Initial Environmental Examination

February 2011

KAZ: Multitranche Financing Facility for the CAREC Transport Corridor I (Zhambyl Oblast Section) [Western Europe–Western People's Republic of China International Transit Corridor] Investment Program—Project 4
Road Section Km 261.5–310.5

### List of Abbreviations and Kazakh Terminologies

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<th>Acronym</th>
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<tr>
<td>ADB</td>
<td>Asian Development Bank</td>
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<tr>
<td>Akim</td>
<td>Town Mayor</td>
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<td>Amsl</td>
<td>Above mean sea level</td>
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<td>AMP</td>
<td>Asphalt mixing plant</td>
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<td>AP</td>
<td>Affected Person</td>
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<td>Btb</td>
<td>Bituminous treated base</td>
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<td>CAREC</td>
<td>Central Asia Regional Economic Cooperation Program</td>
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<td>CEAP</td>
<td>Construction Environmental Action Plan</td>
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<td>CFH</td>
<td>MOA's Committee of Forestry and Hunting</td>
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<td>Ch km</td>
<td>Change kilometer</td>
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<td>CL</td>
<td>Center line</td>
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<td>CO</td>
<td>Carbon monoxide</td>
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<tr>
<td>COPA</td>
<td>Conditions of Particular Application</td>
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<tr>
<td>dBA</td>
<td>Decibel (most common measure of sound)</td>
</tr>
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<td>DOE</td>
<td>Department of Environment (Oblast level)</td>
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<tr>
<td>EA</td>
<td>Executing Agency or Environmental Assessment depending on context.</td>
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<td>EARF</td>
<td>Environmental Assessment Regulatory Framework</td>
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<td>EEC</td>
<td>Environmental Expertise Committee</td>
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<td>EIA</td>
<td>Environmental Impact Assessment</td>
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<td>EMP</td>
<td>Environmental Management Plan</td>
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<td>ESO</td>
<td>Environment/Safety Officer</td>
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<td>ESR</td>
<td>Environmental and Safety Report</td>
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<td>FIDIC</td>
<td><em>Fédération Internationale des Ingénieurs Conseils</em> (the French acronym for International Federation of Consulting Engineers)</td>
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<td>FS</td>
<td>Feasibility Study</td>
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<td>GoK</td>
<td>Government of Kazakhstan</td>
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<td>ha</td>
<td>Hectare</td>
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<td>HC</td>
<td>Hydrocarbons</td>
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<td>IEB</td>
<td>Initial Environmental Baseline</td>
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<td>IEE</td>
<td>Initial Environmental Examination</td>
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<td>IFI</td>
<td>International Financing Institution</td>
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<td>IUCN</td>
<td>International Union for the Conservation of Nature</td>
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<td>JBIC</td>
<td>Japan Bank for International Cooperation</td>
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<td>LARP</td>
<td>Land Acquisition and Resettlement Report</td>
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<tr>
<td>$L_{eq}$</td>
<td>Energy-averaged sound level commonly used to describe traffic noise.</td>
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<tr>
<td>$L_{10%}$</td>
<td>Sound level exceeded 10 percent of the measurement period.</td>
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<tr>
<td>$L_{90%}$</td>
<td>Sound level exceeded 90 percent of the measurement period.</td>
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<tr>
<td>$L_{\text{max}}$</td>
<td>Maximum sound level in a given period</td>
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<td>KARM</td>
<td>Kazakhstan Resident Mission (of ADB) in Astana</td>
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<tr>
<td>KM</td>
<td>Kilometer</td>
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<tr>
<td>KZT</td>
<td>Kazakhstan Tenge (unit of currency)</td>
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<td>m</td>
<td>Meter</td>
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<tr>
<td>Mac</td>
<td>Maximum allowable concentration</td>
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<td>MFF</td>
<td>Multi-Tranche Financing Facility</td>
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<tr>
<td>mg/m$^3$</td>
<td>Milligram per cubic meter</td>
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<tr>
<td>MOA</td>
<td>Ministry of Agriculture</td>
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<td>MOEP</td>
<td>Ministry of Environmental Protection</td>
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<td>MOH</td>
<td>Ministry of Health</td>
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<td>MOTC</td>
<td>Ministry of Transport and Communication</td>
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<tr>
<td>m/s</td>
<td>Meters per second</td>
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<tr>
<td>Acronym</td>
<td>Definition</td>
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<tr>
<td>NGO</td>
<td>Non-Governmental Organization</td>
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<tr>
<td>NH₃</td>
<td>Ammonia NH₃</td>
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<tr>
<td>NO₂</td>
<td>Nitrogen Dioxide</td>
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<tr>
<td>O₃</td>
<td>Ozone</td>
</tr>
<tr>
<td>Oblast</td>
<td>Province</td>
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<td>OM</td>
<td>Operational Manual (of ADB)</td>
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<tr>
<td>PEIA</td>
<td>Preliminary Environmental Impact Assessment</td>
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<td>PC</td>
<td>Public Consultation</td>
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<td>Rayon</td>
<td>District</td>
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<td>RC</td>
<td>MOTC’s Roads Committee</td>
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<td>RoK</td>
<td>Republic of Kazakhstan</td>
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<tr>
<td>RoW</td>
<td>Right of Way</td>
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<td>SanPIN</td>
<td>Sanitary Regulations and Standards (MOH)</td>
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<tr>
<td>SEIA</td>
<td>Summary Environmental Impact Assessment</td>
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<tr>
<td>SES</td>
<td>Sanitary and Epidemiological Services (MOH)</td>
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<tr>
<td>SO₂</td>
<td>Sulfur Dioxide</td>
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<tr>
<td>SPS</td>
<td>Safeguard Policy Statement, ADB (2009)</td>
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<tr>
<td>ToR</td>
<td>Terms of Reference</td>
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<tr>
<td>TSA</td>
<td>Targeted Social Assistance</td>
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<tr>
<td>TSP</td>
<td>Total suspended particulate</td>
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Currency Exchange Rates as of 29 July 2010: 1 USD = 146 KZT (Kazakhstan Tenge)
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5.0 Construction Management Issues

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A. INTRODUCTION

1. A.1: Purpose & Context. The purpose of the Initial Environmental Examination (IEE) Report for the Road Section 261.5-310.5 Project (the Project) is to ensure good environmental practice and documented compliance with the requirements of the Asian Development Bank (ADB). The ADB is providing financing for the Project and has categorized the Project as Category B, i.e., a project requiring an IEE pursuant to its guidelines. Projects so categorized do not require a more rigorous full Environmental Impact Assessment (EIA) unless the IEE leads to a finding to the contrary. In this case it did not.

2. The proponent for the Project is the RoK, acting through its Ministry of Transport and Communications (MOTC), Committee for Roads (CR). The Project is one in a series of actions for the improvement of a road corridor through Kazakhstan extending from the border with China on the east to the border with the Russian Federation on the west. The improvements are being financed by various international financing institutions (IFIs). This particular corridor is one of six identified for improvement and is generally referred to as the Central Asia Regional Economic Cooperation (CAREC) Transport Corridor 1 (Exhibit ES-1). Financing of the improvements occurs within a Multi-Tranche Financing Facility (MFF) in which a number of smaller loans (referred to as "Tranches") are provided rather than one large loan. Each Tranche may be further divided into Projects. ADB Tranche 4, however, includes only the Road Section 261.5-310.5 Project.

3. A.2: Stage of Project Preparation. The term "project preparation" refers to stages represented by pre-feasibility studies (a preliminary step to determine whether the preparation of a full feasibility study is warranted), the feasibility study (in which the potential project is more rigorously defined and subjected to the techniques of economic and financial feasibility), and detailed engineering design preparation, and implementation. The Project addressed by the IEE has been subjected to feasibility analysis within the context of the CAREC Transport Corridor 1 Investment Program of which it is a part. It is currently in the detailed engineering design preparation stage and on the brink of the implementation stage. Detailed engineering designs were completed prior to public consultations in January 2009. These plans, as subsequently modified, and consultations with the concerned agencies and designers are the basis for the information provided.

4. A.3: Extent of IEE Study. The IEE Study is based primarily on earlier Project documentation and limited field investigations conducted by a local consultant in November 2010. The geographic extent of the IEE took note of the fact that the MFF Improvement Program's Environmental Assessment Regulatory Framework (EARF) suggests that IEEs use a standardized approach with a table of boundaries ranging from 50-200 meters depending on the parameter and adjustments as warranted for special conditions.1

5. A.4: Organization & Contents of the IEE. An Outline Table of Contents was supplied by the TOR for the preparation of the IEE and is attached to the IEE as an appendix. Following the introductory section (Part A), the remainder of the IEE Report is organized as follows:
Part B: Project Approvals, Need & Alternatives, Community Consultations;
Part C: Description of the Project;
Part D: Potential Impacts on the Physical and Biological Environment;
Part E: Potential Impacts on the Socioeconomic Environment;
Part F: Public Consultations, Disclosure and Grievance Redress Mechanisms;
Part G: Environmental Management Plan; and
Part H: Conclusions and Recommendations

6. The Summary IEE is organized in the same manner.

B. PROJECT NEED, ALTERNATIVES CONSIDERED, APPROVALS AND LICENSING

7. **B. 1: Type of Project.** The Project is a road improvement project which will upgrade the existing 49-kilometer road segment from km 261.5-310.5 (km post are distances from Almaty as measured by MoTC) from a two-lane highway to a four-lane (two two-lane carriageways) meeting all applicable RoK technical standards, including side shoulders, central median and other criteria. The Project will do so by:

- Constructing additional carriageways adjacent to the existing carriageways in two road segments jointly comprising slightly more than half of the Project's 49 kilometers (26.6 km or 54 percent of the Project). It will replace existing bridges in these sections with
larger bridges and replace or rehabilitate and lengthen existing culverts.

- Constructing new four-lane (two two-lane carriageways) road segments in new alignment in three areas where the existing road traverses or infringes on the territory of the Kyrgyz Republic.

8. The Project will also construct bus stops and shelters, rest areas and provide for animal crossings under the road as will be described in detail in Part C below.

9. **B.2: Need for the Project.** The Project is an element within the overall Transport Strategy developed by the RoK to improve and expand the network over the short to medium term. The primary rationale for the MFF Investment Program in CAREC Transport Corridor I is the fact that it "will improve the existing road and construct bypasses and new alignments to make the Corridor suitable for international traffic" facilitating traffic and international trade from Khorgos on the border with Peoples Republic of China through South Kazakhstan (Almaty and Shymkent) to the Russian Federation's western border. By doing so it is expected to contribute to poverty reduction by job creation during construction, improving access of the local population to markets and basic social services, and increasing demand for roadside services and products. Women are expected to benefit from improved access to basic health and social services and markets. Increased demand for goods and services may be beneficial for those involved in trading and services. The MFF Investment Program has been found to be fully justified on the basis of the economic and financial feasibility studies that underpin and support the Program.

10. In addition to serving the larger strategic considerations and contributing to the goals and objectives of the MFF Investment Program, projected traffic demands for Road Section KM 261.5-310.5 Project, analysis indicates a clear need to upgrade the roadway to technical standards (SNiP RK 3.03-09-2006) for four-lane roadways. Roads of this standard are considered to be warranted when calculated traffic in 20 years is estimated to be above 7,000 vehicles per day. 20-year projection for this road section is 9,900 vehicles per day. The Project will also circumvent incursions into the Kyrgyz Republic - a circumstance that has lead to periodic closings of the road and necessitating lengthy detours through Chu or through Bishkek (thus incurring two border crossings).

11. **B.3: Alternatives Considered.** Alternatives considered in the development of the overarching MFF Program included the development of railways, air travel, and other access roads. A feasibility study prepared by the RoK rejected the non-road transport modes as they appeared uneconomic. Road corridor development was given preference over the expansion and rehabilitation of the railway network because it is judged to be more cost efficient; faster to construct; and serve local demands more flexibly. It is also less complicated since rail gage standards are not compatible among East Asian, Central Asian, Iranian and Central European systems, incurring much handling and processing of cargo and due to the low quality of services and elevated risks for food cargo.

12. The option of "No-Project" was considered and found to be neither reasonable nor prudent in light of the Transport Policy Framework and the Transport Strategy developed by the RoK to improve and expand the network over the short to medium term. In the absence of improvements to Road Section KM 261.5-310.5, vehicular traffic would be forced to continue traversing Kyrgyz territory or to be subject to lengthy detours as is currently the case. In light of the fact that the Project's Feasibility Study documents the economic and financial viability of the proposed improvements to Road Section KM 261.5-310.5, the No-Project option has been determined not to be in the best interest of Kazakhstan and its people.

13. Cement-concrete with bituminous treated base (Btb) meeting Kazakhstan technical standards was selected as the road surface in accordance with the Project's Feasibility Study.
Study which identified the need for rigid pavement with enhanced heavy-duty road surfacing. The selection was made based on lower construction and transport costs and its better adaptability to the sometimes harsh local winter conditions, thus reducing repair and maintenance costs. Three sub-alternatives within this category were analyzed with varying conditions related to sand and gravel mixtures and the use of various percentages of recycled milled asphalt concrete were studied prior to final selection and adoption of the final standards.

14. **B.4: Approvals and Licensing.** The Project is required to comply with the environmental requirements of the RoK and the requirements of the ADB. In addition to these approval processes, the Kazakhstan MFF Program has adopted an approach to road construction projects in which implementation occurs within a legal and administrative framework which includes safeguards similar to the standard "FIDIC" template commonly used for international projects, i.e., the procedures established by the *Federation International Des Ingenieurs Conseils* (International Federation of Consulting Engineers, generally referred to by its French acronym). It includes the adoption of Conditions of Particular Application (COPA) which make contract specifications project-specific. (Recommended COPA environmental provisions for Project are presented in Appendix 2 of the EIA).

15. The COPA routinely stipulates the environmental and related responsibilities of the Contractor, including requirements for Contractor Environmental Action Plans (CEAPs) to make explicit the Contractor's understanding of the requirements of the Environmental Management Plans (EMPs, a required part of the IEE) and to make their implementation both site-specific (e.g., where water quality monitoring will be conducted pursuant to the requirements of the Contract) and time-specific (when and how frequently they must do so). Potential contractors submit bids based on these bid and contract documents. A selection committee, which may include safeguard expertise, chooses the winning contractor. To be meaningful, the IEE and the EMP must go beyond simply making recommendations and become legally enforceable and incorporated in the bid and contract documents. The procedures adopted and previously implemented within the MFF Program establish a framework in which this critical step is recognized and incorporated. Permits (clearances) are also required to conduct any work where environmental effects are likely, e.g. the tree removal, vegetation clearing, removal of soils, culvert replacement, etc. These permits can only be issued only after the CEAP has been approved by the CSC.

2.0 **DESCRIPTION OF THE PROJECT**

16. **C.1: Major Components & Design Characteristics.** The Project plans to upgrade Road Section 261.5-310.5 from a two-lane road to a four-lane, dual carriageway with a center median for its entire length. Its start point (KM 261.5) is the point of connection with grade-separated interchange which will terminate the Blagoveshenka-Otar Road Project (to be constructed as part of Tranche 3). Its end point (KM 310.5) connects with the Road Section 310.5-358.6 Project (also part of an earlier tranche) at a point 250 meters north of the existing road. The Project and its environs are illustrated diagrammatically by Exhibit ES-2. Most (54 percent) of the KM 261.5-310.5 upgrade will be achieved by adding an additional carriageway and median alongside the existing road. Three portions of the existing roadway, however, traverse or infringe on territory of the neighboring Kyrgyz Republic. To circumvent these infringements, the remaining 46 percent of the upgrade will develop new alignments (referred to as Bypasses) and construct two two-lane carriageways (with medians) in the three Bypass areas. Specific km posts for each section are provided by the exhibits. The existing road in the bypassed areas will be abandoned.

17. Two typical cross-sections are provided by the Project documentation, but they differ only in that portions (totaling 23 percent of the length) will include a barrier incorporated in the design of the center median. The profiles and the Project's other design and construction
standards will conform to the standards of Kazakhstan Technical Category I-B (Kazakh SNiP RK 3.03-09-2006). The Project will include the construction of four bridges (three of which require the disassembly of existing bridges at the same locations) as follows:

- **Chu Bridge**: at km 262+379 in the area designated as Bypass 1. Because it is in a new alignment area it will be a new bridge. The bridge it replaces will (apparently) be abandoned in place.

- **Shorgo Bridge**: at km 270+220. The existing bridge at this location will be disassembled and a new bridge built. Its design length is 35.15m.

- **Aksu Bridge**: at km 277+593. The existing bridge at this location will be disassembled and a new bridge built.

- **Karabalta Bridge**: at km 282+120. Its design length is 127.115 m. Because it is in a new alignment area it will be a new bridge. The bridge it replaces will be disassembled.

17. Two other watercourses which are prominent on area maps (the Toktas at km 296+437 and the Sargou at km 306+602) are creeks for which hydrological studies indicate culverts are sufficient. The Project will install or rehabilitate 42 culverts, two of which will also provide cattle crossings under the roadway. A complete tabulation of locations is provided by IEE.

18. Nine junctions will be built at the locations illustrated by Exhibit ES-3. Three of these are crossroads which are counted as two junctions; three are T-Junctions. Typical junction characteristics and designs are provided as exhibits in the IEE.
19. Permanent ancillary features will include four rest areas located near rivers or at locations of old ones. Project designs are reported to include bus stops and shelters. Locations are not specified in the available Project documentation.

20. **C.3 Sources of Materials.** Four potential sources of quarried construction material are identified by the available Project documentation. All are existing operations. With one exception (the Kapkatas Quarry - located at km 253+900) they are located more than 50 km southwest of the Project Area at varying distances off the main road at km 364+000 and will require transport through populated areas. Although the Project Road will be primarily concrete cement, it will use asphalt for various purposes. The available Project documentation and consultations indicate only that existing operating asphalt plant(s) will be used as the source of supply. In all probability this will be either the existing facility in Kordai or another source to the west of the Project Road. In both cases obtaining the asphalt will require transport for considerable distances through populated areas. Potable water for construction camps (discussed below) will be drawn from the following existing wells and the water supply systems of Merke and Zhanaturmys (a village near Merke). Non-potable water used for construction purposes will be derived from: the Chu, Asku and Karabalta Rivers in the Project Area. Fill material will be derived from roadside borrow pits and other sources in the Project Area. Recommendations in regard to these aspects of the Project will be put forward in **Part G: Environmental Management Plan** and **Part H: Conclusions and Recommendations**.

21. **C.4: Temporary Construction Facilities.** Two construction camps are planned; one at near KM 362, 350 meters northwest of intersection of border with Chu River and the other 35 meters south of KM 278+300. No indications of the resident populations or other characteristics of the construction camps are provided by the available documentation, other than the fact that potable water supply will be derived from the sources noted above. Storage areas, each occupying approximately one hectare, have been identified by the
C.5: Land Acquisition & Resettlement. A total of 55 households and five legal entities will lose their lands as a result of the Project. Of these, seven long-term leaseholders, one short-term leaseholder, and one private land owner will lose more than ten percent of their productive lands. Approximately 177 hectares (ha) of lands will be acquired, out of which about 175 ha are agricultural lands and 0.13 ha are used for commercial purposes. Most of the affected lands are leased on a long-term 160.3 (49 years) basis; 16.1 ha, leased for 5–12 years; and 0.13 ha, privately owned. The Project will also need to acquire 60.8 ha of reserved public lands, which are idle or occasionally used as natural pasture land by some villages, and lands of state enterprises. Administration of these lands will be transferred from village authority to the Zhambyl Oblast Roads Department. The transfer of these lands is not expected to adversely affect third party. About 34 ha of land may be temporarily needed during construction. These lands will be rented at the current rental rates in the area. Contractors will be responsible for identifying, negotiating, and renting land from landowners/leaseholders, and will restore the rented land to its original condition at the end of the rental period. The cost of the rental and land restoration will be included in the civil works contracts.5

C.6: Staging. Staging of the Project will have a significant effect on issues of local access, public safety, etc., particularly with regard to road closures, bridge disassembly and interim provisions while awaiting the construction of new bridges. The currently available Project documentation provides no information in regard to staging.

C.7: Contracting & Institutional Aspects of the Project Design. The requirement for CEAPs is discussed above. Approving, supervising and monitoring their implementation are equally important parts of Project Design. Supervision and monitoring provisions of the Project will be primarily the responsibility of the following:

- Project Management Consultant (PMC). As the name implies, the Project Management Consultant (PMC), working with and on behalf of MOTC and the ADB, will be responsible for the implementation of projects within the MFF Program. For individual projects, the PMC is assisted by the following.

- Construction Supervision Consultant (CSC). The CSC will be tasked with specific responsibility to ensure safeguard compliance of civil works – with particular emphasis on the monitoring of implementation of EMPs and related aspects of the Project.

- Contractor’s Environmental Specialist. The preparation of the CEAP will require a licensed person. The Contractor will be required to retain expertise to do this work and must keep that person/firm to oversee the operation throughout the contract period.

D. PHYSICAL & BIOLOGICAL BASELINE, IMPACTS & RECOMMENDED MITIGATION

D.1 Geologic, Physiographic and Soil Characteristics & Resources

Baseline. The Project Area lies in the transition Kyrgyz Range to the south and the Central Asian Steppe to the north. Its underlying geology is complex. The mountain chains of the country and the rest of Central Asia, including the Hindu Kush, Pamir, Karakoram and Himalayan Ranges, are believed to have been the result of a collision of the Indian Plate and Asia Plate. Many of the mountains in southern Kazakhstan and northern Kyrgyzstan are still growing. The Project Area is seismically active. Mineral resources in the region include coal, gold, uranium, mercury and other strategic metals and the area is an abundant source of construction materials. The Project documentation indicates that potential sources of quarried construction materials in the immediate area have been identified as indicated in
the Project Description above. Physiographic characteristics include a general slope to the northwest dissected by the streambeds resulting in undulation as the ROW rises between the crossings of the watercourses, but generally rises to the southwest. The ROW commences at an elevation of 530.5 above mean sea level (msl) and rises to 606.6 above msl. Three main soil types can be distinguished; light south gray soils that found in the piedmont slopes and hills at 600-800 meters; meadow gray soils that are widespread in the area of piedmont slopes and floodplain; and Floodplain-meadow soils formed in the plains of area's meandering rivers.

27. Potential Impacts and Recommended Mitigation. Seismic conditions are relatively uniform in the Project Area and a not a criteria affecting the locations of the proposed actions. Seismic conditions have been mitigated by ensuring that all design parameters appropriate to the seismic risk inherent in the Project Area have been taken into account. Topography, geological resources and soil conditions could be impacted due to fill requirements, borrow pit excavations and quarry operations. Specific clauses are recommended in the COPA to ensure that topsoil is identified, stripped and stored for later use in the establishment of plant life along the embankments. Borrow areas must be located outside the ROWs; pit restoration will follow the completion of works in full compliance all applicable standards and specifications restoration of the borrow areas and their surroundings, in an environmentally sound manner to the satisfaction of the CSC before final acceptance and payment under the terms of contracts. Final forming and re-vegetation must be completed as soon as possible following fill placement to facilitate regeneration of a stabilizing ground cover; trenching will be used where necessary. Mitigation is also recommended to include other related provisions as presented in detail in IEE's Appendix 2. To ensure adequate mitigation of potential adverse impacts to area topographic characteristics, it is recommended that contract documents specify that only licensed quarrying operations are to be used for material sources. If licensed quarries are not available the Contractors may be made responsible for setting up their dedicated crusher plants at approved quarry sites. Use of distant quarries requiring transport for long distances through populated areas as proposed by the Project can not be endorsed as a source for quarried materials unless there is a compelling and documented reason for its potential use. The documentation should be included as part of the study of alternatives Reconsideration of this feature will be recommended as one of the Preparatory Steps in the implementation of the recommended Environmental Management Plan (EMP), Part G. This recommendation will be reiterated in Part H.

28. Testing of potentially lead-contaminated soil is recommended prior to the start of construction. Pursuant to the stipulations of the recommended COPA, Appendix 2, disturbance of potentially lead contaminated roadside soils will require testing and approval prior to the initiation of construction and coordination of acceptable actions with the CSC. If baseline testing indicates that soils are contaminated to a degree that limits their potential use, explicit plans and commitments for suitable disposal are recommended.

29. Testing of potentially contaminated river sediment is recommended. Pursuant to the stipulations of the recommended COPA, Appendix 2, disturbance of river and creek sediments related to bridge construction will require testing and approval before reuse or disposal. If baseline testing indicates that sediments are contaminated to a degree that limits their potential use, explicit plans and commitments for suitable disposal are recommended.

D.2 Hydrology

31. Baseline. The Project Road lies entirely within the catchment of the Chu River (also spelled as the Shu, Chui or Chuy) and four of its tributaries. Surface hydrological features also include two reservoirs (one on the Shorgo River and one on the Asku River, both to the immediate north of the ROW; an irrigation network and a few small wetlands most of them associated with small creeks and low-lying areas. Surface water quality in the Project Area is
reported to be monitored by local agencies for the Chu, Toktas, Aksu, and Karabalta Rivers and relevant data is available in the Project documentation for the Chu and the Asku. The data is presented in terms of an Index of Water Pollution (IWP). The IWP is based on water quality parameters assigned numerical values with a maximum score of 10. Parameters are described in the IEE. Using the IWP, the Kazakhstan authorities rate pollution levels on a scale from one to seven (with one being "very clean" and seven being "very dirty"). The data indicates that recent readings for the Chu River have ranged between Categories 3 (moderately polluted) and 4 (polluted). Those for the Asku range between Categories 3 and 5 ("dirty") Additional data is reportedly exists indicating similar findings for the Toktas and the Karabalta Rivers. Groundwater in the immediate vicinity of the Project Road is reportedly only at shallow level within one to three meters below the surface according to the Design Expertise (March 2009). It is likely to be significantly influenced by surface water contamination, both from road runoff and from agricultural drainage. Because of its chemical properties, the Design Engineers assume that the groundwater next to the alignment, being slightly salty and moderately hard, might be of limited usability for construction works. Accordingly, the Project proposes to draw water for construction (non-potable) purposes from the Chu, Aksu River Channel and the Karabalta Rivers as noted in the Project Description. Drinking water will be taken from existing underground water wells and water supply systems of Merke and Zhanaturmis settlements. No base line data in regard to these sources other than their locations is provided in the Project documentation.

32. Potential Impacts and Recommended Mitigation. Hydrological impacts could include changes to drainage patterns and volumes, and impacts to wetlands and flood and inundation characteristics. Hydrological impacts could occur in the Construction Stage due to a failure to properly plan or implement the safeguards required by the CEAP or because of unanticipated circumstances or accidents. Impacts to hydrology could extend into the Post-Construction/Operational Stage due to improper discharges from site facilities or because of unanticipated circumstances or accidents. As detailed in IEE's Appendix 2, specific contract provisions are recommended to ensure that construction camps and other potential sources of secondary impacts are properly sited and provided with drainage and wastewater facilities. CEAPs are required to detail drainage, locations of fueling operations and liquid and toxic material storage areas, and specify that all fuel and chemical storage (if any) shall be sited on an impervious base within a bund and secured by fencing. Storage areas must be located away from any watercourse or wetlands. The base and bund walls must be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks. Related mitigation actions to avoid adverse impacts to hydrology are also recommended to apply as detailed by the IEE's Appendix 2. Mitigation action of potential hydrological impacts during construction will require strict application of all conditions to the review of the CEAP by the CSC prior to approval and strict supervision during the course of the work. Unannounced site inspections are identified as a routine part of supervision activities are recommended. Weekly and monthly reporting systems are specified. To mitigate potential impacts extending into the Post-Construction/Operational Stage, contracts stipulated that one year into the operating period a final inspection is required and Contractor's final payment is released only after a fully compliant audit is recorded. Potential hydrological issues at the time of the Final Inspection may require additional instrumented monitoring and appropriate provisions have been incorporated in the recommended COPA.

Disturbance of river sediments could adversely affect water quality. Testing of potentially contaminated river sediment is recommended. Pursuant to the stipulations of the recommended COPA, Appendix 2, disturbance of river and creek sediments related to bridge construction will require testing and approval.

D.3  Air Quality

34. Baseline. There is no known routinely gathered empirical ambient air quality data for the Project Area. An air quality model has been devised, however, by the MOTC for other
road sections in the MFF Program. The modeling indicated that roadside levels of carbon monoxide, hydrocarbon, and soot are likely to be within Kazakhstan norms. Nitrogen oxide and lead levels were likely to exceed them. Other regulated air pollutants are likely to be within the allowable concentration standards.

35. **Potential Impacts and Recommended Mitigation.** Mitigation of potential air quality impacts is recommended through strategic avoidance combined with specific provisions including requirements for a baseline air quality survey, and routine air quality monitoring not less than once per month during the course of the Works. Related provisions prohibit open burning, require dust suppression measures, and specify that all trucks used for transporting materials to and from the site will be covered with canvas tarpaulins. An Emergency Response Plan with contingencies for the accidental release of toxic air pollutants is required. Additional commitments, actions and reporting procedures to preserving air quality are presented in detail in IEE’s Appendix 2. The CEAP requires submission within 30 days of the award of the Contract and approval by the CSC prior to the start of construction. The CEAP must specify locations of air-impacting facilities such as construction camps, asphalt plants, etc. All require prior approval by the CSC, MOTC and local officials. Unannounced monitoring of contractor performance undertaken by the CSC is recommended as a routine aspect of project management. Instrumented air quality monitoring will be required at the time of final inspection if determined warranted. No additional mitigation in regard to potential air quality impacts in the Post-Construction/Operational Stage are considered warranted unless determined otherwise by MOEP.

### D.4 Biological Environment

37. **Baseline.** The dominant naturally occurring indigenous flora species in the Project area are compact turf or cushion-like plants which adapt to droughts, strong winds, frost with little snow cover, fires, and grazing. There are no natural forest lands along the ROW. Most of the area is low diverse meadow vegetation with predominantly Germanic plants and herbs, and halophytic-germanic vegetation in places. There are no natural forest lands along the entire ROW. There are, however, forest plantations located almost along the existing road generally at a distance of 10-40 meters. The trees consist mainly of poplar, elm, sometimes birch and maple. There are also forest belt areas (mostly elms) and separate trees located along the ROW. These trees fall under the management of the Zhambyl Oblast territorial office of the Committee of Forestry and Hunting (CFH). A program for essential tree cutting to implement the Project was developed with and approved by the Zhambyl Oblast CFH. A total of 10,772 trees to be sacrificed were identified for this road segment and it is stated that the Project provides for compensation for the cutting. No plans for re-planting to mitigate for tree losses (beyond compensation for the commercial value of the wood) have come to light.

38. Indigenous mammals found in the Kazakh Steppe include rodents such as ground squirrels, lagomorphs such as pikas (*Ochotona*) and hares (*Lepus*). Wolves (*Canis lupus*), foxes (*Vulpes vulpes*, *V. corsac*) and the Siberian polecat (*Mustela eversmanni*) are typical steppe carnivores. Mammals of concern identified by the World Wildlife Fund7 as occurring in this eco-region with threat assessments identified as either critically endangered or vulnerable by the International Union for the Conservation of Nature (IUCN) Red Data List are as follows:

- **Saiga antelope** (*Saiga tatarica*) - currently listed by the IUCN as critically endangered (CR.), i.e., a species "considered to be facing an extremely high risk of extinction in the wild." WWF mapping indicates the possibility of the species just to the north of the Project Area in similar terrain.8
- **Giant mole-rat** (*Spalax giganteus*), currently listed as vulnerable (VU), i.e., a species "considered to be facing a high risk of extinction in the wild".
39. Rare or endangered species within Zhambyl Oblast as reported by the regional environmental protection agencies include the Spoonbill, glossy ibis, stilt-tailed ducks, demoiselle crane, stern, bustards, houbara, black-bellied and pin-tailed sand grouse, Pallas sand grouse, tit-warbler, whistling thrush, paradise flycatcher and greater sand plover. Among the local records for threatened birds of prey are: harrier eagle, lammergeier, Himalayan griffon, neophron, Aquila chrysaetos, Aquila heliaca, Hieraaetus pennatus, steppe eagle, Haliaeetus leucophrys, Haliaeetus albicilla, Saker falcon, peregrine falcon, fish-hawk and eagle owl. Birds are identified by the WWF as potentially found in the area from this eco-region and their current risk category on the IUCN Red Data List are as follows:

<table>
<thead>
<tr>
<th>RISK ASSESSMENT</th>
<th>BIRD SPECIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critically Endangered</td>
<td>Sociable plover (Vanellus gregarius)</td>
</tr>
<tr>
<td>Endangered</td>
<td>White-headed duck (Oxyura leucocephala)</td>
</tr>
<tr>
<td>Vulnerable</td>
<td>Imperial eagle (Aquila heliaca) Lesser kestrel (Falco naumanni) Great bustard (Otis tarda)</td>
</tr>
<tr>
<td>Near Threatened</td>
<td>Pallid harrier (Circus macrourus) Little bustard (Tetrax tetrax). Black-winged pratincole (Glareola nordmanni)</td>
</tr>
</tbody>
</table>

1 an extremely high risk of extinction in the wild.
2 a very high risk of extinction in the wild.
3 a high risk of extinction in the wild.
4 close to qualifying for, or is likely to qualify for, a threatened category in the near future.


40. Other wildlife of concern include four species of Vipera ursini found in the area which are listed as threatened; and four species of Bufo viridis which are also listed as threatened. Field investigations indicated a very low probability of significant aquatic resources and no observations of fishery development at either the commercial or household level. No protected sites are located in or adjacent to the Project Area. The closest protected area is reported to be 50 km distant. The IUCN also indicates, however, that the Project Area is within the delineation of the "Mountains of Middle Asia Centre of Plant Diversity". Although the designation offers no legal protection, it is indicative of the relative importance of the area.

41. Potential Impacts and Recommended Mitigation. Mitigation of impacts to plant species will require action to ensure that losses are kept to a minimum. Bid/contract documents should specify roadside plantings and replacements as part of the road design and contain enforceable provisions in contract specifications to minimize plant loss. Specific recommendations are provided by the IEE's Appendix 2. The Project's intentions in regard to roadside planting and mitigation for the loss of over 10,000 trees (beyond the payment for the commercial value of the wood) should be clarified. Documented consideration should be provided including an analysis of opportunities for shelterbelt plans. Plans to mitigate for tree losses should be developed as part of the Pre-Construction Stage and made available for review.

Impacts to animal species will occur within and adjacent to the ROW. Given the level of traffic along the existing ROW, the likelihood of threatened or endangered species in the immediate vicinity is very low, approximately 46 percent of the revised ROW, however, will be within new alignments. Given the low levels of human activities away from the existing road, the possibilities of suitable habitat and the presence of the threatened and near threatened mammal, bird and other species cannot be eliminated in the absence of a biological survey. Recommendations in regard to this aspect of the Project are put forward in Part G: Environmental Management Plan and addressed in Part H: Conclusions and Recommendations.
E. SOCIOECONOMIC BASELINE, IMPACTS & RECOMMENDED MITIGATION

E.1 Social and Economic Resources

43. **Baseline.** Economic resources in the immediate vicinity of the Project Area are primarily those that support dryland farming, an irrigation network and the grazing potential of the area's pasturelands. No minerals are known to be exploited in the immediate Project Area. The nearest quarries exploited for construction materials are located at conservable distances to the northeast and southwest of the Project Road. No industries or food processing facilities are known to exist in the Project Area. The Project Road's regional transport infrastructure is illustrated by [Exhibit ES-4](#). The most significant transport features in the immediate Project Area are those illustrated by [Exhibit ES-5](#).

44. Most (58%) of population in the Zhambyl Oblast (basically those living in the larger urban settlements) is provided with the centralized water supply, 39% of population use water from the decentralized water sources (water-supply wells, springs) and the remaining part of the inhabitants takes water from the open water bodies or use water delivered to the region. Due to the area's limited rainfall, agricultural production in southern Kazakhstan relies heavily on the use of irrigation systems with water supplies derived from snow melts in the mountains. The current Project documentation does not provide information in regard to existing systems, but does indicate that the Project will include "establishment of new 36 pipes (and the) rehabilitation of 6 pipes". 12

45. All of the area traversed by the Project Road, and the vast majority of Oblast as a whole, relies on sewage treatment is via pit privies and septic tanks, with much of the waste being disposed of manually after cleaning of the privy storage tanks. Sewage is usually buried as there is no tradition of using these materials as fertilizer. Each town is reported to have an organization under the Rayon Akimat which is responsible for collection and disposal of solid waste. None of these organizations extend solid waste collection services to the vicinity of the Project Road. Power supplied from the grid provides a reasonably steady
supply to the villages and towns in the Project Area. Existing electricity lines of 110 kW cross the Project Road at km 272+397 with a minimum high of 7.22 m that correspond with requirements of local standards (SNiP). Therefore rehabilitation of electricity lines will not be required.

46. The Project Area is within Zhambyl Oblast which had a reported January 2010 population of 1.043 million people and a population density of about seven people to km². No documentation of the population residing in the immediate Project Area is available, Project documentation indicates, however, that a total of 55 households and five legal entities will lose their lands as a result of the Project. Of these, seven long-term leaseholders, one short-term leaseholder, and one private land owner will lose more than ten percent of their productive lands. Approximately 177 hectares (ha) of land will be acquired. Of this, about 175 ha are agricultural lands and 0.13 ha are used for commercial purposes. Most of the affected lands are leased on a long-term 160.3 (49 years) basis; 16.1 ha, leased for 5–12 years; and 0.13 ha, privately owned. The Project will acquire 60.8 ha of reserved public lands, which are idle or occasionally used as natural pasture land by some villages, and lands of state enterprises. Administration of these lands will be transferred from village authority to the Zhambyl Oblast Roads Department. The transfer of these lands is not expected to adversely affect third party.

48. At the Oblast level, the most recent data indicates the number of employed people in 2010 was 539 thousand people, 48 percent of whom are hired workers and 52 of whom are self-employed. The number of unemployed people was 37 thousand people; unemployment in the region was 6.5 percent. The share of unemployed men was made 41.9 percent (15.8 thousand people) and unemployed women were 58.1% (21.9 thousand people). The number of young people without work (in ages of 15-24 years) amounted to 6,130 people or 16.2%. The number of economically inactive people (e.g., school pupils, students, householders, retirees and disable people) is 162.5 thousand people with rate of economically passive
people were 22.0 percent.

49. Ethnically, the population of the Oblast is reported as predominantly Kazakh (71%), followed by Russians (12%) with Uzbeks, Tartars and Germans comprising the remainder. Within the immediate vicinity of the Project, the resident population is extremely small and predominantly Kazakh. No specific data in regard to religious groups in the Oblast is currently available. It is probable that Oblast characteristics reflect a greater number of Muslims and a lesser number of Russian Orthodox as was the case with ethnic composition. A socio-economic survey of the area determined that "None of the ethnic groups in the project area maintain social and cultural identities separate from mainstream Kazakhstan society". Given the available data, the populations subject to impact do not appear to warrant categorization as indigenous peoples pursuant to the applicable regulations. Efforts were made during the census to identify poor and vulnerable households. To estimate the number considered economically vulnerable in the Tranche 4 Project, it can be noted that for the three Tranche 3 projects in aggregate, only two affected households were considered vulnerable. Members of vulnerable households are given priority in project-related jobs. Gender statistics for the Oblast show a proportional balance between men and women. 48.5% (493.900) of the population are men and 51.5% (524.400) are women – or 941 men per 1000 women. The MFF Program contracts include provisions for gender equity.

50. Oblast and Rayon level healthcare institutions are being restructured, converting from purely public to being semi-private institutions in keeping with the national policy. No local education facilities or amenities are known to be located in the Project Area. The closest are believed to be located in Asku, Blagoveschenka, Kordai and other villages and settlements.

51. Zhambyl Oblast is one of the valuable historical places of the Republic of Kazakhstan. It has many historical and architectural monuments. Thirteen objects of historical and cultural importance were found during the archeological survey on the Road Section from km 260 to km 383, (i.e., an area larger than but including the Project Area). All of them are located out of road buffer zone (more than 200 meters). According to the Archeological Expertise they are placed at the distances from 210 m to 2.1 km from the Project Road.

52. Potential Impacts and Recommended Mitigation. No adverse impacts on economic activities in the affected area are anticipated other than those considered unavoidable. It is anticipated that potential impacts and specific mitigation to agricultural activities, industries, service sector activities and existing roadside uses will be documented with the preparation of the Project’s Land Acquisition and Resettlement Report.

53. No reconsideration of the Project Location or the Project Design to mitigate adverse impacts to the area transport network is considered warranted. During the Construction Period the existing transport network could be impacted due to the transport of construction materials, especially gravel, sand and related construction materials and the transport of asphalt. Elimination of the Monolit plant in Kordai as a source of asphalt is recommended due to its potential transport impacts. To ensure that potential impacts to the area transport network are avoided in the subsequent stages of the Project, the COPA for the Project recommends a very specific and detailed set of requirements in regard to general traffic management, traffic control, safety provisions that apply to temporary traffic ramps, vertical clearance, signage, temporary fencing, warning lights and other details. (See Appendix 2).

54. Impacts to infrastructure other than transport could include potential impacts to irrigation systems and utilities (such as electricity and pipelines). Potential adverse impacts can be avoided by ensuring complete documentation and by anticipating circumstances that are bound to arise in the construction process. Recommendations are incorporated in the COPA accordingly. Potential impacts to prevailing land uses during construction will be
mitigated by the provisions to protect air and water resources and the recommendations of
the COPA in regard to traffic management, safety and emergency provisions in response to
accidental hazardous spills of hazardous materials, etc. The Final Inspection before turn-
over of the Project will include verification that any impacts to prevailing land uses are
evaluated and a final payment is not made until outstanding issues are resolved. Other than
the enforcement of applicable laws, no mitigation of impacts to the area infrastructure
networks in the Operation Period is considered warranted.

55. **E.2 Noise and Vibration.** Baseline data, potential impacts and recommended
mitigation in regard to noise and vibration are as follows.

56. **Baseline.** No sensitive receptors potentially affected by either construction noise or
operational noise were observed or are known to exist in the Project Area. Nonetheless, the
Project will generate construction noise potentially affecting workers on-site and traffic will
generate road noise in the operational phase of the Project that could affect future land uses.
No facilities sensitive to vibration such as may be generated during construction are located
in the Project Area.

57. **Potential Impacts and Recommended Mitigation.** Field investigations and a review of
the proposed alignment did not indicate the need for alignment adjustments to mitigate
potential impacts. No sensitive receptors (i.e., activities such as hospitals or schools) are
located along the proposed ROW. Significant adverse noise impacts could also occur in the
Construction Stage affecting workers and others in the general vicinity. They can be avoided
by ensuring that bid and contract documents specify enforceable provisions in regard to
acceptable noise levels and requirements for baseline and periodic monitoring. Specific
recommendations are provided by **Appendix 2.** Road noise during the Post-
Construction/Operational Stage will include vehicular noise, road noise, driver behavior, and
related considerations. Such noise impacts will occur in the Project Area due to the
introduction of vehicular traffic. Projected traffic volumes are such that significant adverse
noise impacts are considered unlikely.

58. **E.3: Economic Assessment.** The Road Section km 261.5-310.5 and the other road
segments comprising the MFF Improvement Program have been subjected to feasibility
analysis, including calculations of internal economic and financial rates of return meeting or
exceeding the minimum return conditions required by the financing organizations.

59. The economic activities to be affected by the Project include the transport activities
the improved road infrastructure will support, as well as the farming and grazing activities
that occur in the immediate vicinity of the road. These impacts are expected to be beneficial.

59. **E.4: Cumulative Impacts.** Cumulative impacts are assessed in terms of synergistic
relationships resulting in combination with other projects or foreseeable actions and
cumulative Impacts Inherent within the Project. No other projects or foreseeable actions are
known to be planned in the Project Area. It is possible, however, that induced economic
development may occur as a result of the Project and such an impact is viewed as
beneficial. Cumulative impacts due to factors inherent within the Project (e.g., increased
runoff combined with a potential lack of adequate re-vegetation) will be avoided if the
recommendations put forward herein are adopted.

**F. PUBLIC CONSULTATIONS, DISCLOSURE & GRIEVANCE REDRESS MECHANISM**

60. Designers of the Project took care to ensure that the procedures applied for involving
the public general and the information presented fulfill the requirements of ADB’s guidelines
for Public Consultation, including those laid out in ADB’s Operational Procedures for MFF
(OM Section D14/OP from 6 August 2008). Formal consultation occurred on 12 January
2009 with 54 participants. The consultation was moderated by the Deputy Director of Zhambyl Oblast Department of the Road Committee T.D.Alyakhmetov, assisted by GeoData Plus LLC, and engineers of the Designer Company (KazNIIPI). Care was taken to enable a broad public discussion of the public concerns and recommendations to reconsider the planning process. In particular, the designers followed recommendations for adequate cattle crossing structures, and various safety aspects. The results of the Public Consultation Meeting are reported to have been published in local newspapers. Additional consultative meetings were held with representatives of state authorities during the field survey in November, 2010. Important issues related to road constructions were discussed with the concerned local agencies.

61. Comments received and design responses are documented by the IEE. It is anticipated that in compliance with ADB’s requirements for IEEs (Category B environmental analyses), the document will be provided for disclosure on the ADB website prior to Board consideration of the Project. The ADB’s Environment Policy requires disclosure of Initial Environmental Examination (IEE) reports to the public.17 The Contractor will be contractually obligated to notify and inform the public of construction operations prior to construction works, publish an emergency response plan disclosing his intentions to deal with accidents and emergencies, including environmental/public health emergencies associated with hazardous material spills and similar events, etc.

62. A Grievance Redress Mechanism has been established whereby complaints are received through the staff of the Kordai Akimat, the Zhambyl Committee of Roads or the Project Management Consultants. At the Rayon level, the Deputy Akim is supported by the Land Allocation Unit and Legal Staff of the Akimat. Affected Persons (APs) or other concerned individuals may visit, call or send a letter or fax to any of the appointed officials to register their comments or complaints related to land acquisition or other issues. The Akimats and the Zhambyl Oblast Committee of Roads are required to maintain a record-book to register the complaints, keep track of their status and report monthly to the Project Management. Reports and complaints resolution are subject to follow-up by the external monitoring/evaluation team, and by the Project Management. The existing Grievance Focal Point at the PMC-ADB is also required to regularly coordinate with the Zhambyl Roads Department and Akimats to track complaints received, actions taken and status of resolution. Complaint forms are distributed to the heads of local self governments, the Akimats and the Zhambyl Oblast Roads Department to facilitate recording of complaints. The reports and the process of dispute resolution are observed/monitored by the External Resettlement Monitoring Agency to be engaged by PMC. The Road Department has an Internal Monitoring Specialist (Deputy Director of Zhambyl Road Department has been assigned for this task), who will monitor the resettlement implementation activities.

63. Information about the land acquisition and other aspects of the Project will also be provided to the heads of the local self-governments/rural settlements. Affected Persons (APs) may also opt to initially course their complaints or queries through their local self-government heads. If the heads of the rural settlement cannot resolve or clarify the issue at their level within one week, they can then forward the case to the Grievance Focal Points at the Regional Akimat. If the issue cannot be resolved in two weeks, the Akimat will then pass the complaint to the Grievance Focal Point at the Zhambyl Oblast Committee of Roads. Issues requiring attention or action from the MOTC-Project Management will be forwarded by the Zhambyl Oblast Roads Department to the PMC-ADB which provides technical and supervision support to MOTC for the Project. If the case remains unsolved a complaint can be lodged to the court. Alternatively, people with concerns about the Project may contact the PMC Office, Astana. The PMC has a designated staff (Grievance Focal Point) that is tasked to receive, follow-up and report on a weekly basis all complaints, disputes or questions received about the Project.
G. ENVIRONMENTAL MANAGEMENT PLAN

64. A detailed Environmental Management Plan (EMP) presents impacts and mitigation as discussed in the foregoing sections in a form as requested by the ADB to facilitate implementation.

H. CONCLUSIONS AND RECOMMENDATIONS

65. **H.1: Overall Conclusion.** The benefits of the Road Section 261.5-310.5 Project justify its implementation, provided that the recommended mitigation actions are incorporated in its implementation. These benefits include a contribution to a more efficient transport network for use within the immediate Project Area and for use by regional, national and international traffic, thus contributing to achievement of the strategic transport policy objectives presented in Part B.

66. **H.2: Conclusions Vis-À-Vis ADB Safeguard Requirements.** The SPS specifies Environmental Safeguards required to be met by projects supported by the ADB. The IEE provides a summary statement for the Road Section 261.5-310.5 Project vis-à-vis the Safeguard Policy Statement and the findings of the IEE with cross-references to sections of the IEE Report as appropriate.

67. Issues that should be addressed as part of the Design and Pre-Construction Stage - prior to the start of construction - include the following:

- Re-Vegetation Plans including Analysis of Shelterbelts.
- Testing of Potentially Lead-Contaminated Soil.
- Testing of Potentially Contaminated River Sediment.
- The Need for a Staging Plan.
- The Potential Need for a Bridge Debris Disposal Plan.
- Biological Resources Data Gap Issue
- Sources of Quarried Materials, Asphalt and Water

68. The Conclusions and Recommendations noted that essential tools for environmental management practice are in hand. To make the best use of those tools and as a matter of good project management practice, the following are recommended:

- Pre-Construction Workshops in regard to CEAP Requirements.
- Periodic Skills Enhancement Workshops during the Construction Period.

END NOTES

1 EARF, Table 11


3 Asian Development Bank http://pid.adb.org/pid/LoanView.htm?projNo=41121&seqNo=04&typeCd=3

4 FIDIC is the most widely adopted format for road construction projects and the most widely adopted construction management system.

5 Personal correspondence, ADB Social Safeguard Specialist, 24 January 2011.

6 MoTC IEE for Tranche 4, Dec 2010.


12 1st Draft IEE for Tranche 4, Paragraph 103.

13 1st Draft IEE for Tranche 4, Paragraph 117.

14 LARP (Draft Land Acquisition and Resettlement Plan: (LARP), Project Number: 41121, Multitranche Financing Facility for the CAREC Transport Corridor 1 (Zhambyl Oblast Section) [Western Europe–Western People's Republic of China International Transit Corridor] Investment Program—Project 3 Km 383–Km 404 Road Section, Km 162-Km 260 Road Section “Bypass of Kordai pass”, and “Kordai-Approach to Border of Kyrgyzstan” Section, Prepared by Committee of Roads (CoR), Ministry of Transport and Communications (MOTC), Republic of Kazakhstan, Asian Development Bank., June 2010.

15 LARP (Draft Land Acquisition and Resettlement Plan: (LARP), Project Number: 41121, Multitranche Financing Facility for the CAREC Transport Corridor 1 (Zhambyl Oblast Section) [Western Europe–Western People's Republic of China International Transit Corridor] Investment Program—Project 3 Km 383–Km 404 Road Section, Km 162-Km 260 Road Section “Bypass of Kordai pass”, and “Kordai-Approach to Border of Kyrgyzstan” Section, Prepared by Committee of Roads (CoR), Ministry of Transport and Communications (MOTC), Republic of Kazakhstan, Asian Development Bank., June 2010.


A. INTRODUCTION
A. INTRODUCTION

ORGANIZATION OF PART A

1. In accordance with the outline provided by the Terms of Reference (TOR) for its preparation (attached hereto as Appendix 1), the introductory section of this report is presented in four subsections as follows:

- Purpose and Context of the Report (Item 1.0);
- Stage of Project Preparation (Item 2.0);
- Extent of IEE Study (Item 3.0); and
- Organization and Contents of the Report (Item 4.0).

2. The Road Section KM 261.5 - 310.5 Project (generally referred to hereafter as "the Project") to which it is addressed is briefly described below as part of Item 1 and described in detail in Part C: Description of the Project as stipulated by the TOR. Other aspects of the organization of the report are provided in Item 4.0 below as also stipulated by the TOR.

1.0 PURPOSE AND CONTEXT OF THE REPORT

1.1 Purpose

3. This report provides an Initial Environmental Examination (IEE) of a proposed project to improve and alter the alignment portions of the roadway in southern Kazakhstan designated on international maps as the A-359 from a point near the village of Blagoveschenka (identified as kilometer marking 261.5) to a point designated as km 310.5. The report has been prepared pursuant to the requirements of the Asian Development Bank (ADB) which, together with the Islamic Development Bank (IDB) and the Republic of Kazakhstan (RoK), is providing financing to undertake the Project. In accordance with the outline provided by the TOR for its preparation, Appendix 1), the introductory section of the IEE (Part A) is presented in four subsections as follows:

1.2 Proponent

4. The proponent for the Project is the RoK acting through its Ministry of Transport and Communications (MOTC), Committee for Roads. MOTC has developed a program for improvement of the CAREC Transport Corridor 1 in cooperation with all IFIs participating in the MFF program.

1.3 Programmatic Context

5. The Project is part of a considerably larger program in which various international financing institutions (IFIs), including the ADB, the IDB, the International Bank for Reconstruction and Development (generally known as the World Bank), and others who, together with affected countries, have identified six road corridors extending from the border with China on the east to the border with the Russian Federation on the west as warranting improvement. The corridor in which the Project is located is part of one of these six corridors and is referred to as the Central Asia Regional Economic Cooperation (CAREC) Transport Corridor 1 (Exhibit A-1). The investment program of which the Project is a part is referred to as the CAREC Transport Corridor 1 Investment Program.
6. Loans by the IFIs are made using a financing instrument which they refer to as a Multi-Tranche Financing Facility (MFF). The instrument allows the IFIs to provide for smaller incremental loans referred to as "Tranches" (from the French for slice or piece) rather than one large loan to finance all of the actions in the corridor at one time. The overall Program is referred to as the MFF Investment Program. Tranches may consist of one or more Projects. In this instance, the Project is the sole project proposed to be financed by Tranche 4 of the MFF Investment Program and will be co-financed by the ADB and the RoK.

7. Projects may be further subdivided into Construction Packages so as to better manage the work and accommodate Contractor capabilities. As will be described in Part C: Project Description, it is anticipated that the Road Section Km 261.5 - 310.5 Project will be divided into two Construction Packages.

8. Each Tranche and the projects included in it require separate environmental documentation and technical specifications which are consistent with the overarching agreements for the MFF actions. In accordance with the MFF’s adopted Environmental Assessment Review Framework (EARF), however, projects in each Tranche are categorized according to the highest categorization of the projects to be undertaken in that Tranche. If, for example, a Tranche has three Projects and one is a Category A, then the entire Tranche and each of the Projects within it will be treated as Category A Projects. This aspect of the EARF is moot in this particular interest since Tranche 4 is comprised of only one project.
9. As noted above, this particular Tranche will be financed by the ADB and the RoK. The design and implementation of the section would comply with the relevant environmental and social safeguards of the ADB, including the ADB's Safeguard Policy Statement (2009), as well as all applicable RoK laws and regulations. The relationship between the RoK regulations and those of the ADB is described in Part B: Project Need, Alternatives Considered, Approvals and Licensing.

10. Additional overarching agreements within the MFF Investment Program are documented in various forms, including most notably in the context of this report, an Environmental Assessment Review Framework (EARF) as described in Item 3.0: Organization of the IEE. Within the terms of these agreements, it is recognized that the environmental regulations, terms and procedures of the IFIs vary, but all categorize potential Projects according to the severity of potential impacts and the sensitive of the affected environments. The EARF establishes a consistency in categorization for the purposes CAREC Transport Corridor 1 Investment Program and categorizes projects as Category A, Category B, etc., indicating the level of investigation and documentation required as will be further detailed in Part B: Project Need, Alternatives Considered, Approvals and Licensing.

1.4 Nature, Size, and Location of the Project

11. In addition to the “identification of the Project and its proponent... and any other pertinent information” as provided above, the IEE TOR notes that the subsection of Part A should provide "a brief description of the nature, size and location of the Project and its importance to the country,...".

12. Nature of the Project. The Project is a road improvement project which will upgrade the existing 49-kilometer road segment from a two-lane highway to a four-lane (two two-lane carriageways) meeting all applicable RoK technical standards, including side shoulders, central median and other criteria. The Project will do so by:

- Constructing additional carriageways adjacent to the existing carriageways in two road segments jointly comprising slightly more than half of the Project's 49 kilometers (26.6 km or 54 percent of the Project). It will replace existing bridges in these sections with larger bridges and replace or rehabilitate and lengthen existing culverts.

- Constructing new four-lane (two two-lane carriageways) road segments in new alignment in three areas where the existing road traverses or infringes on the territory of the Kyrgyz Republic.

13. The Project will also construct bus stops and shelters, rest areas and provide for animal crossings under the road as will be described in detail in Part C: Description of the Project.

14. Size. The Project will require the dedication of 49 kilometers of right-of-way (ROW) and he areas for ancillary features such as bus stops and rest areas, and will require the temporary use (estimated as 34 hectares) of land for temporary use for construction camps and related facilities. Its estimated cost is approximately US$ 130.76 million.

15. Location. The starting point for the Project is located in southern Kazakhstan approximately 260 km southwest of Almaty by road along the border with the Kyrgyzstan. The characteristics of the location are briefly described in Part C: Project Description and described in detail in Part D: Physical & Biological Baseline, Impacts & Mitigation Environment and Part E: Socioeconomic Baseline, Impacts & Mitigation.
2.0 STAGE OF PROJECT PREPARATION

16. As noted in the TOR for the preparation of the IEE, the term "project preparation" in this context refers to stages represented by pre-feasibility studies (a preliminary step to determine whether the preparation of a full feasibility study is warranted), the feasibility study (in which the potential project is more rigorously defined and subjected to the techniques of economic and financial feasibility), and detailed engineering design preparation, implementation and so on.

17. The Project addressed by this IEE has been subjected to feasibility analysis within the context of the CAREC Transport Corridor 1 Investment Program of which it is a part. It is currently in the detailed engineering design preparation stage and on the brink of the implementation stage. Detailed engineering designs were completed prior to public consultations in January 2009. These plans, as subsequently modified, and consultations with the concerned agencies and designers are the basis for the information provided in Part C: Description of the Project.

18. This stage is also more generally referred to as the Preconstruction Stage which includes the design and the preparation of engineering plans, contract specifications and related activities that can have a profound affect on the avoidance of adverse environmental impacts on the stages which follow.

3.0 EXTENT OF IEE STUDY

19. The IEE for the Road Section Km 261.5 - 310.5 Project follows the earlier preparation of an overarching IEE for the KAZ: Proposed Multi-Tranche Financing Facility (MFF) for the CAREC Transport Corridor I (Zhambyl Oblast Section) Investment Program (TA No. 7071-KAZ), Ministry of Transport and Communication, Government of Kazakhstan, and the EARF which established the environmental assessment protocol used by MFF Projects. Both were consulted in the preparation of the IEE.

20. Detailed Design was completed in 2008 to address a more extensive project (km 261.5-383.0) including the area of the current Road Section 261.5-310.5 Project. An EIA pursuant to RoK requirements was prepared at that time. Subsequent changes in the Project Definition and financing arrangements lead to the preparation of various draft environmental documents, all of which have been extensively reviewed in the preparation of the document in hand. The reviews included consultations with the authors and subsequent field reconnaissance undertaken by ADB staff and a local consultant. A revised Draft IEE (the document in hand) was prepared with the assistance of an international consultant. Aside from the field reconnaissance by ADB staff and the local consultant, the IEE is based totally on secondary information and similar studies for earlier projects in the CAREC Transport Corridor I Investment Program as documented by end/foot notes throughout the document.

21. The geographic extent of the IEE took note of the fact that the EARF suggests that "For full EIAs the boundaries are established on a case by case basis, considering the geographic extent, duration, severity and reversibility of effects. Boundaries need to address how far in distance and time air quality, noise, effect on sensitive ecosystems, sensitive archeological and cultural heritage sites will be studied, etc." Abbreviated EIAs or IEEs use a more standardized approach, working with a table of boundaries (Exhibit A-2), adjusting for special conditions.

22. These boundaries will be relevant for establishing the recommended Environmental Management Plan (EMP, Part G). For the purpose of preparing the IEE, the ROW is reported to have been visually surveyed in its entirety by the Engineering Design Team for a distance of at least 200 meters on either side of the proposed centerline and available data for all environmental parameters has been derived from all known relevant sources,
including earlier Project documentation as indicated by the accompanying end/footnotes.

23. It should be noted, however, that for the establishment of relevant baseline conditions and the assessment of impacts on any project, the extent of impact requires consideration of:

- **The nature of the proposed action.** Some projects have inherent environmental impacts over large areas – a dam or creation of a new railway line, for example, and clearly have a potential for significant environmental impact; and

- **The sensitivity and circumstances of the environment in which the proposed action will occur.** A roadway through a previously undisturbed environment, for example, particularly one that might contain unique habitats, has a potential for significantly greater environmental impacts than a similar roadway through a previously disturbed area.

- **Project-specific considerations.** Road Section KM 261.5 - 310.5 Project, for example, proposes to obtain quarried materials from sources more than 50 kilometers from the actual construction site.

24. The actions proposed within the context of the Road Section KM 261.5 - 310.5 Project will be largely (but not entirely) confined to the designated road rights-of-way (ROWs) and the immediately adjacent areas. Indirect and cumulative impacts could occur over a considerably larger area, however, and the conceptual limits of the PAI must be expanded in accordance with the circumstances of the particular environmental characteristic under discussion.

### 4.0 ORGANIZATION & CONTENTS OF THE IEE

25. The ADB Safeguard Policy Statement (SPS, 2009) is the most recent official pronouncement in regard to the recommended contents and organizations of environmental documentation meeting ADB standards. The SPS, the Project's EARF (2008) and the ADB Environmental Assessment Guidelines (2003), together with the organizational approaches used in other environmental documentation in the MFF Program have been taken into account and, together with the Outline Table of Contents supplied by the TOR for the preparation of the IEE (Appendix 1), are the primary organizational devices used in the development of the outline followed by the IEE.

26. The remainder of the IEE Report is, therefore, is organized as follows:

- **Part B: Project Approvals, Need & Alternatives, Community Consultations**

- **Part C: Description of the Project.** The brief description above is expanded in Section C following the outline suggested by the ADB Guidelines.

- **Part D: Potential Impacts on the Physical and Biological Environment.** In accordance with the stipulations of the TOR, the physical and biological criteria
identified by the TOR are described in terms of their:

- Baseline Conditions
- Potential Impacts During Construction
- Potential Impacts During Operations
- Mitigation Measures and Monitoring Requirements

- Part E: Potential Impacts on the Socioeconomic Environment. In accordance with the stipulations of the TOR, the socioeconomic criteria identified by the TOR are also described in terms of their:
- Baseline Conditions
- Potential Impacts During Construction
- Potential Impacts During Operations
- Mitigation Measures and Monitoring Requirements

- Part F: Public Consultations, Disclosure and Grievance redress Mechanisms

- Part G: Environmental Management Plan

- Part H: Conclusions and Recommendations

END NOTES

1 Personal communication, ADB Social Safeguards Specialist, 24 January 2011.
2 Personal communication, ADB 24 January 2010.
3 IDB EIA Dated May 2010, Paragraph 71.
B. PROJECT NEED, ALTERNATIVES CONSIDERED, APPROVALS & LICENSING
ORGANIZATION OF PART B

1. In accordance with the outline provided by the Terms of Reference (TOR) for its preparation (attached hereto as Appendix 1), this section of the IEE report is presented in four subsections as follows:

- Type of Project (Item 1.0);
- Need for the Project (Item 2.0);
- Alternatives (Item 3.0); and
- Approvals and Licensing (Item 4.0).

1.0 TYPE OF PROJECT

2. The Project is a road improvement project which will upgrade the existing 49-kilometer road segment from a two-lane highway to a four-lane (two two-lane carriageways) meeting all applicable RoK technical standards, including side shoulders, central median and other criteria. The Project will do so by:

- Constructing additional carriageways adjacent to the existing carriageways in two road segments jointly comprising slightly more than half of the Project's 49 kilometers (26.6 km or 54 percent of the Project). It will replace existing bridges in these sections with larger bridges and replace or rehabilitate and lengthen existing culverts.

- Constructing new four-lane (two two-lane carriageways) road segments in new alignments in three areas where the existing road traverses or infringes on the territory of the Kyrgyz Republic.

3. The Project will also construct bus stops and shelters, rest areas and provide for animal crossings under the road as will be described in detail in Part C: Description of the Project.

2.0 NEED FOR THE PROJECT

4. Strategic Considerations. In addition to its importance within the CAREC Transport Corridor 1, the Road Section KM 261.5 - 310.5 Project is an element within the overall Transport Strategy developed by the Republic of Kazakhstan to improve and expand the network over the short to medium term. The Transport Strategy includes an approach to the road sector which outlines several objectives and sets out quantitative and qualitative targets and operating principles. The underlying theme of the road strategy is to make the road system larger, better, more accessible, more affordable, more efficient, safer, and more environmentally friendly. The Transport Strategy also targets greater integration between different modes, cost recovery, much more outsourcing to the private sector – construction, maintenance, operations, and management and calls for investments in “hard” infrastructure, as well as for institutional effectiveness and change. This includes streamlining the mandate of the MOTC; improving planning, governance, financial and project management, safeguards standards, and road safety measures. The Transport Strategy sequences priority investments splitting them into public and private investments and a mix of both. These create the conditions for investments (the level playing field for public and private actions), and also provide the criteria for operating assets and monitoring performance and results.
5. **Justifications as Documented by the MFF Investment Program.** The rationale for the MFF Investment Program in CAREC Transport Corridor I is the fact that it "will improve the existing road and construct bypasses and new alignments to make the Corridor suitable for international traffic" facilitating traffic and international trade from Khorgos on the border with Peoples Republic of China through South Kazakhstan (Almaty and Shymkent) to the Russian Federation's western border.

6. By doing so it is expected to contribute to poverty reduction through the creation of job opportunities for the local population during construction, for improving access of the local population to markets and basic social services, and increasing demand for road side services and products. Women are expected to benefit from improved access to basic health and social services and markets. Increased demand for goods and services may be beneficial for those involved in trading and services.

7. The MFF Investment Program has been found to be fully justified on the basis of the economic and financial feasibility studies that underpin and support the Program.

8. **Justifications Specific to Road Section KM 261.5 - 310.5 Project.** In addition to serving the larger strategic considerations and contributing to the goals and objectives of the MFF Investment Program, projected traffic demands for Road Section KM 261.5 - 310.5 Project, analysis indicates a clear need to upgrade the roadway to technical standards (SNiP RK 3.03-09-2006) for four-lane roadways. Roads of this standard are considered to be warranted when calculated traffic in 20 years is estimated to be above 7,000 vehicles per day. 20-year projection for this road section is 9,900 vehicles per day.

3.0 **ALTERNATIVES CONSIDERED**

3.1 **Strategic Alternatives Considered Within the MFF Program**

9. Alternatives considered in the development of the overarching MFF Program (of which the Road Section addressed by this IEE is only a part) included those relating to railways, air travel, and other access roads.

10. Given the infrastructure setting and enormous distances covered by the CAREC transport corridor, as well as traffic patterns and limited connectivity, a feasibility study prepared by the RoK rejected the other transport modes as they appeared uneconomic. Road corridor development was given preference over the expansion and rehabilitation of the railway network because roads are judged to be more cost efficient; faster to construct; serve local demands more flexibly; and are ultimately less complicated. Rail gage standards are not compatible among East Asian, Central Asian, Iranian and Central European systems, thus incurring much handling and processing of cargo. The railway alternative was also rejected due to the low quality of actual services and elevated risks for food cargo.

3.2 **The "No-Project" Option**

11. Accepting the MFF Road Improvement Program as the most reasonable alternative to meet overall needs, it is possible to envision the Program without the actions proposed by the Project addressed by this IEE. This option warrants consideration, particularly in light of the fact that the ADB EA Guidelines note that "one alternative that should receive special attention is the "no go" alternative" - also referred to as the "no-project option".

12. The option of "No-Project" has been considered and found to be neither reasonable nor prudent in light of the Transport Policy Framework and the Transport Strategy developed by the Republic of Kazakhstan to improve and expand the network over the short to medium term.
13. Improvement of Road Section KM 261.5-310.5 is an important element within this overall Transport Strategy which has identified the goal of making the road system larger, better, more accessible, more affordable, more efficient, safer, and more environmentally friendly. The Transport Strategy established a program which identifies priority investments such as the improvements to Road Section KM 261.5-310.5 and failure to improve the road section could seriously undermine the financial underpinnings of this program. As also noted in the introductory section, Road Section KM 261.5-310.5 is an important element in the overall MFF Program and its goal of providing an updated east-west transport corridor to serve Kazakhstan's current and future needs.

14. In the absence of improvements to Road Section KM 261.5-310.5, vehicular traffic would be forced to continue the current traverse Kyrgyz territory. In light of the fact that the Project’s Feasibility Study documents the economic and financial viability of the proposed improvements to Road Section KM 261.5-310.5, the no-project option has been determined not to be in the best interest of Kazakhstan and its people.

3.3 Design Alternatives

15. The terminal points of the Road Section KM 261.5-310.5 are established by the road network to which the Road Section will connect. The proposed re-alignments to circumvent Kyrgyz territory alignment follow sound engineering and environmental principles. A review of the re-alignments and field investigations did not suggest a need for reconsideration of the proposed re-alignments. Major components of the design, particularly the accommodation of animal and farm equipment crossings at strategic points are sound mitigation actions to lessen public and animal safety issues.

16. Cement-concrete with bituminous treated base (Btb) meeting Kazakhstan technical standards was selected as the road surface in accordance with the Project’s Feasibility Study which identified the need for rigid pavement with enhanced heavy-duty road surfacing. The selection was made based on:

- Lower construction and transport costs; and
- Better adaptability to the sometimes harsh local winter conditions, thus reducing repair and maintenance costs.

17. Three sub-alternatives within this category were analyzed with varying conditions related to sand and gravel mixtures and the use of various percentages of recycled milled asphalt concrete were studied prior to final selection and adoption of the final standards.

4.0 APPROVALS AND LICENSING

18. The Project is required to comply with the environmental requirements of the RoK and the requirements of the financing organization, in this case the requirements of the ADB.

19. The categorization procedures and environmental compliance requirements of the RoK and those of the ADB are summarized by Exhibit B-1 and discussed below. The Project is will also be required to comply with the environmental approval process established within the MFF Program, including requirements for Comprehensive Environmental Action Plans prior to permitting as explained in Item 4.3.

4.1 Required RoK Environmental Clearance Approvals

20. Legal & Institutional Framework. Kazakhstan has an established national and local legal and institutional framework for environmental protection. The agreements for financing
**ENVIRONMENTAL REQUIREMENTS - ADB & KAZAKHSTAN**

<table>
<thead>
<tr>
<th>ADB</th>
<th>Kazakhstan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Categorization &amp; Levels of Investigation</td>
<td>Projects are assigned to one of the following categories depending on the significance of the potential environmental impacts and risks:</td>
</tr>
<tr>
<td>Category A - projects likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented. These impacts may affect an area larger than the sites or facilities subject to physical works. An environmental impact assessment (EIA), including an environmental management plan (EMP), is required.</td>
<td>Projects are classified by the 5 danger levels with 1 being the highest as defined by norms and standards developed by the Sanitary and Epidemiological Services (SE), in relation to human health and safety. There is little reference to protection of the environment and e.g., forests and wildlife populations. The sensitivity of project is measured by the SE classes of dangers. There are four categories:</td>
</tr>
<tr>
<td>Category B - project’s whose potential adverse environmental impacts are less adverse than those of Category A. Impacts are site-specific, few if any are irreversible, and in most cases mitigation measures can be designed more readily than for Category A projects. An initial environmental examination (IEE), including an EMP, is required.</td>
<td>• Category 1 projects have levels of severity/danger that trigger a full EIA.</td>
</tr>
<tr>
<td>Category C - projects likely to have minimal or no adverse environmental impacts. An EIA or IEE is not required, although environmental implications need to be reviewed;</td>
<td>• Category 2 projects are considered to have lower levels of severity/danger and as such a lesser assessment is undertaken, although still referred to as an Environmental Assessment.</td>
</tr>
<tr>
<td>Category Fl - involves the investment of ADB funds to, or through, a financial intermediary.</td>
<td>• Category 3 and 4 projects are considered to present considerably lower risks of severity/danger as such generally do not warrant an assessment beyond the initial screening.</td>
</tr>
</tbody>
</table>

Road Section 261.5-310.5 Project has been categorized as a Category B Project.

| Who Prepares the Documents | Planning and conduct of an assessment is the duty of the proponent, in this case MOTC. MOTC often retains a licensed consultant, frequently a member of the team undertaking the Feasibility Study. The assessment must be preceded with a scoping study which must be approved before the EIA can begin. The EIA process has five stages: |
| - ADB usually requires EAs to be prepared by the Project Proponent. If capacity is lacking consultants may help fill the gaps, undertake new studies on behalf of the proponent or assist national specialist to improve the documentation. This is a proponent focused activity, with the requirement for close collaboration and ownership. | 1) Overview of Environmental Condition; 2) Preliminary EIA (essentially a terms of reference for the EIA); 3) Preparation of the EIA; 4) Preparation of an Environmental Management Plan; 5) Post-project Analysis. |
| The ADB generally uses a Rapid Environmental Assessment (REA) checklist approach. Projects are categorized into A-C categories by the Bank project team. | |

Road Section 261.5-310.5 Project has been categorized as a Category B Project.

| The Environmental Management Plan | As specified in Ecological Code Article 41, environmental assessment documentation should include: |
| - An EMP is required for A and B category projects. It is considered to be an integral but distinct part of the assessment document. It is not a separate document, but the key summary of the mitigation and monitoring measures to be applied should extractable as a stand-alone section or set of tables. | Description of measures provided for preventing and mitigating impacts on environment, including proposal for ecologic monitoring”—more or less a partial EMP; This description does not comply with ADB requirements. |

| Public Consultations | Kazakhstan has a consultation process but it involves the public sector and rarely a common citizen |
| - The ADB requires two formal public consultation sessions for full EIAs and one session for category B projects. For full EIAs the sessions are scheduled to coincide with early EIA planning and the preparation of the draft EMP or record of likely impacts. For the B-level projects a session | |

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of projects within CAREC Transport Corridor 1 and the MFF Program expand the legal and institutional framework and establish mandates that apply at the project level.

21. Kazakhstan’s environmental protection procedures that apply prior to project approval are implemented pursuant to an Ecological Code (revised in 2007) and more than 120 norms and codes which define how the law must be implemented. The procedures ensure that projects are environmentally sound operate on three levels:

- **Environmental Expertise Committee (EEC).** At the top is the Environmental Expertise Committee (EEC) established and chaired by the Ministry of Environmental Protection (MOEP). The EEC is located in the capital and has the first and last word on all national level EIAs. After the approval of a terms of reference (ToR) and the selection of a licensed Environmental Assessment (EA) specialist consultant, a preliminary environmental assessment (PEIA) (essentially a scoping-level desk study) is prepared in parallel with an engineering feasibility study.

- **Oblast Environment Department.** At the second level is the Oblast Environment Department. The Oblast Environmental Department reviews the PEIA and provides written comments to the EEC. If needed, specialists from within the Oblast Department of Agriculture’s Water Resources Committee and Forestry and Hunting Committee and from the Ministry of Health’s Sanitary and Epidemiological Services (SES) are asked to contribute. The available documentation indicates that in practice this is rarely done. In principal, the EEC receives the comments and recommendations, reviews/edits them, and the preparation of an EIA is authorized. Following review and approval of the EIA, it is sent to the Executing Agency (EA) for action.

- **Proponent Agency (MOTC).** The Proponent Agency, in this case MOTC, is the third level. As the Proponent for the proposed action, it is responsible for required environmental actions and enforcement of the stipulations of the EIA prior to and during the Project's detailed design stage and for coordination of recommended environmental actions thereafter.

22. **Kazakhstan EIA Requirements & Review Process.** The consultant who prepares the PEIA usually undertakes the EIA and proceeds with the detailed analysis focusing on field work and primary date collection, with strict reference to Kazakh norms and codes. The focus of the EIA is the preparation of a comprehensive environmental mitigation and monitoring plan (EMP), in the past prepared separately and referred to as an Ecological Passport, but now included as a section of the EIA. The EIA is prepared in parallel with the Detailed Design Study.

23. The EIA undergoes a similar review; first at the Oblast level and then by Ministry of Environmental Protection (MOEP) and any other agencies MOEP decides to include. Comments are reviewed, edited and assembled by the MOEP. This step takes 30 days, after which the EIA authors are required to defend the EIA at a consultation session with all stakeholders in attendance (usually not the general public). During this 30-day period the public can comment on the EIA, but receive only one announcement in a local newspaper that the EIA is available for review. Provision of contact information and names is not
required. After the 30 days, and the EIA defense is complete, there is a public debate where the authors and the Proponent can answer questions from anyone. The distribution of contact information for a coordinator or liaison officer leading such a public forum is not required, nor are invitations sent out to concerned stakeholders.

24. Once complete, the EIA is revised; a final document is prepared; and a certificate to proceed to the next stage is given to the proponent, but usually only after another 30-day waiting period, allowing for any additional comments.

4.2 Required ADB Environmental Approval

25. Depending on the significance of project impacts and risks, assessments required by the ADB may comprise a full-scale environmental impact assessment (EIA) for category A projects, an initial environmental examination (IEE) or an equivalent process for category B projects, or a desk review. An EIA report requires a rigorous examination and documentation and must meet consultation, information disclosure, and other requirements. An IEE, with its narrower scope, may be conducted for projects with limited impacts that are few in number, generally site-specific, largely reversible, and readily addressed through mitigation measures. Additional detail is provided by Exhibit B-1. The ADB has categorized the Project as a Category B Project, i.e., a project requiring an IEE pursuant to ADB Guidelines.

4.3 Required Comprehensive Environmental Action Plan (CEAP) Approvals

26. Approval requirements and procedures adopted within the Kazakhstan MFF Program are an essential element of environmental stewardship. The Kazakhstan MFF Program has adopted an approach to road construction projects such as Road Section 261.5-301.5 Project which include a safeguards similar to what is found in the standard "FIDIC" template commonly used for international projects, i.e., the procedures established by the Federation International Des Ingenieurs Conseils (International Federation of Consulting Engineers, generally referred to by its French acronym). FIDIC is the most widely adopted format for road construction projects and the most widely adopted construction management system. Accordingly, the bid documentation consists of three components:

- General Conditions of Contract (GCOC). The contents of the General Conditions of Contract (GCOC) are generally adopted verbatim and establish the framework to which more detailed project-specific provisions are applied by the following.

- Conditions of Particular Application (COPA). GCOC are supplemented by Conditions of Particular Application (COPA) to render the contract specifications project-specific. COPA provisions have been drafted for use in the Road Section 261.5-310.5 Project and are presented here as Appendix 2. Within the MFF Program, the COPA routinely stipulates the environmental and related responsibilities of the Contractor. It is recommended and assumed that the same stipulations apply for the Project, particularly the requirements for Contractor Environmental Action Plans (CEAPs). The purpose of the CEAPs is to make explicit the Contractor's understanding of the requirements of the EMPs and to make their implementation both site-specific (e.g., where water quality monitoring will be conducted pursuant to the requirements of the Contract) and time-specific.

- Technical Specifications. Technical Specifications for the highway are prepared and must consistent with the GCOC and COPA. The Specifications stipulate the engineering and technical requirements of the Project.

27. Based on these bid and contract documents, potential contractors submit bids and a selection committee, which may include safeguard expertise, chooses the winning contractor.
28. It is important to note that, to be meaningful, the recommendations of an IEE such as this one and the EMP put forward in Part G must go beyond recommendations and become legally enforceable and incorporated in the bid and contract documents. The framework adopted and previously implemented within the MFF Program provides a framework in which this critical step is recognized and incorporated in the MFF Program.

29. Within the MFF Program’s legal and institutional framework which governs the Construction Period for MFF Projects such as the Road Section 261.5-310.5 Project, the following positions are of particular importance;

- **Project Management Consultant (PMC).** As the name implies, the Project Management Consultant (PMC), working with and on behalf of MOTC and the ADB, is responsible for the implementation of projects within the MFF Program. For individual projects, the PMC is assisted by the following.

- **Construction Supervision Consultant (CSC).** The CSC is tasked with specific responsibility to ensure safeguard compliance of civil works - with particular emphasis on the monitoring of implementation of EMPs and related aspects of the project.

- **Contractor’s Environmental Specialist.** The preparation of the CEAP requires a licensed person. The Contractor must retain expertise to do this work and must keep that person/firm to oversee the operation throughout the contract period.

30. Critical aspects of the established administrative framework for environmental protection in the Pre-Construction Phase include:

- **Issuance of a Bid Announcement or Solicitation.** The bid announcement states the requirements of the work. From an environmental perspective, it is imperative for the bid announcement to be clear and unambiguous about what will be required from the Contractor - and for the potential Contractor to understand the standard to which he will be held.

- **Contractor Selection.** From an environmental perspective, it is essential for the selection criteria to explicitly include consideration of the Contractor’s documented understanding of the Project’s environmental requirements, including all required monitoring and reporting.

- **Preparation and Approval of the CEAP.** Because the preparation of the CEAP occurs after the award of the Contract, it is considered part of the Construction Period, although technically construction does not and should not start until the CEAP is approved.

- **Implementation of the CEAP.** The Contractor must retain the licensed person/firm who prepared the CEAP to oversee the operation throughout the contract period. Implementation of the CEAP also requires active and consistent enforcement by the MOTC and the CSC acting on its behalf. Incidental compliance monitoring is also undertaken by the Inspection Unit of the Zhambyl Oblast Environment Department (OED), which has enforcement and fining powers. OED inspections occur once per year, however, and the Contractor must receive at least a two-week notice prior to the inspection visit. The Contractor is fined only if a third offence occurs and this happens rarely since the duration of most contracts is less than three years. Clearly, however, the onus for the enforcement of the environmental provisions within its own contracts is the primary responsibility of MOTC and the consultants working on its behalf. Recommendations to strengthen this aspect are incorporated in the recommended COPA for the Road Section 261.5-310.5 Project presented in Appendix 2 and referenced throughout this report.
4.4 Licensing/Permitting Procedures

31. When (and only when) the CEAP is approved by the CSC, the Contractor must obtain permits (clearances) to conduct any work where environmental effects are likely, e.g. the tree removal, vegetation clearing, removal of soils, culvert replacement, etc. These permits can only be issued once the CEAP has been approved by the CSC.

END NOTES

1 The TOR titled this section somewhat differently and included "Community Consolations" Community Consultations did not, however, in the contents of the section. The term "Public Consultations, taken to be essentially synonymous to "Community Consolations" appears later in the Outline as Part F.


3 Asian Development Bank http://pid.adb.org/pid/LoanView.htm?projNo=41121&seqNo=04&typeCd=3
C. DESCRIPTION OF THE PROJECT

INTRODUCTION

1. This section of the IEE provides a description of the proposed Project based on the currently available documentation and consultations. It is organized in accordance with the TOR for the IEE and recommendations of the ADB’s SPS which states that the description should include "any associated facility required by and for the project - for example, access roads, power plants, water supply, quarries and borrow pits, and soils disposal." The TOR also states that this section should particularly note "construction operation and staging" and "linkages and operational relationships with existing water supply infrastructure should be described". The description is presented under the following headings:

- Major Components & Design Characteristics (Item 2.0)
- Sources of Materials (Item 3.0)
- Temporary Construction Facilities (Item 4.0);
- Land Acquisition & Resettlement (Item 5.0)
- Staging (Item 6.0); and
- Contracting & Institutional Aspects of the Project (Item 7.0).

1.0 MAJOR COMPONENTS & DESIGN CHARACTERISTICS

1.1 Overview

2. The Project plans to upgrade Road Section 261.5-310.5 from a two-lane road to a four-lane, dual carriageway with a center median for its entire length. Its start point (KM 261.5) is the point of connection with grade-separated interchange which will terminate the Blagoveshenka-Otar Road Project (to be constructed as part of Tranche 3). Its end point (KM 310.5) connects with the Road Section 310.5-358.6 Project (also part of an earlier tranche) at a point 250 meters north of the existing road. The Project and its environs are illustrated diagrammatically by Exhibit C-1. Locations of proposed actions are presented in tabular form by Exhibit C-2.

3. Most (54 percent) of the KM 261.5-310.5 upgrade will be achieved by adding an additional carriageway and median alongside the existing road. Three portions of the existing roadway, however, traverse or infringe on territory of the neighboring Kyrgyz Republic. To circumvent these infringements, the remaining 46 percent of the upgrade will develop new alignments (referred to as Bypasses) and construct two two-lane carriageways (with medians) in the three Bypass areas. Specific km posts for each section are provided by the exhibits. The existing road in the bypassed areas will be abandoned.

1.2 Road Design Standards & Typical Profiles

4. Exhibit C-3 provides the typical cross-sectional characteristics of the proposed upgraded roadway. Two cross-sections are indicated, but they differ only in that portions meeting technical standards discussed below (totaling 23 percent of the length) will include a barrier incorporated in the design of the center median. These profiles and the Project’s other design and construction standards will conform to the standards of Kazakhstan Technical Category I-B (Kazakh SNiP RK 3.03-09-2006).
1.3 Bridges and Culverts

5. The Project will include the construction of four bridges (three of which require the disassembly of existing bridges at the same locations) and the installation or rehabilitation of 42 culverts, two of which will also provide cattle crossings under the roadway. Culvert locations are discussed below. Bridge locations are illustrated by Exhibit C-4. They are:

- **Chu Bridge.** The centerline of the Chu River crosses the Project Road's right-of-way (ROW) at km 262+379 in the area designated as Bypass 1. Its design length is 127.115 meters (m). Because it is in a new alignment area it will be a new bridge. The bridge it replaces will (apparently) be abandoned in place.

- **Shorgo Bridge.** The centerline of the Shorgo River crosses the ROW at km 270+220. The existing bridge at this location will be disassembled and a new bridge built. Its design length is 35.15m.

- **Aksu Bridge.** The centerline of the Aksu Bridge crosses the ROW at km 277+593. The existing bridge at this location will be disassembled and a new bridge built. Its design length is 50.2 m.

- **Karabalta Bridge.** The centerline of the Karabalta Bridge crosses the ROW at km 282+120. Its design length is 127.115 m. Because it is in a new alignment area it will be a new bridge. The bridge it replaces will be disassembled.

6. Two other watercourses which are prominent on area maps (the Toktas at km 296+437 and the Sargou at km 306+602) are creeks for which hydrological studies indicate culverts are sufficient. Conditions of most of the roadway's existing culverts were found to be poor. The Project will replace all but six existing culverts and lengthen the six found to be in good condition. New culverts will also be provided where warranted. A complete tabulation is provided by Exhibit C-5.
### PROJECT CHARACTERISTICS - SCHEMATIC TABLE

<table>
<thead>
<tr>
<th>River/Stream Crossings</th>
<th>Kilometer Posts</th>
<th>Meters</th>
<th>Cross-section Type</th>
<th>Bypass Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chu River Crossing</strong></td>
<td>261.500 - 262.365</td>
<td>855</td>
<td>1 (No barrier)</td>
<td>Bypass 1</td>
</tr>
<tr>
<td></td>
<td>262.365 - 264.320</td>
<td>1,965</td>
<td>2 (With Barrier)</td>
<td>approximately 261.5 to 267.1 = 5.6 km, Requires Construction of 2 2-lane Carriageways in new alignment</td>
</tr>
<tr>
<td></td>
<td>264.320 - 265.675</td>
<td>1,355</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>265.675 - 266.815</td>
<td>1,140</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>266.815 - 267.100</td>
<td>285</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>266.815 - 267.100</td>
<td>285</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Aksu River Crossing</strong></td>
<td>277.100 - 277.820</td>
<td>10,720</td>
<td>1</td>
<td>Additional Carriageway - South Side 14 km</td>
</tr>
<tr>
<td></td>
<td>277.820 - 278.110</td>
<td>290</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>278.110 - 280.865</td>
<td>2,755</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Karabalta River Crossing</strong></td>
<td>280.865 - 282.110</td>
<td>1,245</td>
<td>2</td>
<td>Bypass 2</td>
</tr>
<tr>
<td></td>
<td>282.110 - 286.200</td>
<td>4,090</td>
<td>1</td>
<td>approximately 281.0 to 293.1 = 12.2 km, Requires Construction of 2 2-lane Carriageways in new alignment</td>
</tr>
<tr>
<td></td>
<td>286.200 - 288.690</td>
<td>2,490</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>288.690 - 292.035</td>
<td>3,345</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>292.035 - 293.350</td>
<td>1,315</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>Toktas Crossing</strong></td>
<td>293.350 - 298.350</td>
<td>5,000</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>298.350 - 298.815</td>
<td>465</td>
<td>2</td>
<td>Additional Carriageway - South Side 12.6 km</td>
</tr>
<tr>
<td></td>
<td>298.815 - 300.920</td>
<td>2,105</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>300.920 - 301.320</td>
<td>400</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>301.320 - 302.210</td>
<td>890</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>302.210 - 302.925</td>
<td>715</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>302.925 - 304.220</td>
<td>1,295</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>304.220 - 304.520</td>
<td>300</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>304.520 - 305.900</td>
<td>1,380</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>305.900 - 306.200</td>
<td>300</td>
<td>1</td>
<td>Bypass 3</td>
</tr>
<tr>
<td></td>
<td>306.200 - 307.190</td>
<td>990</td>
<td>2</td>
<td>2 2-lane carriageways, new alignment = 4.6 km</td>
</tr>
<tr>
<td></td>
<td>307.190 - 310.500</td>
<td>3,310</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**Total** 49,000 m 49 km

**Total Type 1** 37,685 = 77% no barrier

**Total Type 2** 11,135 = 23% with barrier 49,000

**Total in Circumvention Areas** 22.4 km = 46%

**Total Non-Circumvention Areas** 26.6 km = 54%

Source: Profile Drawings indicating applicable locations and other design drawings, February 2011.

1.4 **Junctions**

7. Nine junctions will be built at the locations illustrated by Exhibit C-6. Three of these are crossroads which are counted as two junctions; three are T-Junctions. Typical junction characteristics and designs are illustrated by Exhibit C-7 and Exhibit C-8, respectively.

1.5 **Permanent Ancillary Features**

8. **Rest Areas.** Four rest areas will be constructed and will include parking areas (sizes not specified in the available Project documentation), deceleration-acceleration at entries-exits, and toilet facilities. Locations are not specified other than to note that they will be located near rivers or at locations of old ones.

9. **Bus Stops and Shelters.** Project designs are reported to include bus stops and shelters. Each stop will include landings two meters wide and 20 meters long, deceleration-acceleration entries-exits, shelters with footpaths and sanitary facilities. Locations are not specified in the available Project documentation.
See Exhibit C-2 for applicable locations.

**TYPICAL CROSS SECTIONS - (WITH AND WITHOUT CENTRAL BARRIER)**
BRIDGE & MAJOR CULVERT LOCATIONS

EXHIBIT C-4

CULVERT LOCATIONS

<table>
<thead>
<tr>
<th>SECTI ON</th>
<th>#</th>
<th>Project KM</th>
<th>Size (meters)</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning of Bypass 1</td>
<td>1</td>
<td>262+035</td>
<td>Ø1.5m</td>
<td>New</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>263+858</td>
<td>Ø1.5m</td>
<td>New</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>264+048</td>
<td>Ø1.5m</td>
<td>New</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>265+226</td>
<td>Ø1.5m</td>
<td>New</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>266+348</td>
<td>4x2.5m</td>
<td>New Animal Underpass</td>
</tr>
<tr>
<td>End of Bypass 1</td>
<td>6</td>
<td>268+257</td>
<td>2x2</td>
<td>Replacement</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>271+945</td>
<td>Ø1.5m</td>
<td>New</td>
</tr>
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<td></td>
<td>8</td>
<td>273+959</td>
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<tr>
<td></td>
<td>9</td>
<td>276+807</td>
<td>2x2.0x2.0m</td>
<td>Repair and Elongation</td>
</tr>
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<td></td>
<td>10</td>
<td>278+438</td>
<td>Ø1.5m</td>
<td>Replacement</td>
</tr>
<tr>
<td>Beginning of Bypass 2</td>
<td>11</td>
<td>282+047</td>
<td>Ø1.5m</td>
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<tr>
<td></td>
<td>12</td>
<td>282+337</td>
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<td>13</td>
<td>283+821</td>
<td>Ø1.5m</td>
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<td>14</td>
<td>284+580</td>
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<tr>
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<td>289+972</td>
<td>Ø1.5m</td>
<td>New</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>290+524</td>
<td>Ø1.5m</td>
<td>New</td>
</tr>
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<td></td>
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<td>293+248</td>
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</tr>
<tr>
<td></td>
<td>22</td>
<td>294+442</td>
<td>Ø1.5m</td>
<td>Replacement</td>
</tr>
</tbody>
</table>
23 294+692 Ø1.5м Repair and elongation
24 295+731 Ø1.5м Replacement
25 296+437 3x2.5x2.0м Repair and elongation
26 298+389 Ø1.5м Replacement
27 298+957 Ø1.0м Replacement
28 299+508 Ø1.0м Replacement
29 300+648 Ø1.5м Replacement
30 301+398 Ø1.5м Repair and Elongation
31 302+502 4.0x2.5м New Animal Underpass
32 302+986 Ø1.5м Repair and Elongation
33 303+284 Ø1.5м New
34 303+556 Ø1.5м Replacement
35 304+129 Ø1.5м Replacement
36 304+776 Ø1.5м Repair and Elongation
37 305+800 Ø1.5м Replacement
Beginning of Bypass 3 38 306+602 4x2.5м New Individual
39 307+420 Ø1.5м New
40 309+035 Ø1.5м New
41 310+120 Ø1.5м New
42 310+400 Ø1.5м New
End of The Project

1.6 Landscaping and Tree-Planting Provisions

10. A total of 10,772 trees are slated for removal for this road segment. The trees are under the management of the Zhambyl Oblast Territorial Office of the Committee of Forestry and Hunting (CFH). A program for essential tree cutting to implement the Project was developed with and approved by the Zhambyl Oblast CFH and it is reported that the Kazakhstan regulations generally require tree-planting on a "two or three" to one basis. If plans have been made to do so they have not come to light. Recommendations in regard to this aspect of the Project will be put forward in Part G: Environmental Management Plan and Part H: Conclusions and Recommendations.

2.0 SOURCES OF MATERIALS

2.1 Construction Materials

11. Four potential sources of quarried construction material such as sand and gravel are identified by the available Project documentation. All are existing operations. Their locations are as follows:

- **Kapkatas Quarry** - located at km 253+900, one mile on the right (north) with a reported reserve of 30-40 thousand cubic meters (м³);

- **Aya-Service Quarry** - km 364+000, 9.85 km on the left (south) with a reported reserve of 2,887.5 thousand m³;

- **Erzhan Merke Zholdori Quarry** - km 364+000, 10.35 km on the left (south) with a reported reserve of 750 thousand m³; and

- **DSU-86 Quarry** - km 364+000, 9.5 km on the left (south) with a reported reserve of 750 thousand m³.

12. Other than the Kapkatas Quarry located at KM 253+900, the remaining three are
located at more than 50 kilometers from the Project Road and all will require transport through populated areas. Recommendations in regard to this aspect of the Project will be put forward in Part G: Environmental Management Plan and Part H: Conclusions and Recommendations.

2.2 Asphalt

13. Although the Project Road will be primarily concrete cement, it will use asphalt for various purposes including the sub-base for the roadway; a 30-meter transition section adjacent to bridges and the surfaces of bridges; the separation belts at curved sections of alignments and the designs of all junctions. The available Project documentation and consultations indicate only that existing operating asphalt plant(s) will be used as the source of supply. In all probability this will be either the existing facility in Kordai or another source to the west of the Project Road. In both cases obtaining the asphalt will require transport for considerable distances through populated areas. Recommendations in regard to this aspect of the Project will be put forward in Part G: Environmental Management Plan and Part H: Conclusions and Recommendations.

2.3 Potable & Non-Potable Water

14. The Project documentation indicates that potable water for construction camps (discussed below) will be drawn from the following:

- Existing underground well at km 318+465;
- Existing underground well at km 318+959;
- Existing underground well at km 328+548
- Merke water supply system; and
- Zhanaturmys (a village near Merke).

15. Non-potable water used for construction purposes will be derived from:

- Chu River at km 262+370
- Aksu River channel at km 277+591
- Karabalta River at km 282+210

16. Consultations indicate that agreements have been reached with local officials for these purposes. The available documentation, however, does not provide assessment or descriptions of safe withdrawal rates (in the case of the wells and water supply systems) or the potential affects on agriculture and other uses in the case of the river withdrawals. Recommendations in regard to this aspect of the Project will be put forward in Part G: Environmental Management Plan and Part H: Conclusions and Recommendations.

2.4 Fill Material

17. Fill material will be derived from roadside borrow pits and other sources. Side-borrow will be exploited from one or both sides of the embankments. Depth of the borrow pits is at least 1.2 to three meters and width from 4.0 to 15.0 meters. Side borrows will not, however, fully meet the demands of the Project and additional soil will be derived from near-road borrow material sites with transportation distances of two to seven km in the amount of 1,091 940 cubic meters (m³). Three potential sources have been identified:

- Km 267.8 - located on pastures (reserved land), 210 meters north of the Project Road. The total area is 6.46 hectares.
- Km 280.0 - located on pastures (reserved land), 130 meters north of Project Road. The total area is 0.98 hectares.
### JUNCTION LOCATIONS

**EXHIBIT C-6**

![Diagram of Junction Locations]

### JUNCTION CHARACTERISTICS

**EXHIBIT C-7**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>1</th>
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<tbody>
<tr>
<td><strong>See Exhibit C-8 for drawing to</strong></td>
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<td><strong>Direction of Junction</strong></td>
<td>Left</td>
<td>Right</td>
<td>Right</td>
<td>Left</td>
<td>Left</td>
<td>Right</td>
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<td><strong>travel east to west.</strong></td>
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<tr>
<td><strong>Angle of Intersection, a</strong></td>
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<td>90</td>
<td>92</td>
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<td>91</td>
<td>104</td>
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<td><strong>Degree</strong></td>
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<tr>
<td><strong>Length of Fillet Curve L1</strong></td>
<td>30</td>
<td>20</td>
<td>20</td>
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<tr>
<td><strong>Length of Fillet Curve L2</strong></td>
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<td><strong>Highway Width</strong></td>
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<td><strong>Shoulder Width</strong></td>
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<td>220</td>
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<td>100</td>
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<td><strong>Length of 2-Course Asphalt</strong></td>
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<tr>
<td><strong>Length of One-Course Asphalt</strong></td>
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<td><strong>Concrete</strong></td>
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<td><strong>Length of Gravel Pavement</strong></td>
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<td>21.62</td>
<td>23.63</td>
<td>14.12</td>
</tr>
</tbody>
</table>

*Source: Plan of Typical Junctions, Sheet of Typical Junctions, TOO KazNiPi "Dortrans".*
TYPICAL JUNCTION DESIGNS

EXHIBIT C-8

Typical cross - section of junction (IV technical category)

Typical поперечный профиль на примыкающей дороге IV категории
Scale 1:200

Typical cross - section of junction (V technical category)

Typical поперечный профиль примыкающей дороги V категории
Scale 1:200

Strip 2.6 m width, L-100 m

Centre line Осн. осевой дороги

Stationary lane 2.5m, L-100 m

Design and of road профиль строительной полосы
3.0 TEMPORARY CONSTRUCTION FACILITIES

3.1 Construction Camps

18. Two construction camps are planned as part of the Project; one at near KM 362, 350 meters northwest of intersection of border with Chu River and the other 35 meters south of KM 278+300. No indications of the resident populations or other characteristics of the construction camps are provided by the available documentation, other than the fact that potable water supply will be derived from the sources noted above. Recommendations in regard to this aspect of the Project will be put forward in Part G: Environmental Management Plan and Part H: Conclusions and Recommendations.

3.2 Storage Areas

19. Storage areas, each occupying approximately one hectare, have been identified by the Project at the following locations:

- KM 263 +/- (Kyrgyz border) 420 meters southeast
- KM 271.5 - 35 meters south
- KM 278.2 - 35 meters north
- KM 283.0 - 920 meters north
- At a location yet to be clarified.

4.0 LAND ACQUISITION & RESETTLEMENT

20. A total of 55 households and five legal entities will lose their lands as a result of the Project. Of these, seven long-term leaseholders, one short-term leaseholder, and one private land owner will lose more than ten percent of their productive lands. Approximately 177 hectares (ha) of lands will be acquired, out of which about 175 ha are agricultural lands and 0.13 ha are used for commercial purposes. Most of the affected lands are leased on a long-term 160.3 (49 years) basis; 16.1 ha, leased for 5–12 years; and 0.13 ha, privately owned. The Project will also need to acquire 60.8 ha of reserved public lands, which are idle or occasionally used as natural pasture land by some villages, and lands of state enterprises. Administration of these lands will be transferred from village authority to the Zhambyl Oblast Roads Department. The transfer of these lands is not expected to adversely affect third party.

21. About 34 ha of land may be temporarily needed during construction. These lands will be rented at the current rental rates in the area. Contractors will be responsible for identifying, negotiating, and renting land from landowners/leaseholders, and will restore the rented land to its original condition at the end of the rental period. The cost of the rental and land restoration will be included in the civil works contracts.

5.0 STAGING

22. Staging of the Project will have a significant effect on issues of local access, public safety, etc., particularly with regard to road closures, bridge disassembly and interim provisions while awaiting the construction of new bridges. The currently available Project documentation provides no information in regard to staging. Recommendations in regard to this aspect of the Project will be put forward in Part G: Environmental Management Plan and Part H: Conclusions and Recommendations.
6.0 CONTRACTING & INSTITUTIONAL ASPECTS OF THE PROJECT

6.1 Contracting Procedures

23. As also noted in the foregoing discussion of required approvals, the Project Contracting Procedures are an essential aspect of the Project Design. The Project has incorporated and the MFF Road Improvement Program has institutionalized contracting procedures which include important safeguards, most notably Contractor Environmental Action Plans (CEAPs), the purpose of which is to make explicit the Contractor's documented and detailed understanding of the requirements of the EMPs and to make their implementation both site-specific (e.g., where water quality monitoring will be conducted pursuant to the requirements of the Contract) and time-specific.

24. It is important to note that, to be meaningful, the recommendations of the EMP must go beyond recommendations and become legally enforceable and incorporated in the bid and contract documents. The framework adopted and previously implemented within the MFF Program establishes a framework in which this critical step is recognized and incorporated in the MFF Program. Recommendations in regard to this aspect of the Project will be put forward in Part G: Environmental Management Plan and Part H: Conclusions and Recommendations.

6.2 Supervision & Monitoring

25. Supervision and monitoring are an equally important part of Project design. Supervision and monitoring provisions of the Project will be primarily the responsibility of the following:

- **Project Management Consultant (PMC).** As the name implies, the Project Management Consultant (PMC), working with and on behalf of MOTC and the ADB, will be responsible for the implementation of projects within the MFF Program. For individual projects, the PMC is assisted by the following.

- **Construction Supervision Consultant (CSC).** The CSC will be tasked with specific responsibility to ensure safeguard compliance of civil works - with particular emphasis on the monitoring of implementation of EMPs and related aspects of the Project.

- **Contractor's Environmental Specialist.** The preparation of the CEAP will require a licensed person. The Contractor will be required to retain expertise to do this work and must keep that person/firm to oversee the operation throughout the contract period.

26. Recommendations in regard to this aspect of the Project will be put forward in Part G: Environmental Management Plan and Part H: Conclusions and Recommendations.
END NOTES


2 Personal correspondence, ADB Social Safeguard Specialist, 24 January 2011.

3 Data in this section (Item 2.2: Construction Period Framework) is derived primarily from the Facility Administration Manual. Project Number: 41121, MFF Number: 0024, Loan Numbers: L2503 (Tranche 1), L2562 (Tranche 2), Tranche 3, 29 June 2010, Republic of Kazakhstan: Multitranch Financing Facility for the CAREC Transport Corridor I (Zhambyl Oblast Section) [Western Europe–Western People’s Republic of China International Transit Corridor] Investment Program and previous environmental assessments of MFF Program Tranches.
D. PHYSICAL & BIOLOGICAL BASELINE, IMPACTS & RECOMMENDED MITIGATION
D. PHYSICAL & BIOLOGICAL BASELINE, IMPACTS & RECOMMENDED MITIGATION

ORGANIZATION OF PART D

1. In accordance with the outline provided by the Terms of Reference (TOR) for its preparation (attached hereto as Appendix 1), this section of the Initial Environmental Examination report is presented in four subsections as follows:

- Geologic, Physiographic and Soil Conditions (Item 1.0);
- Surface Water & Groundwater (Item 2.0);
- Air Quality (Item 3.0); and
- Biological Environment (Item 4.0).

2. Each subsection presents:

- Baseline Conditions;
- Potential Impacts foreseeable in three Project stages:
  - Pre-Construction/Design,
  - Construction;
  - Post-Construction/Operational Stage; and
- Recommended Mitigation & Monitoring.

1.0 GEOLOGIC, PHYSIOGRAPHIC AND SOIL CHARACTERISTICS & RESOURCES

1.1 Geologic Characteristics & Resources

3. Baseline. The Project Area lies in the transition Kyrgyz Range to the south and the Central Asian Steppe to the north. Its underlying geology is complex and generally described in terms of plate tectonics, i.e., the premise that the earth’s crust is made up of continent-sized slabs of rocks or plates which float on a more fluid layer of material known as the mantle. The plates move, collide, break up and reform as a result of currents and upwelling in the mantle. Within this context, the mountain chains of the country and the rest of Central Asia, including the Hindu Kush, Pamir, Karakoram and Himalayan Ranges, are believed to have been the result of a collision of the Indian Plate and Asia Plate. The process is believed to have begun approximately 50 million years ago and to continue to the present day. As a result of the continuity of the process, many of the mountains in southern Kazakhstan and northern Kyrgyzstan are still growing.

4. Given these geological conditions and as evidenced by history, the Project Area is seismically active. Earthquakes with magnitudes of six-seven on the Richter Scale are rather frequent and there are records of catastrophic earthquakes in the relatively recent past, including a major earthquake with an epicenter near Kulan in May 2003 with an intensity of eight on the Richter scale. In the mountainous areas, rockslides, landslides and snow avalanches triggered by seismic events are common and are a distinctive feature of the flood regime of the Republic’s mountain streams and rivers.

5. Mineral resources in the region surrounding the Project Area include coal, gold, uranium, mercury and other strategic metals and the area is an abundant source of construction materials. The Project documentation indicates that potential sources of quarried construction materials in the immediate area have been identified as follows:
6. Potential Impacts and Recommended Mitigation. Potential impacts to geologic characteristics and resources are assessed and actions to mitigate them are recommended as follows:

<table>
<thead>
<tr>
<th>Potential Impacts: Geologic Characteristics and Resources</th>
<th>Recommended Mitigation &amp; Monitoring: Geologic Characteristics and Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Construction Stage</strong></td>
<td>Recommended actions to mitigate potential impacts include the following:</td>
</tr>
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<td>• Ensuring that all design parameters appropriate to the seismic risk inherent in the Project Area have been taken into account;</td>
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<td>• Adopting contract provisions specify that licensed and in compliance with applicable regulations and industry standards. The documents are recommended to state that selection of the quarries to be used shall require the review and written approval of the CSC to ensure that avoidable adverse impacts are minimized. Specific provisions are provided by the recommended COPA, Appendix 2.</td>
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<td></td>
<td>• Recommendations for actions in the Pre-Construction Stage in regard to mitigate impacts due to quarries used by the Project are provided in Part H: Conclusions and Recommendations.</td>
</tr>
<tr>
<td><strong>Construction Stage</strong></td>
<td>Assuming that the recommended contract provisions are put in place, no adverse impacts to geological conditions are anticipated in the Construction Stage of the Project and no mitigation action (other than the conditions that apply to the transport of all construction materials) is considered warranted for this parameter in this stage.</td>
</tr>
<tr>
<td></td>
<td>Routine documented monitoring of the quarry operations and transport practices is recommended as the responsibility of the CSC as detailed in the recommended COPA, Appendix 2.</td>
</tr>
<tr>
<td><strong>Localized impacts could occur, however, due to quarry operations and transport.</strong></td>
<td>It is recommended that contract provisions specify that licensed and in compliance with applicable regulations and industry standards. (See also related recommendations for the transport of quarried materials).</td>
</tr>
<tr>
<td><strong>No adverse impacts to the area's seismology are expected due to construction activities. Construction procedures and safeguards, however, must be cognizant of the seismicity of the area.</strong></td>
<td>No mitigation action is considered warranted for this parameter in this stage. The Project documentation indicates that the area's seismic conditions have been taken into account in the design of bridges and other structures.</td>
</tr>
<tr>
<td><strong>No adverse impacts to the area's seismology are expected due to Post-Construction/Operational Stage condition.</strong></td>
<td>No mitigation action is considered warranted for this parameter in this stage. The Project documentation indicates that the area's seismic conditions have been taken into account in the design of bridges and other structures.</td>
</tr>
<tr>
<td><strong>Post-Construction/Operational Stage:</strong> The extraction of mineral resources will be facilitated by the road in the Post-Construction/Operational Stage.</td>
<td>No mitigation is considered warranted due to the potential of additional extraction of mineral resources, provided that these operations are licensed and in compliance with applicable regulations and industry standards.</td>
</tr>
</tbody>
</table>

1.2 Physiographic Characteristics

7. Baseline. Road Section 261.5-310.5 traverses a transitional zone between the Kazakh Steppe to the north (an area of approximately 804,500 km² equal to one-third of the country and the world's largest dry steppe region) and the Kyrgyz Mountain Range to the south. Within this context the area traversed slopes generally to the northwest and is
dissected by the streambeds. The ROW undulates to a degree, rising between the crossings of the watercourses, but generally rises to the southwest. The ROW commences at an elevation of 530.5 meters above mean sea level (msl) and rises to 606.6 meters above msl. The topographic, climatic and soil conditions (discussed below) are such that most of the lands along the Road Section 261.5-310.5 ROW are used for agricultural, including use as pastures and crop production.

8. **Potential Impacts and Recommended Mitigation.** Potential impacts to physiographic characteristics are assessed and actions to mitigate them are recommended as follows:

<table>
<thead>
<tr>
<th>Potential Impact: Physiographic Characteristics</th>
<th>Recommended Mitigation: Physiographic Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Construction Stage:</strong> Impacts to physiographic characteristics in the Pre-Construction stage (defined to include preparation of the bid documents and contracts). Bid and contract documents prepared in this phase will determine:</td>
<td></td>
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<tr>
<td>• Embankment Heights and Fill Requirements. These decisions will determine the amount of fill required.</td>
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<tr>
<td>• Borrow Pit Excavations. Embankments and other requirements for fill may necessitate the use of borrow pits. Unless properly controlled, borrow pits cause drainage and visual problems and present a potential for increased vector activity (e.g., mosquitoes or water contamination). When water-filled, they also attract livestock to the roadway thereby slowing of traffic flow and creating safety hazards. Decisions made in the Pre-Construction Stage will determine whether the bid and contractual conditions control or fail to control borrow pit development and restoration.</td>
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<tr>
<td>• Quarry Operations. Crushed rock will be used for construction purposes. Considerable changes to topography could result from quarry operations and clay extractions. Decisions made in the Pre-Construction Stage will determine the bid and contractual conditions controlling (or failing to control) the indirect impact of the Project on these operations. Specific recommendations to avoid or otherwise adverse impacts in this stage are provided below.</td>
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</tr>
<tr>
<td>Avoidance is the preferred form of mitigation wherever possible. Potential adverse impacts to area topography during the Pre-Construction Stage can be avoided through:</td>
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<tr>
<td>• Cognizance of all relevant topographic and soil conditions in final design decisions, and</td>
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<tr>
<td>• Specification of tree-planting to facilitate embankment consolidation and other plantings to ensure slope stabilization. (See related discussed in regard to flora and vegetation below).</td>
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<tr>
<td>Specific clauses are recommended in the COPA in regard to:</td>
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<tr>
<td>• <strong>Cut &amp; Fill and Re-vegetation Requirements.</strong> Bid and contract documents should include requirements to ensure that topsoil is identified, stripped and stored for later use in the establishment of plant life along the embankments; final forming and re-vegetation will be completed as soon as possible following fill placement to facilitate regeneration of a stabilizing ground cover; trenching will be used where necessary to ensure successful establishment of vegetation; seeding with a fast growing crop and potential native seed mix will occur immediately after fill placement to prevent scour and to encourage stabilization; stabilization of embankment slopes and road cuts by re-vegetation with grazing resistant plant species, placement of fiber mats, riprap, rock gabions, or other appropriate technologies; completion of discharge zones from drainage structures with riprap to reduce erosion when required; stepped embankments will be used for embankments greater than six meters; construction in erosion- and flood-prone areas will be restricted to the dry season. Mitigation is also recommended to include other related provisions as presented in detail in Appendix 2.</td>
<td></td>
</tr>
<tr>
<td>• <strong>Borrow Pits Excavations.</strong> It is recommended that bid and contract document specify that: topsoil from borrow pit areas will be saved and reused in re-vegetating the pits to the satisfaction of the CSC Supervising Engineer; borrow areas will be located outside the ROWs; pit restoration will follow the completion of works in full compliance all applicable standards and specifications; arrangements for opening and using material borrow pits will contain enforceable provisions; the excavation and restoration of the borrow areas and their surroundings, in an environmentally sound manner to the satisfaction of the Construction Supervision Consultant (CSC) will be required before final acceptance and payment under the terms of contracts; borrow pit areas will be graded to ensure drainage and visual uniformity, or to create permanent tanks/dams. Mitigation is also recommended to include other related provisions as presented in detail in Appendix 2.</td>
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</tr>
<tr>
<td>• <strong>Quarry Operations.</strong> Potential sources of quarried material are addressed above. To ensure adequate mitigation of potential adverse impacts to area topographic characteristics, it is recommended that contract documents specify that only licensed quarrying operations are to be used for material sources. If licensed quarries are not available the contractors may be made responsible for setting up their dedicated crusher plants at approved quarry sites.</td>
<td></td>
</tr>
</tbody>
</table>

| **Construction Stage:** Adverse impacts to topographic could occur due to improper excavation of borrow pits, etc. |
| Mitigation of topographic impacts during the Construction Stage requires enforcement of the contract provisions outlined above. |
| Routine documented monitoring of all contract provisions is recommended as the responsibility of the CSC as detailed in the |
Post-Construction/Operational Stage:

<table>
<thead>
<tr>
<th>Name of Substance</th>
<th>Maximum Allowable Concentration (MAC) Mg/kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead (gross form)</td>
<td>32.0</td>
</tr>
<tr>
<td>Cupric (flexible form)</td>
<td>3.0</td>
</tr>
<tr>
<td>Cupric (gross form)</td>
<td>33</td>
</tr>
<tr>
<td>Chrome (flexible form)</td>
<td>3.0</td>
</tr>
<tr>
<td>Chrome +</td>
<td>0.05</td>
</tr>
<tr>
<td>Manganese (gross form)</td>
<td>1500</td>
</tr>
<tr>
<td>Nickel (flexible form)</td>
<td>4.0</td>
</tr>
<tr>
<td>Zink (gross form)</td>
<td>23.0</td>
</tr>
<tr>
<td>Cadmium (gross form)</td>
<td>0.5</td>
</tr>
<tr>
<td>Arsenic (gross form)</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Source: Joint Decree of the Ministry of Health of RoK No 99 of 30.01.2004 and Ministry of Environmental Protection No. 21-p of 27.01.2004 updated by the Draft EIA for Tranche 4, December 2010

11. Soil investigations undertaken for earlier MFF Tranches\(^7\) found that lead contamination was a concern. Assessments indicated that along existing roads, the soil surface layer to a depth of at least 50 cm depth is highly contaminated with lead, as much as 15-20 times the GoK standard. The fact that these areas are used for vegetable growing and animal grazing poses serious health hazards. It was estimated that somewhere between 40 and 50 meters from the roadside contamination levels approach or exceed the standard.
only additional soil testing data along or in the vicinity of the Road Section 260.5-310.5 ROW is provided by an EIA study prepared by GeoData Plus LLC (Almaty, 2008) which contains data provided in Exhibit D-2. It is based on field sample results taken near the existing bridge over the Chu River within Project Area.

POLLUTANTS IN SOIL NEAR CHU RIVER

<table>
<thead>
<tr>
<th>Number of Sample</th>
<th>Oil Products (mg/kg)</th>
<th>Gross Contamination (mg/kg)</th>
<th>Flexible Forms (mg/kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Lead (Pb)</td>
<td>Cadmium (Cd)</td>
</tr>
<tr>
<td>1</td>
<td>14.154</td>
<td>15.283</td>
<td>0.663</td>
</tr>
<tr>
<td>2</td>
<td>9.074</td>
<td>11.022</td>
<td>0.370</td>
</tr>
</tbody>
</table>

Source: Нормативные концентрации показаны в таблице D-6, Almay August 2008.

12. The data indicates that the concentrations of harmful substances in the soil do not exceed maximum allowable concentrations. It must be noted that the samples were taken near a local road of Rayon-level importance with intensity of 500 cars per day. It may not be indicative of the baseline conditions along the Road Section 261.5-310.5 ROW.

13. Given this limited available data, the situation in regard to potential lead contamination in roadside soils is deemed to be inconclusive and the possibility of lead contamination in the soils bordering the Road Section 261.5-310.5 ROW cannot be eliminated in the absence of additional testing.

14. The Project proposes to remove bridges and constructed new bridges - activities that will disturb the sediment of waterways that are known to be polluted (see discussion of surface hydrology, Item 2.2, below).

15. Potential Impacts and Recommended Mitigation. Potential impacts to soils are assessed and actions to mitigate them are recommended as follows:

<table>
<thead>
<tr>
<th>Potential Impact: Soils</th>
<th>Recommended Mitigation &amp; Monitoring: Soils</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Construction Stage</td>
<td>Potential adverse impacts to area soils can be avoided in the Pre-Construction Stage through the adoption of bid and contract which state that:</td>
</tr>
<tr>
<td></td>
<td>• Topsoil from borrow pit areas will be saved and reused in re-vegetating the pits to the satisfaction of the CSC Supervising Engineer. Current design documents should be reviewed to ensure that plans have been developed for the storage of topsoil for both Construction Packages.</td>
</tr>
<tr>
<td></td>
<td>• Erosion impacts will be mitigated by requiring planting to facilitate embankment consolidation and other planting to ensure slope stabilization.</td>
</tr>
<tr>
<td></td>
<td>• Disturbance of existing, potentially lead contaminated roadside soils will require testing and approval before reuse or disposal.</td>
</tr>
<tr>
<td></td>
<td>• Disturbance of river and creek sediments related to bridge construction will require testing and approval before reuse or disposal.</td>
</tr>
<tr>
<td></td>
<td>Details of the recommended mitigation actions are discussed as part of the Part G: Environmental Management Plan and specific contract provisions to facilitate implementation are provided by Appendix 2. An Environmental Baseline Survey Work Program and a subsequent Monitoring Program for soils and sediments is specified by Item 2.4.3 therein.</td>
</tr>
<tr>
<td></td>
<td>Reconsideration of providing roadside ditches on only one side of the road is recommended as a mitigation measure. Consideration of the alternative of doing so should be included in the Project's assessment of alternatives. Reconsideration of this feature will be recommended as one of the Preparatory Steps in the implementation of the recommended Environmental Management Plan (EMP), Part G.</td>
</tr>
</tbody>
</table>

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described in Item 2.2 below.

| Construction Stage. | Avoidable impacts to soils could occur in the Construction Stage due to improper earth-moving operations, uncontrolled discharges from construction camps and other facilities and from accidental spill of hazardous materials. | Significant adverse impacts to soils during the Construction Stage will be obviated if the proper bid and contract provisions are put in place, implemented and properly supervised. Threats such as uncontrolled discharges will be mitigated by the proposed contract provisions and required site inspections. The use of hazardous materials will be tightly controlled and appropriate Emergency Response Plans will be mitigated by the requirements outlined for the CEAP. |
| Post-Construction/Operational Stage. | Current plans do not indicate that roadside ditches will be provided. If that is the case, potentially contaminated runoff to flow directly to neighboring fields. | Reconsideration of providing roadside ditches on only one side of the road is recommended as a mitigation measure. Consideration of the alternative of doing so should be included in the Project's assessment of alternatives. Reconsideration of this feature will be recommended as one of the Preparatory Steps in the implementation as specified by Part G: Environmental Management Plan (EMP). |

### 2.0 HYDROLOGY

#### 2.1 Surface Hydrology

16. **Baseline.** Precipitation amounts in Kazakhstan are low. Its rivers have two principal sources: snow and glacial melting (or a combination of the two). All but one of Kazakhstan's major rivers drain to internal closed basins (Caspian Sea, the Aral Sea, or Lake Balkhash). The exception is the Irtysk River in the northern part of the country which eventually joins with the Ob River and discharges into the Arctic Ocean. Flood times mainly occur in the summer months.

17. The Project Road lies entirely within the catchment of the Chu River (also spelled as the Shu, Chui or Chuy) - one of the river systems that in wet years eventually flows to the Aral Sea. Salient characteristics of the Chu, its tributaries and other surface water in the Project area are as follows:

- **Chu River.** The Chu River is formed by the confluence of Joon-Aryk and Kochkor Rivers in Kyrgyzstan's Naryn Province and drains the northern Kyrgyz ranges of the western Tian Shan. After passing through the Boom Gorge, it enters the comparatively flat Chu Valley and forms the border between Kyrgyzstan and Kazakhstan for more than 100 kilometers. It enters wholly into Kazakhstan near Blagoveshenka and the start point of the Road Section 261.5-310.5 Project. Thereafter it continues westward. In most years it eventually disappears in the Kazakh steppe. In wet years it flows into the Syr Darya River which, in turn, discharges to the Aral Sea.

- **Four tributaries of the Chu River.** Four tributaries of the Chu traverse the ROW flowing from the mountains to the south toward the north-northwest. They are: Shorgo (also spelled Sorgo) - which crosses the ROW at km 282.12; Aksu - which crosses the ROW at km 277.591; Karabalta - which crosses the ROW at km 282.210; Toktas - which crosses the ROW at km 296+435; and Sargoiat - which crosses the ROW at km 306+670. All originate in the mountains of the Kyrgyz Range to the south of the Project Road ROW and flow to the north connecting to the Chu at or beyond Lake Tasotkel, located approximately 20 km north of the Project Road.

- **Two reservoirs.** The Project documentation indicates two reservoirs are located in the Project area: one on the Shorgo River to the immediate north of the ROW and one on the Asku River, also to the immediate north of the ROW.

- **Irrigation Networks.** Waters of the Chu are diverted into a network of canals for farming on both the Kyrgyz and Kazakh sides of the river. An interstate agreement has been reached with the Kyrgyz Republic (May 1992) to address water allocation issues between the two republics, considering the total resources generated in the basin
There are reportedly a few small wetlands along the ROW, most of them associated with small creeks and low-lying areas. Most of these wetlands are characterized by patches of dense reed grasses which dry out in late summer. Incidental observations permitted only a general survey of wildlife associated with these wetlands; common birds are reported to include clovers, wagtails, doves, herons, gulls, thrushes, sterns and a variety of duck species. Birds of prey are reportedly regularly seen as visitors in these small habitats. Water snakes and tortoises, lizards and arachnoids are recorded as frequent inhabitants of the lacustrine and reed grass biotopes. (See also Biological Environment: Item 4.0).

18. Potential Impacts and Recommended Mitigation. Potential impacts to surface hydrologic conditions are assessed and actions to mitigate them are recommended as follows:

<table>
<thead>
<tr>
<th>Potential Impact</th>
<th>Recommended Mitigation &amp; Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Surface Hydrology</strong></td>
<td><strong>Surface Hydrology</strong></td>
</tr>
<tr>
<td><strong>Pre-Construction Stage</strong>: Decisions made in the Pre-Construction Stage in regard to design (e.g., maximum embankment slopes) and in the preparation of bid and contract documents will determine the extent of potential impacts to:</td>
<td>Increased runoff will be mitigated by the drainage provisions incorporated in the Project Design. Beyond these provisions, and as detailed in Appendix 2, specific contract provisions are recommended to ensure that construction camps and other potential sources of secondary impacts are properly sited and provided with drainage and wastewater facilities. The following provisions are recommended in regard to:</td>
</tr>
<tr>
<td><strong>Drainage Patterns &amp; Volumes</strong>. Road construction will increase the amount of impervious surface and design decisions in regard to increased runoff could adversely impact the area drainage.</td>
<td><strong>Construction Camp Wastewater Disposal and Site Drainage Systems</strong>. The following conditions shall apply:</td>
</tr>
<tr>
<td><strong>Wetlands</strong>. Wetlands could be impacted by design decisions altering flow patterns, etc.</td>
<td>- <strong>Explanations of Proposed Site Drainage Systems</strong>. Locations likely to be subject to water quality impacts or significant runoff (construction camps, staging areas, etc.) and an explanation of the proposed site drainage system shall be indicated on the CEAP site plans.</td>
</tr>
<tr>
<td><strong>Flood and Inundation Characteristics</strong>. Inadequate culverts or other cross drainage structures could fail to allow floodwaters to equilibrate and pass freely and to avoid prolonging flood periods and by heightening the flood levels on the upstream side of the roads.</td>
<td>- <strong>Wastewater</strong>. Wastewater arising on the site shall be collected, removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance. The site plan required by CEAPs shall indicate the system proposed and the locations of related facilities in the site, including latrines, holding areas, etc. There shall be no direct discharge of sanitary or wash water to surface water. Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies shall be prohibited. Liquid material storage containment areas shall not drain directly to surface water. Liquid material storage containment areas equipped with drains shall be valved, and the valve shall be maintained locked in the closed position with supervisory control of the key. Lubricating and fuel oil spills shall be cleaned up immediately and spill clean-up shall be materials be maintained at the storage area.</td>
</tr>
<tr>
<td>The Design Documents indicate that the Project will draw water for use in the construction from:</td>
<td>- <strong>Drainage</strong>. The site plan shall be devised to ensure that rain run-off from the construction sites is not deposited directly into any watercourse, stream, or canal and shall indicate the system proposed, including the locations of retention ponds and other facilities. There shall be no direct discharge of sanitary wastewater, wash water, chemicals, spoil, waste oil or solid waste to surface water bodies. Fuel, lubricating oil and chemical spills shall be contained and cleaned-up immediately. Spill clean up equipment will be maintained on site.</td>
</tr>
<tr>
<td>- Chu River at km 262+370</td>
<td></td>
</tr>
<tr>
<td>- Aksu River Channel at km 277+591</td>
<td></td>
</tr>
<tr>
<td>- Karabala River at km 282+210</td>
<td></td>
</tr>
<tr>
<td>Drinking water will be taken from existing underground water wells at km 318+465; km 318+959; km 328+546 and water supply systems of Merke and Zhanaturmis settlements.</td>
<td>- <strong>Locations of Fueling Operations and Liquid and Toxic Material Storage Areas</strong>. The site plans shall specify the locations for the storage of liquid materials and toxic materials. The following conditions to avoid adverse impacts due to improper fuel and chemical storage.</td>
</tr>
<tr>
<td>Although agreements have been reported with local officials at these locations, no assessments of safe yields or potential impacts on other users are known to have been documented.</td>
<td>Although agreements have been reported with local officials at these locations, no assessments of safe yields or potential impacts on other users are known to have been documented.</td>
</tr>
</tbody>
</table>

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- Fueling operations shall occur only within containment areas.
- All fuel and chemical storage (if any) shall be sited on an impervious base within a bund and secured by fencing. The storage area shall be located away from any watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks.
- Filling and refueling shall be strictly controlled and subject to formal procedures and will take place within areas surrounded by bunds to contain spills / leaks of potentially contaminating liquids.
- All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.
- The contents of any tank or drum shall be clearly marked. Measures shall be taken to ensure that no contaminated discharges enter any drain or watercourses.
- Disposal of lubricating oil and other potentially hazardous liquids onto the ground or water bodies will be prohibited.
- Should any accidental spills occur immediate clean up will be undertaken and all cleanup materials stored in a secure area for disposal to a site authorized to dispose of hazardous waste.
- Locations Relative to Watercourses. The site plans shall be devised to ensure that, insofar as possible, all temporary construction facilities are locate at least 50 meters away from a water course, stream, or canal.

Related mitigation actions are also recommended to apply as detailed by Appendix 2.

Agreements in regard to water withdrawals should be reviewed and verified prior to the start of construction.

**Construction Stage.** Hydrological impacts could occur in the Construction Stage due to a failure to properly plan or implement the safe guards required by the CEAP or because of unanticipated circumstances or accidents.

Mitigation action of potential hydrological impacts during construction will require strict application of all conditions to the review of the CEAP by the CSC prior to approval and strict supervision during the course of the work. Unannounced site inspections are identified as a routine part of supervision activities. Weekly and monthly reporting systems are also recommended as detailed in Appendix 2.

Water use and potential impacts on local communities should be routinely monitored as a responsibility of the CSC.

**Post-Construction/Operational Stage.** Impacts to hydrology could extend into the Post-Construction/Operational Stage due to improper discharges from site facilities or because of unanticipated circumstances or accidents.

To mitigate potential impacts extending into the Post-Construction/Operational Stage, contracts stipulated that one year into the operating period a final inspection is required and contractor’s final payment is released only after a fully compliant audit is recorded.

Potential hydrological issues may require additional instrumented monitoring and appropriate provisions have been incorporated in the recommended COPA presented in Appendix 2. Any impacts to hydrology and water quality are part of the final inspection process and final payments can not be made until outstanding issues are resolved.

### 2.2 Water Quality

19. **Baseline.** Surface waters in the Project Area are reported to be monitored by local agencies for the Chu, Toktas, Aksu, and Karabalta Rivers and relevant data is available in the Project documentation for the Chu and the Asku. The data is presented in terms of an Index of Water Pollution (IWP). The IWP is based on water quality parameters assigned numerical values with a maximum score of 10. Parameters generally include (but are not limited to):

- **Dissolved Oxygen (DO)** - a measure of free (i.e., not chemically combined) oxygen dissolved in water. It is essential to the metabolism of all aerobic aquatic organisms. Reduced levels have been shown to harm and even kill plants and fish.
- **Biochemical Oxygen Demand (BOD)** - a chemical procedure for determining the amount of dissolved oxygen needed by aerobic biological organisms in a body of water to break down organic material present in a given water sample at certain temperature over a specific time period. It is not a precise quantitative test, although it is widely used as an indication of the organic quality of water. It is most commonly expressed in milligrams of oxygen consumed per liter of sample during five days of incubation at 20 °C and is often used as a robust surrogate of the degree of organic pollution of water.

- **pH** - a measure of the acidity or alkalinity of a water body. It can affect aquatic organisms both directly, by impairing respiration, growth, and development of fish, and indirectly, by increasing the bioavailability of certain metals such as aluminum and nickel.

- **Conductivity** - a measure of the ability of water to carry an electric current, which depends on the presence of ions. Increases in conductivity can lead to changes that reduce biodiversity and alter community composition.

- **Nitrogen and phosphorus** - both are naturally occurring elements essential for all living organisms, but are often found in growth-limiting concentrations in aquatic environments. Increases in nitrogen or phosphorus in natural waters, largely as a result of human activities in the drainage basin (e.g., from agricultural runoff from manure and synthetic fertilizers, and from municipal and industrial waste-water discharge), can over-stimulate plant growth and choke off oxygen supplies.

20. Using the IWP, the Kazakhstan authorities rate pollution levels on a scale from one to seven as indicated by Exhibit D-3.

<table>
<thead>
<tr>
<th>IWP POLLUTION CATEGORIES</th>
<th>EXHIBIT D-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
<td>Characterization</td>
</tr>
<tr>
<td>1</td>
<td>Very clean</td>
</tr>
<tr>
<td>2</td>
<td>Clean</td>
</tr>
<tr>
<td>3</td>
<td>Moderately polluted</td>
</tr>
<tr>
<td>4</td>
<td>Polluted</td>
</tr>
<tr>
<td>5</td>
<td>Dirty</td>
</tr>
<tr>
<td>6</td>
<td>Very dirty</td>
</tr>
<tr>
<td>7</td>
<td>Extremely dirty</td>
</tr>
</tbody>
</table>

21. The available data for the Chu and Aksu Rivers is presented by Exhibit D-4.

<table>
<thead>
<tr>
<th>IWPss FOR CHU &amp; ASKU RIVERS 2009/2010</th>
<th>EXHIBIT D-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Water Course</td>
<td>Index of Water Pollution (IWP)</td>
</tr>
<tr>
<td></td>
<td>3rd Quarter 2009</td>
</tr>
<tr>
<td>Chu River</td>
<td>1.48</td>
</tr>
<tr>
<td>Aksu River</td>
<td>2.11</td>
</tr>
</tbody>
</table>

The data indicates that recent readings for the Chu River have ranged between Categories 3 and 4. Those for the Asku range between Categories 3 and 5. Additional data is reportedly exists indicating similar findings for the Toktas and the Karabalta Rivers.

22. **Potential Impacts and Recommended Mitigation.** Potential impacts to water quality are assessed and actions to mitigate them are recommended as follows:

<table>
<thead>
<tr>
<th>Potential Impact</th>
<th>Recommended Mitigation &amp; Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water Quality</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Pre-Construction Stage:</strong> Decisions made in the Pre-Construction Stage in regard to conditions to be imposed on the locations and operations of construction camps, handling of fuels, provisions for response plans in the events of hazard material spills, etc, will largely determine the extent of impact during the construction stages of the work.</td>
<td>Mitigation actions recommended to protect water quality are detailed above in the discussion of potential hydrological impacts. <strong>NOTE:</strong> See related recommendations made in regard to disturbances to sediments due to bridge construction in Item 1.3 above.</td>
</tr>
<tr>
<td><strong>Construction Stage:</strong> Water quality impacts could occur in the Construction Stage due to a failure to properly plan or implement the safe guards required by the CEAP or because of unanticipated circumstances or accidents.</td>
<td>Mitigation action of potential water quality impacts during construction will require strict application of all conditions to the review of the CEAP by the CSC prior to approval and strict supervision during the course of the work. Unannounced site inspections are identified as a routine part of supervision activities. Weekly and monthly reporting systems are also recommended as detailed in Appendix 2. An Environmental Baseline Survey Work Program and a subsequent Monitoring Program for water quality are specified therein.</td>
</tr>
<tr>
<td><strong>Post-Construction/Operational Stage:</strong> Water Quality Impacts could extend into the Post-Construction/Operational Stage due to improper discharges from site facilities or because of unanticipated circumstances or accidents.</td>
<td>To mitigate potential impacts extending into the Post-Construction/Operational Stage, contracts stipulated that one year into the operating period a final inspection is required and contractor’s final payment is released only after a fully compliant audit is recorded. Potential water quality issues may require additional instrumented monitoring and appropriate provisions have been incorporated in the recommended COPA presented in Appendix 2. Any impacts to hydrology and water quality are part of the final inspection process and final payments can not be made until outstanding issues are resolved.</td>
</tr>
</tbody>
</table>

2.3 **Groundwater**

23. **Baseline.** The Republic of Kazakhstan is reportedly rich enough in groundwater to fully satisfy the population with domestic, potable, technical and other waters in accordance with the needs of the population, industry and agriculture - but its distribution is extremely uneven. Quality and reserves of ground water vary considerably. Roughly half of the groundwater resources are concentrated in the south. Documentation of earlier MFF Tranches indicates that groundwater aquifers in the vicinity of the Project Road occur at two levels.

- **Shallow Aquifers.** The shallow groundwater aquifers in the general area are one-two meters below the surface. Documentation of the environmental conditions for earlier Tranches indicates that in some areas the shallow aquifer is heavily influenced by surface water contamination, such as from road runoff and water from the shallow aquifer is generally not used for drinking unless treated. While not measured, an examination of the concentrations in the air and soil near the roads in earlier Tranches suggested a strong likelihood that significant road-related pollution is taking place. Fortunately most of the storm water runoff does not flow directly (other than from bridge decks) into streams, but instead is diverted to an infiltration area near the shoulders of the area road before emptying into a water course or percolating into the soil. The exception is in urban areas where there are concrete drains. Rainfall along the road is relatively infrequent, with a total annual precipitation (2007) of 30.3 cm, all occurring within a few weeks in the spring and early summer. This means that the first flush of storm water is highly contaminated.

- **Deep Aquifer.** The deep groundwater aquifer is located 20-30 m below the surface. No additional data in regard to the Deep Aquifer is known to be available.
24. Groundwater aquifers in the immediate vicinity of the Project Road occur, according to the Design Expertise (March 2009), only at shallow level within one to three meters below the surface. The shallow groundwater is likely to be significantly influenced by surface water contamination, both from road runoff and from agricultural drainage. The chemical composition of the underground and surface waters next to the road alignment is likely to be highly variable. The hydro-chemical properties are influenced by influx of drainage waters (containing possibly pesticides from agricultural land-uses), from storm waters of the existing roadways, and from salts utilized during winter road service actions, resulting in increased concentrations of hydrocarbons, chlorides, and sulfates.

25. Because of these chemical properties, the Design Engineers suppose that the groundwater right next to the alignment, being slightly salty and moderately hard water, might be of limited usability for construction works. Accordingly, during the construction of Road Section KM 261.5-310.5 technical water will be taken from:

- Chu River at km 262+370
- Aksu River Channel at km 277+591
- Karabalta River at km 282+210

26. As noted above, drinking water will be taken from existing underground water wells at km 318+465; km 318+959; km 328+548 and water supply systems of Merke and Zhanaturmis settlements. No base line data in regard to these sources other than their locations are provided in the Project documentation.

27. Potential Impacts and Recommended Mitigation. Potential impacts to groundwater are assessed and actions to mitigate them are recommended as follows:

<table>
<thead>
<tr>
<th>Potential Impact Groundwater</th>
<th>Recommended Mitigation and Monitoring Groundwater</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Construction Stage:</strong> The water-related provisions noted above will also serve to protect groundwater. No impacts to groundwater resources are anticipated as a result of the proposed Project Design or Location. No wells/hand pumps within the proposed construction zones are located in the area of potential impact. There will be no net loss of water access points. Potential impacts to groundwater due to the Project’s use of water from existing wells have not been documented.</td>
<td>No relocation or reconsideration of Project Design is considered warranted in regard to groundwater conditions. The recommended contract provisions (Appendix 2), do, however, recommend routine monitoring of groundwater in the conduct of the work. The groundwater circumstances of the proposed sources of drinking water should be documented and their adequacy verified by the CSC prior to the start of construction.</td>
</tr>
<tr>
<td><strong>Construction Stage:</strong> Groundwater impacts could occur in the Construction Stage due to a failure to properly plan or implement the safe guards required by the CEAP or because of unanticipated circumstances or accidents.</td>
<td>Mitigation action of potential groundwater impacts during construction will require strict application of all conditions to the review of the CEAP by the CSC prior to approval and strict supervision during the course of the work. Unannounced site inspections are identified as a routine part of supervision activities. Weekly and monthly reporting systems are also recommended as detailed in Appendix 2. An Environmental Baseline Survey Work Program and a subsequent Monitoring Program for groundwater is specified therein. Groundwater withdrawal amounts should be monitored and potential issues discussed with local officials during the course of the work.</td>
</tr>
<tr>
<td><strong>Post-Construction/Operational Stage:</strong> Impacts to groundwater conditions could extend into the Post-Construction/Operational Stage due to improper discharges from site facilities or because of unanticipated circumstances or accidents.</td>
<td>To mitigate potential impacts extending into the Post-Construction/Operational Stage, contracts stipulated that one year into the operating period a final inspection is required and contractor’s final payment is released only after a fully compliant audit is recorded. Potential groundwater issues may require additional instrumented monitoring and appropriate provisions have been incorporated in the recommended COPA presented in Appendix 2. Any impacts to groundwater are part of the final inspection process and final payments can not be made until outstanding issues are resolved.</td>
</tr>
</tbody>
</table>

3.0 AIR QUALITY

28. Baseline. The climatic context and ambivalent air quality conditions in the Project
Area are as follows.

**Climatic Context**

29. The base data for the climatic characteristics of the Project Area has been obtained from the long-term statistical records of different meteorological stations in Zhambyl Oblast (Exhibit D-5) for the nearest of these station, Merke.

<table>
<thead>
<tr>
<th>CLIMATIC CHARACTERISTICS</th>
<th>EXHIBIT D-5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Climatic Parameters, units</strong></td>
<td><strong>Merke</strong></td>
</tr>
<tr>
<td>Average annual temperature, °C</td>
<td>+9.2 °C</td>
</tr>
<tr>
<td>Absolute recorded maximum temperature, °C</td>
<td>+44 °C</td>
</tr>
<tr>
<td>Absolute recorded minimum temperature, °C</td>
<td>-40 °C</td>
</tr>
<tr>
<td>Depth of soil freezing</td>
<td>132 cm</td>
</tr>
<tr>
<td>Average amount of precipitation</td>
<td>435 mm</td>
</tr>
<tr>
<td>Width of snow cover</td>
<td>35 cm</td>
</tr>
<tr>
<td>Mean annual wind speed, m/sec</td>
<td>1.8 m/c</td>
</tr>
</tbody>
</table>

Source: Technical Drawings and explanations provided by Designer Company KazHIiPI DorTrans, July 2010

30. The climate of the Project Area is typical continental, i.e. dry hot summer and moderate winter periods, and a sharp temperature contrast between day and nighttime. Springs are short, warm, with frequent cold spells and frost even occurring until late May. The autumn is dry and warm. The frost-free period lasts a minimum of 160 days. The salient averages for the local temperatures in Southern Zhambyl Oblast, (lowland steppe) are: the warmest months are July (23.8°C) and August (22.3°C), the coldest month is January (-6.6°C). The region’s absolute peak values recorded over the past 22 years are summer maximum temperatures of 44°C and winter minimum of -40°C. At the end of winter time the soil freezes to depths up to 1.3 m.

31. The annual saturation deficit is 7.6 – 8.2%. The air saturation deficit is high, especially during the summer months causing draughts and a number of disadvantages for the local agriculture production which largely depends on functional irrigation systems. The average annual precipitation ranges from 360 - 465 mm, whereby 187 - 252 mm falls during the warm period (April-September). During the cold period (October-March) precipitation varies between 182 – 237 mm. In recent years, the actual amount of precipitation varied considerably, from full absence to heavy rains up to 100 mm/month in May, October and December.

32. The wind regime is rather uniform (Exhibit D-6). Southerly winds prevail in the entire area. The speed of the winds recorded from the meteorological stations (above) ranges from 3-7 m/sec, with strong winds (>10 m/sec) occurring mostly during spring months. In the Project Area, about 30 days/year are characterized by such strong winds, frequently developing into dust storms which may considerably impact both settlements and driving conditions. Occasionally, warm winds (foehns) descend from the Southern mountain ranges (Tian Shan). Such conditions often appear during the cold half-year period as a result of strong cyclonic winds blowing over Central Asia. These hot dry winds blowing from southerly directions can increase the ambient temperature up to 10°C within few hours. During February and March strong snow storms (blizzards) from southwest to southern directions frequently blow over the vast plains.

**Ambient Air Quality Conditions**

33. Kazakhstan’s 2002 Law on Air Protection defines the basic terms and principles of State control of air conditions. Two units of MOEP (the Department of Permitting & Incentive-based Mechanisms for Regulation and the Committee for Environmental Control) play key
roles in establishing facility-specific regulatory requirements and ensuring compliance with them at the national level, including air. Ambient air quality standards are established by the Sanitary Regulations and Standards (referred to as "SanPiN") as published by the Ministry of Health (Exhibit D-7).

### AIR QUALITY STANDARDS

<table>
<thead>
<tr>
<th>Substance</th>
<th>Maximum Allowable Concentration, mg/m$^3$</th>
<th>Hazard Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>One Time Maximum</td>
<td>Daily Average</td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td>5.0</td>
<td>3</td>
</tr>
<tr>
<td>Nitrogen Oxide</td>
<td>0.4</td>
<td>0.06</td>
</tr>
<tr>
<td>Nitrogen Dioxide</td>
<td>0.085</td>
<td>0.04</td>
</tr>
<tr>
<td>Suspended Particulates</td>
<td>0.5</td>
<td>0.15</td>
</tr>
<tr>
<td>Phenol</td>
<td>0.01</td>
<td>0.003</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>0.035</td>
<td>0.003</td>
</tr>
<tr>
<td>Lead</td>
<td>0.001</td>
<td>0.0003</td>
</tr>
<tr>
<td>Ammonia</td>
<td>0.2</td>
<td>0.04</td>
</tr>
<tr>
<td>Sulfur Dioxide</td>
<td>0.5</td>
<td>0.05</td>
</tr>
<tr>
<td>Hydrogen Sulfide</td>
<td>0.008</td>
<td>-</td>
</tr>
<tr>
<td>Chlorine</td>
<td>0.1</td>
<td>0.03</td>
</tr>
<tr>
<td>Fluorine hydride</td>
<td>0.02</td>
<td>0.005</td>
</tr>
<tr>
<td>Ozone</td>
<td>0.16</td>
<td>0.03</td>
</tr>
<tr>
<td>Chlorine hydride</td>
<td>0.2</td>
<td>0.1</td>
</tr>
<tr>
<td>Chrome (VI)</td>
<td>-</td>
<td>0.0015</td>
</tr>
<tr>
<td>Cadmium</td>
<td>-</td>
<td>0.0003</td>
</tr>
<tr>
<td>Arsenium</td>
<td>-</td>
<td>0.003</td>
</tr>
<tr>
<td>Chrome</td>
<td>-</td>
<td>0.0015</td>
</tr>
<tr>
<td>Cuprum</td>
<td>-</td>
<td>0.002</td>
</tr>
<tr>
<td>Sulfuric Acid (Total)</td>
<td>0.1</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Source: Health and Hygiene Rules and Standards (SanPiN) - Sanitary-Epidemiology Requirements for Atmospheric Air approved by Decree № 629 of Ministry of Public Health dated to August 18, 2004

34. Basic terms describing air quality are given based on current Kazakh norms. The main regulating document is GOST 17.2.1.03-84, Nature Protection. Atmosphere. Terms and Definitions of Pollution Control. Definitions are as follows:
- **One-time maximum allowable concentration (MAC\textsubscript{ot})** - the concentration of harmful substances in the air of settling areas that do not cause reflex reactions in humans within 20 minutes. MAC\textsubscript{ot} is used during scientific-technical norms identification – maximum allowable harmful substances emissions. However, in case of dispersion of substances in air as a result of meteorological conditions, concentration of harmful substances on the boundary of sanitary-safety zone of the source of emissions at any point of time should not exceed MAC\textsubscript{ot} level.

- **Daily average maximum allowable concentration (MAC\textsubscript{da})** - is concentration of harmful substances in the air of settling areas that must not make direct or indirect impact on humans during an indefinitely long period of breathing. MAC\textsubscript{da} is calculated for all groups of population and for an indefinite long period of influence and as a result serves as the most important sanitary and hygienic norm for identification concentration of harmful substances in atmosphere. MAC\textsubscript{da} is usually represents as criteria for evaluation of air quality in settling area. However it worth to say that MAC\textsubscript{da} became the most measurable unit in the last years.

35. There is no known routinely gathered empirical ambient air quality data for the Project Area. Given that lack, air quality modeling was undertaken and reported in a Preliminary EIA (PEIA) prepared by the MOTC for other road sections in the MFF Program. The modeling indicated that roadside levels of carbon monoxide, hydrocarbon, and soot were likely to be within Kazakhstan norms. Nitrogen oxide and lead levels were likely to exceed them. Lead, most likely concentrated in aerosols as well as in soils adjacent to road shoulders, was noted as a concern. The PEIA also noted that "secondary risks need also to be addressed, as lead contaminates drinking water and enters the food chain through agricultural products originating from croplands near the road network." The PEIA indicated that the levels of the major air pollutants would "be verified and addressed during the project implementation" of the earlier MFF Program Tranches.\textsuperscript{10} No data is known to be currently available, however.

36. Modeled data relating to the Road Section 261.5-310.5 Project were retrieved from the PEIA. Calculations of concentrations near the ground were made by the PEIA before and after implementation of road projects, including all parameters of impact (emissions, noise, soil pollution, general toxicity). It is important to take into account that road adjacent territory is mostly developed. According to the minutes given in GeoData Plus EIA report\textsuperscript{11} harmful substances in the air along road do not exceed normative maximum allowable concentrations (MAC) of toxic substances.

37. The PEIA concluded that the amounts of toxic gaseous substances originating from exhaust gases along the future road corridor are likely to be within the allowable concentration standards published in the national legislation, with the exception of NOx and lead in aerosol. The studies refer to recent regional test samples and concentration models for carbon monoxide, and hydrocarbons, concluding that the results were within the permissive environmental standards of Kazakhstan, while NOx and lead concentration levels exceed the standards even at 60 meters from the roadside. The high lead concentrations can be explained by the use of leaded petrol by a large portion of the vehicle fleet until 2009. Given the known association with brain function impairment, particularly in children, lead has been banned from fuels in many countries for decades. Values estimated in the studies even at 100 meters from the road are alarming, namely almost three times the GoK standard\textsuperscript{12}. Lead in aerosol solutions is easily absorbed and most dangerous for humans, while soils contaminated by spillage of leaded fuel presents a significant health risk when planning for excavation and re-use of embankment soils.

38. NOx, a byproduct of the burning of diesel fuel resulting from inadequate refining, is also believed a problem affecting the local air quality. NOx when mixed with water forms nitric acid and comes to earth as acid rain and acidic aerosol, damaging human health,
plants and structures. The situation in the proposed road corridor for this Project might be less dramatic due to the location near wide steppe habitats at foothill regions which is frequently exposed to strong winds and clean air from northerly directions.

39. With other parameters there is uncertainty as to whether the PEIA’s model results for exhaust emissions corresponds to reality, since Kazakh truck and bus fleets is gradually modernizing over the past decade. Newer vehicles imported to Kazakhstan are likely to be fitted with catalytic converters, and they would be dysfunctional with leaded and/or poorly refined.

40. Potential Impacts and Recommended Mitigation. Potential impacts to air quality are assessed and actions to mitigate them are recommended as follows:

<table>
<thead>
<tr>
<th>Potential Impact</th>
<th>Recommended Mitigation &amp; Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Air Quality</strong></td>
<td></td>
</tr>
</tbody>
</table>
| **Pre-Construction Stage**: Air quality impacts could result in later stages due to decisions taken (or not taken) in the preparation of bid and contract documents in the Pre-Construction Stage. It is essential for bid and contract documents and briefings to potential bidders to clearly specify the Project’s requirements. These preparations must be completed in the Pre-Construction Stage. | Mitigation is recommended through strategic avoidance combined with construction and monitoring. Bid and contract documents are recommended to specify that a Contractor Environmental Action Plan (CEAP) shall be required as detailed in Appendix 2: Recommended Conditions of Particular Application (COPA). The following requirements (and others) are presented therein. Baseline Air Quality Survey. Air quality baseline monitoring shall be carried out as soon after the date of acceptance of the Bid as practicable to determine ambient levels of the air pollutants at specified monitoring stations as indicated by Appendix 2. Baseline monitoring is required to be carried out for a one-week period with measurements to be taken at each monitoring station according to the frequency schedule specified in Appendix 2. The CEAP shall indicate when the Contractor proposes to undertake the required baseline air quality survey and shall provide references to locations indicated by the accompanying site plan(s) as appropriate. Proposed locations require the approval of the CSC. Routine Air Quality Monitoring. Air quality shall be monitored not less than once per month during the course of the Works. Monitoring results shall be submitted to CSC two (2) working days of the completion of the monitoring period for analysis and review. Actions taken in response to the monitoring results shall also be required. Additional monitoring shall be undertaken as deemed warranted by the CSC. Other CEAP Air Quality Provisions. The CEAP is required to indicate understanding of and a commitment to the requirements that:  
  • No burning of debris or other materials will occur on the Site.  
  • No furnaces, boilers or other similar plant or equipment using any fuel that may produce air pollutants will be installed without prior written consent of the CSC.  
  • Dust suppression measures shall be instituted, including requirements that all trucks used for transporting materials to and from the site will be covered with canvas tarpaulins, or other acceptable type cover (which shall be properly secured) to prevent debris and/or materials from falling from or being blown off the vehicle(s); hard surfaces will be required in areas with regular movements of vehicles; effective use of water sprays will be implemented (e.g., all roads within the construction areas of the Site shall be sprayed at least twice each day, and more if necessary to control dust to the satisfaction of the CSC); acceptable practices in regard to cement and asphalt, and other provisions are specified in detail by Appendix 2. Emergency Response Plan. The Emergency Response Plan required as part of the CEAP shall include contingencies for the accidental release of toxic air pollutants. Additional commitments, actions and reporting procedures to preserving air quality are presented in detail in Appendix 2. |
| **Construction Stage**: Air quality impacts will occur due to construction activities. Failure to enforce contract provisions as outlined above will render the meaningless and result in significant adverse impacts. | The CEAP requires submission within 30 days of the award of the Contract and approval by the CSC prior to the start of construction. MOTC and local supervision/enforcement mechanism must be adequately equipped and motivated to enforce the recommended contract provisions. The locations of air-impacting facilities such as |
construction camps, asphalt plants, etc. All require prior approval by the CSC, MOTC and local officials. Unannounced monitoring of contractor performance will be undertaken by the CSC as a routine aspect of project management.

**Post-Construction/Operational Stage:**
Air quality impacts will occur due to the introduction of vehicular traffic. Projected traffic volumes are such that significant adverse to air quality in the Project Area is unlikely.

Instrumented air quality monitoring will be required at the time of final inspection if determined warranted. No additional mitigation in regard to potential air quality impacts in the Post-Construction/Operational Stage are considered warranted unless determined otherwise by MOEP.

### 4.0 BIOLOGICAL ENVIRONMENT

#### 4.1 Flora (Vegetation and Plant Species)

41. The vegetation of the Project Area consists mainly of low diverse meadow vegetation with predominantly germanous plants and herbs, and halophytic-germanous vegetation in some places. Floodplain-meadow soils and forest-meadow soils are usually rich in herbs, small bushes and germanous plants. These habitats are of importance for the local livestock breeders and for provision of firewood to the local population. Most of the scattered wetlands found in the area are characterized by patches of dense reed grasses such as goosefoot, canes (*Phragmites*), rush (*Juncus*), bluejoint (*Calamarostis*), wheat-grass (*Agropyron repens*), shore bugs (*Aeluropus*), seat worm (*Enterobius vermicularis*), dropwort (*Filipendula*), pea tree (*Caragana*), salt tree (*Haliodendron*), and tamarisks (*Tamarix spp.*). Most are likely to dry out in late summer.

42. Much of the Kazakh Steppe, the general area in which the Project is located, was plowed in the 1950s for crop production. It is estimated that now only 17 to 36 percent of the original steppe remains undisturbed. Since the 1990s, however, agriculture uses in the Steppe have decreased significantly and many previously plowed lands have been abandoned. The use of pesticides is reported to have decreased to one percent of the former level and large portions of the Steppe have returned to their original characteristics, in spite of other threats such as poaching of some species at unprecedented levels, and threats related to the oil industries and mining. The surviving and regenerating unplowed habitat is generally strongly modified and fragmented communities on relief positions (gullies, areas around lakes and hill slopes) or soil types (sandy or salty soils), that are not suitable for plowing, resulting in a mosaic of agricultural lands: fields, abandoned fields, roads, etc.

43. The dominant indigenous flora species in the surviving and regenerating unplowed habitat areas are compact turf or cushion-like plants which adapt to droughts, strong winds, frost with little snow cover, fires, and grazing. Ephemers and ephemeraloids are two other dominant life forms that can complete their annual life cycle during the short spring (species in the families Liliaceae and Amaryllidaceae; genera *Tulipa*, *Onnithogalum*, *Gagea*, *Ixolirion*, and *Eremurus*). Another dominant life form is "perekati pole" (tumbleweed). Inflorescents form a shape of resilient strong lattice spheres, which allow the plant to snap off easily in heavy wind and roll over many kilometers, disseminating seeds. During the growing season, there are six to twelve waves of growth and flowering periods (called aspects), during which different species replace each other. A particular species is abundant and noticeable during only one wave. It can be almost undetectable during the rest of the season. The Steppe's appearance changes dramatically during the season, and species composition recorded at different times in the same season can be very different.

44. There are no natural forest lands along the entire ROW. There are, however, forest plantations located almost along the existing road generally at a distance of 10-40 meters. The trees consist mainly of poplar, elm, sometimes birch and maple. There are also forest belt areas (mostly elms) and separate trees located along the ROW.
45. These trees fall under the management of the Zhambyl Oblast territorial office of the Committee of Forestry and Hunting (CFH). A program for essential tree cutting to implement the Project was developed with and approved by the Zhambyl Oblast CFH. A total of 10,772 trees to be sacrificed were identified for this road segment and it is stated that the Project provides for compensation for the cutting. No plans for re-planting to mitigate for tree losses (beyond compensation for the commercial value of the wood) have come to light and consultations indicate that no funds for re-planting are included in the Project as now defined.

46. **Potential Impacts and Recommended Mitigation.** Potential impacts to vegetation and plant species are assessed and actions to mitigate them are recommended as follows:

<table>
<thead>
<tr>
<th>Potential Impact: Flora Vegetation &amp; Plant Species</th>
<th>Recommended Mitigation &amp; Monitoring Flora: Vegetation &amp; Plant Species</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Construction Stage</strong>: Preliminary assessments did not indicate the presence unique plant habitat within the area of influence. Most plants are ubiquitous native species, which are highly tolerant of grazing, compaction, and other physical disturbances. The area is noted, however, as included within the Middle Asia Centre for Plant Diversity as delineated by the IUCN. Losses of non-special status trees will be significant. As noted in the Baseline discussion above, a total of 10,772 trees to be sacrificed were identified for this road segment and it is stated that the Project provides for compensation for the cutting. No plans for re-planting to mitigate for tree losses (beyond compensation for the commercial value of the wood) have come to light.</td>
<td>Mitigation will require action to ensure that losses are kept to a minimum. Bid/contract documents should specify roadside plantings and replacements as part of the road design and contain enforceable provisions in contract specifications to minimize plant loss. Plans to mitigate for tree losses should be developed as part of the Pre-Construction Stage and made available for review. The fact that no funds for re-planting are included in the Project makes that very unlikely. Plans for a supplemental tree-planning project are, therefore, recommended to mitigate the environmental impact of the loss of 10,772 trees and the shelterbelt benefits they provide.</td>
</tr>
<tr>
<td><strong>Construction Stage</strong>: Unavoidable impacts will occur due to construction activities.</td>
<td>Construction contract provisions to minimize impacts are warranted and are provided by Appendix 2.</td>
</tr>
<tr>
<td><strong>Post-Construction/Operational Stage</strong>: No significant adverse impacts to flora are expected in the Post-Construction/Operational Stage of the Project. Cumulative development pressures leading to increased urbanization of the area due to the construction of the road are considered unlikely.</td>
<td>To mitigate potential impacts extending into the Post-Construction/Operational Stage, contracts stipulated that one year into the operating period a final inspection is required and contractor’s final payment is released only after a fully compliant audit is recorded. The audit should include verification that required planting have been emplaced and the plants are established. Any failures in this regard should be part of the final inspection process and final payments can not be made until outstanding issues are resolved. No additional mitigation actions to offset impacts to flora in the operational period are considered warranted.</td>
</tr>
</tbody>
</table>

### 4.2 Fauna

47. **Baseline.** Baseline conditions in regard to mammals, birds, reptile and other species and in regard to aquatic resources, sensitive habitats and protected areas are as follows. Baseline data in regard to threatened and endangered species is provided where warranted.

**Mammals**

48. **Overview.** Most of the indigenous mammals found in the Kazakh Steppe burrow, live in colonies, or migrate. Those typically found include numerous rodents such as ground squirrels (*Citellus*), hamsters (*Cricetus, Cricetulus, Podopus*), voles (*Microtus*), birch mice (*Sicista*), lemmings (*Lagurus*), marmots (*Marmota bobac*); and lagomorphs such as pikas (*Ochotona*) and hares (*Lepus*). Wolf (*Canis lupus*), foxes (*Vulpes vulpes, V. corsac*) and Siberian polecat (*Mustela eversmanni*) are typical steppe carnivores. The saiga antelope (*Saiga tatarica*) is also indigenous to the area. It was at the verge of extinction in the early 20th century but was restored and is now a major game species. Long-distance migrations between winter pastures and summer "maternal wards" are characteristic for saiga.14

49. **Threatened and Endangered Mammal Species.** Mammals of concern identified by
the World Wildlife Fund\textsuperscript{15} as occurring in this eco-region with threat assessments identified as either critically endangered or vulnerable by the International Union for the Conservation of Nature (IUCN) Red Data List are as follows:

- **Saiga antelope** (*Saiga tatarica*) - currently listed by the IUCN as critically endangered (CR.), i.e., a species "considered to be facing an extremely high risk of extinction in the wild." Saigas form very large herds that graze in semi-desert steppes eating several species of plants, including some that are poisonous to other animals. They can cover considerable distances and swim across rivers, but they avoid steep or rugged areas. WWF mapping indicates the possibility of the species just to the north of the Project Area in similar terrain.\textsuperscript{16}

- **Giant mole-rat** (*Spalax giganteus*), currently listed as vulnerable (VU), i.e., a species "considered to be facing a high risk of extinction in the wild". The giant mole rat is a subterranean rodent which uses its teeth to burrow.

50. Other species noted in the area by the WWF as likely to be found in the Kazakh Steppe, but considered abundant and neither threatened nor near threatened (species of least concern (LC), include:

- Corsac fox (*Vulpes corsac*)
- Steppe pika (*Ochotona pusilla*)
- Bobac marmot (*Marmota bobac*)
- Ground squirrel (*Spermophilus major*)
- Birch mouse (*Sicista subtilis*) Least concern.; and
- Migratory hamster (*Cricetulus migratorius*).

51. Impacts to animal species will occur within and adjacent to the ROW. Given the level of traffic along the existing ROW, the likelihood of threatened or endangered species in the immediate vicinity is very low. Approximately 46 percent of the revised ROW, however, will be within new alignments. Given the low levels of human activities away from the existing road, the possibilities of suitable habitat and the presence of the threatened and near threatened mammal and other species cannot be eliminated in the absence of a biological survey. Recommendations in regard to this aspect of the Project are put forward in **Part G: Environmental Management Plan** and addressed in **Part H: Conclusions and Recommendations**.

**Birds**

52. **Overview.** Hundreds of thousands of waterfowl species visit desert water bodies in Kazakhstan Steppe area on their spring and fall migratory routes and some nest in the area. Wetlands, such as the system of Kourgaldzhin and Tengiz Lakes (2,580 sq. km) included in the Ramsar Convention List of Wetlands of International Importance. These wetlands are especially important for the conservation of such rare aquatic birds such as:

- Gulls (*Larus relictus, L. ichthyaetus*),
- White-headed duck (*Oxyura leucocephala*),
- Marbled teal (*Anas angustirostris*),
- Flamingo (*Phoenicopterus roseus*),
- Ferruginous duck (*Aythya nyroca*),
- Sociable plover (*Vanellus gregarius*),
- White & Dalmatian pelicans (*Pelecanus crispus, P. onocrotalus*), and others.

53. Special international research is conducted here on ecology and biology of waterfowl (*Steganopodes, Ciconiformes*), as well as on herring gull (*Larus argentatus*) and thin-billed curlew (*Numenius tenuirostris*). Other rare or endangered bird species include:
Eagles (Aquila chrysaetos, A. heliaca, A. rapax, Circaetus gallicus),
Osprey (Pandion haliaetus),
Falcons (Falco cherrug, F. pelegrinoides, F. peregrinus, F. rusticolus),
Demoiselle crane (Anthropoides virgo), and
Bustards (Otis tarda, Otis tetrax).

54. In spite of the relatively small number of endemics, this eco-region is globally important because it supports the largest populations of several rare and imperiled species. Lakes provide sanctuaries for diverse and rare species of waterfowl, great amount of migratory birds from different parts of the world are nesting and feeding in protected wetland areas, such as Kourgaldzhin and Tengiz Lakes. The largest northern population of pink flamingo (Phoenicopterus roseus) is found here.17

55. Threatened and Endangered Bird Species. The regional environmental protection agencies record the following rare or endangered species within Zhambyl Oblast: Spoonbill, glossy ibis, stiff-tailed ducks, demoiselle crane, stern, bustards, houbara, black-bellied and pin-tailed sand grouse, Pallas sand grouse, taw- rabeler, whistling thrush, paradise flycatcher and greater sand plover. Among the local records for threatened birds of prey are: A. chrysaetos, A. heliaca, Hieraaetus pennatus, steppe eagle, Haliaeetus leucophrys, Haliaeetus albicilla, Saker falcon, peregrin falcon, fish-hawk and eagle owl.18 Birds are identified by the WWF19 as potentially found in the area from this eco-region and their current risk categories on the IUCN Red Data List are as follows:

<table>
<thead>
<tr>
<th>BIRD SPECIES RISK LEVELS</th>
<th>EXHIBIT D-8</th>
</tr>
</thead>
<tbody>
<tr>
<td>RISK LEVELS</td>
<td>BIRD SPECIES</td>
</tr>
<tr>
<td>• Critically Endangered 1</td>
<td>Sociable plover (Vanellus gregarius)</td>
</tr>
<tr>
<td>• Endangered 2</td>
<td>White-headed duck (Oxyura leucocephala)</td>
</tr>
<tr>
<td>• Vulnerable 3</td>
<td>Imperial eagle (Aquila heliaca)</td>
</tr>
<tr>
<td></td>
<td>Lesser kestrel (Falco naumanni)</td>
</tr>
<tr>
<td></td>
<td>Great bustard (Otis tarda)</td>
</tr>
<tr>
<td>• Near Threatened 4</td>
<td>Pallid harrier (Circus macrourus)</td>
</tr>
<tr>
<td></td>
<td>Little bustard (Tetrax tetrax)</td>
</tr>
<tr>
<td></td>
<td>Black-winged pratincole (Glareola nordmanni)</td>
</tr>
</tbody>
</table>

Notes
1 an extremely high risk of extinction in the wild. 2 a very high risk of extinction in the wild.
3 high risk of extinction in the wild.
4 close to qualifying for, or is likely to qualify for, a threatened category in the near future.

Downloaded on 23 July 2010

56. Impacts to animal species will occur within and adjacent to the ROW Given the level of traffic along the existing ROW, the likelihood of threatened or endangered species in the immediate vicinity is very low. Approximately 46 percent of the revised ROW, however, will be within new alignments. Given the low levels of human activities away from the existing road, the possibilities of suitable habitat and the presence of the threatened and near threatened birds and other species cannot be eliminated in the absence of a biological survey. Recommendations in regard to this aspect of the Project are put forward in Part G: Environmental Management Plan and addressed in Part H: Conclusions and Recommendations.

Reptiles & Other Species

57. Overview. Reptiles found in the area include the common lizards (Lacerta agilis) and vipers (Vipera ursini); amphibians include toads (Bufo viridis) and frogs (Rana arvalis).20

58. Threatened and Endangered Reptile Species. Four species of Vipera ursini found in
the area are listed as threatened; four species of *Bufo viridis* are also listed as threatened.\(^{21}\)

59. Impacts to animal species will occur within and adjacent to the ROW. Given the level of traffic along the existing ROW, the likelihood of threatened or endangered species in the immediate vicinity is very low. Approximately 46 percent of the revised ROW, however, will be within new alignments. Given the low levels of human activities away from the existing road, the possibilities of suitable habitat and the presence of the threatened and near threatened reptile and other species cannot be eliminated in the absence of a biological survey. Recommendations in regard to this aspect of the Project are put forward in **Part G: Environmental Management Plan** and addressed in **Part H: Conclusions and Recommendations**.

### Aquatic Resources

60. **Overview.** The Kazakhstan has extensive water resources, with good potential for fish production. Fisheries research is reported to be carried out by the Department of Hydrobiology and Water Toxicology of Institute of Zoology (Almaty), which focuses on water quality, bio-productivity of inland water bodies and state of forage reserves for fish, and by the Department of Zoology and Ichthyology of Kazakh National University (Almaty), which is responsible for training in the area of ichthyology and hydrobiology and research in the field of conservation of fish diversity.\(^{22}\) The fish fauna recorded by the Fisheries Inspection Department of Zhambyl Oblast includes several economically important species like pike (*Esox lucius*), Common Carp (*Cyprinus carpio*), Crucian carp (*Carassius auratus*), Silver Carp (*Hypophthalmichthys molitrix*), Chebachek (*Pseudorasbora sp.*), White Amur (*Parabramis pekinensis*), Red-eyed Rudd (*Scardinius eryrophthalmus*), Roach (*Rutilus sp.*), River perch (*Perca fluviatilis*), and Snakehead (*Channa argus*). Fishing is subject to specific licenses issued by the Regional Fisheries Department. Other minor fish species migrating through the network-like system of irrigation channels are of less economic importance. The Oblast Fisheries Inspectors reported that due to the occasional drying out of the surface waters and due to man-made impacts (illegal fishing, pesticides, water pollution related to accidents from the adjacent road) the local fish production can vary considerably over the years.\(^{23}\)

61. The Chu River is of the largest fishing place of the Zhambyl Oblast. It and other waters in the Project Area are reported to contain river perches, crucian carp, stunned fish and others in the rivers. Due to the fact that the rivers often dry up, however, these resources are not significant enough to have commercial value and are used only for amateur fishery. Among amphibians, green frogs are found in the rivers and its presence indicates favorable ecological conditions of the rivers.\(^{24}\)

62. **Potential Impacts and Recommended Mitigation.** Potential impacts to fauna are assessed and actions to mitigate them are recommended as follows:

<table>
<thead>
<tr>
<th>Potential Impact: Fauna</th>
<th>Recommended Mitigation &amp; Monitoring: Fauna</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Construction Stage.</strong> Impacts to animal species will occur within and adjacent to the ROW.</td>
<td>To mitigate potential impacts to species listed as critically endangered or facing a high rate of extinction in the wild, a biological survey by a qualified biologist with expertise related to the species in question is recommended and included as one of the Preparatory Actions put forward in <strong>Part G: Environmental Management Plan</strong> and <strong>Part H: Recommendations and Conclusions</strong>.</td>
</tr>
<tr>
<td>Impacts to animal species will occur within and adjacent to the ROW. Given the level of traffic along the existing ROW (reported as over 3,300 vehicles per day in 2008), the likelihood of threatened or endangered species in the immediate vicinity is very low. Approximately 46 percent of the revised ROW, however, will be within new alignments. Given the low levels of human activities away from the existing road, the possibilities of suitable habitat and the presence of the threatened and near threatened species cannot be eliminated in the absence of a biological survey. Recommendations in regard to this aspect of the Project are put forward in <strong>Part G: Environmental Management Plan</strong> and addressed in <strong>Part H: Conclusions and Recommendations</strong>.</td>
<td>Mitigation actions in regard to all species are stipulated as follows:</td>
</tr>
<tr>
<td>• Habitat Loss. Contracts include provisions to minimize habitat loss and minimize disturbance. Borrow pits and quarries used for construction materials the purposes of the improvements will be restricted to licensed areas previously disturbed.</td>
<td>• Habitat Fragmentation. Areas where provisions to allow animals to underpass the road are been identified and eight underpasses have been incorporated in the Project Design. Culverts will also...</td>
</tr>
</tbody>
</table>
Part H: Conclusions and Recommendations. They mammals of primary concern are:

- Saiga antelope (Saiga tatarica), currently listed by the IUCN as critically endangered;
- Giant mole-rat (Spalax giganteus), currently listed as vulnerable (VU), i.e., a species "considered to be facing a high risk of extinction in the wild."

Five bird and eight reptile species (identified in the Baseline discussion above) are also as issues of concern.

Impacts to the species (if present) and other species of lesser concern could occur due to:

- Habitat Loss. Development of the road will displace habitat and convert the land necessary to transport use.
- Habitat Fragmentation. Habitat fragmentation occurs when a road cuts through an ecosystem. Some habitat fragmentation may occur, but will be offset to a degree by provisions made for underpass of the road.
- Interruption of Migration Patterns. Animal species that migrate tend to follow established patterns in their daily and seasonal movements. A road blocking a wildlife corridor results in either a cessation in its use because animals are reluctant to cross the road, an increase in mortality due to collisions, or a delay in migration patterns. No evidence of such patterns was noted in the available Project documentation, but the possibility of such migrations in the area cannot be eliminated in the absence of a qualified biological survey.
- Accidents Involving Wildlife. Accidents involving wildlife attempting to cross the road are a potential impact faced by many road projects.

Consideration has been given to potential indirect wildlife impacts under the following headings:

- Accessibility. Penetration of previously unmodified areas and upgrading existing roads generally facilitates an increase in the number of people having access and is accompanied by an increase in the likelihood of impacts.
- Ecological Disequilibrium. The importation of new plant and animal species along a roadway can upset the dynamic balance that exists in the ecosystem. Native species face competition for resources from new arrivals. Predator-prey relationships can be altered, often to the detriment of the native species.

| Construction Stage: The potential for significant adverse impact to wildlife during the Construction Period (if any) will be definitively determined by the recommended biological resource survey. |
| Post-Construction/Operational Stage. The potential for significant adverse impact to wildlife during the Operational Period (if any) will be definitively determined by the recommended biological resource survey. |

Specific actions to avoid adverse impacts to wildlife during the Construction Period (if warranted) will be determined will be definitively determined by the recommended biological resource survey.

Specific actions to avoid adverse impacts to wildlife during the Operational Period (if warranted) will be determined will be definitively determined by the recommended biological resource survey.

### 4.3 Sensitive Habitats & Protected Areas

63. IUCN indicates that the Project Area is within the area delineated as the "Mountains
of Middle Asia Centre of Plant Diversity as illustrated by Exhibit D-9. The designation offers no legal protection, but is indicative of the relative importance of the area.

An examination of the Kazakhstan and World Wildlife Fund Redbook on endangered plants and animals, the Birdlife International website, the RAMSAR website, and discussions with the Environmental Department in Taraz recorded no protected sites in the Project Area. The closest protected area is reported to be 50 km distant. This is likely to be the Karakunuz Zakaznak which the IUCN indicates is located to the southeast of the Project Area.

64. **Potential Impacts and Recommended Mitigation.** Potential impacts to sensitive habitats and protected areas are assessed and actions to mitigate them are recommended as follows.

### DELINEATION OF CENTRE OF PLANT DIVERSITY
![Exhibit D-9](image-url)

<table>
<thead>
<tr>
<th>Potential Impact: Sensitive Habitats and Protected Area</th>
<th>Recommended Mitigation and Monitoring: Sensitive and Protected Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Construction Stage.</strong> No adverse impacts to protected areas are anticipated due to decisions made in the Pre-Construction Stage of the Project. As noted in the baseline conditions, however, the area is included within the Middle Asia Centre for Plant Diversity as delineated by the ICNU and warrants consideration as potentially containing sensitive habitat.</td>
<td>Other than the recommended construction contract provisions for the exercise of care in all construction activities and the proper design and operation of ancillary facilities (e.g., construction camps and asphalt plants), no additional actions in the Pre-Construction Stage (e.g., design reconsiderations) to mitigate potential impacts to sensitive habitats and protected areas are considered warranted. This finding will be re-assessed, however, upon the completion of the recommended biological surveys.</td>
</tr>
<tr>
<td><strong>Construction Stage.</strong> Impacts to sensitive habitats could occur in the Construction Stage due to careless construction techniques, improper disposal of liquid or solid waste and improper land uses.</td>
<td>Other than strict enforcement of recommended construction contract provisions for the exercise of care all construction activities and the proper design and operation of ancillary facilities (e.g., construction camps and asphalt plants) no additional actions in the Pre-Construction Stage (e.g., design reconsiderations) to mitigate potential impacts to sensitive habitats and protected areas are considered warranted. This finding will be re-assessed, however, upon the completion of the recommended biological surveys.</td>
</tr>
<tr>
<td><strong>Post-Construction/Operational Stage.</strong> Impacts to sensitive habitats could occur in the Post-</td>
<td>Other than proper stewardship of the land with oversight from the concerned land use control agencies, no additional mitigation to</td>
</tr>
</tbody>
</table>
Construction/Operational Stage due to careless or improper disposal of liquid or solid waste and improper land uses. mitigate potential impacts to sensitive habitats and protected areas are considered warranted. This finding will be re-assessed, however, upon the completion of the recommended biological surveys.

END NOTES


2 Draft Environmental Impact Assessment for the Almati-Kordai-Blagoveschenka-Merke-Tashkent-Termez Section (162 to 260 km), Proposed Multitranche Financing Facility for the CAREC Transport Corridor 1 (Zhambyl Oblast) in Kazakhstan, April 2010 (2nd Draft EIA).

3 MoTC IEE for Tranche 4, Dec 2010.


8 Records from former Soviet Meteorological Service Goss Stroy SSSR

9 Environmental Performance Reviews, United Nations Economic Commission for Europe, Committee on Environmental Policy, 2008 http://www.unece.org/env/epr/epr_studies/kazakhstan%20II.pdf

10 Summary Environmental Impact Assessment, Kazakhstan: Multi-Tranche Financing Facility for the CAREC Transport Corridor 1 (Zhambyl Oblast Section) Investment Program, Tranche 2, May 2009

11 EIA developed by GaoData Plus LLC pursuant to Kazakh Legislation in December, 2008.

12 The GOK standard is significantly less stringent than internationally accepted lead levels that may affect human health.

13 Национальный атлас РК


22 Food and Agriculture Organization of the United Nations, Fisheries and Aquaculture Department, http://www.fao.org/fishery/countrysector/Fl-CP_KZ/en


E. SOCIOECONOMIC BASELINE, IMPACTS & RECOMMENDED MITIGATION
ORGANIZATION OF PART E

1. The Terms of Reference (TOR) for its preparation (attached hereto as Appendix 1), stipulate that Part E of the IEE will be presented in four sections as follows:

- Social and Economic Resources (Item 1.0);
- Noise and Vibration (Item 2.0);
- Economic Assessment (Item 3.0); and
- Cumulative Impacts (Item 4.0).

2. Also in accordance with the TOR (and with the additional of a subsection addressing the Pre-Construction/Design Stage), each section presents:

- Baseline Conditions;
- Potential Impacts due to Design/Pre-Construction Decisions;
- Potential Impacts During Construction;
- Potential Impacts during Operations; and
- Mitigation Measures & Monitoring Recommendations

1.0 SOCIAL AND ECONOMIC RESOURCES

1.1 Economic Resources

1.1.1 Agricultural & Industrial Resources

3. **Baseline.** Resources in the major sectors of the economy (agriculture, industries and services) in Zhambyl Oblast include its mineral deposits and areas suitable for agricultural production - both crop production and the raising of livestock. The area’s existing infrastructure is also a significant resource and is discussed below. In total in 2009, Zhambyl oblast numbered 344 industrial enterprises. At the Oblast level, industrial output of the manufacturing industry is about 77.2 percent (2009) *(Exhibit E-1)*. This includes Novozhambyl Phosphorous Plant (production of phosphorous, phosphoric acid), Fertilizer Plant (phosphate-nitrogen fertilizer, superphosphate), Taraz Metallurgy Plant (ferrous alloys, anode paste). The Taraz Metallurgy Plant also produces slag crushed stone and slag sand for road construction in accordance with GOST 3344-83. Other industrial production includes electricity and natural gas at 17.2 percent, and other mining at 5.6 percent. No industries are reported in the immediate Project Area.

### PRODUCTION, INVESTMENT & TRANSPORT - ZHAMBYL OBLAST (2009) EXHIBIT E-1

*(Millions of Tenge unless otherwise noted)*

<table>
<thead>
<tr>
<th>Industrial Production</th>
<th>Total Agricultural Production</th>
<th>Crop Production</th>
<th>Livestock Farming Production</th>
<th>Volume of Provided Services</th>
<th>Capital Investments</th>
<th>Turnover of Cargo Transport (mil. Tonne-km)</th>
<th>Turnover of passenger Transport (mil. Tonne-km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>115,612.0</td>
<td>68,463.1</td>
<td>34,925.5</td>
<td>33,553.6</td>
<td>19,480.7</td>
<td>222,800</td>
<td>1,654.6</td>
<td>3639.5</td>
</tr>
</tbody>
</table>

*Source: Department of Statistics of Jambyl Oblast, accessed in January 2011 (http://www.zhambyl.stat.kz)*

4. Dryland farming, livestock raising, market garden and orchard farms near the mountains support more than half (55 percent) of Oblast population in rural agricultural area,
Agricultural production consists of approximately 362 agro-industrial enterprises, 12,196 farms, and 166,787 small scale private farms, which all roughly provide six percent of all agricultural production of the country, including wheat, various vegetables and fruit, meat and meat products, dairy and dairy products. Recently under the Government Program for Industrial and Innovation Development, the new large-capacity meat processing and tinning factory has been opened in Merke. The apiculture industry is also represented in the area as reflected in the large amount of roadside honey sales. Zhambyl Oblast is rich in mineral resources such as phosphates and fluor spar. 71.9 % of commercial phosphate reserves of the Kazakhstan, 68 % of fluor spar, 8.8 % of gold, 3 % of copper and 0.7 % of uranium are concentrated within the territory of the Oblast. The Province also has natural gas fields, about 10% of the total reserves of Kazakhstan. Potential lead-zinc sources were recently discovered in Chu-Illiskye region.

5. Economic resources in the immediate vicinity of the Project Area are primarily those that support dryland farming, an irrigation network and the grazing potential of the area's pasturelands. No minerals are known to be exploited in the immediate Project Area. The nearest quarries exploited for construction materials are located at conservative distances to the northeast and southwest of the Project Road. No industries or food processing facilities are known to exist in the Project Area.

6. **Potential Impacts and Recommended Mitigation.** Potential impacts to economic resources are assessed and actions to mitigate them are recommended as follows:

<table>
<thead>
<tr>
<th>Potential Impact</th>
<th>Recommended Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Agricultural &amp; Industrial Resources</strong></td>
<td><strong>Agricultural &amp; Industrial Resources</strong></td>
</tr>
<tr>
<td><strong>Pre-Construction Stage:</strong> The location of the proposed road ROW has the potential to benefit the selected areas and, by implication, to withhold such benefits from other areas. No adverse impacts on natural resources or industries requiring mitigation due to decisions taken in the establishment of the Project Location, are anticipated other than those considered unavoidable.</td>
<td>The need to mitigate impacts to agricultural activities, industries, service sector activities and existing roadside uses have been addressed in the Pre-Construction Stage and it anticipated that it will be by a Land Acquisition and Resettlement Report.</td>
</tr>
<tr>
<td>No adverse impacts to natural resources or industries are anticipated due to decisions taken in the Project Design Stage. Potential impacts due to the transport of natural resources from quarries are significant, however. Consideration has been given to potential impacts on:</td>
<td></td>
</tr>
<tr>
<td>- Agricultural uses,</td>
<td></td>
</tr>
<tr>
<td>- Industries,</td>
<td></td>
</tr>
<tr>
<td>- Service sector activities and</td>
<td></td>
</tr>
<tr>
<td>- Existing roadside uses.</td>
<td></td>
</tr>
<tr>
<td>Approximately 177 hectares (ha) of lands will be acquired, out of which about 175 ha are agricultural lands and 0.13 ha are used for commercial purposes. The Project will also need to acquire 60.8 ha of reserved public lands, which are idle or occasionally used as natural pasture land by some villages, and lands of state enterprises. Administration of these lands will be transferred from village authority to the Zhambyl Oblast Roads Department. The transfer of these lands is not expected to adversely affect third party.</td>
<td></td>
</tr>
<tr>
<td><strong>Construction Stage:</strong> Economic impacts during the Construction Stage will include the expenditure of a portion of the construction budget in the local area for the purchase of goods and services. In addition to the direct impact of these expenditures, indirect economic activity will occur due to the &quot;multiplier effect&quot; due to re-spending. Disruption of roadside economic activities at the two terminal points will also occur in the Construction Stage.</td>
<td>Impacts to natural resources and industries can be mitigated by the exercise of proper care during the construction process.</td>
</tr>
</tbody>
</table>
Because of the relatively low density of the area traversed by the ROW, the potential impacts of delays and detours generally associated with road construction projects will be relatively slight.

**Post-Construction/Operational Stage.** Natural resources in the Project Area will be more accessible in the Post-Construction/Operational Stage of the project and area industries and economic activities will benefit due to increased accessibility and mobility.

No actions to mitigate impacts to natural resources and industries in the Post-Construction/Operational Stage are considered warranted.

1.1.2 Transport Infrastructure Resources

7. **Baseline.** The Project Road's regional transport infrastructure is illustrated by Exhibit E-2.

8. The highway in which the Project Road is a link is the major element within the regional transport system. The main railroad line links Almaty and Taraz and is roughly parallel to the MFF Improvement Corridor linking the same two cities (and beyond) at a distance ranging from approximately 40 to 65 kilometers north of the Project Road. Reports indicate that most large volumes of dry goods are shipped by rail. The most significant railway depots in proximity to the Project Area are located in Merke (approximately 40 kilometers by road southwest western terminus of the Project Road) and Chu (approximately 45 kilometers northwest of the eastern terminus of the Project Road via the Blagoveschenka-Chu Road. The closest international airports are the Manas International Airport located approximately 25 kilometers north of those Bishkek (Kyrgyz Republic) and reachable through Kordai (assuming no border complications) and the Almaty International Airport approximately 280 kilometers to the east-northeast. A domestic airport is located in Taraz approximately 160 kilometers to the west. No significant waterborne transport is known to be active in the Region.

9. In addition to the Project Road, the most significant transport features in the immediate Project Area are those illustrated by Exhibit E-3. They are:
Kamishanovka Road (Junctions 1 & 2). The Kamishanovka Road leads to (and beyond) the village of Kamishanovka in the Kyrgyz Republic. It is reported to be an asphalt road and will join the realigned Project Road at km 268.3

Aksu Road (Junction 3). The Asku Road which provides access to the settlement of Asku and another unnamed settlement approximately north of the Project Road intersects the Project Road at km 276.

A T-Junction (Junction 4) at km 292.79 leading south toward the village of Stepnoe (Krygyz Republic)

A Crossroad (Junctions 5 & 6) leading to the village of Stepnoe (Krygyz Republic) to the south and areas to the north in Kazakhstan intersecting the Project Road at approximately km 296.79

A Crossroad (Junctions 7 & 8) which intersects the Project Road at approximately km 299.9.

A T-junction (Junction 9) which provides access to the south at the Kyrgyz border.

10. Potential Impacts and Recommended Mitigation. Potential impacts to transport infrastructure resources are assessed and actions to mitigate them are recommended as follows:
Potential Impact
Transport Infrastructure Resources

Pre-Construction Stage. The location of the proposed ROW is essentially pre-determined by the area's road network.

No significant adverse impacts on the area's transport network are anticipated due to the Project Location or Project Design, but the following are noted as requiring attention:

- Additional and more detailed plans are needed in regard to staging, provisions for interim river crossings during bridge removal and construction, etc.
- The existing roadways will continue to carry traffic during construction and will present significant safety challenges that should be anticipated in the Pre-Construction Stage.

Construction Stage. Reconstruction will require detours and significant traffic delays.

Impacts could also occur due to the transport of construction materials, especially gravel, sand and related construction materials and the transport of asphalt.

Post-Construction/Operational Stage. No adverse impacts to the area transport infrastructure are anticipated in the Operational Period.

Recommended Mitigation
Transport Infrastructure Resources

No reconsideration of the Project Location or the Project Design to mitigate adverse impacts to the area transport network is considered warranted. However, the development of more detailed plans ensuring the safety of the proposed road with is recommended.

To that end, the COPA for the Project recommends a very specific and detailed set of requirements in regard to general traffic management, traffic control, safety provisions that apply to temporary traffic ramps, vertical clearance, signage, temporary fencing, warning lights and other details. (Appendix 2: Recommended Conditions of Particular Application: Environmental Provisions)

Potential adverse impacts to the area transport network and safety in the Construction Period can be mitigated by due diligence and strict enforcement of the contract provisions referenced above and presented in detail in Appendix 2: Recommended Conditions of Particular Application: Environmental Provisions

Other than the enforcement of traffic laws, no mitigation of impacts to the area transport network in the Operation Period is considered warranted.

1.1.3. Water Supply & Irrigation Systems

11. Baseline. Baseline conditions in regard to water supply, wastewater treatment and irrigation facilities are reported as follows:

12. Water Supply. Most (58%) of population in the Zhambyl Oblast (basically those living in the larger urban settlements) is provided with the centralized water supply, 39% of population use water from the decentralized water sources (water-supply wells, springs) and the remaining part of the inhabitants takes water from the open water bodies or use water delivered to the region. The Project documentation indicates that potable water for construction camps will be drawn from the following sources:

- Existing underground well at km 318+465;
- Existing underground well at km 318+959;
- Existing underground well at km 328+548
- Merke water supply system; and
- The village of Zhanaturmys.

Non-potable water used for construction purposes will be derived from:

- Chu River at km 262+370
- Aksu River channel at km 277+591
- Karabalta River at km 282+210

13. According to information obtained from the oblast Akimat, there are large amounts of underground water resources available for the local water supply, but not all of them have been put into production. In addition, the local authorities include in these balances slightly saline waters that could still be used for various domestic and industrial purposes.

14. Irrigation Systems. Due to the area's limited rainfall, agricultural production in southern Kazakhstan relies heavily on the use of irrigation systems with water supplies derived from snow melts in the mountains. The current Project documentation does not
provide information in regard to existing systems, but does indicate that the Project will include "establishment of new 36 pipes (and the) rehabilitation of six pipes".2

15. Potential Impacts and Recommended Mitigation. Potential impacts to potable water supply and irrigation facilities are assessed and actions to mitigate them are recommended as follows:

<table>
<thead>
<tr>
<th>Potential Impact Water Supply &amp; Irrigation Systems</th>
<th>Recommended Mitigation Water Supply &amp; Irrigation Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Construction Stage.</strong> Plans to derive potable water from existing wells and water supply systems could impact the current users of those systems. Likewise, plans to derive water from area rivers for construction purposes could adversely impact the water bodies and other users. The current Project Documentation should be augmented with additional information in regard to irrigation systems and reassurances that water demands related to the Project will not adversely affect those dependent on irrigation.</td>
<td>To mitigate potential impacts to water supply and irrigation systems, it is recommended that before the completion of the Pre-Construction Related to Water Supply. Documentation is needed to ensure that the water demands of the Project will not affect other users. Estimates of safe withdrawal rates should be provided and compared to the projected aggregate demands. Related to Protection of Irrigation Systems. In addition to the supply issues noted above, it is recommended that bid and contract documents state that in order to avoid potential adverse impacts to irrigation systems, the Contractor shall ensure irrigation channels diverted during the construction phase will be returned to their original status. Where this is not possible, or where channels are irrevocably altered, consultation will be held with landowners to ensure that an adequate redesign is undertaken to ensure that irrigation channels are returned as closely as possible to their former layout. The Contractor will undertake all necessary works to achieve this status, including provision of labor.</td>
</tr>
<tr>
<td><strong>Construction Stage.</strong> Impacts to water supply systems could occur due to excess demands. Impacts to irrigation systems could occur due to inaccuracies in data used for planning purposes, accidents or other unforeseen events.</td>
<td>Water withdrawal rates should be monitored during the construction purposes as a responsibility of the CSC. The conditions presented by Appendix 2 in regard to protection of irrigation infrastructure will require extensive coordination with the concerned agencies. Potential adverse impacts to both water supply and irrigation systems in the Construction Period can be mitigated by due diligence and strict enforcement of the contract provisions outlined therein.</td>
</tr>
<tr>
<td><strong>Post-Construction/Operational Stage:</strong></td>
<td>To mitigate potential impacts extending into the Post-Construction/Operational Stage, contracts stipulated that one year into the operating period a final inspection is required and contractor’s final payment is released only after a fully compliant audit is recorded. The audit should include verification that any impacts to infrastructure are part of the final inspection process and a final payment is not made until outstanding issues are resolved. Other than the enforcement of applicable laws, no mitigation of impacts to the area infrastructure networks in the Operation Period is considered warranted.</td>
</tr>
</tbody>
</table>

1.1.4 Wastewater & Solid Waste Disposal

16. Baseline. Baseline conditions in regard to wastewater and solid waste disposal are reported as follows:

17. Wastewater. Four towns and two urban villages in the Oblast have centralized sewage systems. Public buildings and industries in Merke, the urban settlement closest to the Project Area, are reported to rely on the use of pit latrines. Public buildings and industrial complexes In Kulan, the next closest urban settlement, are reportedly connected to a centralized sewage treatment system.3 All of the area traversed by the Project Road, and the vast majority of Oblast as a whole, rely on sewage treatment via pit privies and septic tanks, with much of the waste being disposed of manually after cleaning of the privy storage tanks. Sewage is usually buried as there is no tradition of using these materials as fertilizer.

18. Solid Waste Disposal. Each town is reported to have an organization under the Rayon Akimat which is responsible for collection and disposal of solid waste. None of these organizations extend solid waste collection services to the vicinity of the Project Road.
19. **Potential Impacts and Recommended Mitigation.** Potential impacts associated with wastewater and solid waste disposal are assessed and actions to mitigate them are recommended as follows:

<table>
<thead>
<tr>
<th>Potential Impact Wastewater &amp; Solid Waste Disposal</th>
<th>Recommended Mitigation Wastewater &amp; Solid Waste Disposal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Construction Stage:</strong> Decisions made in the Pre-Construction Stage in regard to the sites and conditions (or lack of conditions) imposed on waste-generating aspects of the Project such as construction camps, and the disposal of solid waste generated by the Project will have a significant effect on the impacts of the Project. In addition to the solid waste usually generated by road construction projects, demolition of existing bridges will result in a large volume of materials requiring disposal. No planned disposal sites have been made known.</td>
<td>Sites for the disposal of large volumes waste should be determined in the Pre-construction Stage. As detailed in Appendix 2, specific contract provisions are recommended to ensure that construction camps and other potential sources of secondary impacts are properly sited and provided with drainage and wastewater facilities. The following provisions are recommended in regard to:</td>
</tr>
<tr>
<td><strong>- Construction Camp Wastewater Disposal and Site Drainage Systems.</strong> The following conditions shall apply:</td>
<td>• <strong>Construction Camp Wastewater Disposal and Site Drainage Systems.</strong> The following conditions shall apply:</td>
</tr>
<tr>
<td>Explanations of Proposed Site Drainage Systems. Locations likely to be subject to water quality impacts or significant runoff (construction camps, staging areas, etc.) and an explanation of the proposed site drainage system shall be indicated on the CEAP site plans.</td>
<td>- <strong>Explanations of Proposed Site Drainage Systems.</strong> Locations likely to be subject to water quality impacts or significant runoff (construction camps, staging areas, etc.) and an explanation of the proposed site drainage system shall be indicated on the CEAP site plans.</td>
</tr>
<tr>
<td>Wastewater. Wastewater arising on the site shall be collected, removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance. The site plan required by CEAPs shall indicate the system proposed and the locations of related facilities in the site, including latrines, holding areas, etc. There shall be no direct discharge of sanitary or wash water to surface water. Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies shall be prohibited. Liquid material storage containment areas shall not drain directly to surface water. Liquid material storage containment areas equipped with drains shall be valved, and the valve shall be maintained locked in the closed position with supervisory control of the key. Lubricating and fuel oil spills shall be cleaned up immediately and spill clean-up shall be materials be maintained at the storage area.</td>
<td>- <strong>Wastewater.</strong> Wastewater arising on the site shall be collected, removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance. The site plan required by CEAPs shall indicate the system proposed and the locations of related facilities in the site, including latrines, holding areas, etc. There shall be no direct discharge of sanitary or wash water to surface water. Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies shall be prohibited. Liquid material storage containment areas shall not drain directly to surface water. Liquid material storage containment areas equipped with drains shall be valved, and the valve shall be maintained locked in the closed position with supervisory control of the key. Lubricating and fuel oil spills shall be cleaned up immediately and spill clean-up shall be materials be maintained at the storage area.</td>
</tr>
<tr>
<td>Drainage. The site plan shall be devised to ensure that rain run-off from the construction sites is not deposited directly into any watercourse, stream, or canal and shall indicate the system proposed, including the locations of retention ponds and other facilities. There shall be no direct discharge of sanitary wastewater, wash water, chemicals, spoil, waste oil or solid waste to surface water bodies. Fuel, lubricating oil and chemical spills shall be contained and cleaned-up immediately. Spill clean up equipment will be maintained on site.</td>
<td>- <strong>Drainage.</strong> The site plan shall be devised to ensure that rain run-off from the construction sites is not deposited directly into any watercourse, stream, or canal and shall indicate the system proposed, including the locations of retention ponds and other facilities. There shall be no direct discharge of sanitary wastewater, wash water, chemicals, spoil, waste oil or solid waste to surface water bodies. Fuel, lubricating oil and chemical spills shall be contained and cleaned-up immediately. Spill clean up equipment will be maintained on site.</td>
</tr>
<tr>
<td>Locations of Fueling Operations and Liquid and Toxic Material Storage Areas. The site plans shall specify the locations for the storage of liquid materials and toxic materials. The following conditions to avoid adverse impacts due to improper fuel and chemical storage.</td>
<td>• <strong>Locations of Fueling Operations and Liquid and Toxic Material Storage Areas.</strong> The site plans shall specify the locations for the storage of liquid materials and toxic materials. The following conditions to avoid adverse impacts due to improper fuel and chemical storage.</td>
</tr>
<tr>
<td>Fueling operations shall occur only within containment areas.</td>
<td>- <strong>Fueling operations shall occur only within containment areas.</strong></td>
</tr>
<tr>
<td>All fuel and chemical storage (if any) shall be sited on an impervious base within a bund and secured by fencing. The storage area shall be located away from any watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks.</td>
<td>- <strong>All fuel and chemical storage (if any) shall be sited on an impervious base within a bund and secured by fencing. The storage area shall be located away from any watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks.</strong></td>
</tr>
<tr>
<td>Filling and refueling shall be strictly controlled and subject to formal procedures and will take place within areas surrounded by bunds to contain spills / leaks of potentially contaminating liquids.</td>
<td>- <strong>Filling and refueling shall be strictly controlled and subject to formal procedures and will take place within areas surrounded by bunds to contain spills / leaks of potentially contaminating liquids.</strong></td>
</tr>
<tr>
<td>All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.</td>
<td>- <strong>All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.</strong></td>
</tr>
</tbody>
</table>
| The contents of any tank or drum shall be clearly marked. Measures shall be taken to ensure that no contaminated discharges enter any drain or watercourses. | - **The contents of any tank or drum shall be clearly marked. Measures shall be taken to ensure that no contaminated discharges enter any drain or watercourses.**
Disposal of lubricating oil and other potentially hazardous liquids onto the ground or water bodies will be prohibited. Should any accidental spills occur immediate clean up will be undertaken and all cleanup materials stored in a secure area for disposal to a site authorized to dispose of hazardous waste. Locations Relative to Watercourses. The site plans shall be devised to ensure that, insofar as possible, all temporary construction facilities are locate at least 50 meters away from a water course, stream, or canal.

Related mitigation actions are also recommended to apply as detailed by Appendix 2.

Construction Stage. Hydrological impacts could occur in the Construction Stage due to a failure to properly plan or implement the safe guards required by the CEAP or because of unanticipated circumstances or accidents.

Mitigation action of potential hydrological impacts during construction will require strict application of all conditions to the review of the CEAP by the CSC prior to approval and strict supervision during the course of the work. Unannounced site inspections are identified as a routine part of supervision activities. Weekly and monthly reporting systems are also recommended as detailed in Appendix 2.

Post-Construction/Operational Stage. Impacts to hydrology could extend into the Post-Construction/Operational Stage due to improper discharges from site facilities or because of unanticipated circumstances or accidents.

To mitigate potential impacts extending into the Post-Construction/Operational Stage, contracts stipulated that one year into the operating period a final inspection is required and contractor's final payment is released only after a fully compliant audit is recorded. Potential hydrological issues may require additional instrumented monitoring and appropriate provisions have been incorporated in the recommended COPA presented in Appendix 2. Any impacts to hydrology and water quality are part of the final inspection process and final payments can not be made until outstanding issues are resolved.

1.1.5 Electrical Power, Pipelines & Other Utilities

20. Baseline. Power supplied from the grid provides a reasonably steady supply to the villages and towns in the Project Area. Existing electricity lines of 110 kW cross the Project Road at km 272+397 with a minimum high of 7.22 m that correspond with requirements of local standards (SNiP). Therefore rehabilitation of electricity lines will not be required.

21. Potential Impacts and Recommended Mitigation. Potential impacts related to electrical power, pipelines and other utilities are assessed and actions to mitigate them are recommended as follows:

<table>
<thead>
<tr>
<th>Potential Impact - Electrical Power, Pipelines &amp; Other Utilities</th>
<th>Recommended Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Construction Stage.</strong> Impacts to other infrastructure (i.e., other than transport infrastructure) includes potential impacts to irrigation systems and utilities (such as electricity and pipelines). Networks are indicated by maps of the area and preliminary designs. Potential adverse impacts to these facilities in the subsequent stages of the work can be avoided by ensuring complete documentation and by anticipating circumstances that are bound to arise in the construction process.</td>
<td>To avoid potential adverse impacts to utilities, Appendix 2: Recommended Conditions of Particular Application: Environmental Provisions presents a detailed set of provisions. Potential adverse impacts to other area infrastructure can be mitigated by due diligence and strict enforcement of the contract provisions</td>
</tr>
<tr>
<td><strong>Construction Stage.</strong> Impacts to other area infrastructure could occur do to inaccuracies in data used for planning purposes, accidents of other unforeseen events.</td>
<td>The conditions presented by Appendix 2 in regard to protection of infrastructure require extensive coordination with the concerned agencies. Potential adverse impacts to the area infrastructure networks in the Construction Period can be mitigated by due diligence and strict enforcement of the contract provisions outlined therein.</td>
</tr>
<tr>
<td><strong>Post-Construction/Operational Stage:</strong></td>
<td>To mitigate potential impacts extending into the Post-Construction/Operational Stage, contracts stipulated that one year into the operating period a final inspection is required and contractor’s final payment is released only after a fully compliant audit is recorded. The audit should include verification that any impacts to infrastructure are part of the final inspection process and a final payment is not made until outstanding issues are resolved. Other than the enforcement of applicable laws, no mitigation of impacts to the area infrastructure networks in the Operation Period is considered warranted.</td>
</tr>
</tbody>
</table>
1.2 Social Characteristics & Resources

1.2.1 Land Uses and Displacement Issues

22. **Baseline.** Land uses along the Project Road are dominated by agriculture; mostly grazing (cattle, sheep, goats and herding of horses) and dry cash crops such as wheat and corn. Farm crops are mainly fodder plants, wheat and maize. Almost all homesteads in the rural areas have small horticulture gardens for growing common vegetables for self consumption. Some level of irrigated farming exists in the area as evidenced by the fact that the Project includes plans to rehabilitate 36 irrigation pipes and add an additional six.

Although no documentation of the number residing in the Project Area is currently available for review, Project documentation indicates that a total of 55 households and five legal entities will lose their lands as a result of the Project. Of these, seven long-term leaseholders, one short-term leaseholder, and one private land owner will lose more than ten percent of their productive lands. Approximately 177 hectares (ha) of lands will be acquired, out of which about 175 ha are agricultural lands and 0.13 ha are used for commercial purposes. Most of the affected lands are leased on a long-term 160.3 (49 years) basis; 16.1 ha, leased for 5–12 years; and 0.13 ha, privately owned. The Project will also need to acquire 60.8 ha of reserved public lands, which are idle or occasionally used as natural pasture land by some villages, and lands of state enterprises. Administration of these lands will be transferred from village authority to the Zhambyl Oblast Roads Department. The transfer of these lands is not expected to adversely affect third party.

23. **Potential Impacts and Recommended Mitigation.** Potential impacts related to prevailing land uses are assessed and actions to mitigate them are recommended as follows:

<table>
<thead>
<tr>
<th>Potential Impact Land Uses &amp; Displacement Issues</th>
<th>Recommended Mitigation Land Uses &amp; Displacement Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Construction Stage.</strong> Potential impacts to prevailing land uses need to be addressed in the Pre-Construction Stage so that adverse impacts can be avoided and beneficial impacts enhanced.</td>
<td>Impacts to prevailing land uses will be mitigated by protection of the networks that support them (including the transport and irrigation networks) that support them. Protection of the area's natural resources will also serve these ends.</td>
</tr>
<tr>
<td>No significant changes to the overall character and prevailing land uses are anticipated. Displacement will occur, however, as explained above.</td>
<td>As of this writing, displacement issues are currently being documented by the ADB and will be separately addressed.</td>
</tr>
<tr>
<td><strong>Construction Stage.</strong> Impacts to prevailing land uses like farming and grazing due to construction activities are minimized.</td>
<td>Mitigation of potential impacts to prevailing land uses during construction is provided by the provisions to protect air and water resources and the recommendations of the COPA in regard to traffic management, safety and emergency provisions in response to accidental hazardous spills of hazardous materials, etc.</td>
</tr>
<tr>
<td><strong>Post-Construction/Operational Stage.</strong> Post-Construction impacts could include changes to current land uses due to increased accessibility to the area.</td>
<td>The Final Inspection before turn-over of the Project should include verification that any impacts to prevailing land uses are part of the final inspection process and a final payment is not made until outstanding issues are resolved. Other than the enforcement of applicable laws, no mitigation of impacts to the area infrastructure networks in the Operation Period is considered warranted.</td>
</tr>
</tbody>
</table>

1.2.2 Demographic Characteristics

24. **Baseline.** The Project Area is within Zhambyl Oblast which had a reported 2009 population of 1.0221 million people (6.4 percent of the RoK) and a population density of about seven people to km². There are ten districts (rayons) in the Oblast, three cities (excluding Taraz) and more than 300 villages. The Project Area is contained within two of the Oblast's rayons: the Merke Rayon and the Chu Rayon. According to the 2009 Census the amount of urban population totals 39.6 percent and rural population - 60.4 percent.

25. The gender statistics shows an almost proportional balance between men and
women. 48.6 percent of the population are men and 51.4 percent are women. As for the birth rates, the statistics of Zhambyl Oblast show that the number of boys born per 100 girls is 103. More that 100 nationalities live in the region, the Kazakhs represents 71.4 % of all population.  

26. Data on demographic situation of the Rayons the territory of which are crossed by project road sections is provided BY Exhibit E-4.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Merke Rayon</td>
<td>78,224</td>
<td>1,637</td>
<td>559</td>
<td>749</td>
<td>1010</td>
<td>44,139</td>
</tr>
<tr>
<td>Chu Rayon</td>
<td>95,021</td>
<td>2,121</td>
<td>777</td>
<td>500</td>
<td>1,353</td>
<td>51,876</td>
</tr>
</tbody>
</table>

Source: Department on Statistics of Dzhambyl Oblast

27. Potential Impacts and Recommended Mitigation. Potential impacts related to the Project Area's demographic characteristics are assessed and actions to mitigate them are recommended as follows:

<table>
<thead>
<tr>
<th>Potential Impact Demographic Characteristics</th>
<th>Recommended Mitigation Demographic Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Construction Stage.</strong> Impacts to the local population have been considered in the Pre-Construction Stage.</td>
<td>No changes to the Project Location or Project Design are considered warranted to potential demographic impacts.</td>
</tr>
<tr>
<td><strong>Construction Stage.</strong> Impacts to demographic characteristics of the population along the proposed ROW in the Construction Period will be significant. The Project documentation indicates that two construction camps will be located in the Project Area. Based on the experience of Tranche 2 they are likely to house a total population of 300-400 persons.</td>
<td>The influx temporary of population will be mitigated by the contract provisions recommended to govern the location and operation of construction camps as outlined above and presented in detail in Appendix 2. Large scale relocations of families are not anticipated. The contract recommendations include provisions to ensure that public health and safety are adequately taken into account, including specific provisions presented in detail in Appendix 2.</td>
</tr>
<tr>
<td><strong>Post-Construction/Operational Stage.</strong> Significant retention of temporary construction workers in the Project Area is not anticipated in the Post-Construction/Operational Stage of the Project.</td>
<td>Assuming that the recommended contract provisions are put in place, no adverse impacts to conditions are anticipated in the Post-Construction/Operational Stage of the Project and no mitigation action is considered warranted for this parameter in this stage.</td>
</tr>
</tbody>
</table>

1.2.3 Administrative Organization

28. Baseline. The Project Area is located in Zhambyl Oblast, one of 14 oblasts (provinces) into which Kazakhstan is divided. The oblasts are divided into rayons. Zhambyl Oblast consists of 10 rayons, the city of Taraz and 3 towns of Rayon importance – Karatau, Zhanatas and Chu. The road sections pass through the territory of two sub-units of Zhambyl Oblast – Chu and Merke Rayons.

29. The territory of Merke Rayon is 7,100 km². The administrative center of the rayon is located in Merke village. The rayon is subdivided into 14 village area and it includes 44 settlements. The territory of Chu Rayon is 4,300 km². Administrative center of the rayon is located in Chu village. The rayon is subdivided into 18 village area and it includes 1 town and 33 other settlements.

30. Each oblast and rayon and most urban settlements have their own elective councils, charged with drawing up a budget and supervising local taxation. The president appoints the heads of the local administrations (known by the Kazakh term akim) and has the power to override or revoke decisions taken by local councils; an akim has the power to control budgetary decisions and to appoint the members of his staff, who are the department heads.
of the jurisdiction. The akim also can reverse budgetary decisions of the local councils.

31. **Potential Impacts and Recommended Mitigation.** Potential impacts related to the Project Area’s administrative structure are assessed and actions to mitigate them are recommended as follows:

<table>
<thead>
<tr>
<th>Potential Impact Administrative Structure</th>
<th>Recommended Mitigation Administrative Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Construction Stage.</strong> Local officials have been informed and consulted in regard to the development of Project proposals, including issues of Project Location and Design. No impact to the current administrative structure is expected as a result of the proposed construction.</td>
<td>None warranted in regard to administrative organization in the Pre-Construction Stage.</td>
</tr>
<tr>
<td><strong>Construction Stage.</strong> The administrative structure of the Rayon and Oblast in which the Project is located will provide the framework for Grievance Resolution as described in detail in Part F. Impacts due to construction activities can be anticipated as a normal part of Project implementation.</td>
<td>Mitigation is required in the form of technical and clerical support to the Rayon and Oblast offices to ensure that Grievance Redress Mechanisms operate properly and efficiently.</td>
</tr>
<tr>
<td><strong>Post-Construction/Operational Stage.</strong> No adverse impacts to conditions are anticipated in the Post-Construction/Operational Stage of the Project.</td>
<td>No mitigation action is considered warranted for this parameter in the Post-Construction/Operational Stage.</td>
</tr>
</tbody>
</table>

### 1.2.4 Employment

32. **Baseline.** The leading economic drivers in the Zhambyl Oblast are mining, chemical and electric-power industries. The number of economically active people of Zhambyl Oblast is 577.1 thousand people including 286 thousand women and 225 thousand people living in urban area (about 40 %). The number of employed people in 2010 has increased to 539.2 thousand people, 48% of whom are hired workers and 52% of whom are self-employed people. The number of unemployed people amounts to 37.7 thousand people. The current level of unemployed in the region is 6.5%. The share of unemployed men made 41.9% (15.8 thousand people) and unemployed women is 58.1% (21.9 thousand people). The number of young people without work (in ages of 15-24 years) amounts to 6,130 people or 16.2%. The unemployment rate of young people is estimated as 6.3%. The number of economically inactive people (e.g., school pupils, students, householders, retirees and disable people) is 162.5 thousand people with rate of economically passive people equal to 22.0%. Statistical data on relevant to Project Area rayons is given in Exhibit E-5.

<table>
<thead>
<tr>
<th>EMPLOYMENT IN PROJECT AREA RAYONS EXHIBIT E-5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administrative Unit</td>
</tr>
<tr>
<td>---------------------</td>
</tr>
<tr>
<td>Merke Rayon</td>
</tr>
<tr>
<td>Chu Rayon</td>
</tr>
</tbody>
</table>

Source: Department on Statistics of Dzhambyl Oblast

33. **Potential Impacts and Recommended Mitigation.** Potential impacts related to the Project Area’s administrative structure are assessed and actions to mitigate them are recommended as follows:

<table>
<thead>
<tr>
<th>Potential Impact</th>
<th>Recommended Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Construction Stage.</strong> Calculations in the Pre-Construction Stage indicate that approximately 425 direct jobs will be created by the Project. Additional employment opportunities are likely to result from the “multiplier effect”, i.e., the creation of additional indirect jobs. Steps taken in the Pre-Construction Stage will determine issues such as gender equity in employment practices.</td>
<td>Mitigation of employment inequities can be achieved by actions taken in the Pre-Construction Stage.</td>
</tr>
</tbody>
</table>
### Construction Stage
Direct job creation will impact the Project Area beneficially due to increased demand for goods and services in the area and subsequent increases in employment in response thereto. No adverse impacts to employment conditions are anticipated in the Construction Stage of the Project and no mitigation action is considered warranted for this parameter in the Construction Stage.

### Post-Construction/Operational Stage
Some impacts to area employment characteristics can be expected in the Operational Period due to enhanced economic opportunities and greater efficiency in the transport sector. No adverse impacts to employment conditions are anticipated in the Post-Construction/Operational Stage of the Project and no mitigation action is considered warranted for this parameter in the Post-Construction/Operational Stage.

### 1.2.5 Ethnic & Vulnerable Groups

34. **Baseline.** Baseline conditions in regard to wastewater and solid waste disposal are reported as follows:

35. **Ethnic Groups.** Native Kazakhs, a mix of Turkic and Mongol nomadic tribes, migrated into the area now known as Kazakhstan region in the 13th century and remain the country’s largest ethnic group. The area was conquered by Russia in the 18th century. Kazakhstan became a Soviet Republic in 1936. During the 1950s and 1960s agricultural “Virgin Lands” program, Soviet citizens were encouraged to help cultivate Kazakhstan’s northern pastures. This influx of immigrants (mostly Russians, but also some other deported nationalities) altered the ethnic mixture and enabled non-Kazakhs to outnumber natives. Independence in 1991 caused many of these newcomers to emigrate. The 2009 Census reported Kazakhstan’s ethnic groups as follows:

- Kazakh 63.1%
- Uzbek 2.8%
- Uyghur 1.4%
- Russian 23.7%
- German 1.1%
- Other 4.5%
- Ukrainian 2.1%
- Tatar 1.3%
- Other nationalities 2.2%

36. **Census 2009 discloses the following data in regard to Zhambyl Oblast:**

- Kazakh (71.4%)  
- Turks (2.9%)  
- Azerbajianis (1.0%)  
- Kyrgyz (0.7%)  
- Russians (12.0%)  
- Uzbeks (2.4%)  
- Koreans (1.0%)  
- Ukrainians, Byelorussians (0.6%)  
- Dungan (4.2%)  
- Kurds (1.3%)  
- Tatars (0.9%)  
- German (0.4%)  
- Other nationalities (2.2%)

37. The population of the Oblast differs from the national averages with a larger percentage of Kazakhs and a significantly smaller number of Russians. Within the immediate vicinity of the Project, the resident population is extremely small and predominantly Kazakh.

38. **Religious Groups.** The Census of 2009 first time in the history reported Zhambyl Oblast religious composition:

- Muslim 85.5%
- Christian 13.5%
- Buddhism 0.1%
- Other 0.1%
- Judaism 0.0%
- Atheist 0.7%

39. **Vulnerable Groups.** The term “vulnerable groups” in the vernacular of the multi-lateral development banks and international financing organizations includes concepts such as “minorities” and “indigenous peoples” and is used to refer to all social groups with a social and cultural identity distinct from the dominant society that makes them vulnerable to being disadvantaged in the development process. The people so described have been traditionally marginalized and exploited. Indigenous or tribal peoples are commonly known to be among the poorest segments of a population. They traditionally engage in economic activities that range from shifting agriculture in or near forests to wage labor or even small-scale market-
oriented activities. The term "Indigenous Peoples" is defined by the ADB "to refer to a distinct, vulnerable, social and cultural group possessing the following characteristics in varying degrees:

- **Self-identification** as members of a distinct indigenous cultural group and recognition of this identity by others;
- **Collective attachment** to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories;
- **Customary cultural, economic, social, or political institutions** that are separate from those of the dominant society and culture; and
- **A distinct language**, often different from the official language of the country or region. In considering these characteristics, national legislation, customary law, and any international conventions to which the country is a party will be taken into account."

40. Kazakhstan families with an average per capita income below the poverty line (defined as 40 percent of the subsistence minimum) are considered vulnerable and are entitled to the Targeted Social Assistance (TSA) program of the government. As of June 2009, the official subsistence minimum in Kazakhstan was 13,393 KZT per capita. The poverty line therefore is 5,357.2 KZT per capita. TSA for each household is computed as follows: Household income – (poverty line x number of family members). In addition, there are State social benefits, financed from the central budget, that provide monetary transfers to citizens in need due to disability, loss of the family breadwinner, or old age. Local governments (Akimat) are mandated to identify poor and vulnerable households in their area.

41. A recent socio-economic survey of the area determined that "None of the ethnic groups in the project area maintain social and cultural identities separate from mainstream Kazakhstan society". Given the available data, the populations subject to impact do not appear to warrant categorization as indigenous peoples pursuant to the applicable regulations. The poverty situation in Zhambyl has continuously improved over the past years. However, poverty in the oblast is still among the highest in the country. In 2003, the percentage of people in the oblast with incomes below the subsistence minimum was recorded at 30 percent. As of 2009, the average per capita income per month in Zhambyl Oblast is 27,626 KZT, one of the lowest in the country. The rate of unemployment is also high. Half of those with income sources are self-employed, with majority relying on agriculture. Efforts were made during the census to identify poor and vulnerable households show they are absence within Project Area.

42. **Potential Impacts and Recommended Mitigation.** Potential impacts related to the Project Area’s ethnic and vulnerable groups are assessed and actions to mitigate them are recommended as follows:

<table>
<thead>
<tr>
<th>Potential Impact Ethnic and Vulnerable Groups</th>
<th>Recommended Mitigation Ethnic and Vulnerable Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Construction Stage</strong>. No impacts to ethnic or vulnerable groups are anticipated.</td>
<td>No additional mitigation action in regard to ethnic and vulnerable groups is considered warranted.</td>
</tr>
<tr>
<td><strong>Construction Stage.</strong> Unforeseen impacts to ethnic and vulnerable groups could occur.</td>
<td>Unforeseen impacts to ethnic or vulnerable groups will be mitigated through the Project’s Grievance Redress Mechanism (See Part F).</td>
</tr>
<tr>
<td><strong>Post-Construction/Operational Stage.</strong> No adverse impacts anticipated.</td>
<td>No adverse impacts to ethnic or vulnerable groups are anticipated in the Post-Construction/Operational Stage of the Project and no mitigation action is considered warranted for this parameter in the Post-Construction/Operational Stage.</td>
</tr>
</tbody>
</table>
1.2.6 Health Facilities and Public Health Issues

43. **Baseline.** Following its appointment as a member of the World Trade Organization (WTO), Kazakhstan has brought its local medical regulations in line with international standards. A program of reforming and development of public health has been approved by the Government. Its main measures include plans to increase public health expenditure to four percent of GDP by 2010\(^{10}\). In keeping with this national policy, the oblast and rayon level healthcare institutions are being restructured from being purely public to being semi-private institutions.

44. The closest medical facility to the proposed ROW is believed to be those located in Kordai.

45. **Potential Impacts and Recommended Mitigation.** Potential impacts related to the Project Area’s local health facilities and public health are assessed and actions to mitigate them are recommended as follows:

<table>
<thead>
<tr>
<th>Potential Impact: Health Facilities and Public Health Issues</th>
<th>Recommended Mitigation: Health Facilities and Public Health Issues</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Construction Stage.</strong> The fact that the Project could impact local health facilities and public health can been recognized as an issue requiring attention in the Pre-Construction Stage. Potential impacts could include the need to respond to emergencies, first aid needs, safety needs</td>
<td>Mitigation recommended includes the following provisions in regard to health care for Construction Workers:</td>
</tr>
<tr>
<td></td>
<td>Emergency Response Plan. An emergency response plan to deal with accidents and emergencies, including environmental/public health emergencies associated with hazardous material spills and similar events, shall be prepared for the approval of the CSC.</td>
</tr>
<tr>
<td></td>
<td>First Aid Base. A fully equipped first aid base shall be climatically controlled to maintain the temperature of the inside of the building at 20 degrees C. Arrangements for emergency medical services shall be made to the satisfaction of the CSC.</td>
</tr>
<tr>
<td></td>
<td>HIV-Aids Awareness Program. Details of the recommended HIV-Aids Awareness Program are presented in Appendix 2.</td>
</tr>
<tr>
<td></td>
<td>Related issues of Public Safety are discussed in Item 1.2.9 below.</td>
</tr>
<tr>
<td><strong>Construction Stage.</strong> Impacts to the local health facilities and public health in the Construction Period will be substantially reduced if the recommended provisions are adopted. Potential public health impacts include:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Demands due to accidents beyond the capacity of the Contractor to respond and requiring hospital attention.</td>
</tr>
<tr>
<td></td>
<td>• Introduction of new diseases into previously unexposed areas, especially sexually transmitted infections (STIs).</td>
</tr>
<tr>
<td></td>
<td>• Contamination of local water supplies if temporary labor camps and the water supply and wastewater disposal associated with them are not properly planned and managed.</td>
</tr>
<tr>
<td></td>
<td>• Air pollution. Construction activities can affect public health due to the levels of dust and other air-borne particulate matter resulting from the construction process.</td>
</tr>
<tr>
<td></td>
<td>• Noise issues with health consequences.</td>
</tr>
<tr>
<td></td>
<td>Mitigation due to potential Construction Stage impacts on Public Health include</td>
</tr>
<tr>
<td></td>
<td>• Development of coordinated emergency response plans with all concerned local officials.</td>
</tr>
<tr>
<td></td>
<td>• Implementation of the HIV-Aids Awareness Program presented in Appendix 2.</td>
</tr>
<tr>
<td></td>
<td>• Full enforcement of all provisions related to worker camps and other Project facilities as they have been outlined above and presented in detail in Appendix 2.</td>
</tr>
<tr>
<td></td>
<td>• Full enforcement of all provisions related to air quality as they have been outlined above and presented in detail in Appendix 2.</td>
</tr>
<tr>
<td></td>
<td>• Full enforcement of all provisions related to noise as they have been outlined above and presented in detail in Appendix 2.</td>
</tr>
<tr>
<td><strong>Post-Construction/Operational Stage.</strong> Impacts to the local health facilities and public health in the Operational Period could result from accidents.</td>
<td>Mitigation of potential impacts to local health facilities and public health in the Operational Period will require coordination with local officials.</td>
</tr>
</tbody>
</table>
1.2.7 Local Education Facilities and Amenities

46. **Baseline.** Primary and secondary education in Kazakhstan consists in three main educational phases:

- Primary education (forms 1-4),
- Basic general education (forms 5-9) and
- Senior level education (forms 10-11 or 12) divided into continued general education and professional education.

47. In Zhambyl Oblast, as in other regions of Kazakhstan, public secondary education is mandatory for all children under 18 years of age. According to National Statistical Agency, for January 2008, 99.6% of schools in Zhambyl oblast are computerized, 93 percent of schools connected to telephone land lines, and 88.2 percent of schools have access to internet. The colleges and universities are not free and charge substantial annual tuition fees. Zhambyl Oblast has 476 schools with 204.5 thousand students, 28 colleges with 24.1 thousand students, and 5 higher education institutes and universities with 37.3 thousand students. Most of higher education institutions are located in Taraz, and Karatau.11

48. No local education facilities or amenities are known to be located in the Project Area. The closest are believed to be located in Blagoveschenka, Kordai and other villages and settlements.

49. **Potential Impacts and Recommended Mitigation.** Potential impacts related to the Project Area's local education facilities and amenities are assessed and actions to mitigate them are recommended as follows:

<table>
<thead>
<tr>
<th>Potential Impact: Local Education Facilities and Amenities</th>
<th>Recommended Mitigation: Local Education Facilities and Amenities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Construction Stage.</strong> Surveys in the Pre-Construction Period indicate that no local educational facilities or amenities will be subject to impacts.</td>
<td>No mitigation actions are warranted.</td>
</tr>
<tr>
<td><strong>Construction Stage.</strong> Temporary construction workers are not expected to adversely affect local educational facilities or amenities.</td>
<td>No mitigation actions are warranted.</td>
</tr>
<tr>
<td><strong>Post-Construction/Operational Stage.</strong> No significant adverse impacts to local educational facilities or amenities are anticipated in the Post-Construction/Operational Stage.</td>
<td>No mitigation actions are warranted.</td>
</tr>
</tbody>
</table>

1.2.8 Cultural Resources

50. **Baseline.** The term “cultural heritage” refers to both physical cultural resources and traditions and customs passed down through the generations. Physical cultural resources generally inventoried by planning projects includes shrines, burial grounds, historic locations and other aspects of the physical environment and/or social perceptions that give special significance to places or objects, either natural (e.g., certain land forms or places where important events occurred or are commemorated) or man-made (e.g., historic buildings or mosques of special importance beyond their inherent importance as a community facility).

51. Zhambyl Oblast is one of the valuable historical places of the Republic of Kazakhstan. It has many historical and architectural monuments. Thirteen objects of historical and cultural importance were found during the archeological survey on the road section from km 260 to km 383, (i.e., an area larger than but including the Project Area. All of them are located out of road buffer zone (more that 200 meters). According to the Archeological Expertise they are placed at the distances from 210 m to 2.1 km.

52. **Potential Impacts and Recommended Mitigation.** Potential impacts related to the
Project Area's cultural heritage are assessed and actions to mitigate them are recommended as follows:

<table>
<thead>
<tr>
<th>Potential Impact Cultural Heritage</th>
<th>Recommended Mitigation Cultural Heritage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Construction Stage.</strong> Pre-Construction surveys of the potentially affected area indicated the locations of cultural resources. The Project Design was modified to avoid impact.</td>
<td>No additional modifications to the Project Location or Project Design are recommended.</td>
</tr>
</tbody>
</table>
| **Construction Stage.** Impacts to cultural resources could occur due to unexpected discoveries in the construction process. | To mitigate the potential impact to unexpected cultural resource discoveries, it is recommended that contract provisions state that: "In the event of unanticipated discoveries of cultural or historic artifacts (movable or immovable) in the course of the work, the Contractor shall take all necessary measures to protect the findings and shall notify the CSC and concerned Rayon and Oblast-level and central government levels representatives."
| **Post-Construction/Operational Stage.** No adverse impacts to cultural resources are anticipated in the Post-Construction/Operational Stage of the Project. | None warranted. |

### 1.2.9 PUBLIC SAFETY

53. **Baseline.** Most of the population living in rural village is employed in agriculture. Average family size in the two districts in which the Project is located is four people. Given the high incidence of poverty, relatively poor market situation, limited health and education facilities, it is concluded that the overall social well-being is not highly developed in rural areas. There is a special state program of bank loans for agricultural purposes. Although such financing facilities are available and accessible to everyone, rural people are often reluctant to lend money, be it for lack of confidence or because of high interest rates. There exists no insurance system for agricultural enterprises, and rural associations became less efficient after the collapse of the Soviet system.

54. The local police headmaster of Zhambyl oblast did not reveal any major problems associated with crimes (drugs, smuggling, trafficking), but indicated sporadic incidences of domestic violence and street fights.

55. No official records could be retrieved that would disclose specific gender issues, or type and frequency of any girl trafficking. Domestic violence against women seems a general problem, but no specific data were provided.

56. **Potential Impacts and Recommended Mitigation.** Potential impacts related to social well-being, crime rates and gender issues are assessed and actions to mitigate them are recommended as follows:

<table>
<thead>
<tr>
<th>Potential Impact Public Safety</th>
<th>Recommended Mitigation Public Safety</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Construction Stage.</strong> No significant existing issues of social public safety or crime have come to light in the Pre-Construction Stage.</td>
<td>Development of a Staging Plan including the establishment of clear policies for road closures, provisions for temporary crossings if water courses during bridge construction, etc., is recommended as part of the Pre-Construction Period.</td>
</tr>
<tr>
<td>Public safety has been considered in the Pre-Construction Stage as evidenced by the incorporation of underpasses for animals and farm equipment.</td>
<td>These aspects of the Project should be fully reviewed by and require the approval of the CSC prior to the start of construction.</td>
</tr>
<tr>
<td>Impacts of the Project will include road closures and detours that will give rise to public safety issues.</td>
<td></td>
</tr>
<tr>
<td><strong>Construction Stage.</strong> Impacts to social characteristics of the Project Area will occur due to the influx of workers into a sparsely populated area. Safety issues are inherent in any construction.</td>
<td>Safety issues during the construction period include, most notably, on-the-job safety issues and traffic management safety.</td>
</tr>
<tr>
<td>Worker safety programs are required by the Conditions of Particular Application as follows:</td>
<td></td>
</tr>
</tbody>
</table>
Safety Training Program. A Safety Training Program is required and shall consist of:

- **Initial Safety Induction Course.** All workmen shall be required to attend a safety induction course within their first week on Site.

- **Periodic Safety Training Courses.** Period safety course shall be conducted not less than once every six months. All Subcontractor employees will be required to participate in relevant training courses appropriate to the nature, scale and duration of the subcontract works. Training courses for all workmen on the Site and at all levels of supervision and management.

- **Safety Meetings.** Regular safety meetings will be conducted on a monthly basis and shall require attendance by the safety representatives of Subcontractors unless otherwise agreed by the CSC. The CSC will be notified of all safety meetings in advance. The minutes of all safety meetings will be taken and sent to the CSC within seven (7) days of the meeting.

- **Safety Inspections.** The Contractor shall regularly inspect, test and maintain all safety equipment, scaffolds, guardrails, working platforms, hoists, ladders and other means of access, lifting, lighting, signing and guarding equipment. Lights and signs shall be kept clear of obstructions and legible to read. Equipment, which is damaged, dirty, incorrectly positioned or not in working order, shall be repaired or replaced immediately.

- **Safety Equipment and Clothing.** Safety equipment and protective clothing are required to be available on the Site at all material times and measures for the effective enforcement of proper utilization and necessary replacement of such equipment and clothing, and all construction plant and equipment used on or around the Site shall be fitted with appropriate safety devices. These shall include but not be limited to:
  - Effective safety catches for crane hooks and other lifting devices, and
  - Functioning automatic warning devices and, where applicable, an up-to-date test certificate, for cranes and hoists.

- **Requirements for Sub-Contractors’ Safety Plans.** All subcontractors will be supplied with copies of the CEAP. Provisions will be incorporated into all sub-contracts to ensure the compliance with the CEAP at all tiers of the sub-contracting. All subcontractors will be required to appoint a safety representative who shall be available on the Site throughout the operational period of the respective sub-contract unless the Engineer’s approval to the contrary is given in writing. In the event of the CSC’s approval being given, the CSC, without prejudice to their other duties and responsibilities, shall ensure, as far as is practically possible, that employees of subcontractors of all tiers are conversant with appropriate parts of the CEAP.

- **Temporary Evacuations.** In the event that temporary evacuations are required due to safety or other considerations appropriate compensation will be provided.

<table>
<thead>
<tr>
<th>Post-Construction/Operational Stage.</th>
<th>No mitigation warranted other than enforcement of all applicable traffic and safety laws.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public safety impacts during the Post-Construction/Operational Stage will be those associated with all highway operations. No significant impacts to criminal incidents are anticipated.</td>
<td></td>
</tr>
</tbody>
</table>

2.0 Noise and Vibration

57. **Baseline.** Noise is traditionally defined as any unwanted sound. The concept of noise is, therefore, highly subjective. Existing noise conditions (and potential project-related impacts) might be considered an aspect physical environment (since it is a vibration phenomena physically transmitted through a medium such as air. Doing so allows the discussion to accompany other regulated environmental parameters such as air quality.
Alternatively, it may be considered an aspect of the social environment (since sound requires a recipient to be considered noise). Like many environmental criteria it is both. It is considered in this report under the heading of the Socioeconomic Environment at the behest of the TOR, Appendix 1.

58. In accordance with Order № 136 of March 24, 2005, maximum permissible ambient noise levels in residential areas as 55 decibels (dBA) during the day and 45 dBA at night. The standards are comparable to those of other countries such as Japan and the United States. The maximum permissible increase in noise levels for areas adjacent to dwelling houses, rest areas of districts, and group of dwelling houses, kindergarten areas, school areas, etc., for noise created by transport in Kazakhstan is 10 dBA.

59. In addition to establishing acceptable standards, noise levels are generally regulated with respect to sound levels at specific places referred to as "sensitive receptors" such as schools, hospitals or, in the absence of such facilities, at residential buildings or a given distance from the source of the noise. No sensitive receptors potentially affected by either construction noise or operational noise were observed or are known to exist in the Project Area. Nonetheless, the Project will generate construction noise potentially affecting workers on-site and traffic will generate road noise in the operational phase of the Project that could affect future land uses. No facilities sensitive to vibration such as may be generated during construction are located in the Project Area.

60. Potential Impacts and Recommended Mitigation. Potential impacts related to noise are assessed and actions to mitigate them are recommended as follows:

<table>
<thead>
<tr>
<th>Potential Impact Noise and Vibration</th>
<th>Recommended Mitigation Noise and Vibration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Construction Stage:</strong> Noise impacts could result due to decisions taken in the Pre-Construction Stage, e.g.,</td>
<td></td>
</tr>
<tr>
<td>• Alignment adjustments to avoid noise impacts on sensitive land uses are sometime required. In the case of the Project Road, field investigations and a review of the proposed alignment did not indicate the need for alignment adjustments to mitigate potential impacts.</td>
<td></td>
</tr>
<tr>
<td>• Incorporation of (or failure to incorporate) adequate noise provisions in the Project's bid and tender documents and contract specifications to apply in the Construction Period.</td>
<td></td>
</tr>
<tr>
<td>It should be noted that virtually no sensitive receptors (i.e., activities such as hospitals or schools) are located along the proposed ROW.</td>
<td></td>
</tr>
<tr>
<td>No re-alignments or similar actions are considered warranted to mitigate potential noise impacts.</td>
<td></td>
</tr>
<tr>
<td>Potential noise impacts could occur in the Construction Stage can be avoided/mitigated in the Pre-Construction Stage by ensuring that bid and contract documents specifying enforceable provisions in regard to:</td>
<td></td>
</tr>
<tr>
<td>• <strong>Source Controls</strong>, i.e., requirements that all exhaust systems will be maintained in good working order; properly designed engine enclosures and intake silencers will be employed; and regular equipment maintenance will be undertaken.</td>
<td></td>
</tr>
<tr>
<td>• <strong>Site Controls</strong>, i.e., requirements that stationary equipment will be placed as far from sensitive land uses as practical; selected to minimize objectionable noise impacts; and provided with shielding mechanisms where possible.</td>
<td></td>
</tr>
<tr>
<td>• <strong>Time and Activity Constraints</strong>, i.e., operations will be scheduled to coincide with periods when people would least likely be affected; work hours and work days will be limited to less noise-sensitive times. Hours-of-work will be approved by the site engineer having due regard for possible noise disturbance to the local residents or other activities. Construction activities will be strictly prohibited between 10 PM and 6 AM in the residential areas.</td>
<td></td>
</tr>
<tr>
<td>• <strong>Community Awareness</strong>, i.e., public notification of construction operations will incorporate noise considerations; methods to handle complaints will be specified. Sensitive receptors will be avoided as possible (i.e., aggregate crushers, operators, etc.). Disposal sites and haul routes will be coordinated with local officials.</td>
<td></td>
</tr>
<tr>
<td>• <strong>Baseline and Routine Noise Monitoring as Part of Construction Supervision</strong>, Pre-construction monitor of existing noise and vibration will be undertaken in conjunction with selected construction packages to provide a baseline for the measurement of impacts during the construction period. Routine monitoring will also be required in areas of high potential impact (pile-driving sites and areas of intensive noise-generating activities) during the life of the Project.</td>
<td></td>
</tr>
<tr>
<td>Specific recommendations in regard to baseline and routine monitoring are provided by Appendix 2: Recommended Conditions of Particular Application.</td>
<td></td>
</tr>
</tbody>
</table>
### Construction Stage

Jobsite noise levels can exceed acceptable standards and may require protective equipment in some instances.

Offsite noise and vibration impacts may occur. Typical noise levels associated with highway construction activities such as grading and clearing are generally in the range from 80-90 dBA. It is generally intermittent and depends on the type of operation, location and function of the equipment and the equipment usage cycle. It attenuates (decreases) quickly with distance. Potential construction related noise levels of 85-90 dBA at 18 meters from the source would be reduced to less than 62 dBA 700 meters from the source. Excavation noise levels, for example, assuming bulldozer and dump truck activity only, would yield a Leq of approximately 85 dBA at 18 meters. These noise levels would decrease by about three or four dBA with every doubling of distance and would be reduced to approximately 67 dBA at 100 meters. Vibration during the construction period will also be a significant consideration, particularly during pile-driving operations.

Given the absence of sensitive receptors in the Project Area, no significant off site noise impacts are anticipated.

Mitigation of noise impacts during the Construction Stage will be mitigated by enforcement of the contract provisions outlined above.

It will be the responsibility of the Contractor, properly supervised by the CSC, to ensure that the equipment used fulfills all applicable requirements, including acceptable noise standards.

It is recommended that in addition to the duties placed on the Contractor as spelled out in detail in Appendix 2, the CSC staff should be provided with hand-held noise monitors to spot-check noise levels on a routine basis during the course of the work.

In light of the lack of sensitive receptors along the ROW and the distances of receptors from the roadway, noise issues associated with the construction of the Project Road will be concerned with jobsite noise levels and worker safety.

### Post-Construction/Operational Stage

Sources of road noise during the Post-Construction/Operational Stage of road projects generally considered in the environmental assessment include factors such as vehicle noise, road noise, driver behavior, and related considerations. Such noise impacts will occur in the Project Area due to the introduction of vehicular traffic. Projected traffic volumes are such that significant adverse noise impacts are considered unlikely.

Estimated noise levels due to road use following construction warrant consideration of mitigation actions if the noise is likely to impact sensitive receivers for which noise levels may exceed the ambient noise standards.

As noted, field investigations included visual surveys for sensitive receivers within the potential noise impact areas. No sensitive receivers were noted in proximity to the proposed Project Road ROW. Projected traffic volumes are such that mitigation actions such as noise barriers, etc., are considered unwarranted.

### 3.0 ECONOMIC ASSESSMENT

61. The Road Section km 261.5-310.5, together with the other road segments comprising the MFF Improvement Program has been subjected to feasibility analysis, including calculations of internal economic and financial rates of return meeting or exceeding the minimum return conditions required by the financing organizations.

62. The economic activities to be affected by the Project include the transport activities the improved road infrastructure will support, as well as the farming and grazing activities that occur in the immediate vicinity of the road. The economic benefits resulting from the proposed project will include:

- Decreasing the vehicle operating cost and travel time costs due to better/improved road facility, reduced traffic congestion, uninterrupted and smooth traffic flow;
- Improved air quality in the Project Area as a result of less traffic jams and improved road condition due to upgrading of the existing road and construction of a new bypass for Kirgiz border;
- Decrease of detrimental effects on health resulting in decreasing the medical cost of the people;
- Increase in value of land along the new road alignment;
Improvement of the overall the commercial activities in the Project area resulting in economic uplift of the local people, thus contributing to regional poverty alleviation.

4.0 CUMULATIVE IMPACTS

4.1 Resulting in Combination with Other Projects or Foreseeable Actions

63. The KM 261.5-310.5 Road Section Project is part of a larger strategic approach to transport needs in Kazakhstan and the larger region of which it is a part. Its impacts must be viewed in conjunction with the other road improvement projects in which it is a link. The concept of Cumulative Impacts, however, goes beyond such strategic considerations and includes impacts on the environment that result when the effects of implementing the Project's activities and sub-projects are added to effects of other past, present and reasonably foreseeable future actions. Cumulative impacts are important because impacts of individual projects may be minor when considered in isolation, but significant when the projects are viewed collectively.

64. Other than the road improvements included in the MFF Program, no other development projects or programs potentially affecting the KM 261.5-310.5 Road Section Project Area have come to light.

4.2 Cumulative Impacts Inherent within the Project

65. Some of the above identified impacts can generate additive, multiplicative and/ synergetic effects and create damage to ecological functions at large local scale, be it on landscape integrity, ecosystems, life cycles of affected terrestrial and aquatic animals, and subsequently affect economic conditions and development. However, due to its moderate dimensions this Project is unlikely to result in major spill-over effects as it does not involve resettlement or large shifts of environmental assets. This Project is (i) rather short in length, (ii) prevailing a rehabilitation work of an existing road, with few kilometers of new bypass construction in uninhabited, unstructured steppe and agricultural lands. Most anticipated construction-related impacts are short-termed and moderate, and they are believed to be manageable as long as the prescribed mitigation measures are followed.

66. Nonetheless, residual impacts may pertain, some of which having a cumulative potential. They are summarized as follows:

- **Curbing Accident Rates.** The proposed actions, warning systems, training and awareness programs aiming at decreasing the current road accident rates will have multifold beneficial consequences, being noted in the medical costs, insurance costs, expenditures on rescue operations, environmental compensation costs, easing individual suffering and human losses. The proposed animal underpasses, in junction with adequate roadside fencing, will substantially reduce accident risks caused by collisions with livestock and wild animals.

- **Deterioration of Ambient Air Quality.** With increasing traffic volume and expanding economic opportunities it is assumed that additional development may be attracted to the area, potentially affecting the general air quality and certain habitats in specific (such as roadside plantations and their intrinsic ecological functions). The Project, together with others in the area, road rehabilitation may induce potential development of new industries may also attribute to further deterioration of the local air quality, requiring more fossil fuels to be burnt and thereby releasing more pollutants into the air.

- **Exacerbation of Soil Contamination Issues.** Contaminated embankment soils, excavated for widening bear the risk to be contaminated with lead and other heavy metals, and their inappropriate storage/disposal could lead to a cascade of impacts. These could start with
few health-related problems, then contamination of locally-grown food items exposed to lead in soil, leading to reduction in mental capacity in children who live within 150 m. However, given the local settling patterns in this road corridor, and with application of meticulous control of waste piles containing sacrificed old pavement and embankment material, the assessed risks tend to be minimal for affecting the general public health. The danger of leachates contaminated with lead entering surface water or groundwater system cannot be ruled out unless all precautions are met to completely remove and safely deposit all soils that have been tested positive for lead contamination.

- **Disturbance of the Social Fabric of the Roadside Communities.** Community disturbances, business impairments and subsequent economic losses will be felt on individual level. Given the sparse population in the area social tensions, if appearing at all, are unlikely to persist beyond the construction period. Attraction of new industrial complexes and in-migration of various businesses to the newly established road corridor could result both in positive and negative side-effects as long as not effectively addressed. Successful mitigation means include thoughtful planning. Countermeasures to avoid social tensions related to construction works include proper timing of construction activities (after close consultation with the local authorities), work safety planning, and site-specific environmental precautions. Changes in land prices, new business and industrial development, potentially increasing crime rates (prostitution, smuggling, trafficking) may all be adverse spin-offs of an improved road connectivity which can be controlled by various political and policing actions.

- **Cumulative Positive Impacts Relating to Social Conditions.** Long-term beneficial impacts, many of them resulting in secondary benefits, will be associated with the improved road conditions and connectivity, access to services and markets (especially trans-boundary links with/from nearby Kyrgyzstan), improved social connections, swifter emergency response, and improved road controls. The positive influx of increased job opportunities will be rather limited to short periods and is unlikely to result in long-term effects. Some land-owners possessing private land near the new bypass alignment will benefit from increased land prices.

- **Ecological Enhancement.** With the implementation of the proposed roadside plantation schemes (if such schemes are, in fact made part of the Project), the sound rehabilitation of decommissioned borrow pits and provision of adequate drainage structures there is good potential to enhance the ecological values and functions of the local environment and result in tangible positive side effects such as improved animal habitats, stop-over places for migratory birds, and increase of scenic values which may attract tourism and recreational business.

- **Environmental Awareness.** With implementation of the planned environmental awareness campaigns, addressing both the labor forces, engineers and the broad public, the project is likely to result in various secondary and cumulative benefits by enhancing public behavior toward general environmental protection principles, waste avoidance and management, and protection of natural assets and functions.

67. A careful review of potential impacts triggered by local industries and better transportation routes for products indicates only marginal indirect impact magnification. The Project will improve access and considerably minimize time for transportation for all types of road transport on territory of the Zhambyl Oblast.
END NOTES

1 Tranche 2 EIA (Summary Environmental Impact Assessment, Project Number: 41121, May 2009, Kazakhstan: Multitranch Financing Facility for the CAREC Transport Corridor 1 (Zhambyl Oblast Section) Investment Program—Tranche 2.

2 1st Draft IEE for Tranche 4, Paragraph 103.

3 Tranche 2 EIA (Summary Environmental Impact Assessment, Project Number: 41121, May 2009, Kazakhstan: Multitranch Financing Facility for the CAREC Transport Corridor 1 (Zhambyl Oblast Section) Investment Program—Tranche 2. with corrections as noted by the 1st Draft IEE for Tranche 4, Paragraph 95.

4 1st Draft IEE for Tranche 4, Paragraph 107 and 108.


9 LARP (Draft Land Acquisition and Resettlement Plan: (LARP), Project Number: 41121, Multitranch Financing Facility for the CAREC Transport Corridor 1 (Zhambyl Oblast Section) [Western Europe–Western People's Republic of China International Transit Corridor] Investment Program—Project 3 Km 383–Km 404 Road Section, Km 162-Km 260 Road Section "Bypass of Kordai Pass", and "Kordai-Approach to Border of Kyrgyzstan" Section, Prepared by Committee of Roads (CoR), Ministry of Transport and Communications (MOTC), Republic of Kazakhstan, Asian Development Bank., June 2010.


F. PUBLIC CONSULTATIONS, DISCLOSURE & GRIEVANCE MECHANISM
F. PUBLIC CONSULTATIONS, DISCLOSURE & GRIEVANCE REDRESS MECHANISM

ORGANIZATION OF PART F

1. The ADB Safeguard Policy Statement (SPS) states that the "section (of environmental analyses which addresses public consultations and disclosure):

- Describes the process undertaken during the project design...

- Summarizes comments and concerns received from affected people and other stakeholders and how these comments have been addressed in the project design and mitigation measures ... and

- Describes the planned information disclosure measures ....and the process for carrying out consultation with affected people and facilitating their participation during project implementation."

2. Accordingly, these issues are discussed in item 1.0: Public Consultations and Disclosure.

3. The TOR (Appendix 1) stipulates that this section shall also present the Project's Grievance Redress Mechanism. It is presented in Item 2.0

1.0 PROCESS UNDERTAKEN DURING PROJECT DESIGN

1.1 Public Consultations Conducted

4. The available Project documentation reports that the designers of the Project took care to ensure that the procedures applied for involving the public general and the information presented fulfill the requirements of ADB's guidelines for Public Consultation, including those laid out in ADB's Operational Procedures for MFF (OM Section D14/OP from 6 August 2008). Preparatory steps are reported to have included:

- Identification of stakeholders,
- Public announcements in various media and
- Invitation of key stakeholders, both from the governmental and the private sector.

5. Following arrangements made by staff members of GeoData Plus LLC, Almaty, a number of Public Consultation (PC) activities were carried out in junction with the preparation of the entire CAREC Project.

6. Formal Public Consultations took place in a conference room of the administrative offices in Merke on the 12 January 2009 with 54 participants. The consultation was moderated by the deputy director of Jambyl Oblast Department of the Road Committee T.D.Alyakhmetov, and assisted by employees of GeoData Plus LLC, and engineers of the Designer Company (KazNIIPI). Care was taken to enable a broad public discussion of the public concerns and recommendations to reconsider the planning process. In particular, the designers followed recommendations for adequate cattle crossing structures, and various safety aspects. The results of the Public Consultation Meeting are reported to have been published in local newspapers.
7. A report providing a full record of the Public Consultations, including the material presented, is provided by Appendix 3. Minutes of the Consultations are provided by Appendix 4.

8. Additional consultative meetings were held with representatives of state authorities during the field survey in November, 2010. Important issues related to road constructions were discussed with the following agencies:

- Zhambyl Oblast Territorial Road Department / MOTC;
- Department of Natural Resources and Nature Use Management;
- Zhambyl Territorial Department of Environment;
- Agency of Statistics;
- Department of State Sanitary and Epidemiological Supervision of Zhambyl Oblast; and
- Zhambyl Oblast Territorial Department of Forest and Hunting.

1.2 Comments Received & Design Response

9. The available Project documentation indicates that the concerns and questions received in the public hearings related primarily to:

- **Land acquisition, compensation and impacts on private business and farming activities.** The available Project documentation indicates that these issues are to be followed up by the Resettlement Expert engaged by ADB.

- **Agricultural irrigation systems.** These included impacts and questions of rehabilitation of irrigation channels and drips in places of intersection with the Project Road. The current Project documentation does not provide information in regard to existing systems, but does indicate that the Project will include "establishment of new 36 pipes (and the) rehabilitation of 6 pipes". The available Project documentation indicates that these issues are to be followed up by the Resettlement Expert engaged by ADB.

- **Adequate cattle crossing structures, and various safety aspects.** Cattle crossings have been incorporated in the Project Design at km 266+348 and km 302+502 (See foregoing Exhibit C-4 and Exhibit C-5). Bus stops and rest stops with shelters, toilet facilities and safety features have been incorporated in the Project Design.

- **Contractor Selection.** The people worried about selection of the Contractors and they wanted to get more information about the construction companies responsible for civil works within Project Area. It is assumed that this information will be disclosed.

- **Asphalts Plants.** The questions about asphalt concrete plants location, with comments urging consideration of selected plant’s emissions were raised by participants. Current Project documentation indicates that asphalt will be derived from existing (but unnamed) sources - the most likely being the existing facility in Kordai discussed elsewhere in this report. Recommendations in regard to asphalt sources are provided in Part H: Conclusions and Recommendations.

- **Soil Reserves.** Soil reserves from which fill material will be derived have been identified. No issues related to the selected areas are noted in the available Project documentation.

1.3 Planned Information Disclosure

10. It is anticipated that in compliance with ADB’s requirements for IEEs (Category B environmental analyses), the document will be provided for disclosure on the ADB website prior to Board consideration of the Project. The ADB’s Safeguard Policy Statement requires disclosure of Initial Environmental Examination (SIEE) reports to the public.
11. The Contractor will be contractually obligated to notify and inform the public of construction operations prior to construction works, publish an emergency response plan disclosing his intentions to deal with accidents and emergencies, including environmental/public health emergencies associated with hazardous material spills and similar events, etc.

2.0 GRIEVANCE MECHANISM

2.1 Administrative Structure

12. The legal and administrative framework for the implementation of the MFF Program includes established Grievance Procedures. In the case of projects within the Zhambyl Oblast complaints are received through the staff of the Akimats, the Zhambyl Committee of Roads or the Project Management Consultants. Appointive officials have been designated at these levels to receive, help resolve, report or forward complaints received from Affected Persons (APs) and the general public. The Grievance Focal Points designated for the Project is:

- Mr. Aliakhmetov Toishibai Zhanadilovich, Deputy Director
  Zhambyl Oblast Roads Department, 1a Tauke Khan Street, Taraz City
  Telephone: 8 (7262) 31-6006 / 8 (7262) 31-6004

- Deputy Akim
  Merke Rayon
  Telephone: To be supplied.

- Deputy Akim
  Chu Rayon
  Telephone: To be supplied.

13. At the Rayon level, the Deputy Akim is supported by the Land Allocation Unit and Legal Staff of the Akimat. APs or other concerned individuals may visit, call or send a letter or fax to any of the appointed officials to register their comments or complaints related to land acquisition or other aspects of the Projects.

14. The Merke Akimat, the Chu Akimat and the Zhambyl Oblast Committee of Roads are required to maintain a record-book to register the complaints, keep track of their status and report monthly to the Project Management. Reports and complaints resolution will be subject to follow-up by the external monitoring/evaluation team, and by the Project Management.

15. The existing Grievance Focal Point at the PMC-ADB is also required to regularly coordinate with the Zhambyl Roads Department, the Merke Akimat and the Chu Akimat to track complaints received, actions taken and status of resolution. Complaint forms will be distributed to the heads of local self governments, the concerned Akimat and the Zhambyl Oblast Roads Department to facilitate recording of complaints.

16. The reports and the process of dispute resolution are observed/monitored by the External Resettlement Monitoring Agency to be engaged by PMC. The Road Department has an Internal Monitoring Specialist (Deputy Director of Zhambyl Road Department has been assigned for this task), who will monitor the resettlement implementation activities.

2.2 Dispute Resolution Processes

17. Information about the land acquisition and other aspects of the Project will also be provided to the heads of the local self-governments/rural settlements. APs may also opt to initially course their complaints or queries through their local self-government heads.
18. In case the heads of the rural settlement cannot resolve or clarify the issue at their level within one week, they can then forward the case to the Grievance Focal Points at the Regional Akimat. If the issue cannot be resolved in two weeks, the Akimat will then pass the complaint to the Grievance Focal Point at the Zhambyl Oblast Committee of Roads.

19. Issues requiring attention or action from the MOTC-Project Management will be forwarded by the Zhambyl Oblast Roads Department to the PMC-ADB which provides technical and supervision support to MOTC for the Project. If the case remains unsolved a complaint can be lodged to the court.

20. Alternatively, people with concerns about the Project may contact the PMC Office, Astana. The PMC has a designated staff (Grievance Focal Point) that is tasked to receive, follow-up and report on a weekly basis all complaints, disputes or questions received about the Project.

21. The following standards will be used in responding to or referring complaints received by the Project:

<table>
<thead>
<tr>
<th>LEVELS/STAGES</th>
<th>RESPONSIBILITY</th>
<th>STEPS IN COMPLAINT HANDLING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Village-level</td>
<td>Head of Local Self Government</td>
<td>Registers the complaint and attempts to solve it. If complaint is not resolved in one week, it is passed to the regional Akimat for resolution.</td>
</tr>
<tr>
<td>Regional-level</td>
<td>Vice Akim, Appointive official</td>
<td>Receives the complaint, registers it and attempts to resolve it. If there is no resolution in two weeks, it is passed to the Zhambyl Roads Department</td>
</tr>
<tr>
<td>Zhambyl Road Department</td>
<td>Deputy Director, Zhambyl Oblast Roads Department</td>
<td>Receives the complaint and attempts to resolve it. If there is no resolution within two weeks, it will be passed to the appointed official at the Committee of Roads RK</td>
</tr>
<tr>
<td>Committee of Roads/PMC</td>
<td>Appointive Official/Grievance Focal Point</td>
<td>Receives the complaint and coordinate with the concerned units or agencies to find timely solution. If there is no resolution within two weeks, the case will be presented to a Kazakh court and resolved according to Kazakh’s legislation.</td>
</tr>
<tr>
<td>Court</td>
<td>Oblast court</td>
<td>Hears the case and renders decision.</td>
</tr>
</tbody>
</table>

END NOTES

1 1st Draft IEE for Tranche 4, Paragraph 103.
G. ENVIRONMENTAL MANAGEMENT PLAN
G. ENVIRONMENTAL MANAGEMENT PLAN

1.0 INTRODUCTION

1. The ADB Safeguard Policy Statement (SPS, 2009) states that "..., the Environmental Management Plan, (EMP) deals with a set of migration and management measures to be taken during the project implementation to:

   - Avoid
   - Reduce
   - Mitigate, or
   - Compensate for adverse environmental impacts (in that order of priority)".

2. 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 in Part H: Conclusions and Recommendations and reflected in the proposed EMP. The SPS 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."

3. These recommended key components as they apply to the Road Section 261.5-310.5 Project are addressed for each of the major environmental criteria in Exhibit G-1 through Exhibit G-3 which are addressed to the Pre-Construction, Construction and Post-Construction-Operational Stages of the Project, respectively. The data is provided in tabular form under the headings of the key components identified by ADB (Mitigation, Monitoring, Implementation and Indicators). In addition to the outline of preparatory steps perceived as necessary for the implementation of the EMP, the key components of the EMP are discussed for the major environmental parameters:

   - Air,
   - Water,
   - Noise,
   - Topographic, Soils & Physiographic Considerations;
   - Biological Resources; and
   - Social/Cultural Considerations.

4. In compliance with the recommendations of the SPS, mitigation is explained in terms of the potential impact or issue identified as requiring an action and the recommended mitigation measure including links to other related plans (e.g., the Project's anticipated Land Acquisition and Resettlement Report). Monitoring is explained in terms of recommended measures and procedures (including parameters to be measured, sampling locations, frequencies, etc. Implementation arrangements and performance indicators are also provided as specified by the SPS guidelines. The program is cross-referenced to the recommendations of the COPA, Appendix 2, which is the foundation upon which the EMP is structured.
2.0 CONTEXT

5. It is important to note that the EMP will be implemented within the context provided by the contractual framework for the implementation of the MFF program as explained in foregoing Part B. Key components to be recalled include:

- **Conditions of Particular Application.** Within the established contractual framework for the MFF Program, these conditions as they are recommended to apply to the Road Section 261.5-310.5 Project are referenced throughout the IEE and are presented in detail for adoption in Appendix 2.

- **Requirements for Contractor Environmental Action Plans (CEAPs).** CEAPs are a routine part of MFF program projects and the specific conditions and requirements of the CEAPs, including deadlines, approval procedures, contents, etc., for the Road Section 261.5-310.5 Project are specified by Appendix 2. As specified therein, the CEAPs must be submitted within 30 days of the contract award and construction cannot commence until the CEAPs are approved.

- **The Role of the Construction Supervision Consultants.** As noted in Part B, the CSC is tasked with specific responsibility to ensure safeguard compliance of civil works - with particular emphasis on the monitoring of implementation of EMPs and related aspects of the project. The preparation of the CEAP requires a licensed person. The Contractor must retain expertise to do this work and must keep that person/firm to oversee the operation throughout the contract period.

3.0 ENVIRONMENTAL COSTS

6. Most costs associated with the environmental recommendations are a normal part of preparing the bid and contract documents and ensuring that proper environmental provisions are incorporated therein. The installation of septic systems at construction camps, for example, is an environmental necessity, but not generally considered an "environmental cost". Bid solicitations will call for the costs of recommended baseline monitoring to be included in the bids. Both baseline and periodic monitoring during construction are normally considered to be a part of good engineering practice and included in the Project Budget. Supervision and monitoring of Contractor activities and reporting thereon are a normal responsibility of the Construction Supervision Consultant (CSC), included in the Project Budget and not a separable cost. Nonetheless, the most overt and explicit environmental mitigation and monitoring activities can be estimated. Those for the Road Section 261.5-310.5 Project are summarized by Exhibit G-4. They include estimates for the conduct of the recommended Biological Reconnaissance Survey, training in regard to the requirements of CEAPs, baseline monitoring of the major environmental parameters and routine periodic monitoring and reporting during the Construction Stage.
### ENVIRONMENTAL MANAGEMENT PLAN: PRE-CONSTRUCTION STAGE

#### 1. EMP: PRE-CONSTRUCTION STAGE: PREPARATORY ACTIONS

<table>
<thead>
<tr>
<th>Potential Impact or Issue</th>
<th>Mitigation Measure &amp; Related Links</th>
<th>Monitoring</th>
<th>Reporting</th>
<th>Scheduling</th>
<th>Organizational Arrangements</th>
<th>Cost &amp; Source of Funds</th>
<th>INDICATOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction Debris Disposal Site Selection</td>
<td>Potential demolition of bridges and other Project Activities may generate a much greater volume of debris than normal. Disposal sites should be analyzed, reviewed and approved prior to the start of construction.</td>
<td>Not applicable</td>
<td>An analysis of alternatives should be documented.</td>
<td>Prior to the start of construction.</td>
<td>MOTC with supporting analysis as it deems necessary.</td>
<td>Included in Project Preparation costs.</td>
<td>Establishment of an agreed course of action.</td>
</tr>
<tr>
<td>Re-vegetation/Shelterbelt Plan</td>
<td>No plans for re-vegetation are known to exist. Re-vegetation plans should be prepared as part of Project Design with due consideration to the replanting requirements of the RoK and the potential for shelterbelt creation. If incorporating the Re-vegetation Plan in the current Project cannot be achieved, an early follow-on project for doing so is recommended.</td>
<td>Not applicable</td>
<td>An analysis of re-vegetation alternatives should be documented.</td>
<td>Prior to the preparation of bid documents or as a follow-on project.</td>
<td>MOTC with supporting analysis as it deems necessary.</td>
<td>To be determined.</td>
<td>Establishment of an agreed course of action.</td>
</tr>
<tr>
<td>Documentation of Suitability of Water Supply Proposals</td>
<td>Proposed sources of potable water should be documented to ensure safe withdrawal rates and to avoid adverse impacts to others dependent on the same sources.</td>
<td>Not applicable</td>
<td>An analysis of alternatives should be documented.</td>
<td>Prior to the preparation of bid documents</td>
<td>MOTC with supporting analysis as it deems necessary.</td>
<td>Included in Project Preparation costs.</td>
<td>Establishment of an agreed course of action.</td>
</tr>
<tr>
<td>Staging Plan</td>
<td>Plans are needed in regard to staging, provisions for interim river crossings during bridge removal and construction, etc. The question of which road segments and bridges will be built first and in what sequence to ensure a continuous flow of traffic should be addressed. Proposed Staging Plans should be a part of the bid solicitation and a required element in bid submissions.</td>
<td>Not Applicable</td>
<td>Proposed Staging Plans should be a part of the bid solicitation and a required element in bid submissions.</td>
<td>The requirement should be incorporated in bid solicitations.</td>
<td>MOTC with supporting analysis as it deems necessary.</td>
<td>Included in Project Preparation costs.</td>
<td>Establishment of an agreed course of action.</td>
</tr>
<tr>
<td>Selection of quarry sites for construction materials could lead to significant transport-related environmental impacts.</td>
<td>Documented assessment of alternative quarries as sources of material for the Project is recommended. Use of distant quarries for the Project Road would require transport for long distances through populated areas. It would present potentially avoidable adverse transport impacts. At a minimum this aspect of the Project requires a thoughtful analysis of the alternatives. Whatever quarry sites are selected, environmental problems, such as erosion, sedimentation, soil contamination, loss of habitats, should be addressed in Project Preparation, including preparation of a site management plan, indicating rehabilitation options and requirements to observe environmental safeguards, especially for adjacent water resources and croplands.</td>
<td>Not applicable</td>
<td>An analysis of alternatives should be documented.</td>
<td>Prior to the preparation of bid documents</td>
<td>MOTC with supporting analysis as it deems necessary.</td>
<td>Included in Project Preparation costs.</td>
<td>Establishment of an agreed course of action.</td>
</tr>
<tr>
<td>Selection of a strategy for the supply of asphalt to the Project.</td>
<td>Use of the existing asphalt plant (Monolit) southeast of Kordai or other distant plant as a supplier to the project is not cannot be recommended unless there is a compelling and documented reason for its use included in the Project’s Alternative Analysis (including the use of a temporary Project-specific plant).</td>
<td>Not applicable</td>
<td>An analysis of alternatives should be documented.</td>
<td>Prior to the preparation of bid documents</td>
<td>MOTC with supporting analysis as it deems necessary.</td>
<td>Included in Project Preparation costs.</td>
<td>Establishment of an agreed course of action.</td>
</tr>
</tbody>
</table>
### 2. EMP: PRE-CONSTRUCTION STAGE: AIR-RELATED COMPONENTS

<table>
<thead>
<tr>
<th>Potential Impact</th>
<th>Mitigation Measure &amp; Related Links</th>
<th>Monitoring Measures</th>
<th>Reporting</th>
<th>Scheduling</th>
<th>Organizational Arrangements</th>
<th>Cost &amp; Source of Funds</th>
<th>INDICATOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air quality impacts could result in later stages due to decisions taken in the Pre-Construction Stage in regard to the Project’s bid and tender documents and contract specifications.</td>
<td>To mitigate potential impacts to air quality in the subsequent stages of the work, adoption of the COPA provisions presented in Appendix 2 is considered to be a key element in the EMP. Aspects related to air quality include stipulations that: No furnaces, boilers or other similar plant or equipment using any fuel that may produce air pollutants will be installed without prior written consent of the CSC. No burning of debris or other materials will occur on the Site. Dust suppression measures including but not limited to the following will be implemented: • Stockpiles of sand and aggregate greater than 20 cubic meters for use in concrete manufacture shall be enclosed on three sides, with walls extending above the pile and two (2) meters beyond the front of the piles. Locations shall be indicated by the CEAP. • Effective water sprays shall be used during the delivery and</td>
<td>Monitoring requirements are stipulated by Appendix 2 as follows: Baseline Air Quality Survey. Air quality baseline monitoring shall be carried out as soon after the date of acceptance of the Bid as is practicable. Routine Periodic Air</td>
<td>Reporting requirements are stipulated by Appendix 2 as follows: Baseline Reporting. Monitoring results shall be submitted to CSC within two (2) working days of completion of the monitoring period for analysis and review. Actions taken in response to the scheduling</td>
<td>Scheduling requirements are stipulated by Appendix 2 as follows: Baseline Scheduling. Three readings required within a one-week period: a continuous period of at least 24-hours; a second measurement for at least</td>
<td>Appointment and approval of an Environment/ Safety Officer (ESO) is required before work can commence. The ESO shall be responsible for day-to-day issues of environmental management and shall be subject to the CSC’s approval. The Contractor shall not undertake any works on the Site until the ESO has</td>
<td>Contract preparation costs currently budgeted as part of project preparation (including consulting services). Monitoring and reporting costs will be part of the Contractor’s bid. Estimated costs provided by Exhibit G-4.</td>
<td>Compliance with all applicable air quality standards. Air-related issues as reported in weekly and monthly reports. Complaints as received through the grievance redress mechanism.</td>
</tr>
</tbody>
</table>

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**Table Note:**
- **Baseline Air Quality Survey:** A comprehensive survey to assess the baseline air quality conditions before the commencement of construction activities.
- **Routine Periodic Air:** Regular monitoring of air quality to detect any deviations from the baseline.
- **Baseline Reporting:** Documentation of monitoring results to identify deviations from the baseline.
- **Baseline Scheduling:** Setting of timelines for monitoring activities to ensure timely reporting.

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**Cost & Source of Funds:**
- Estimated as US $16,000 for biological consultant and expenses.
- Estimated as US $8,000 for biological consultant and expenses.

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**INDICATOR:**
- Not applicable.
handling of all raw sand and aggregate, and other similar materials, when dust is likely to be created and to dampen all stored materials during dry and windy weather.

- Areas within the Site where there is a regular movement of vehicles shall have an acceptable hard surface and be kept clear of loose surface material. Locations shall be indicated by the CEAP.

- Conveyor belts shall be fitted with wind-boards, and conveyor transfer points and hopper discharge areas shall be enclosed to minimize dust emission. All conveyors carrying materials that have the potential to create dust shall be totally enclosed and fitted with belt cleaners. Locations shall be indicated by the CEAP.

- Cement and other such fine-grained materials delivered in bulk shall be stored in closed silos fitted with a high-level alarm indicator. The high-level alarm indicators shall be interlocked with the filling line such that in the event of the hopper approaching an overfull condition, an audible alarm will operate, and the pneumatic line to the filling tanker will close. Locations shall be indicated by the CEAP Plan.

- All air vents on cement silos shall be fitted with suitable fabric filters provided with either shaking or pulse-air cleaning mechanisms. The fabric filter area shall be determined using an air-cloth ratio (filtering velocity) of 0.01 - 0.03 m/s.

- Weigh hoppers shall be vented to a suitable filter.

- The filter bags in the cement silo dust collector must be thoroughly shaken after cement is blown into the silo to ensure adequate dust collection for subsequent loading.

- Adequate dust suppression including water bowers with spray bars.

- Areas of reclamation shall be completed, including final compaction, as quickly as possible consistent with good practice to limit the creation of wind blown dust.

- All roads within the construction areas of the Site shall be sprayed at least twice each day, and more if necessary to control dust to the satisfaction of the CSC.

**Quality Monitoring.** Air quality impact shall be monitored not less than once per month during the course of the Works.

**Parameters -** Measured air quality shall include Particulates (TSP) and other air pollutants as determined warranted by the CSC could include: Sulfur Dioxide (SO2), Nitrogen Dioxide (NO2), Carbon Monoxide (CO), Ozone (O3), Ammonia (NH3), Hydrocarbons (HC)

**Locations. Not less than two points in each Construction Package.** Additional locations to be determined on the basis of CEAPs.

**Equipment Requirements.** Air quality monitoring will require:

- A high volume monitoring results shall also be required. Additional monitoring shall be undertaken as deemed warranted by the CSC. Final results shall be reported in the required Initial Environmental Baseline Report.

**Weekly & Monthly Reporting Schedules.** Monitoring results shall be submitted to CSC two (2) working days of the completion of the monitoring period for analysis and review. Actions taken in response to the monitoring results shall also be required. Additional monitoring shall be undertaken as deemed warranted by the CSC. Results shall be reported in the required weekly Regular Environmental and Safety Reports. Documented one two-hour period; and a third measurement for at least one two-hour period.

**Routine Periodic Monitoring.** Air quality impact shall be monitored not less than once per month during the course of the Works and more often if determined advisable by the CSC.

**Contract compliance supervision will be a budgeted activity for the CSC.**
• All vehicles, while parked on the Site, will be required to have their engines turned off.
• All equipment and machinery on the Site will be checked at least weekly and make all necessary corrections and or repairs to ensure compliance with safety and air pollution requirements.
• All vehicles will be properly cleaned (bodies and tires are free of sand and mud) prior to leaving the site areas. The necessary cleaning facilities will be provided on site to ensure that no water or debris from such cleaning operations is deposited off-site. Locations should be indicated by the CEAP Plans.
• All trucks used for transporting materials to and from the site will be covered with canvas tarpaulins, or other acceptable type cover (which shall be properly secured) to prevent debris and/or materials from falling from or being blown off the vehicle(s).
• Construction walls will be provided in all locations where strong winds could cause the blowing of dust and debris.

At any concrete batching plant or crushing plant being operated on the Site the following additional conditions shall apply:
• Dust nuisance as a result of Project activities will be avoided. An air pollution control system shall be installed and shall be operated whenever the plant is in operation.
• Where dusty materials are being discharged to vehicles from a conveying system at a fixed transfer point, a three-sided roofed enclosure with a flexible curtain across the entry shall be provided. Exhaust fans shall be provided for this enclosure and vented to a suitable fabric filter system. Locations shall be indicated by the CEAP.
• Any vehicles with an open load carrying area used for moving potentially dust-producing materials shall have properly fitting side and tailboards. Materials having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin in good condition. The tarpaulin shall be properly secured and shall extend at least 300 millimeters over the edges of the side and tailboards.
• The concrete batching plant and crushing plant sites and ancillary areas will be frequently cleaned and watered to minimize any dust emissions.

The concrete batching plant and crushing plant sites and ancillary areas will be frequently cleaned and watered to minimize any dust emissions.

The dust (TSP) levels will be measured by the High Volume Method for Total Suspended Particulates.
• Equipment capable of providing the monitoring specified by the Monitoring Plan.
• Suitable access, hard standing and a galvanized wire fence and gate at each monitoring station at locations on the site boundaries.
• Equipment as necessary to ensure that all samples collected as part of the monitoring program shall be monitored.
### Dry mix batching shall be carried out in a totally enclosed area with exhaust to suitable fabric filters.

**Other Provisions related to Air Quality.** Additional provisions related to air quality shall apply as specified in Appendix 2.

### 3. EMP: PRECONSTRUCTION STAGE: WATER-RELATED COMPONENTS

<table>
<thead>
<tr>
<th>Potential Impact or Issue</th>
<th>Mitigation Measure &amp; Related Links</th>
<th>Monitoring Measures</th>
<th>Reporting</th>
<th>Scheduling</th>
<th>Organizational Arrangements</th>
<th>Cost &amp; Source of Funds</th>
<th>INDICATOR</th>
</tr>
</thead>
</table>
| Impacts to water resources could result in later stages due to decisions taken in the Pre-Construction Stage in regard to the Project's bid and tender documents and contract specifications. | To mitigate potential impacts to area waterways, the following conditions shall apply to the Contractor's Construction Camps and work staging areas:  
- Waste Disposal. All water and waste products arising on the site shall be collected, removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance. The site plan required as part of the CEAP shall indicate the system proposed and the locations of related facilities in the site, including latrines, holding areas, etc. There shall be no direct discharge of sanitary or wash water to surface water. Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies shall be prohibited. Liquid material storage containment areas shall not drain directly to surface water. Liquid material storage containment areas equipped with drains shall be valve, and the valve shall be maintained locked in the closed position with supervisory control of the key. Lubricating and fuel oil spills shall be cleaned up immediately and spill clean-up shall be materials be maintained at the storage area.  
- Drainage. The site plan required as part of the CEAP shall be devised to ensure that rain run-off from the construction sites is not deposited directly into any watercourse, stream, or canal and shall indicate the system proposed, including the locations of retention ponds and other facilities. There shall be no direct discharge of sanitary wastewater, wash water, chemicals, spoil, waste oil or solid waste to surface water bodies. Fuel, lubricating oil and chemical spills shall be contained and cleaned-up immediately. Spill clean up equipment will be maintained on site.  
- Fueling Operations. Fueling operations shall occur only within | Monitoring requirements are stipulated by Appendix 2 as follows:  
Baseline Survey. Pre-construction quality monitoring shall be carried to establish baseline conditions.  
Parameters. Measured water quality parameters shall include:  
- Suspended solids (SS)  
- Biological Oxygen Demand (BOD)  
- Dissolved oxygen (DO)  
- Conductivity  
- Fecal coliform  
- Oil and grease | Reporting requirements are stipulated by Appendix 2 as follows:  
Baseline Reporting. Monitoring results shall be submitted to CSC within two (2) working days of completion of the monitoring period for analysis and review. Actions taken in response to the monitoring results shall also be required. Additional monitoring shall be undertaken as deemed warranted by the CSC. Final results shall be reported in the required Initial Environmental | Scheduling requirements are stipulated by Appendix 2 as follows:  
Baseline Survey. Baseline water quality monitoring shall be carried out twice within a one-week period.  
Routine Monitoring. Monthly monitoring of runoff from the site areas, construction camps, staging areas and camps, etc., shall be undertaken not less than once per month and additional monitoring may be required at the discretion of | The ESO shall be responsible for day-to-day issues of environmental management and shall be subject to the CSC's approval. The Contractor shall not undertake any works on the Site until the ESO has commenced duties on Site unless specifically agreed in writing by the CSC. | Contract preparation costs currently budgeted as part of project preparation (including consulting services)  
Water-related issues as reported in weekly and monthly reports.  
Complaints as received through the grievance redress mechanism.  
Contract compliance supervision will be a budgeted activity for the CSC. | Compliance with all applicable water quality standards.  
Water-related issues as reported in weekly and monthly reports.  
Complaints as received through the grievance redress mechanism. |
### Relationship to Watercourses
The site plans required as part of the CEAP shall be devised to ensure that, insofar as possible, all temporary construction facilities are located at least 50 meters away from a watercourse, stream, or canal.

### Wheel Washing Facilities
If determined warranted by the CSC, the Contractor shall provide a wash pit or a wheel washing and/or vehicle cleaning facility at the exits from the sites. If so requested, the Contractor shall ensure that all vehicles are properly cleaned (bodies and tires are free of sand and mud) prior to leaving the site areas. The Contractor shall provide necessary cleaning facilities on site and ensure that no water or debris from such cleaning operations is deposited off-site.

### Other Water-Related Facilities
The Contractor is required to construct, maintain, remove and reinstate as necessary temporary drainage works and take all other precautions necessary for the avoidance of damage by flooding and silt washed down from the Works. Site Plans must indicate adequate precautions to ensure that no spoil or debris of any kind are allowed to be pushed, washed down, fallen or be deposited on land or water bodies adjacent to the Site.

### Other Water Quality Provisions
- All existing stream courses and drains within, and adjacent to, the Site will be kept safe and free from any debris and any excavated materials arising from the Works. Chemicals, sanitary wastewater, spoil, waste oil and concrete agitator washings will not be deposited in the watercourses.
- All water and waste products arising on the Site will be collected, removed from the Site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance.
- Drainage works will be constructed, maintained, removed and reinstated as necessary and all other precautions necessary for the avoidance of damage by flooding and silt washed down from the Works will be taken. Adequate precautions will be taken to ensure that no spoil or debris of any kind are allowed to be pushed, washed down, fallen or be deposited on land adjacent to the Site.

<table>
<thead>
<tr>
<th>Equipment Required</th>
<th>Baseline Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>All water quality sampling and analysis shall be in conformance with standard methods and standards of the Government of Kazakhstan.</td>
<td>Weekly &amp; Monthly Reporting Schedules. Monitoring results shall be submitted to CSC two (2) working days of the completion of the monitoring period for analysis and review.</td>
</tr>
</tbody>
</table>

### Baseline Locations
Baseline locations will be determined in consultation with the Engineer and shall include locations likely to be subject to water quality impacts or significant runoff (construction camps, staging areas, etc.).

### Routine Monitoring
Monitoring of runoff from the site areas, construction camps, staging areas and camps etc. not less than once per month as directed by the CSC.

### Routine Monitoring Locations
Routine monitoring of

| the CSC if warranted by site observations. | Documented safety and environmental audits shall be undertaken on weekly basis. Environmental and Safety Reports (ESRs) summarizing the results of the audits shall be submitted to the CSC if warranted by site observations. |
In the event of any spoil or debris from construction works being deposited on adjacent land or any silt washed down to any area, then all such spoil, debris or material and silt shall be immediately removed and the affected land and areas restored to their natural state by the Contractor to the satisfaction of the Engineer.

- Downstream slopes will be stabilized with concrete, rock gabions or walls to avoid erosion where warranted.
- Contractor will ensure that construction camps and other potential sources of secondary impacts are properly sited and provided with drainage and wastewater facilities.
- Downstream slopes will be stabilized with concrete, rock gabions or walls to avoid erosion where warranted.
- Contractor will ensure that construction camps and other potential sources of secondary impacts are properly sited and provided with drainage and wastewater facilities.

runoff is required at site areas, construction camps, staging areas and camps etc., and additional monitoring may be required at the discretion of the CSC if warranted by site observations.

CSC on a monthly basis. Analytical reports may be required by the CSC to explain anomalies and problems encountered. Actions taken in response to the monitoring results shall also be required.

Downstream slopes will be stabilized with concrete, rock gabions or walls to avoid erosion where warranted.

Contractor will ensure that construction camps and other potential sources of secondary impacts are properly sited and provided with drainage and wastewater facilities.

### 4. PRE-CONSTRUCTION STAGE: NOISE-RELATED COMPONENTS

<table>
<thead>
<tr>
<th>Potential Impact or Issue</th>
<th>Mitigation Measure &amp; Related Links</th>
<th>Monitoring</th>
<th>Reporting</th>
<th>Implementation Arrangements</th>
<th>Cost &amp; Source of Funds</th>
<th>INDICATOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise - including construction noise on the jobsite and adjacent areas and noise generated along any transport routes used by the Project.</td>
<td>To mitigate potential noise impacts, the recommended contract conditions stipulate that:</td>
<td>Baseline Requirement. Baseline noise monitoring will be conducted at agreed upon areas continuously over 24-hour period at sensitive locations, including the Roads point of origin and termination. The CEAP shall indicate when and where the Contractor</td>
<td>Noise monitoring results shall be submitted to CSC two (2) working days of the completion of the monitoring period for analysis and review. Actions taken in response to the monitoring results shall also be required. Noise monitoring results will be included in the Project’s Monthly Progress.</td>
<td>Jobsite Monitoring. Monitoring of jobsite noise levels shall be undertaken as directed by the CSC. During Pile Driving. During piling, or any other activity likely to be a source of significant vibration designated by the CSC, the Contractor shall record vibration.</td>
<td>Compliance with all applicable noise standards. Noise-related issues as reported in weekly and monthly reports. Complaints as received through the grievance redress mechanism.</td>
<td></td>
</tr>
<tr>
<td>Noise monitoring results will be included in the Project’s Monthly Progress.</td>
<td>Appointment and approval of an Environment/Safety Officer (ESO) is required before work can commence. The ESO shall be responsible for day-to-day issues of environmental management and shall be subject to the CSC’s approval. The Contractor shall not undertake any works on the Site until the ESO has commenced duties.</td>
<td>Contract preparation costs currently budgeted as part of project preparation (including consulting services). Monitoring and reporting costs will be part of the Contractor’s bid. Estimated costs provided by Exhibit G-4.</td>
<td>Contract</td>
<td>Contract</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Monitoring and reporting costs will be part of the 

<table>
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<th>Cost &amp; Source of Funds</th>
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<tbody>
<tr>
<td>Contract preparation costs currently budgeted as part of project preparation (including consulting services). Monitoring and reporting costs will be part of the Contractor’s bid. Estimated costs provided by Exhibit G-4.</td>
<td>Compliance with all applicable noise standards. Noise-related issues as reported in weekly and monthly reports. Complaints as received through the grievance redress mechanism.</td>
</tr>
</tbody>
</table>
- Provide public notification of construction operations prior to construction works.
- Ensure that sensitive receptors will be avoided as possible (i.e., aggregate crushers, operators, etc.).
- Ensure that all exhaust systems will be maintained in good working order; properly designed engine enclosures and intake silencers will be employed; and regular equipment maintenance will be undertaken.
- Ensure that stationary equipment will be placed as far from sensitive land uses as practical; selected to minimize objectionable noise impacts; and provided with shielding mechanisms where possible.
- Schedule operations to coincide with periods when people would least likely be affected; work hours and work days will be limited to less noise-sensitive times. Hours-of-work will be approved by the site engineer having due regard for possible noise disturbance to the local residents or other activities. Construction activities will be strictly prohibited between 10 PM and 6 AM in the residential areas.
- The Contractor shall also note and record the condition of the structure being monitored and any change in condition from the time of the previous round of monitoring.

*Notes:
Leq is defined as an energy-averaged sound level that includes both steady background sounds and transient short-term sounds commonly used to describe traffic noise levels that tend to experience hourly peaks.
L_{10\%} - the sound level exceeded 10 percent of the measurement period and represents the peak sound levels.
L_{90\%} - the sound level exceeded 90 percent of the measurement period and is commonly used to represent background sound levels.
L_{max} - the maximum sound level.

<table>
<thead>
<tr>
<th>Proposed activities</th>
<th>Reports</th>
<th>Other periods, Other then during period of pile driving, noise shall be monitored not less than once per month and more frequently if determined warranted by the CSC.</th>
<th>Compliance supervision will be a budgeted activity for the CSC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Contractor proposes to undertake the required baseline noise survey and provide references to locations on the site plan required as a part of the CEAP. The proposed locations require the approval of the CSC.</td>
<td>Noise shall be measured in terms of: Leq, L_{10%}, L_{90%}.</td>
<td>Parameters.</td>
<td>Reports.</td>
</tr>
<tr>
<td>Required Equipment.</td>
<td>Equipment as necessary to ensure monitoring meeting the noise standards of the Government of Kazakhstan is required.</td>
<td>Other Periods.</td>
<td>Other than during period of pile driving, noise shall be monitored not less than once per month and more frequently if determined warranted by the CSC.</td>
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<td>Other Periods.</td>
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### 5. PRE-CONSTRUCTION STAGE: TOPOGRAPHIC, SOIL-RELATED & PHYSIOGRAPHIC COMPONENTS

<table>
<thead>
<tr>
<th>Potential Impact or Issue</th>
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<th>Organizational Arrangements</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Possible use of Distant Quarries</td>
<td>See Preparatory Steps Above.</td>
<td>See Preparatory Steps Above.</td>
<td>See Preparatory Steps Above.</td>
<td>See Preparatory Steps Above.</td>
<td>See Preparatory Steps Above.</td>
<td>See Preparatory Steps Above.</td>
<td>See Preparatory Steps Above.</td>
</tr>
<tr>
<td>Potential lead contamination in roadside soils and contaminants in river sediments.</td>
<td>Measurements of contaminant levels in the soil and sediments are necessary prior to their disturbance and use for fill or other purpose.</td>
<td>Parameters will include: Lead, Pb, fecal coliform, oil and grease, and Pesticides</td>
<td>Monitoring results shall be submitted to CSC two (2) working days of the completion of the monitoring period for analysis and review. Actions taken in response to the monitoring results shall also be required. Monitoring results will be included in the Project's Monthly Progress Reports.</td>
<td>Scheduling requirements are stipulated by Appendix 2 as follows:</td>
<td>Baseline Survey. Baseline soil and sediment monitoring shall be carried out twice within a one-week period.</td>
<td>The ESO shall be responsible for day-to-day issues of environmental management and shall be subject to the CSC's approval. The Contractor shall not undertake any works on the Site unless specifically agreed in writing by the CSC.</td>
<td>Contract preparation costs currently budgeted as part of project preparation (including consulting services).</td>
</tr>
</tbody>
</table>
| Impacts associated with all quarries. | To mitigate potential impacts to topography, soils and physiographic conditions, the recommended COPA provisions stipulate that: Use of licensed quarrying operations for material sources and prior approval of the CSC shall be required. The potential impact of transport of quarried materials shall be considered in the approval process. | Monitoring of compliance with mitigation measures in regard quarries will be the responsibility of the Contractor shall be required to obtain prior approval for the use of all quarries. Inspections to ensure compliance are discussed below as part of the Construction Stage activities. | The Contractor shall be responsible for compliance with day-to-day issues of environmental management such as proper quarry operations. | Contract preparation costs currently budgeted as part of project preparation (including compliance with all applicable contract provisions and quarry regulations. | Compliance with all applicable water quality standards. Water-related issues as reported in weekly and monthly reports. Complaints as received through the grievance redress mechanism.
If licensed quarries are not available the Contractors may be made responsible for setting up their dedicated crusher plants at approved quarry sites only with the approval of the CSC.

**Plans for quarry operations shall be included in the required CEAP submission.**

The CSC and will occur in the Construction Period discussed below.

**Monitoring of compliance with mitigation measures in regard to borrow pits will be the responsibility of the CSC and will occur in the Construction Period discussed below.**

**Inspections to ensure compliance are discussed below as part of the Construction Stage activities.**

**Appointment and approval of an Environment/Safety Officer (ESO) is required before work can commence.**

The ESO shall be responsible for day-to-day issues of environmental management and shall be subject to the CSC’s approval. The Contractor shall not undertake any works on the Site until the ESO has commenced duties on Site unless specifically agreed in writing by the CSC.

**Borrow pit related issues as reported in weekly and monthly reports.**

Complaints as received through the grievance redress mechanism.

---

**Need for proper drainage and re-vegetation.**

Mitigation of potential adverse impacts due to earth-moving, cut and fill and similar requirements shall include contract stipulations which require:

- Selection of less erodible material, placement of gibbons and riprap and good compaction, particularly around bridges and culverts.

**Monitoring of compliance with mitigation measures in regard cut and fill operations will be the**

**The Contractor shall be required to obtain prior approval for plans in regard to cut and fill operations.**

**Inspections to ensure compliance are discussed below as part of the Construction Stage activities.**

**The ESO shall be responsible for day-to-day issues of environmental management such as proper quarry operations.**

**Contract preparation costs currently budgeted as part of project preparation (including consulting services).**

**Compliance with all applicable contract provisions.**

Borrow pit-related issues as reported in weekly and monthly reports.

Complaints as received through the grievance redress mechanism.

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**Borrow pits**

- cause drainage and visual problems and present a potential for increased vector activity (e.g., mosquitoes or water contamination).

**The locations of all borrow pits will require the prior approval of the CSC before any material is removed and all will be located outside the ROWs.**

- Borrow pits will be developed in a manner which does not cause drainage or visual intrusion or present a potential for increased vector activity (e.g., mosquitoes or water contamination).

- Pit restoration will follow the completion of works in full compliance all applicable standards and specifications.

- The excavation and restoration of the borrow areas and their surroundings, in an environmentally sound manner to the satisfaction of the CSC is required before final acceptance and payment under the terms of contracts.

- Borrow pit areas will be graded to ensure drainage and visual uniformity, or to create permanent tanks/dams.

- Topsoil from borrow pit areas will be saved and reused in re-vegetating the pits to the satisfaction of the Contractor.

- Additional borrow pits will not be opened without the restoration of those areas no longer in use.

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**Monitoring of compliance with mitigation measures in regard to borrow pits will be the responsibility of the CSC and will occur in the Construction Period discussed below.**

**Inspections to ensure compliance are discussed below as part of the Construction Stage activities.**

**Appointment and approval of an Environment/Safety Officer (ESO) is required before work can commence.**

The ESO shall be responsible for day-to-day issues of environmental management and shall be subject to the CSC’s approval. The Contractor shall not undertake any works on the Site until the ESO has commenced duties on Site unless specifically agreed in writing by the CSC.
- Specification that final forming and re-vegetation will be completed as soon as possible following fill placement to facilitate regeneration of a stabilizing ground cover.
- Trenching where necessary to ensure successful establishment of vegetation.
- Seeding with a fast growing crop and potential native seed mix immediately after fill placement to prevent scour and to encourage stabilization.
- Placement of grass sods where applicable.
- Stabilization of embankment slopes and road cuts by re-vegetation with grazing resistant plant species, placement of fiber mats, riprap, rock gabions, or other appropriate technologies.
- Completion of discharge zones from drainage structures with riprap to reduce erosion when required.
- Down drains/chutes lined with rip-rap/masonry or concrete to prevent erosion.
- Side slopes adjusted in the range based on soil and other conditions as specified by the Project Specifications to reduce erosion potential. It is recommended that steep slopes be stabilized, covered with riprap or other material to prevent soil erosion.
- Stepped embankments for embankments greater than six meters. Construction in erosion- and flood-prone areas should be restricted to the dry season.
- Use stepped embankments for embankments greater than six meters.

### 6. PRE-CONSTRUCTION STAGE: BIOLOGICAL RESOURCES COMPONENT

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<tr>
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<tbody>
<tr>
<td>Undertake recommended biological resource survey</td>
<td>See Preparatory Steps Above.</td>
<td>See Preparatory Steps Above.</td>
<td>See Preparatory Steps Above.</td>
<td>See Preparatory Steps Above.</td>
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| Impacts to existing transport infrastructure | To mitigate potential impacts to the existing transport network, a Traffic Control Plan shall be submitted to explain the means and methods to be taken for proper and adequate control of traffic during the course of the Works. This Plan shall include but not be limited to:  
- The traffic control equipment the Contractor proposes to use for the Works;  
- Traffic control signage including location and sign descriptions;  
- How and when the Contractor proposes to use traffic control flag men;  
- Traffic control means during no-working periods;  
- Traffic control means and devices for night and off-hour periods. | Monitoring of compliance with mitigation measures in regard to potential impacts on existing transport networks will be the responsibility of the CSC and will occur in the Construction Period discussed below. | The Contractor shall be required to include traffic safety issues as a routine part of Monthly Progress Reports. | Contractors are required to outline all intentions with regard to traffic as a part if the initial CEAP submission. Updates of planned actions with regard to traffic issues shall be required as determined. | The ESO shall be responsible for day-to-day issues of environmental management and safety, including the implementation of the Traffic Control Plan. Oversight supervision is the responsibility of the CSC with full participation by the | Contract preparation costs currently budgeted as part of project preparation (including consulting services). | Incidents of avoidable traffic disruption, unsafe conditions, etc., as included in Monthly Progress Reports. |

7. PRE-CONSTRUCTION STAGE: SOCIAL/CULTURAL ASPECTS OF THE EMP

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<tbody>
<tr>
<td>To incorporate survey recommendatio ns into the Conditions of Particular Application.</td>
<td>To be determined by the Biological Resource Survey.</td>
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<tr>
<td>Potential impacts to plant diversity</td>
<td>Unnecessary disruption of plant materials shall be avoided.</td>
<td>Visual inspections and observations by the CSC.</td>
<td>Unnecessary disruptions should be reported as a routine part of Monthly Progress Reports.</td>
<td>Visual observations by the CSC should occur on all job sites not less than weekly.</td>
<td>MOTC &amp; CSC Contract compliance supervision will be a budgeted activity for the CSC.</td>
<td>Compliance with all applicable contract provisions. Plant issues as reported in weekly and monthly reports. Complaints as received through the grievance redress mechanism.</td>
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Incorporate survey recommendations into the Conditions of Particular Application.

To be determined by the Biological Resource Survey.

To be determined by the Biological Resource Survey.

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network are avoided in the subsequent stages of the Project, the COPA for the Road Section 261.5-310.5 Road Project recommends a very specific and detailed set of requirements in regard to general traffic management, traffic control, safety provisions that apply to temporary traffic ramps, vertical clearance, signage, temporary fencing, warning lights and other details. (See Appendix 2: Recommended Conditions of Particular Application: Environmental Provisions)

| Potential impacts to irrigation systems | Monitoring of compliance with mitigation measures in regard to irrigation networks will be the responsibility of the CSC and will occur in the Construction Period discussed below. | The Contractor shall be required to report issues associated with irrigation networks as a routine part of Monthly Progress Reports. | Inspections to ensure compliance are discussed below as part of the Construction Stage activities. | Inspections to ensure compliance are discussed below as part of the Construction Stage activities. | The ESO shall be responsible for day-to-day issues of environmental management and safety, including periodic site visits to assess issues associated with impacts to irrigation networks. | Contract preparation costs currently budgeted as part of project preparation (including consulting services) | Compliance with all applicable contract provisions. |

| No impacts to environmental and/or vulnerable groups are anticipated other than those identified and addressed by the Project's Land Acquisition and Resettlement Report. | See the Project's Land Acquisition and Resettlement Report. | See the Project's Land Acquisition and Resettlement Report. | See the Project's Land Acquisition and Resettlement Report. | See the Project's Land Acquisition and Resettlement Report. | See the Project's Land Acquisition and Resettlement Report. | See the Project's Land Acquisition and Resettlement Report. | |

| Mitigation recommended includes the following provisions in regard to health care for Construction Workers: | Monitoring of compliance with mitigation measures in regard to health facilities and public health shall be the responsibility of the CSC and will occur in the Construction Period discussed below. | Documented Agreements with Local Health Facilities. Documentation of the agreements reached with local health facilities shall be included in the Contractor's initial CEAP | Commitments to the requirements in regard to health facilities and public health shall be required as part of the initial CEAP submission due within 30 days of the bid award and prior to the commencement of construction | The ESO shall be responsible for day-to-day issues of environmental management and safety, including steps to ensure that the necessary health facilities and programs for workers are available and in compliance with the requirements, | Cost of providing the required facilities and programs will be included in the bids for the Project. | |

**Emergency Response Plan.** An emergency response plan to deal with accidents and emergencies, including environmental/public health emergencies associated with hazardous material spills and similar events, shall be prepared for the approval of the CSC.

**First Aid Base.** A fully equipped first aid base shall be climatically controlled to maintain the temperature of the inside of the building at 20 degrees C. Arrangements for emergency medical services shall be made to the satisfaction of the CSC.

**Safety Training Program.** A Safety Training Program is required.
and shall consist of:

- **Initial Safety Induction Course.** All workmen shall be required to attend a safety induction course within their first week on Site.

- **Periodic Safety Training Courses.** Period safety course shall be conducted not less than once every six months. All Subcontractor employees will be required to participate in relevant training courses appropriate to the nature, scale and duration of the subcontract works. Training courses for all workmen on the Site and at all levels of supervision and management.

- **Safety Meetings.** Regular safety meetings will be conducted on a monthly basis and shall require attendance by the safety representatives of Subcontractors unless otherwise agreed by the CSC. The CSC will be notified of all safety meetings in advance. The CSC may attend in person or by representative at his discretion. The minutes of all safety meetings will be taken and sent to the CSC within seven (7) days of the meeting.

- **Contractor Safety Inspections.** The Contractor shall regularly inspect, test and maintain all safety equipment, scaffolds, guardrails, working platforms, hoists, ladders and other means of access, lifting, lighting, signing and guarding equipment. Lights and signs shall be kept clear of obstructions and legible to read. Equipment, which is damaged, dirty, incorrectly positioned or not in working order, shall be repaired or replaced immediately.

- **Safety Equipment and Clothing.** Safety equipment and protective clothing are required to be available on the Site at all material times and measures for the effective enforcement of proper utilization and necessary replacement of such equipment and clothing, and all construction plant and equipment used on or around the Site shall be fitted with appropriate safety devices. These shall include but not be limited to effective safety catches for crane hooks and other lifting devices, and functioning automatic warning devices and, where applicable, an up-to-date test certificate, for cranes and hoists.

- **Requirements for Sub-Contractors’ Safety Plans.** All subcontractors will be supplied with copies of the CEAP. Provisions will be incorporated into all sub-contracts to ensure the compliance with the CEAP at all tiers of the sub-contracting. All subcontractors will be required to appoint a safety representative who shall be available on the Site throughout the operational period of the respective sub-contract unless the

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**Emergency Response Plan**

- will be required as part of the initial CEAP submission.

**Safety Reports**

- The minutes of all safety meetings will be taken and sent to the CSC within seven (7) days of the meeting.

The ESO will coordinate with Rayon and Oblast Health Officials as required throughout the course of the work. Supervision and insurance of compliance will be the responsibility of the CSC.
Engineer’s approval to the contrary is given in writing. In the event of the CSC's approval being given, the CSC, without prejudice to their other duties and responsibilities, shall ensure, as far as is practically possible, that employees of subcontractors of all tiers are conversant with appropriate parts of the CEAP.

- **Temporary Evacuations.** In the event that temporary evacuations are required due to safety or other considerations appropriate compensation will be provided.

- **HIV-Aids Awareness Program.** Details of the recommended HIV-Aids Awareness Program are presented in Appendix 2.

**Coordination with local public health officials.** The Contractor shall coordinate with local public health officials and shall reach a documented understanding with regard to the use of hospitals and other community facilities.
### 1. CONSTRUCTION STAGE: AIR-RELATED ASPECTS OF THE EMP

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</tr>
</thead>
<tbody>
<tr>
<td>Air quality impacts could occur in the Construction Phase due to accidents or failures to comply with the stipulated air quality provisions.</td>
<td>All contract stipulations established in the Pre-Construction Stage as outlined above will apply. Additional mitigation measures could be warranted in the event of unanticipated conditions or in response to accidental spills or volatile materials or significant accidental air pollutant emissions. Period unannounced site visits are also recommended to verify air quality and all other environmental compliance.</td>
<td>Documented visual and observational safety and environmental audits (including air quality observations) shall be undertaken on weekly basis. Instrumented air quality impact shall be occur not less than once per month. Air monitoring - shall include Particulates (TSP) and other air pollutants as determined warranted by the CSC could include: Sulfur Dioxide (SO2) Nitrogen Dioxide (NO2), Carbon Monoxide (CO), Ozone (O3), Ammonia (NH3), Hydrocarbons (HC) Not less than two points in each Construction Package will be monitored. Additional locations to be determined on the basis of the CEAP and the Monthly Reports.</td>
<td>Weekly Environmental and Safety Reports (ESRs). Results of the safety and environmental audits (including air quality observations) shall be reported in the required</td>
<td>Air quality impacts shall be monitored not less than once per month during the course of the Works. Additional monitoring shall be undertaken as deemed warranted by the CSC.</td>
<td>The ESO will be responsible for day-to-day issues of environmental management and compliance with air quality requirements. Insurance of contract compliance is the responsibility of the CSC.</td>
<td>Monitoring and reporting costs will be part of the Contractor's bid. Estimated costs provided by Exhibit G-4. Contract compliance supervision is a budgeted activity for the CSC.</td>
<td>Compliance with all established air quality standards.</td>
</tr>
</tbody>
</table>

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February 2011
## 2. EMP: CONSTRUCTION STAGE: WATER-RELATED ASPECTS

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<tbody>
<tr>
<td>Impacts to water resources could occur in the Construction Phase due to failure to accidents or failure to comply with the stipulated water quality provisions.</td>
<td>All contract stipulations established in the Pre-Construction Stage as outlined above will apply. Additional mitigation measures could be warranted in the event of unanticipated conditions or in response to accidental spills or volatile materials or significant accidental air pollutant emissions. Periodic unannounced site visits are also recommended to verify compliance.</td>
<td>Routine Monthly Water Quality Monitoring. Water quality impact shall be monitored not less than once per month during the course of the Works. <strong>Parameters</strong> - shall include Particulates (TSP) and other air pollutants as determined warranted by the CSC could include: Sulfur Dioxide (SO₂), Nitrogen Dioxide (NO₂), Carbon Monoxide (CO), Ozone (O₃), Ammonia (NH₃), Hydrocarbons (HC). <strong>Locations</strong>. Not less than two points in each Construction Package. Additional locations to be determined on the basis of the CEAP and Monthly Reports.</td>
<td>Weekly &amp; Monthly Reporting Schedules. Monitoring results shall be submitted to CSC as stipulated above. Monthly Scheduling. Water quality shall be monitored not less than once per month during the course of the Works.</td>
<td>The ESO will be responsible for day-to-day issues of environmental management and compliance with air quality requirements. Insurance of contract compliance is the responsibility of the CSC.</td>
<td>Monitoring and reporting costs will be part of the Contractor's bid. Estimated costs provided by Exhibit G-4.</td>
<td>Compliance with all established water quality standards.</td>
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## 3. EMP: CONSTRUCTION STAGE: NOISE-RELATED ASPECTS

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<td>Noise impacts could occur in the Construction Phase due to failure to failure to comply with the stipulated noise</td>
<td>All contract stipulations established in the Pre-Construction Stage as outlined above will apply. Additional mitigation measures could be warranted in the event of unanticipated conditions or in response to unforeseen circumstances. Periodic unannounced site visits are also recommended to verify compliance.</td>
<td>Documented visual and observational safety and environmental audits (including noise observations) shall be undertaken on weekly basis. Lmax noise readings shall be measured twice daily at times of pile driving at locations agreed with the CSC.</td>
<td>Noise monitoring results shall be reported to CSC two (2) working days of the completion of the monitoring period for analysis and noise levels shall be measured twice daily at times of pile driving at locations agreed with the CSC.</td>
<td>The ESO will be responsible for day-to-day issues of environmental management and compliance with air quality requirements.</td>
<td>Monitoring and reporting costs will be part of the Contractor's bid. Estimated costs provided by Exhibit G-4.</td>
<td>Compliance with all established noise standards.</td>
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requirements. be obtained by the ESO during the weekly environmental audits and during Periodic unannounced site visits are also recommended to verify compliance. Instrumented noise monitoring will be conducted at times of pile driving and not less than once a month at other times at locations determined by the CSC in each Construction Package.

Other than during period of pile driving, noise shall be monitored not less than once per month and more frequently if determined warranted by the CSC.

Results of the safety and environmental audits (including noise) shall be reported in the required weekly Regular Environmental and Safety Reports (ESRs). Results will also be summarized submitted as part of the Project's Monthly Progress report.

Insurance of contract compliance is the responsibility of the CSC. Contract compliance supervision is a budgeted activity for the CSC.

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### 4. EMP: CONSTRUCTION STAGE: TOPOGRAPHIC, SOIL-RELATED & PHYSIOGRAPHIC COMPONENTS

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<tr>
<td>Impacts associated with all quarries.</td>
<td>All contract stipulations established in the Pre-Construction Stage as outlined above and detailed in Appendix 2 will apply. Quarry operations require the prior approval of the CSC. Regular periodic site inspections of all quarry operations and transport routes for materials by the CSC are required as a routine part of supervision activities.</td>
<td>Regular periodic site inspections of all quarry operations and transport routes for materials by the CSC are required as a routine part of supervision activities.</td>
<td>Weekly Environmental and Safety Reports. (ESRs) shall include reports of quarry operations. Findings of audits will also be summarized submitted as part of the Project's Monthly Progress Reports.</td>
<td>Inspections and reports of quarry operations are required weekly and summarized monthly.</td>
<td>Contractors are responsible for compliance in their operations. The CSC has primary supervision responsibility. Additional oversight by OEP is encouraged.</td>
<td>Monitoring and reporting costs will be part of the Contractor's bid. Estimated costs provided by Exhibit G-4. Contract compliance supervision is a budgeted activity for the CSC.</td>
<td>Reports of compliance violations as indicated by Monthly Progress Reports.</td>
</tr>
<tr>
<td>Borrow pit operations and inspections</td>
<td>All contract stipulations established in the Pre-Construction Stage as outlined above and detailed in Appendix 2 will apply.</td>
<td>Regular periodic site inspections of all borrow pits and transport routes</td>
<td>ESRs shall include reports of borrow pit</td>
<td>Inspections and reports of borrow pit</td>
<td>Contractors are responsible for compliance in their operations.</td>
<td>Monitoring and reporting costs will be</td>
<td>Reports of compliance violations as...</td>
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**5. EMP: CONSTRUCTION STAGE: BIOLOGICAL RESOURCES COMPONENT**

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</tr>
</thead>
<tbody>
<tr>
<td>Enforcement of recommendatios as may be presented by biological resource survey.</td>
<td>To be determined by the Biological Resource Survey.</td>
<td>To be determined by the Biological Resource Survey.</td>
<td>To be determined by the Biological Resource Survey.</td>
<td>Primary responsibility will rest with the Contractors and CSC with additional oversight as may be recommended by the surveys.</td>
<td>To be determined by the Biological Resource Survey.</td>
<td>Reports of compliance violations as indicated by Monthly Progress Reports.</td>
<td></td>
</tr>
<tr>
<td>Potential impacts to plant diversity</td>
<td>Sites shall be routinely inspected to ensure that avoidable impacts to plant life do not occur.</td>
<td>Visual inspections and observations by the CSC.</td>
<td>Unnecessary disruptions should be reported as a routine part of Monthly Progress Reports.</td>
<td>Visual observations by the CSC should occur on all job sites not less than weekly.</td>
<td>Contractors are responsible for their operations. The CSC has primary supervision responsibility. Additional oversight by OEP is encouraged.</td>
<td>Monitoring is part of the Contractor's bid. Contract compliance supervision is a budgeted activity for the CSC.</td>
<td>Reports of compliance violations as indicated by Monthly Progress Reports.</td>
</tr>
</tbody>
</table>
### 6. EMP: CONSTRUCTION STAGE: SOCIAL/CULTURAL ASPECTS OF THE EMP

<table>
<thead>
<tr>
<th>Potential Impact or Issue</th>
<th>Mitigation Measure &amp; Related Links</th>
<th>Monitoring Measures</th>
<th>Reporting</th>
<th>Scheduling</th>
<th>Organizational Arrangements</th>
<th>Cost &amp; Source of Funds</th>
<th>INDICATOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impacts to existing transport infrastructure</td>
<td>All contract stipulations established in the Pre-Construction Stage as outlined above and detailed in Appendix 2 will apply, including issues of transport safety, etc. All proposed actions in regard to traffic management and safety issues require the prior approval of the CSC. Regular periodic site inspections of all detours, diversions and other traffic arrangements for materials by the CSC are required as a routine part of supervision activities.</td>
<td>Visual inspections and observations by the CSC.</td>
<td>Unnecessary transport disruptions should be reported as a routine part of Monthly Progress Reports.</td>
<td>Visual observations by the CSC should occur on all affected roadways not less than weekly.</td>
<td>Contractors are responsible for compliance in their operations. The CSC has primary supervision responsibility. The full participation of all appropriate offices of MOTC is encouraged.</td>
<td>Monitoring and reporting costs will be part of the Contractor's bid. Contract compliance supervision is a budgeted activity for the CSC.</td>
<td>Reports of compliance violations as indicated by Monthly Progress Reports.</td>
</tr>
<tr>
<td>Potential impacts to ethnic and/or vulnerable groups</td>
<td>Mitigation of potential impacts to ethnic and/or vulnerable groups shall be in compliance with the recommendations of the Project's Land Acquisition and Resettlement Report.</td>
<td>Visual observations during site visits by the CSC and reviews of Grievance Redress Procedures.</td>
<td>Addressed in Monthly Progress Reports.</td>
<td>Addressed in Monthly Progress Reports.</td>
<td>As determined by the Project's Land Acquisition and Resettlement Report.</td>
<td>As determined by the Project's Land Acquisition and Resettlement Report.</td>
<td>As determined by the Project's Land Acquisition and Resettlement Report.</td>
</tr>
<tr>
<td>Impacts to local health facilities and public health</td>
<td>All contract stipulations established in the Pre-Construction Stage as outlined above and detailed in Appendix 2 will apply. This includes all required provisions for worker health provisions, health awareness and safety program (including HIV awareness) as presented in detail in Appendix 2.</td>
<td>Confirmation that all required health and safety related programs and workshops are being implemented in compliance with the CEAP shall be included in monthly Progress Reports.</td>
<td>Addressed in Monthly Progress Reports.</td>
<td>Addressed in Monthly Progress Reports.</td>
<td>Contractors are responsible for compliance in their operations. The CSC has primary supervision responsibility. The full participation of all appropriate local health officials is encouraged.</td>
<td>Monitoring and reporting costs will be part of the Contractor's bid. Contract compliance supervision is a budgeted activity for the CSC.</td>
<td>Reports of compliance violations as indicated by Monthly Progress Reports.</td>
</tr>
</tbody>
</table>
## 1. POST-CONSTRUCTION /OPERATIONAL STAGE: AIR-RELATED ASPECTS OF THE EMP

<table>
<thead>
<tr>
<th>Potential Impact or Issue</th>
<th>Mitigation Measure &amp; Related Links</th>
<th>Monitoring Measures</th>
<th>Reporting</th>
<th>Scheduling</th>
<th>Organizational Arrangements</th>
<th>Cost &amp; Source of Funds</th>
<th>INDICATOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air quality impacts due to vehicular use of the roadway.</td>
<td>Potential impacts due to the use of the highway are the purview of MOEP and other national agencies charged with protection of the environment.</td>
<td>Periodic air monitoring is recommended.</td>
<td>As determined by MOEP</td>
<td>As determined by MOEP</td>
<td>MOEP</td>
<td>MOEP annual budget.</td>
<td>Compliance with all established air quality criteria.</td>
</tr>
</tbody>
</table>

## 2. EMP: POST-CONSTRUCTION /OPERATIONAL STAGE: WATER-RELATED ASPECTS

<table>
<thead>
<tr>
<th>Potential Impact or Issue</th>
<th>Mitigation Measure &amp; Related Links</th>
<th>Monitoring Measures</th>
<th>Reporting</th>
<th>Scheduling</th>
<th>Organizational Arrangements</th>
<th>Cost &amp; Source of Funds</th>
<th>INDICATOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impacts to hydrology and water quality as a result of construction activities.</td>
<td>Contracts stipulated that one year into the operating period a final inspection is required and contractor’s final payment is released only after a fully compliant audit is recorded. This includes the decommissioning of construction camps, asphalt plants and other ancillary aspects of the Project with significant environmental implications. Any impacts to hydrology and water quality are part of the final inspection process and final payments can not be made until outstanding issues are resolved.</td>
<td>The final inspection is defined to include provisions for any and all instrumented water quality monitoring as may be determined necessary by the MOTC and/or the CSC acting on MOTC’s behalf.</td>
<td>A final inspection report is required.</td>
<td>Once one year after the completion of construction.</td>
<td>After the completion of the final inspection to the satisfaction of MOTC, operational monitoring of environmental parameters (if any) becomes the responsibility of MOEP.</td>
<td>Inspection and related monitoring costs are included in the contractor’s bid. Contract compliance supervision is a budgeted activity for the CSC.</td>
<td>Correction of any drainage or other hydrological issues. Compliance with all established water quality parameters.</td>
</tr>
<tr>
<td>Impacts to hydrology and/or water quality as a result highway operations.</td>
<td>Operational impacts such as spills of hazardous materials resulting from accidents are mitigated by emergency response procedures of the responsible agencies.</td>
<td>As determined necessary by circumstances.</td>
<td>As determined necessary by circumstances.</td>
<td></td>
<td>MOTC and MOEP</td>
<td>MOTC and MOEP annual budgets.</td>
<td>As determined necessary by circumstances.</td>
</tr>
</tbody>
</table>

## 3. EMP: POST-CONSTRUCTION/OPERATIONAL STAGE: NOISE-RELATED ASPECTS

<table>
<thead>
<tr>
<th>Potential Impact or Issue</th>
<th>Mitigation Measure &amp; Related Links</th>
<th>Monitoring Measures</th>
<th>Reporting</th>
<th>Scheduling</th>
<th>Organizational Arrangements</th>
<th>Cost &amp; Source of Funds</th>
<th>INDICATOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise impacts</td>
<td>Potential impacts due to the use of the highway are the</td>
<td>Periodic air monitoring is</td>
<td>As determined</td>
<td>As determined</td>
<td>MOEP</td>
<td>MOEP annual</td>
<td>Compliance with</td>
</tr>
</tbody>
</table>
due to vehicular use of the roadway.

<table>
<thead>
<tr>
<th>Potential Impact or Issue</th>
<th>Mitigation Measure &amp; Related Links</th>
<th>Monitoring Measures</th>
<th>Reporting</th>
<th>Scheduling</th>
<th>Organizational Arrangements</th>
<th>Cost &amp; Source of Funds</th>
<th>INDICATOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adverse impacts resulting from quarries operations, borrow pits and other earth-disturbing aspects of the Project...</td>
<td>Contracts stipulated that one year into the operating period a final inspection is required and contractor's final payment is released only after a fully compliant audit is recorded. This includes the continuing effects of quarry and borrow pit operations and other ancillary aspects of the Project with significant environmental implications. Any continuing impacts and restorative actions that may be necessary are part of the final inspection process and final payments can not be made until outstanding issues are resolved.</td>
<td>The final inspection is defined to include restorative actions and related monitoring as may be determined necessary by the MOTC and/or the CSC acting on MOTC's behalf.</td>
<td>A final inspection report is required.</td>
<td>After the completion of the final inspection to the satisfaction of MOTC, operational monitoring of environmental parameters (if any) becomes the responsibility of MOEP.</td>
<td>Inspection and related monitoring costs are included in the Contractor's bid. Contract compliance supervision is a budgeted activity for the CSC.</td>
<td>Correction of any drainage or other hydrological issues. Compliance with all established water quality parameters.</td>
<td></td>
</tr>
<tr>
<td>Adequacy of erosion prevention features and re-vegetation.</td>
<td>Erosion prevention and re-vegetation aspects of the Project will be part of the final inspection.</td>
<td>The final inspection is defined to include restorative actions and related monitoring as may be determined necessary by the MOTC and/or the CSC acting on MOTC's behalf.</td>
<td>A final inspection report is required.</td>
<td>After the completion of the final inspection to the satisfaction of MOTC, operational monitoring of environmental parameters (if any) becomes the responsibility of MOEP.</td>
<td>Inspection and related monitoring costs are included in the Contractor's bid. Contract compliance supervision is a budgeted activity for the CSC.</td>
<td>Correction of any drainage or other hydrological issues. Compliance with all established water quality parameters.</td>
<td></td>
</tr>
</tbody>
</table>

5. EMP: POST-CONSTRUCTION/OPERATIONAL STAGE: BIOLOGICAL RESOURCES COMPONENT

<table>
<thead>
<tr>
<th>Potential Impact or Issue</th>
<th>Mitigation Measure &amp; Related Links</th>
<th>Monitoring Measures</th>
<th>Reporting</th>
<th>Scheduling</th>
<th>Organizational Arrangements</th>
<th>Cost &amp; Source of Funds</th>
<th>INDICATOR</th>
</tr>
</thead>
</table>
| Enforcement of recommendations as may be presented by                                    | To be determined by the Biological Resource Survey.                                                | To be determined by the Biological Resource Survey. | To be determined by the Biological Resource | For one year after completion of construction, primary | To be determined by the Biological Resource | To be determined by the Biological Resource

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### 5. EMP: CONSTRUCTION STAGE: SOCIAL/CULTURAL ASPECTS OF THE EMP

<table>
<thead>
<tr>
<th>Potential Impact or Issue</th>
<th>Mitigation Measure &amp; Related Links</th>
<th>Monitoring Measures</th>
<th>Reporting</th>
<th>Scheduling</th>
<th>Organizational Arrangements</th>
<th>Cost &amp; Source of Funds</th>
<th>INDICATOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impacts to local health facilities and public health due to highway accidents.</td>
<td>Operational impacts such as accidents are mitigated by emergency response procedures of the responsible agencies.</td>
<td>As determined necessary by circumstances.</td>
<td>As determined necessary by circumstances.</td>
<td>As determined necessary by circumstances.</td>
<td>MOTC and MOEP</td>
<td>MOTC and local health and safety agency annual budgets.</td>
<td>As determined necessary by circumstances.</td>
</tr>
</tbody>
</table>
## ESTIMATED ENVIRONMENTAL COSTS

<table>
<thead>
<tr>
<th>Activity/Item</th>
<th>Frequency</th>
<th>Locations &amp; Number of Samples or Events</th>
<th>Unit Cost</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PREPARATORY ACTIONS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction Debris Disposal Site Selection &amp; Approval</td>
<td>Once</td>
<td>One or more as determined by CSC</td>
<td>Included as in Project Budget</td>
<td>0</td>
</tr>
<tr>
<td>Preparation of Re-Vegetation-Shelterbelt Plan</td>
<td>Once</td>
<td>Plan area to include the length of the Project Road</td>
<td>To be determined as a separate Project</td>
<td>0</td>
</tr>
<tr>
<td>Implementation of Re-Vegetation-Shelterbelt Plan</td>
<td>Once</td>
<td>Plan area to include the length of the Project Road</td>
<td>To be determined as a separate Project</td>
<td>0</td>
</tr>
<tr>
<td>Documentation of Suitability of Potable &amp; Non-Potable Water Supply Proposals</td>
<td>Once</td>
<td>Nine potential sites currently identified</td>
<td>Included as typical activity in Project Budget</td>
<td>0</td>
</tr>
<tr>
<td>Preparation of Staging Plan</td>
<td>Once</td>
<td>Not applicable</td>
<td>Included in Project Budget</td>
<td>0</td>
</tr>
<tr>
<td>Selection &amp; approval of quarry sites</td>
<td>Once</td>
<td>Not applicable</td>
<td>Included in Project Budget</td>
<td>0</td>
</tr>
<tr>
<td>Selection of approval of asphalt source.</td>
<td>Once</td>
<td>One source identified; alternatives to be documented</td>
<td>Included in Project Budget</td>
<td>0</td>
</tr>
<tr>
<td>Need for definitive biological resource surveys</td>
<td>Once</td>
<td>Reconnaissance Survey of ROW with focus on Bypass Areas</td>
<td>US $8,000 (See Note 3)</td>
<td>US $8,000</td>
</tr>
<tr>
<td>Incorporation of environmental requirements in bid documents</td>
<td>Once</td>
<td>Once prior to the preparation of bid solicitations.</td>
<td>Included in Project Budget</td>
<td>0</td>
</tr>
<tr>
<td>CEAPs Workshop</td>
<td>One 4-day course</td>
<td>Once prior to the preparation of bid and contract documents</td>
<td>US $16,000 (See Note 4)</td>
<td>US $16,000</td>
</tr>
<tr>
<td><strong>BASELINE MONITORING</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air Quality</td>
<td>3 in a one-week period</td>
<td>2 in each of 2 Packages = 4 x 3/ wk - Total samples = 12</td>
<td>US $ 100</td>
<td>1,200</td>
</tr>
<tr>
<td>Water Quality</td>
<td>2 in a one-week period.</td>
<td>Not less than 2 groundwater samples per Package (=4 x 2 = 8) and at the sites of bridge disassembly and/or construction (=5 x 2 = 10). Total samples = 18</td>
<td>US $ 80</td>
<td>1,440</td>
</tr>
<tr>
<td>Soil Contamination</td>
<td>2 in a one-week period.</td>
<td>Not less than four points in each Package = 8 samples</td>
<td>US $ 75</td>
<td>600</td>
</tr>
<tr>
<td>Soil &amp; Sediment Contamination</td>
<td>2 in a one-week period.</td>
<td>At each bridge construction and/or disassembly location = 10 x 2 = 20</td>
<td>US $ 75</td>
<td>1,500</td>
</tr>
<tr>
<td>Noise</td>
<td>Once</td>
<td>Road point of origin, point of termination and sensitive locations as determined by CSC. Total of 4 assumed.</td>
<td>US $ 40</td>
<td>160</td>
</tr>
<tr>
<td><strong>ROUTINE MONITORING DURING CONSTRUCTION</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air Quality</td>
<td>Not less than once per month</td>
<td>2 in each of 2 Construction = 4, 30-month construction period assumed = 120</td>
<td>100</td>
<td>12,000</td>
</tr>
<tr>
<td>Water Quality</td>
<td>Not less than once per month</td>
<td>Not less than 2 groundwater samples per Package (=4) and at the sites of bridge disassembly and/or construction (=5x2 = 10) = 14/month. 30-month construction period assumed = 420</td>
<td>80</td>
<td>33,600</td>
</tr>
<tr>
<td>Soil Contamination</td>
<td>None</td>
<td>Not required after initial determination of levels and appropriate actions</td>
<td>NA</td>
<td>0</td>
</tr>
<tr>
<td>Sediment Contamination</td>
<td>None</td>
<td>Not required after initial determination of levels and</td>
<td>NA</td>
<td>0</td>
</tr>
</tbody>
</table>

Subtotal Baseline: US $ 4,900
### Noise

<table>
<thead>
<tr>
<th>Action</th>
<th>Description</th>
<th>Frequency</th>
<th>Cost per Action</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise</td>
<td>Not less than once per month per Package and during pile driving</td>
<td>At job sites and sensitive locations as determined by CSC. Total of 3 per month and 30-month construction period assumed = 90</td>
<td>40</td>
<td>3,600</td>
</tr>
</tbody>
</table>

| Subtotal Routine: | US $ 49,200 |
| GRAND TOTAL:      | US $ 78,100 |

**Notes:**
1. Unit costs are based on tabulations for similar projects in Kazakhstan, including the Kazakhstan: Central Asia Regional Economic, Cooperation Corridor 2 (Mangystau Oblast Sections) Investment Program and comparison to similar road improvement projects elsewhere. ([http://www.adb.org/Documents/IEES/KAZ/43439/43439-01-kaz-iee](http://www.adb.org/Documents/IEES/KAZ/43439/43439-01-kaz-iee))
2. Zero indicates items that are typically included in Project Budgets or recommendations for separate but related projects recommended by the IEE.
3. Assumes services by a qualified local biologist for a reconnaissance of the ROW, with project familiarization beforehand, report preparation time and expenses.
4. Based on similar workshops incorporated in related projects. Given that this activity is included in the budget of similarly funded projects it might also be considered to be included in the Project Budget rather a separable environmental cost.

**END NOTES**

H. CONCLUSIONS AND RECOMMENDATIONS

1.0 OVERALL CONCLUSION

1. The benefits of the Road Section 261.5-310.5 Project justify its implementation, provided that the recommended mitigation actions are incorporated in its implementation. These benefits include a contribution to a more efficient transport network for use within the immediate Project Area and for use by regional, national and international traffic, thus contributing to achievement of the strategic transport policy objectives presented in Part B.2.0: Need for the Project.

2.0 CONCLUSIONS VIS-À-VIS ADB ENVIRONMENTAL SAFEGUARD REQUIREMENTS

2. The SPS specifies Environmental Safeguards required to be met by projects supported by the ADB. The following provides a summary statement for the Road Section 261.5-310.5 Project vis-à-vis the Safeguard Policy Statement and the findings of the IEE with cross-references to sections of the IEE Report as appropriate.

<table>
<thead>
<tr>
<th>ENVIRONMENTAL SAFEGUARD REQUIREMENTS</th>
<th>EXHIBIT H-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requirements</td>
<td>Responses vis-à-vis the Requirements</td>
</tr>
<tr>
<td>Environmental Assessment.</td>
<td>A Category B, initial environmental examination, is required by the Road Section 261.5-310.5 Project and is provided by the document in hand.</td>
</tr>
<tr>
<td>Environmental Planning and Management</td>
<td>The IEE contains an Environmental Management Plan (EMP) meeting the requirements of this Safeguard (Part G: Environmental Management Plan)</td>
</tr>
<tr>
<td>Information Disclosure</td>
<td>It is anticipated that the IEE (including the draft EMP) will be made available and accessible and in a form and languages understandable to the affected people and other stakeholders. (See also Part F: Public Consultation, Information Disclosure, Grievance Redress Mechanism)</td>
</tr>
<tr>
<td>Consultation and Participation</td>
<td>The consultation process conducted in the preparation of the Project is described in Part F: Public Consultation, Information Disclosure, and Grievance Redress Mechanism.</td>
</tr>
<tr>
<td>Grievance Redress Mechanism</td>
<td>A Grievance Redress Mechanism has been established and is explained in detail in Part F: Public Consultation, Information Disclosure, Grievance Redress Mechanism.</td>
</tr>
<tr>
<td>Monitoring and Reporting</td>
<td>The EMP includes the required monitoring and reporting provisions. See Part G: Environmental Management Plan.</td>
</tr>
<tr>
<td>Unanticipated Environmental Impacts</td>
<td>MOTC, the Proponent for the Project, is committed to updating or preparing a revised IEE if warranted by unanticipated impacts.</td>
</tr>
<tr>
<td>Biodiversity Conservation &amp; Sustainable Natural Resource Management</td>
<td>The potentially affected area is considered to be a modified habitat (as defined by the ADB Safeguard Requirements) and has been designated a Centre for Plant Diversity and potential habitat for vulnerable species. Biological resource surveys are recommended and should specify appropriate mitigation actions (if any) are required. See Part D: Physical &amp; Biological Baseline, Impacts &amp; Mitigation Environment and Part H: Conclusions &amp; Recommendations.</td>
</tr>
<tr>
<td>Pollution Prevention and Abatement</td>
<td>The provision included in the EMP, including, for example, stipulations in regard to fuel storage and disbursement, hazard spill responses, etc., are in compliance with the ADB Safeguard Requirements. (See Recommended Conditions of Particular Application, Appendix 2).</td>
</tr>
</tbody>
</table>
Health and Safety

The recommended contract provisions in regard to construction worker health needs, AIDS prevention and education, waste disposal, etc., are in compliance with the ADB Safeguard Requirements. (See Recommended Conditions of Particular Application, Appendix 2).

Physical Cultural Resources

Visual surveys were undertaken to identify Physical Cultural Resources and ROW design adjustments were made accordingly. Field observations did not indicate the presence of such resources in the impact area. Provisions for notification of unexpected archaeological discoveries in the construction process are included in the recommended contract provisions. (See Recommended Conditions of Particular Application, Appendix 2).

3.0 CONCLUSIONS & RECOMMENDATIONS IN REGARD TO SPECIFIC ISSUES

3. Assuming proper mitigation actions as recommended herein and specified in contract terms by Appendix 2, and assuming that additional information needed in response to the data gaps and other issues noted below do not indicate to the contrary, no significant adverse environmental impacts are anticipated and the preparation of a full Environmental Impact Assessment (EIA) is not warranted. Issues that require actions to either verify or contradict these assumptions prior to finalization of the environmental assessment process include the following.

3.1 Design & Pre-Construction Issues

4. Issues that should be addressed as part of the Design and Pre-Construction Stage - prior to the start of construction:

- **Re-Vegetation Plans including Analysis of Shelterbelts.** The Project includes no provisions to mitigate the loss of over 10,000 trees (beyond the payment for the commercial value of the wood).

  In ideal circumstances Project Design should include a documented analysis of tree re-planting and opportunities for shelterbelt restorations. Roadside shelterbelts have been successfully designed to trap blowing snow and reduce the occurrence of blizzard-like conditions, making for safer winter driving and reducing the burden of road maintenance. Shelterbelts can be designed to trap blowing snow and deposit it as close to the belt as possible. The shelterbelt should therefore be fairly dense with no bottom gap. If roadside shelterbelts are planted too close to the road, snow can accumulate on the road. Shelterbelts designs considered should be placed at a distance so that prevents the micro-climate effect produced by trees or shrubs from affecting road conditions. This is an important consideration since trees or shrubs planted too close may affect temperatures on the road, resulting in icy patches. The amount of snow that needs to be trapped will affect the number of rows needed. If the fetch distance is short or if only moderate amounts of blowing snow occur, dense conifers or one row of shrubs is usually enough. But if more snow storage capacity is required, multiple rows of shrubs and/or conifers may be needed. Since two rows planted close together store practically no more snow than one row, the rows should be at least 15 m apart to trap the most snow. Designs considered should avoid planting shelterbelts at road intersections where they may create visibility hazards. Since the length of the snow bank depends on the height and density of the shelterbelt, the belt should be placed parallel to the road at a distance of ten times the height of the mature shelterbelt. In open areas with large fetch distances, this measurement may have to be increased. The fact that no provisions have been made for the incorporation of a Re-Vegetation Plan in the Project Design, or in the Project Budget, appears to preclude the possibility of addressing the issue as part of
Project Design without a delay of the Project. In lieu of doing so, the preparation of a follow-on project to achieve the same ends is recommended.

- **Testing of Potentially Lead-Contaminated Soil.** Pursuant to the stipulations of the recommended COPA, Appendix 2, disturbance of potentially lead contaminated roadside soils will require testing and approval prior to the initiation of construction and coordination of acceptable actions with the CSC. If baseline testing indicates that soils are contaminated to a degree that limits their potential use, explicit plans and commitments for suitable disposal are recommended.

- **Testing of Potentially Contaminated River Sediment.** Pursuant to the stipulations of the recommended COPA, Appendix 2, disturbance of river and creek sediments related to bridge construction will require testing and approval before reuse or disposal. If baseline testing indicates that sediments are contaminated to a degree that limits their potential use, explicit plans and commitments for suitable disposal are recommended.

- **Staging Plan.** Travel in the Project Area is currently disrupted or halted due to the existing road's incursions into the territory of the Kyrgyz Republic necessitating lengthy diversions through Chu or through Bishkek (thus entailing two border crossings) Bidders should be required to include a Staging Plan as part of their submissions to explain their proposals in light of these circumstances. Staging Plans should demonstrate a developed strategy for construction of the most critical road sections and bridges to restore traffic flow as soon as possible. The Staging Plan should also demonstrate strategies to minimize disruptions including, for example, the removal of existing bridges only after the construction of new bridges if possible - or the provision of temporary crossing arrangements if the new bridges are to be built at the same location.

- **Debris Disposal Plan.** Contract requirements for the disposal of solid waste from construction camps and as a normal part of road construction are addressed by the provisions of COPA, Appendix 2. In this instance, however, the demolition of bridges will produce a large volume of material to be disposed of in an acceptable manner in an acceptable place. An agreement on the plan is recommended prior to the initiation of construction.

### 3.2 Biological Resources Data Gap Issue

5. Impacts to animal species will occur within and adjacent to the ROW. Given the level of traffic along the existing ROW, the likelihood of threatened or endangered species in the immediate vicinity of the existing alignment is very low. Approximately 46 percent of the revised ROW, however, will be within new alignments. Given the low levels of human activities away from the existing road, the possibilities of suitable habitat and the presence of the threatened and near threatened species cannot be eliminated in the absence of a biological survey. Such a survey, including a visual reconnaissance of the Project Road's Bypass ROWs, could be conducted by qualified of OEP or privately contracted.

### 4.0 SOURCES OF MATERIALS & WATER

6. Recommendations are made in regard to sources of materials and water as follows:

- **Quarried Construction Materials.** The Project proposes to use three quarries more than 50 kilometers from the Project Road. If used, transport from these quarries, in addition to long-distance transport, will require transport through populated areas. At a minimum, the alternative of a documented analysis of alternative sources should be required, including the alternative developing quarries in the Project Area. It may be that such an alternative is not viable. It should be the subject of a documented analysis, however, and not simply dismissed out of hand.
Asphalt. As noted in Part C: Description of the Project, Item 3.2, although the Project Road will be primarily concrete cement, it will use asphalt for various purposes including the sub-base for the roadway; a 30-meter transition section adjacent to bridges and the surfaces of bridges; the separation belts at curved sections of alignments and the designs of all junctions. The available Project documentation and consultations indicate only that existing operating asphalt plant(s) will be used as the source of supply. In all probability this will be either or both of the following:

- Monolit Asphalt Plant. The Monolit Asphalt Plant is also located approximately in Kordai approximately 50 km east of the Project Road. Its use as a source of asphalt would require transport through the town of Kordai and other populated areas. It would present possibly avoidable adverse transport impacts; and/or

- Other Identified Sources. Other sources may exist west of the Project Road. In all likelihood, they would also require long distance transport through populated areas.

Additional documented consideration of the alternative of providing a temporary plant within the vicinity of the proposed ROW is recommended. Additional costs of a temporary plant (if any) warrant documented consideration as a mitigation measure to be incorporated in the Project. It may be that such an alternative is not viable. It should be the subject of a documented analysis, however, and not simply dismissed out of hand.

Potable and Non-Potable Water Supplies. The Project proposes to draw non-potable water for construction purposes from area rivers which also water source for local users and irrigation systems. It proposes to draw portable water from various wells and community water supply systems. The abilities of these sources to do so without adverse impact to other users need to be documented, reviewed and approved by those responsible for the Project.

5.0 PROJECT MANAGEMENT ISSUES

7. The environmental review also leads to the conclusion that the essential tools for environmental management practice are in hand. To make the best use of those tools and as a matter of good project management practice, the following are recommended:

- Pre-Construction Workshops in regard to CEAP Requirements. The recommended Conditions of Particular Application (COPA) for the Road Section 261.5-310.5 Project provide detailed requirements for the Contractor Environmental Action Plans (CEAPs) which will be required for the Road Section 261.5-310.5 Project - as they are for all Projects in the MFF Program. How well these plans are understood and prepared by the Contractors, and how well they are understood and supervised by the MOTC staff and its consultants (particularly the Construction Supervision Consultants, CSCs) is critical to the goal of meaningful environmental protection.

The requirements of the Plans are specified in Appendix 2 and referenced throughout this Report. The requirements are rigorous in terms of levels of specificity, commitments to monitoring requirements, reporting procedures and other details. It will be essential for potential bidders to understand the minimum requirements of the CEAPs - and the seriousness with which they will be taken - before bids are prepared. The requirements of the CEAPs must be reflected in the bids. If they are not, the bids should be rejected as non-responsive. Backing up a step, for the Contractors to be aware of the implications of the CEAP requirements, it is essential for the MOTC staff and its consultants (particularly the CSC) to be aware of these implications and fully conversant on the details to ensure that they are reflected in the bid and contract documents - and that the bids received are fully responsive to these requirements. Accordingly,
workshops to ensure that this is the case are recommended prior to the preparation of the bid announcement. The workshops are included as a Preparatory Action in the foregoing EMP, Part G.

- **Periodic Skills Enhancement Workshops during the Construction Period.** Although (pending the outcome of the recommended biological surveys) no significantly adverse or irreversible impacts have identified, the executing and implementing agency are expected to pay special attention to potential impacts commonly associated with construction activities such as establishment of access roads, temporary diversions, earthworks and aggregate borrow pit operation, work camp wastes and fuels, asphalt and concrete production, air and noise pollution, water pollution, and drainage congestion during bridge and culvert replacement. The recommended COPA presented in Appendix 2 and referenced throughout this report provides the contractually mandated and legally enforceable way to do so. A review of the requirements outlined in Appendix 2 will confirm that the Contractors will be required to re-new the awareness of their staffs (and be sure to properly orient new staff as they are added during the life of the Project). **Section 2.5.4,** for example, states that "Periodic safety courses shall be conducted not less than once every six months. All Subcontractor employees will be required to participate in relevant training courses appropriate to the nature, scale and duration of the subcontract works. Training courses for all workmen on the Site and at all levels of supervision and management." The philosophy that underlies this requirement for Contractors and their staffs should apply to the practices of MOTC and the consultants, especially the CSCs on which it relies.

**END NOTES**

APPENDIX 1

TERMS OF REFERENCE

<table>
<thead>
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<td>Project</td>
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Objective/Purpose of the Assignment:
To finalize the environmental assessment document following the requirements of the ADB's Safeguard Policy Statement and relevant legislations of the Republic of Kazakhstan.

Scope of Work:
The International Environment Consultant will finalize the environmental assessment report for the road section Km 261.5 – 310.5 of Tranche 4 project. The report will include an environmental monitoring plan (EMP) with cost estimates for environmental monitoring and mitigation.

Detailed Tasks:
I) To prepare the initial Environmental Examination of the project in accordance with the requirements of the ADB's Safeguard Policy Statement 2009; and also the relevant legislation of the Republic of Kazakhstan. A sample table of contents for the assessment is attached to this TOR. Each environmental study should cover the following:
- provide information about the environmental setting of the project areas and the location of sensitive receptors as baseline data. The consultant must provide quantitative data for the key environmental issues relating to the project;
- provide information on potential impacts of the project and the characteristics of the impacts, magnitude, distribution, sensitive receptors and affected groups, and their duration. Key environmental impacts associated with each project must be assessed quantitatively;
- provide information on potential mitigation measures to minimize the impact including mitigation costs;
- assess alternatives for the project considering costs and benefits in terms of financial, social, and environmental issues.

II) To prepare a fully costed environmental management and monitoring plan.

Key Environmental Issues to be Assessed
The environmental assessments for the project must include the issues identified below:
- Topographical maps of the alignment should be large scale at least 1:100,000 showing the alignment, location of quarries, asphalt plants, construction camps (if known);
- Project information. The report should include quantities of cut and fill, and traffic projections;
- Flora. The report should include the survey of trees to be felled;
- Archaeological studies. The report should include the results of archaeological survey prepared by the government;
- Water quality data. The report should include water quality data in major rivers crossed by the road;
- Socio-economic data. Local committee on statistics can be a source of socio-economic data.

Outline Table of Contents for an IEE.

Executive Summary
This section provides a concise summary of the critical facts, significant findings and recommended actions.

Part A Introduction and Background
This section usually includes the following:
• Purpose of the report, including identification of the project and its proponent, a brief description of the nature, size, and location of the project and its importance to the country, and any other pertinent background information;
• Stage of project preparation (i.e., pre-feasibility study, feasibility study, detailed engineering design preparation);
• Extent of the IEE study, including the scope of the study, magnitude of effort, and persons/expertise or agency performing the study and corresponding person months;
• Brief outline of the contents of the report, including any special techniques or methods used for identifying issues, assessing impacts, and designing environmental protection measures.

Part B Project Approvals, Need and Alternatives, Community Consultation

Type of project
Need for the project – The IEE will include a short strategic assessment of the need, scale and scope of the project in relation to the proposed road.
Location - using maps and plans to show the general location, specific locations and project boundaries and project site lay outs.
Alternatives- The rationale for selecting the project location, design, technology and components will be analysed. A cost benefit analysis taking environmental costs and benefits of the various alternatives will be included.
Licensing and approvals- A summary of the key approvals required under the relevant legislation of the Kazakhstan. This section should NOT be a lengthy description of Kazakhstan's environmental legislation.

Part C Description of the Project

A detailed description of the proposal, including construction, operation and staging. All infrastructure components must be clearly identified and described in terms of location, construction operation, size and scale. Linkages and operational relationships with the existing water supply infrastructure should be described.

Each section describing the impacts of the project will have the following sections:
• Baseline conditions – a description of existing conditions, with quantitative data.
• Impacts during construction – a quantitative assessment of likely impacts during construction
• Impacts during operation – a quantitative assessment of likely impacts during operation
• Mitigation measures and monitoring requirements

Part D Impacts on the Physical and Biological Environment
Geology and Soils
Surface water and groundwater
Air Quality
Biological Environment

Part E Impacts on the Socioeconomic Environment
Social and economic resources
Noise and Vibration
Economic Assessment
Cumulative Impacts

Part F Public Consultations and Disclosure and Grievance Redress Mechanism

Part G Environmental Management Plan

Part G Conclusion and Recommendations

Output/Reporting Requirements:
(i) Initial Environmental Examination
(ii) EMP
Maximum Working Days per Week:

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NOTE: Actual schedule to be confirmed with User Unit.
APPENDIX 2

Appended to the Initial Environmental Examination of the Road Section 261.5-310.5 Project (Kazakhstan)

RECOMMENDED CONDITIONS OF PARTICULAR APPLICATION

ENVIRONMENTAL PROVISIONS

Prepared for incorporation in the bid and contract documents
1.0 ENVIRONMENTAL MANAGEMENT, SAFETY & TRAFFIC CONTROL REQUIREMENTS

1.1 General Provisions

The Contractor shall take all necessary measures and precautions and otherwise ensure that the execution of the Works and all associated operations on the Work Sites or off-site are carried out in conformity with statutory and regulatory environmental requirements of the Government of Kazakhstan. The Contractor shall take all measures and precautions to avoid any nuisance or disturbance arising from the execution of Project Activities. This shall, wherever possible, be achieved by suppression of the nuisance at source rather than abatement of the nuisance once generated.

1.2 Preparation of a Contractor Environmental Action Plan (CEAP)

The Contractor shall prepare and submit a Contractor Environmental Action Plan (CEAP) to the Construction Supervision Consultant (CSC) for review and approval no later than 30 days after Notice to Proceed. The CEAP shall meet the requirements specified below.

2.0 COMPONENTS OF THE CEAP

The CEAP shall be organized in six sections as follows:

- Management Acknowledgements (Item 1.0)
- Organization & Staffing (Item 2.0)
- Communications And Reporting (Item 3.0)
- Environmental Management Provisions (Item 4.0)
- Safety Provisions (Item 5.0)
- Traffic Provisions (Item 6.0)

Review and approval of the CEAP will be provided by the CSC following the receipt of all necessary information and documentation. Approval may be conditional as specified by the CSC. The CSC may also require periodic reviews, updating and supplements to the CEAP in the course of the work. Contractors should particularly note that aspects of the CEAP will affect the ability to commence work, including the following:

- Appointment and approval of an Environment/Safety Officer (ESO) is required before work can commence. The ESO shall be responsible for day-to-day issues of environmental management and shall be subject to the CSC’s approval. The Contractor shall not undertake any works on the Site until the ESO has commenced duties on Site unless specifically agreed in writing by the CSC.
- Environmental baseline surveys are required at the earliest practical data as specified in detail below.
- Initial Safety Induction Courses are required for all workmen within their first week on the site.
2.1 Management Acknowledgements

2.1.1 Certification and Commitment

The CEAP submitted by the Contractor shall provide a signed statement from the Contractor’s managing directors attesting to a commitment that all environmental protection, safety, and industrial health aspects of the Project will be given highest priority in the discharge of contractual obligations and certifying a commitment to the provisions specified by the CEAP as approved by the CSC.

2.1.2 Statutory Understanding and Compliance

The CEAP shall provide a statement attesting the firm’s understanding of, and means of ensuring due compliance with, the statutory regulations relating to construction work in the Government of Kazakhstan, specifically in regard to compliance with:

(a) All safety and industrial health legislation including, without limitation, the Rules and Regulation of the Government of Kazakhstan and the authorities having jurisdiction.

(b) All current environmental laws and regulations, including both national and local regulations, related to the following, but not limited to:

- Noise and Vibration;
- Air pollution;
- Water contamination;
- Solid waste disposal;
- Liquid waste disposal;
- Sanitary conditions (water supply, sewerage, etc.);
- Use of explosives; and
- Protection of public traffic, etc.

2.1.3 Availability of Documents

The CEAP shall state where copies of safety and industrial health regulations and documents will be available on the construction site and verify that all regulations and documents have been or will be available and displayed or kept alongside each other in both the Russian and English languages.

2.1.4 Management of Subcontractors

The CEAP shall provide a commitment that the Contractor for the Work shall:

(a) Provide Subcontractors with copies of the CEAP and will incorporate provisions into all Subcontract documentation to ensure the compliance with such plan at all tiers of the Subcontracting.

(b) Require all Subcontractors to appoint an environmental and safety representative who shall be available on the site throughout the operational period of the respective Subcontract and ensure, as far as is practically possible, that employees of Subcontractors of all tiers are conversant with appropriate parts of the CEAP and the statutory regulations.

2.2 Organization and Staffing

2.2.1 Organization Chart
The CEAP shall include an organization chart labeled as *Attachment 2A* identifying (by job title and by the name of the individual) the personnel to be engaged solely for environmental protection, safety, traffic control. The chart and the supporting text shall identify participants and their areas of responsibility.

### 2.2.2 Identification of Responsibilities

The CEAP shall provide a description of the responsibilities of the Environment/Safety Staff appearing on the Organization Chart, either by notes included as a part of Attachment 2A or supplements thereto.

### 2.2.3 Nomination of the Proposed Environment/Safety Officer

The CEAP shall indicate the name of the proposed ESO. The ESO shall be responsible for day-to-day environmental management on the site.

### 2.2.4 Certification Related to the Environment/Safety Officer

The CEAP shall certify that:

- The ESO will be appointed and assigned duties throughout the period of the Contract entirely connected with the environmental, safety, and traffic control activities on the Site.

- The proposed ESO is suitably qualified and experienced to supervise and monitor compliance with the CEAP and will, in particular but without limitation, carry out auditing of the operation of the CEAP in accordance with a rolling program to be submitted, from time to time, to the CSC for his consent.

- The ESO will not be removed from the site without the express written permission of the CSC. Within fourteen (14) days of any such removal or notice of intent of removal, a replacement ESO will be nominated for the CSC’s approval.

- The ESO will be provided with supporting staff in accordance with the staffing levels set out in the CEAP. As detailed below, the supporting shall include at least one (1) Deputy ESO whose appointment is also subject to the CSC’s approval. The Deputy ESO is capable of assuming the duties and functions of the ESO whenever necessary.

- The ESO and the EOS staff will be empowered to instruct all employees of the Contractor or Subcontractors at any level to cease operations and take urgent and appropriate action to make safe the Site and prevent unsafe working practices or other infringements of the CEAP or the statutory regulations.

- The ESO shall maintain a daily site diary comprehensively recording all relevant matters concerning site environmental management, safety and traffic control, inspections and audits, related incidents and the like. The site diary shall be available at all times for inspection by the CSC.

### 2.2.5 Contact Information

Contact information for all Environment/Safety Staff shall be provided in the CEAP.

### 2.2.6 Qualifications of the Proposed Staff

Curriculum vita (CVs) and other relevant information explaining the qualifications of the proposed staff and their abilities to perform the duties assigned shall be provided with the CEAP.
2.3 Reporting Procedures

2.3.1 Communications & Routine Reporting Procedures

The CEAP shall explain the proposed interaction and communication procedures between construction personnel and environmental protection, safety and traffic control staff, including:

- Communication facilities.
- Routine communication and reporting systems.

2.3.2 Environmental and Safety Reports

The following environmental and safety reports shall be submitted:

- Initial Environmental Baseline Report. An Initial Environmental Baseline (IEB) Report shall be submitted as specified by Section 2.4.

- Environmental and Safety Reports. Documented safety and environmental audits shall be undertaken on weekly basis. Environmental and Safety Reports (ESRs) summarizing the results of the audits shall be submitted to the CSC on a monthly basis.

- Incorporation of Summaries in the Project Monthly Reports. Summaries of these reports will be included in the Project’s Monthly Progress Reports.

2.3.3 Notification of Accidents

The CEAP shall verify that provisions have been made to ensure that:

- The CSC will be notified immediately of any accidents which occur whether on-site or off-site in which the Contractor, his personnel or construction plant, or those of any Subcontractors are directly or indirectly involved and which result in any injuries to any persons.

- Such initial notification may be verbal and shall be followed by a written comprehensive report within 24 hours of the accident.

2.3.4 Communications with Subcontractors

The CEAP shall specify:

- The means by which environmental management, safety and traffic control and industrial health matters and requirements will be communicated to Subcontractors at all levels and their due compliance with the CEAP and all relevant statutory regulations is ensured. Subcontractors shall be supplied with copies of the CEAP. Additional activities may include attendance at training programs, circulation of newsletters and other means as specified by the CEAP.

- The method by which the procedures and practices proposed by Subcontractors will be reviewed for compliance with the CEAP and statutory regulations. This could include, for example, the inclusion of environmental and safety criteria as a part of daily and/or weekly site inspections.
2.4 Environmental Control Provisions

The required CEAP shall contain:

- A site plan for each construction site indicating the major environmental requirements as noted below;
- Proposed Environmental Baseline Work Programs;
- Proposed Monitoring Schedules;
- Verification of Arrangements for Required Equipment; and
- Other Environmental Provisions as noted below.

Detailed requirements are as follows.

2.4.1 Site Plans

The CEAP shall include site plans for each construction site and staging areas indicating the locations and arrangements of all storage areas and work sites subject to activities that may result in environmental impacts. At a minimum, the site plans must indicate the following:

- **The Basic Site Organization.** The basic site organization shall be provided by a site plan at a scale of 1:1,000.

- **Hard Surface Areas.** Areas within the site where there is a regular movement of vehicles shall have an acceptable hard surface and be kept clear of loose surface material and shall be so indicated on the required site plan.

- **Waste Disposal and Site Drainage Systems.** The following conditions shall apply:
  - **Waste Disposal.** All water and waste products arising on the site shall be collected, removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance. The site plan shall indicate the system proposed and the locations of related facilities in the site, including latrines, holding areas, etc. There shall be no direct discharge of sanitary or wash water to surface water. Disposal of materials such as, but not limited to, lubricating oil and onto the ground or water bodies shall be prohibited. Liquid material storage containment areas shall not drain directly to surface water. Liquid material storage containment areas equipped with drains shall be valved, and the valve shall be maintained locked in the closed position with supervisory control of the key. Lubricating and fuel oil spills shall be cleaned up immediately and spill clean-up shall be materials be maintained at the storage area.
  - **Drainage.** The site plan shall be devised to ensure that rain run-off from the construction sites is not deposited directly into any watercourse, stream, or canal and shall indicate the system proposed, including the locations of retention ponds and other facilities. There shall be no direct discharge of sanitary wastewater, wash water, chemicals, spoil, waste oil or solid waste to surface water bodies. Fuel, lubricating oil and chemical spills shall be contained and cleaned-up immediately. Spill clean up equipment will be maintained on site.
  - **Locations of Groundwater Monitoring Stations.** Locations for groundwater monitoring stations as required by Item 2.4.3 below shall be indicated.
  - **Locations and Design Requirements for Fueling Operations & Liquid and Toxic Material Storage Areas.** Fueling operations shall occur only within containment areas. The site plans shall specify the locations for the storage of liquid materials...
and toxic materials. The following conditions to avoid adverse impacts due to improper fuel and chemical storage:

- All fuel and chemical storage (if any) shall be sited on an impervious base within a bund and secured by fencing. The storage area shall be located away from any watercourse or wetlands. The base and bund walls shall be impermeable and of sufficient capacity to contain 110 percent of the volume of tanks.

- Filling and refueling shall be strictly controlled and subject to formal procedures and will take place within areas surrounded by bunds to contain spills / leaks of potentially contaminating liquids.

- All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.

- The contents of any tank or drum shall be clearly marked. Measures shall be taken to ensure that no contaminated discharges enter any drain or watercourses.

- Disposal of lubricating oil and other potentially hazardous liquids onto the ground or water bodies will be prohibited.

- Should any accidental spills occur immediate clean up will be undertaken and all cleanup materials stored in a secure area for disposal to a site authorized to dispose of hazardous waste.

- **Locations Relative to Watercourses.** The site plans shall be devised to ensure that, insofar as possible, all temporary construction facilities are locate at least 50 meters away from a water course, stream, or canal.

- **Other Water-Related Facilities.** The Contractor is required to construct, maintain, remove and reinstate as necessary temporary drainage works and take all other precautions necessary for the avoidance of damage by flooding and silt washed down from the Works. Site Plans must indicate adequate precautions to ensure that no spoil or debris of any kind are allowed to be pushed, washed down, fallen or be deposited on land or water bodies adjacent to the Site.

- **Location of Batching Plant(s).** Dry mix batching shall be carried out in a totally enclosed area with exhaust to suitable fabric filters. The locations of these facilities should be clearly illustrated by the site plans.

- **Location of Wheel Washing Facilities.** If determined warranted by the CSC, the Contractor shall provide a wash pit or a wheel washing and/or vehicle cleaning facility at the exits from the sites. If so requested, the Contractor shall ensure that all vehicle are properly cleaned (bodies and tires are free of sand and mud) prior to leaving the site areas. The Contractor shall provide necessary cleaning facilities on site and ensure that no water or debris from such cleaning operations is deposited off-site. The locations of these facilities shall be clearly illustrated by the site plans. Connections to the area highways designated as the M39 and the A359 will be given consideration as locations requiring such facilities.

- **Location of Sand and Aggregate Storage Provisions.** The Contractor shall implement dust suppression measures that shall include, but not be limited to the following:

  - **Stockpiles of sand and aggregate greater than 20 cubic meters for use in concrete manufacture shall be enclosed on three sides, with walls extending above the pile and two (2) meters beyond the front of the piles.**
- Cement and other such fine-grained materials delivered in bulk shall be stored in closed silos fitted with a high-level alarm indicator. The high-level alarm indicators shall be interlocked with the filling line such that in the event of the hopper approaching an overfull condition, an audible alarm will operate, and the pneumatic line to the filling tanker will close.

- **Conveying Systems.** Where dusty materials are being discharged to vehicles from a conveying system at a fixed transfer point, a three-sided roofed enclosure with a flexible curtain across the entry shall be provided. Exhaust fans shall be provided for this enclosure and vented to a suitable fabric filter system. Locations and essential details for these facilities shall be indicated on the site plan as warranted.

- **Other Air Quality Features.** Construction walls will be provided in all locations where strong winds could cause the blowing of dust and debris. The CEAP shall indicate where such facilities are proposed.

- **Conformance with the Montréal Protocol.** All refrigerants and fire extinguishing materials shall be in accordance with Montréal Protocol which specifies acceptable materials for these purposes.

- **Locations of Proposed Air Quality Monitoring Stations.** Sheltered air quality monitoring stations are required at each location for baseline air quality monitoring. The Contractor shall construct suitable access, hard standing and a galvanized wire fence and gate at each monitoring station. The exact location and direction of the monitoring equipment at each monitoring station shall be agreed with the CSC. The locations proposed should be clearly illustrated by the site plans.

- **Explanations of Proposed Site Drainage Systems.** Locations likely to be subject to water quality impacts or significant runoff (construction camps, staging areas, etc.) and an explanation of the proposed site drainage system shall be indicated on the site plans.

- **Noise Monitoring Stations.** The Contractor will carry out noise monitoring at such points within the Site or outside the Site and at times as shall be determined by the CSC. The location(s) proposed should be clearly illustrated by the Site Plan(s).

### 2.4.2 Standards and Required Equipment

Contractors are required to meet the prevailing standards and regulations of the Government of Kazakhstan. In instances in which the requirements of the General Specifications and those of the Government of Kazakhstan differ (if any), the more stringent shall apply. Instrumented monitoring as called for herein will require Subcontractor services for which the following should be noted:

- **Air Quality.** Air quality monitoring will require:
  - A high volume air sampler and associated equipment and shelters in accordance with accepted international practice.
  - A direct reading dust meter capable of reading one-hour TSP in the range 0.1-100 mg/m³. The dust (TSP) levels will be measured by the High Volume Method for Total Suspended Particulates.
  - Equipment capable of providing the monitoring specified by the Monitoring Plan.
  - Suitable access, hard standing and a galvanized wire fence and gate at each
monitoring station at locations on the site boundaries.

- Equipment as necessary to ensure that all samples collected as part of the monitoring program shall be analyzed according to accepted international practice.

- **Water Quality.** All sampling and analysis shall be in conformance with standard methods and standards of the Government of Kazakhstan. There shall be no direct discharge of sanitary wastewater, wash water, chemicals, spoil, waste oil or solid waste to surface water bodies. Fuel, lubricating oil and chemical spills shall be contained and cleaned-up immediately. Spill clean up equipment will be maintained on site.

- **Noise.** Baseline noise monitoring shall conform to the requirement of the Government of Kazakhstan. Equipment as necessary to ensure monitoring meeting these standards is required.

### 2.4.3 Environmental Baseline Survey Work Program

The following are required as a part of the environmental baseline survey (EBS):

- **Air Quality Baseline.** Air quality baseline monitoring shall be carried out as soon after the date of acceptance of the Bid as is practicable, to determine ambient levels of the air pollutants indicated below at specified monitoring stations. The baseline monitoring is required to be carried out for a one-week period with measurements to be taken at each monitoring station according to the frequency schedule below. The CEAP shall indicate when the Contractor proposes to undertake the required baseline air quality survey and shall provide references to locations indicated by the accompanying site plan(s) as appropriate. The proposed locations require the approval of the CSC.

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<tr>
<td>• Hydrocarbons (HC)</td>
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- **Water Quality Baseline.** Pre-construction water quality monitoring shall be carried out twice within a one-week period to establish baseline conditions at locations determined in consultation with the Engineer and shall include locations likely to be subject to water quality impacts or significant runoff (construction camps, staging areas, etc.) and shall include:

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<td>Biological Oxygen Demand (BOD)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dissolved oxygen (DO),</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conductivity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fecal coliform,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil and grease</td>
<td></td>
<td></td>
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</table>

- **Soil and Sediment Baseline.** Pre-construction soil and sediment monitoring shall be
carried out twice within a one-week period to establish baseline conditions at locations
determined in consultation with the Engineer and shall include locations in which
roadside soils will be disturbed and used for fill or other purposes and at the locations of
bridge construction in which sediments will be disturbed and could impact water quality
or be used inappropriately (if contaminated) for other purposes (e.g., crop production). I:

### Baseline Monitoring: Soils and Sediments

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Frequency</th>
<th>Locations</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead</td>
<td>Once at each location.</td>
<td>At each bridge location.</td>
<td>As specified by OEP</td>
</tr>
<tr>
<td>Ph</td>
<td></td>
<td>Roadside at not less than two points in each Construction Package.</td>
<td></td>
</tr>
<tr>
<td>Fecal coliform,</td>
<td></td>
<td>Additional locations to be determined on the basis of CEAPs.</td>
<td></td>
</tr>
<tr>
<td>Oil and grease</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pesticides</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sediments surveys</td>
<td>Consist of three samples at each river</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>crossing, one at the centerline of the</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>river and one near each shoreline at a</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>distance based on the width of the river.</td>
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### Baseline Monitoring: Noise

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Frequency</th>
<th>Locations</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>$L_{eq}$</td>
<td>Once prior to</td>
<td>At the Project's point of origin and terminal point and other areas as</td>
<td>Instrumented measurements and</td>
</tr>
<tr>
<td></td>
<td>construction.</td>
<td>determined warranted by the CSC.</td>
<td>reporting by Contractors</td>
</tr>
<tr>
<td>$L_{10%}$</td>
<td></td>
<td></td>
<td>supervised by the CSC.</td>
</tr>
<tr>
<td>$L_{90%}$</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$L_{eq}$ represents a sound level equivalent, i.e., an energy-averaged sound level that includes both steady background sounds and transient short-term sounds commonly used to describe traffic noise levels that tend to experience hourly peaks.

$L_{\%}$ is defined as the percentile distributions of sound levels, i.e., the sound level exceeded for an indicated percentage of the measurement period. $L_{90\%}$ is the sound level exceeded 90 percent of the measurement period and is commonly used to represent background sound levels. $L_{10\%}$ is the sound level exceeded 10 percent of the measurement period and represents the peak sound levels.

### 2.4.4 Monitoring Schedules During Construction

The following scheduling provisions shall apply in regard to routine periodic monitoring
during the life of the Project:

- **Air Quality.** Air quality impact shall be monitored not less than once per month during the course of the Works. Monitoring results shall be submitted to CSC two (2) working days of the completion of the monitoring period for analysis and review. Actions taken in response to the monitoring results shall also be required. Additional monitoring shall be undertaken as deemed warranted by the CSC.

- **Water Quality Monitoring.** Monitoring of runoff from the site areas, construction camps, staging areas and camps etc., shall be undertaken not less than once per month and additional monitoring may be required at the discretion of the CSC if warranted by site observations. Analytical reports may be required by the CSC to explain anomalies and problems encountered. Actions taken in response to the monitoring results shall also be
Noise Monitoring. Instrumented noise monitoring will be conducted at times of pile driving and not less than once a month at other times at locations determined by the CSC in each Construction Package. The maximum acceptable jobsite noise level ($L_{max}$) shall not exceed 85 dBA unless protective equipment is supplied. Off-site noise levels due to construction activities shall not exceed a $L_{eq}$ of 70 dBA at any time and, insofar as possible, shall not exceed 55 dBA during the day (6:00 to 8:00 PM) and 40 dBA at night (8:00 PM to 6:00 AM). Noise levels shall be measured during times of pile driving and during other periods as follows:

**During Pile Driving.** During piling, or any other activity likely to be a source of significant vibration designated by the CSC, the Contractor shall record vibration levels at locations agreed with the CSC at least twice daily. The frequency of monitoring may be relaxed if it can be shown that vibration levels are consistent and within acceptable levels. These shall be done at times during the active use of the equipment likely to be a source of vibration.

**Other Periods.** Other than during period of pile driving, noise shall be monitored not less than once per month and more frequently if determined warranted by the CSC.

In all cases monitoring results shall be submitted to CSC two (2) working days of the completion of the monitoring period for analysis and review. Actions taken in response to the monitoring results shall also be required.

2.4.5 Post-Construction and Final Inspection Monitoring

Following the completion of construction and one year into the operating period a final inspection will be required and the Contractor’s final payment will be released only after a fully compliant audit is recorded. This includes the decommissioning of construction camps, asphalt plants and other ancillary aspects of the Project with significant environmental implications. Monitoring of air quality, water quality and/or other environmental parameters will be undertaken at the time of the final inspection as directed by the CSC. Any impacts to hydrology and water quality are part of the final inspection process and final payments can not be made until outstanding issues are resolved.

Other Environmental Provisions

Related to Air Quality

The CEAP shall indicate understanding of and a commitment to the requirements that:

(a) No furnaces, boilers or other similar plant or equipment using any fuel that may produce air pollutants will be installed without prior written consent of the CSC.

(b) No burning of debris or other materials will occur on the Site.

(c) Dust suppression measures including but not limited to the following will be implemented:

- Stockpiles of sand and aggregate greater than 20 cubic meters for use in concrete manufacture shall be enclosed on three sides, with walls extending above the pile and two (2) meters beyond the front of the piles. Locations shall be indicated by the CEAP.

- Effective water sprays shall be used during the delivery and handling of all raw sand and aggregate, and other similar materials, when dust is likely to be
created and to dampen all stored materials during dry and windy weather.

- Areas within the Site where there is a regular movement of vehicles shall have an acceptable hard surface and be kept clear of loose surface material. Locations shall be indicated by the CEAP.

- Conveyor belts shall be fitted with wind-boards, and conveyor transfer points and hopper discharge areas shall be enclosed to minimize dust emission. All conveyors carrying materials that have the potential to create dust shall be totally enclosed and fitted with belt cleaners. Locations shall be indicated by the CEAP.

- Cement and other such fine-grained materials delivered in bulk shall be stored in closed silos fitted with a high-level alarm indicator. The high-level alarm indicators shall be interlocked with the filling line such that in the event of the hopper approaching an overfull condition, an audible alarm will operate, and the pneumatic line to the filling tanker will close. Locations shall be indicated by the CEAP.

- Cement manufactured from dredging of off-shore coral reef resources will not be used in the project.

- All air vents on cement silos shall be fitted with suitable fabric filters provided with either shaking or pulse-air cleaning mechanisms. The fabric filter area shall be determined using an air-cloth ratio (filtering velocity) of 0.01 - 0.03 m/s.

- Weigh hoppers shall be vented to a suitable filter.

- The filter bags in the cement silo dust collector must be thoroughly shaken after cement is blown into the silo to ensure adequate dust collection for subsequent loading.

- Adequate dust suppression including water bowsers with spray bars.

- Areas of reclamation shall be completed, including final compaction, as quickly as possible consistent with good practice to limit the creation of wind blown dust.

- All roads within the construction areas of the Site shall be sprayed at least twice each day, and more if necessary to control dust to the satisfaction of the CSC.

- All vehicles, while parked on the Site, will be required to have their engines turned off.

- All equipment and machinery on the Site will be checked at least weekly and make all necessary corrections and or repairs to ensure compliance with safety and air pollution requirements.

- All vehicles will be properly cleaned (bodies and tires are free of sand and mud) prior to leaving the site areas. The necessary cleaning facilities will be provided on site to ensure that no water or debris from such cleaning operations is deposited off-site. Locations should be indicated by the CEAPs.

- All trucks used for transporting materials to and from the site will be covered with canvas tarpaulins, or other acceptable type cover (which shall be properly secured) to prevent debris and/or materials from falling from or being blown off the vehicle(s).
- Construction walls will be provided in all locations where strong winds could cause the blowing of dust and debris.

(d) At any concrete batching plant or crushing plant being operated on the Site the following additional conditions shall apply:

- Dust nuisance as a result of Project activities will be avoided. An air pollution control system shall be installed and shall be operated whenever the plant is in operation.

- Where dusty materials are being discharged to vehicles from a conveying system at a fixed transfer point, a three-sided roofed enclosure with a flexible curtain across the entry shall be provided. Exhaust fans shall be provided for this enclosure and vented to a suitable fabric filter system. Locations shall be indicated by CEAPs.

- Any vehicles with an open load carrying area used for moving potentially dust-producing materials shall have properly fitting side and tailboards. Materials having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin in good condition. The tarpaulin shall be properly secured and shall extend at least 300 millimeters over the edges of the side and tailboards.

- The concrete batching plant and crushing plant sites and ancillary areas will be frequently cleaned and watered to minimize any dust emissions.

- Dry mix batching shall be carried out in a totally enclosed area with exhaust to suitable fabric filters.

Related to Soils

a) Cut and Fill Activities. In undertaking cut and fill activities associated with the Works the Contractor shall:

- Select less erodible material, placement of gabions and riprap and good compaction, particularly around bridges and culverts.

- Complete final forming and re-vegetation will be completed as soon as possible following fill placement to facilitate regeneration of a stabilizing ground cover.

- Trench where necessary to ensure successful establishment of vegetation.

- Seed with a fast growing crop and potential native seed mix immediately after fill placement to prevent scour and to encourage stabilization.

- Stabilize embankment slopes and road cuts by re-vegetation with grazing resistant plant species, placement of fiber mats, riprap, rock gabions, or other appropriate technologies.

- Complete discharge zones from drainage structures with riprap to reduce erosion when required.

- Line down drains/chutes with rip-rap/masonry or concrete to prevent erosion.

- Adjust side slopes adjusted in the range from based on soil and other conditions and within a range as determined in consultation with the Contractor to reduce erosion potential or, if necessary, cover with riprap or other material to prevent
soil erosion.

- Use stepped embankments for embankments greater than six meters.

b) **Borrow Pits.** The following conditions shall apply to borrow pits:

- The locations of all borrow pits will require the prior approval of the CSC before any material is removed and all will be located outside the ROWs.

- Borrow pits will be developed in a manner which does not cause drainage or visual intrusion or present a potential for increased vector activity (e.g., mosquitoes or water contamination).

- Pit restoration will follow the completion of works in full compliance all applicable standards and specifications.

- The excavation and restoration of the borrow areas and their surroundings, in an environmentally sound manner to the satisfaction of the CSC is required before final acceptance and payment under the terms of contracts.

- Borrow pit areas will be graded to ensure drainage and visual uniformity, or to create permanent tanks/dams.

- Topsoil from borrow pit areas will be saved and reused in re-vegetating the pits to the satisfaction of the CSC.

- Additional borrow pits will not be opened without the restoration of those areas no longer in use.

c) **Quarries.** To ensure adequate mitigation of potential adverse impacts, only licensed quarrying operations are to be used for material sources and prior approval of the CSC shall be required. If licensed quarries are not available the Contractors may be made responsible for setting up their dedicated crusher plants at approved quarry sites only with the approval of the CSC.

d) **Erosion.** To avoid potential adverse impacts due to erosion, the Contractor shall:

- Line spillage ways with riprap to prevent undercutting.

- Provide mitigation plantings and fencing where necessary to stabilize the soil and reduce erosion.

- Upgrade and adequately size, line and contour storm drainage to minimize erosion potential.

**Related to Water Quality**

Other water quality provisions will include but will not be limited to the following:

- All existing stream courses and drains within, and adjacent to, the Site will be kept safe and free from any debris and any excavated materials arising from the Works. Chemicals, sanitary wastewater, spoil, waste oil and concrete agitator washings will not be deposited in the watercourses.

- All water and waste products arising on the Site will be collected, removed from the
Site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance.

- Drainage works will be constructed, maintained, removed and reinstated as necessary and all other precautions necessary for the avoidance of damage by flooding and silt washed down from the Works will be taken. Adequate precautions will be taken to ensure that no spoil or debris of any kind are allowed to be pushed, washed down, fallen or be deposited on land adjacent to the Site.

- In the event of any spoil or debris from construction works being deposited on adjacent land or any silt washed down to any area, then all such spoil, debris or material and silt shall be immediately removed and the affected land and areas restored to their natural state by the Contractor to the satisfaction of the Engineer.

- Downstream slopes will be stabilized with concrete, rock gabions or walls to avoid erosion where warranted.

- Contractor will ensure that construction camps and other potential sources of secondary impacts are properly sited and provided with drainage and wastewater facilities.

Related to Noise and Vibration

To avoid potential adverse noise and vibration impacts, the Contractor shall:

- Be responsible for repairing any damage caused as the result of vibrations generated from or by the use of his equipment, plant, and machinery.

- Erect temporary noise barriers where schools are within 50 meters of construction activities.

- Provide public notification of construction operations prior to construction works.

- Ensure that sensitive receptors will be avoided as possible (i.e., aggregate crushers, operators, etc.).

- Ensure that all exhaust systems will be maintained in good working order; properly designed engine enclosures and intake silencers will be employed; and regular equipment maintenance will be undertaken.

- Ensure that stationary equipment will be placed as far from sensitive land uses as practical; selected to minimize objectionable noise impacts; and provided with shielding mechanisms where possible.

- Schedule operations to coincide with periods when people would least likely be affected; work hours and work days will be limited to less noise-sensitive times. Hours-of-work will be approved by the site engineer having due regard for possible noise disturbance to the local residents or other activities. Construction activities will be strictly prohibited between 10 PM and 6 AM in the residential areas.

- Vibration and noise monitoring shall be undertaken as specified by Item 2.4.4 above.

- The Contractor shall also note and record the condition of the structure being monitored and any change in condition from the time of the previous round of monitoring.
Related to Protection of Irrigation Systems

To avoid potential adverse impacts to irrigation systems, the Contractor shall ensure irrigation channels diverted during the construction phase will be returned to their original status. Where this is not possible, or where channels are irrevocably altered, consultation will be held with landowners to ensure that an adequate redesign is undertaken to ensure that irrigation channels are returned as closely as possible to their former layout. The Contractor will undertake all necessary works to achieve this status, including provision of labor.

Related to Protection of Historic and Cultural Resources

To avoid potential adverse impacts to historic and cultural resources, the Contractor shall:

- Protect sites of known antiquities, historic and cultural resources by the placement of suitable fencing and barriers;

- The Contractor will undertake formal public meetings prior to construction works to identify potential historic and cultural sites that may be affected by Project works.

- Not locate construction camps within 500 meters from cultural resources.

- Adhere to accepted international practice and all applicable historic and cultural preservation requirements of the government of Kazakhstan, including all appropriate local government entities

- In the event of unanticipated discoveries of cultural or historic artifacts (movable or immovable) in the course of the work, the Contractor shall take all necessary measures to protect the findings and shall notify the CSC and concerned Rayon and Oblast-level and central government levels representatives.

If continuation of the work would endanger the finding, project work shall be suspended until a solution for preservation of the artifacts is agreed upon.

Related to Protection of Utilities

To avoid potential adverse impacts to utilities, the Contractor shall:

- Ascertain and take into account in his method of working the presence of utility services on and in the vicinity of the Site.

- Take into account in his program the periods required to locate, access, protect, support and divert such services, including any periods of notice required to affect such work in consultation with authorities operating such services.

- Assume all responsibility to locate or to confirm the details and location of all utility services on or in the vicinity of the Site.

- Exercise the greatest care at all times to avoid damage to or interference with services.

- Assume responsibility for any damage and/or interference caused by him or his agents, directly or indirectly, arising from actions taken or a failure to take action, and for full restoration of the damage.

- Wherever existing ground surfaces are to be disturbed for construction of the Works,
carry out full and adequate preliminary investigations to locate all services in the area by means of hand-dug trial holes and trenches in combination with electronic and electro-mechanical devices, where appropriate. Each service thus exposed shall be identified. Every such service at risk shall be fully exposed and adequately protected and supported in situ or diverted to the satisfaction of the appropriate authority prior to the commencement of such construction.

- When working in the vicinity of overhead power cables, ascertain and certify safe clearances to be maintained from the power cables in consultation with the authority operating the power line. Where existing overhead power lines, communications cables or other major utilities require relocation, the Contractor will use the services of specialist enterprises with the necessary skills and technology to carry out the work.

- The Contractor will consult with the concerned agencies to determine the proposed schedule for future utilities works on the Project Road. If such works, i.e. cable laying, is proposed in the near future the Contractor should propose an appropriate works schedule to synchronize such activities and reduce potential disruption.

Related Land Communication

Construction operations will be conducted in a manner to minimize their impact on land communications in and around the areas of construction. Measures to accomplish this requirement shall include but not be limited to the following:

- Loading of all trucks used for transporting materials and equipment and shall not exceed the legal limits as stipulated by the government of Kazakhstan.

- The speed for all trucks used for transporting materials and equipment shall not exceed 60 kilometers per hour on highways.

- Transport of materials and equipment and shall be in accordance with the all relevant requirements and regulations.

- Avoidance of loading and transportation of materials and equipment during rush hours to avoid aggravating conditions on road in the construction area.

- Installation of proper and sufficient traffic signs.

- Proper supervision of drivers to ensure awareness and adherence to regulations.

- Control of drivers to prevent the use of alcohol and drugs. The Contractor shall stipulate that such usage shall be grounds for termination of employment on the Works.

- The storage of construction materials.

The CEAP shall attest to the fact that the Contractor will be responsible for all road damage that may occur from the transporting of materials and equipment to and from the Works and will be responsible for coordinating with all concerned agencies for implementing all necessary repairs and/or restorations. The Contractor shall be required to repair any damage to the satisfaction of the Engineer and at no cost to the Employer.

Contingency Provisions

Special circumstances and conditions may make the imposition of special environmental
provisions from time to time. The CEAP shall attest to the fact that the Contractor understands that such provisions may be imposed by the CSC. Such special conditions may result from oil spills or spills of toxic materials or other impacts resulting from Project-related activities.

2.5 Health & Safety Provisions

2.5.1 Emergency Response Plan

An emergency response plan to deal with accidents and emergencies, including environmental/public health emergencies associated with hazardous material spills and similar events, shall be prepared for the approval of the CSC.

2.5.2 First Aid Base

A fully equipped first aid base shall be climatically controlled to maintain the temperature of the inside of the building at 20 degrees Celsius (20°C). Arrangements for emergency medical services shall be made to the satisfaction of the CSC.

2.5.3 On-Site Safety Publicity

The Contractor shall ensure that safety, rescue and industrial health matters are given a high degree of publicity to all persons regularly or occasionally on the Site. Posters, in both Russian and English, drawing attention to site safety, rescue and industrial health regulation shall be made or obtained from the appropriate sources and shall be displayed prominently in relevant areas of the Site.

2.5.4 Safety Training Program

A Safety Training Program is required and shall consist of:

- **Initial Safety Induction Course.** All workmen shall be required to attend a safety induction course within their first week on Site.

- **Periodic Safety Training Courses.** Periodic safety courses shall be conducted not less than once every six months. All Subcontractor employees will be required to participate in relevant training courses appropriate to the nature, scale and duration of the subcontract works. Training courses for all workmen on the Site and at all levels of supervision and management.

- **Safety Meetings.** Regular safety meetings will be conducted on a monthly basis and shall require attendance by the safety representatives of Subcontractors unless otherwise agreed by the CSC. The CSC will be notified of all safety meetings in advance. The CSC may attend in person or by representative at his discretion. The minutes of all safety meetings will be taken and sent to the CSC within seven (7) days of the meeting.

- **Safety Inspections.** The Contractor shall regularly inspect, test and maintain all safety equipment, scaffolds, guardrails, working platforms, hoists, ladders and other means of access, lifting, lighting, signing and guarding equipment. Lights and signs shall be kept clear of obstructions and legible to read. Equipment, which is damaged, dirty, incorrectly positioned or not in working order, shall be repaired or replaced immediately.

- **Safety Equipment and Clothing.** Safety equipment and protective clothing are required to be available on the Site at all material times and measures for the effective enforcement of proper utilization and necessary replacement of such equipment and clothing, and all construction plant and equipment used on or around the Site shall be fitted with
appropriate safety devices. These shall include but not be limited to:

- Effective safety catches for crane hooks and other lifting devices, and

- Functioning automatic warning devices and, where applicable, an up-to-date test certificate, for cranes and hoists.

### Requirements for Subcontractors' Safety Plans
All Subcontractors will be supplied with copies of the CEAP. Provisions will be incorporated into all Subcontracts to ensure the compliance with the CEAP at all tiers of the Subcontracting. All Subcontractors will be required to appoint a safety representative who shall be available on the Site throughout the operational period of the respective Subcontract unless the Engineer’s approval to the contrary is given in writing. In the event of the CSC’s approval being given, the CSC, without prejudice to their other duties and responsibilities, shall ensure, as far as is practically possible, that employees of Subcontractors of all tiers are conversant with appropriate parts of the CEAP.

### Temporary Evacuations
In the event that temporary evacuations are required due to safety or other considerations appropriate compensation will be provided.

### Coordination with Local Public Health Officials
The Contractor shall coordinate with local public health officials and shall reach a documented understanding with regard to the use of hospitals and other community facilities. Documentation of the agreements reached shall be included in the Contractor's initial CEAP submission.

### 2.5.5 HIV-Aids Awareness Program

It shall be a requirement of the Contract that the Contractor:

- **2.5.5.1** Subcontracts with an Approved Service Provider to provide an HIV Awareness Program to the Contractor’s Personnel and the Local Community as soon as practicable after the Contractor’s Personnel arrive at the Site but in any case within two weeks after the Contractor’s Personnel arrive at Site and to repeat the HIV Awareness Program at intervals not exceeding four months;

- **2.5.5.2** Gives any representative of the Approved Service Provider, the Employer and the National HIV/AIDS Authority all reasonable access to the Site in connection with the HIV Awareness Program;

- **2.5.5.3** If the National Aids Authority has not provided the names of available Approved Service Providers within two weeks after being asked the Contractor may select its own service provider after consultation with the appropriate UNAIDS and/or National HIV/AIDS Authority office;

- **2.5.5.4** Instructs the Contractor’s Personnel to attend the HIV Awareness Program in the course of their employment and during their normal working hours or any period of overtime provided for in the relevant employment contracts and uses all reasonable endeavors to ensure this instruction is followed;

- **2.5.5.5** Provides suitable space for delivery of the HIV Awareness Program and does nothing to dissuade the Contractor’s Personnel from attending the HIV Awareness Program;
2.5.6 As soon as practicable, notifies the National HIV/AIDS Authority of its subcontract with an Approved Service Provider to facilitate the National HIV/AIDS Authority’s audit of Approved Service Providers;

2.5.7 Gives all reasonable cooperation to the National HIV/AIDS Authority if it exercises its right to audit the provision by the Approved Service Provider of the HIV Awareness Program.

2.5.8 Makes condoms complying with the requirements of ISO 4074 available to all Contractor’s employees at readily accessible points on the site, suitably protected from the elements, for the duration of the contract;

2.5.9 Either place and maintain HIV/AIDS awareness posters of size of not less than A1 in areas which are highly trafficked by construction workers, or provide construction workers with a pamphlet, in languages largely understood by construction workers, which reinforce the outcomes of the HIV Awareness Program stated in 2.5.5.1;

2.5.10 Encourages voluntary HIV/STD testing, and

2.5.11 Provides information on services concerning counseling, support and care of those that are infected.

It is not a requirement of this contract for the Contractor to undertake or pay for treatment or medication for personnel found to be suffering from HIV/AIDS. Such personnel shall not be discriminated against however.

2.5.6 The outcomes of the HIV Awareness Program shall as a minimum, result in Contractors personnel exposed to such a program being able to:

a) Communicate the existence of problems of HIV and be able to outline the consequences of transmission of HIV to or from the local community;

b) Recall and communicate the mode of HIV transmission and preventative measures including the proper use of the condom.

c) Be aware of the advantages of abstinence/avoidance

2.5.7 Reporting

2.5.7.1 The Contractor shall prepare and attach to his claims for payment a brief report which outlines how the actions taken by the Contractor in the period for which payment is claimed satisfy the requirements and a schedule which lists the names, identity numbers, trade / occupation and name of employer of all construction workers exposed to the program.

2.5.7.2 The employer’s representative shall certify the report and schedule described in 2.5.5.1 whenever a claim for payment is issued to the employer.
2.5.8 Where a clinic is provided on behalf of the Contractor on site, the Contractor shall ensure that such clinic provides to the Contractor's personnel, on request and without charge:

2.5.8.1 Counseling and advice on AIDS in compliance with UNAIDS or National HIV/AIDS Authority guidelines; and

2.5.8.2 Condoms that comply with either the current ISO standard or WHO/UNAIDS Specification and Guidelines for Condoms 1998 or any more recent equivalent publication by the National HIV/AIDS Authority.

2.5.9 The Contractor shall be entitled to be reimbursed by the Employer for any payments made under a subcontract made on either cost incurred in accordance with the relevant provisions in the Contract, and in particular, for the amounts included in the Bill of Quantities;

2.5.10 Where the Contract does not provide for reimbursement of named costs, the amount paid by the Contractor to the Approved Service Provider shall be added to any lump sum to be paid by the Employer to the Contractor under the Contract and, before such lump sum is paid, the Contractor shall provide to the Employer evidence of:

2.5.10.1 Payment of the amount claimed to the Approved Service Provider; and

2.5.10.2 Provision of the HIV Awareness Program (e.g., a Compliance certificate issued by the Approved Service Provider).

2.5.11 Where the Contractor subcontracts any of its obligations under the Clause of the Contract it shall require any Subcontractor to comply with sub-clauses of the Contract as if it were the Contractor.

2.6 Traffic Management Provisions

A Traffic Control Plan shall be submitted to explain the means and methods to be taken for proper and adequate control of traffic during the course of the Works. This Plan shall include but not be limited to:

- The traffic control equipment the Contractor proposes to use for the Works;
- Traffic control signage including location and sign descriptions;
- How and when the Contractor proposes to use traffic control flag men;
- Traffic control means during no-working periods;
- Traffic control means and devices for night and off-hour periods.

2.6.1 General Traffic Management Requirements

(a) The Contractor shall keep open to traffic existing roads during the performance of the Works, provided that when approved by the CSC the Contractor may bypass traffic over a detour. The Contractor shall at all times keep roads and footpaths, affected by his operations, free from soil and material spillage.

(b) The Contractor shall keep the length of the project construction areas in such condition that traffic will be accommodated safely. Traffic control devices and services shall be provided and maintained both inside and outside the project limits.
as needed to facilitate traffic guidance should this be necessary.

(c) Prior to the start of construction operations, the Contractor shall erect such signs, barricades, and other traffic control devices as may be required by the plans, specifications or directed by the CSC. Traffic control devices shall be operated only when they are needed and only those devices that apply to conditions actually in existence shall be operable.

(d) Temporary fence shall be placed to provide a visual barrier between the work area and adjacent traffic or buildings and at locations directed by the CSC.

(e) Any devices provided under this Clause that are lost, stolen, destroyed, or deemed unacceptable while their use is required on the project shall be replaced by the Contractor without additional compensation.

(f) During non-working hours and following completion of a particular construction operation, all warning signs, except those necessary for the safety of the public, shall be removed or entirely covered with either metal or plywood sheeting so that the sign panel will not be visible.

(g) Retro-reflective sheeting on signs, barricades, and other devices shall be kept clean. The Contractor shall promptly correct stretches, rips, and tears in the sheeting. Retro-reflective sheeting shall have a maintained retro-reflection.

(h) Nighttime operations shall be illuminated by a lighting system approved by the CSC. The lighting system shall be positioned and operated to preclude glare. Incandescent lights will not be permitted.

(i) The Contractor shall take necessary care at all times during the execution of the works to ensure the existing convenience and safety of residents along and adjacent to the road, and any public highway or port facility that may be affected by the Works. Street lighting shall be relocated as necessary to maintain the same standard of lighting during the course of the works until new lighting facilities are brought into operation.

(j) The Contractor should thoroughly acquaint himself with existing traffic conditions and understand the importance of maintaining traffic safety and the avoidance of excessive traffic delay. The Contractor shall co-operate with the pertinent agencies regarding traffic control and all details will be subject to the CSC's approval.

(k) The Contractor shall be responsible for investigating and establishing the requirements for traffic control and safety ion all work areas and shall submit such details in his Safety, Traffic Control and Environmental Plan as required.

(l) The Contractor's requirements shall include, but not be limited to, construction of detours, temporary bridges and approach roads, of traffic control devices and services for the control and protection of traffic through areas of construction.

(m) Any failure of the Contractor to meet these requirements will entitle the Engineer to carry out such works as he deems to be necessary and to charge the Contractor with the full cost thereof plus ten percent of such cost, which sum will be deducted from any money due or which may become due to the Contractor under the Contract.

2.6.2 Temporary Road Works

(a) The Contractor shall furnish, maintain, and remove on completion of the work for
which they are required, all temporary roads and road works such as sleeper tracks and staging over roads, access and service roads, temporary crossings of bridges over streams or unstable ground, and shall make them suitable in every respect for carrying materials for the work, for providing access for traffic for himself or others, or for any other purpose. Such temporary road works shall be constructed to the satisfaction of the CSC, but the Contractor shall nevertheless be responsible for any damage done to or caused by such temporary road works.

(b) Before constructing temporary road works, the Contractor shall make all necessary arrangements, including payment if required, with the public authorities or landowners concerned, for the use of the land and he shall obtain the approval of the CSC. Such approval will be dependent on the CSC being satisfied with the Contractor’s proposals for items such as signing, lighting and riding quality of the temporary road together with the proposed maintenance arrangements. Such approval will not, however, relieve the Contractor of his responsibilities under the Contract. Upon completion of the works the Contractor shall clean up and restore the land to the satisfaction of the CSC.

(c) The Contractor, when required by the CSC, shall submit for the Engineer’s approval drawings giving full details of temporary roads. Such details shall include alignment, profile, pavement construction, signing, lighting and the duration of the temporary road.

(d) The Contractor shall make all arrangements necessary to permit the passage of materials and employees.

2.6.3 Temporary Traffic Ramps

In cases where it is necessary or required by the CSC, the Contractor shall construct and maintain temporary traffic ramps, and furnish all the labor and materials required.

2.6.4 Traffic Control

(a) In order to facilitate traffic through or around the Works, or wherever ordered by the CSC, the Contractor shall erect and maintain at prescribed points on the work and at the approaches to the work, traffic signs, lights, flares, barricades, rubber cones with traffic lamps and other facilities as necessary or required by the CSC for the proper direction and control of traffic.

(b) As necessary for proper control of traffic or when/where directed by the CSC, the Contractor shall furnish and station competent flagmen whose sole duties shall consist of directing the movement of traffic through or around the work.

(c) The Contractor shall furnish and erect, within or in the vicinity of the project area, such warning and guide signs as may be necessary or ordered by the CSC.

(d) In order to minimize disruption to traffic flows the Contractor shall enclose the Site with temporary fence to provide a visual barrier between his work and adjacent traffic. The temporary fence shall be of 2.0-m height and the movement of men, materials and plant into and out of the barriered area shall be controlled by flagmen.

2.6.5 Number of Lanes for Traffic Control

Insofar as possible, the existing number of traffic lanes shall be maintained during the work and if diversions are provided these must be of the same traffic capacity as the original road. Notwithstanding the above, the CSC may give approval to reductions in traffic capacity if the
Contractor can show that these will not cause excessive delay to traffic or are unavoidable. If such approval is given, the CSC may specify the hours during the day when the reduction in capacity may be applied and it should be anticipated that these hours may not include the peak period for the traffic movement under consideration.

The Contractor shall cooperate with the pertinent agencies regarding traffic control and all details will be subject to the approval of the CSC.

2.6.6 Half-Width Construction

(a) Where, in the opinion of the CSC, a detour is not feasible, construction on existing public roads shall be undertaken only over half of the full width of the roadway. The length of such half-width construction shall be kept as short as possible.

(b) Where half-width construction is necessary, work on culverts must be completed and the embankments adjacent to them must be reinstated so that at least half the full width shall be available for use by the public throughout the next rainy season.

(c) Where single-lane traffic becomes necessary over a particular length of the works or over the approaches thereto, the Contractor, in maintaining through traffic, shall provide a single lane at least three and a half meters wide on the roadway or embankment to be kept open to traffic.

(d) The Contractor shall so conduct his operations as to offer the least possible obstruction, inconvenience, and delay to traffic and shall be responsible for the adequate control of the traffic using such lengths of single lane.

2.6.7 Extraordinary Traffic

The Contractor shall be responsible for carrying out any necessary investigations and the obtaining of approvals, licenses, escorts and any other necessary facilities in order to enable extraordinary traffic to be moved on the roads in the project area.

2.6.8 Vertical Clearance

In general any temporary works placed over roads or diversions used by public traffic should maintain a vertical clearance of at least 4.5 meters. Where required by the CSC the Contractor shall erect and maintain suitable approved check-gates, fitted with warning signs indicating the vertical clearance.

2.6.9 Materials for Traffic Control Devices

Materials for traffic control devices shall conform to the requirements set forth below:

(a) Retro-reflective Material. Unless otherwise specified in the contract, sign panels, barricades, cones, vertical panels, and flagger paddles shall have retro-reflective sheeting meeting requirements for retro-reflective material as specified by the CSC.

(b) Sign Panels. Sign panels shall be orange with black legend unless otherwise required.

(c) Sign Posts. Signposts shall be fabricated from untreated softwood, metal, or other materials acceptable to the CSC. Signs shall be capable of remaining in position during normal traffic flow and wind conditions.

(d) Barricades. Barricades shall be constructed of wood, metal or plastic.
(e) Cones. Cones shall be a minimum of 75 cm in height with a broadened base and shall be capable of withstanding impact without damage to the cones or vehicles. All cones shall be orange/white colored and highly visible both in daylight and darkness. Cones shall be capable of remaining bright and in position during normal traffic flow and wind conditions in the area where they are used. Lamps for cones shall be suitable for purpose.

(f) Temporary Fencing. Temporary fencing shall be fabricated in panels with timber framework and galvanized metal panels. The panel face towards the traffic shall be painted.

(g) Vertical Panels. Vertical panels shall be constructed of wood, metal or plastic.

(h) Warning Lights (flashing or steady). Warning lights shall be Type A (low intensity flashing), Type B (high intensity flashing), or Type C (steady burn) as approved by the CSC.
APPENDIX 3
Appended to the Initial Environmental Examination of the Road Section 261.5-310.5 Project (Kazakhstan)

OUTLINE TERMS OF REFERENCE FOR BIOLOGICAL SURVEYS

APPENDIX 3
Appended to the Initial Environmental Examination of the Road Section 261.5-310.5 Project (Kazakhstan)

RECORD OF PUBLIC CONSULTATIONS FOR CAREC TRANCHE 4
APPENDIX 3
Appended to the Initial Environmental Examination of the Road Section 261.5-310.5 Project (Kazakhstan)
RECORD OF PUBLIC CONSULTATIONS FOR CAREC TRANCHE 4

Information on Public Consultation Activities Carried Out for Project 2 (Tranche 4 of CAREC Program-KAZ)

Prepared for ADB to Document Fulfilment Of the Public Consultation Requirements In Line with the Bank’s Guidelines and Policies
By
Gulnara Junussova (Geo Data Plus LLP)
Almaty, 01 December 2010
(Edited for Inclusion in IEE for Tranche 4 January 2010)

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1. OVERVIEW OF THE PUBLIC MEETINGS

1.1 Background

1. Hereunder, all information is compiled with regard to the Public Consultation (PC) activities (announcements, meetings, records, documentation) in junction with the proposed road rehabilitation and construction project (Tranche 2 and 4 of the CAREC-Program in Kazakhstan). The information provided is summarized in a form that is expected to fulfil the requirements of ADB’s guidelines for Public Consultation, as well as those laid out in ADB’s Operational Procedures for MFF (OM Section D14/OP issued on 6 August 2008). Copies of the original announcements and presentation material used during the consultations are included in the Appendices. Where applicable and deemed to be in line with the Bank’s Social Dimensions and Safeguard Requirements, translations respectively summaries in English are provided at the same time.

2. The information of the Public Consultations conducted in January 2009 is compiled by employees of “GeoData Plus” LLP, represented by Mr. Babalyk E.A., Deputy Director and Ms. Dzhunusova G.A., Environment Specialist, who both participated in four public hearings in the said road corridor focusing on a broad discussion of the assessment of the proposed Project’s likely impacts on the social context, on the ambient environment and on the daily and future livelihood of the community.

1.2 Acknowledgements

3. The author of this Report would like to acknowledge the support of the following persons and institutions to compile all necessary information:

- Ms M. Dzhunusova of “GeoData Plus” LLP for all translations for the documentation, and the compilation of all necessary information together with Ms. Dzhunusova G.A of “GeoData Plus” LLP.
- Mr. Vadim Tzhay (Geo Data Plus) for preparing the presentation material used during the public venues and presented in this report.
- Ms Ayzhan Tuganova (Road Committee, Taraz) for retrieving the announcement materials for the PCs

2. PREPARATION STEPS

2.1 Pre-Identification of Stakeholders

4. The following stakeholders (Attachment 1) have been identified by GeoData Plus LLC to be invited to the Public Consultation Hearings:

(a) Local communities, private persons:
   - All local population, whose interests are likely/potentially are affected by the planned road reconstruction and related activities;

(b) Government and local government bodies:
   - Local executive agencies – Akimats of the Merke and Kulan;
   - Local executive agencies – Akimats of the Korday and Taraz;
   - Territorial Roads Department of the Roads Committee of the MOTC in the Zhambul Oblast in Taraz;
• Emergency Management Department in Taraz;
• Road Maintenance Department in Taraz;
• Housing and Communal Services Department in Taraz;
• Architecture Department in Taraz.

(c) Representatives of the local civil societies:
• Deputies of local village districts;
• Mayors of villages and their rayons (Districts).

(d) Representatives of the private sector:
• Farm owners;
• Private companies;
• Local entrepreneurs.

(e) Other institutions:
• NGOs
• Designer Compani involved in this Project, being: “KazNII PI Dortrans” LLC.

2.2 Contacting Stakeholders and Public Announcement of the Venues

5. The contacting of the stakeholders being invited for venues held in the Project Corridor was arranged by:
   • Territorial Roads Departments of the Roads Committee of the MTC in the Zhambyll Oblast in Taraz;
   • Local executive agencies – Akimats of the Merke and Kulan;
   • Designer Companies, namely the “KazDorProject” LLC”, “KazNII PI Dortrans” LLC,”, and “KaragandadorproektLLC”.

6. All stakeholders were informed in person via phone by either the abovementioned local executive agencies or representatives from the Designer Companies, a week before the PC venues actually took place.

7. Respective written announcements were advertised in all public locations like schools, hospitals, markets etc. The text of the announcement information on these publicly presented leaflets is shown in Attachment 2.

8. In addition, an announcement on the planned public hearings has been published in regional newspaper “Ak Zhol” newspaper, №4-5 (16.812-16.813), January 10, 2009. This newspaper is relevant for all persons living in the respective construction corridor, and it can be obtained on all local kiosks. A copy of such newspaper announcement is also included in Attachment 2.

---

1 The Road Department (Project Carrier) has forwarded invitation letters to the following institutions:
- State Department of Sanitary Epidemiology Supervision of Zhambyl Oblast, Taraz
- State Department of Land-Use of Zhambyl Oblast, Taraz
- Shu-Talas Department of Environmental Protection of Zhambyl Oblast, Taraz
- Mayors /Akims of all Districts located in the Project corridor
- Two Designer Compani

All invitation letters are available in photo copies at GeoData Plus LLC.
3. IMPLEMENTATION OF THE VENUES

3.1 Locations of Meetings within the Proposed Corridor of Tranche 2

9. In January 2009, two employees of “GeoData Plus” LLP (Mr. Babalyk E.A., Deputy Director and Ms. Dzhunusova G.A., Environment Specialist), participated in four public hearings held in the project corridor. The respective locations are specified hereunder:

10. Both representatives were asked to assist and moderate the venues as far as environmental issues were treated. At the same time, the task of taking minutes was delegated to the said representatives.

Table 1: Locations where the Public Consultation meetings took place within the Project Area.

<table>
<thead>
<tr>
<th>Name of settlement</th>
<th>Location</th>
<th>Date</th>
<th>Time</th>
<th>Number of local participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Merke</td>
<td>Conference room of the Akimat (administration of the settlement)</td>
<td>12.01.2009</td>
<td>15 pm</td>
<td>29</td>
</tr>
</tbody>
</table>

11. In addition, Public Consultation meetings were held in Korday (12.07.09 at 10 AM, Conference Room of Korday Akimat) and in Taraz (14.01.09 at 10 AM, at the Conference Room of Zhambyl Oblast, Dept. of Road Committee, Taokhana 1a). Details for reference are kept with “GeoData Plus” LLP.

3.2 Records of Attendants

12. Lists of participants in the two meetings held in the Project Area were collected by A.K Tuganova., Territorial Roads Department of the Roads Committee of the MOTC in Zhambyl Oblast. Additional record notes were taken during the venues by G.A. Junussova from GeoData Plus LLC. The corresponding lists of participants with names, gender, profession, contact particulars, institutional affiliation, and signatures are shown in Attachment 3.

3.3 Record of Moderation and Minutes

The public hearings were exclusively devoted to the discussion of the potential/anticipated environmental impact associated with the detailed design solutions for the respective section (=Tranche 2) of the international transit corridor “West Europe-West China” financed by the Asian Development Bank and Islamic Bank. In spite of the main topic being environmental issues, several participants forwarded their concerns and recommendations that related to compensation issues. For completeness of documentation, also such contributions were taken into account and are reflected in the original minutes.

On behalf of the project proponent (Road Committee of MOTC Zhambyl Oblast) Comprehensive minutes were taken by Ms. G.Junussova, Environmental Specialist of GeoDataPlus. These minutes are presented in tabular form in Attachment 4. A selection of the photos taken during the events is also included in this Appendix.

Videos from the meetings in Kulan and Merke were recorded on DVD in AVI format. Copies can be obtained upon request from Igor Pryhodkin (IT specialist employed by GeoData Plus, fax. +8-727-7 tel. +8-727-7410025, or +8-777-14269 67).
4. PERFORMANCE & METHODOLOGIES APPLIED

All four public consultations provided detailed information on the planned project features its foreseen activities and pre-identified environmental implications. At all consultation venues, the local people’s knowledge, perception and attitude towards project benefits and potential impacts were duly taken into consideration.

The meetings were moderated by Mr. T.D. Alyakhmetov, Deputy Head of the Territorial Roads Department of the Roads Committee of the MOTC in the Zhambyl Oblast).

The following methodologies were applied to accomplish the public consultation:

4.1 Presentations: Designers presented the Design Projects of the road by using technical presentations in Microsoft PowerPoint. (See Attachment 6)

4.2 Speeches: The following speakers delivered information on specific aspects of the planned road construction:
   - In Merke - Aulisyaniv R.M. (Deputy Director General, LTD "Kazakhstan Scientific and Industrial Institution DORTTRAN") introduced the Project of the International transit corridor M-39 motorway (Merkinskii region) on 260-383km segment; he also delivered a MSPowerPoint Presentation (see Attachment 6)

4.3 Public Discussion: After presentations all participants could address their questions and individual concerns with their own suggestions to representatives of Local Authorities, Territorial Roads Department of the Roads Committee of the MOTC in the Zhambyl Oblast, Designer Companies and GeoData Plus LLC. All questions, concerns, recommendations and contributions forwarded in this public discussion were duly taken into account (see Attachment 7)

4.4 Illustrations, Posters, Maps: In order to illustrate the presented information more clearly, posters, maps and other pictorial material has been prepared by GeoData. These illustration materials were displayed along the walls in the respective meeting halls (examples of the materials displayed are assembled in Attachment 8).

4.5 Handout Information Leaflets:

All participants were supplied by A4 format Leaflets containing the following information:
   - Description and contact particulars of the Project Proponent,
   - Maps and summarized designer drawing solutions
   - Description of the procedures how and where to forward grievances and complaints, i.e. the individuals’ rights with respect to the project.

The content of the hand-out Leaflet is shown in Attachment 9.
5. ACTIONS TAKEN

Respective information on immediate actions taken by Territorial Roads Department of the Roads Committee of the MOTC in the Zhambyl Oblast has been requested from the Project Proponent. The response indicated that there will be an answer to this request in near future. There is personal communication from Ms Ayzhan Tuganova employed by Territorial Roads Department of the Roads Committee of the MOTC in the Zhambyl Oblast that the following information will soon be made available to the EIA team:

- Copy of the official letter send to the Designer Companies requesting urgent corrections to be made in the Detailed Design Drawings and planning notes, in full compliance to some of the local peoples’ concerns shown in Appendix 7. In specific, the following amendments were to be made:
  - to increase number of cattle crossings
  - to enlarge dimension of cattle crossings;
  - to establish crossing tunnels or other suitable structures to be used by heavy agricultural machineries.

The Project Proponent has also indicated to make available an article about the Public Consultation that has been published in the local newspaper.

The forthcoming EIA will take the minutes of these Public Consultation into due account and reflect the proposed recommendations and mitigation measures in the Environmental Management and Monitoring Plan.
Attachment 1

Letter to Road Committee to initiate the Public Consultation process,
And identification of stakeholders

Summary of content: Notice about importance of Public Consultations with reference To the Kazakh legislation,
And guidelines on how to prepare Public Consultation Meetings

TOO «ГеоДата Плюс»

Исх. № 1
от 6.01.2009г.

Департамент автомобильных дорог Жамбылской области

Настоящим сообщаем, что в соответствии с Экологическим кодексом Республики Казахстан и требованиями Азиатского банка развития в рамках проекта реконструкции транзитного коридора «Западная Европа – Западный Китай» Заказчик (инициатор) намечаемой управленческой, хозяйственной, инвестиционной и иной деятельности (далее Заказчик) должен провести общественные слушания в населенных пунктах Жамбылской области, на которые оказывается воздействие в ходе реализации проекта.

В связи с чем, Заказчику необходимо:
1. Информировать население в СМИ и предоставить информацию о проводимых общественных слушаниях, дате, времени и месте их проведения;
2. Обеспечить явку всех землепользователей, попадающих под воздействие намечаемой деятельности (в соответствии со списками, имеющимися у проектировщиков), заинтересованной общественности, местных исполнительных органов, территориальных органов охраны окружающей среды, заказчика и разработчика;
3. Организовать пункт приема и регистрации предложений и замечаний, поступающих от общественности;
4. Обеспечить документирование процесса учета общественного мнения (в виде стенограмм, фото-видеосъемок, аудио записей и других материалов), в том числе:
   • дать объявления о проведении учета общественного мнения;
   • проводить регистрацию лиц, участвующих в общественных слушаниях;
   • подготовить списки участников общественных слушаний;
   • регистрировать поступившие письменные предложения и замечания по проекту ОВОС;
   • составить протокол общественных слушаний, в котором фиксируются основные вопросы обсуждения и разногласия между общественностью и Заказчиком;
   • подготовить комментарий по учету предложений и замечаний общественности.

Приложение:
1. График проведения общественных слушаний
2. Образец бланка регистрации участников общественных слушаний
3. Образец списка участников общественных слушаний
4. Образец объявления в СМИ

Заместитель
Генерального директора

Е.Бабальк
Attachment 2
Public Announcements and Invitations

*Short description of content of Newspaper Announcement:* Invitation of all organizations and local people to take part in the Public Consultation, with specification of Road Sections to be discussed, location of venues, time and dates of venues, and contact information.

Жамбылский областной Департамент Комитета автомобильных дорог МТиК РК совместно с проектной организацией ТОО «КазНИИПИдортранс» сообщает о проведении общественных слушаний по оценке воздействия на окружающую среду решений рабочего проекта при реконструкции участков автомобильных дорог «Алматы-Кордай-Благовещенка-Мерке-Ташкент-Термез», км 260-383 международного транзитного коридора «Западная Европа – Западный Китай».

К участию в общественных слушаниях приглашаются общественные организации и все заинтересованные лица.

Слушания состоятся по адресу: с.Мерке, ул. Исымалиева, 169
Малый зал районного акимата, «12» января 2009 г в 15-00 часов.
Content of Public Announcement information sheet: Invitation of all organizations and local people to take part in the Public Consultation in Kulan with the specification of Road Section, location, time, date of venue and contact information.

Жамбылский областной Департамент Комитета автомобильных дорог МТиК РК совместно с проектной организацией ТОО «Каздорпроект» сообщает о проведении общественных слушаний по оценке воздействия на окружающую среду решений рабочего проекта при реконструкции участков автомобильных дорог «Алматы-Кордай-Благовещенка-Мерке-Ташкент-Термез», км 383-483 международного транзитного коридора «Западная Европа – Западный Китай».

К участию в общественных слушаниях приглашаются общественные организации и все заинтересованные лица.

Слушания состоятся по адресу: с.Кулан, ул. Жибек жолы, 75
Малый зал районного акимата,
« 13 » января 2009 г в 12-00 часов.
## Attachment 3

**Lists of Participants in the Public Meetings**

**In Merke**

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<thead>
<tr>
<th>№ п/п</th>
<th>ФИО</th>
<th>Контактный телефон</th>
<th>Роль деятельности</th>
<th>Источник информации</th>
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<tr>
<td>1</td>
<td>Шмаханов К.К.</td>
<td>2-20-20</td>
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<td>2</td>
<td>Левашова И.И.</td>
<td>2-05-25</td>
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<tr>
<td>3</td>
<td>Соболева И.</td>
<td>8777325446</td>
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<td>4</td>
<td>Коваль М.</td>
<td>6-55-84</td>
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<tr>
<td>5</td>
<td>Перцева Е.</td>
<td>2-35-45</td>
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<td></td>
</tr>
<tr>
<td>6</td>
<td>Иванова И.</td>
<td>2-31-33</td>
<td></td>
<td></td>
</tr>
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Список участников общественных слушаний по итогам разработки РП и ООС по реконструкции межгосударственного транспортного коридора "Западная Европа-Западный Китай" по участкам: участок 105-105-383 трассы М 79
г. Мерке  15-00 часов, 12.01.2009г.

| № п/п | ФИО                  | Место работы | Пол
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Translation of the original List above:

Public Consultation hearing records

Location: Merke (Zhambyl region) Kazakhstan – January 12, 2009, 15:00

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<td>Miheyev G.</td>
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Attachment 4

Photos of the Venues

Photo 1. One of the First Participants, signing attendance list

Photo 2. Beginning of the presentation
**Photo 3.** Engineer explains design and alignments

**Photo 4.** Public discussions, designer explanations
Appendix 5
Presentation Material used by the KazNIIPIDORTRANS

Основные технико-экономические показатели:

1. Интенсивность движения на перспективный 20 -ый год: 9 900 авт/сут
2. Категория дороги: 1,5
3. Строительная длина: 48,1 км
4. Количество полос движения: 4
5. Ширина полосы движения: 3,75 м
6. Ширина проезжей части: 2 х 7,5 м
7. Ширина обочин: 3,75 м
8. Ширина краевой полосы у обочин: 0,75 м
9. Ширина разделительной полосы: 0,75 м
10. Ширина полосы отвода сторожевых автомобилей: 2,0 м
11. Ширина пешеходного полосы у обочин: 1,0 м
12. Техническая норма: капитальный
13. Принятые материалы:

13.1. Мосты: 2 шт
13.2. Непроницаемые трубы, в том числе:
- железобетонные трубы d=1,5: 20 шт
- железобетонные трубы отверстие 2,0×2,0: 3 шт
- железобетонные трубы отверстие 2×2,5×2,0 (удлинение): 5 шт
- железобетонные трубы отверстие 4,0×2,5: 1 шт
- железобетонные трубы отверстие 2×4,5×2,0: 2 шт
13.3. Естественные оросительные и дренажные системы: 2 шт
13.4. Транспортная развязка в разных уровнях: 1 шт
13.5. Площадки отдыха: 2 шт
13.6. Автобусные остановки (с автопавильонами): 4 шт

Жамбылская область
УЧАСТОК КМ 260 – КМ 383
РЕКОНСТРУКЦИЯ АВТОМОБИЛЬНОЙ ДОРОГИ
«АЛМАТЫ-КОРДАЙ-Б.ЛАГОВЩЕНКА МЕРКЕ-ТАПКЕНТ-ТЕРМЕЗ»
Заказчик: Жамбылский областной департамент КАД
Исполнитель: Казахский научно - исследовательский и проектный институт дорожно - транспортных проблем КазНИИПИ «Дортранс»
Technical Design Solutions presented
Схема транспортной развязки и перспективная среднегодовая суточная интенсивность движения по основным дорогам и на съездах, приведенная к легковому автомобилю приведена ниже.

Геометрические размеры съездов:
1. Ширина проезжей части:
   - Правоповоротных – 5,0 м
   - Левоповоротных – 5,5 м
2. Минимальные радиусы горизонтальных кривых:
   - Правоповоротных – 150 м
   - Левоповоротных – 60 м
3. Максимальный продольный уклон съездов – 40%
4. Количество полос движения на съездах – 1.
5. По основным дорогам, в местах примыкания и отмывания съездов предусмотрены переходно-скоростные полосы шириной 3,75 м
Contacts of Designer, and where to address further questions or recommendations:

Благодарим за внимание!
Пожалуйста вопросы!

ТОО «КазНИиПИ
«Дортранс»
dortr@mail.ru
8(727)2446522, 8(727)2446521
<table>
<thead>
<tr>
<th>Location</th>
<th>Reference Question from Minutes</th>
<th>Issues and Questions forwarded by the Participants</th>
<th>Mitigation comments/proposal forwarded by the Participant</th>
<th>Answer given during the Meeting</th>
<th>Follow up ad/or inclusion of the recommended action in the EMP</th>
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<tr>
<td>Merke</td>
<td>Q-1: Will there be any fences within the villages along the road to prevent livestock from crossing the road?</td>
<td>Concern about safety and use for animal crossing the new road</td>
<td>Plan for fences in areas at risk that livestock will cause accidents</td>
<td>(Aulisyanov R.M. - engineer, LTD &quot;Kazakhstan Scientific and Industrial Institution Dortrans&quot;): Yes, the road will be fenced for road traffic safety within villages.</td>
<td>to be followed up in the EMP</td>
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<td>Q-6: Can we sow this year?</td>
<td>Concern about missing a cultivation season, and thus income shortages</td>
<td>Negotiate with the local farmers the land acquisition schedule</td>
<td>(Aulisyanov R.M. - engineer, LTD &quot;Kazakhstan Scientific and Industrial Institution Dortrans&quot;): Yes, you can sow this year. You will be informed before the process of acquisition starts. You can use your land before the Akimat's (official's) decision of land acquisition.</td>
<td>to be followed up in the EMP</td>
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<tr>
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<td>Q-7: Will the driving along the new road be free of charge?</td>
<td>Concern about additional road user costs</td>
<td>Plan for public highway free of user charges</td>
<td>(Alyakhmetov T.D. – Deputy Director, Zhambyl Oblastal Department of Transportation): The new road within the Zhambyl Oblast will be free of charge.</td>
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<td>Q-8: Aspara village is located close to the road, and there are fields on the other side of the road. How will we cross the road?</td>
<td>Hindrance of movements to/from the fields; construction of passageways for safely crossing the highway.</td>
<td>Taking into the consideration that the agricultural machinery used is extremely slow and dirty, and therefore need a safe crossing facility</td>
<td>(Aulisyanov R.M. - engineer, LTD “Kazakhstan Scientific and Industrial Institution Dortrans”): Special adjusting lines (marker lines) will be established in the crossroads of new high-speed road sections wherever secondary roads enter from the villages.</td>
<td>All irrigation pipes will be replaced with new ones; their location will remain the same.</td>
<td>to be followed up in the EMP</td>
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<tr>
<td>Q-9: What is planned to be done in future with the Zhana Aspara water channel?</td>
<td>As above, Q-8</td>
<td>As above, Q-8</td>
<td>(Aulisyanov R.M. - engineer, LTD “Kazakhstan Scientific and Industrial Institution Dortrans”): All existing channels crossing the road will be taken into consideration and the existing pipes will be replaced with the new ones.</td>
<td>to be followed up in the EMP</td>
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<tr>
<td>Q-11: When does the construction work start?</td>
<td>(Alyakhmetov T.D. – Deputy Director, Zhambyl Oblastal Department of Transportation): Commencement is planned for 2009, first section of road rehabilitation to be finished will be along the Kordaiskii rayons (districts), and around Blagoveschenka village</td>
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<td>Q-13: How large is the width of the right of way?</td>
<td>Settlement impact insecurity</td>
<td>(Aulisyanov R.M. - engineer, LTD “Kazakhstan Scientific and Industrial Institution Dortrans”): The width of right of way equals 70m according to the 1B technical category</td>
<td>to be addressed in the Resettlement Planning</td>
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<tr>
<td>Q-14: Our livestock usually crosses right over the road. Is it planned to construct cattle crosses?</td>
<td>Safe and suitable cattle crossings</td>
<td>Plan for safe and suitable cattle crossings</td>
<td>(Aulisyanov R.M. - engineer, LTD “Kazakhstan Scientific and Industrial Institution Dortrans”): Yes, it is planned to construct cattle crosses for livestock.</td>
<td>Taken into immediate action by Road Committee and Designer</td>
<td></td>
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Attachment 7

Illustrations, Maps, Posters used in the Public Consultation
Оценка воздействия на окружающую среду реконструкции международного коридора «Западная Европа - Западный Китай» в границах Кызылординской, Южно-Казахстанской и Жамбылской областей.
Общественные слушания по предварительной оценке воздействия на окружающую среду при реконструкции международного коридора «Западная Европа – Западный Китай»
APPENDIX 3
Appended to the Initial Environmental Examination of the Road Section 261.5-310.5 Project (Kazakhstan)

OUTLINE TERMS OF REFERENCE FOR BIOLOGICAL SURVEYS

APPENDIX 4
Appended to the Initial Environmental Examination of the Road Section 261.5-310.5 Project (Kazakhstan)

MINUTES OF PUBLIC CONSULTATIONS FOR CAREC TRANCHE 4
Minutes of Public Consultations
On the environmental impact assessment under the detailed design decisions for the reconstruction of the road sections km 260-km 383 of the M-39 highway (Merke village) of the international transit corridor “West Europe – West China”.
Date of Public (Consultation) Hearing: 12.01.09 at 15:00
Place of Public Hearing: Assembly Hall of Merke akimat

Participants:
1. T. Alyakhmetov – Deputy Director, Zhambyl Oblast Department, Committee of Roads,
2. K. Shaikhiyev – Head of Akim’s Apparatus of Merkenskiy raion
3. A. Tuganova – Head of Department of Quality and Acceptance of Zhambyl Oblast Department, Committee of Roads
4. R. Aulisyanov – Engineer of LLP «KazNiiPiDorTrans» (designer)
5. Y. Babalik – “GeoData Plus” Deputy General Director
6. G. Junusova – Head ecologist of LLP “GeoData Plus”
7. Others. Total 29 people (list attached)

Chairman of Public Hearing – Mr. Alyakhmetov
Secretary A. Tuganova

The Agenda:
“Public Hearings on the environmental impact assessment under the detailed design decisions for the reconstruction of the road sections km 260- km 383 of the M-39 highway ( Merke village) of the international transit corridor “West Europe – West China”.

Speakers:
1. Introduction by T. Alyakhmetov – Deputy Director, Zhambyl Oblast Department, Committee of Roads introduced basic elements of the detailed design for the reconstruction of the international transit corridor “West Europe – West China”.
2. The detailed design of the project on reconstruction of the sections 260-383 km of the M-39 highway ( Merke village) of the international transit corridor “West Europe – West China” was presented by R. Aulisyanov - Engineer of LLP «KazNiiPiDorTrans»

Questions and Comments
Question 1. Is there going to be a protective fence so that the livestock does not appear on the road?
Answer (R. Aulisyanov - Engineer of LLP «KazNiiPiDorTrans»): Yes, there will be a fence in order for the livestock not to disturb the traffic on the road.

Question 2. What is going to happen to our land? Are we going to get a compensation or similar land?
Answer: We ordered “Smart” appraisal company to assess the value of the land and constructions. Concluded a contract with the land users and agreed on the price. All the land users who are impacted by the road construction got the contracts. It is possible if you wish so to get a land plot of similar quality but at different location in replacement for acquired land. This can be solved by the akimat if they have reserved lands.

Answer (Y. Babalik – “GeoData Plus” General Director Deputy): This issue is solved with each land user individually. If the land user wishes to get a similar piece of land instead of the compensation it is his/her right to do so. If the compensation does not satisfy the land user then he has the right to order an assessment of his land to a different appraisal company and submit assessment by this company for compensation. If you were denied the compensation according to the assessment which you have done independently from the Designer, then you have the right to request a compensation based on the assessment you ordered through the court.

Question # 3. I have a café along the road. Do I get a compensation?
Answer (Y. Babalik – “GeoData Plus” General Director Deputy): The policy of the Asian Development Bank is that all people who are impacted by the construction of the international transit corridor should get compensations, i.e. all structures including fences and aryks (small canals) as well as trees should be assessed and upon that compensations paid off.

Question # 4. Can we get the telephone numbers of the companies? The thing is that my name is not in the list of land users and I want to get detailed information about the compensation and how much of my land will be taken away. I’m afraid that they will tell me that I am not in the list and that I will not get my compensation.
Answer (T. Alyakhmetov – Road Committee of Zhambyl Oblast Department Director Deputy):
The assessment is done by NPC Zem (НПЦЗем) Mr. Artayev. The designing company provided him with the plan of the route, then NPC Zem (НПЦЗем) provided us with the list according to which agreements were drawn.

Answer (R. Aulisyanov – Engineer of LLP «KazNiiPiDorTrans»): If your land or structures are impacted by the construction of the road you should be in the list under the condition that you have entitlement documents for that property. For information you can contact Mr.
Artayev at NPC Zem. Basically, the new road will be built on the basis of existing route and the land will be taken only on new bypasses, which you can see on the maps.

Question #5. How much is paid for a hectare of land?

Answer (R. Aulysyanov – Engineer of «KazNiiPiDortrans» limited partnership): It depends on the type of land. For instance irrigated land or pastures. In each case there are different categories and prices. A hayfield, for example would be cheaper than irrigated land.

Question #6. Can we sow this year?

Answer (R. Aulysyanov – Engineer of «KazNiiPiDortrans» limited partnership): Yes you can sow this year. We, the designers of the project, will provide notices in advance on acquiring land. Before the akimat’s regulation on land acquisition you can sow the land.

Question #7. Will the road be a toll road?

Answer (T. Alyakhmetov – Road Committee of Zhambyl Regional Department Director Deputy): In Zhambyl oblast, the road will not be a toll road.

Question #8. Aspa village is located along the road and the fields are located on the other side of the road. How are we going to drive through? And secondly, there is a lake near the village and the water that we use for irrigation flows through 2 big pipes. So will they remain there?

Answer (R. Aulysyanov – Engineer of «KazNiiPiDortrans» limited partnership): All the turns and slip roads will remain in their places. At the entrance there will only be transitional acceleration lanes, for instance: at the exit of the village transport will pass through the acceleration lane for 180 m bringing it to the main road – those are security requirements. All the pipes are staying where they are, we are going to renew them as the axle load will be increased and all the bridges will be totally reconstructed.

Question #9. There is also a channel called Zhana Aspara. What will happen to it?

Answer (R. Aulysyanov – Engineer of «KazNiiPiDortrans» limited partnership): In Taraz there is a Shu-Talas water department, there is also a БЦК, we agreed the design with them. Our section has 159 pipes on 129 km. We understand that the water used for villages flows through these pipes. All existing pipes will remain in place.

Question #10. Along the road there are gas stations. They did not get a chance to get a state act for the land. What will happen to them?

Answer (R. Aulysyanov – Engineer of «KazNiiPiDortrans» limited partnership): You have time to get your documents done.

Question #11. When is the construction starting? And in how many places?

Answer (T. Alyakhmetov – Road Committee of Zhambyl Oblast Department Director Deputy): We plan to start the construction in 2009 on sections of Korday and Zhualin raions.

Question #12. Who is financing the project?
Answer (T. Alyakhmetov – Road Committee of Zhambyl Oblast Department Director Deputy):

The road is going to be built at the expense of investments of Asian Development Bank and Islamic Development Bank.

Question # 13. When is the compensation going to be paid off?

Answer (R. Aulisyanov – Engineer of « KazNiiPidortrans » limited partnership): We have included all compensations to the cost estimates.

Question # 14. How many meters of land acquisition is it going to take?

Answer (R. Aulisyanov – Engineer of « KazNiiPidortrans » limited partnership): For the road category 1B the requirement is 70 meters.

Question # 15. We move the livestock across the road and in the future it would be harder to do that. Are any cattle passes planned to be provided?

Answer (R. Aulisyanov – Engineer of « KazNiiPidortrans » limited partnership): Yes, cattle passes are envisaged in locations where livestock pass the road.

Chairman of Public Consultations (Alyakhmetov T., Deputy Director) – signature

Secretary of Public Consultations (Tuganova A., Head of Unit) - signature