	5	5	5
12	Asphalt Plant	2	2	2	2	2	2	2	2	2
13	Concrete plant	2	2	1	1	1	1	1	1	1
14	Emulsion Plant	1	1	1	1	1	1	1	1	1
15	Crushing Plant	2	2	2	2	2	2	2	2	2
16	Mobile Crusher	2	2	1	1	2	2	2	2	2
17	Piling machine	0		0	1	1	1	1	1	1
18	Rock drill	3	3	2	2	2	2	2	2	2
19	Low-Back Trailers	5	2	1	2	2	2	2	2	2
20	Mixer machine	4	4	6	3	3	3	3	3	3
21	Distributor	1	1	1	1	1	1	1	1	1
22	Bitumen Trucks	4	4	4	1	1	1	1	1	1
23	Concrete Paver	0		0	0	0	0	0	0	0
24	Cars	86	118	114	110	110	110	110	110	110
25	Dead-end	0		0	1	1	1	1	1	1
26	Others	15	15	8	0	0	0	0	0	0
Total:		531	632	499	556	574	546	529	519	519

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 details description of works executed for the Contract 001 and Contract 002 are given in Table 1.1 and Table 1.2.

Table 1.4: Description of Works Executed for the Contract-001-ADB/CW-2014 by December 2015

Sl. No	Work description	Unit	Total as per contract	Planned for 2015	Achieved in December	Cumulat. to date	Achieved in 2015 (%)
1	Earthworks	thousand m3	4 136.4	1 647.550	78 981	1 555, 807	94,43
2	Sub-base h-21	km	85.4	31.0	1,15	37,77	121,8
3	Base h-15	km	85.4	31.0	3,81	35,39	114,1
4	High Porous course asphalt Concrete h-12cm	km	85.4	31.0	3,81	31,61	101,9
5	Porous Asphaltic concrete base course h-10cm	km	85.4	31.0	3,78	31,57	101,8
6	Wearing course h-5 cm	km	85.4	-	-	-	-

Table 1.5: Description of Works Executed for the Contract-002-ADB/CW-2014 by December 2015

Sl No	Work description	Unit	Total as per contract	Planned for 2015	Achieved in December	Cumulative to date	Achieved in 2015 (%)
1	Earthworks	thousand m3	5 219.9	3 198.4	51.50	3040.80	95.0
2	NEW CARRIAGEWAY SIDE OF AXIS						
3	Sub-base h-20cm	km	68.3	18.5	1.58	24.25	131.0
4	Base h-20cm	km	68.3	18.5	1.04	23.11	124.9
5	High Porous asphalt concrete h-12cm	km	68.3	18.5	1.46	22.72	122.8
6	Porous Asphaltic concrete base course h-10cm	km	68.3	18.5	2.81	21.75	117.5
7	Wearing course h-5 cm	km	68.3	-	-	-	-
	EXISTING CARRIAGEWAY SIDE of Axis						
8	Sub-base h-20cm	km	68.3	18.5	0.06	19.00	102.7
9	Base h-20cm	km	68.3	18.5	0.5	18.98	102.6
10	Porous course asphalt mixture h-12cm	km	68.3	18.5	0.78	18.77	101.4
11	Asphaltic concrete base course h-10cm	km	68.3	18.5	0.74	18.64	100.7
12	Wearingcourse h-5 cm	km	68.3	-	-	-	-
13	Repair of existent pavement 786-802 km, Aktau						
14	Asphaltic concrete base course h-7cm	km	15.6	15.6	3.01	15.48	99.8
14.1	Wearing course h-5 cm	km	16.0	16.0	-	-	-
15	Bridges & overpasses	Units	3	23.3	0.2	0.2	
16	Culverts	Units	53	21		17	80.9

1.9 Relationship's 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 Sanayi ve 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 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. In early July 2015, 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: Km729.5)

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 guidelines.

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, 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 such document but there was missing information and plan for the project. Hence, the Contractor was asked to submit a detailed site/project specific Environmental Management Plan based on the EIA that was provided

during the first bi-annual environmental monitoring report (January-June 2015), 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 of 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):

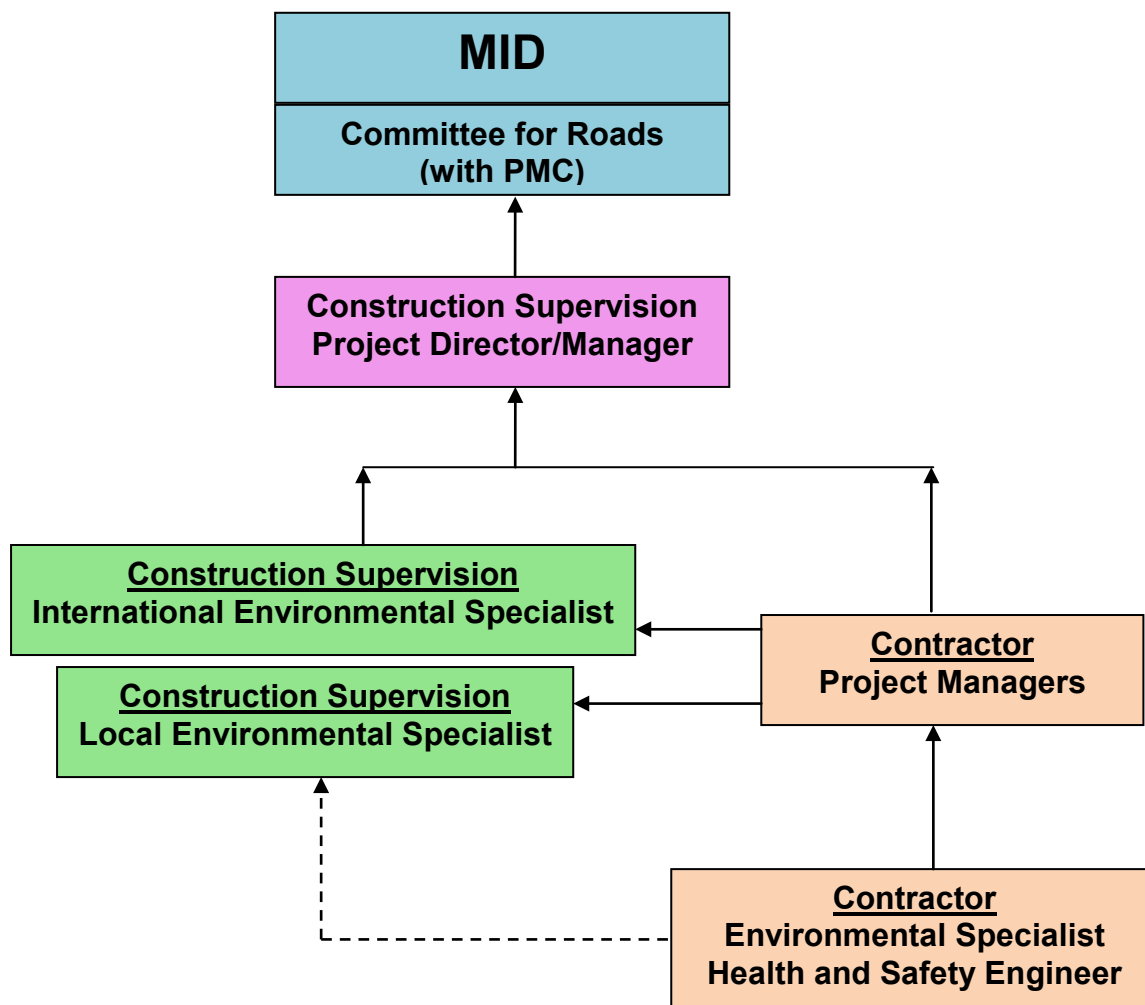


Figure 2.1: Work Coordination Arrangement

Specific tasks shall be undertaken by the Environmental Representatives 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 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 her in the presence of the Team Leader and provide your comments on his 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 & ADB mission 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 / review 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 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 Kazakhstan¹

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 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 and also incorporating in the second 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 environment 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 International Environment Specialist in July 2015, on-the-spot field inspections to various impact sites such as borrow pit, 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 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 has been developed an environmental auditing protocol for the construction period, formulate a detailed environment 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 / consultant engineers 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 Assistance Resident Engineer (ARE) 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 during first bi-annual environmental monitoring report on 23rd April 2015 and the another training for the contractor staffs was conducted in consultant office at the Zhetibay camp site on 3rd July 2015.
- **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, soil 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, noise & soil 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 the physical environment at the vicinity of the project road from March 2015 and it is continuing regularly in every month. 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. Monthly readings taken on noise and vibration were not exceeding the norms.
- **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.
- **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 in May 2015 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): 645,654,664,674,684,694,704,714,724,734 ,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: 645,654,664,674,684,694,704,714,724,734 ,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 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-violet 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 is to be operationalized. A medical facility has been arranged in contractor camp site from early June 2015 which was fully operationalized 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 should be readily available.

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 (EBS) on (i) air quality; (ii) water quality; (iii) soil quality and (iv) noise. 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 second Bi-annual Environmental Monitoring Report for the project. In addition, the consultant local 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 (July - December 2015) the Contractor undertook monthly monitoring of air quality, noise & vibration, water quality and soil quality at specified locations from July to December 2015. The Engineer likewise, as part of his tasks, monitors the environmental aspects of the project as well as reviews the environmental mitigating performance of the Contractor. Within the period, the international environmental specialist of the Engineer (SMEC) visited the site in early July 2015 as part of Consultant's periodic monitoring. The International environmental specialist communicates with the consultant management (SMEC-Sapa SZ) for mobilizing the local environmental specialist under the

direction of the international environmental specialist's performed environmental audit for the project. There were several meetings with the contractor representatives for mobilizing the contractor environmental specialist and finally, the contractor mobilize the environmental specialist to work with the consultant engineers. Joint inspection was done by the specialists (International 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 July to December 2015, the consultant engineers were responsible to the site to undertake audit into the sites. Correspondingly, the regular monthly Environmental Monitoring Report was drafted for consultant monthly progress report and submitted to the Employer and this is the second 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 his 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 all the lots 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, safety arrangements and usage of personal protective equipments 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 monthly 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, in July 2015, 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 (July to December 2015) at the different locations as shown in the Table 3.1.

Noise and vibration: Measurements of noise and vibration has monitored during this period at the different locations as shown in Table 3.2.

Water quality: Surface water quality testing has completed during this period 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 (July to December 2015) 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 July 2015 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 in May 2015 and health & safety staff in 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 (July to December 2015). Monthly parameter readings and

observation with summary report were compiled. In the previous 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 – July 2015 to November 2015
- Soil Quality Measurement – July 2015 to November 2015
- Noise Measurements – July 2015 to November 2015
- Water Quality Measurements – July 2015 to November 2015

Monthly monitoring data has been collected during this monitoring period from July 2015 through November 2015 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 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).

During the last one year, the Contractor (Cengiz Insaat Sanayi ve Ticaret A.S) undertook monthly parameter readings and observation with compiled an annual environmental protection report (Annexure D) and submitted to the engineer on 25 December 2015. The results of the previous six months monitoring activities are shown below:

Air Quality Analysis

Measurements were done monthly at 27 sampling stations (Photograph 3.1) 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 July to November 2015 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 contaminants 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.

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.



Photograph 3.1: Air Quality Monitoring at AK-23 (730km) PK 120 and AK-28 (739km) PK 207

Table 3.1: Air Quality Measurement

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-8 (645 km)	09.07.2015	0,44	2,11	0	0,0025
	20.08.2015	0,28	2,07	< 0,02	< 0,025
	17.09.2015	0,32	<1,5	< 0,02	< 0,025
	22.10.2015	0,45	<1,5	< 0,02	< 0,025
	18.11.2015	0,042	<1,5	< 0,02	< 0,025
AK-9 (654 km)	09.07.2015	0,39	2,55	0	0,00035
	20.08.2015	0,45	2,29	< 0,02	< 0,025
	17.09.2015	0,47	<1,5	< 0,02	< 0,025
	22.10.2015	0,47	<1,5	< 0,02	< 0,025
	18.11.2015	0,030	<1,5	< 0,02	< 0,025
AK-10 (657 km, Shetpe camp)	09.07.2015	0,43	3,41	0	0,00064
	20.08.2015	0,41	3,18	< 0,02	< 0,025
	17.09.2015	0,42	2,44	< 0,02	< 0,025
	22.10.2015	0,43	2,01	< 0,02	< 0,025
	18.11.2015	0,10	2,01	< 0,02	< 0,025
AK-11 (657 km, Shetpe camp)	09.07.2015	0,41	3,30	0	0,00042
	20.08.2015	0,25	3,20	< 0,02	< 0,025

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
	17.09.2015	0,39	3,02	< 0,02	< 0,025
	22.10.2015	0,38	2,95	< 0,02	< 0,025
	18.11.2015	0,13	2,95	< 0,02	< 0,025
AK-12 (657 km, Shetpe camp)	09.07.2015	0,4	2,8	0	0,00031
	20.08.2015	0,42	3,0	< 0,02	< 0,025
	17.09.2015	0,46	3,17	< 0,02	< 0,025
	22.10.2015	0,41	3,28	< 0,02	< 0,025
	18.11.2015	0,15	3,28	< 0,02	< 0,025
AK-13 (657 km, Shetpe camp)	09.07.2015	0,37	3,52	0	0,00019
	20.08.2015	0,44	3,13	< 0,02	< 0,025
	17.09.2015	0,45	3,04	< 0,02	< 0,025
	22.10.2015	0,36	3,76	< 0,02	< 0,025
	18.11.2015	0,18	3,76	< 0,02	< 0,025
AK-14 (664 km)	10.07.2015	0,17	0,93	0	0,00027
	20.08.2015	0,39	1,5	< 0,02	< 0,025
	17.09.2015	0,37	<1,5	< 0,02	< 0,025
	22.10.2015	0,41	1,62	< 0,02	< 0,025
	18.11.2015	0,31	1,62	< 0,02	< 0,025
AK-15 (674 km)	10.07.2015	0,39	3,07	0	< 0,025
	20.08.2015	0,24	2,46	< 0,02	< 0,025
	17.09.2015	0,40	<1,5	< 0,02	< 0,025
	22.10.2015	0,39	<1,5	< 0,02	< 0,025
	18.11.2015	0,056	<1,5	< 0,02	< 0,025
AK-16 (684 km)	10.07.2015	0,4	2,41	0	< 0,025
	20.08.2015	0,40	2,48	< 0,02	< 0,025
	17.09.2015	0,45	<1,5	< 0,02	< 0,025
	22.10.2015	0,26	<1,5	< 0,02	< 0,025
	18.11.2015	0,023	<1,5	< 0,02	< 0,025
AK-17 (694 km)	10.07.2015	0,19	1,95	0	< 0,025
	20.08.2015	0,27	1,79	< 0,02	< 0,025
	17.09.2015	0,38	<1,5	< 0,02	< 0,025
	22.10.2015	0,37	1,80	< 0,02	< 0,025
	18.11.2015	0,066	1,80	< 0,02	< 0,025
AK-18 (704 km)	10.07.2015	0,38	2,92	0	0

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
	20.08.2015	0,46	2,69	< 0,02	< 0,025
	17.09.2015	0,42	<1,5	< 0,02	< 0,025
	22.10.2015	0,35	<1,5	< 0,02	< 0,025
	18.11.2015	0,066	<1,5	< 0,02	< 0,025
AK-19 (707 km, entrance to Zhetybay village)	10.07.2015	0,43	2,54	0	0,00018
	20.08.2015	0,41	2,13	< 0,02	< 0,025
	17.09.2015	0,45	1,63	< 0,02	< 0,025
	22.10.2015	0,40	2,08	< 0,02	< 0,025
	18.11.2015	0,11	2,08	< 0,02	< 0,025
AK-20 (713 km, entrance to Zhetybay village)	10.07.2015	0,42	1,96	0	0,00064
	20.08.2015	0,42	2,29	< 0,02	< 0,025
	17.09.2015	0,45	<1,5	< 0,02	< 0,025
	22.10.2015	0,40	2,33	< 0,02	< 0,025
	18.11.2015	0,055	2,33	< 0,02	< 0,025
AK-21 (714 km)	10.07.2015	0,39	2,61	0	0,0002
	20.08.2015	0,39	2,42	< 0,02	< 0,025
	17.09.2015	0,44	<1,5	< 0,02	< 0,025
	22.10.2015	0,44	1,66	< 0,02	< 0,025
	18.11.2015	0,072	1,66	< 0,02	< 0,025
AK-22 (724 km)	10.07.2015	0,43	1,97	0	0,00064
	20.08.2015	0,36	1,67	< 0,02	< 0,025
	17.09.2015	0,40	<1,5	< 0,02	< 0,025
	22.10.2015	0,38	1,96	< 0,02	< 0,025
	18.11.2015	0,053	1,96	< 0,02	< 0,025
AK-23 (730 km, Zhetybay camp)	10.07.2015	0,4	3,13	0	0,00039
	21.08.2015	0,39	<1,5	< 0,02	< 0,025
	18.09.2015	0,32	<1,5	< 0,02	< 0,025
	23.10.2015	0,41	1,80	< 0,02	< 0,025
	19.11.2015	0,22	1,80	< 0,02	< 0,025
AK-24 (730 km, Zhetybay camp)	10.07.2015	0,37	3,38	0	0,0005
	21.08.2015	0,26	<1,5	< 0,02	< 0,025
	18.09.2015	0,38	<1,5	< 0,02	< 0,025
	23.10.2015	0,46	2,01	< 0,02	< 0,025
	19.11.2015	0,20	2,01	< 0,02	< 0,025

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-25 (730 km, Zhetybay camp)	10.07.2015	0,42	3,28	0	0,00067
	21.08.2015	0,23	<1,5	< 0,02	< 0,025
	18.09.2015	0,45	<1,5	< 0,02	< 0,025
	23.10.2015	0,44	<1,5	< 0,02	< 0,025
	19.11.2015	0,21	<1,5	< 0,02	< 0,025
AK-26 (730 km, Zhetybay camp)	10.07.2015	0,4	3,54	0	0,00043
	21.08.2015	0,43	<1,5	< 0,02	< 0,025
	18.09.2015	0,20	<1,5	< 0,02	< 0,025
	23.10.2015	0,40	1,80	< 0,02	< 0,025
	19.11.2015	0,12	1,80	< 0,02	< 0,025
AK-27 (734 km)	10.07.2015	0,29	2,39	0	0,0003
	21.08.2015	0,46	2,00	< 0,02	< 0,025
	18.09.2015	0,24	1,67	< 0,02	< 0,025
	23.10.2015	0,45	<1,5	< 0,02	< 0,025
	19.11.2015	0,18	<1,5	< 0,02	< 0,025
AK-28 (739 km, sanctuary border)	10.07.2015	0,4	3,04	0	0
	21.08.2015	0,19	3,22	< 0,02	< 0,025
	18.09.2015	0,20	1,82	< 0,02	< 0,025
	23.10.2015	0,46	<1,5	< 0,02	< 0,025
	19.11.2015	0,16	<1,5	< 0,02	< 0,025
AK-29 (744 km)	10.07.2015	0,24	1,75	0	0
	21.08.2015	0,41	2,64	< 0,02	< 0,025
	18.09.2015	0,32	2,04	< 0,02	< 0,025
	23.10.2015	0,35	1,96	< 0,02	< 0,025
	19.11.2015	0,16	1,96	< 0,02	< 0,025
AK-30 (754 km)	10.07.2015	0,42	2,65	0	0
	21.08.2015	0,17	2,21	< 0,02	< 0,025
	18.09.2015	0,42	1,73	< 0,02	< 0,025
	23.10.2015	0,32	2,08	< 0,02	< 0,025
	19.11.2015	0,20	2,08	< 0,02	< 0,025
AK-31 (764 km)	10.07.2015	0,24	2,06	0	0,00016
	21.08.2015	0,29	1,89	< 0,02	< 0,025
	18.09.2015	0,31	1,68	< 0,02	< 0,025
	23.10.2015	0,40	1,80	< 0,02	< 0,025

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
	19.11.2015	0,30	1,80	< 0,02	< 0,025
AK-32 (771 km, sanctuary border)	10.07.2015	0,3	2,09	0	0,00042
	21.08.2015	0,20	2,30	< 0,02	< 0,025
	18.09.2015	0,28	<1,5	< 0,02	< 0,025
	23.10.2015	0,36	<1,5	< 0,02	< 0,025
	19.11.2015	0,26	<1,5	< 0,02	< 0,025
AK-33 (774 km)	10.07.2015	0,3	2,74	0	0,0004
	21.08.2015	0,31	2,26	< 0,02	< 0,025
	18.09.2015	0,15	<1,5	< 0,02	< 0,025
	23.10.2015	0,46	<1,5	< 0,02	< 0,025
	19.11.2015	0,23	<1,5	< 0,02	< 0,025
AK-34 (784 км)	10.07.2015	0,38	2,22	0	0,0041
	21.08.2015	0,39	1,91	< 0,02	< 0,025
	18.09.2015	0,37	<1,5	< 0,02	< 0,025
	23.10.2015	0,40	1,62	< 0,02	< 0,025
	19.11.2015	0,009	1,62	< 0,02	< 0,025

Source: Contractor Annual Environmental Protection Report, See Annexure D

Noise and Vibration Level Measurement

Regarding noise and vibration, the contractor is obliged to undertake monthly noise measurement and vibration monitoring along the project road. Accordingly, Noise and vibration testing has been carried out at fourteen locations (Photograph 3.2) along or close to the road alignment at sensitive locations within the project road.

Noise level measurements were below the established level of 80 decibels. The highest registered noise level was 78 dBA in AK-2 (636 km, entrance to Shetpe village) on September 2015 which can be due to the construction activities. 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. However, the contractor was requested that future monitoring includes a photo record of the position of the noise / vibration monitor for the contractor environmental protection report.



Photograph 3.2: Measurement of noise in the presence of a representative of the project management committee

Table 3.2: Noise and Vibration Level Measurement

Sampling Locations	Sampling Date	Noise, dBA	Vibration, dB
Maximum concentration limits		80	100
AK-2 (636 km, entrance to Shetpe village)	09.07.2015	56	65
	20-21.08.2015	56	65
	17-18.09.2015	78	66
	22-23.10.2015	70	64
	18.11.2015	36	69
AK-8 (645 km, exit from Shetpe village)	09.07.2015	62	62
	20-21.08.2015	58	60
	17-18.09.2015	63	62
	22-23.10.2015	60	69
	18.11.2015	37	66
AK-10 (657 km, Shetpe camp)	09.07.2015	66	60
	20-21.08.2015	61	73
	17-18.09.2015	68	60
	22-23.10.2015	71	63
	18.11.2015	35	68
AK-11 (657 km, Shetpe camp)	09.07.2015	68	64
	20-21.08.2015	65	69
	17-18.09.2015	69	64
	22-23.10.2015	74	69
	18.11.2015	40	70

Sampling Locations	Sampling Date	Noise, dBA	Vibration, dB
Maximum concentration limits		80	100
AK-12 (657 km, Shetpe camp)	09.07.2015	70	70
	20-21.08.2015	63	71
	17-18.09.2015	71	66
	22-23.10.2015	70	66
	18.11.2015	38	63
AK-13 (657 km, Shetpe camp)	09.07.2015	59	60
	20-21.08.2015	58	60
	17-18.09.2015	66	61
	22-23.10.2015	70	64
	18.11.2015	48	59
AK-19 (707 km, entrance to Zhetybay village)	10.07.2015	68	58
	20-21.08.2015	64	56
	17-18.09.2015	67	56
	22-23.10.2015	72	66
	18.11.2015	42	84
AK-20 (713 km, exit from Zhetybay village)	10.07.2015	72	68
	20-21.08.2015	63	66
	17-18.09.2015	69	57
	22-23.10.2015	68	64
	18.11.2015	47	84
AK-23 (730 km, Zhetybay camp)	10.07.2015	70	66
	20-21.08.2015	64	68
	17-18.09.2015	70	70
	22-23.10.2015	74	70
	18.11.2015	40	70
AK-24 (730 km, Zhetybay camp)	10.07.2015	72	70
	20-21.08.2015	63	64
	17-18.09.2015	71	70
	22-23.10.2015	72	66
	18.11.2015	42	69
AK-25 (730 km, Zhetybay camp)	10.07.2015	68	60
	20-21.08.2015	62	57
	17-18.09.2015	72	73
	22-23.10.2015	74	74
	18.11.2015	44	70

Sampling Locations	Sampling Date	Noise, dBA	Vibration, dB
Maximum concentration limits		80	100
AK-26 (730 km, Zhetybay camp)	10.07.2015	72	68
	20-21.08.2015	61	57
	17-18.09.2015	68	70
	22-23.10.2015	66	62
	18.11.2015	42	68
AK-28 (739 km, sanctuary border)	10.07.2015	70	60
	20-21.08.2015	67	61
	17-18.09.2015	68	56
	22-23.10.2015	66	56
	18.11.2015	40	72
AK-32 (771 km, sanctuary border)	10.07.2015	68	62
	20-21.08.2015	54	61
	17-18.09.2015	66	57
	22-23.10.2015	68	60
	18.11.2015	44	72

Source: Contractor Annual Environmental Protection Report, See Annexure D

Water Quality Monitoring

In the project road alignment, there is a one water body, the Aschyagar River at Km 755. Water quality, in terms of Dry residue, Nitrates, Sulfates, Chloride, Petroleum products and Total Iron are tested in November 2015 at one location to detect environmental impacts from the road construction activities. Measurements results for water quality are generally acceptable with the six (06) parameters for the sample from the water sampling station at the Aschyagar 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.

Table 3.3: Water Quality Monitoring Result

Sampling Location	Characteristics /Parameters	ACL by ND, (ml/m3)	Actual Concentration ml/m3
			November (19.11.2015)
Aschyagar river at 755 km	Dry residue, mg/dm ³	-	974
	Nitrates, mg/dm ³	40	0,17
	Sulfates, mg/dm ³	100	94,65
	Chloride, mg/dm ³	300	259,0
	Petroleum products, mg/dm ³	0,05	0,032
	Total iron, mg/dm ³	1	0,09

Source: Contractor Annual Environmental Protection Report, See Annexure D

Soil Quality Monitoring

Soil quality test were done monthly at 27 sampling stations (Photograph 3.3) along the project road, villages, and camp sites. 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 July to November 2015 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 contaminants 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.



Photograph 3.3: Soil Sample Collection at AK-17 (694km) PK 587 and AK-33 (774km) PK 563

Table 3.4: Soil Quality Data

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		-	-	-	32	-
AK-8 (645 km)	09.07.2015	8,2	0,008	0,063	6,32	18,48
	20-21.08.2015	8,1	0,0095	0,04	6,92	16,92
	17-18.09.2015	8,1	0,011	0,08	4,85	20,63
	22-23.10.2015	8,2	0,008	0,05	5,64	21,07
	18.11.2015	8,1	0,0085	0,042	3,31	18,97
AK-9 (654 km)	09.07.2015	8,5	0,007	0,15	6,98	19,11
	20-21.08.2015	8,5	0,005	0,16	6,92	19,73
	17-18.09.2015	8,4	0,005	0,16	6,92	19,73
	22-23.10.2015	8,3	0,014	0,12	8,44	15,32
	18.11.2015	8,3	0,008	0,14	6,95	17,0
AK-10 (657 km, Shetpe camp)	09.07.2015	8,3	0,006	0,15	7,54	21,02
	20-21.08.2015	8,4	0,009	0,20	5,02	19,25

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		-	-	-	32	-
	17-18.09.2015	8,4	0,007	0,27	8,22	20,11
	22-23.10.2015	8,3	0,009	0,22	7,87	21,33
	18.11.2015	8,2	0,008	0,23	5,36	18,1
AK-11 (657 km, Shetpe camp)	09.07.2015	8,6	0,007	0,095	6,3	18,76
	20-21.08.2015	8,4	0,0073	0,22	5,66	19,48
	17-18.09.2015	8,4	0,012	0,18	7,69	18,21
	22-23.10.2015	8,4	0,01	0,19	8,00	17,54
	18.11.2015	8,3	0,012	0,20	6,53	19,96
AK-12 (657 km, Shetpe camp)	09.07.2015	8,4	0,008	0,18	5,4	18,57
	20-21.08.2015	8,4	0,0087	0,16	3,59	18,16
	17-18.09.2015	8,5	0,008	0,14	8,41	19,33
	22-23.10.2015	8,6	0,003	0,20	6,99	20,53
	18.11.2015	8,7	0,005	0,17	5,36	17,01
AK-13 (657 km, Shetpe camp)	09.07.2015	8,4	0,010	0,12	6,45	18,92
	20-21.08.2015	8,6	0,0098	0,17	5,78	19,50
	17-18.09.2015	8,6	0,011	0,13	8,18	19,28
	22-23.10.2015	8,6	0,013	0,15	7,22	20,24
	18.11.2015	8,6	0,009	0,25	7,88	18,75
AK-14 (664 km)	10.07.2015	8,4	0,016	0,17	8,66	19,91
	20-21.08.2015	8,5	0,015	0,10	8,08	19,38
	17-18.09.2015	8,5	0,017	0,15	14,31	19,63
	22-23.10.2015	8,4	0,015	0,17	11,22	20,79
	18.11.2015	8,4	0,013	0,29	8,0	18,67
AK-15 (674 km)	10.07.2015	8,4	0,054	0,043	7,91	18,41
	20-21.08.2015	8,2	0,041	0,11	8,35	14,76
	17-18.09.2015	8,2	0,050	0,08	6,89	18,15
	22-23.10.2015	8,3	0,07	0,06	9,00	16,55
	18.11.2015	8,4	0,08	0,06	7,93	17,15
AK-16 (684 km)	10.07.2015	8,6	0,020	0,21	9,20	17,98
	20-21.08.2015	8,4	0,0098	0,18	5,58	19,57
	17-18.09.2015	8,4	0,010	0,12	10,95	19,29
	22-23.10.2015	8,4	0,0099	0,19	8,41	18,71
	18.11.2015	8,4	0,053	0,14	6,43	16,98
AK-17 (694 km)	10.07.2015	8,2	0,015	0,10	7,13	19,88
	20-21.08.2015	8,1	0,013	0,18	8,31	19,34

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		-	-	-	32	-
	17-18.09.2015	8,2	0,018	0,14	7,33	18,02
	22-23.10.2015	8,3	0,016	0,18	8,97	19,01
	18.11.2015	8,2	0,01	0,11	11,56	18,08
AK-18 (704 km)	10.07.2015	8,4	0,010	0,11	9,23	20,80
	20-21.08.2015	8,1	0,018	0,19	9,02	19,26
	17-18.09.2015	8,1	0,011	0,17	9,21	20,00
	22-23.10.2015	8,2	0,013	0,22	9,47	19,90
	18.11.2015	8,2	0,012	0,22	9,57	20,91
AK-19 (707 km, entrance to Zhetybay village)	10.07.2015	8,7	0,016	0,18	8,67	18,33
	20-21.08.2015	8,6	0,014	0,16	8,46	19,43
	17-18.09.2015	8,5	0,018	0,16	5,52	19,44
	22-23.10.2015	8,4	0,016	0,13	8,00	18,91
	18.11.2015	8,4	0,014	0,09	6,5	19,2
AK-20 (713 km, entrance to Zhetybay village)	10.07.2015	8,3	0,018	0,16	6,14	18,09
	20-21.08.2015	8,1	0,015	0,11	7,28	16,20
	17-18.09.2015	8,1	0,019	0,11	10,68	17,17
	22-23.10.2015	8,2	0,012	0,10	8,01	18,02
	18.11.2015	8,2	0,012	0,13	7,02	17,58
AK-21 (714 km)	10.07.2015	8,1	0,008	0,21	11,35	17,41
	20-21.08.2015	8,1	0,011	0,35	15,69	16,32
	17-18.09.2015	8,1	0,008	0,24	12,56	17,92
	22-23.10.2015	8,1	0,014	0,2	13,58	16,77
	18.11.2015	8,2	0,013	0,17	14,27	17,5
AK-22 (724 km)	10.07.2015	8,0	0,010	0,13	6,03	14,22
	20-21.08.2015	8,1	0,008	0,12	7,13	10,77
	17-18.09.2015	8,1	0,012	0,20	10,80	12,18
	22-23.10.2015	8,2	0,018	0,14	8,01	14,00
	18.11.2015	8,2	0,02	0,10	8,45	14,68
AK-23 (730 km, Zhetybay camp)	10.07.2015	8,0	0,013	0,15	13,32	18,9
	20-21.08.2015	8,1	0,0096	0,10	14,23	15,88
	17-18.09.2015	8,0	0,016	0,13	12,92	19,46
	22-23.10.2015	8,1	0,013	0,16	13,11	19,99
	18.11.2015	8,1	0,014	0,18	13,57	18,08
AK-24 (730 km, Zhetybay)	10.07.2015	8,0	0,007	0,095	6,14	18,54
	20-21.08.2015	8,0	0,0028	0,26	6,08	16,01

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		-	-	-	32	-
camp)	17-18.09.2015	8,0	0,005	0,16	7,08	15,31
	22-23.10.2015	8,0	0,008	0,20	10,48	16,11
	18.11.2015	8,1	0,008	0,27	7,85	16,18
AK-25 (730 km, Zhetybay camp)	10.07.2015	8,6	0,010	0,10	4,0	18,92
	20-21.08.2015	8,4	0,007	0,19	5,50	17,14
	17-18.09.2015	8,3	0,011	0,17	8,31	18,68
	22-23.10.2015	8,2	0,011	0,15	8,06	19,00
	18.11.2015	8,2	0,008	0,14	8,59	19,07
AK-26 (730 km, Zhetybay camp)	10.07.2015	8,2	0,010	0,19	4,36	18,87
	20-21.08.2015	8,2	0,0085	0,17	7,85	14,16
	17-18.09.2015	8,2	0,005	0,20	7,93	19,26
	22-23.10.2015	8,2	0,0053	0,22	6,02	17,71
	18.11.2015	8,2	0,0069	0,24	6,36	20,22
AK-27 (734 km)	10.07.2015	8,5	0,026	0,0096	5,39	19,33
	20-21.08.2015	8,4	0,01	0,15	10,38	16,19
	17-18.09.2015	8,3	0,009	0,11	10,56	18,28
	22-23.10.2015	8,3	0,005	0,17	9,24	18,71
	18.11.2015	8,2	0,007	0,20	7,25	16,07
AK-28 (739 km, sanctuary border)	10.07.2015	8,2	0,029	0,19	16,94	18,79
	20-21.08.2015	8,0	0,024	0,30	18,60	17,33
	17-18.09.2015	8,1	0,028	0,22	18,01	17,33
	22-23.10.2015	8,2	0,025	0,17	15,33	8,39
	18.11.2015	8,1	0,025	0,35	19,17	8,55
AK-29 (744 km)	10.07.2015	8,2	0,05	0,071	6,71	18,38
	20-21.08.2015	8,3	0,05	0,12	7,56	14,97
	17-18.09.2015	8,2	0,035	0,09	8,35	17,38
	22-23.10.2015	8,3	0,055	0,11	6,12	15,97
	18.11.2015	8,3	0,045	0,10	8,16	18,9
AK-30 (754 km)	10.07.2015	7,8	0,010	0,10	7,82	21,41
	20-21.08.2015	7,9	0,012	0,09	8,89	12,48
	17-18.09.2015	8,0	0,013	0,15	6,43	12,88
	22-23.10.2015	8,1	0,014	0,11	9,79	13,44
	18.11.2015	8,0	0,013	0,12	10,65	18,58
AK-31 (764 km)	10.07.2015	7,9	0,016	0,22	8,65	17,19
	20-21.08.2015	8,0	0,011	0,16	18,04	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		-	-	-	32	-
	17-18.09.2015	8,1	0,013	0,25	14,28	19,36
	22-23.10.2015	8,1	0,011	0,19	11,36	18,29
	18.11.2015	8,1	0,009	0,31	18,98	17,84
AK-32 (771 km, sanctuary border)	10.07.2015	7,9	0,014	0,097	4,5	19,24
	20-21.08.2015	7,9	0,014	0,097	4,5	19,24
	17-18.09.2015	8,0	0,012	0,17	9,96	18,28
	22-23.10.2015	8,2	0,012	0,15	9,0	20,09
	18.11.2015	8,1	0,015	0,21	8,58	20,23
AK-33 (774 km)	10.07.2015	8,5	0,015	0,20	6,88	18,88
	20-21.08.2015	8,4	0,008	0,26	7,44	16,31
	17-18.09.2015	8,3	0,015	0,21	9,68	19,30
	22-23.10.2015	8,3	0,009	0,22	11,22	18,31
	18.11.2015	8,3	0,009	0,30	9,4	19,14
AK-34 (784 km)	10.07.2015	8,4	0,014	0,089	5,32	18,99
	20-21.08.2015	8,4	0,009	0,21	9,38	17,43
	17-18.09.2015	8,4	0,008	0,17	8,36	19,11
	22-23.10.2015	8,3	0,0095	0,19	10,11	17,87
	18.11.2015	8,2	0,007	0,21	8,53	18,07

Source: Contractor 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 (International) undertook inspection intermittently at the project site in July 2015 during this period 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 (Ms. Umirbekova Natalya, and Mr. Ali Baydar). The output of the environmental inspection of the international environmental specialist and consultant engineers is included in the Table below entitled “Observed Issues during the Environmental Inspections” Table 4.1.

The International Environmental Specialist of the Engineer conducted audit on the required documents from the Contractor. During the reporting period, the International Environmental Specialist has been reviewed the contractor monthly environmental protection reports and

second semi-annual environmental protection report & annual environmental protection report which were submitted by the contractor. The international 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 during the first bi-annual monitoring period 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 Contractor. 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 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 Progress Report and bi-annual environmental monitoring report. 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, 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.

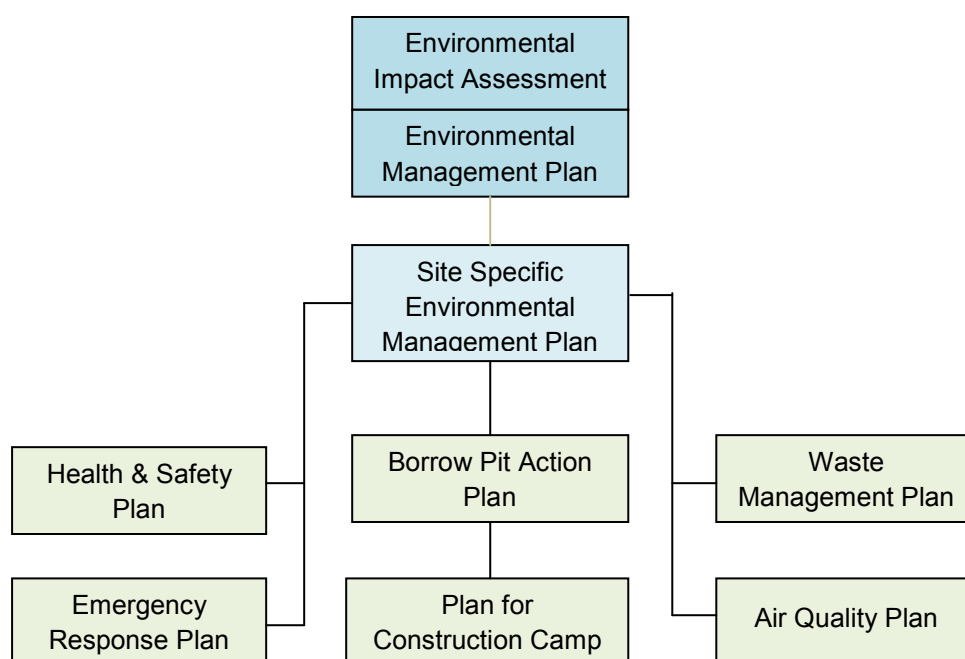


Figure 4.1: The SSEMP and its supporting documents

4.3 Observed Environmental Impacts and Mitigation Measures

During the periodic field mobilization and inspection of the International Environmental Specialists in July 2015 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. 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 area, access roads, bridges and culverts, canals, and Contractor's work camp.
- Detailed inspection was done on the environmental and safety issues set-up at 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 will be continuing with the deployment of local environmental specialist, whose main duties is to oversee the impacts generated and monitor 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 environmental, health and safety issues observed at the vicinity of project worksites during the monitoring of the CSC personnel, field reconnaissance of the CS International Environmental Consultant and consultant engineers (Table 4.1).

Table 4.1: Observed Issues during the Environmental Inspections

Environmental problems description	Description of the proposed action
Dust pollution occurs in certain limited areas of base repair. Water truck was used to minimize the consequences (photo 4.1, 4.2)	To reduce dust during construction through watering. It is recommended that EP specialist of Contractor to schedule watering of the road, where it is necessary to prevent the effects of dust on the local residents.
 <p>Photo 4.1: The increased level of dust in the work areas because of the work of Cengiz Insaat techniques</p>	
 <p>Photo 4.2: Water Sprayed during construction</p>	

Environmental problems description	Description of the proposed action
<p><u>Wearing of protective clothing and safety shoes and safety gear</u></p> <p>Workers are provided with helmets, reflective clothing, rods to alert during traffic, there are controllers to give a signal to road users.</p>	<p>The response from the Contractor:</p> <p>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.</p> <p>Strict adherence to the policy of protective measures on all construction sites.</p>



Photo 4.3: Workers in protective clothing.



Photo 4.4: Removing of road signs, workers in protective clothing.

Environmental problems description	Description of the proposed action
<p><u>Techniques: mobilization techniques can lead to air pollution and noise in the neighboring settlements.</u></p> <p>Now there is a mobilization of equipment that requires careful control to avoid formation of dust, especially in windy weather.</p> <p>Contractor follows the low speed when moving heavy machinery during road maintenance.</p>	<p>Until today there have been no complaints from the local population.</p>
<p><u>Air pollution and noise in the nearby settlements</u></p>	<p>Air quality - at an acceptable level for the existence according to the measurement of air quality (made from July to December 2015). Measurement of noise and vibration produced in compliance with the local standard limit.</p>
<p>The Contractor uses a traffic control methods to limit the interference to traffic and ensure the safety of traffic and pedestrians.</p>	<p>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. Material for winter maintenance of roads developed and agreed in Kazavtodor and SAPA SZ.</p> <p>Being developed the material about the flood waters for the spring period.</p>
<p><u>Possible impacts on road user safety</u></p> <p>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</p>	<p>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.</p> <p>Traffic accidents are recorded. All of accidents recorded in the corresponding journal of traffic safety service.</p>
<p><u>Mandatory quarry recovery plan - the project uses a lot of quarries for pavement.</u></p> <p>Excavation without a plan leads to difficulties in the rehabilitation of areas (photo 4.6)</p>	<p>Contractor developed and submitted a plan for the restoration of quarries. Implementation of the plan should be made before the demobilization.</p>



Photo 4.6:Quarry Development for the embankment

Environmental problems description	Description of the proposed action
<p><u>Technique - numerous amounts of Contractor's trucks equipped with a canopy. (photo 4.7)</u></p>	<p>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.</p>
 <p>Photo 4.7: Machinery fitted with a canopy at km 757.3</p>	
<p><u>Ambulance Kits / Medical Equipment</u> An ambulance with a doctor is available from June 2015.</p>	<p>The Contractor has mobilized a medical room with first aid resources. (Photo 4.9.)</p>
  <p>Photo 4.1: The ambulance service in Zhetybay camp: Km 757.3</p>	

4.4 Site Inspection and Audits

Periodic audits of the work camps and construction sites have been conducted during the construction period (July to December 2015) and have resulted in improved conditions at the camps and sites. Camps and sites will be regularly monitored throughout the construction season and particular focus will be given to works along the project alignment.

According to the observations during the site inspections by Environmental Representatives and consultant engineers further improvements were done at the sites within this period. Joint inspections of the consultant 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 Table 4.2 presents the summary of site visits in last six months from July to December 2015.

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)	
01.09.2015	@	@	Environmental protection mission of ADB
02.09.2015	@	@	Meeting with ADB representative
11.09.2015	@	@	ADB mission in Kazakhstan for review of conformity of protective measures execution in the framework of the current project
12.09.2015	@	@	
14.09.2015	@	@	Mission meeting on the results of the review of the monitoring area
11.10.2015	@		ADB mission. Site visit by contract №1
13.10.2015		@	ADB mission. Site visit by contract №2
30.10.2015	@	@	Informational training on HIV / AIDS
07.12.2015		@	Training on safety and environmental protection
14.01.2016	@	@	Meeting with ADB representative

@ Indicates Number Cases

Sources: Compiled

4.5 Training and Meetings

One of the functional responsibilities of the ecologist is the development of programs for environmental protection training of Staff of the Contractor. The aim of the environmental protection training program is the environmental inspection and monitoring of their compliance with environmental reporting, which will be held in conjunction with the assistance of international experts for environmental protection. The training was conducted for all personnel, issues were clarified and defined measures for its implementation. Photos of the training attached below (photo 4.11).

Also, in conjunction with the regional center on HIV / AIDS, according to the approved schedule, organized training seminars with the distribution of booklets, brochures, flyers,

safety means in order to give full information about HIV / AIDS, the ways and possibilities to prevent infection. Photo of the training attached below (photo 4.12)

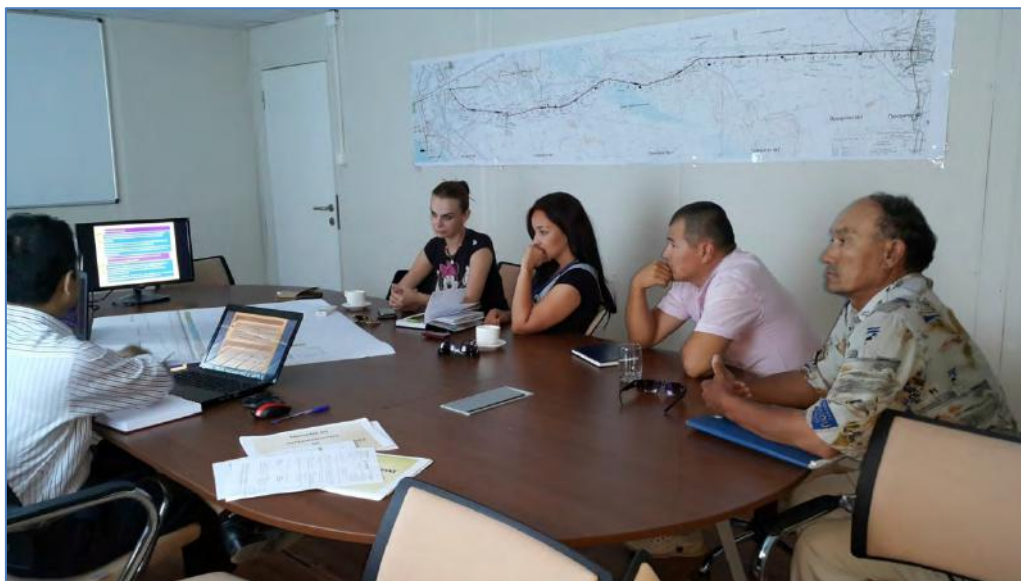


Photo 4.11: Training for personnel in Zhetybay camp

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 23rd April 2015 for consultant staffs but unfortunately, the international specialist was not able to arrange training for the contractor staffs in April 2015 since contractor environmental specialist was not mobilize. Therefore, the training program for the contractor staff has been organized on 3rd July 2015 for contractor staffs. The main purpose of the training is 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 4.12 and Photograph 4.13) and the PowerPoint presentation slides are given in Annexure C.



Photograph 4.12: Training program for Consultant Staffs at Zhetibay Camp Site



Photograph 4.13: Training program for Contractor Staffs at Zhetibay Camp Site

Several meetings were held with the participation of the Contractor, Engineer and ADB representatives in April 2015, June 2015 and July 2015. These meetings were basically focused on the initial activities of the Contractor for the EMP implementation and further action (Photograph 4.14).

Monthly meetings between the Contractor's Project management staff and the Consultant are held to discuss the Project, 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.



Photograph 4.14: Meeting with Contractor & Consultants Engineers at Zhetibay Camp Site

4.6 Notices and Letters

During the previous six-month period, the CS Consultant had 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 No.	Date	From	To	Subject
5017016/CR/0225	01.07.2015	SMEC-Sapa SZ	Cengiz Insaat	Training program on environmental issues
5017016/CR/0243	10.07.2015	SMEC-Sapa SZ	Cengiz Insaat	Comments on monthly and annual environmental reports
5017016/CR/0402	20.10.2015	SMEC-Sapa SZ	Cengiz Insaat	Air quality during operation of crushing plant in camp
5017016/CR/0410	26.10.2015	SMEC-Sapa SZ	Cengiz Insaat	Check list on environmental monitoring
5017016/CR/0463	30.11.2015	SMEC-Sapa SZ	Cengiz Insaat	Social and ecological monitoring
AKT-CGZ-SS-2015-312	10.08.2015	Cengiz Insaat	SMEC-Sapa SZ	Environmental report for July
AKT-CGZ-SS-2015-345	07.09.2015	Cengiz Insaat	SMEC-Sapa SZ	Environmental report for August
AKT-CGZ-SS-2015-380	02.10.201	Cengiz Insaat	SMEC-Sapa SZ	Environmental report for September
AKT-CGZ-SS-2015-426	28.10.2015	Cengiz Insaat	SMEC-Sapa SZ	Check list on environmental monitoring
AKT-CGZ-SS-2015-435	04.11.2015	Cengiz Insaat	SMEC-Sapa SZ	Environmental report for October
AKT-CGZ-SS-2015-451	18.11.2015	Cengiz Insaat	SMEC-Sapa SZ	Sampling
AKT-CGZ-SS-2015-345	07.12.2015	Cengiz Insaat	SMEC-Sapa SZ	Environmental report for November
AKT-CGZ-SS-2015-345	25.12.2015	Cengiz Insaat	SMEC-Sapa SZ	Annual Environmental Report

4.7 Corrective Action Plans

Within July–December 2015 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 Inspectors. The issues encountered in this periodic inspection were in the aspect of site safety, asphalt plant arrangement, and

management dust management, hindrance on normal traffic and oil contamination. Work related 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. The measures to mitigate impacts were recommended accordingly and discussed within this report. Intensive inspection was undertaken by the Environmental Specialist and consultant engineers during this period and the result was presented and discussed in the meeting at the Engineer's office (Zhetibay). The Descriptions of Proposed Measures included in Table 4.1. Observed Issues during the Environmental Inspections has to be complied by the Contractor in the monthly environmental protection report. The CSC inspectors 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 Inspection Monitoring was provided by the International Environmental Specialist earlier to Contractor environmental specialist as a guide to facilitate regular EHS inspections and monitoring.

In early July 2015, CSC International Environmental Specialist was mobilized to undertake environmental inspection and audit as outlined in the TOR and preparation of first bi-annual environmental monitoring report (January to June 2015) 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 International Environmental Specialist and consultant engineers for environmental issues are summarized below:

- Discussion with Team Leader on assignments responsibilities and expectations.
- Attended meeting with ADB missions, PMC officials, Engineers and Contractor's representatives.
- Obtain monthly/quarterly/bi-annual environmental progress reports and other pertinent documents on EHS.
- Review monthly environmental parameter measurements, and EHS records maintained by Contractor.
- Meeting with Contractor's Representatives regarding environmental monitoring procedure and monthly and 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 (with road safety engineers).
- 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 EMP was also to be revised. Guidance was already provided by the International Environmental Specialist and the Contractor's Environmental staff has 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.

4.8 Conclusions and Recommendations

4.8.1 Conclusions

This second Bi-annual Environmental Monitoring Report (July to December 2015) 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 (MID), 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 contractor); site visits, incorporating the results of the required 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 consultant Engineers in last six months and International Environmental Specialist in early July 2015, which became the basis for the writing of the second Bi-annual Environmental Monitoring Report for the Employer (CR, MID) 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 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 July to December 2015, the contractor has conducted monitoring of ambient air, soil, noise and water samples for last five months. The monitoring results of all the parameters are within the standard of Republic of Kazakhstan.

During the environmental monitoring the followings were identified:

- No serious environmental issues were identified at the early construction stage. The construction works are on early stages of progress. Accommodation, office facilities are ready in compliance with environmental requirements.
- Contractor is taking necessary steps in implementation of EMP requirements. Required permits from local authorities are being obtained.
- Monitoring activities and checklists as indicated in EMP implemented and conducted regularly as required.
- 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.
- Grievance Redress Mechanism elaborated by the Contractor on the project site level and nominated contact people have to be designated.

In addition, a checklist for the Procedure on Environmental Inspection Monitoring was provided by the International Environmental Specialist to consultant engineers as a guide to facilitate regular environmental inspections and monitoring. Accordingly, the environmental monitoring checklist has been completed regularly during site visit for further improvements and also sample fill-up checklist is attached in Annexure B.

The next third Bi-annual Environmental Monitoring Report will be submitted to CR, MID and ADB in July 2016.

4.8.2 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 by the Contractor within the next reporting period. In addition, it is noted that some issues, such as waste 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 monitoring checklist) and monthly reports, bi-annual environmental monitoring report and to date the contractor has submitted monthly reports regularly during this period and second bi-annual environmental monitoring report (July to December 2015). 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: Workers in safety clothing on PK324 -326 Lot 3 (Contract - 2)



Photograph 2: Ashyagar river bridge reconstruction Lot 4 (Contract - 2)



Photograph 3: Embankment compaction on PK628-630 Lot 4 (Contract - 2)



Photograph 4: Installation – dismantling of road signs on a by-pass road PK310-312 Lot 3
(Contract - 2)



Photograph 5: Contractor's trucks equipped with canopy PK42 Lot3 (Contract 2)



Photograph 6: Asphalt pavement milling PK80-85 Lot 3 (Contract 2)



Photograph 7: Zhetybay camp asphalt-concrete plant (km729.5)



Photograph 8: By-pass road signs PK727 Lot 3 (Contract 2)



Photograph 9: Pier cap of pier #2 of Ashyagar PK376 Lot 4 (Contract 2)



Photograph 10: Embankment construction PK262-265 Lot 3 (Contract 2)

Annexure B: Sample Environmental Monitoring Checklist

Environmental Monitoring Checklist

Site Walkover Checklist		
Date of Walkover: <i>8.12.15</i> Time: to	Engineer's Representative  Contractor Representative Umirbekova N. 	Engineer's Reference Number Contractor Reference Number
Weather Conditions:		
Work in progress:		
Environmental Problems	Possible Causes	Proposed Mitigations
Solid waste	Untimely cleaning of territory	ensure timely cleaning
Environmental Audit carried out by: 		Representative of contractor: 

No.	Environmental Protection Measures	Implemented		Functioning		Comments
		Yes	No	Yes	No	
Contractor's Camp						
1	Septic tanks installed and emptied according to approved procedures	✓				Re- concluded the contract for removal of sewage from septic tank
2	All waste water is directed to septic tanks or technical water tanks	✓				
3	All hazardous liquids stored in the designated area on an impervious base with runoff collection	✓				
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	✓				Recycling by the contractor IE Shynzhymbek
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.	✓				During the construction of any project, the public is informed by local media
8	Open storage containers provided with cover nets or similar	✓				
9	All open burning is prohibited	✓				
10	Adequate firefighting equipment <ul style="list-style-type: none">▪ Buckets of sand & Spades▪ Foam Extinguishers▪ Fire blanket in kitchen area	✓				there is no protective coating in the canteen
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	✓				There are specially designated smoking

No.	Environmental Protection Measures	Implemented		Functioning		Comments
		Yes	No	Yes	No	
						areas
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.	✓				bottled water
16	All worker's uniforms are laundered on a daily basis	✓				
17	All employees are provided with three meals per day	✓				
18	Hygienic canteen facility at camp sites	✓				
19	Emergency medical facilities and first aid box at camp site and work sites	✓				
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 litter or waste present except in designated areas	✓				Territory cleaning on daily basis
22	Provision of recreational facilities at camp sites	✓				
23	Children below 15 employment for works					Child labor is prohibited by the Labour Code of Kazakhstan
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	✓				
2	Liquid waste from the Asphalt plant is stored in the designated tank and emptied by specialized suction vehicles of ≤MTTSTH≥ of Liman	✓				
3	Bitumen is stored in the designated area and bended in concrete to a					

No.	Environmental Protection Measures	Implemented		Functioning		Comments
		Yes	No	Yes	No	
	volume of 110%					
4	Solid waste from Asphalt plant is stored in the designated area and disposed of in accordance to approved procedures	✓				
5	The plant area is graveled for reduction of dust emission	✓				In autumn and summer dust control is carried out with water
6	The plant area is watered for reduction of dust emission	✓				
7	No plant may discharge effluent water to any watercourse; impervious concrete basins will be constructed for receiving such waters	✓				
8	All staffs at Asphalt, Concrete and Crusher Plant are supplied with dust masks and ear defenders	✓				
9	All staffs at Asphalt, Concrete and Crusher Plants are wearing their dust masks and ear defenders.	✓				
10	All sands and aggregate for concrete and asphalt batching kept damp or covered	✓				
11	The Asphalt, Concrete and Crushing plants are provided with adequate firefighting equipment	✓				there are fire extinguishers
12	Plant or equipment causing high vibration levels are of appropriate design, well maintained and correctly operated	✓				
13	Fencing is erected to protect the river / canal	✓				
Fuel Station						
1	Oil filling and refueling will be strictly controlled and is permitted only at the fuel filling station and workshops area	✓				
2	Fuel tanks storage area is bunded and impervious bottom and roof is closed	✓				
3	Fuel station provided with adequate	✓				There are fire

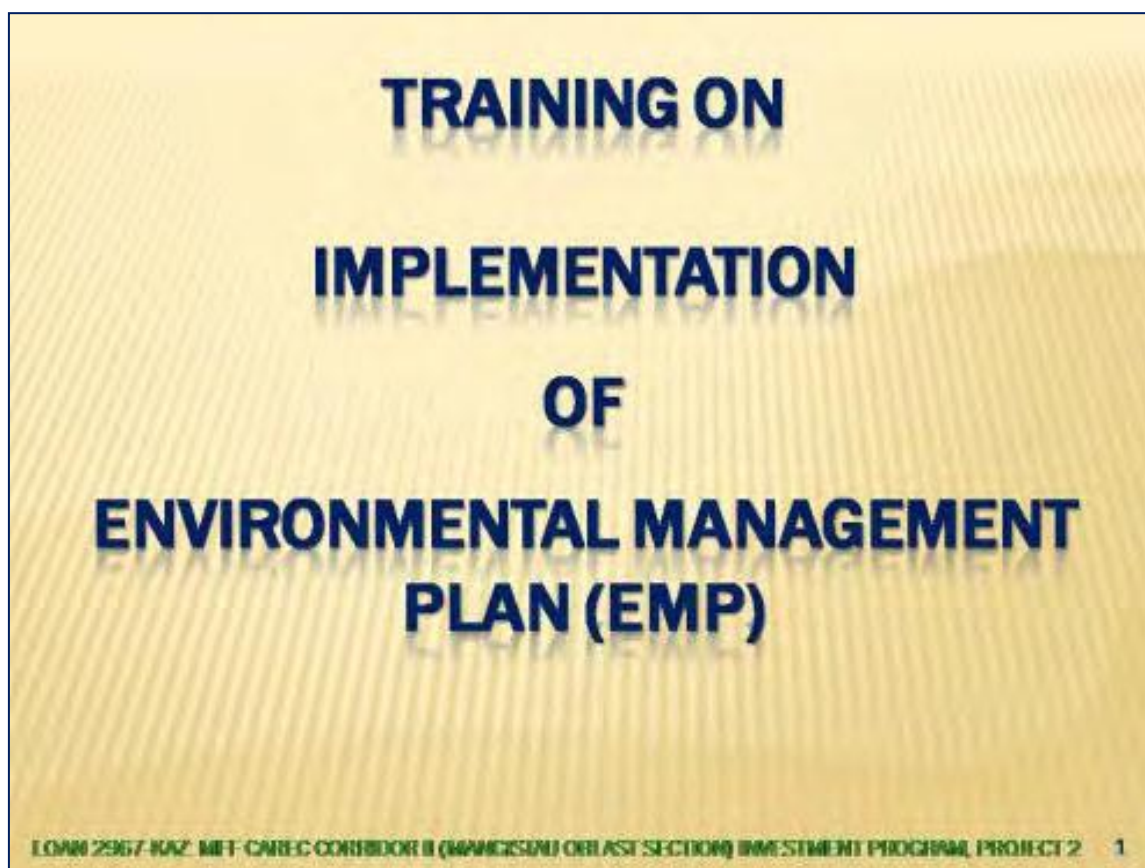
No.	Environmental Protection Measures	Implemented		Functioning		Comments
		Yes	No	Yes	No	
	firefighting equipment checked weekly					extinguishers in the workplace
4	Fuel station provided with safety ribbon and warning signs		✓			Installed temporary road signs
5	Fuel station provided with wastebasket			✓		
Contractor's Workshop and Car Wash						
1	Liquid hazardous materials stored in the designated secure area at the workshops	✓				
2	Solid hazardous materials stored in the designated secure area at the workshops	✓				stored in a workshop after the disposal by the contractor
3	Containers for waste oils and hydraulic fluids provided	✓				
4	Used oil collected in used oil tank bunded in concrete to a volume of 110% and emptied according to approved procedures	✓				
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	✓				
Project Road						
1	All roads impacted by construction activities watered by sprinkler trucks	✓		✓		For construction period
2	The project road is provided with flags		✓			At the end of the

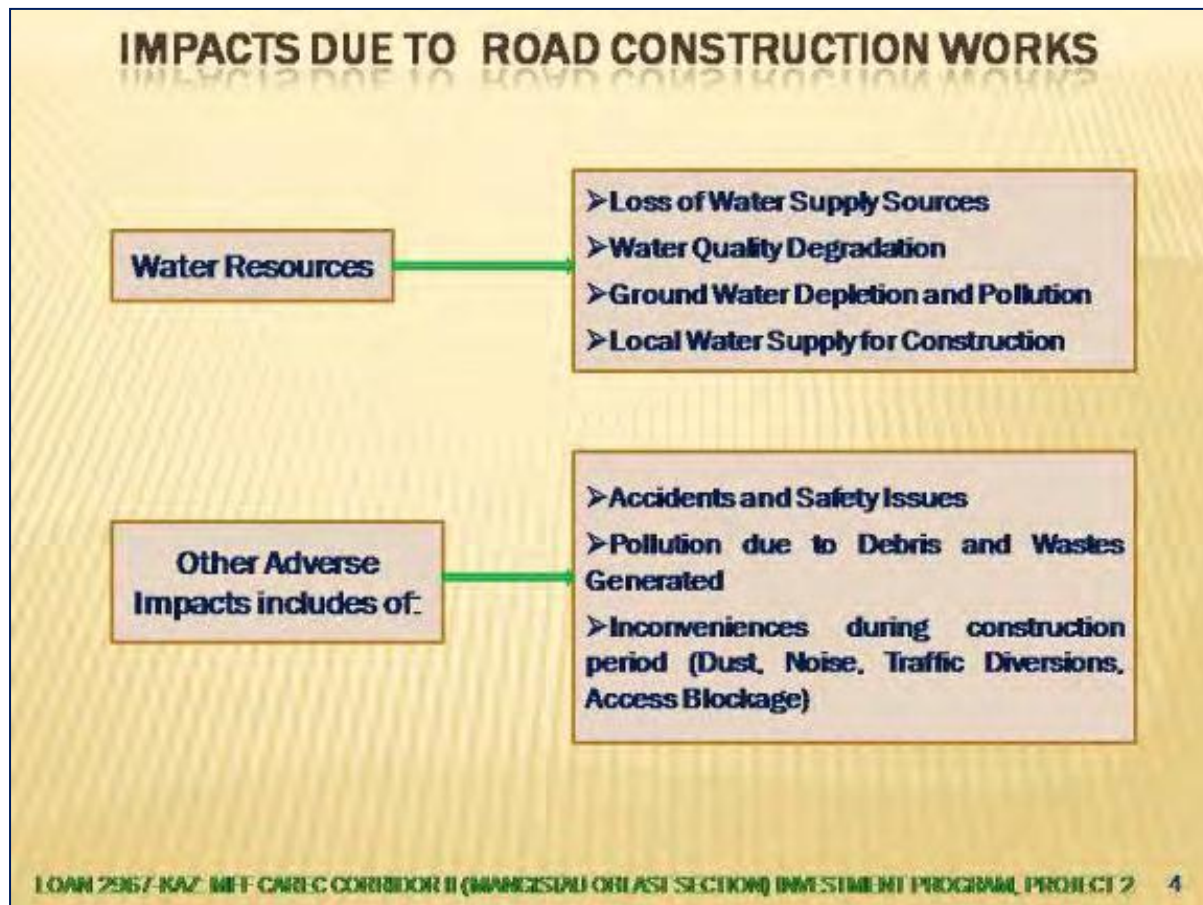
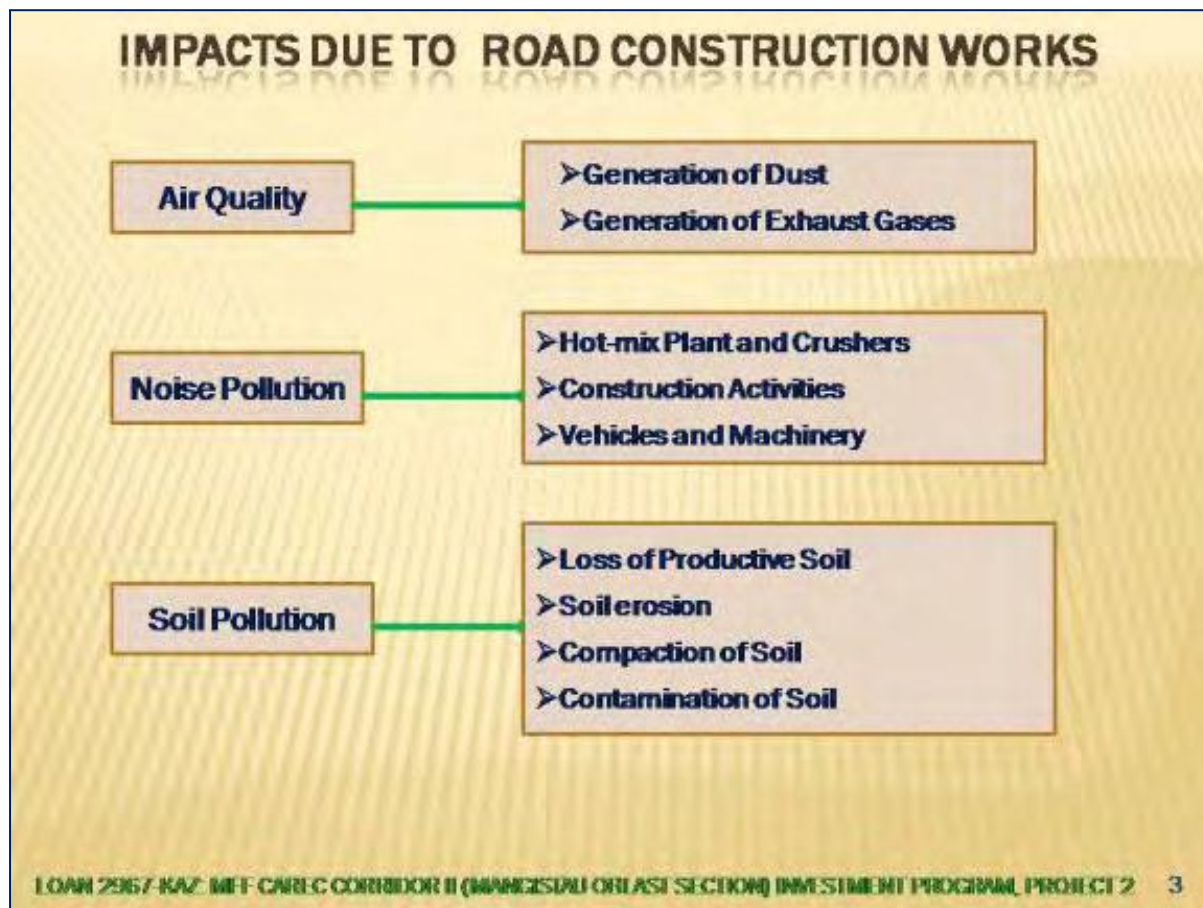
No.	Environmental Protection Measures	Implemented		Functioning		Comments
		Yes	No	Yes	No	
	at appropriate places for passage of cattle, sheep and other animals					assembly of artificial structures will be installed appropriate signs
3	Culvert and bridge construction areas provided with safety ribbons and wringing signs	✓				There are safety ribbons
4	Fencing and access control installed at all work sites where practicable	✓				
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	✓				
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	✓				
2	Within 200m of the nearest habitation construction work is stopped between 22.00 and 6.00 hours	✓				
3	Aggregates only obtained from approved borrow areas	✓				
4	Aggregate extraction is not taking place within 100m of a river or watercourse	✓				
5	Stockpiles do not exceed 3m in height		✓			
6	All vehicles with an open load-carrying area used for transporting potentially dust producing material properly fitting side and tail boards	✓				Use the canopy to reduce dust formation during transportation of bulk materials

No.	Environmental Protection Measures	Implemented		Functioning		Comments
		Yes	No	Yes	No	
7	During construction all noise volume restricted to the national standards	✓		✓		
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	✓		✓		
9	All vehicles, machinery, and plant meet Euro standards for exhaust emissions	✓				
10	All temporary acquired land is rehabilitated	✓				At the end of the project will be carried out recultivation
11	All spilled materials and contaminated earth collected and disposed accordance with approved procedures	✓				
12	During the delivery and handling of materials provided effected water sprays					
13	Any adjacent areas disturbed due to spoil restored to its original state	✓				
14	River banks protected from materials deposited or temporary contractor stockpiles					
15	Nuisances or disturbance arising from the execution of the works controlled to tolerable level according to standards					
16	Access roads to quarry, borrow pits, stock pile areas and traffic operations maintained to approved standards	✓				
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	✓				There are no ancient trees at the construction site

No.	Environmental Protection Measures	Implemented		Functioning		Comments
		Yes	No	Yes	No	
3	Cutting down has not taken place without the prior approval of the relevant local authorities	✓				
4	Trees or shrubs only felled or removed if they impinge directly on the permanent works or necessary temporary works					
5	Construction avoided on bridge sites during spawning seasons (indicate yes or no to construction activities on going, providing date)					
6	Construction on rivers only take place during period of low flow to minimize pollution	✓				

Annexure C: PowerPoint Slides in the EMP Training





ENVIRONMENTAL MANAGEMENT PLAN (EMP)

LOAN 2967-KAZ: MFF CAREC CORRIDOR II (MANGISTAU OBLAST SECTION) INVESTMENT PROGRAM, PROJECT 2 5

What Actually is EMP????

**“Environmental
Management Plan is a
Tool”**

LOAN 2967-KAZ: MFF CAREC CORRIDOR II (MANGISTAU OBLAST SECTION) INVESTMENT PROGRAM, PROJECT 2 6

Purpose of EMP.....

- Minimize Negative Impacts
- Enhance Positive Impacts
- Helps in bringing in Environment friendly construction management
- Reduce Problems and Delays during implementation
- Improve Over-all Project Quality

LOAN 2967-KAZ: MFF CAREC CORRIDOR II (MANGISTAU OBLAST SECTION) INVESTMENT PROGRAM, PROJECT 2 7

Aspects Covered

- Water
- Air
- Soil
- Noise
- Damage to Flora and Fauna
- Disruption to Users
- Traffic Control and Safety
- Construction Materials
- Worker's Accident Risks
- Workers' Health Risks including Hygiene
- Enhancement of natural and man-made features

LOAN 2967-KAZ: MFF CAREC CORRIDOR II (MANGISTAU OBLAST SECTION) INVESTMENT PROGRAM, PROJECT 2 8

Disposal of Debris from Road Surface

- Contractor will identify pre-designated disposal site for disposal of waste or subject to approval of Environmental Representative.
- Responsibility of contractor to arrange – transportation, maintenance, dismantling and debris clearing or as directed by Environmental Representative.

Other Construction Waste Disposal

- Contractor will prepare a detail "Comprehensive Solid Waste Disposal Plan" with approval of Environmental Consultant
- Joint inspection of all disposal site by Environment Representative and Contractor prior to approval.
- Unsuitable materials not to be disposed off near: water course, agriculture land, natural habitat, etc.
- All disposal site will be certified by Environmental Consultant prior to handing over.

LOAN 2967-KAZ: MFF CAREC CORRIDOR II (MANGISTAU OBLAST SECTION) INVESTMENT PROGRAM, PROJECT 2 9

Accessibility

- Contractor will provide safe and convenient passage for vehicles, pedestrians and livestock, if necessary, temporary connecting road.
- Contractor will also ensure, existing accesses are not blocked without providing adequate provisions.

Planning for Traffic Diversions and Detours (alternative route)

- Temporary diversions constructed after approval of the Engineer and Environmental Representative.
- Specific safety measures for: pedestrian and workers working at night
- Sprinkling of water three/four times a day to keep Diversion/Detours are dust free
- Traffic control plans shall contain: a) details of diversions, b) traffic safety arrangements c) safety measures for night time traffic; and, d) transportation of hazardous materials.

LOAN 2967-KAZ: MFF CAREC CORRIDOR II (MANGISTAU OBLAST SECTION) INVESTMENT PROGRAM, PROJECT 2 10

Transporting Construction Materials and Haul Road Management

- Contractor will maintain all roads used for transporting construction materials, equipment and machinery.
- Compact haul roads. Provide a layer of coarse aggregate on top and roll it to prevent generation of dust.
- Sprinkle water on the haul roads at regular interval decided by the Environmental Consultant.

Disruption to Other Users of Water

- Contractor at its cost will arrange adequate supply for the whole construction period.
- Precaution to minimize the wastage of water in the construction process/operation

LOAN 2967-KAZ: MFF CAREC CORRIDOR II (MANGISTAU OBLAST SECTION) INVESTMENT PROGRAM, PROJECT 2 11

Drainage

- Contractor will take necessary measures to prevent the blockage of water flow.
- Contractor will take all required measures to prevent temporary or permanent water diversion of the site or any adjacent area.

Slope Protection and Control of Soil Erosion

- Contractor will take slope protection measures to control soil erosion on the basis of site conditions.
- Turfing works will be taken up as soon as possible provided the season is favorable.

LOAN 2967-KAZ: MFF CAREC CORRIDOR II (MANGISTAU OBLAST SECTION) INVESTMENT PROGRAM, PROJECT 2 12

Water Pollution from Construction Wastes

- Contractor will take measures to prevent the wastewater generated during construction from entering into water bodies.
- Waste arising from the project is to be disposed off in the manner that is acceptable to the National Environmental Law.

Water Pollution from Fuel and Lubricants

- Parking location, fuel/lubricants storage sites, vehicle, machinery and equipment maintenance and refueling sites - at least 100 m from water bodies.
- Location and lay-out plans of such sites will be submitted by the Contractor prior to their establishment for approval from Environmental Representative.
- Spillage of fuels and lubricants does not contaminate the groundwater
- Oil interceptors will be provided for vehicle parking, wash down and refueling areas.
- All spills and collected petroleum products will be disposed off in accordance with National Environmental Law and MOTC.
- Environmental Representative will certify that all arrangements comply with the guidelines of National Environmental Law or any other relevant laws.

LOAN 2967-KAZ: MFF CAREC CORRIDOR II (MANGISTAU OBLAST SECTION) INVESTMENT PROGRAM, PROJECT 2 13

Dust Pollution

- Precaution to reduce the level of dust by sprinkling of water, encapsulation of dust source and by erection of screen/barriers.
- Plants located at least 1 km in the downwind direction from the nearest human settlement if any.
- Provide necessary certificates for all crushers used in construction conform to relevant dust emission control legislation.

Emission from Construction Vehicles, Equipment and Machineries

- Contractor will ensure that all vehicles, equipment and machinery (pollution emission levels) comply with requirements of national environmental law and ADB safeguard policy.
- Contractor will submit validity certificates for all vehicles / equipment/ machinery used for the project.

LOAN 2967-KAZ: MFF CAREC CORRIDOR II (MANGISTAU OBLAST SECTION) INVESTMENT PROGRAM, PROJECT 2 14

Noise Pollution: Noise from Vehicles, Plants and Equipments

- Contractor will ensure that all vehicles, equipment and machinery (pollution emission levels) comply with requirements of national environmental law.
- Contractor will submit validity certificates for all vehicles/ equipment /machinery used for the project.

- Plants and equipment used in construction shall strictly conform to the National environmental law/ADB noise standards.
- Vehicles and equipment used in construction will be fitted with exhaust silencers.
- Limits of noise emission for construction equipment shall not exceed 75 dB.
- No Construction activity near (100 m) sensitive areas between 9.00 pm to 6.00 am.

LOAN 2967-KAZ: MFF CAREC CORRIDOR II (MANGISTAU OBLAST SECTION) INVESTMENT PROGRAM, PROJECT 2 15

Personal Safety Measures for Labour

- Contractor will provide labour with: Protective footwear, protective goggles, Earplugs, Luminous jacket, hard hats and hand gloves.
- International Labor Organization (ILO) Convention No. 62 as far as those are applicable to this contract.
- Contractor will not employ any person below the age of 14 years for any work.

Traffic and Road Safety

- Contractor will take all necessary measures like barricading, including signs, markings, flags, lights and flagmen as proposed in the Traffic Control Plan/Drawings.
- Contractor will ensure that all signs, barricades, pavement markings are provided as per the specifications.
- Before taking up construction on any section, a Traffic Management Plan will be devised and implemented to the satisfaction of the Environmental Representative / Road Safety Engineer

LOAN 2967-KAZ: MFF CAREC CORRIDOR II (MANGISTAU OBLAST SECTION) INVESTMENT PROGRAM, PROJECT 2 16

First Aid

- A readily available first aid unit including adequate supply of sterilized dressing materials and appliances as per the Safety Measures Rules in every work section.
- Suitable transport at all times to take injured or sick person(s) to the nearest hospital.

Accommodation

- The location, layout and basic facility provision of each labour camp will be submitted to Engineer and MOTC and construction commence after written approval of the Environmental Representative.
- Will maintain living accommodation and ancillary facilities in functional and hygienic manner and as approved by the Engineer.

LOAN 2967-KAZ: MFF CAREC CORRIDOR II (MANGISTAU OBLAST SECTION) INVESTMENT PROGRAM, PROJECT 2 17

Portable Water

- In all Labour accommodation, uncontaminated water is available for drinking, cooking and washing.
- Water storage tank at least 1m above the surrounding ground level.
- Well within 25m proximity to toilet will be disinfected before water is used for Drinking.

Sanitation and Sewerage System

- Sewage system for the camp are designed, built and operated in such a fashion that no health hazards occurs.
- All toilets are to be cleaned and kept in a strict sanitary condition.

LOAN 2967-KAZ: MFF CAREC CORRIDOR II (MANGISTAU OBLAST SECTION) INVESTMENT PROGRAM, PROJECT 2 18

Waste Disposal

➤ Segregated garbage bins in the camps and ensure that these are regularly emptied and disposed off as per the Comprehensive Solid Waste Management Plan

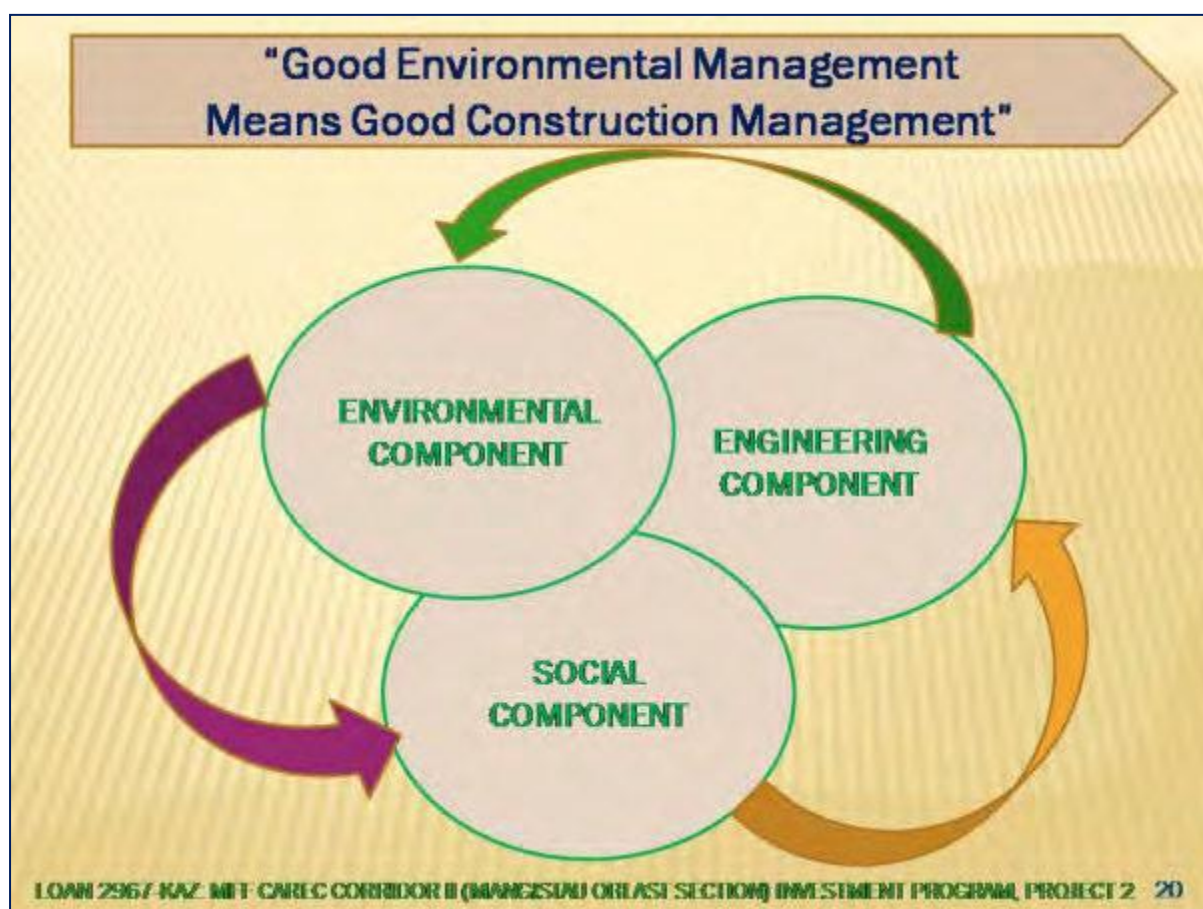
Clean-up Operations, Restoration and Rehabilitation

➤ Clean-up and restoration operations are to be implemented by the Contractor prior to demobilization.

➤ Contractor will clear all temporary structures, dispose all garbage, and waste as per Comprehensive Waste Management Plan and as approved by Engineer OR Environmental Specialist.

➤ All construction zones including bridges, culverts, road-side areas, camps, hot mix plant sites, crushers, batching plant sites and any other area used/affected by the project will be left clean and tidy, at the contractor's expense, to the entire satisfaction to the Environmental Specialist.

LOAN 2967-KAZ: MFF CAREC CORRIDOR II (MANGISTAU OBLAST SECTION) INVESTMENT PROGRAM, PROJECT 2 19



Annexure D: Contractor's Annual Environmental Protection Report (January to December 2015)



**MINISTRY OF INVESTMENT AND DEVELOPMENT
REPUBLIC OF KAZAKHSTAN**

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

**Financed by:
Asian Development Bank (ADB)**

**ENVIRONMENT PROTECTION REPORT
FOR 2015**

**Section km 632,3 – km802«Shetpe-Aktau»
of the road «Aktau - Beineu»**

Prepared by: Andrey Ivlev

December 2015

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Project Description

Road «Beyneu-Aktau» it 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 road of national significance and of great importance 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.

Road «Beyneu-Aktau» it 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.

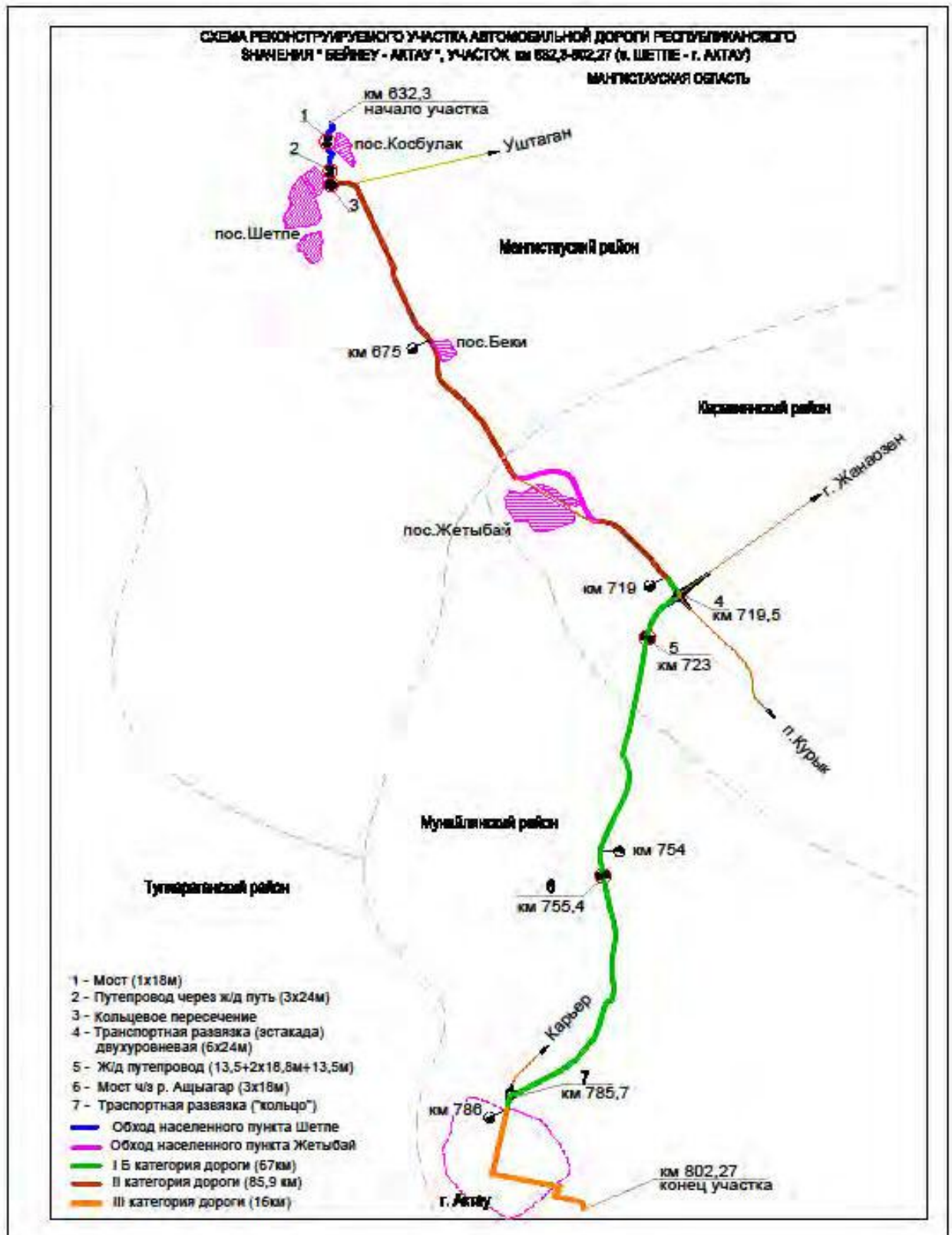
- construction of transport junction in two levels at the intersection of highways «Aktau – Zhana Ozen» and «Shetpe - Kuryk» on km 720 with the passage of four-lane road on top (on a ramp of 6x24m) via highway «Shetpe - Kuryk » and lightning with a length of 5,08 km.

- 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.



1. Environment management plan performance report

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:

- Plan for water quality management,
- The management plan of measures to prevent dust,
- The plan for the management and restoration of quarries,
- Management Plan for the condition of the ground (soil),
- Management Plan for fuels and chemicals,
- Management Plan for the construction site,
- Management Plan for solid waste,
- Management Plan to minimize the noise.

Contractor from the date of commencement of work, in March 2015, taking into account the requirements of a contract for the construction, a monthly report on the implementation of MPEP, besides this was presented an additional report for the first half of 2015.

This report is a report on the work of Contractor for 2015.

To control the execution of the management plan, environmental specialist ecologist of the Contractor constantly monitor 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.

In the intervening period the consultant on environmental safeguards of ADB visited the construction site, specialists of the Contractor take part in seminars and trainings conducted by ADB consultant.

2.1 Land resources

The necessary permits and approvals for the temporary land allocation for the storage site of materials, soil and aggregate quarries, for a temporary bypass arrangement in the area of reconstruction km632,3-km802, temporary bypass roads for the possibility of communications relocation, entrance to the soil and aggregate quarries, as well as to the camp received by the Contractor since the beginning of the work, in particular from Mangistau, Karakiya and Munaily Districts Akimats and other competent bodies. Also received the Manghystau region Akimat and other competent authorities' approval for 10hectare for land allocation for camp construction and asphalt and crusher plants installation. The decision of Manghystau region Akim received and the contract for 10hectare land renting concluded.

Temporary bypass road arranged. The arrangement of roads carried out in such a way that minimized the impact on the surrounding communities, including schools and hospitals.

Received decisions for the temporary land allocation for the asphalt plant site and communications arrangement (gas line, water line, electric line) for Zhetybay camp from Karakiya region Akimat, and the contract for land renting concluded. Land for laying communications executed, negotiated the project of electricity, gas and water for "Zhetybay" camp by area of 16hectare. Received decisions of Karakiya region Akim, and contracts for 23,4648hectare land sections renting are concluded.

To reduce the impact on the land resources the following events perform by Contractor:

- Topsoil removed from all road sections, where it is stipulated,
- Technological cycle of work is obeying,
- Subgrade slopes strengthening performing in order to prevent erosion,
- Equipment refueling is carried out in designated areas,
- In order to avoid getting oil on the soil cover, parking, repair and maintenance of equipment are carried out in the construction camp repair area near Zhetybay village,
- carried out separate collection and storage of waste,
- soil cover monitoring is performing.
- roads water sprinkling is performed in works performed places to reduce the formation of dust,
- equipment traffic is carried out on existing roads.

During 2015 were given the recommendations to the Contractor for taking additional measures to prevent dusting. In accordance with the corrective actions was increased the frequency of roads watering.

2.2 Soil quarries:

For registration of the rights to the extraction of minerals from the ground quarries was signed the contract with the Company "Mangystau Geology" to conduct geological exploration on the estimated reserves of soil for the construction of the road "Shetpe-Zhetybay-Aktau". Completed work on geodetic breakdown of access roads to quarries.

Executive survey of 21 soil quarries and 7 SGM quarries with break down by area is finished. The project of survey and assessment work with the approval of reserves by 28 quarries received and approved by the competent authorities. In the Interregional Department "Zapkaznedra" of Committee for Geology and Subsoil Use in Aktobe received Cartogram, and approved the coordinates and obtained geological allotment of 28 quarries. All agreed projects are directed to the Interregional Department "Zapkaznedra" Committee for Geology and Subsoil Use in Aktobe for approval mountain reserves.

Permission for soil quarries and SGM quarries reserves survey obtained by Manghystau region Akim.

West-Kazakhstan Interregional Department of Geology and Subsoil Use approved the "project for prospecting and evaluation operations on sites №№1-28 of soil rocks (sandy loam, loam, sand), suitable for the reconstruction of the road Aktau-Beineu in a segment Aktau-Shetpe in the Manghystau region".

Projects of industrial development of the soil (clay rocks and sand) in the areas 1-28 for road reconstruction Aktau-Beineu on the segment path Shetpe-Aktau in the Mangistau region of the Republic of Kazakhstan provided to working off of soils 28 sites that are on the balance of the State and the number of as at 05.01.2015 amounts to C1 category 28354,0 thousands m³. For their working off Cartogram issued of a total area of 5809832m² or 581.0 hectares.

Characteristics of quarries

№№		Location (geographic)	Quarries location by PK	Absolute marks (m)	Sizes (m x m)
п/п	sections				
1	1	In 4 km southwest from Manghyshlak station	64+450	20,68 -23,39	500 x 720
2	18	In 9 km southeast from section №1	55+150	18,30 -24,48	400-800x1200
3	2	In 1,8 km southwest from section №18	55+360	21,85 -22,90	650x1150
4	26	In 2 km southeast from section №2	52+900	20,68 – 23,39	70-100x300

5	3	In 8 km southeast from section №18 (Karagiye hallow)	47+500	(-82,01) – (-79,44)	350x300-600
6	4	In 8 km southeast from section №3 (Karagiye hallow)	38+800	(-96,56) – (-98,57)	350x300-600
7	17	In 6 km east from section №4 (Karagiye hallow)	32+650	(88,750- (-104,89)	220-550x150-700
8	5	In 2 km southeast from section №17 (Karagiye hallow)	31+550	(-89,41) – (-115,2)	250x800-1200
9	25	In 2 km east from section №17 (Karagiye hallow downhill)	38+850	2,75 – 12,40	350-400 x50
10	6	In 8 km southeast from section №25	22+200	107,3 – 109,68	260-400x1050
11	7	In 15 km northwest from Munayshy station	15+760	107,75 -110,22	500 x 550
12	8	In 5 km northwest from Munayshy station	6+200	139,39 – 140,10	100 x 850
13	9	In 6 km northwest from Zhetybay station	68+300	140,11 – 144,6	700 x 700
14	10	In 6 km northwest from section №9	63+200	155,05 – 160,35	500 x 500
15	21	In 6 km northwest from section №10	56+300	164,5 – 168,08	600 x 200
16	11	In 2 km southeast from section №21	56+100	179,06 – 181,2	350 x 250
17	12	In 8 km northwest from section №21	48+200	203,78 – 208,16	500 x 500
18	28	In 1km southeast from section №12	46+850	215,12 – 221,53	250 x 500
19	27	In 0,2 km northwest from section №28	46+650	217,11 – 223,68	200 x 300
20	13	In 9 km southeast from section №27	37+700	146,25 – 149,16	150-250 x 300
21	14	In 7 km southeast from section №13	30+050	203,6 – 207,4	200-300 x 250
22	15	In 9 km southeast from section №14	23+600	241,24 – 252,57	500 x 500
23	16	In 8 km southeast from Shetpe station	17+150	293,75 – 310,23	500 x 500
24	19	In 4 km southeast from Shetpe station	5+700	203,8 – 217,5	440 x 190
25	24	In 1km southeast from section №19	4+900	210,83 – 223,83	150-250 x 100
26	23	In 2 km southeast from section №24	2+700	223,87 – 232,75	80-140 x 200
27	22	In 0,2 km southeast from section №23	2+350	224,52 – 230,02	100-150 x 150
28	20	In 2 km east from section №22	0+450	215,52 – 225,2	100-250 x 250

According to the draft, soil reserves will be worked out for 3 years (2015-2017).

The performance of the enterprise by years (commodity products) will be: 2015 - 7571.5 thousand m³; 2016 - 2603.2 thousand m³; 2017 - 64.2 thousand m³.

The project of industrial development was coordinated in the authorized state bodies and received following reconciliation:

- by Munaily District Office for the Protection of Consumer Rights № 1317 dd 13.07.2015;

- Sanitary-Epidemiological Conclusion # 34 dd 08.07.2015 g issued by the Office for Consumer Protection of the Mangistau region;
- Finally, the inspection of the Mangystau regional geology and mineral resources # 27-9-7-4-423 dd 02.07.2015;
- Conclusion of the Committee of the Department of Industrial Development and Industrial Safety of the Mangystau region on 21.08.2015.

Industrial development project was discussed at a public hearing on July 1, 2015.

Received the state ecological expertise of the project of industrial development of the soil (clay rocks and sand) on sections 1-28 for reconstruction of the road Aktau-Beineu on the segment path Shetpe-Aktau in the Mangystau region of Kazakhstan, issued by the Department of Natural resources and environmental management of Mangystau region (№KZ08VDC00038921 от 04.08.2015 г).

Received permission for the right of subsoil use common minerals used in construction (reconstruction) and repair of roads, railways and hydraulic structures # 0000026 dated August 14, 2015.

Conducted public hearings on the environmental action plan for the period of mining operations on sections 1-28.

The permission for emissions into the environment has obtained (№KZ61VDD00040796 от 19.10.2015 г со сроком действия с 11.09.2015 года по 26.08.2017 года).

By "Mangistau-Geologiya" LLP was developed a working draft of land reclamation, disturbed the development of soils (clay rocks and sand) in the areas 1-28 for road reconstruction Aktau-Beineu on the segment path Shetpe-Aktau in the Mangistau region of the Republic of Kazakhstan. On the project had received letters from Munaily District Office for Consumer Protection № 1316 dd 13.07.2015 and Mangistau District Office for Consumer Protection № 422 dd 21.08.2015.

Obtain the conclusion of the state ecological expertise on the working draft of the land reclamation, disrupted within the development of soil (clay rocks and sand) on sections 1-28 for reconstruction of the road Aktau-Beineu on the segment path Shetpe-Aktau in the Mangistau region of Kazakhstan, issued by the management of natural resources and environmental management of Mangistau region (№KZ13VDC00039025 от 06.08.2015 г).

2.3 Aerial environment

During construction work, given that the main sources of air pollution are construction machinery and vehicles, most of the measures to reduce air pollution associated with their operation

The following measures to reduce emissions of pollutants are taken by Contractor:

- during the earthworks dedusting is carried out by water pouring (distribution) by water trucks, tanks equipped with switchgears. Dedusting carried out on the bypass roads, and roads to the construction site,
- delivery of soil and mixes prepared in mixing plants, to the work site by specialized vehicles or fitted trucks with tightly closed sides and covered with an awning, preventing the weathering and losing of transported material,

- using serviceable equipment with the selection of the type of fuel, type of engine and its mode of operation and load,

- Technological cycle of work is obeying,

- loading and unloading of dusty materials (cement, etc.) is mechanized, hand work with these materials are allowed as an exception in taking appropriate action against sputtering (protection from wind, losses, etc.).

- speed limit signs are installed,

- atmospheric air is being monitored under the Agreement with accredited laboratory,

- maintenance and repair of road-building equipment and vehicles is organized in a special area of the construction camp,
- transport traffic is carried out on the existing and temporary hard surfaced bypass roads, which reduces the impact of ongoing work on the composition of atmospheric air,
- equipment refueling is carried out in designated areas,
- under adverse weather conditions, the work stopped or reduced.

On the recommendation of engineering services in connection with the hot season was increased amount of equipment for road sections watering.

2.4 Noise and vibration

While performing work under reconstruction of the section road is carried out the impact of physical factors as noise and vibration. The sources of exposure are: operation of a crusher, asphalt and concrete mixing plants, as well as machinery and vehicles.

Contractor performs the following activities to reduce the impact of noise and vibration:

- use of facilities, equipment and machinery with the noise of the appropriate sanitary standards,
- limited operating time of heavy equipment,
- construction sites where are placed crushers, asphalt and concrete facilities are located at a significant (more than 3 km) distance from the settlements,
- not allowed the operation of the equipment and plant idling,
- to reduce the crushing plants are used the rubber gaskets, as sound insulation material used rubber-sponge - service equipment staff use personal protective equipment, such as (headphones) type.
- road construction machinery equipped with protective covers.

During the period of work vibration may occur from process equipment, so for its reduction provided:

- the establishment of flexible connections, elastic pads and springs;
- reducing time spent in conditions of vibration;
- the use of personal protective equipment.

To monitor the level of exposure control measurements are made of noise and vibration 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 reserve.

The obtained results of monitoring of noise and vibrations indicate an acceptable impact on the environment, the employees of the Contractor, the residents of nearby settlements.

2.5 Aquatic environment

In the area of work, there is one body of water, the river Aschyagar to 755 km. The bridge 30 m long crosses a river that dries up during the hot period of the year. In April, there was the passage of floodwaters, to monitor the level of exposure water samples were taken.

Except of specified section of the road on km755, the rest of the section of work is characterized by a complete lack of surface water. Temporary streams occur only during heavy rains or snowmelt abundant. There are no permanent streams.

Hydrogeologically section refers to the construction of the road area with deep groundwater level. Groundwater in the area of road reconstruction lie at a depth of 8-10 m.

Thus, the plan does not provide for the use of surface and groundwater as a source of industrial water for the project. For technical purposes the water from the water main, for which signed a contract with "KazTransGas" JSC.

In June 2015, due to the hot weather the riverbed went dry. In November 2015, in connection with more precipitation (rain) water movement began along the riverbed. Contractor monitored the surface water.

Despite the lack of surface water and groundwater, the Contractor performs the following events:

- exercises control over the technical condition of vehicles, excluding the leakage of fuel and lubricants;
- concrete for concrete and reinforced concrete structures accepted for sulfate-resisting portland cement;
- corrosion protection of metal structures;
- production processes excluded in operation any drains on the relief of technological platforms with a firm covering, which can be contaminated with oil and other chemicals;

2.6 Impact of Karagiye –Karakol State Natural (zoological) wildlife sanctuary

From 739 km to 772 km of existing road laid in the area Karagiye -Karakol State Natural (zoological) sanctuary of republican significance.

Seen from the road section carrying out control over implementation of the following requirements:

- ramps and platforms for short breaks are provided in place of the existing facilities
- the installation of information and road signs
- reduction of the period of construction works in the territory.
- removal of construction sites and equipment placement outside the sanctuary
- implementation of measures for dust suppression,
- waste collection takes place outside the sanctuary.

The results of the annual monitoring indicates an acceptable impact on the environment of the Reserve by Contractor, while working at the construction site.

2.7 Production wastes

Work on the road section is accompanied by the formation of various types of waste, temporary storage of which, transportation, or disposal of waste could be potential sources of contamination in the various components of the environment.

During the reconstruction of the road "Beineu-Aktau" 632-802,27 km (Shetpe - Aktau), possible the formation of the following types of waste:

- Asphalt concrete breakage
- Oily rags
- Welding electrode stubs
- Used containers from the paint and varnish materials
- Metal Scrap
- Construction waste
- Solid domestic waste

When operating the crusher, asphalt and concrete plants, possible the formation of the following types of waste:

- Oily rags
- Solid domestic waste

Asphalt concrete breakage - This type of waste refers to the green list of wastes generated during the milling of the old roadway. Asphalt concrete breakage reused at own enterprise for arranging temporary bypass roads.

Used containers from the paint and varnish materials- This type of waste applies to amber list of waste AD070, formed during painting work.

Oily rags- It is formed by the elimination of the straits, owing wipe the soiled surface vehicles, machinery parts and other repair work. This type of waste applies to amber list of waste AS030, flammable, solid, insoluble in water.

Construction waste - (remnants of concrete, shuttering, fragments reinforced concrete products, the remains of cables and wires, insulators, etc.) are formed in the course of construction and installation works related to green list waste GG170. Solid, not flammable.

Metal Scrap (inert waste remaining in the construction, maintenance and installation of equipment - metal shavings, metal pieces, defective parts identified in the process of renovation and not subject to recovery, cutting pipes, valves, etc.) - Solid, not flammable, the green list waste GA090.

Welding electrode stubs – inert waste, remaining during welding - solid, not flammable, green list waste GA090.

Solid domestic waste (household waste, packaging materials, and others.) - this type of waste refers to green list waste GO060, non-hazardous.

Waste production and consumption must be collected, stored, are neutralized, transported to the disposal site or disposal.

All waste is immediately stored in designated areas in metal containers. Containers are installed on special reinforced concrete floors and closed with metal lids.

All production and consumption waste exported to specialized companies for further processing, recycling or disposal.

Waste passports coordinated with the Department of Ecology of Mangistau region.

An agreement on the export of waste is concluded with "EkoServisNefteGaz" LLP.

2.8 Flora and fauna

The area of the road section is located in the desert area. Flora has a clearly expressed desert character.

On the territory, there are no places of localization of seasonal animal species.

Revegetation will begin after the cessation of construction work directly related to the impact on vegetation.

In order to minimize the impact during the performance of work on the road section with the employees of contractors and subcontractors hold conversations with an explanation of the following requirements:

- strict ban on the feeding of wild animals by personnel, as well as proper storage of wastes, which are bait for wild animals;
- the vehicular traffic only by established transport scheme, with reasonable limit of alarm sounds;
- preventing uncontrolled discharge of fuel and lubricants to the ground;
- the maximum possible reduction in noise factor to environmental fauna;

In addition, when carrying out a visual inspection of the production site draws attention to detect oily spots.

2.9 Changing of surface drainage during construction

When working on the construction site of the road can cause the following changes in riverbed, contamination of soil, water.

To exclude changes in surface drainage Contractor shall perform the following activities:

- deletion and movement of culvert takes place during the dry months,
- promptly remove construction materials from the channels,
- during the work does not create artificial barriers,
- to prevent large debris from entering into the mainstream during the demolition of channels,
- exercises to strengthen embankments.

2.10 Storage of Fuel and chemical matters

In carrying out inspections of the plan of environmental management ecologist of the Contractor paid special attention to the storage of fuel and chemicals. The audit found that:

Storage of lubricants produced in sealed containers having fencing and fire equipment.

Refueling of road construction machinery performed by tanker "on wheels".

Repair work, maintenance of machinery is carried out in the repair area at a construction site near the Zhetybay village.

During the test of road sections and construction sites, spills of fuel and oil is not revealed.

Contractor employees and subcontractors are informed that in case of spillage of oil, a strait place filled with sand, collected in special containers and transported in the designated areas. All-purpose machines must be equipped with a container with sand, pallets, shovel.

2.11 Camps, crusher, concrete and asphalt plant location.

Shift camp, in which there are asphalt and concrete plants are located on the 73 km of the road section "Aktau-Zhetybay" and refers to the administrative area of Karakiya district of Manghystau region. Distance to the nearest town - the Zhetybay village and Munaishy village - about 12 km.

Production area, in which a mobile asphalt and concrete plant placed, located at a distance of 100 meters to the north of the road. The site, with a total area of 11 hectares, allocated by the decision №226 dd 09.30.2014 of Karakiya district Akimat.

Shetpe camp coordinates

AK-10 (N44°01.950' E052°09.973')

AK-11 (N44°02.018' E052°09.847')

AK-12 (N44°02.151' E052°10.040')

AK-13 (N44°02.091' E052°10.144')

The site area, in which there are asphalt and crushing plants is approximately 200 m to the west of the road, on the highway of Shetpe station – Zhetybay village. The distance from the site to the nearest residential area – Shetpe station is 15 km, the distance to the Zhetybay village - 62 km. The site is relatively flat terrain with a slight slope terrain, the excess portion of one side over the other is 4 meters. Total slope terrain from the southeast to the northwest. The plot is covered with semi-desert vegetation. Production area that hosts a mobile asphalt and crushing plants 10 hectares.

Zhetybay camp coordinates

AK-23 (N43°32.644' E051°58.296')

AK-24 (N43°32.555' E051°58.660')

AK-25 (N43°32.646' E051°58.764')

AK-26 (N43°32.757' E051°58.351')

Section km 632-719

With «Caspian HES Consulting» LLP signed a contract for the development and approval in the authorized state bodies of the project "Reconstruction of the road" Beineu - Aktau ", 632-719 km (Shetpe -Zhetybay). Adjustment of the construction of the mobile asphalt and crushing plants", with the section "Environmental Protection ".

Received the following permits for the operation of the crusher and asphalt plant on the site:

- Obtained sanitary-epidemiological conclusion # 39 dd 06/03/2015 issued by the Department of Consumer Protection of Manghystau region.
- Obtained conclusion of the state ecological expertise # 04-08/1376 dd 23.04.2015 issued by the Office of Natural Resources and Environmental Control of Manghystau region.
- Received permission to emissions into the environment № 0002170 dd 30.04.2015, valid from 01.05.2015 up to 31.08.2017.

Developed a plan of environmental management for the period of implementation of the project on reconstruction.

Public hearings on the working project "Reconstruction of the road"Beineu - Aktau", 632-719 km (Shetpe - Zhetybay) were conducted. Adjustment in part of the construction of the mobile asphalt and crushing plants».

Completed the mobilization works on the construction of the working town "Shetpe" and fencing of the territory.

According to the signed sub contractual agreement performed works on electrical supply of "Shetpe" camp: reconstruction of power substations and 10 kV overhead line built, executed internal wiring and connected all internal communications.

Obtain technical conditions for gas supply "Shetpe" camp and conducted the design and construction of the supply and internal gas line.

In order to ensure the camp with portable water concluded the contract for water consumption with "MangystauZhyly su" SCE.

Signed a contract with LLP "Temirzholsu-Mangystau» № CGZ/2-1/2015 dated 01.06.2015 for pumping and removal of fecal waste.

Approvals from the public authorities on agreement of Shetpe camp placement working project has obtained:

- a letter № 385 dated 29.06.2015 from the Mangistau District Office of Consumer Protection of the Department of Consumer Protection of Manghystau region;
- letter № 25-20-13-2 / 859 dated 14.07.2015 from the Department of the Committee of industrial development and safety of Manghystau region;
- conclusion dated 09.17.2015 of the state ecological expertise issued by the Office of Natural Resources and regulation of the Manghystau region.

Section km 719-802

With «Caspian HES Consulting» LLP signed a contract for the development and approval in the authorized state bodies of the project "Reconstruction of the road" Beineu - Aktau ",719-802 km (Zhetybay-Aktau). Adjustment of the construction of the mobile asphalt and crushing plants", with the section" Environmental Protection ".

Received the following permits for the operation of the concrete and asphalt plant on the site:

- Obtained sanitary-epidemiological conclusion # 10 dd 02/02/2015 issued by the Department of Consumer Protection of Manghystau region.
- Obtained conclusion of the state ecological expertise # 04-08/535 dd 27.02.2015 issued by the Office of Natural Resources and Environmental Control of Manghystau region.
- Received permission to emissions into the environment № 0002135 dd 10.03.2015, valid from 10.03.2015 up to 10.03.2017.

Developed a plan of environmental management for the period of implementation of the project on reconstruction.

Public hearings on the working project "Reconstruction of the road "Beineu - Aktau",719-802 km (Zhetybay-Aktau) were conducted. Adjustment in part of the construction of the mobile asphalt and concrete plants».

Signed a contract with IE Takisheva ДЖ/ycl/3 dated 20.05. 2015 for pumping and removal of fecal waste.

By the contract with LLP "Akat Munay" was developed working project of Zhetybay camp.

Approvals from the public authorities on agreement of Zhetybay camp placement working project has obtained:

- letter №79 dated 03.09.2015 from the Karakiya District Office of Consumer Protection Department of Consumer Protection Manghystau region;
- conclusion dated 30.09.2015 of the state ecological expertise issued by the Office of Natural Resources and regulation of the Manghystau region;
- the permission for emissions into the environment for Zhetybay camp № KZ07VDD00033426 dd 05.10.2015.

To reduce the impact on the environment by the Contractor performed the following events:

- control over compliance with production schedules of production;
- excluded the work of equipment in forced mode;
- It supervises the work control and measuring equipment and control systems of technological devices;
- when changing the technological regime, leading to an increase in emissions of pollutants into the atmosphere operation of the plant is terminated.
- capturing dust in the exhaust from the drying apparatus and the mixing unit of the air-gas mixture in the baghouse
- use of collected dust by applying its by elevator to a "hot" tank.

The Contractor representative regularly carries out the monitor the implementation of an Environmental Management Plan by the checklist proposed by Engineer Service.

Contractor employees are informed of the need to comply with the following requirements
Environment protection report for 2015

1. when working with asphalt:

- Avoid any contact of asphalt with water and dust,
- not to shed asphalt and solvents on the ground, ditches or ponds. Promptly remove and dispose of spills,
- not to burn the waste with hot asphalt,
- use protective equipment when performing manual work with asphalt,
- not to work with asphalt in winter, rainy or stormy weather,
- trucks, dump trucks must be equipped with canopy.

2. when working with concrete:

- Avoid any of the concrete work during the windy, cold or hot weather,
- implement measures for dust suppression,
- fresh concrete surface cover with film to prevent moisture loss
- use protective equipment when working with additives.



Zhetybay asphalt-concrete plant



Concrete plant

2.12 Social media and public relations

During the reporting period, complaints and suggestions from interested parties have not been received.

When conducting inspections on the road section in the reporting month attention was drawn to the following requirements:

- Ensuring optimal operation of vehicles and road construction machinery
- implementation of the regular road dedusting
- to ensure the safety of residents of settlements the installation traffic signs regulating the speed and direction of vehicles in the areas of works.
- the visual-information boards, which specifies the name of the organization, leading the work, the location of the office and contact numbers.

During 2015 the Contractor when deciding on the placement of the construction sites with the installation of mobile asphalt, crushing, concrete plants organized public hearings on their environmental impact. Contractor developed mechanisms for complaints received. During the reporting period, complaints from interested parties have not been received.

2.13 Natural, historical and agriculture monuments

Natural and architectural monuments have been not found. However, employees of contractors and subcontractors are informed that if the performance of work to be found on any findings should be reported to the Regional Department of Cultural Heritage and the construction work must stop until until a relevant conclusion. To move environmental graves / memorial signs in memory of those killed in car accidents is necessary to obtain permission from the local executive bodies.

3. The results of environmental monitoring at the reconstruction of the section "Shetpe-Aktau" (632-802 km) of road " Aktau-Beineu " for November of 2015

Based on contract to render services specialists of environment laboratory of "Aktobe plant of chromium compounds" JSC in November of 2015 conducted laboratory analyzes in the reconstruction of the section "Shetpe-Aktau" (632-802) km of the road "Aktau-Beineu". The customer of works is **branch of «CENGİZ İNŞAAT SANAYİ VE TİCARET ANONİM ŞİRKETİ» 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 to a large extent 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 conducted in accordance with the normative acts.

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

Organization and carrying out air monitoring

1. GOST 17.2.3.01-86 "The Nature Conservancy. Atmosphere. Rules of air quality of human settlements".
2. Guidelines for the Control of atmospheric pollution. RD 52.04.186-89, Moscow, 1991.
3. Health 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 Decree of the Government of the Republic of Kazakhstan dated 25 January 2012 № 168.

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,
- borders of the state reserve - 2 control points

Total for road section 27 monitoring points, over the period from March to November 2015 total were taken and analyzed 243 samples of ambient air. In December 2015 samples were not selected because of the reduced volume of works on the site.

The organization and monitoring of soils

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 for road section 27 monitoring points, over the period from March to November 2015 total were taken and analyzed 243 samples of the soil. In December 2015 samples were not selected because of the reduced volume of works on the site.

Water

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

Organization and carrying out monitoring of surface waters.

Ashiagar river is low watered, water movement occurs during the spring flood, in November due to prolonged precipitation (rain) was produced by sampling of surface water. During 2015 it was selected and analyzed three samples of surface water.

Noise and vibration

Noise and vibration measurements were carried out from April to November 2015, in December 2015 measurements were not carried out due to the reduced volume of works on 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 reserve - 2 control points.

Beginning in July 2015 on the recommendation of an EP international specialist of CCS measurement of noise and vibration carried out in three poles: minimum, maximum equivalent.

The objects of environmental research and analysis are:

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

Table 3.1

The list of parameters monitored in environmental monitoring

№ п/п	Name of the controlled parameter
Chemical analysis of air	
1	Inorganic dust
2	Carbon monoxide
3	Nitrogen dioxide
4	Sulfur dioxide
Chemical analysis of soil	
1	pH
2	Zinc
3	Petroleum products
4	Cadmium
5	Plumbum
Measurement of noise, vibration	
1	Noise

2	Vibration
Chemical analysis of surface water	
1	dry residue
2	nitrates
3	sulphates
4	chlorides
5	petroleum products
6	iron

In July 2015, was produced samples of air, soil, measurement of noise and vibration in the presence of the Contractor, EP international specialist of CCS.

In November 2015, was produced samples of air, soil, measurement of noise and vibration in the presence of the Contractor, Engineering Services, Project Management Committee.

Information about the methods used to monitor the environment

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

1. Guidance document "Guidelines on Air Pollution Monitoring RD 52.04.186-89".
2. Measurement procedure "Determination of the mass concentration of harmful substances in the air, in the working area, in industrial emissions with gas analyzer GANK-4", registered in the Republic of Kazakhstan at No. KZ.07.00.01608-2012 of September 27, 2012, valid until 27.09.2017.

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, 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

Device name	Device number	Verification data
aspirator PU-ZE/12	№ 807	Verification certificate № BA-07-01-05375 dd 02.06.2015 up to 02.06.2016
gas analyzer GANK-4	№ 609	Manufacturer verification label № 086726617 dd 21.05.2015 up to 21.06.2016
Scales electronic laboratory MettlerToledoXS205DU	№ B141330205	Verification certificate № BB-02-10000003091 dd 16.11.2015 up to 15.11.2016

Soil

Device name	Device number	Verification data
Scales electronic laboratory XS205DU	№ B141330205	Verification certificate № BB-02-10000003091 dd 16.11.2015 up to 15.11.2016
combined measuring instrument SevenEasy pH	№ 1231405267	Verification certificate № BB-09-9856423426/ № BB-09-9856423467 dd 04.09.2015 up to 04.09.2016
Atomic Absorption Spectrometer MGA-915M	№ 394	Verification certificate № BB-17-0000000012 dd 08.01.2015 up to 08.01.2016
liquid analyzer "Fluorat"-02-3M	№ 5593,	Verification certificate № BB-11-9654785555 dd 13.05.2015 up to 13.01.2016

Noise, vibration

Device name	Device number	Verification data
Noise and vibration analyzer «Assistant»	№ 162613	Verification certificate № BA-12-05 868 dd 04.03.2015 up to

Water

Device name	Device number	Verification data
Photoelectric photometer KFK	0900775	Verification certificate № BB-11-

3-01 ZOMS		9654785695 dd 06.11.2015
fluid analyzer "Fluorat" -02-3M	№ 5593	Verification certificate № BB-11-9654785555 dd 13.05.2015 up to 13.05.2016
Scales laboratory VL-210	№ A 073	Verification certificate № BB-02-0000005681 dd 04.02.2015 up to 03.02.2016

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 sampling points are determined by the Customer.

Field work 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')	04.03.2015	04.03.2015	04.03.2015
	21.04.215	21.04.215	21.04.215
	25.05.2015	25.05.2015	25.05.2015
	18.06.2015	18.06.2015	18.06.2015
	09.07.2015	09.07.2015	09.07.2015

AK-9 (654 km) PK 190 (N44°03.121' E052°11.429')	20.08.2015 17.09.2015 22.10.2015 18.11.2015	20.08.2015 17.09.2015 22.10.2015 18.11.2015	20.08.2015 17.09.2015 22.10.2015 18.11.2015
Shetpe camp			
AK-10 (657 km) PK 220 (N44°01.950' E052°09.973')	04.03.2015 21.04.215	04.03.2015 21.04.215	04.03.2015 21.04.215
AK-11(657 km) PK 220 (N44°02.018' E052°09.847')	25.05.2015 18.06.2015	25.05.2015 18.06.2015	25.05.2015 18.06.2015
AK-12(657 km) PK 220 (N44°02.151' E052°10.040')	09.07.2015 20.08.2015	09.07.2015 20.08.2015	09.07.2015 20.08.2015
AK-13 (657 km) PK 220 (N44°02.091' E052°10.144')	17.09.2015 22.10.2015 18.11.2015	17.09.2015 22.10.2015 18.11.2015	17.09.2015 22.10.2015 18.11.2015
Road			
AK-14 (664 km) PK 290 (N43°58.654' E052°07.510')	04.03.2015 21.04.215	04.03.2015 21.04.215	04.03.2015 21.04.215
AK-15 (674 km) PK 390 (N43°54.290' E052°04.632')	25.05.2015 18.06.2015	25.05.2015 18.06.2015	25.05.2015 18.06.2015
AK-16 (684 km) PK 490 (N43°49.187' E052°02.406')	09.07.2015 20.08.2015	09.07.2015 20.08.2015	09.07.2015 20.08.2015
AK-17 (694 km) PK 587 (N43°43.670' E052°03.724')	17.09.2015 22.10.2015	17.09.2015 22.10.2015	17.09.2015 22.10.2015
AK-18 (704 km) PK 686 (N43°38.586' E052°05.051')	18.11.2015	18.11.2015	18.11.2015
Borders of Zhetybay village (entrance and exit)			
AK-19 (707 km) PK 715 (N43°36.831' E052°05.681')	04.03.2015 21.04.215 25.05.2015 18.06.2015	04.03.2015 21.04.215 25.05.2015 18.06.2015	04.03.2015 21.04.215 25.05.2015 18.06.2015
AK-20 (713 km) PK 790 (N43°34.035' E052°06.954')	09.07.2015 20.08.2015 17.09.2015 22.10.2015 18.11.2015	09.07.2015 20.08.2015 17.09.2015 22.10.2015 18.11.2015	09.07.2015 20.08.2015 17.09.2015 22.10.2015 18.11.2015
Road			
AK-21 (714 km) PK 800 (N43°33.503' E052°07.302')	04.03.2015 21.04.215 25.05.2015 18.06.2015	04.03.2015 21.04.215 25.05.2015 18.06.2015	04.03.2015 21.04.215 25.05.2015 18.06.2015
AK-22 (724 km) PK 63 (N43°31.886' E052°01.347')	09.07.2015 20.08.2015 17.09.2015 22.10.2015 18.11.2015	09.07.2015 20.08.2015 17.09.2015 22.10.2015 18.11.2015	09.07.2015 20.08.2015 17.09.2015 22.10.2015 18.11.2015
Zhetybay camp			
AK-23 (730 km) PK 120 (N43°32.644' E051°58.296')	05.03.2015 22.04.215	05.03.2015 22.04.215	05.03.2015 22.04.215
AK-24 (730 km) PK 120 (N43°32.555' E051°58.660')	26.05.2015 19.06.2015	26.05.2015 19.06.2015	26.05.2015 19.06.2015

AK-25 (730 km) PK 120 (N43°32.646' E051°58.764')	10.07.2015 21.08.2015	10.07.2015 21.08.2015	10.07.2015 21.08.2015
AK-26(730 km) PK 120 (N43°32.757' E051°58.351')	18.09.2015 23.10.2015 19.11.2015	18.09.2015 23.10.2015 19.11.2015	18.09.2015 23.10.2015 19.11.2015
Road			
AK-27 (734 km) PK 163 (N43°33.286' E051°55.202')	05.03.2015	05.03.2015	05.03.2015
AK-29 (744 km) PK 263 (N43°34.157' E051°47.642')	22.04.215 26.05.2015	22.04.215 26.05.2015	22.04.215 26.05.2015
AK-30 (754 km) PK 363 (N43°35.618' E051°40.479')	19.06.2015 10.07.2015	19.06.2015 10.07.2015	19.06.2015 10.07.2015
AK-31 (764 km) PK 463 (N43°35.365' E051°33.610')	21.08.2015 18.09.2015	21.08.2015 18.09.2015	21.08.2015 18.09.2015
AK-33 (774 km) PK 563 (N43°36.466' E051°26.915')	23.10.2015 19.11.2015	23.10.2015 19.11.2015	23.10.2015 19.11.2015
AK-34 (784 km) PK 663 (N43°39.045' E051°20.212')			
Sanctuary borders			
AK-28 (739 km) PK 207 (N43°34.056' E051°51.826')	05.03.2015 22.04.215 26.05.2015 19.06.2015	05.03.2015 22.04.215 26.05.2015 19.06.2015	05.03.2015 22.04.215 26.05.2015 19.06.2015
AK-32 (771 km) PK 533 (N43°36.026' E051°28.595')	10.07.2015 21.08.2015 18.09.2015 23.10.2015 19.11.2015	10.07.2015 21.08.2015 18.09.2015 23.10.2015 19.11.2015	10.07.2015 21.08.2015 18.09.2015 23.10.2015 19.11.2015

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 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 until there around 300g. Soil grounded in a mortar and pestle and sieved through a sieve with a hole diameter of 1 mm. If necessary triturated attritor.

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. Information about laboratory

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

Information about the laboratory are given in the table below:

Table 3.4

№ п/п	Name of the accredited testing laboratory	Number and duration of test laboratory accreditation certificate	Field testing laboratory accreditation
1	2	3	4
1	Laboratory Environment "Aktobe plant of chromium compounds" JSC	Accreditation certificate № KZ.I.05.0916 dd 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, petroleum, 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 2015 monitored the ambient air. Sampling points and frequency defined in the monitoring program, which is a mandatory attachment to PEPM. Total in 2015 in 27 control points were selected 243 samples. In December of 2015, samples were not selected because of the reduced volume of works on the site.

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-November 2015).

ROAD. Averages basic measurements (March 2015) of this section are as follows: 0.56 for dust MPC (maximum one-time maximum allowable concentration) of carbon monoxide 0.45 MPC, nitrogen dioxide 0 MPC, sulfur dioxide at 0.0004 MPC The maximum the basic measurements of the dust constituted 0.68 MPC by carbon monoxide - 0.57 MPC, nitrogen dioxide 0 MPC by sulfur dioxide - 0.0014 MPC.

Obtained monitoring results for March-November 2015 the value amounted to: 0.62 dust MPC by carbon monoxide 0.438 MPC, nitrogen dioxide 0 MPC, sulfur dioxide at 0.0008 MPC The maximum measurements for March-November 2015 amounted to 0.94 on a dust MPC by carbon monoxide - less than 0.3 MPC, nitrogen dioxide 0,1 MPC, sulfur dioxide by - less than 0.05 MPC.

SHETPE CAMP (657 KM). Averages baseline measurement (March 2015) of this section are as follows: 0.52 for dust MPC (maximum one-time maximum allowable concentration) of carbon monoxide 0.348 MPC, nitrogen dioxide 0 MPC, sulfur dioxide at 0.0008 MPC The maximum the basic measurements of the dust constituted 0.58 MPC by carbon monoxide - 0.396 MPC, nitrogen dioxide 0 MPC, for sulfur dioxide - 0.0022 MPC.

Obtained monitoring results for March-November 2015 the value amounted to: 0.64 MPC of dust, carbon monoxide at 0.49 MPC, nitrogen dioxide 0 MPC, sulfur dioxide by 0,002 MPC The maximum measurements for March-November 2015 amounted to 0.92 on a dust MPC by carbon monoxide - 0.55 MPC, nitrogen dioxide 0,1 MPC, sulfur dioxide on - at least 0.05 MPC.

Comparison of the average baseline results with average data for the entire observation period showed a slight increase of a dust. In this area were found exceeding the MPC none of controlled substances.

ZHETYBAY VILLAGE (ENTRANCE AND EXIT). Averages basic sizes (March 2015) of this section are as follows: 0.52 for dust MPC (maximum one-time maximum allowable concentration) of carbon monoxide 0.45 MPC, nitrogen dioxide 0 MPC, sulfur dioxide at 0.00138 MPC The maximum the basic measurements of dust was 0.54 MPC by carbon monoxide - 0.47 MPC, nitrogen dioxide 0 MPC, for sulfur dioxide - 0.0017 MPC.

Obtained monitoring results for March-November 2015 the value amounted to: 0.66 dust MPC by carbon monoxide 0.496 MPC, nitrogen dioxide 0 MPC by sulfur dioxide 0,0013PDK m The maximum measurements for March-November 2015 amounted to 0.9 on a dust MPC by carbon monoxide - 0.986 MPC, nitrogen dioxide below 0.1 MPC, for sulfur dioxide – less than 0.05 MPC.

Comparison of the average baseline results with average data for the entire observation period showed a slight increase of a dust, carbon monoxide. In this area were found exceeding the MPC none of controlled substances.

ZHETYBAY CAMP (730 KM). Averages baseline measurement (March 2015) of this section are as follows: 0.57 for dust MPC (maximum one-time maximum allowable concentration) of carbon monoxide 0.51 MPC, nitrogen dioxide 0 MPC, sulfur dioxide by 0.00 MPC The maximum the basic measurements of dust was 0.62 MPC by carbon monoxide - 0.544 MPC, nitrogen dioxide 0 MPC, for sulfur dioxide - 0.0008 MPC.

Obtained monitoring results for March-November 2015 the value amounted to: 0.62 MPC of dust, carbon monoxide at 0.48 MPC, nitrogen dioxide 0 MPC, sulfur dioxide at least 0.05 MPC The maximum measurements for March-November 2015 amounted to 0.92 on a dust MPC by carbon monoxide - 0.71 MPC, nitrogen dioxide below 0.1 MPC, for sulfur dioxide - less than 0.05 MPC.

Comparison of the average baseline results with average data for the entire observation period showed a slight increase of a dust. In this area were found exceeding the MPC none of controlled substances.

RESERVE BORDERS (ENTRANCE AND EXIT). Averages baseline measurement (March 2015) of this section are as follows: 0.58 for dust MPC (maximum one-time maximum allowable concentration) of carbon monoxide 0.48 MPC, nitrogen dioxide less than 0,1 MPC, sulfur dioxide at less than 0.05 MPC The maximum the basic measurements of dust was 0.66 MPC by carbon monoxide - 0,5 MPC, nitrogen dioxide less than 0,1 MPC, sulfur dioxide on - less than 0.05 MPC.

Obtained monitoring results for March-November 2015 the value amounted to: 0.58 MPC of dust, carbon monoxide by 0.5 MPC, nitrogen dioxide below 0.1 MPC by sulfur dioxide is less than 0.05 MPC The maximum measurements for March-November 2015 amounted to 0.92 on a dust MPC by carbon monoxide - 0.64 MPC, nitrogen dioxide below 0.1 MPC, for sulfur dioxide - less than 0.05 MPC.

Comparison of the average baseline results with average data for the entire observation period showed a slight increase of carbon monoxide. In this area were found exceeding the MPC none of controlled substances.

Proceeding from the results of control measurements imply that the actions of the Contractor during the performance of work at the construction site, provided the permissible impact on the environment. Accepted by the Contractor as part of the measures PEPM are effective.

Table 3.5

The results of measurements of the concentration of pollutants substances in the air of 2015

Characteristics of sampling points		The concentration of harmful substances, mg/m³			
description	Sampling date	Dust	Oxide carbon	Nitrogen dioxide	Sulfur dioxide
		MPC meanings			
		0,5	5	0,2	0,5
ROAD					
AK-8 (645 km)	04-05.03.2015	0,31	1,97	0	0
	21-22.04.2015	0,28	1,94	0	0
	25-26.05.2015	0,28	1,94	0	0
	18-19.06.2015	0,4	2,82	0	0,0057
	09.07.2015	0,44	2,11	0	0,0025
	20.08.2015	0,28	2,07	< 0,02	< 0,025
	17.09.2015	0,32	<1,5	< 0,02	< 0,025
	22.10.2015	0,45	<1,5	< 0,02	< 0,025
	18.11.2015	0,042	<1,5	< 0,02	< 0,025
AK-9 (654 km)	04-05.03.2015	0,26	1,8	0	0
	21-22.04.2015	0,31	1,77	0	0
	25-26.05.2015	0,26	1,84	0	0
	18-19.06.2015	0,45	2,11	0	0
	09.07.2015	0,39	2,55	0	0,00035
	20.08.2015	0,45	2,29	< 0,02	< 0,025
	17.09.2015	0,47	<1,5	< 0,02	< 0,025

	22.10.2015	0,47	<1,5	< 0,02	< 0,025
	18.11.2015	0,030	<1,5	< 0,02	< 0,025
AK-14 (664 km)	04-05.03.2015	0,24	2,13	0	0,00025
	21-22.04.2015	0,34	2,04	0	0,00033
	25-26.05.2015	0,29	2,21	0	0,00029
	18-19.06.2015	0,39	1,98	0	0,00013
	10.07.2015	0,17	0,93	0	0,00027
	20.08.2015	0,39	1,5	< 0,02	< 0,025
	17.09.2015	0,37	<1,5	< 0,02	< 0,025
	22.10.2015	0,41	1,62	< 0,02	< 0,025
	18.11.2015	0,31	1,62	< 0,02	< 0,025
AK-15 (674 km)	04-05.03.2015	0,26	2,3	0	0,00058
	21-22.04.2015	0,27	2,23	0	0,00051
	25-26.05.2015	0,3	2,38	0	0,00063
	18-19.06.2015	0,41	1,94	0	0,00073
	10.07.2015	0,39	3,07	0	0,00078
	20.08.2015	0,24	2,46	< 0,02	< 0,025
	17.09.2015	0,40	<1,5	< 0,02	< 0,025
	22.10.2015	0,39	<1,5	< 0,02	< 0,025
	18.11.2015	0,056	<1,5	< 0,02	< 0,025
AK-16 (684 km)	04-05.03.2015	0,29	2,22	0	0,00023
	21-22.04.2015	0,31	2,47	0	0,00017
	25-26.05.2015	0,28	2,38	0	0,00026
	18-19.06.2015	0,43	2,52	0	0,0003
	10.07.2015	0,4	2,41	0,	0,0003
	20.08.2015	0,40	2,48	< 0,02	< 0,025
	17.09.2015	0,45	<1,5	< 0,02	< 0,025
	22.10.2015	0,26	<1,5	< 0,02	< 0,025
	18.11.2015	0,023	<1,5	< 0,02	< 0,025
AK-17 (694 km)	04-05.03.2015	0,33	2	0	0,00034
	21-22.04.2015	0,3	2,36	0	0,00041
	25-26.05.2015	0,32	2,25	0	0,00038
	18-19.06.2015	0,4	2,9	0	0,00038
	10.07.2015	0,19	1,95	0	0,00053
	20.08.2015	0,27	1,79	< 0,02	< 0,025
	17.09.2015	0,38	<1,5	< 0,02	< 0,025
	22.10.2015	0,37	1,80	< 0,02	< 0,025
	18.11.2015	0,066	1,80	< 0,02	< 0,025
AK-18 (704 km)	04-05.03.2015	0,24	1,94	0	0
	21-22.04.2015	0,27	1,68	0	0,00068
	25-26.05.2015	0,23	1,97	0	0,00078

	18-19.06.2015	0,31	4,26	0	0
	10.07.2015	0,38	2,92	0	0
	20.08.2015	0,46	2,69	< 0,02	< 0,025
	17.09.2015	0,42	<1,5	< 0,02	< 0,025
	22.10.2015	0,35	<1,5	< 0,02	< 0,025
	18.11.2015	0,066	<1,5	< 0,02	< 0,025
AK-21 (714 km)	04-05.03.2015	0,28	2,43	0	0,00038
	21-22.04.2015	0,32	2,51	0	0,00035
	25-26.05.2015	0,3	2,48	0	0,00041
	18-19.06.2015	0,43	2,32	0	0
	10.07.2015	0,39	2,61	0	0,0002
	20.08.2015	0,39	2,42	< 0,02	< 0,025
	17.09.2015	0,44	<1,5	< 0,02	< 0,025
	22.10.2015	0,44	1,66	< 0,02	< 0,025
	18.11.2015	0,072	1,66	< 0,02	< 0,025
AK-22 (724 km)	04-05.03.2015	0,31	2,4	0	0,00071
	21-22.04.2015	0,35	2,66	0	0,00069
	25-26.05.2015	0,3	2,54	0	0,00076
	18-19.06.2015	0,39	2,97	0	0,00019
	10.07.2015	0,43	1,97	0	0,00064
	20.08.2015	0,36	1,67	< 0,02	< 0,025
	17.09.2015	0,40	<1,5	< 0,02	< 0,025
	22.10.2015	0,38	1,96	< 0,02	< 0,025
	18.11.2015	0,053	1,96	< 0,02	< 0,025
AK-27 (734 km)	04-05.03.2015	0,34	2,43	0	0,00031
	21-22.04.2015	0,31	2,38	0	0,00037
	25-26.05.2015	0,33	2,46	0	0,00034
	18-19.06.2015	0,42	2,84	0	0,00024
	10.07.2015	0,29	2,39	0	0,0003
	21.08.2015	0,46	2,00	< 0,02	< 0,025
	18.09.2015	0,24	1,67	< 0,02	< 0,025
	23.10.2015	0,45	<1,5	< 0,02	< 0,025
	19.11.2015	0,18	<1,5	< 0,02	< 0,025
AK-29 (744 km)	04-05.03.2015	0,26	2,15	0,000007	0,00038
	21-22.04.2015	0,26	1,97	0,000009	0,00052
	25-26.05.2015	0,28	2,22	0,000006	0,00047
	18-19.06.2015	0,39	1,57	0	0
	10.07.2015	0,24	1,75	0	0
	21.08.2015	0,41	2,64	< 0,02	< 0,025
	18.09.2015	0,32	2,04	< 0,02	< 0,025
	23.10.2015	0,35	1,96	< 0,02	< 0,025

	19.11.2015	0,16	1,96	< 0,02	< 0,025
AK-30 (754 km)	04-05.03.2015	0,29	2,85	0,000042	0,00012
	21-22.04.2015	0,28	2,81	0,000054	0,00037
	25-26.05.2015	0,27	2,93	0,000047	0,00044
	18-19.06.2015	0,43	1,96	0	0
	10.07.2015	0,42	2,65	0	0
	21.08.2015	0,17	2,21	< 0,02	< 0,025
	18.09.2015	0,42	1,73	< 0,02	< 0,025
	23.10.2015	0,32	2,08	< 0,02	< 0,025
	19.11.2015	0,20	2,08	< 0,02	< 0,025
AK-31 (764 km)	04-05.03.2015	0,25	2,37	0	0,00012
	21-22.04.2015	0,34	2,13	0	0,00021
	25-26.05.2015	0,29	2,54	0	0,00018
	18-19.06.2015	0,4	1,34	0	0,00012
	10.07.2015	0,24	2,06	0	0,00016
	21.08.2015	0,29	1,89	< 0,02	< 0,025
	18.09.2015	0,31	1,68	< 0,02	< 0,025
	23.10.2015	0,40	1,80	< 0,02	< 0,025
	19.11.2015	0,30	1,80	< 0,02	< 0,025
AK-33 (774 km)	04-05.03.2015	0,25	2,3	0	0,00037
	21-22.04.2015	0,3	2,17	0	0
	25-26.05.2015	0,27	2,37	0	0,00041
	18-19.06.2015	0,42	2,37	0	0,00047
	10.07.2015	0,3	2,74	0	0,0004
	21.08.2015	0,31	2,26	< 0,02	< 0,025
	18.09.2015	0,15	<1,5	< 0,02	< 0,025
	23.10.2015	0,46	<1,5	< 0,02	< 0,025
	19.11.2015	0,23	<1,5	< 0,02	< 0,025
AK-34 (784 km)	04-05.03.2015	0,25	2,5	0	0,00054
	21-22.04.2015	0,29	2,82	0	0,00062
	25-26.05.2015	0,31	2,68	0	0,00059
	18-19.06.2015	0,37	1,88	0	0,00013
	10.07.2015	0,38	2,22	0	0,0041
	21.08.2015	0,39	1,91	< 0,02	< 0,025
	18.09.2015	0,37	<1,5	< 0,02	< 0,025
	23.10.2015	0,40	1,62	< 0,02	< 0,025
	19.11.2015	0,009	1,62	< 0,02	< 0,025
Basic values	average	0,28	2,25	0	0,0002
	minimum	0,24	1,8	0	0
	maximum	0,34	2,85	0	0,00071
For 2015	average	0,31	2,19	0	0,0004

	minimum	0,009	0,93	0	0
	maximum	0,47	<1,5	< 0,02	< 0,025

Characteristics of sampling points		The concentration of harmful substances, mg/m³			
description	Sampling date	Dust	Oxide carbon	Nitrogen dioxide	Sulfur dioxide
		MPC meanings			
		0,5	5	0,2	0,5
SHETPE CAMP (657 KM)					
AK-10	04-05.03.2015	0,24	1,62	0	0,0011
	21-22.04.2015	0,27	1,84	0	0,0054
	25-26.05.2015	0,23	1,78	0	0,00063
	18-19.06.2015	0,38	0,98	0	0,0011
	09.07.2015	0,43	3,41	0	0,00064
	20.08.2015	0,41	3,18	< 0,02	< 0,025
	17.09.2015	0,42	2,44	< 0,02	< 0,025
	22.10.2015	0,43	2,01	< 0,02	< 0,025
	18.11.2015	0,10	2,01	< 0,02	< 0,025
AK-11	04-05.03.2015	0,29	1,78	0	0,00044
	21-22.04.2015	0,33	1,36	0	0,00036
	25-26.05.2015	0,3	1,81	0	0,00047
	18-19.06.2015	0,41	1,36	0	0,00022
	09.07.2015	0,41	3,30	0	0,00042
	20.08.2015	0,25	3,20	< 0,02	< 0,025
	17.09.2015	0,39	3,02	< 0,02	< 0,025
	22.10.2015	0,38	2,95	< 0,02	< 0,025
	18.11.2015	0,13	2,95	< 0,02	< 0,025
AK-12	04-05.03.2015	0,25	1,98	0	0,00028
	21-22.04.2015	0,27	2,17	0	0,00042
	25-26.05.2015	0,24	2,06	0	0,00038
	18-19.06.2015	0,23	1,52	0	0,0082
	09.07.2015	0,4	2,8	0	0,00031
	20.08.2015	0,42	3,0	< 0,02	< 0,025
	17.09.2015	0,46	3,17	< 0,02	< 0,025
	22.10.2015	0,41	3,28	< 0,02	< 0,025
	18.11.2015	0,15	3,28	< 0,02	< 0,025
AK-13	04-05.03.2015	0,27	1,58	0	0
	21-22.04.2015	0,23	1,77	0	0
	25-26.05.2015	0,28	1,64	0	0
	18-19.06.2015	0,27	1,85	0	0
	09.07.2015	0,37	3,52	0	0,00019

	20.08.2015	0,44	3,13	< 0,02	< 0,025
	17.09.2015	0,45	3,04	< 0,02	< 0,025
	22.10.2015	0,36	3,76	< 0,02	< 0,025
	18.11.2015	0,18	3,76	< 0,02	< 0,025
Basic 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 2015	average	0,32	2,45	0	0,001
	minimum	0,24	1,58	0	0
	maximum	0,46	3,76	0	< 0,025

Characteristics of sampling points		The concentration of harmful substances, mg/m³			
description	Sampling date	Dust	Oxide carbon	Nitrogen dioxide	Sulfur dioxide
		MPC meanings			
		0,5	5	0,2	0,5
ZHETYBAY VILLAGE (ENTRANCE AND EXIT)					
AK-19 (707 km)	04-05.03.2015	0,27	2,2	0	0,00084
	21-22.04.2015	0,36	2,13	0	0,00081
	25-26.05.2015	0,28	2,27	0	0,00087
	18-19.06.2015	0,37	4,32	0	0,00028
	10.07.2015	0,43	2,54	0	0,00018
	20.08.2015	0,41	2,13	< 0,02	< 0,025
	17.09.2015	0,45	1,63	< 0,02	< 0,025
	22.10.2015	0,40	2,08	< 0,02	< 0,025
	18.11.2015	0,11	2,08	< 0,02	< 0,025
AK-20 (713 km)	04-05.03.2015	0,25	2,34	0	0,00042
	21-22.04.2015	0,28	2,23	0	0,00055
	25-26.05.2015	0,27	2,39	0	0,00049
	18-19.06.2015	0,4	4,93	0	0,00022
	10.07.2015	0,42	1,96	0	0,00064
	20.08.2015	0,42	2,29	< 0,02	< 0,025
	17.09.2015	0,45	<1,5	< 0,02	< 0,025
	22.10.2015	0,40	2,33	< 0,02	< 0,025
	18.11.2015	0,055	2,33	< 0,02	< 0,025
Basic 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 2015	average	0,33	2,48	0	0,00063
	minimum	0,055	1,63	0	0,00042
	maximum	0,45	4,93	< 0,02	< 0,025

Characteristics of sampling points		The concentration of harmful substances, mg/m³			
description	Sampling date	Dust	Oxide carbon	Nitrogen dioxide	Sulfur dioxide
		MPC meanings			
		0,5	5	0,2	0,5
ZHETYBAY CAMP (730 KM)					
AK-23	04-05.03.2015	0,26	2,47	0	0,00028
	21-22.04.2015	0,36	2,32	0	0,00033
	25-26.05.2015	0,31	2,54	0	0,0003
	18-19.06.2015	0,33	2,47	0	0,0023
	10.07.2015	0,4	3,13	0	0,00039
	21.08.2015	0,39	<1,5	< 0,02	< 0,025
	18.09.2015	0,32	<1,5	< 0,02	< 0,025
	23.10.2015	0,41	1,80	< 0,02	< 0,025
	19.11.2015	0,22	1,80	< 0,02	< 0,025
AK-24	04-05.03.2015	0,3	2,42	0	0,00038
	21-22.04.2015	0,24	2,09	0	0,00049
	25-26.05.2015	0,29	2,51	0	0,00043
	18-19.06.2015	0,27	1,71	0	0,0051
	10.07.2015	0,37	3,38	0	0,0005
	21.08.2015	0,26	<1,5	< 0,02	< 0,025
	18.09.2015	0,38	<1,5	< 0,02	< 0,025
	23.10.2015	0,46	2,01	< 0,02	< 0,025
	19.11.2015	0,20	2,01	< 0,02	< 0,025
AK-25	04-05.03.2015	0,27	2,72	0	0
	21-22.04.2015	0,3	2,37	0	0
	25-26.05.2015	0,26	2,81	0	0
	18-19.06.2015	0,28	1,92	0	0,0026
	10.07.2015	0,42	3,28	0	0,00067
	21.08.2015	0,23	<1,5	< 0,02	< 0,025
	18.09.2015	0,45	<1,5	< 0,02	< 0,025
	23.10.2015	0,44	<1,5	< 0,02	< 0,025
	19.11.2015	0,21	<1,5	< 0,02	< 0,025
AK-26	04-05.03.2015	0,31	2,52	0	0,00042
	21-22.04.2015	0,28	2,66	0	0,00042
	25-26.05.2015	0,25	2,59	0	0,00051
	18-19.06.2015	0,23	1,87	0	0,0057
	10.07.2015	0,4	3,54	0	0,00043
	21.08.2015	0,43	<1,5	< 0,02	< 0,025
	18.09.2015	0,20	<1,5	< 0,02	< 0,025

	23.10.2015	0,40	1,80	< 0,02	< 0,025
	19.11.2015	0,12	1,80	< 0,02	< 0,025
Basic values	average	0,285	2,53	0	0
	minimum	0,26	2,42	0	0
	maximum	0,31	2,72	0	0,00042
For 2015	average	0,31	2,405	0	0,001
	minimum	0,12	<1,5	0	0
	maximum	0,46	3,54	< 0,02	< 0,025

Characteristics of sampling points		The concentration of harmful substances, mg/m³			
description	Sampling date	Dust	Oxide carbon	Nitrogen dioxide	Sulfur dioxide
		MPC meanings			
		0,5	5	0,2	0,5
RESERVE BORDERS (ENTRANCE AND EXIT)					
AK-28 (739 km)	04-05.03.2015	0,25	2,33	0	0,00057
	21-22.04.2015	0,3	2,51	0	0,00051
	25-26.05.2015	0,23	2,48	0	0,00063
	18-19.06.2015	0,31	2,1	0	0
	10.07.2015	0,4	3,04	0	0
	21.08.2015	0,19	3,22	< 0,02	< 0,025
	18.09.2015	0,20	1,82	< 0,02	< 0,025
	23.10.2015	0,46	<1,5	< 0,02	< 0,025
	19.11.2015	0,16	<1,5	< 0,02	< 0,025
AK-32 (771 km)	04-05.03.2015	0,33	2,51	0,000049	0,00064
	21-22.04.2015	0,33	2,78	0,000037	0,00055
	25-26.05.2015	0,3	2,66	0,000044	0,00068
	18-19.06.2015	0,36	2,09	0	0,00042
	10.07.2015	0,3	2,09	0	0,00042
	21.08.2015	0,20	2,30	< 0,02	< 0,025
	18.09.2015	0,28	<1,5	< 0,02	< 0,025
	23.10.2015	0,36	<1,5	< 0,02	< 0,025
	19.11.2015	0,26	<1,5	< 0,02	< 0,025
Basic 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 2015	average	0,29	2,45	< 0,02	< 0,025
	minimum	0,16	<1,5	< 0,02	< 0,025
	maximum	0,46	3,22	< 0,02	< 0,025



Air sampling on AK-23 (730km) PK 120

November 2015



Air sampling on AK-20 (713km) PK790

October 2015



Air sampling on AK-27 (734km) PK 163

August 2015



Air sampling on AK-27 (734km) PK163

September 2015

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 2015 monitored the soil. Sampling points and frequency defined in the monitoring program, which is a mandatory attachment to PEMP. Total in 2015 in 27 control points were selected 243 samples. In December of 2015, samples were not selected because of the reduced volume of works on the site.

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 in 2015 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: oil products 0,017 mg / kg for cadmium of 0.43 on average content in the soils of the world, plumbum 0.37 MPC, zinc 0.73 MPC.

The maximum basic measurements are as follows: oil products 0,052 mg / kg for cadmium in the normal range of the average content in soils of the world, plumbum by 0.905 MPC, zinc 0.85 MPC.

Obtained monitoring results for March-November 2015 average values were: oil products 0,016 mg / kg for cadmium of 0.35 on average content in the soils of the world, plumbum 0.31 MPC, zinc 0.74 MPC. The maximum values for the period March-November 2015 were: oil products 0.08 mg / kg for cadmium in the normal range of the average content in soils of the world, plumbum 0.905 MPC, zinc 0.85 MPC.

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

SHETPE CAMP (657 KM). Averages baseline measurement (March 2015) of this section are as follows: oil products 0,007 mg / kg, for cadmium of 0.423 on average content in the soils of the world, plumbum 0.25 MPC, zinc 0.77 MPC.

The maximum basic measurements are as follows: oil products 0,009 mg / kg for cadmium content of 0.62 on average in the soils of the world, plumbum 0.3 MPC, zinc 0.86 MPC.

Obtained monitoring results for March-November 2015 average values were: oil products 0,008 mg / kg for cadmium of 0.39 on average content in the soils of the world, plumbum 0.23 MPC, zinc 0.80 MPC. The maximum values for the period March-November 2015 were: oil products 0,013 mg / kg for cadmium of 0.68 on average content in the soils of the world, plumbum 0.33 MPC, zinc 0.92 MPC.

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

ZHETYBAY VILLAGE (ENTRANCE AND EXIT). Averages baseline measurement (March 2015) of this section are as follows: oil products 0,022 mg / kg for cadmium 0.4 times the average content in soils of the world, plumbum 0.34 MPC, zinc 0.74 MPC.

The maximum basic measurements are as follows: oil products 0,032 mg / kg for cadmium 0.4 times the average content in soils of the world, plumbum 0.36 MPC, zinc 0.84 MPC.

Obtained monitoring results for March-November 2015 average values were: oil products 0.0165 mg / kg for cadmium of 0.32 on average content in the soils of the world, plumbum 0.26 MPC, zinc 0.78

MPC. The maximum values for the period March-November 2015 were: oil products 0,032 mg / kg for cadmium of 0.51 on average content in the soils of the world, plumbum 0.36 MPC, zinc 0.89 MPC.

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

ZHETYBAY CAMP (730 KM). Averages baseline measurement (March 2015) of this section are as follows: oil products 0.0065 mg / kg for cadmium of 0.37 on average content in the soils of the world, plumbum 0.35 MPC, zinc 0.72 MPC.

The maximum basic measurements are as follows: oil products 0,011 mg / kg for cadmium of 0.54 on average content in the soils of the world, plumbum 0.67 MPC, zinc 0.85 MPC.

Obtained monitoring results for March-November 2015 average values were: oil products 0,007 mg / kg for cadmium of 0.35 on average content in the soils of the world, plumbum 0.29 MPC, zinc 0.75 MAC. The maximum values for the period March-November 2015 were: oil products 0,016 mg / kg for cadmium of 0.62 on average content in the soils of the world, plumbum 0.69 MPC, zinc 0.88 MAC.

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

RESERVE BORDERS (ENTRANCE AND EXIT). Averages baseline measurement (March 2015) of this section are as follows: oil products 0,012 mg / kg for cadmium of 0.81 on average content in the soils of the world, plumbum 0.61 MPC, zinc 0.83 MPC.

The maximum basic measurements are as follows: oil products 0,013 mg / kg for cadmium of 0.98 on average content in the soils of the world, plumbum 0.91 MPC, zinc 0.87 MPC.

Obtained monitoring results for March-November 2015 average values were: oil products 0,016 mg / kg for cadmium 0.5 times the average content in soils of the world, plumbum 0.45 MPC, zinc 0.81 MAC. The maximum values for the period March-November 2015 were: oil products 0,029 mg / kg of cadmium within the average content in soils of the world, plumbum 0.91 MPC, zinc 0.88 MAC.

Comparison of the average baseline results with average data for the entire observation period showed a slight increase on oil products. In this area were not found exceeding any of the controlled substances.

Table 3.6

Results of soil tests in November of 2015

Characteristics of sampling points		The concentration of harmful substances				
description	Sampling date	pH	Petroleum products, mg/g	Cadmium, mg/kg	Plumbum, mg/kg	Zinc, mg/kg
		MPC meanings				
		-	-	0,5	32	23
ROAD						
AK-8 (645 km)	04-05.03.2015	8,9	0,005	0,1	8,66	17,48
	21-22.04.2015	8,8	0,003	0,14	9,23	14,89
	25-26.05.2015	8,7	0,004	0,11	9,09	16,81
	18-19.06.2015	8.4	0.008	0.09	6.98	16.88

	09.07.2015	8,2	0,008	0,063	6,32	18,48
	20-21.08.2015	8,1	0,0095	0,04	6,92	16,92
	17-18.09.2015	8,1	0,011	0,08	4,85	20,63
	22-23.10.2015	8,2	0,008	0,05	5,64	21,07
	18.11.2015	8,1	0,0085	0,042	3,31	18,97
AK-9 (654 km)	04-05.03.2015	8,2	0,005	0,12	9,24	18,01
	21-22.04.2015	8,4	0,004	0,17	9,8	16,31
	25-26.05.2015	8,4	0,003	0,15	7,56	17,01
	18-19.06.2015	8,4	0,003	0,18	7,87	20,33
	09.07.2015	8,5	0,007	0,15	6,98	19,11
	20-21.08.2015	8,5	0,005	0,16	6,92	19,73
	17-18.09.2015	8,4	0,005	0,16	6,92	19,73
	22-23.10.2015	8,3	0,014	0,12	8,44	15,32
	18.11.2015	8,3	0,008	0,14	6,95	17,0
AK-14 (664 km)	04-05.03.2015	8,1	0,049	0,24	12,98	17
	21-22.04.2015	8,1	0,041	0,29	13,11	18,07
	25-26.05.2015	8,2	0,035	0,18	12,01	16,89
	18-19.06.2015	8,4	0,014	0,22	11,26	20,35
	10.07.2015	8,4	0,016	0,17	8,66	19,91
	20-21.08.2015	8,5	0,015	0,10	8,08	19,38
	17-18.09.2015	8,5	0,017	0,15	14,31	19,63
	22-23.10.2015	8,4	0,015	0,17	11,22	20,79
	18.11.2015	8,4	0,013	0,29	8,0	18,67
AK-15 (674 km)	04-05.03.2015	8,2	0,052	0,13	7,79	16,67
	21-22.04.2015	8,4	0,048	0,093	7,12	15,11
	25-26.05.2015	8,3	0,045	0,1	8,05	16,99
	18-19.06.2015	8,6	0,038	0,054	9,08	19,16
	10.07.2015	8,4	0,054	0,043	7,91	18,41
	20-21.08.2015	8,2	0,041	0,11	8,35	14,76
	17-18.09.2015	8,2	0,050	0,08	6,89	18,15
	22-23.10.2015	8,3	0,07	0,06	9,00	16,55
	18.11.2015	8,4	0,08	0,06	7,93	17,15
AK-16 (684 km)	04-05.03.2015	8,2	0,017	0,3	9,24	12,66
	21-22.04.2015	8,1	0,011	0,41	9,02	13,01
	25-26.05.2015	8,2	0,012	0,26	10,04	11,6
	18-19.06.2015	8,5	0,012	0,073	7,98	20,72
	10.07.2015	8,6	0,020	0,21	9,20	17,98
	20-21.08.2015	8,4	0,0098	0,18	5,58	19,57
	17-18.09.2015	8,4	0,010	0,12	10,95	19,29
	22-23.10.2015	8,4	0,0099	0,19	8,41	18,71
	18.11.2015	8,4	0,053	0,14	6,43	16,98
AK-17 (694 km)	04-05.03.2015	8,7	0,006	0,12	9,62	18,66
	21-22.04.2015	8,6	0,004	0,18	10,22	19,07
	25-26.05.2015	8,6	0,005	0,14	8,45	17,02
	18-19.06.2015	8,2	0,015	0,15	12,17	16,5
	10.07.2015	8,2	0,015	0,10	7,13	19,88
	20-21.08.2015	8,1	0,013	0,18	8,31	19,34
	17-18.09.2015	8,2	0,018	0,14	7,33	18,02
	22-23.10.2015	8,3	0,016	0,18	8,97	19,01

AK-18 (704 km)	18.11.2015	8,2	0,01	0,11	11,56	18,08
	04-05.03.2015	8,9	0,003	0,18	7,54	19,4
	21-22.04.2015	8,8	0,005	0,23	6,87	20,11
	25-26.05.2015	8,9	0,003	0,21	7,55	19,78
	18-19.06.2015	8,7	0,008	0,16	10,02	20,3
	10.07.2015	8,4	0,010	0,11	9,23	20,80
	20-21.08.2015	8,1	0,008	0,19	9,02	19,26
	17-18.09.2015	8,1	0,011	0,17	9,21	20,00
	22-23.10.2015	8,2	0,013	0,22	9,47	19,90
	18.11.2015	8,2	0,012	0,22	9,57	20,91
AK-21 (714 km)	04-05.03.2015	8,3	0,048	0,52	28,97	16,97
	21-22.04.2015	8,4	0,032	0,5	26,11	16
	25-26.05.2015	8,3	0,038	0,5	29,05	17,42
	18-19.06.2015	8,4	0,012	0,35	16,89	18,17
	10.07.2015	8,1	0,008	0,21	11,35	17,41
	20-21.08.2015	8,1	0,011	0,35	15,69	16,32
	17-18.09.2015	8,1	0,008	0,24	12,56	17,92
	22-23.10.2015	8,1	0,014	0,2	13,58	16,77
	18.11.2015	8,2	0,013	0,17	14,27	17,5
AK-22 (724 km)	04-05.03.2015	7,9	0,006	0,2	10,23	11,54
	21-22.04.2015	8	0,004	0,018	10,3	12,02
	25-26.05.2015	8	0,004	0,15	8,57	9,99
	18-19.06.2015	7,9	0,008	0,13	7,81	14,08
	10.07.2015	8,0	0,010	0,13	6,03	14,22
	20-21.08.2015	8,1	0,008	0,12	7,13	10,77
	17-18.09.2015	8,1	0,012	0,20	10,80	12,18
	22-23.10.2015	8,2	0,018	0,14	8,01	14,00
	18.11.2015	8,2	0,02	0,10	8,45	14,68
AK-27 (734 km)	04-05.03.2015	8,1	0,015	0,28	12,77	17,31
	21-22.04.2015	8,2	0,01	0,31	10,91	15,45
	25-26.05.2015	8	0,012	0,26	11,22	14,98
	18-19.06.2015	8,4	0,023	0,15	8,94	18,19
	10.07.2015	8,5	0,026	0,096	5,39	19,33
	20-21.08.2015	8,4	0,01	0,15	10,38	16,19
	17-18.09.2015	8,3	0,009	0,11	10,56	18,28
	22-23.10.2015	8,3	0,005	0,17	9,24	18,71
	19.11.2015	8,2	0,007	0,20	7,25	16,07
AK-29 (744 km)	04-05.03.2015	8,3	0,029	0,12	10,49	15
	21-22.04.2015	8,2	0,02	0,14	8,93	16,11
	25-26.05.2015	8,3	0,019	0,09	9,06	15,97
	18-19.06.2015	8	0,04	0,12	8,47	18,15
	10.07.2015	8,2	0,05	0,071	6,71	18,38
	20-21.08.2015	8,3	0,05	0,12	7,56	14,97
	17-18.09.2015	8,2	0,035	0,09	8,35	17,38
	22-23.10.2015	8,3	0,055	0,11	6,12	15,97
	19.11.2015	8,3	0,045	0,10	8,16	18,9
AK-30 (754 km)	04-05.03.2015	8	0,008	0,11	14,61	19,48
	21-22.04.2015	8,1	0,006	0,09	12,04	16,02
	25-26.05.2015	8,2	0,004	0,07	12,51	17,12

	18-19.06.2015	8	0,009	0,15	10,94	20,82
	10.07.2015	7,8	0,010	0,10	7,82	21,41
	20-21.08.2015	7,9	0,012	0,09	8,89	12,48
	17-18.09.2015	8,0	0,013	0,15	6,43	12,88
	22-23.10.2015	8,1	0,014	0,11	9,79	13,44
	19.11.2015	8,0	0,013	0,12	10,65	18,58
AK-31 (764 km)	04-05.03.2015	8,1	0,004	0,3	20,53	18,51
	21-22.04.2015	8,2	0,003	0,27	19,37	19
	25-26.05.2015	8,2	0,005	0,31	18,01	18,12
	18-19.06.2015	8,1	0,011	0,19	14,22	17,48
	10.07.2015	7,9	0,016	0,22	8,65	17,19
	20-21.08.2015	8,0	0,011	0,16	18,04	18,01
	17-18.09.2015	8,1	0,013	0,25	14,28	19,36
	22-23.10.2015	8,1	0,011	0,19	11,36	18,29
	19.11.2015	8,1	0,009	0,31	18,98	17,84
AK-33 (774 km)	04-05.03.2015	8,1	0,006	0,3	7,89	17,97
	21-22.04.2015	8	0,005	0,38	8,09	16,01
	25-26.05.2015	8,1	0,01	0,27	7,32	15,66
	18-19.06.2015	8,3	0,017	0,2	9,66	19,93
	10.07.2015	8,5	0,015	0,20	6,88	18,88
	20-21.08.2015	8,4	0,008	0,26	7,44	16,31
	17-18.09.2015	8,3	0,015	0,21	9,68	19,30
	22-23.10.2015	8,3	0,009	0,22	11,22	18,31
	19.11.2015	8,3	0,009	0,30	9,4	19,14
AK-34 (784 km)	04-05.03.2015	8,4	0,005	0,19	7,75	16,91
	21-22.04.2015	8,4	0,006	0,29	8,05	14,01
	25-26.05.2015	8,3	0,006	0,26	7,84	17,15
	18-19.06.2015	8,6	0,009	0,18	6,71	18,02
	10.07.2015	8,4	0,014	0,089	5,32	18,99
	20-21.08.2015	8,4	0,009	0,21	9,38	17,43
	17-18.09.2015	8,4	0,008	0,17	8,36	19,11
	22-23.10.2015	8,3	0,0095	0,19	10,11	17,87
	19.11.2015	8,2	0,007	0,21	8,53	18,07
Basic 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	0,50	28,97	19,48
For 2015	average	8,27	0,016	0,176	9,89	17,4
	minimum	7,8	0,003	0,018	3,31	9,99
	maximum	8,9	0,08	0,50	29,05	21,41

Characteristics of sampling points		The concentration of harmful substances				
description	Sampling date	pH	Petroleum products, mg/g	Cadmium, mg/kg	Plumbum, mg/kg	Zinc, mg/kg
		MPC meanings				
		-	-	0,5	32	23
SHETPE CAMP (657 KM)						
AK-10	04-05.03.2015	8,2	0.006	0,31	9,47	19,3

	21-22.04.2015	8,1	0,008	0,34	8,57	18,9
	25-26.05.2015	8,2	0,008	0,29	9	18,56
	18-19.06.2015	8	0,009	0,18	7,26	21,02
	09.07.2015	8,3	0,006	0,15	7,54	19,25
	20-21.08.2015	8,4	0,009	0,20	5,02	20,48
	17-18.09.2015	8,4	0,007	0,27	8,22	20,11
	22-23.10.2015	8,3	0,009	0,22	7,87	21,33
	18.11.2015	8,2	0,008	0,23	5,36	18,1
AK-11	04-05.03.2015	8,2	0,009	0,18	7,49	16,72
	21-22.04.2015	8,2	0,004	0,12	8,19	18,91
	25-26.05.2015	8,1	0,006	0,15	7,97	15,2
	18-19.06.2015	8,6	0,008	0,21	10,64	19,47
	09.07.2015	8,6	0,007	0,095	6,3	18,76
	20-21.08.2015	8,4	0,0073	0,22	5,66	19,48
	17-18.09.2015	8,4	0,012	0,18	7,69	18,21
	22-23.10.2015	8,4	0,01	0,19	8,00	17,54
	18.11.2015	8,3	0,012	0,20	6,53	19,96
AK-12	04-05.03.2015	8,2	0,007	0,16	8,11	15,01
	21-22.04.2015	8,2	0,008	0,21	8,05	12,77
	25-26.05.2015	8,1	0,007	0,23	9,01	13,55
	18-19.06.2015	8,4	0,012	0,19	6,97	18,39
	09.07.2015	8,4	0,008	0,18	5,4	18,57
	20-21.08.2015	8,4	0,0087	0,16	3,59	18,16
	17-18.09.2015	8,5	0,003	0,14	8,41	19,33
	22-23.10.2015	8,6	0,003	0,20	6,99	20,53
	18.11.2015	8,7	0,005	0,17	5,36	17,01
AK-13	04-05.03.2015	8,2	0,006	0,2	7,09	19,82
	21-22.04.2015	8,4	0,005	0,31	8	17,92
	25-26.05.2015	8,4	0,005	0,22	6,14	16,66
	18-19.06.2015	8	0,009	0,15	7,63	20,75
	09.07.2015	8,4	0,010	0,12	6,45	18,92
	20-21.08.2015	8,6	0,0098	0,17	5,78	19,50
	17-18.09.2015	8,6	0,011	0,13	8,18	19,28
	22-23.10.2015	8,6	0,013	0,15	7,22	20,24
	18.11.2015	8,6	0,009	0,25	7,88	18,75
Basic 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 2015	average	8,35	0,008	0,196	7,3	18,5
	minimum	8	0,003	0,095	3,59	12,77
	maximum	8,7	0,013	0,34	10,64	21,33

Characteristics of sampling points		The concentration of harmful substances				
description	Sampling date	pH	Petroleum products, mg/g	Cadmium, mg/kg	Plumbum, mg/kg	Zinc, mg/kg
		MPC meanings				
		-	-	0,5	32	23

ZHETYBAY VILLAGE (ENTRANCE AND EXIT)						
AK-19	04-05.03.2015	8,1	0,032	0,21	11,55	19,42
	21-22.04.2015	8,1	0,03	0,17	10,08	17,87
	25-26.05.2015	8,2	0,024	0,19	10,96	18,03
	18-19.06.2015	8,5	0,014	0,095	8,14	20,44
	10.07.2015	8,7	0,016	0,18	8,67	18,33
	20-21.08.2015	8,6	0,014	0,16	8,46	19,43
	17-18.09.2015	8,5	0,018	0,16	5,52	19,44
	22-23.10.2015	8,4	0,016	0,13	8,00	18,91
	18.11.2015	8,4	0,014	0,09	6,5	19,2
AK-20	04-05.03.2015	8,2	0,012	0,19	9,89	14,63
	21-22.04.2015	8,3	0,013	0,22	9,92	16,03
	25-26.05.2015	8,3	0,01	0,17	8,88	15,13
	18-19.06.2015	8,5	0,008	0,18	6,19	18,53
	10.07.2015	8,3	0,018	0,26	6,14	18,09
	20-21.08.2015	8,1	0,015	0,11	7,28	16,20
	17-18.09.2015	8,1	0,019	0,11	10,68	17,17
	22-23.10.2015	8,2	0,012	0,10	8,01	18,02
	18.11.2015	8,2	0,012	0,13	7,02	17,58
Basic 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 2015	average	8,3	0,0165	0,158	8,44	17,9
	minimum	8,1	0,008	0,09	5,52	14,63
	maximum	8,7	0,032	0,26	11,55	20,44

Characteristics of sampling points		The concentration of harmful substances				
description	Sampling date	MPC meanings				
		pH	Petroleum products, mg/g	Cadmium, mg/kg	Plumbum, mg/kg	Zinc, mg/kg
		-	-	0,5	32	23
ZHETYBAY CAMP (730 KM)						
AK-23	04-05.03.2015	8,2	0,011	0,08	21,45	13,7
	21-22.04.2015	8,2	0,009	0,07	20,59	10,21
	25-26.05.2015	8,2	0,01	0,06	22,01	14,16
	18-19.06.2015	8,3	0,008	0,13	16,64	19,49
	10.07.2015	8,0	0,013	0,15	13,32	18,9
	20-21.08.2015	8,1	0,0096	0,10	14,23	15,88
	17-18.09.2015	8,0	0,016	0,13	12,92	19,46
	22-23.10.2015	8,1	0,013	0,16	13,11	19,99
	19.11.2015	8,1	0,014	0,18	13,57	18,08
AK-24	04-05.03.2015	8,1	0,006	0,25	7,13	15,42
	21-22.04.2015	8	0,009	0,31	8,2	16,02
	25-26.05.2015	8	0,007	0,29	8,03	13,11
	18-19.06.2015	8,3	0,002	0,16	7,39	19,61

	10.07.2015	8,0	0,007	0,095	6,14	18,54
	20-21.08.2015	8,0	0,0028	0,26	6,08	16,01
	17-18.09.2015	8,0	0,005	0,16	7,08	15,31
	22-23.10.2015	8,0	0,008	0,20	10,48	16,11
	19.11.2015	8,1	0,008	0,27	7,85	16,18
AK-25	04-05.03.2015	8,4	0,004	0,22	8,4	17,82
	21-22.04.2015	8,5	0,002	0,14	6,42	16,52
	25-26.05.2015	8,4	0,003	0,11	6,01	17,01
	18-19.06.2015	8,6	0,004	0,16	6,31	19,6
	10.07.2015	8,6	0,010	0,10	4,0	18,92
	20-21.08.2015	8,4	0,007	0,19	5,50	17,14
	17-18.09.2015	8,3	0,011	0,17	8,31	18,68
	22-23.10.2015	8,2	0,011	0,15	8,06	19,00
	19.11.2015	8,2	0,008	0,14	8,59	19,07
AK-26	04-05.03.2015	8,2	0,005	0,19	7,85	19,61
	21-22.04.2015	8,2	0,005	0,28	8,11	17,38
	25-26.05.2015	8,3	0,004	0,2	7,58	19,17
	18-19.06.2015	8,1	0,008	0,14	5,71	19,94
	10.07.2015	8,2	0,010	0,19	4,36	18,87
	20-21.08.2015	8,2	0,0085	0,17	7,85	14,16
	17-18.09.2015	8,2	0,005	0,20	7,93	19,26
	22-23.10.2015	8,2	0,0053	0,22	6,02	17,71
	19.11.2015	8,2	0,0069	0,24	6,36	20,22
Basic 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 2015	average	8,2	0,007	0,174	9,43	17,4
	minimum	8	0,002	0,06	4	10,21
	maximum	8,6	0,016	0,31	22,01	20,22

Characteristics of sampling points		The concentration of harmful substances				
description	Sampling date	pH	Petroleum products, mg/g	Cadmium, mg/kg	Plumbum, mg/kg	Zinc, mg/kg
		MPC meanings				
		-	-	0,5	32	23
RESERVE BORDER (ENTRANCE AND EXIT)						
AK-28	04-05.03.2015	8,1	0,013	0,49	29,03	18,06
	21-22.04.2015	8,1	0,01	0,5	28,3	19,26
	25-26.05.2015	8	0,014	0,34	25,51	18
	18-19.06.2015	7,9	0,021	0,25	18,98	17,87
	10.07.2015	8,2	0,029	0,19	16,94	18,79
	20-21.08.2015	8,0	0,024	0,30	18,60	17,33
	17-18.09.2015	8,1	0,028	0,22	18,01	17,33
	22-23.10.2015	8,2	0,025	0,17	15,33	18,39
	19.11.2015	8,1	0,025	0,35	19,17	18,55
AK-32	04-05.03.2015	7,9	0,011	0,32	9,96	20
	21-22.04.2015	7,8	0,009	0,25	7,26	18,77

	25-26.05.2015	7,9	0,01	0,3	7,33	17,84
	18-19.06.2015	8,1	0,005	0,19	7,37	19,56
	10.07.2015	7,9	0,014	0,097	4,5	19,24
	20-21.08.2015	7,9	0,014	0,097	4,5	19,24
	17-18.09.2015	8,0	0,012	0,17	9,96	18,28
	22-23.10.2015	8,2	0,012	0,15	9,0	20,09
	19.11.2015	8,1	0,015	0,21	8,58	20,23
Basic 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 2015	average	8,03	0,016	0,25	14,35	18,7
	minimum	7,8	0,005	0,097	4,5	17,33
	maximum	8,2	0,029	0,5	29,03	20,23



Soil sampling on AK-17 (694km) PK 587
November 2015



Air sampling AK-15 (674km) PK 390
September 2015



Soil sampling on AK-23 (730km) PK 120
August 2015



Air sampling AK-9 (654km) PK 190
October 2015

Noise and vibration

Measurements of noise and vibration were carried out on a monthly basis: at the entrance and exit of the Shetpe village and Shetpe camp, at the entrance and exit of the Zhetybay village and Zhetybay camp, on the borders of the sanctuary.

To control the levels of impact are carried out control measurements of noise and vibration in March 2015 (Protocol № 102 dd 24.11.2015). Starting from July 2015 on the recommendation of the EP international specialist of CCS measurement of noise and vibration carried out in three poles: minimum, maximum, equivalent.

NOISE

SHETPE VILLAGE ENTRANCE AND EXIT. Averages baseline measurement (April 2015) the noise in this area amounted: 61 dBA, the maximum basic measurements were as follows: 68 dBA at a rate of 80 dBA.

The obtained monitoring results for the April-November 2015 the average value was equivalent: 60 dBA, the maximum equivalent value of average data is 78 dBA.

In this area were not found exceeding of the noise.

SHETPE CAMP (657 KM). Averages baseline measurement (April 2015) the noise in this area amounted: 66 dBA, the maximum basic measurements made 70 dBA at norm of 80 dBA.

The obtained monitoring results for the April-November 2015 the average equivalent value was 60 dBA, the maximum equivalent value of average data was 74 dBA.

In this area were not found exceeding of the noise.

ZHETYBAY VILLAGE ENTRANCE AND EXIT. Averages baseline measurement (April 2015) the noise in this area amounted: 66 dBA, the maximum basic measurements were as follows: 70 dBA at norm of 80 dBA.

The obtained monitoring results for the April-November 2015 the average equivalent value was 64 dBA, the maximum equivalent value of average data was 74 dBA.

In this area were not found exceeding of the noise.

ZHETYBAY CAMP (730 KM). Averages baseline measurement (April 2015) the noise in this area amounted: 66 dBA, the maximum basic measurements made 72 dBA at norm of 80 dBA.

The obtained monitoring results for the April-November 2015 the average equivalent value was 64 dBA, the maximum equivalent value of average data was 74 dBA.

In this area were not found exceeding of the noise.

RESERVE BORDER. Averages baseline measurement (April 2015) the noise in this area amounted: 59 dBA, the maximum basic measurements were as follows: 60 dBA at norm of 80 dBA.

The obtained monitoring results for the April-November 2015 the average equivalent value was 62 dBA, the maximum equivalent value of average data was 74 dBA.

In this area were not found exceeding of the noise.

Table 3.7

Sampling point	Sampling date	Noise, dBA		
		equivalent	maximum	minimum
		Normative value, 80		
SHETPE VILLAGE ENTRANCE AND EXIT				
AK-2 (636 km, entrance to Shetpe)	21-22.04.2015	68	*	*
	25-26.05.2015	64	*	*
	18-19.06.2015	70	*	*
	09.07.2015	56	60	50
	20-21.08.2015	56	60	50
	17-18.09.2015	78	80	54
	22-23.10.2015	70	75	57
	18.11.2015	36	39	36
AK-8 (645 km, exit from Shetpe)	21-22.04.2015	54	*	*
	25-26.05.2015	58	*	*
	18-19.06.2015	74	*	*
	09.07.2015	62	68	56
	20-21.08.2015	58	61	56
	17-18.09.2015	63	80	55
	22-23.10.2015	60	77	50
	18.11.2015	37	39	38
Basic values	average	61	*	*
	minimum	54	*	*
	maximum	68	*	*
For 2015	average	60	64	50
	minimum	36	39	36
	maximum	78	80	57

SHETPE CAMP (657 KM)				
AK-10	21-22.04.2015	63	*	*
	25-26.05.2015	60	*	*
	18-19.06.2015	70	*	*
	09.07.2015	66	72	64
	20-21.08.2015	61	70	67
	17-18.09.2015	68	78	60
	22-23.10.2015	71	78	66
	18.11.2015	35	36	33
AK-11	21-22.04.2015	68	*	*
	25-26.05.2015	63	*	*
	18-19.06.2015	68	*	*
	09.07.2015	68	74	66
	20-21.08.2015	65	69	63
	17-18.09.2015	69	79	63
	22-23.10.2015	74	77	66
	18.11.2015	40	44	38
AK-12	21-22.04.2015	70	*	*
	25-26.05.2015	64	*	*
	18-19.06.2015	72	*	*

	09.07.2015	70	74	62
	20-21.08.2015	63	70	63
	17-18.09.2015	71	79	66
	22-23.10.2015	70	75	58
	18.11.2015	38	41	34
AK-13	21-22.04.2015	62	*	*
	25-26.05.2015	60	*	*
	18-19.06.2015	74	*	*
	09.07.2015	59	63	54
	20-21.08.2015	58	60	56
	17-18.09.2015	66	77	61
	22-23.10.2015	70	78	62
	18.11.2015	48	50	38
Basic values	average	66	*	*
	minimum	62	*	*
	maximum	70	*	*
For 2015	average	64	67	57
	minimum	35	36	33
	maximum	74	79	67
ZHETYBAY VILLAGE ENTRANCE AND EXIT				
AK-19 (707 km, entrance to Zhetybay village)	21-22.04.2015	70	*	*
	25-26.05.2015	66	*	*
	18-19.06.2015	68	*	*
	10.07.2015	68	72	60
	20-21.08.2015	64	66	61
	17-18.09.2015	67	74	63
	22-23.10.2015	72	78	66
	18.11.2015	42	46	40
AK-20 (713 km, entrance to Zhetybay village)	21-22.04.2015	68	*	*
	25-26.05.2015	65	*	*
	18-19.06.2015	70	*	*
	10.07.2015	72	74	60
	20-21.08.2015	63	73	65
	17-18.09.2015	69	73	62
	22-23.10.2015	68	78	60
	18.11.2015	47	50	40
Basic values	average	69	*	*
	minimum	68	*	*
	maximum	70	*	*
For 2015	average	65	68	58
	minimum	42	46	40
	maximum	72	78	66
ZHETYBAY CAMP (730 KM)				
AK-23	21-22.04.2015	58	*	*
	25-26.05.2015	61	*	*
	18-19.06.2015	70	*	*
	10.07.2015	70	72	57
	20-21.08.2015	64	72	67
	17-18.09.2015	70	75	62

	22-23.10.2015	74	76	64
	19.11.2015	40	50	36
AK-24	21-22.04.2015	64	*	*
	25-26.05.2015	60	*	*
	18-19.06.2015	64	*	*
	10.07.2015	72	74	60
	20-21.08.2015	63	70	66
	17-18.09.2015	71	76	63
	22-23.10.2015	72	78	66
	19.11.2015	42	55	40
AK-25	21-22.04.2015	72	*	*
	25-26.05.2015	68	*	*
	18-19.06.2015	68	*	*
	10.07.2015	68	76	58
	20-21.08.2015	62	66	60
	17-18.09.2015	72	77	64
	22-23.10.2015	74	78	70
	19.11.2015	44	58	42
AK-26	21-22.04.2015	68	*	*
	25-26.05.2015	65	*	*
	18-19.06.2015	66	*	*
	10.07.2015	72	74	60
	20-21.08.2015	61	64	60
	17-18.09.2015	68	74	61
	22-23.10.2015	66	70	56
	19.11.2015	42	52	36
Basic values	average	66	*	*
	minimum	58	*	*
	maximum	72	*	*
For 2015	average	64	69	57
	minimum	40	50	36
	maximum	74	78	70
RESERVE BORDER				
AK-28 (739 km, reserve border)	21-22.04.2015	60	*	*
	25-26.05.2015	62	*	*
	18-19.06.2015	74	*	*
	10.07.2015	70	71	60
	20-21.08.2015	67	71	63
	17-18.09.2015	68	72	64
	22-23.10.2015	66	78	60
	19.11.2015	40	48	36
AK-32 (771 km, reserve border)	21-22.04.2015	58	*	*
	25-26.05.2015	64	*	*
	18-19.06.2015	70	*	*
	10.07.2015	68	74	54
	20-21.08.2015	54	69	59
	17-18.09.2015	66	70	63
	22-23.10.2015	68	74	66
	19.11.2015	44	50	40

Basic values	average	59	*	*
	minimum	58	*	*
	maximum	60	*	*
For 2015	average	62	68	57
	minimum	40	48	36
	maximum	74	78	66

VIBRATION

SHETPE VILLAGE ENTRANCE AND EXIT. Averages baseline measurement (April 2015) of the vibration on the site are as follows: 59 dB, the maximum basic measurements were as follows: 60 dB at norm of 100 dB.

The obtained monitoring results for the April-November 2015 the average equivalent vibration value was 66 dB, maximum equivalent value according to the average was 85 dB.

In this area has not been detected exceeding of the vibration.

SHETPE CAMP (657 KM). Averages baseline measurement (April 2015) of the vibration on the site are as follows: 63 dB, the maximum basic measurements were as follows: 65 dB at norm of 100 dB.

The obtained monitoring results for the April-November 2015 the average equivalent vibration value was 65 dB, maximum equivalent value according to the average was 76 dB.

In this area has not been detected exceeding of the vibration.

ZHETYBAY VILLAGE ENTRANCE AND EXIT. Averages baseline measurement (April 2015) of the vibration on the site are as follows: 67 dB, the maximum basic measurements were as follows: 68 dB at norm of 100 dB.

The obtained monitoring results for the April-November 2015 the average equivalent vibration value was 68 dB, maximum equivalent value according to the average was 84 dB.

In this area has not been detected exceeding of the vibration.

ZHETYBAY CAMP (730 KM). Averages baseline measurement (April 2015) of the vibration on the site are as follows: 66 dB, the maximum basic measurements were as follows: 70 dB at norm of 100 dB.

The obtained monitoring results for the April-November 2015 the average equivalent vibration value was 67 dB, maximum equivalent value according to the average was 74 dB.

In this area has not been detected exceeding of the vibration.

RESERVE BORDER. Averages baseline measurement (April 2015) of the vibration on the site are as follows: 53 dB, the maximum basic measurements were as follows: 54 dB at norm of 100 dB.

The obtained monitoring results for the April-November 2015 the average equivalent vibration value was 62 dB, maximum equivalent value according to the average was 80 dB.

In this area has not been detected exceeding of the vibration.

Table 3.8

Sampling point	Sampling date	Vibration, dB		
		equivalent	maximum	minimum
		Normative value, 100		
SHETPE VILLAGE ENTRANCE AND EXIT				
AK-2 (636 km, entrance to Shetpe)	21-22.04.2015	60	*	*
	25-26.05.2015	58	*	*

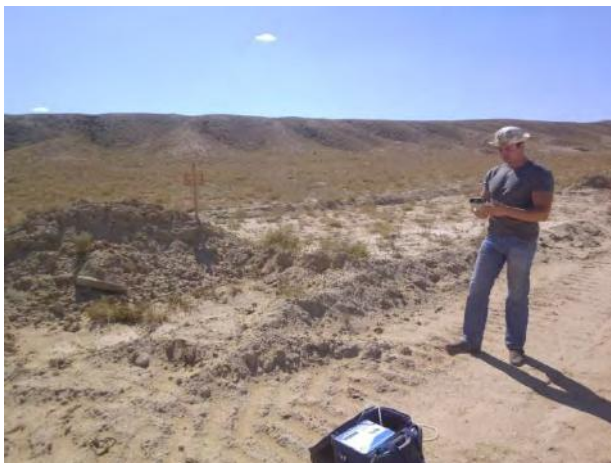
	18-19.06.2015	82	*	*
	09.07.2015	65	66	63
	20-21.08.2015	65	66	62
	17-18.09.2015	66	80	52
	22-23.10.2015	64	72	48
	18.11.2015	69	101	68
AK-8 (645 km, exit from Shetpe)	21-22.04.2015	58	*	*
	25-26.05.2015	58	*	*
	18-19.06.2015	85	*	*
	09.07.2015	62	64	60
	20-21.08.2015	60	62	54
	17-18.09.2015	62	77	50
	22-23.10.2015	69	81	55
	18.11.2015	66	90	70
Basic values	average	59	*	*
	minimum	58	*	*
	maximum	60	*	*
For 2015	average	66	76	58
	minimum	58	62	48
	maximum	85	101	70
SHETPE CAMP (657 KM)				
AK-10	21-22.04.2015	65	*	*
	25-26.05.2015	62	*	*
	18-19.06.2015	72	*	*
	09.07.2015	60	62	58
	20-21.08.2015	73	75	70
	17-18.09.2015	60	64	58
	22-23.10.2015	63	70	62
	18.11.2015	68	82	66
AK-11	21-22.04.2015	62	*	*
	25-26.05.2015	60	*	*
	18-19.06.2015	70	*	*
	09.07.2015	64	70	58
	20-21.08.2015	69	72	61
	17-18.09.2015	64	66	61
	22-23.10.2015	69	72	58
	18.11.2015	70	88	64
AK-12	21-22.04.2015	64	*	*
	25-26.05.2015	60	*	*
	18-19.06.2015	68	*	*
	09.07.2015	70	72	60
	20-21.08.2015	71	73	62
	17-18.09.2015	66	68	63
	22-23.10.2015	66	70	60
	18.11.2015	63	79	60
AK-13	21-22.04.2015	60	*	*
	25-26.05.2015	58	*	*
	18-19.06.2015	76	*	*
	09.07.2015	60	66	58

	20-21.08.2015	60	64	57
	17-18.09.2015	61	64	56
	22-23.10.2015	64	69	60
	18.11.2015	59	71	60
Basic values	average	63	*	*
	minimum	60	*	*
	maximum	65	*	*
For 2015	average	65	71	61
	minimum	58	62	56
	maximum	76	88	70
ZHETYBAY VILLAGE ENTRANCE AND EXIT				
AK-19 (707 km, entrance to Zhetybay village)	21-22.04.2015	68	*	*
	25-26.05.2015	65	*	*
	18-19.06.2015	78	*	*
	10.07.2015	58	60	48
	20-21.08.2015	56	58	52
	17-18.09.2015	56	58	53
	22-23.10.2015	66	69	60
	18.11.2015	84	99	63
AK-20 (713 km, entrance to Zhetybay village)	21-22.04.2015	66	*	*
	25-26.05.2015	68	*	*
	18-19.06.2015	80	*	*
	10.07.2015	68	72	58
	20-21.08.2015	66	70	59
	17-18.09.2015	57	56	54
	22-23.10.2015	64	65	60
	18.11.2015	84	99	63
Basic values	average	67	*	*
	minimum	66	*	*
	maximum	68	*	*
For 2015	average	68	70	57
	minimum	56	56	48
	maximum	84	99	63
ZHETYBAY CAMP (730 KM)				
AK-23	21-22.04.2015	60	*	*
	25-26.05.2015	62	*	*
	18-19.06.2015	70	*	*
	10.07.2015	66	69	52
	20-21.08.2015	68	71	62
	17-18.09.2015	70	74	56
	22-23.10.2015	70	78	60
	19.11.2015	70	76	62
AK-24	21-22.04.2015	68	*	*
	25-26.05.2015	62	*	*
	18-19.06.2015	68	*	*
	10.07.2015	70	71	59
	20-21.08.2015	64	67	61
	17-18.09.2015	70	75	51
	22-23.10.2015	66	70	58

	19.11.2015	69	74	62
AK-25)	21-22.04.2015	70	*	*
	25-26.05.2015	64	*	*
	18-19.06.2015	66	*	*
	10.07.2015	60	64	48
	20-21.08.2015	57	60	54
	17-18.09.2015	73	76	56
	22-23.10.2015	74	80	60
	19.11.2015	70	76	62
AK-26	21-22.04.2015	64	*	*
	25-26.05.2015	67	*	*
	18-19.06.2015	68	*	*
	10.07.2015	68	70	59
	20-21.08.2015	57	60	54
	17-18.09.2015	70	73	55
	22-23.10.2015	62	70	60
	19.11.2015	68	81	66
Basic values	average	66	*	*
	minimum	60	*	*
	maximum	70	*	*
For 2015	average	67	72	58
	minimum	57	60	48
	maximum	74	81	66
RESERVE BORDER				
AK-28 (739 km, reserve border)	21-22.04.2015	54	*	*
	25-26.05.2015	58	*	*
	18-19.06.2015	80	*	*
	10.07.2015	60	62	58
	20-21.08.2015	61	64	53
	17-18.09.2015	56	59	52
	22-23.10.2015	56	62	50
	19.11.2015	72	91	70
AK-32 (771 km, reserve border)	21-22.04.2015	52	*	*
	25-26.05.2015	55	*	*
	18-19.06.2015	76	*	*
	10.07.2015	62	63	52
	20-21.08.2015	61	63	55
	17-18.09.2015	57	59	53
	22-23.10.2015	60	64	56
	19.11.2015	72	90	70
Basic values	average	53	*	*
	minimum	52	*	*
	maximum	54	*	*
For 2015	average	62	68	57
	minimum	52	59	50
	maximum	80	91	70



Measurement of noise in the presence of a representative of the project management committee



Vibration measurement on AK-32(771km) PK533
September 2015

Noise measurement on AK-24(730km) PK120
October 2015

Water quality monitoring.

In the area of work, there is one body of water, the river Aschiagar to 755 km. The river is a low watered, in this connection, sampling was carried out in the flood period - April, May and November due to ongoing heavy rains water samples were taken. Accredited laboratory analyzed samples from the definition: a dry residue, nitrates, sulfates, chlorides, oil products, iron.

Table 3.9

Indicator name, measurement unit	Norm	Actual value		
Sampling date		22.04.2015	26.05.2015	19.11.2015
Dry residue, mg/dm ³	-	700	674	974
Nitrates, mg/dm ³	40	3,68	3,20	0,17

Sulfates, mg/dm ³	100	87,24	84,77	94,65
Chlorides, mg/dm ³	300	184,76	167,3	259,0
Oil products, mg/dm ³	0,05	0,038	0,03	0,032
Iron total, mg/dm ³	1	0,069	0,055	0,09

The actual values by results of surface water analysis do not exceed the norms of maximum permissible concentrations established by regulatory requirements of the Republic of Kazakhstan.

SUMMARY AND CONCLUSIONS.

1. 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.
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.

КАРТА ТОЧЕК КОНТРОЛЯ КОМПОНЕНТОВ ОКРУЖАЮЩЕЙ СРЕДЫ

