

KAZ: PROPOSED MULTITRANCHE FINANCING FACILITY FOR THE CAREC TRANSPORT CORRIDOR I (ZHAMBYL OBLAST SECTION) INVESTMENT PROGRAM

SUMMARY INITIAL ENVIRONMENTAL EXAMINATION

A. Introduction

1. The CAREC Western Europe to Western China Transport Corridor (Zhambyl Oblast) Project is classified as environment category B in accordance with ADB's *Environmental Assessment Guidelines* (2003). The summary of initial environmental examination (IEE), which was prepared by the project preparatory technical assistance (TA) consultant on behalf of the Road Fund, is consistent with the requirements of *ADB's Safeguards Policy* (2002) and *Environmental Assessment Guidelines* (2003). The undertaking which is Project 1 of three projects of a Multilateral Financing Facility (MFF) will involve upgrading of Sections 3 and 6 of National E-W Highway and the replacement of 90 culverts and 13 bridges. This project requires a full environmental assessment under Kazakhstan's Ecological Code (2007), and this is being completed for each of the two sections of the project.

B. Description of the Project

2. The Project will involve road widening, carriageway strengthening as well as bridge and culvert replacement for a total length of about 130 km. Upgrading shall be confined within the existing 40-60 meter (m) ROW (20 to 30 m on either side of the road centerline). The main working width will be 8–10 m centered over the existing carriageway. Construction and movement of materials will need to connect with communities on the way and therefore a number of at grade-intersections and 4-5 interchanges will be built. The Project will not involve land acquisition and resettlement. Rehabilitation works will require more than 4 million m³ of earthworks for subgrade, shoulder and carriageway repair. Site works are expected to commence in late 2009 with actual work progressing for 3-3.5 years.

C. Description of the Environment

3. **Topography and Geology.** The topography of the land through which the two road sections pass includes mostly steppe and slightly undulating terrain as Section 3 passes along the foot of the Tian Shan mountains range. Section 6 is located in an alluvial plain following the Shu River, which flows to the NW from Kyrgyzstan. The geology reflects this difference in that Section 3 has gravel and unconsolidated aggregate deposits extending as fingers from the Shan Tian mountains northward toward the dry steppes, covered with a relatively thin topsoil, while Section 6 is on deep alluvial deposits left by the meanders of the Shu River, as it flows from Issyk kul Lake in Khyrgyztan through the Tashomkesh Reservoir near Blagoveschenka northward in a long arc across the center of Zhambyl Oblast.

4. The geology through Section 6 presents a problem in that aggregate sources are not readily available and will need to be hauled either by truck or preferably by rail to a storage area for use by that project. Section 3 has readily available supplies but selection of new sites will be important given the visually stunning landscape and gently sculpted terrain.

5. **Climate, Air Quality and Noise.** Generally the climate on the project area is temperate and continental, with rain accumulations of 31 cm from during a short rainy period and snow fall of about 38 cm over the November to March period. These data are for Zhambyl oblast as a whole and therefore values for the project corridor are likely 25% higher, given the proximity of

the mountains. Temperatures are hot in the summer reaching into the high 30s and in winter well below freezing and as low as -25C. Section 3 being close to the mountains has unpredictable weather with severe rainstorms in the summer and snow with high winds in the winter creating blizzard and wind-chill conditions. Being at about 44o North latitude, there are approximately 8 hours daylight in the winter and 16 hours in full summer.

6. For Section 3 at 10m from the road Carbon monoxide, Hydrocarbons and Soot were estimated to be within the Kazakhstan standard, while NOx and lead exceed the standard even at 50m from the roadside. The large exceedence for lead can be explained by the use of leaded petrol by as much as 90% of vehicle fleet. 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 PEIA even at 100m from the road are alarming, namely almost three times the GoK standard¹. Aerosol (in the air) lead is the most easily absorbed and most dangerous for humans, and may be taken in by construction workers as they excavate the shoulders for road widening.

7. NOx is a byproduct of the burning of diesel fuel. The higher the NOx emissions the poorer the quality (due to poor refining) of the fuel. NOx when mixed with water forms nitric acid and comes to earth as acid rain and acidic aerosol, damaging people, plants and structures. For Road Section 3, NOx levels even 100m from the road were almost 20x the permitted level.

8. With other parameters so high it is questionable whether the model results for soot are correct, since Kazakh truck and bus fleets is at least 10 or more years old with many vehicles more than 20 years old, are poorly maintained and emit large amounts of TSP. Further any newer vehicles coming to Kazakhstan would have their catalytic converters, rendered useless after even the first tank of leaded fuel.

9. Noise levels, based on the Preliminary EIA (PEIA) are problematic since the traffic volumes, high vehicle speed, fleet mix and driving habits of with frequent accelerations and decelerations would suggest considerably higher values². With less than half of the traffic of Section 6, Section 3 noise levels were estimated at about 10dBA higher. Under field conditions this would mean that traffic volumes would need to be almost three times that of Section 6 instead of the other way around. Nevertheless the values ranged around 70 dBA for Section 3 and around 65 dBA for Section 6. Regardless of the values, night noise limits were exceeded >50m from the edge-of-pavement.

10. **Surface Water Resources.** Sections 3 and 6 have >90 culverts and 13 bridges which all have to be rebuilt and widened. The Shu River is the largest river and is crossed by the existing Section 6 at Blagoveschenka. It drains Issyk Kul Lake in Kyrgyzstan and flows northward into Kazakhstan, through central Zhambyl Oblast. It receives Bishkek's raw sewage in a large discharge canal as well as untreated industrial wastes before flowing into Kazakhstan. Along the way into Kazakhstan there is considerable diversion and intensive agriculture, reducing the flow and further contaminating the water. The water quality of the Shu is badly degraded and the bridge replacement work will not contribute to further contamination so long as careful construction methods are applied.

¹ The GOK standard is significantly less stringent than internationally accepted human health impact lead levels.

² All data for air noise and water quality were predicted using some data and the CREDO Transport Planning Model. There were not field measurements of any kind.

11. While no data exists for the two other named rivers crossed by the Section 6, they are both tributaries of the Shu, draining the intensively used grazing and farming lands to the NE of the Section 6 road and therefore likely degraded. The many culverts are for surface drainage and period waters draining from the mountain slopes along Section 3 during spring snowmelt and during the short wet period in the early summer and fall. Data obtained for three rivers affected by the roadwork showed that for oil and phenol contamination of the surface waters averaged 0.08 and 0.002 mg/L respectively, which were at exceeding permissible levels.

12. **Groundwater Resources** Groundwater aquifers in Section 3 and 6 occur at two levels. The shallow groundwater aquifer is within 1-2m below the surface and is heavily influenced by surface water contamination, such as from road runoff and agricultural drainage. Some road runoff could increase pollution leading to higher petroleum, phenol and lead contamination in the shallow aquifer. While not measured, an examination of the concentrations in the air and soil near the road suggests that there is a strong likelihood that significant road-related pollution is taking place. Fortunately most of the stormwater runoff does not flow directly (other than from bridge decks) into streams, but instead is diverted to an infiltration area near the shoulder of the road before emptying into a water course or percolating into the soil. The exception is in urban areas where there are concrete drains.

13. 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 stormwater is highly contaminated.

14. The deep groundwater aquifer located 20-30 m below the surface is relatively unaffected by the road works since there will be no pile driving or deep excavation and groundwater quality data were not available to the consultant.

15. **Flora and Fauna.** An examination of the Kazakhstan and World Wildlife Fund Redbook on endangered plants and animals, the Birdlife Int'l. Website, the RAMSAR website, and discussions with the Env. Department in Taraz as well as the FHC expert, no rare, endangered species or protected sites were indicated. The closest site is 50km away. The consultant also examined the Kazakhstan Ecological Atlas (2006) and found no reference to any protected species or habitat anywhere within the corridor of impact.

16. There is no natural forest land along either Section, but instead shelter belts, in some cases 4-8 trees deep, extend for several kilometers along Section 6, with mature ash and poplar dominating. These are between 30-50 years old and form a kind of micro-habitat along the road and represent the only large tree stand along the two sections.

17. The project corridor is on the Caspian, Siberian and/or Central Asian Flyways to and from the Siberian wetlands and as such large migrating flocks can be seen in the fields beside the road from spring through early summer and again in the fall. During the consultant's field visit along Section 3 on May 6th, several flocks of steppe eagles, numbering in the many 100s, were seen in the roadside fields.

18. **Economic and Cultural Resources.** The population of Zhambyl Oblast in 2007 was about 1.009 million people, with the density of about 7 people to km². Population is predominantly Kazakh ethnics (64.8%), with Russians (18.1%) being the next largest group, followed by Uzbeks (2.3%), Tatars (1.3%) and Germans (1.2%). The T Ryskulov district (Section 3) has the population of 61 thousand people, with the density of 6.7 people/ km². The

Merke and Korday district, which is part of the Section 6 road alignment, has the combined population of 184 thousand people, with about 11 people/km².

19. All communities (towns and villages) operate on the traditional Kazakh village model with a government assigned *Akim*, a council and the citizens' committees involved in managing the affairs of the local area. As a carry over from the soviet era, a strict chain of command-and-control policies and division of labour exists, resulting in very slow and protracted institutional involvement.

20. Outside the main urban areas infrastructure aside from electrical power is scarce. Power supplied from the grid provides a reasonably steady supply to the villages and towns in and near the road corridor. Most of the stormwater is simply directed to the side of the road and then infiltrates into the soil. Overall there is very little drainage control. At bridges water is directed vertically through drain holes in the bridge deck to the stream or area below.

21. Potable water comes from local wells and boreholes, with piped potable water in homes a rarity (aside from Taraz, Merke and Blagoveschenka). An estimated 65 % of the corridor population have no piped potable water in their homes.

22. The vast majority of 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. About 90 % of the households in the corridor rely on outdoor plumbing, and in winter must haul and heat water for consumption cooking and washing.

23. Life in the villages and towns within the corridor is harsh. This is particularly true for Section 3 where most household heat with wood, have communal outdoors wells, have outdoor pit privies and in winter have no services for snow clearing and road maintenance (most roads are gravel and mud during the spring thaw). Tuberculosis and anthrax are two dangerous diseases common in the region, particularly during the cold months (October-March). During the winter it is difficult to reach the main road, with feeder roads often impassable.

24. It is hoped that the improved road may bring small scale investment and raise the living standard of local people, including the provision of better municipal services.

25. No known cultural relics or historically important sites will be disturbed by the road improvements planned. There are a number of roadside grave markers and graves of accident victims which will need to be moved to accommodate widening. It is estimated that there 10-14 of these on Section 3 and 5-10 along Section 6. While graveyards are visible from the road they are more than 75m from the edge of the carriageway

D. Screening Environmental Impacts and Mitigation Measures

26. Both Sections 3 and 6 are road improvements, being undertaken totally within the road RoW which ranges anywhere from 30-60 m.

27. **Pre-Construction Phase.** The Environmental Management Plan included in the IEE defines 7 preconstruction mitigative measures, each addressing actions needed by either the proponent or the designers to prevent negative impacts from occurring later in the project's development. Most important of these are measures to ensure that the IEE and its EMP are actually used during the rest of the project, for preparation of the environmental clauses of the

bid documents, the contractors' environmental action plan and as a general guide to environmental safeguards.

28. The burning of leaded fuel has resulted in highly toxic soil conditions up to 50 m from the roadside, areas where construction workers will need to excavate these soils and which local people uses a animal grazing and agricultural lands (despite the GoK's 50m restricted use regulation for major roads). Given predicted values as high as 20 times the allowable standard a lead sampling program is proposed, to establish actual field conditions along the roads and then establish a protocol based on these results.

29. **Construction Phase.** Fourteen construction period impacts are identified in the EMP, with implementing responsibility falling with the contractors and all subcontractors doing the work. Monitoring of the implementation of these measures will be supervised by the MOTC' Roads Committee (RC) or its Project Management Consultant (PMC). A few of the important impacts and mitigative measures listed below.

1. Inadequate Technical Capacity

30. The essential first mitigative action will be for the contractor to retain environmental safeguard expertise to complete the Construction Environmental Action Plan (CEAP) and obtain the various permits to begin the work. The MOTC's RC will ensure that each contractor has this expertise and it is retained for the duration all contracts. The GoK recognizes that hiring an 'environmental expert' is not a guarantee that credible work will be done, and therefore will hold a training workshop in EMP implementation and monitoring focusing on donor requirements.

2. Earthworks and Aggregate Site Operations Mismanagement

31. Five impacts and associated mitigative measures address issues surrounding earthworks. These are the handling and transport of materials, storage of topsoil, repair to cut and fills, aggregate site planning and management of construction related dust and noise. Detailed actions are indicated and the RC and/or the PMC will insure that the steps as specified in the IEE's EMP are undertaken.

3. Failure to Manage Lead Contaminated Soils

32. The roadside soil lead testing program will identify the general levels of contaminated in terms of distance from the road and to what depth. Any soil found to have lead levels consistently above the GoK standard and requiring excavation to widen the road will be treated as toxic material and need a disposal permit and agreement with the experts on how to dispose of or detoxify the soils. Strict record of all such works will be maintained by the contractor. The Sanitary and Epidemiological Service of the Ministry of Health will be directly involved in establishing any needed disposal protocol.

4. Failure to Manage Construction Camp Wastes and Fuels

33. Proper management of construction work camps, maintenance and storage areas is often a serious compliance issue. Impacts associated with inadequate waste management, poor fuel handling and inadequate site rehabilitation on completion of the work will be mitigated by the contractor taking five specific steps to make sure that none of these problems become an issue. These actions include the proper handling and management of all fuels and petroleum

products, proper handling and disposal of sewage and garbage and finally environmentally safe decommissioning of the any temporary work area to near-preconstruction condition.

5. Poor Management of Asphalt and Concrete Production Process

34. Large quantities of bitumen will need to be handled and one or two mobile asphalt plants established. Careful plant sighting and bitumen handling and storage procedures will be a major mitigation task. Spills and sloppy handling of the bitumen must be avoided. Further, concrete batch plants will also be established, generating dust and noise. Both pollutants must be managed, particularly cement dust as it contains Chromium +6, a highly carcinogenic form of this heavy metal. Batch plants will need to have dust suppression equipment installed and noise will be controlled by limiting operating hours and locating the plants at least 3 km from any settlement and at least 1 km from any water course. The MOTC or its PMC will ensure that this happens.

6. Construction Period Air Pollution

35. A constant complaint by local populations near construction operations is local air pollution stemming from improper fleet maintenance, overloading of vehicles, inadequate diesel generator maintenance, poor dust suppression, excessive vehicle speed and the habit of keeping vehicles idling when not in use. To minimize that six actions are specified in the EMP addressing each of these issues, which the contractors and all their sub-contractors will be required to follow.

7. Unacceptable Culvert and Bridge Replacement and Repair

36. For Road Sections 3 and 6 all existing 90 culverts and 13 bridges will need to be replaced. This means a good deal of work in and near water courses, the potential for siltation, chronic erosion and flow blockages and obstructions during runoff periods. To reduce the likelihood of problems arising from faulty construction a short safeguards advisory note has been prepared and is included as an annex to the IEE, defining good culvert design, placement and erosion protection measures and for bridges safeguard steps when working over water along river shorelines or when waters need to be temporarily diverted.

8. Excessive Tree Cutting

37. Since both road sections, particularly Road Section No. 6, have roadside shelterbelt trees, in some cases providing the only mature tree area for many kilometers around, the widening must avoid cutting as much as possible. While maintained by the MOTC these trees are considered protected and under the management of the Ministry of Agriculture's Forest and Hunting Committee (CFH), specifically the Zhambyl Oblast Territorial Office of CFH. During the detailed design a cutting plan will be prepared and approved by the Oblast CFH and included in the contract specifications. Contractors will be required to limit cutting and pay strict attention to the detailed design measure and consult with CFH

38. **Operation Phase.** At least four significant impacts and one program-level inaction could lead to serious future problems. To prevent and/or mitigate the predicted effects a number of actions will be required; are described in the EMP and summarized in this section.

1. Inadequate Preparation of the Post-Commissioning Project Audit

39. Under Kazakhstan law, all large projects require a full compliance audit 1 year after operations begin. This audit examines all elements of the project and matches specifications with what was actually done. To properly audit environmental safeguards, the auditors will use the EMP as the base guide and confirm that each item was completed. The output will be a checklist report. Should any non compliance issues be found, immediate corrective actions will be taken by MOTC and if problems are for the construction period, final payment to the contractor will be withheld until compliance is confirmed.

2. Air Quality Changes

40. The improvements of the road surfaces and widening will improve the flow of traffic, reduce deceleration-acceleration cycles and idling periods, therefore leading to the overall reduction in the emission levels, despite an increase in the overall traffic volume. The expected annual growth in traffic will be 6% after construction is completed, or a 2% generated and diverted traffic increase over pre construction levels. Not enough to be significant project-related emission. Therefore the NOx sampling will be undertaken if funds are available.

41. Kazakhstan's 50m roadside use restriction will be enforced to help deal with the localized air pollution. The construction of bypasses will further improve conditions in towns and will reduce truck traffic through the densely populated areas.

42. Should Kazakhstan continue to use leaded petrol, lead contamination of roadside soils and airsheds will continue to grow. However there are indications the leaded fuels are being phased out over the next 5 years.

3. Noise Issues

43. Traffic analysis suggests that the annual increase without the project will be about 4% per year and therefore noise levels will continue to stay more or less the same for many years since an audible rise associated with a 3dBA change occurs every time there a doubling of the traffic or a large shift in the fleet composition. Considering both generated and diverted traffic, a project-related traffic volume increase of only 2% per year is expected, making project generated noise a non issue along these sections. Given the proposal for bypasses at Kulan and Merke, noise levels should drop in the more populated urban areas.

44. The existing noise projections do show high existing noise levels close to the road, therefore a careful monitoring of any attempts by people to live close to the road edge will be undertaken and the GoK's 50m rule for Class I and II roads, restricting any use of this corridor for all but road-related activities, will be enforced. Beyond 50m the noise predictions indicate levels at or below 65 dBA.

45. The actual data collected during the final EIA (to be completed before December 2008) will establish the real conditions and if the same as in the PEIA no further action will be needed. If standard exceedences are recorded, a noise monitoring program will be needed covering sensitive sites within 150m of the road, focusing on schools, hospitals and any quiet zones. Noise levels at night will be carefully monitored (although data suggest that there is little traffic at night).

E. Institutional Requirements and Environmental Monitoring Plan

46. The environmental management plan (EMP) proposed in the IEE shall be made legally binding through inclusion as environmental clauses in the Loan Agreement between the RoK and the ADB as well as in the specifications in the contract-bid documents. The contractor shall be responsible in implementing the identified mitigation measures during the construction stage and shall be required to prepare not only the CEAP, defining steps they will take to ensure timely and proper implementation of mitigation measures using, as basis, the environmental controls recommended in the IEE, but also semi-annual implementation reports to the ADB, which will include an environmental section. The Project will likely be managed by the PMC with responsibility for all aspects of the day-to-day project implementation.

47. Environmental management will be the primary responsibility of the Department of Environment's Inspection Unit in Taraz, but given the bureaucratic bottleneck blocking adequate monitoring the PMC will undertake unannounced environmental inspections and file reports with the Inspection Unit when any problems come to light.

48. During the project design period, monitoring will focus on confirming MOTC's commitment to arranging and participating in training programs on environmental assessment, mitigation and monitoring methods and reporting. Secondly the contract documentation will be examined to assure that appropriate environmental safeguards have been added, such as the requirement to implement and adhere to the environmental mitigation and monitoring plan. Thirdly the completion of the lead-in-soils testing program will be carefully assessed.

49. Construction period monitoring³ will deal mostly with compliance monitoring of the following construction-related actions: (i) consultation with local community people prior to initiation of work that affects their livelihoods, e.g., access restriction and traffic congestion, noise; (ii) execution and management of re-vegetation program; (iii) handling and delivery of construction materials; (iv) dust management at construction sites; and (v) general good housekeeping activities by the contractor at all construction sites.

50. Operating period monitoring will concentrate on the examination of noise level changes and necessary mitigative measures as well as examining the air quality data of the EIAs now under preparation to determine if operating period air quality sampling is needed. Efforts will be made to ensure that the 50m restricted zone regulation is enforced. MOTC will ensure that the year-one operational period audit is undertaken in a credible, transparent and timely manner. NOx monitoring will be undertaken in collaboration with the Zhambyl Oblast Environment Department.

F. Public Consultation and Information Disclosure

51. Given the 1.5month project period and the long (>3 weeks) preparatory time, including special permitting from the Chief Prosecutor's Office, needed for the organization of public consultations, 15 meeting with 1-6 people each, were held in Taraz, along the road sections in Kulan, Merke, in Almaty and Astana. Minutes of five of the more important meetings are presented in the IEE Annex 2, and minutes of all meeting are available and on file with MOTC. Public consultation as practiced by the donors is forbidden in Kazakhstan. Public debates are

³ MOTC will establish an internal and informal monitoring process that will provide the semi-annual environmental reporting, and alert MOEP that a formal audit is needed if serious issues arise.

possible but are triggered only if significant direct project impacts are likely and the Chief Prosecutor's office provides a format, venue and approves a table of contents. The local voice is the *Akim* or district head, and he (99% male) speaks for the local people.

52. Several *Akims* were interviewed in addition to many officials at all levels of government in the oblast, Almaty and Astana. Since the project work is well within the well marked road RoW and there are no unusual project-generated issues.

53. The comments and concerns as presented in the table below raised important issues, and ones that the public at large agree with.

No.	Issue Raised: including real and perceived environmental issues	Action to Be Taken (as indicated by the consultant)
1	Preliminary Environmental Impact Assessment has been prepared in 2 months (no field work) with the help of the CREDO simulation model. All data on environmental pollution is simulated for preliminary considerations only.	Detailed EIA must be undertaken as required by KAZ law in order to bring environmental safeguards into compliance.
2	Problems with coordinating international organizations, public agencies (national-level and regional-level), and private contractors, involved with the project	Organize a clearer chain of command and better project collaboration/communication network
3	International/National level project management and reporting requirements will presuppose the limited environmental institutional capacities of oblast- and rayon-level public organizations.	Training and counterpart assistance for KAZ experts to be undertaken
4	Good quality detailed design documentation should prevent non-compliance issues.	The inclusion of mitigation items from the EMP of the IEE should help to address this issue
5	Contractor's compliance with environmental norms and cooperation with local public agencies.	Solid contract specification and appropriate monitoring and enforcement should significantly reduce this concern
6	The permit for planned environmental inspection requires several months of preparation and approval of oblast prosecutor's office.	The permit to initiate the construction could delay the beginning of the work considerably, and to that end a fast-track process is suggested where a team assigned to the project (given its nearly \$ 500 million size) and credibly process the permits (which included not only environmental permits)
7	Environmental inspection can be carried out on request in the case of formal application of complaint from the public.	For the environmental safeguard to be accepted by the donor the monitoring process will need to be revised to permit unannounced, unencumbered construction monitoring for as many times per year as needed
8	Contractor's compliance of rules and norms, and cooperation with local people through Rayon <i>Akimat</i> .	Contractor compliance will be improved by the inclusion of appropriate safeguard clauses in the contract document, such that if non-compliant the contract will have monthly payments delayed/withheld.
10	Merke small businesses (cafes and shops) along the existing road through town mostly likely will lose customers. However Deputy <i>Akim</i> does not consider Merke as a high risk area for resettlement or environmental problems during road construction.	Social survey of socioeconomic impact of the creating of a bypass and improvement to the road to the north of Merke in the local business needs to be completed, and if negative effects shown a plan of action prepared and implemented by 2010.
11	Deputy <i>Akim</i> raised a risk of construction and resettlement of highly populated area of mountain range between Zhambyl and Shimkent, and the importance of the local people participation.	Sections 3 and 6, comprising Project 1, will have no resettlement.
12	Mudslides and flooding of season rivers	This will be an important issue in Section 4 and 5 but to date no indication this is an issue along Section 3 or 6.

No.	Issue Raised: including real and perceived environmental issues	Action to Be Taken (as indicated by the consultant)
13	Erosion of in mountain areas	Same as above
14	The project required cooperation of Oblast Meteorological stations and Environmental Inspection agencies in the region.	As part of the proponents effort to improve collaboration among the specialist agencies , KAZHYDROMET needs to be included

54. The one theme repeated many times was pedestrian safety and the need to incorporate pedestrian safety measures as part of the road upgrading.

G. Findings and Recommendations

55. When all items labelled as environmental are included, the total mitigation and monitoring cost for the Project I Roads is estimated to be USD1,143,600. This cost includes all mitigation, monitoring and capacity building and expenses for the 6.5 year duration. A major extraordinary cost is the overall soil-lead contamination testing and management program for a total of USD 237,925 and the noise monitoring at USD 87,100 plus per diems. Should the soils testing conducted during the detailed design stage show only minor contamination, much or all of the remaining USD 392,250 in fees, costs and per diems will not be needed.

56. Further the re-allocation of the environmental engineering items to the construction costs will reduce the mitigation and monitoring cost by a further \$ 526,000. If both of these changes occur (at the moment this uncertain) the total cost will drop to \$ 263,185. The larger figure has been retained in the IEE to permit proper budgeting of environmental mitigative actions for the project as a whole.

57. As road improvement projects the two sections within Project 1 do not present difficult engineering or design issues and no likely environmental impacts that cannot be prevented or adequately mitigated. The problems come with the level of confidence of the available data, primarily the PEIA and the experience of all stakeholders with donor safeguard requirements. In addition to the finding that the PEIA results are pure modeling output lacking any verification, a more careful examination revealed many internal inconsistencies suggesting something was wrong with the input data and the assumptions used. Just one example is in the roadside air quality modeled using traffic volumes. Road section 6 yielded almost no roadside air pollution while Section 3 with less than half the traffic volume had several parameter exceeding standards to a dangerous level. This has raised serious doubts on the overall validity of the PEIA outputs.

58. To counter this problem, the MOTC has commissions 7 full EIAs, five part of the ADB loan and two for the ISDB roads. For Project I Road Sections 3 and 6, the EIAs must include robust mitigation and monitoring plans and be fully verifiable according to international safeguard standards. They will be used to supplement and adjust the IEE as needed.

1. Process Policy and Technical Capacity Issues

59. The Preliminary EIA is not only technically limited, but seems to use inaccurate input data, making the output very general. This is particularly true for air, noise and water quality data. The full MOTC EIA, which is needed before the project can receive approval under GoKs process, has not been started. At the same time the detailed design is scheduled to be finished by the end of 2008 at which time the bid documents will be nearing completion. Should this schedule be maintained, the bid documents will be prepared without the benefit of a complete

MOTC EIA and its Environmental Management Plan. To avoid this, the EMP contained in this IEE will be used to guide preparation of environmental contract specifications.

60. GoK standards seem to be used not as absolutes to protect the environment, but rather as levels above which pollution is permitted so long as adequate payment is received (as it was explained to the consultant in Taraz). Therefore, it is questionable if any standards really end up protecting the environment. Clearly this must change and standard must be recognized as levels established to protect the biophysical environment and people from serious impacts, leading to costly mitigation or worse chronic negative effects.

61. There is a one-per-year limit and two-week advance notice required for environmental inspections (Kazakh Ecological Code, 2007), unless special circumstances arise, and contractors are allowed two failed inspections, after which they are fined. Since most contracts are 3 years long, the contractors have little to fear from this compliance monitoring, making it unacceptable under donor rules. An amendment to these norms is urgently needed if safeguard standards are to be met and to that end MOTC proposes to hold a monitoring policy form to find an option route to more acceptable compliance monitoring. Finding a solution to this limitation is important since implementation reports containing environmental update must be submitted semi annually once the loan funds are accessed.

62. Kazakhstan has highly skilled technical experts, who have spent their careers, following norms (there are >120 related to environment) and standards without much question. The skills of interpreting results and relating them to standards and norms are only marginally available. Credible environmental assessment output which requires such skills, points to a need for training in EIA methods. This would include training via case examples and counterpart work in a) provision of preventative environmental design, b) practical mitigation; c) establishment of adequate feedback mechanisms through clear and functioning monitoring and d) the implementation of internationally acceptable enforcement and reporting.

63. Kazakh experts do not understand these elements well, and having to find their way through a minefield of often conflicting and restricting norms and standards, the thought process is not about reasoning and possibilities but rather on how can the project not fall afoul of a norm and/or code, etc.

64. In addition to workshops and an environmental policy revision session, the capacity building will focus on learning by doing, where Kazakh specialists are partnered with an international specialist or a Kazak who has been trained and has practiced outside Kazakhstan.

65. Contractors must not be left out of the training loop and to that end assistance with the preparation of CEAPs will be provided by an international safeguards specialist once contractors are ready to mobilize.

2. Lead from Petrol in Roadside Soils

66. Both roads will be widened and as such the shoulder areas will need to be excavated and material transported, deposited, etc. The PEIA modeling data suggest that these roadside soils have lead levels 10-20 times the accepted GoK standard. The modeling results further indicate that these levels exist 30-40m from the edge of the pavement. At the same time this zone is used by local farmers to graze their goats and sheep. No doubt the milk is used in the dairy industry and the meat is consumed. Some vegetables and cash crops are also grown in this zone.

67. For the past 30+ years the dangers of lead have been well known and very small concentrations permanently affecting mental and motor functions in humans, particularly children. There is a danger that roadside lead is getting into the food chain.

68. The excavation of these shoulder areas (there will be more than 75,000 m³ of this material to be handled) during dry periods, could easily transfer the lead into the air attached to dust particles, leading to more lead poisoning.

69. To address this problem a program of soils, milk and food testing along the road is planned during the detailed design stage. Should contamination be found, a handling and treatment protocol will be implemented during the construction period and local users will be warned of the dangers. The GoKs 50-m exclusive use rule for Class I and II roads will be enforced as well.

70. The continued use of leaded fuels will only increase the soil and airshed lead pollution, threatening the health future generations.

3. Construction and Operating Period Noise

71. When applying the single 70 dBA standard (as suggested in the PEIA), noise data from the PEIA suggest marginal issues and minor non-compliance. Problems were suspected when, during the field period a) the consultant was told of excessive noise levels disturbing people in towns and villages and b) the model's noise outputs for Road Section 3 were significantly higher than for Section 6, even though traffic volumes for Section 6 were twice that of Section 3. These uncertainty has caused MOTC will undertake an operating period noise monitoring program at sensitive sites (where the road is within 30m of residences, schools and hospitals) along the two roads for at least one year of operations (see EMP for details).

72. Construction period noise is less of an issue assuming that monitors can check compliance with requirements defined in the IEE's mitigation and monitoring plans.

4. Work Camp and Maintenance Yard Good Housekeeping

73. Management of construction camps, maintenance yards, asphalt plant and concrete batch plant sites is often very badly done, primarily because there is no inspection and enforcement. To avoid this, a set of measures designed of controlling waste and fuel pollution and to ensure proper operation and decommissioning of contractor and subcontractor managed sites, will need to be undertaken and enforced through regular quarterly unannounced inspections. The measures are defined in detail in the IEE's EMP and will be used in development of contract specifications. If non-compliance is found the inspections will increase and fines will be levied.

5. Aggregate Site Development and Operations

74. Widening and raising the vertical alignment of the two roads means a lot of fill material for the sub-base and rock and aggregate for the asphalt and concrete surfaces. However to date there are few specific date on where the rock will come from , but it will likely be foothill quarries, with materials trucked or transported by rail to the crushing plants.

75. The existing process of locating a new source of aggregate is a matter of location on a geological map and choosing the location closest to the work. Under GOK rules there is no

screening of sites to establish any environmental limits and there is little concern for local landuse⁴. Usually people accept money without understanding the real consequences of such actions. To reduce these problems a process of screening is proposed, including discussions with local *Akims*, and local land users to determine the existing use of the aggregate sites and make sure that these locations are not important for the natural environment and at least they are out of the line of sight from the road. For any aggregate site access road construction, safe use, maintenances and decommissioning will a basic requirement each contractor will have to comply with.

76. The inspection of the rehabilitation and decommissioning activity of each site will be a part of the mandatory 1-year post commissioning GoK audit.

77. The field and internet search revealed that the area running E-W between the road and the foot of the Tian Shan mountains is crossed by at least three bird flyways, and as such various species could use these strip as a resting and feeding area on the way to and from the Siberian wetlands. Therefore aggregate site selection will have to include consideration for migratory bird resting area disturbance. Contractors will therefore need to consult the CFH's office in Taraz and consult with the person in charge protected natural areas.

6. Culvert and Bridge Replacement

78. The two roads will require the replacement of 90 or so culverts, many of these being large partially poured-in-place concrete box culverts, as well as the replacement and widening of 13 bridges. Working in and over water and along river banks can mean a great deal of damage very quickly. To help prevent this, guiding principles on environmentally sensible culvert and bridge reconstruction were developed by the consultant and are provided in Annex 4 of the IEE. As a bare minimum, contractors will be required to adhere to the steps and will be inspected to check compliance.

7. Other Issues Found

79. Water quality data were so scarce that little could be said about the conditions along the road. The PEIA contained no water quality data other than a listing of standards. An examination of the KAZHYDROMET data on rivers in the area revealed that these data were being inconstantly reported. For example, data for obscure small streams were invariably available and indicated significant contamination, while large river data, e.g., the Shu River which is crossed by Road Section 6, had almost no data, but included a conclusion that its waters were mildly polluted. This is unusual also because it is common knowledge that all the sewage and most industrial liquid waste from Bishkek ends up in the Shu River, which is only 100km from where passes the KAZHYDROMET Shu R. sampling station at Blagoveshenka; and after receiving all sorts of added effluents on the way.

80. Only copper, oil and phenol level data were available and they indicate contamination. Phenols were 2X the allowable standard for human use, while all measurements exceeded levels for water used by fish and fisheries.

⁴ Unconfirmed information suggests that contractors establishing new aggregate sites must now (as of the 2007 Ecological Code) undertake a screening study to establish effects and a site management system. However on review of the Code (which was only partial due to language problems), these specifications were not found.

81. Fortunately, the road and bridge work is not expected to have significant impacts on surface water quality, as long as guidelines are followed and are enforced. However any construction induced pollution will be much harder to detect since there are no baseline data. To mitigate this, MOTC has instructed the EIA teams to be sure to collect some baseline water quality, air quality and noise data.

H. Conclusion

82. With MOTC ensuring that the mitigation and monitoring measures as defined in the EMP will be implemented and environmental specifications, will be added to the bid documentation, and that compliant EIA are being completed and will be available for ADB review, the project will need no further environmental analysis.

83. Should the preconstruction lead sampling show high levels a construction and operating period monitoring program will be launched and lead contaminated soils handling process devised.

84. The MOTC EIAs being undertaken by Kazakh consultant will also be used to update and adapt the IEE results to reflect on-the-ground conditions. These changes will be made in collaboration with the ADB and changes in the EMP confirmed by both sides.

85. MOTC recognizes the need for capacity building and is committed to undertaking the workshops and assistance programs to be sure that environmental safeguards are actually implemented lead to improved environmental management of road projects.

86. The IEE is considered sufficient to identify anticipated impacts associated with the Project and provides measures for their mitigation and management, and therefore no further environmental assessment is required.