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Environmental Assessment

of the

Jalalabad – Asmar Road Improvement Project

A part of the Afghanistan Rehabilitation of Economic Facilities and Services (REFS) Program
Contract 306-C-00-02-00500-00



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LIST OF ACRONYMS/GLOSSARY

A		MIWRE	Ministry of Irrigation Water Resources and Environment
ACCA	Afghan Assistance Coordination Authority	MMI	Ministry of Mines and Industry
ACIA	Afghanistan Civil Infrastructure Assessment	MOC	Ministry of Communications
ADB	Asian Development Bank	MOI	Ministry of Interior
AIA	Afghanistan Interim Administration	MOIC	Ministry of Information and Culture
B		MOP	Ministry of Power
BOD	Biological Oxygen Demand	MPW	Ministry of Public Works
C		msl	Mean Sea Level
CFR	Code of Federal Regulations	N	
COPA	Conditions of Particular Application	NGO	Non-Governmental Organization
CSC	Construction Supervision Consultant	NMT	Non-Motorized Traffic
D		NO	Nitrogen Oxide
dB	Decibel	P	
DO	Dissolved Oxygen	PAP	Project Affected Person
E		Pb	Lead
EA	Environmental Assessment	PCF	Post Conflict Fund
EIA	Environmental Impacts Assessment	R	
F		REFS	Rehabilitation of Economic Facilities and Services
FIDIC	<i>Federation International Des Ingenieurs Conseils</i> (International Federation of Consulting Engineers)	S	
G		SE	Supervising Engineer
GC	General Contractor	<i>Shura</i>	District (typically 15-20 <i>gozars</i>)
GCOC	General Conditions of Contract	SPM	Suspended Particulate Matter
<i>Gozar</i>	Neighborhood	SS	Suspended Solids
GoA	Government of Afghanistan	STD	Sexually Transmitted Disease
GPD	Gross Domestic Product	T	
GPS	Global Positioning System	TOR	Terms of Reference
H		TSP	Total Suspended Particulate
Ha	Hectare	U	
I		UN	United Nations
ICB	International Competitive Bidding	UNDP	United Nations Development Fund
IDA	International Development Association	UNEP	United Nations Environment Program
IEE	Initial Environmental Examination	UNMAC	United Nations Mine Action Center
ISAF	International Security Assistance Forces	USAID	United States Agency for International Development
ICUN	International Union for the Conservation of Nature	USAID/GC	USAID General Contractor
J		UXO	Unexploded Ordnance
K		V	
KM	Kilometer	W	
L		X	
LCB	Local Competitive Bidding	Y	
M		Z	
M	Meters		
MHBTP	Ministry of Housing, Building and Town Planning		

ENVIRONMENTAL ASSESSMENT
Of The:
JALALABAD - ASMAR ROAD REHABILITATION PROJECT
Proposed As Part Of The
REHABILITATION OF ECONOMIC FACILITIES AND SERVICES (REFS) PROGRAM
With Funding Provided By
UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT
Contract 306-C-00-02-00500-00

Summary of Findings

Proposed Action. The United States Agency for International Development (USAID) proposes to fund the Jalalabad - Asmar Road Rehabilitation Project as a part of its Afghanistan Rehabilitation of Economic Facilities and Services (REFS) Program. The Jalalabad - Asmar road rehabilitation work covers the length of road linking the city of Jalalabad to Asmar (close to the border of Pakistan), a distance of approximately 121km. The Project Road forms an important link between the Kabul, Jalalabad and the border of Pakistan.

Examination Methodology. Pursuant to Environmental Procedures established by Title 22 of the U.S. Code of Federal Regulations, Part 216 (22 CFR 216), USAID made a *Positive Determination* for REFS Component 1 (the Component of with the proposed Project is a part), i.e., a determination that environmental documentation will be required on a project-by-project basis. The USAID Mission in Kabul has determined that an EA is warranted for this project. In accordance with the recommended EA format, the initial section of the EA (the section in hand) presents a Summary of Findings pursuant to 22 CFR 216.6 (c) (1) 22 which states (in its entirety) that the initial section of the EA shall be a summary and that "*the summary shall stress the major conclusions, areas of controversy, if any, and the issues to be resolved*". Accordingly, the Summary of Findings is organized to present:

- **Major Conclusions** (Item 1);
- **Areas of Controversy** (Item 2); and
- **Issues to be Resolved** (Item 3).

1. MAJOR CONCLUSIONS

The Environmental Assessment finds that:

- No significant adverse impacts are likely to result from the proposed Project, provided that the actions to avoid or otherwise mitigate potential adverse impacts are incorporated in the Project as specified herein. Specific environmental provisions for the Project's contractual Conditions of Particular Application (COPA) are provided by **Appendix A**.
- The Project is not expected to result in significant impacts to residences and agricultural land, however in the even that such issues do arise recommended guidelines to mitigate impacts to project-affected persons (PAPs), based on the precedents set by related policies in Afghanistan, are provided by **Appendix B**.

- Consideration of additional actions beyond the scope of the Project are warranted as follows:
 - Assist MPW in the Establishment of a Traffic Safety Program;
 - Assist NEPA with the development of Forestry Protection Initiative in Nangahar, Kunar and Nuristan;
 - Assist Coordination of Future Land Use & Transport Plans; and
 - Integrate Road Rehabilitation with REFS Institutional Strengthening Initiatives.

2. AREAS OF CONTROVERSY

The phrase "Areas of Controversy" in this context is taken to mean areas of disagreement emerging from public comment and participation in the definition of the Project and the Proposed Action. No such areas of controversy have emerged.

3. ISSUES TO BE RESOLVED

No socio – environmental issues are to be resolved.

1.0 INTRODUCTION

1.1 PURPOSE OF THE EA

This document presents an Environmental Assessment (EA) of the Jalalabad - Asmar Road Rehabilitation Project (the Project) proposed for funding by the United States Agency for International Development (USAID) as part of its Afghanistan Rehabilitation of Economic Facilities and Services (REFS) Program. The purpose of the EA is to ensure that environmental issues have been foreseen in its development and implementation plans. The administrative and strategic context provided by the REFS Program is explained in **Item 1.2** below. Details of the proposed Project are provided by **Section 2.0**, Project Description.

To ensure that environmental issues associated with projects such as the Jalalabad - Asmar Road are adequately foreseen, all projects identified for funding by USAID are subject to the Environmental Procedures established by Title 22 of the U.S. Code of Federal Regulations, Part 216 (22 CFR 216). The USAID Mission in Kabul has recommended that the Jalalabad Road Rehabilitation Project requires an EA.

1.2 ADMINISTRATIVE & STRATEGIC CONTEXT

The REFS Program of which the Jalalabad - Asmar Road is a part was developed on the basis of an Afghanistan Civil Infrastructure Assessment (ACIA) for which field investigations were undertaken in the period from 13 June to 18 July 2002 and documented by a Final Report to USAID/Afghanistan on 20 August 2002. The purpose of the ACIA was to identify and prioritize Afghanistan's civil infrastructure and its reconstruction, repair and rehabilitation needs and the need for agricultural market centers. The ACIA recommended a prioritized program for:

- Labor-intensive inter-provincial road rehabilitation projects;
- Development of rural market centers ;
- Major roads and bridge projects;
- A National Secondary Roads Program; and
- A National Primary Roads Program.

The REFS Program was developed on the basis of the ACIA specifically *"to promote economic recovery and political stability in Afghanistan by repairing selected infrastructure needed to lower transportation cost, improve the provision of water and sanitation services, increase access to education, health and local government facilities, restore electrical transmission and distribution systems, and repair/reconstruct irrigation systems, dams/diversions and canals critical to the reactivation of the agricultural sector, the dominant means of livelihood in the country."*¹

To achieve these goals, the REFS Program consists of three components:

- Rehabilitation and Construction Projects (Component 1);
- Institutional strengthening of selected public services (Component 2); and
- Purchase, importation and distribution of construction materials and supplies not otherwise available in Afghanistan (Component 3).

In accordance with its internal procedures and in accordance with the regulations as outlined above, USAID made a Positive Determination for REFS Component 1, i.e., a determination that environmental documentation will be required on a project-by-project basis for projects involving civil works. The EA presented herewith provides the required environmental documentation.

1.3 ORGANIZATION OF THE EA

The EA is organized as follows:

- **Section 1.0: Introduction.** The section in hand provides introductory information.
- **Section 2.0: Project Description.** Section 2.0 presents details of the proposed Project and a description of the existing environmental policies and procedures in Afghanistan.
- **Section 3.0: Environmental Screening.** Section 3.0 presents the relevant environmental criteria as identified based on USAID regulations, and additional environmental considerations and issues associated with rehabilitation projects and the specifics of the Jalalabad - Asmar Road Rehabilitation Project. The discussions of the criteria present statements of:
 - Existing Conditions;
 - Potential Impacts and Anticipated Design Avoidance/Mitigation Actions; and
 - Additional Recommendations.
- **Section 4.0: Environmental Guidelines.** The Environmental Guidelines presented in Section 4.0 present:
 - A Recommended Checklist - Completion of the Checklist is recommended as a part of final Project design; and
 - Recommended Monitoring.
- **Section 5.0: Conclusions and Recommendations.**

¹ REFS Contract, page C-2.

2.0 PROJECT DESCRIPTION

2.1 OVERVIEW

This 121 km road links Nangahar and Kunar Provinces, beginning at Jalalabad (Km 0) and ending at Asmar (Km 121). In general, from Km 0 to Km 121, the road runs alongside the Kunar River which is on the right side, which provides life blood to the valley inhabitants.

From Jalalabad (Km 0) to Nurgal (Km 47) the existing road has been constructed on asphalt surface in the early 60's however the surface was completely damaged during the occupation of the Russian Forces and more recently the defense during the Taliban Regime. The remaining damaged asphalt pavement was found in short sections between Km 26 and Km 47. Between Nurgal and Asmar, the existing road is constructed of gravel surface, but due to non maintenance, this narrow section of road is badly damaged.

Therefore in order to best service the valley for the movement of people and produce at a greater speed and efficiency the decision was made to upgrade this provincial road. Safety is another concern and it is recommended that a traffic awareness and educational program be introduced by the Government to prepare for the increased speed and usage of the upgraded provincial road. **Exhibit 2-1** illustrates the location of the Project within the context of Afghanistan.



Exhibit 2-1. Jalalabad - Asmar Road, Afghanistan

Exhibit 2-2 indicates the Projects location within the Eastern Region of Afghanistan. Details of the existing conditions in the potentially affected area are provided item-by-item under the headings of the relevant environmental criteria in Section 3.0.

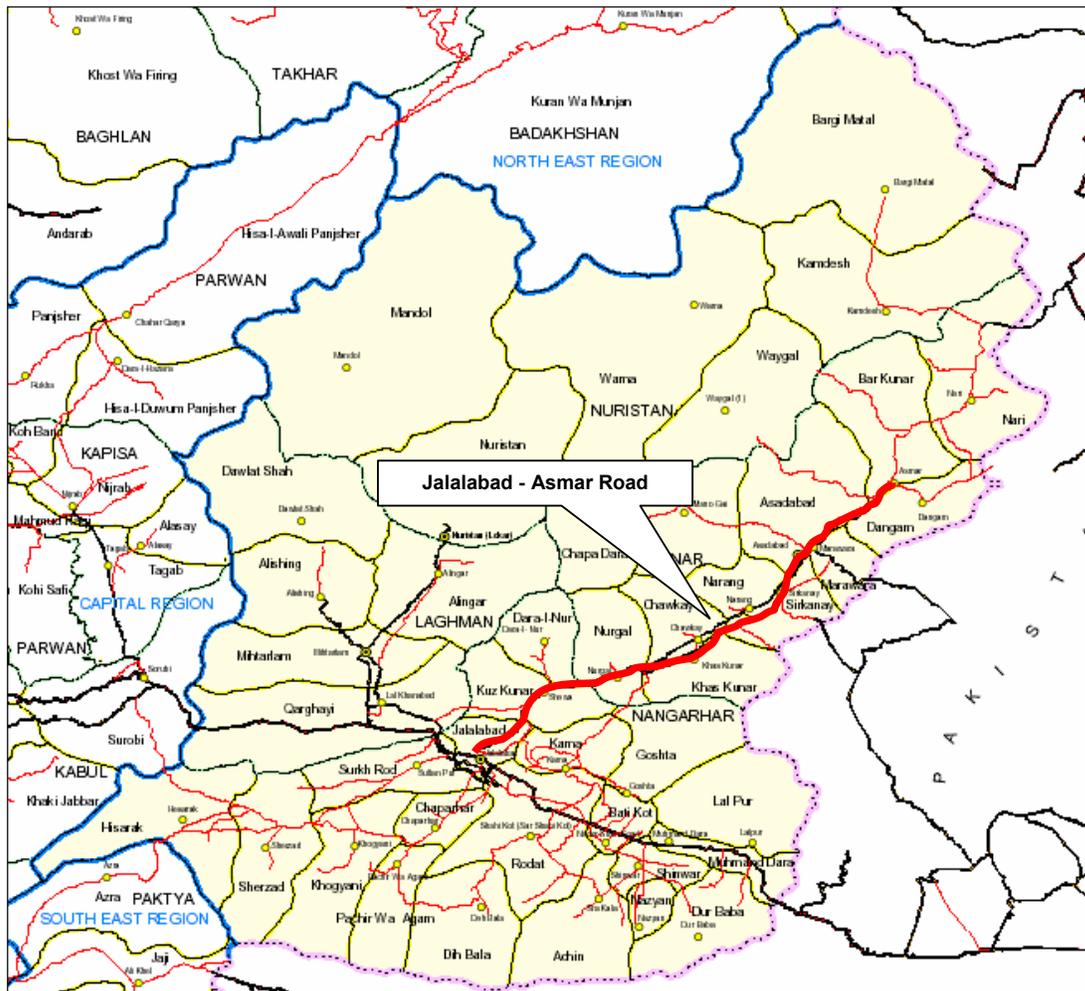


Exhibit 2-2. Jalalabad - Asmar Road.

2.2 DETAILS OF THE PROPOSED ACTION

The cross section design is split into two separate sections. The first 94 km from the entrance from Jalalabad is designed for a typical cross section consisting of a 6.0 meter wide Double Bituminous Surface Treatment (DBST) carriageway with 1.0 meter wide DBST shoulders each side. The second section which is a further 27 km long, is designed to a typical cross section of 6.0 meters wide with DBST and no shoulders either side. Initially the contract award was split into 4 Contracts, Km 0 to Km 10, Km 10 to Km 20, Km 20 to Km 30 and Km 30 to Km 121. Due to non performance, all the contracts were terminated, and the full section was later awarded to BSC-C&C JV on 30 October 2005. The contract value awarded to BSC-C&C JV is \$40.65 Million.

The pavement design was based on results from a full investigation of the geology of the road and CBR results of the original ground materials. Initial traffic counts taken over a 24/7

period have also formed the basis of the pavement design. Several site inspections were made in order to prepare a Scope of Work and provisional Bill of Quantities.

The resulting design is divided into 7 sections. For Section 1 from Km 0 to Km 37, Section 3 from Km 57 to Km 66 and Section 7 from Km 94 to Km 113+500, the design incorporates 200mm granular sub base; 200mm granular base course with DBST. For the Section 2 from Km 37 to Km 57, Section 4 from Km 66 to Km 75 and Section 6 from Km 80 to Km 94, the design incorporate 150mm granular sub base, 150mm granular base course and DBST. For the Section 5, from Km 75 to Km 80, the design incorporates 300mm sub grade, 150mm granular sub base and 150mm granular base course. For Section 8 from Km 113+500 to Km 121, the design incorporates 250mm granular sub base and 150mm granular base course. For the DBST work. 1st seal aggregate of 19mm and 2nd seal aggregate of 14mm has been selected. All granular and aggregate materials are found locally with both crushing and screening plants located along the full length of the road construction.

Priority was also given in providing additional drainage structures while replacing the existing damaged ones. All existing causeways are designed to be overlaid with 140mm Reinforced Concrete panels. About 28,000 lin.m of lined side drain is designed to protect the road from erosion. The drainage design also includes 170 new culverts construction and repairing or extending the 450 Nos. of existing culvert. 2,100 lin.m of retaining wall structure is also included in the design as part of slope stability and erosion protection work.

Taking safety aspect into consideration, guardrail and guide post will be placed at sharp bends and steep slope sections. Traffic signs indicating narrow road will be provided to forewarn the drivers when approaching the narrow section at Km 48.

2.3 AFGHAN ENVIRONMENTAL POLICIES AND PROCEDURES

2.3.1 General

In June 2002, for the first time in the history of Afghanistan, an authority for environmental management was mandated in the newly formed government – The Ministry of Irrigation, Water Resources and Environment (MIWRE). Since 2002 several ministerial changes have occurred, MIWRE is now defunct and has been replaced by the Ministry of Energy and Water (MoEW). Of most relevance to this report is the creation of the new National Environmental Protection Agency (NEPA), whom, with the aid of UNEP have produced draft environmental legislation shortly to be enacted.

2.3.2 Legislative Framework

The proposed Environmental Management Act (EMA) drafted by NEPA focuses on several areas including:

- Integrated Environmental Management
 - Environmental Impact Assessment
 - Integration of Environmental Issues into Development Planning
- Integrated Pollution Control
 - Pollution Prevention Control (including licensing)

- Waste Management (duty of care, waste management licenses etc)
- Water Resource Conservation and Management
- Biodiversity and Natural Resource Conservation and Management
 - National Biodiversity Strategy
 - Protected Areas Management
 - Sustainable Use and Conservation of Species
 - Species Trade
 - Access to Genetic Resources
- Compliance and Enforcement

As mentioned, the Act is currently in Draft form and is likely to be enacted shortly. Accordingly, this report conforms to the regulations stipulated by Title 22 of the U.S. Code of Federal Regulations, Part 216 (22 CFR 216). Future reports prepared under the REFS programme will however adhere to both 22 CFR 216 regulations and the new EMA.

In addition to the EMA several other environmental related laws currently exist as illustrated by the table below.

Afghan Environmental Law	Date
Water Law	1981
The Forestry Law	2000
Law for Land Ownership	2000
Nature Protection Law	1986/2000
Hunting and Wildlife Protection Law	2000
Range Management Law	2000
Agriculture Cooperative Development Law	2000
Charter for the Development of Fertilizer and Agro-chemicals	2000

2.3.3 Afghan Environmental Assessment Procedures

Prior to 2005 no formal EIA process has been practiced in Afghanistan. As a result many projects, such as deep-well drilling or large-scale irrigation projects were conducted without considering the environmental consequences of such activities. Additionally, there wasn't, and in some circumstances, still isn't any consistent application of EIA amongst donor agencies and international organizations currently working in the country.

Specific guidelines have now been produced as part of the Draft Environmental Management Act to deal with Environmental Impact Assessment. In theory there are several key stages in the assessment procedure as follows:

1. Any project, plan or policy of significant size or scope (no screening list defined as yet) shall submit to NEPA a brief containing enough information to enable NEPA to determine the potential adverse effects and positive impacts of the project, plan or policy.
2. After reviewing the brief and acting on behalf of the EIA Board of Experts (yet to be established) NEPA will either:
 - a. Recommend the project proceeds without further environmental assessment;
 - or

- b. Submit an environmental assessment / comprehensive mitigation plan
3. The outline of the EIA is roughly similar to that contained herewith, however, alternatives should also be considered, e.g. alternative design, technologies, routes etc.
4. Once the EIA has been approved by the Executive Secretary General (acting on the advice of the EIA Board of Experts) a permit is granted allowing continuation of the proposed project, plan or policy. If the permit is refused for whatever reason an appeal can be submitted within 60 days of the refusal.

The draft regulations also state that Public Participation should also be part of the EIA process. Public participation in this sense includes distributing copies of the EIA to affected persons and undertaking public hearings.

3.0 ENVIRONMENTAL SCREENING

As noted in **Section 1.2**, USAID has determined that REFS Component 1 activities require environmental screening to identify the appropriate level of documentation for infrastructure activities. This section of the EA provides the necessary screening for the Jalalabad – Asmar Road Rehabilitation Project.

3.1 SCREENING METHODOLOGY

Introduction. To establish the context for the environmental screening, the following:

- Reviews the definition of environmental criteria as established by the applicable USAID regulations and other considerations;
- Defines the Project Area for the purpose of the screening;
- Explains the screening process used to identify:
 - Potential impacts based on the proposed actions and the sensitivity of the environment in which they will occur;
 - Provisions to avoid or otherwise mitigate actions incorporated in the Project; and
 - Additional recommendations.

A summary table of the screening process is presented by **Exhibit 3-1**. Application of the screening process is documented in **Items 3.2** through **Item 3.5**.

Potential Impact Identification Methodology. Potential impacts have been identified on the basis of experience on similar projects and in similar circumstances; and, insofar as possible, a “scoping process” incorporating consultations with local stakeholders with intimate knowledge of the Project Area. Persons beyond the immediate Project Area having expertise relevant to the environmental aspects of the proposed action have consulted in the process, including representatives of the Afghan and local host governments, public and private institutions, the USAID Mission staff and the staff of other concerned agencies such as the UNEP. A list of organizations and individuals contacted is provided by **Appendix C**.

Environmental Criteria. The environmental criteria applied in the screening process have been determined on the basis of applicable USAID regulations and other considerations as follows:

- **Applicable USAID Regulations.** Paragraph 216.1 (c) (10) of the Agency Environmental Procedures states that the “*term environment, as used in these procedures with respect to effects occurring outside the United States, means the natural and physical environment*”. Accordingly, the screening addresses:

Item 3.2 (Physical Resources). Physical resources are generally defined to include topographic, soil, geological and related attributes. Sub-headings in this section are:

- Topography (Item 3.2.1)
- Soils (Item 3.2.2)
- Seismic & Geological Characteristics (Item 3.2.3)
- Hydrology (Item 3.2.4)
- Air Quality & Climate (Item 3.2.5)
- Mines and Unexploded Ordnance (Item 3.2.6).

**EXHIBIT 3-1
POTENTIAL IMPACTS AND MITIGATION**

The following summarizes standard environmental provisions incorporated in REFS road contracts. Depending on the nature of the work to be undertaken, not all provisions may be relevant to all projects.

ENVIRONMENTAL CRITERIA	POTENTIAL IMPACTS	Avoidance / Mitigation Action
1.0 PHYSICAL RESOURCES		
1.1 Topography & Land Forms	Cut & Fill and Borrow Pits	<p>Designs will balance all cut and fill activities within the construction site insofar as it is possible to do so. Provisions for the treatment of slopes to ensure stabilization are incorporated in the contract provisions.</p> <p>Requirements for fill may necessitate the use of borrow pits which may cause drainage and visual problems and present a potential for increased vector activity (e.g., water contamination). Provisions for the restoration of borrow pits to their former condition are incorporated in the contract provisions.</p>
	Quarry Operations	Only licensed quarrying operations are to be used; if licensed quarries are not available the Sub-Contractor will be responsible for setting up their dedicated crusher plants at approved quarry sites.
	Erosion/Scour	<p>Potential erosion impacts will be avoided by:</p> <ul style="list-style-type: none"> ▪ Lining spillage ways with riprap to prevent undercutting. ▪ Improvements in drainage structures ▪ Soils will be stabilized to reduce erosion. ▪ Storm drainage will be upgraded and drainage ways will be adequately sized, lined and contoured to minimize erosion potential. <p>Contract documents shall state that ditches are to be designed for the toe of slopes in cut sections with gutters or drainage chutes being employed to carry water down slopes to prevent erosion. Interceptor ditches shall be designed and constructed near the top of the back of slopes or on benches in the cut slopes as well as when there is a slope on adjacent ground toward the fill. When the roadway has a steep longitudinal slope, a drain is to be designed and constructed at the down-slope end of the cut to intercept longitudinal flow and carry it safely away from the fill slopes.</p>
1.2 Soils	Erosion/Scour	See 1.1 above.
	Contamination Due to Spills	<p>Fuel and chemical storage will 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.</p> <p>Filling and refueling shall be strictly controlled and subject to formal procedures.</p> <p>All valves and trigger guns shall be resistant to unauthorized interference and vandalism and be turned off and securely locked when not in use.</p> <p>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 contract specifications also require the preparation of an Emergency Response Plan to deal with accidents and emergencies, including environmental/public health emergencies associated with hazardous material spills and similar events.</p>
1.3 Seismic & Geological Characteristics	Demand for Quarried Materials	Only licensed quarrying operations are to be used; if licensed quarries are not available the Sub-Contractor will be responsible for setting up their dedicated crusher plants at approved quarry sites.
	Seismic Vulnerability	Earthquake Loading Design is specified for the Project.

1.4 Hydrology	Surface Hydrology	<p>No significant interruptions or diversions or flow are anticipated. No significant increase in water usage is anticipated.</p> <p>Potential impacts during the rehabilitation process will be mitigated through coordination with local land use planning authorities and local residents. Construction camps and other potential sources of secondary impacts must be properly sited and provided with drainage and wastewater facilities. During rehabilitation all projects works should impact as little as possible on the supply of water to the downstream irrigation system and subsequent agricultural lands. There will be no disruption to water supply during canal rehabilitation works, all waters shall be diverted to ensure constant supply.</p> <p>Rehabilitation activities should be timed so minimal disruption to agricultural areas is achieved. On embankment areas less than three meters in height and where surface runoff is low, ditches shall be placed adjacent to the toe. For higher fills (if any), the ditch shall be separated from the fill by a three-meter wide bench.</p> <p>Construction-related interference with the supply to, of abstraction from, of the pollution of, water resources is prohibited. The Sub-Contractor shall not discharge or deposit any matter arising from the execution of the Work into any waters except with the permission of the regulatory authorities concerned. Existing stream courses and drains must be kept safe and free from any debris and any materials.</p>
	Area Wetland	No wetlands of biological significance have been identified within the vicinity of the Project Road.
	Subsurface Hydrology	No impacts to subsurface hydrology are anticipated. The Sub-Contractor is required to prevent interference with the supply to, of abstraction from, or pollution of, water resources including underground percolating water..."
	Flood characteristics	No impacts resulting from flood conditions are anticipated. No mitigation actions required.
1.5 Air Quality & Climate	Rehabilitation Impacts	<p>Contract provisions shall state:</p> <ul style="list-style-type: none"> ▪ The Sub-Contractor will be required to spray road surfaces, excavation and construction sites. ▪ Trucks carrying earth, sand or stone will be covered with tarps. ▪ Contract provisions allow suspension of work in unfavorable condition. ▪ Machinery and equipment will be fitted with pollution control devices and checked at regular intervals. ▪ Open burning will be prohibited in populated areas.
1.6 Mines and Unexploded Ordnance	Uncontrolled Detonation	The Project has received a Certificate from the United Nations Mine Action Center that there are no mines/UXO at or near the site.
2.0 NATURAL/BIOLOGICAL RESOURCES		
2.1 Flora	Destruction of Habitat	The project is not anticipated to have significant negative impacts to flora within the vicinity of the Project Road.
2.3 Fauna	Destruction of Habitat	The project is not anticipated to have significant negative impacts to fauna within the vicinity of the Project Road.
2.3 Aquatic Habitat	Destruction of Habitat	The project is not anticipated to have significant negative impacts on natural habitats within the vicinity of the Project Road.
2.4 Protected Areas	Rehabilitation Impacts	The Project road is located more than 100km from the nearest protected area.
3.0 OTHER ENVIRONMENTAL CONCERNS NOTED BY 22 CFR 216		
3.1 Land Use and Development Policies and Controls	Potential PAPs Impacts	No impacts to project-affected persons (PAPs) as that term is generally defined by the international assistance community (i.e., persons whose livelihood is directly or indirectly affected by a project) have been identified. Adoption of guidelines attached as Appendix B are recommended in the event that such impacts emerge unexpectedly.
	Rehabilitation Impacts	Coordination with local land use planning authorities is required. Construction camps and other potential sources of secondary impacts must be properly sited and provided with drainage and wastewater facilities.
	Operational Impacts	Impacts are expected to be minimal. No mitigation actions warranted.

3.2 Energy & Conservation	Exploitation of Energy Resources	Impacts are expected to be minimal. No mitigation actions warranted.
	Demand for Petroleum Products	Impacts are expected to be minimal. No mitigation actions warranted.
3.3 Use of Natural / Depletable Resources	Exploitation of Natural Resources	Impacts are expected to be minimal. No mitigation actions warranted.
	Demand for Construction Materials	Impacts are expected to be minimal. No mitigation actions warranted.
3.4 Urban Quality / Design of the Built Environment	Impacts to Roadside Structures and Activities	Impacts are expected to be minimal. No mitigation actions warranted.
3.5 Historic & Cultural Resources	Demolition or Damage Due to Rehabilitation	<p>There are several graveyards within close proximity to the Project Road. To avoid potential adverse impacts to these and other identified historic and cultural resources, the Project specifications will state that the Sub-Contractor shall:</p> <ul style="list-style-type: none"> ▪ Consult with provincial-level representatives of the Archaeological Committee under the Ministry of Information and Culture, obtain any necessary clearances in regard to historic and cultural resources prior, and provide written documentation of these consultations to the Contractor prior to the initiation of work. ▪ Protect sites of known antiquities, historic and cultural resources by the placement of suitable fencing and barriers; ▪ Adhere to accepted international practice and all applicable historic and cultural preservation requirements of the Government of Afghanistan, including all appropriate local government entities. <p>In the event of unanticipated discoveries of cultural or historic artifacts, the Sub-Contractor is obligated to shall take all necessary measures to protect the findings and shall notify the Contractor and provincial-level representatives of the Archaeological Committee and the Ministry of Information and Culture. 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.</p>
4.0 ADDITIONAL ENVIRONMENTAL CONCERNS RAISED BY SIMILAR PROJECTS		
4.1 Socio-Economic Considerations	Impacts are Deemed Beneficial	No mitigation actions warranted.
4.2 Public Health & Safety	Disease Transmission	The Sub-Contractor is required to provide basic emergency health facilities for workers.
	Access to Health Facilities	Access to health facilities will be improved by Project activities. No mitigation actions required.
	Contamination Due to Spills	See 1.4 above.
	Air and Noise Impacts	See 1.5 above.
4.3 Noise	Noise impacts to Sensitive Receptors	Impacts are not expected to significantly affect sensitive receptors within proximity to the Project Road. No mitigation actions required other than those specified on contract provisions.
4.4 Other Infrastructure Networks	Water Supply & WW Collection Networks	Impacts are expected to be minimal. No mitigation actions warranted.
	Irrigation Systems	Impacts are expected to be minimal. No mitigation actions warranted.

Item 3.3 (Natural/Biological Resources) - the natural/biological aspects of the potentially affected environment. These are discussed under the sub-headings of:

- Flora (Plant Species) (Item 3.3.1)
- Fauna (Wildlife) (Item 3.3.2);
- Protected Areas (Item 3.3.3); and
- Aquatic Habitat (Item 3.3.4).

In addition to these requirements, Paragraph 216.6 of the Procedures states that "... *Environmental Assessment(s) should include discussions of possible conflicts between the proposed action and land use plans policies and controls for the areas concerned; energy requirements and conservation potential of various alternatives and mitigation measures; natural or depletable resource requirements and conservation potential of various requirements and mitigation measures; urban quality; historic and cultural resources; design of the built environment; reuse and conservation potential of various alternatives and mitigation measures; and means to mitigate adverse environmental impacts*". Accordingly, these issues are addressed under the following heading and subheadings:

Item 3.4 (Other Environmental Concerns Noted by 22 CFR 216) describes these aspects of the environment under the following sub-headings:

- Land Use and Development Policies & Controls (3.4.1)
 - Energy & Conservation (3.4.2)
 - Use of Natural/Depletable Resources (3.4.3)
 - Urban Quality/Design of the Built Environment (3.4.4)
 - Historic and Cultural Resources (3.4.5)
- **Additional Considerations Generally Associated with Rehabilitation Projects.** Additional environmental issues are generally associated with rehabilitation projects and are addressed as:

Item 3.5 (Additional Environmental Concerns Noted for Consideration). These are discussed under the sub-headings of:

- Socio-Economic Considerations (Item 3.5.1);
- Public Health and Safety (Item 3.5.2),
- Gender and Disabled Persons Issues (Item 3.5.3),
- Noise (Item 3.5.4) and
- Other Infrastructure Networks (Item 3.5.5).

Definition of the Project Area. The potentially impacted area of a given project (generally referred to as the Project Area) is defined by the nature of the proposed action and the sensitivity and circumstances of the environment in which it will occur.

Potential direct impacts of a project such as the Jalalabad - Asmar Road will be largely confined to the Project's construction limits and immediately adjacent environs. The conceptual limits of the Project Area must be expanded, however, to include the potential impacts of network improvements and other indirect and cumulative impacts in accordance with the circumstances of the particular environmental characteristic under discussion.

If an action affects an area stream, for example, any significant down-stream impacts must be taken into account – even if they occur in distant locations. The boundaries of the project area must, therefore be conceptually adjusted to take such potential circumstances into account. Generally, however, given the limited nature of the actions included in the Project the potential for direct impact is contained within the immediate environs of the Project Road.

Types of Impacts Considered. Environmental consequences resulting from the impacts of rehabilitation projects include:

- Direct Impacts - i.e., those directly due to the Project itself such as the conversion of land previously used for agriculture. Direct impacts also include the impact of rehabilitation expenditures in the local economy.
- Indirect Impacts - i.e., those resulting from activities prompted by the Project, but not directly attributable to it. The use of rock or crushed brick for project works, for example, has an indirect impact of increasing the demand for these materials.
- Cumulative Impacts - i.e., impacts in conjunction with other activities.

Impacts in all three categories may be either:

- Short-term – i.e., impacts which occur during rehabilitation and affect land use, air quality and other factors. Many of these impacts, however, will be short-lived and without long-lasting effects. Even the effects of some relatively significant impacts may be eventually erased if appropriate mitigation actions are taken. Many potential short-term negative impacts can be avoided or otherwise mitigated through proper engineering designs and by requiring Sub-Contractors to apply environmentally appropriate construction methods. Or;
- Long-term – Long-term negative impacts can result from the loss of agricultural land to other land uses; air and water pollution and haphazard growth.

Both short-term and long-term impacts may be either beneficial or adverse. Short-term positive impacts will include, for example, the generation of employment opportunities during the rehabilitation period. Long-term benefits will include enhanced development opportunities and economic growth.

Determination of the Scope & Significance of Issues. To determine the scope and significance of issues to be analyzed, including direct and indirect effects of the Project on the environment, the following examines each environmental criterion identified above and presents:

- Existing Conditions. The current statement of existing conditions is drawn primarily from site observations in 2005.
- Potential Impacts and Avoidance/Mitigation Measures. Potential impacts and measures incorporated in the Project to avoid or otherwise mitigate the potential impacts are identified. These include measures incorporated in contracting procedures and the Project design. Cognizance of the Project's design and contracting provisions is deemed to be an important means of "*narrowing the discussion of these issues to a brief presentation of why they will not have a significant impact on the environment*" in accordance with the 22 CFR 216 Procedures.
- Additional Recommendations. The examination also identifies the issues for which

mitigation beyond that already incorporated in the Project design and standard contracting procedures are considered warranted, including recommendations beyond the scope of the Jalalabad - Asmar Road Rehabilitation Project, but within the scope of REFS.

3.2 PHYSICAL RESOURCES

3.2.1 Topography

Existing Conditions. Afghanistan's topography is dominated by Hindu Kush Mountains which run northeast to southwest through the central portion of the country dividing the northern provinces from the remainder of the country. The southwest is occupied by desert plateau. The lowest point in the country is at Amu Darya at 258 meters above mean sea level (msl). The highest point is at Nowshak 7,485 meters above msl. The southern and western parts of the country are covered by deserts at elevations ranging from 500 to 1,000 meters above msl.¹

The Project Road traverses the valley of the Kunar River from Jalalabad to Asmar. The road elevation ranges from 570 m above msl in Jalalabad to 869 m above msl in Asmar. The road is located on the northern side of the valley and is bounded by the Kunar River immediately to the south and by the foothills of the Hindu Kush to the north. Further south lay the horns of the Safed Koh mountain range which borders the neighboring North-West Frontier Province of Pakistan. Peaks reach more than 4,000 meters msl towards Asmar. The Project Road itself, where possible, traverses the valley floor rising up to 50 meters above the river line at various points, **Exhibits 3.2 and 3.3** illustrate this point. Some embankment works will be required in areas close to drainage ditches and areas prone to localized flooding, however, such embankments will not be greater than 2 meters in height. **Exhibit 3.4** illustrates the topography of the Project Road.



Exhibit 3.2. Flat section of the Project Road (KM40)

Potential Impacts and Planned Avoidance/Mitigation Actions. Potential impacts to topographic conditions of road projects are generally associated with:

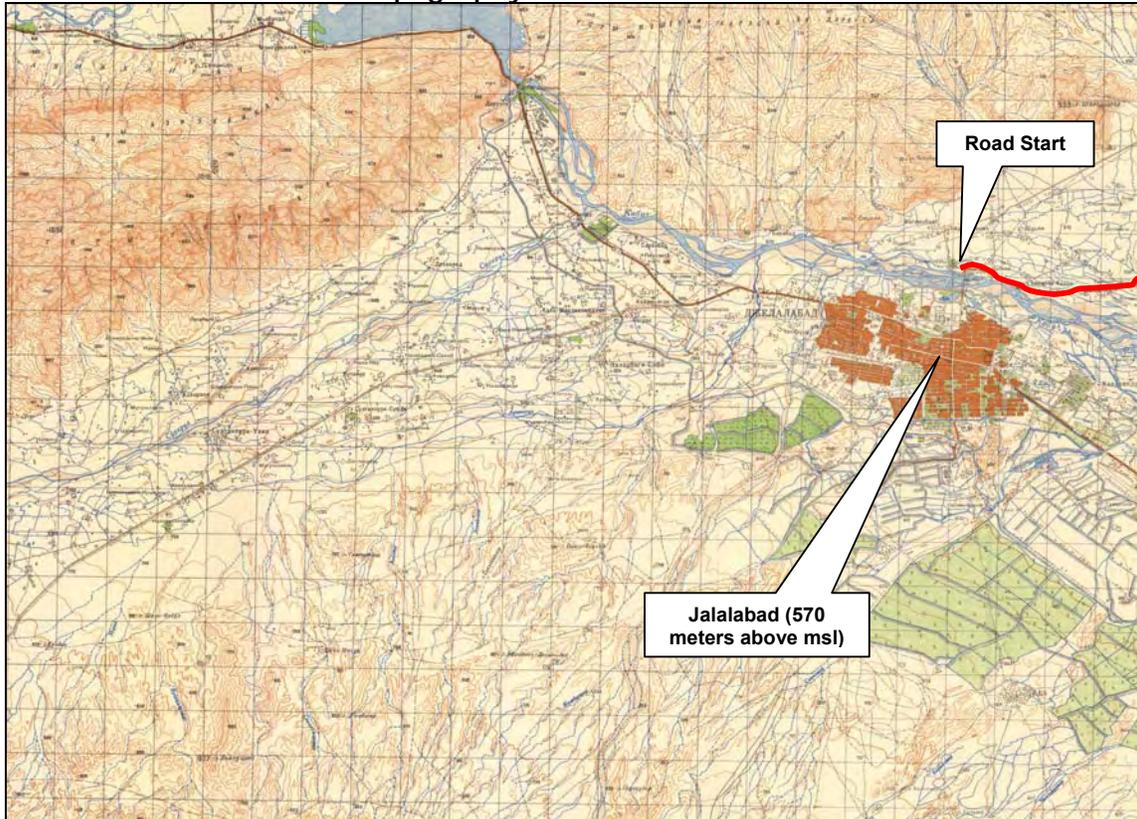
- **Cut and Fill.** Cut activity will be necessary associated with repair works to shoulders and culverts. To avoid adverse impacts due to these activities the Conditions of Particular Application (COPA) portion of the Conditions of Contract include provisions to ensure:
 - Selection of less erodable material, placement of gabions and riprap and good compaction, particularly around bridges and culverts.
 - Stabilization of embankment slopes as warranted.

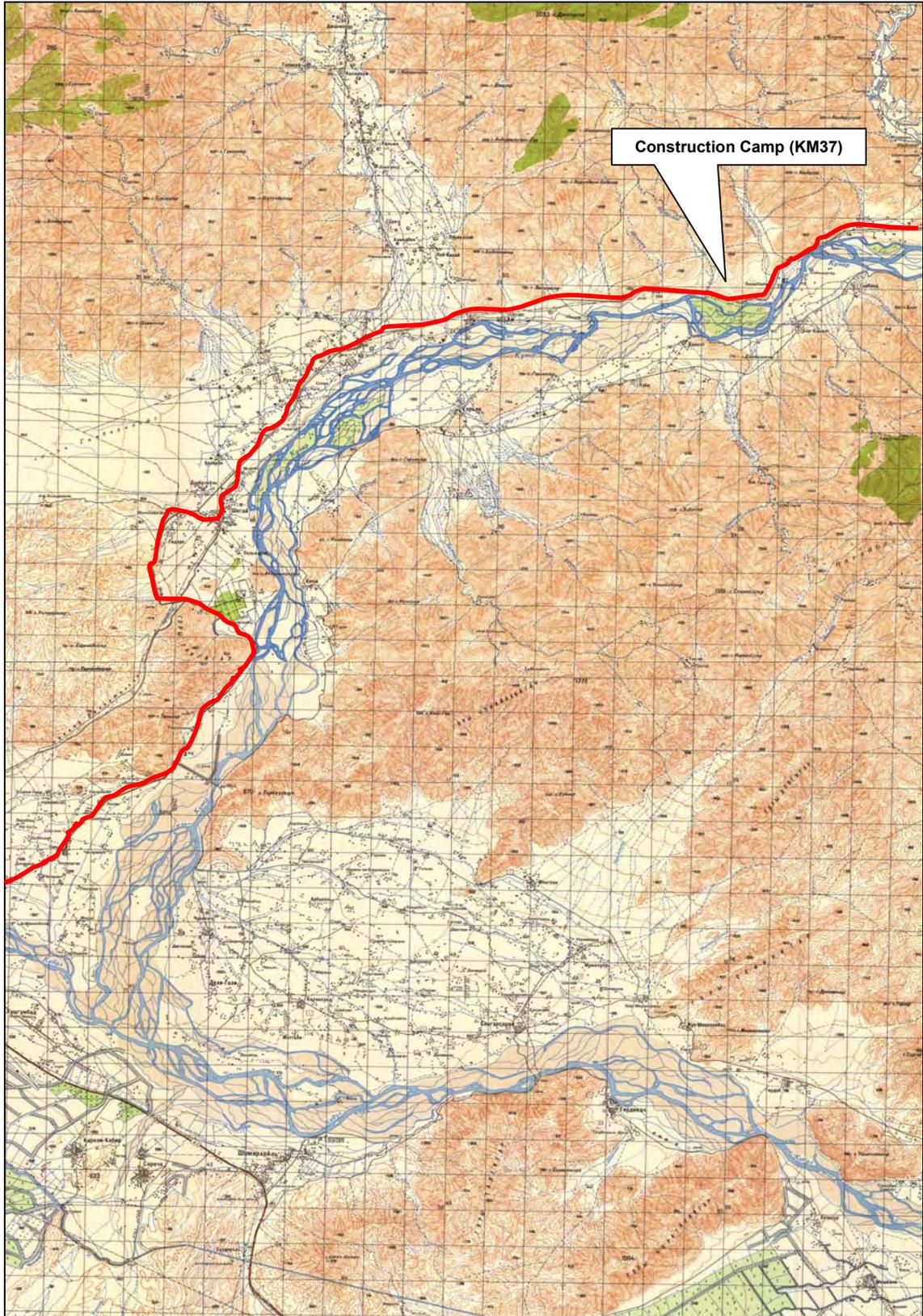


Exhibit 3.3. Road traversing the hillside (KM115)

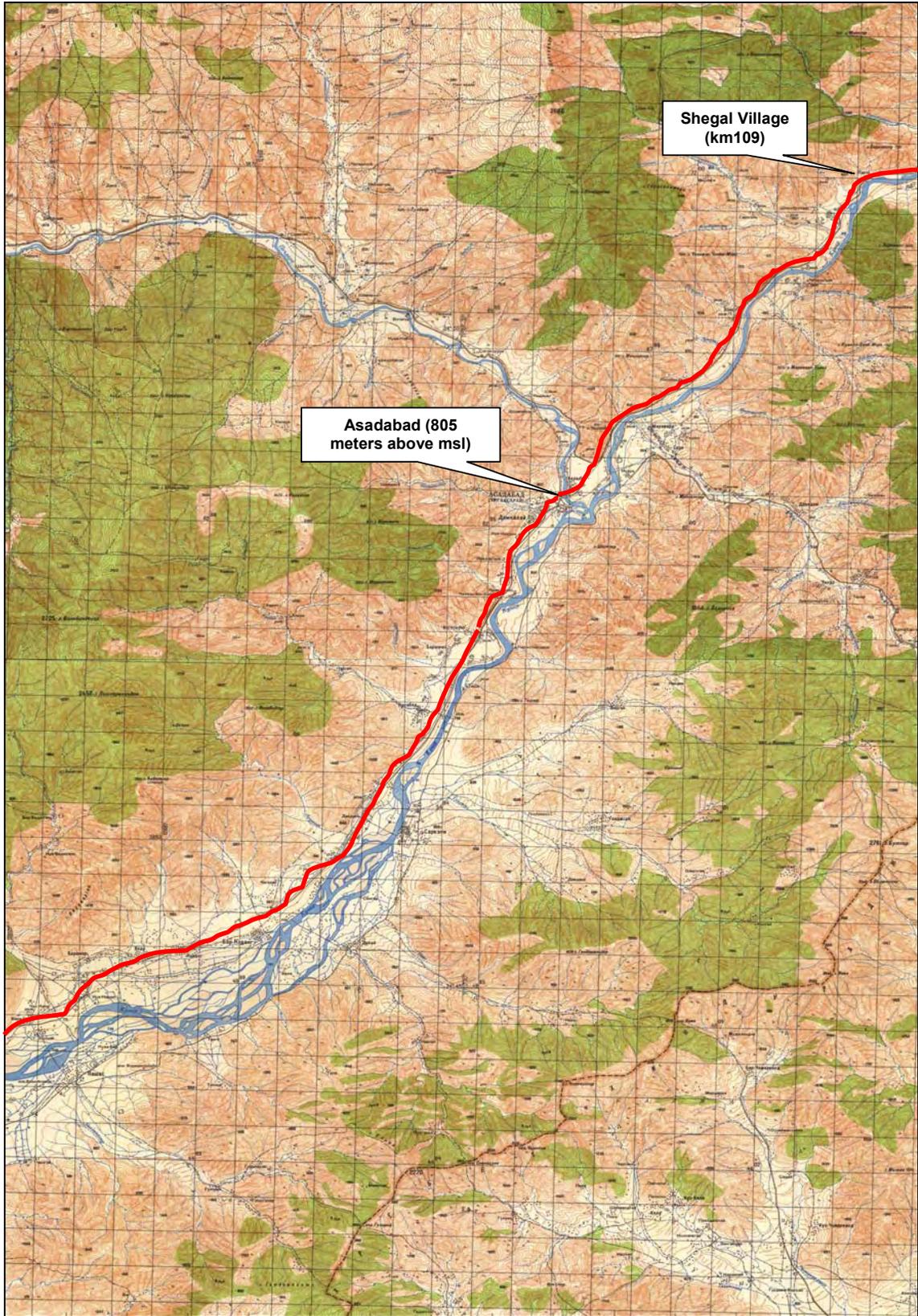
- Completion of discharge zones from drainage structures with riprap to reduce erosion when required.
- Down drains/chutes lined with rip-rap/masonry or concrete to prevent erosion.
- Side slopes adjusted in the range based on soil and other conditions as specified by the Project Specifications to reduce erosion potential.

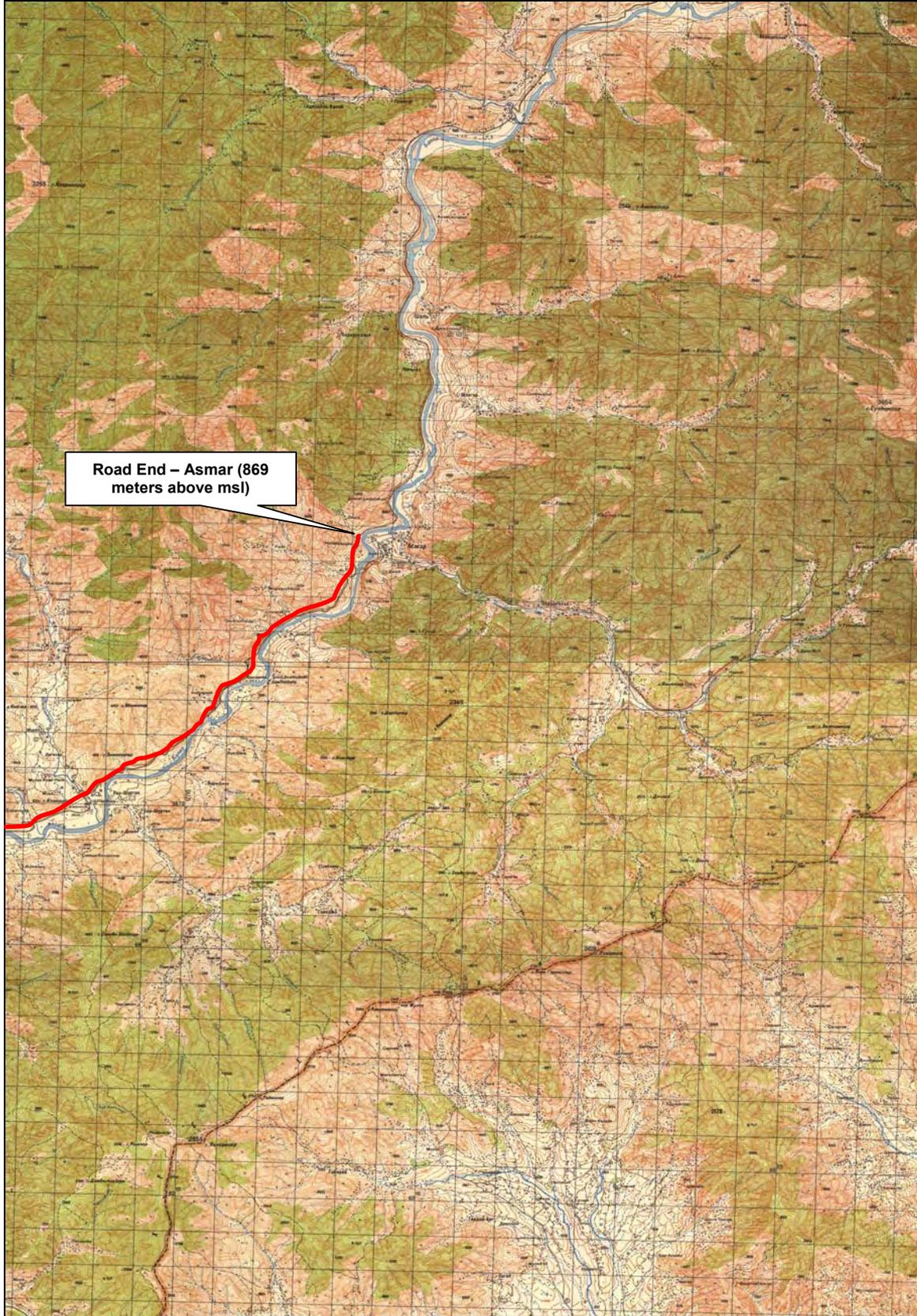
Exhibit 3-4. Topography of the Jalalabad - Asmar Road











- Quarry Operations. Crushed rock will be needed for construction purposes. Considerable changes in this aspect of the topography could result from quarry operations. To ensure adequate mitigation of potential adverse impacts, contract documents will specify only licensed quarrying operations are to be used for material sources.
- Borrow Pit Excavations. Embankments and other requirements for fill may necessitate the use of borrow pits in some areas. Unless properly controlled, borrow pits cause drainage and visual problems and present a potential for increased vector activity (e.g., water contamination). When water-filled, they also attract livestock to the roadway thereby slowing of traffic flow and creating safety hazards. Accordingly Contract documents will specify that:
 - 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 USAID General Contractor (USAID/GC) 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.
 - Topsoil from borrow pit areas will be saved and reused in re-vegetating the pits to the satisfaction of the USAID/GC.
 - Additional borrow pits will not be opened without the restoration of those areas no longer in use.

Erosion and Scour. Certain types of road improvements (e.g., road widening) could result increased runoff and/or increased velocities which could lead to additional soil loss. In this instance, however, virtually all rehabilitation activities will be confined to the existing ROW and no significant increase in the amount of impervious surfaces and/or the quantity or velocity of run off is anticipated.

Potential erosion impacts will be avoided by lining spillage ways with riprap to prevent undercutting. Drains will be provided at points where surface flows currently overtop the road, depositing soil and debris of the existing pavement, thereby creating serious hazards to traffic after storms. Improvements in drainage structures will better contain the intermittent flows to existing drainage ways and reduce sheet erosion which may occur when the road is overtopped by flash flooding. Soils will be stabilized to reduce erosion. As detailed in the hydrology discussion below, storm drainage will be upgraded and drainage ways will be adequately sized, lined and contoured to minimize erosion potential. Contract documents also state that ditches are to be designed for the toe of slopes in cut sections with gutters or drainage chutes being employed to carry water down slopes to prevent erosion. Interceptor ditches shall be designed and constructed near the top of the back of slopes or on benches in the cut slopes as well as when there is a slope on adjacent ground toward the fill. When the roadway has a steep longitudinal slope, a drain is to be designed and constructed at the down-slope end of the cut to intercept longitudinal flow and carry it safely away from the fill slopes.

Additional Recommendations. None warranted.

3.2.2 Soils

Existing Conditions. Within the country as a whole, the soils are characterized as high mountains serozems, desert steppe or meadow steppe. Loess is found in the north. The river valley soils are generally alluvial or meadow alluvial. Serozems and brown desert soils cover large portions of the country in the north and southwest.² Overgrazing, deforestation, desertification, degradation of watersheds and erosion have been identified as significant environmental issues contributing to soil degradation and reduced soil productivity throughout Afghanistan. Land degradation has also been caused by land mines, which reduce access to agricultural land and irrigation.

Soils in the Kunar valley comprise sand, river gravels, loam and sandy loam and are underlain by rock. The lowlands in the Kunar Valley benefit from a semi-tropical climate and have the highest proportion of intensively irrigated, high yield land in the country. The riverine farms situated along the valley floors produce a range of crops throughout the year. Double cropping is the rule rather than the exception, and triple cropping is noted in areas offering 365 growing days per year. Semi-tropical crops such as citrus, sugar cane and henna are produced around Jalalabad.³

Potential Impacts & Planned Avoidance/Mitigation Actions. Impacts to soils generally associated with road rehabilitation projects such as Jalalabad - Asmar Road include:

- Loss of Soil for Agricultural Production. Although this potential impact is noted as a possibility, in this instance, however, virtually all rehabilitation activities will be confined to the existing ROW and little or no loss of agricultural land due to road widening or re-alignments will occur.
- Erosion & Scour. See **Item 3.2.1** above.
- Conversion of Agricultural Soils Due to Indirect/Induced Impacts. Although the contract documents will contain provisions controlling direct impacts of land takings for both the road and ancillary functions (asphalt plants, construction camps, etc.), control of the induced impacts is largely beyond the scope of the Project and will require actions as part of Component 2 of the Afghanistan REFS Program (Institutional Strengthening).
- Contamination Due to Spills or Hazardous Materials. Provisions for the control of hazardous materials and actions to be taken in the event of accidental spills are incorporated in contract to avoid adverse impacts due to improper fuel and chemical storage as follows:
 - 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.
 - 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.

The contract specifications also require the preparation of an Emergency Response Plan to deal with accidents and emergencies, including environmental/public health emergencies associated with hazardous material spills and similar events.

Additional Recommendations. None warranted.

3.2.3 Seismic & Geological Characteristics

Existing Conditions.⁴ Afghanistan's geological circumstances are 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 upwellings in the mantle. The mountain chains comprised of 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 which began approximately 50 million years ago and continues to the present day. Much of the country is known to be seismically active.

There is a history of damaging earthquakes that are most frequent in the northeast of Afghanistan. The entire length of the Project Road is potentially prone to earthquakes up to 7.3 on the Richter scale.

Potential Impacts & Planned Avoidance/Mitigation Actions. Potential adverse consequences of seismic events in the construction and operational phases could be exacerbated or lessened as a result of the rehabilitation of bridges and other structures. Geological resources could be affected due to Project-induced demand for resources such as rock, sand and building materials. Given Afghanistan's circumstances, the Project-induced demand is unlikely to cause or contribute significantly to their depletion. Specific sources used for road upgrading materials will depend upon the location of the segment being upgraded. Existing sources in active operation are expected to be used in most cases although Sub-Contractors may elect to use other supply options provided they are cost competitive and provide rock meeting established quality standards.

The seismic and geological characteristics of the potentially affected area have been taken into account. Actions to ensure the use of proper sources of rock have been noted above (Item 3.2.1) to the degree warranted by the rehabilitation nature of the Project. Other than the actions as noted and adherence to good engineering practice, no mitigation actions related geological and seismic characteristics are warranted.

Additional Recommendations. None warranted.

3.2.4 Hydrology

The sources of most of Afghanistan's rivers are in the mountains. Water levels in the rivers vary greatly with the highest levels in spring and early summer. In the remaining seasons the rivers may change into small streams or entirely disappear. Five river basins can be differentiated in Afghanistan:

- The Kabul Basin (Indus). The Kabul Basin includes the Kabul and Logar Rivers and their tributaries which drain the eastern part of the country. The rivers within the eastern basin flow generally to the east and eventually join the Indus River and the Arabian Sea. The Project Road is located within this basin.
- The Hilmand Basin. The rivers of the Hilmand Basin flow generally to the southwest to the Lake of Sistan on the Afghanistan-Iran border and include the Helmand, the country's longest river, the Farah and the Khash.

- The Northern Basin. The rivers in the northern part of the country flow northward to the Amu Darya River on the country's northern boundary (and eventually to the Aral Sea) or disappear in the desert sands.
- The Amu Darya Basin. The Amu Darya basin has its headwater in the High Pamir Mountains of Afghanistan and Tajikistan. The Basin covers 14% of the national territory but drains more than 57% of the total annual water flow of Afghanistan. Therefore the basin has great hydropower potential that is largely unused.
- The Harirod – Murghab. The Harirod – Murghab river basin contributes a tiny 4 percent of the total flow of Afghanistan. The main rivers are the Hari, which takes its source from the western slope of the Koh-i-Baba Mountains in the central highlands and the Murghab, which comes from the Tir Band-I Mountains.

The following table summarizes the key features of each basin:

	Amu Darya	Harirod-Murghab	Hilmand	Kabul	Northern
Area (km²)	90,692	77,604	262,341	76,908	70,901
Settled Population	2,968,122	1,722,275	5,887,571	7,184,974	2,783,033
Population Density	33	22	22	93	39
Water Bodies	62	13	2,271	25	33
Marshlands	678	127	2,284	264	205
Irrigated Land	3,540	1,725	4,758	3,060	2,378
Rain fed Land	13,156	9,371	2,344	1,554	18,747
Rangeland	56,643	52,481	113,258	37,152	32,148
Forest Cover	648	99	114	12,141	64

As stated above, the Project Road is located within the Kabul (Indus) Basin. The Kabul basin includes all Afghan rivers that join the Indus River in Pakistan which eventually empty into the Arabian Sea of the Indian Ocean. The basin covers 12% of the national territory, but alone it drains 26% of the total annual water flow of Afghanistan. As such, the basin has major hydropower potential which is already partly developed including the Darunta Dam and the Bandi Naghlu Dam.

The Kabul basin is divided into eight main watersheds:

- Kabul
- Chak wa Logar Rod
- Ghorband wa Panjshir
- Alingar
- Kunar
- Shamal
- Gomal
- Pishin Lora

The Kunar watershed drains water from the Karakoram range south of the Wakhan corridor in Pakistan and from the southern slopes of the Hindu Kush in Nuristan Province. The Kunar

River (see **Exhibit 3-5**) takes its source from glaciers in the region of the Taraj Mir Mountains (7,750m above msl) and bears the name of the Yarkhun River, which in turn becomes the Chitral River once it enters the Chitral Valley in Pakistan. These high mountains bear glaciers that maintain or increase river flow during the summer. The Yakhurn / Chitral takes the name Kunar River when it crosses the border into Afghanistan in Nari District of



Exhibit 3-5. Kunar River

Kunar Province. The Kunar has two main tributaries, the Bashgal and the Pech which are sourced from the Hindu Kush. In Nangahar Province, just after the gorge of Tangi Tokchi, the Kunar River forms a delta and irrigates the agricultural land of Kama on the left bank and Jalalabad districts on the right bank. The Kunar watershed ends when the Kunar River joins the Kabul River east of Jalalabad Town. Peak discharge periods are between June and August when discharge can reach 1200cubic meters per second.⁵

The watershed is roughly dominated by natural forests (38%), rangeland (24%) and permanent snow (18%). Irrigated land is found in narrow strips on valley floors and represents 3.2% of the total surface of the watershed. The following table summarizes the main characteristics of the watershed:

Kunar watershed	
Main River Name	Kunar
Area (km ²)	11664
Settled Population	600237
Population Density (per km ²)	51
Water Bodies (km ²)	1.2
Marshlands (km ²)	48.3
Irrigated Land (km ²)	178
Rain fed Land (km ²)	573
Rangeland (km ²)	2775
Forest Cover (km ²)	5081

The Project Road follows the left bank of the river for its entire length. Several causeways are located along the middle section of the Project Road. They will require rehabilitation to prevent the road becoming blocked by debris during the late spring / summer melt in the mountains.

Potential Impacts and Planned Avoidance/Mitigation Actions. Potential impacts due to rehabilitation could include impacts to:

- **Surface Hydrology.** Surface hydrological impacts could occur to the Kunar River during the construction period due to erosion and construction activities. Potential adverse impacts to surface hydrology in the rehabilitation phase of the Project will be avoided through the enforcement of contract provisions and oversight by the USAID/GC. Drainage provisions and other aspects of the Project are not expected to alter the current status of natural water bodies and irrigation structures. In addition to adherence to good engineering and construction practices and the enforcement of contract

provisions related to drainage during both the rehabilitation and operational stages of the Project Sub-Contractors will be obligated to coordinate with local land use planning authorities. Contract provisions will ensure that construction camps and other potential sources of secondary impacts are properly sited and provided with drainage and wastewater facilities. On embankment areas less than three meters in height and where surface runoff is low, ditches shall be placed adjacent to the toe. For higher fills (if any), the ditch shall be separated from the fill by a three-meter wide bench. (Note: wetland issues are separately discussed below.)

- Wetlands. Consideration to impacts upon wetlands is given under **Item 3.3.3** below.
- Subsurface Hydrology. No impacts to groundwater resources are anticipated as a result of the proposed actions in the corridor in either the construction or operational phases of the Project. 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. As a contingency, however, the COPA portion of the Conditions of Contract specifically provide that "*The Sub-Contractor shall prevent interference with the supply to, of abstraction from, or the pollution of, water resourcesincluding underground percolating water...*"
- Flood and Inundation Characteristics. Increased runoff in the both the construction and operational phases of the Project could result in adverse flood conditions. Raising the road formation level in flood-prone areas without installing culverts or other cross drainage structures to allow floodwaters to equilibrate and pass freely could result in adverse impacts. Local flooding conditions could be aggravated both by prolonging the flood period and by heightening the flood level on the upstream side of the road. Road designs have incorporated appropriate levels of drainage to prevent localized flood impacts. In addition, project works will rehabilitate culverts on the Project Road thus improving drainage in the Project Area.

Additional Recommendations. None warranted.

3.2.5 Air Quality and Climate

Existing Conditions. The climate of Afghanistan is continental in nature, with cold winters and hot summers. Most of the country is arid or semi arid, with low amounts of precipitation and high variability between years.

The mean daily temperatures within the Project Road Corridor can range from a minimum of 8°C in January to a maximum of 40°C in July. Mean monthly temperature in Jalalabad is 21°C. Mean monthly precipitation in Jalalabad varies from 5-6mm in summer to 30-40 mm in spring. Annual precipitation ranges from 200-400 mm in Jalalabad.

Climatic and soil conditions of the Project Area are such, that it is likely to be subject to dust storms, particularly in the summer months, leading to higher levels of Suspended Particulate Matter (SPM). Generally, however, except for the effects of traffic, ambient air pollution levels outside of the urban areas are considered to be relatively low due to the low level of industrialization. No other unusual air quality or micro-climate conditions in the Project Area have come to light that may have significant repercussions to Project activities.

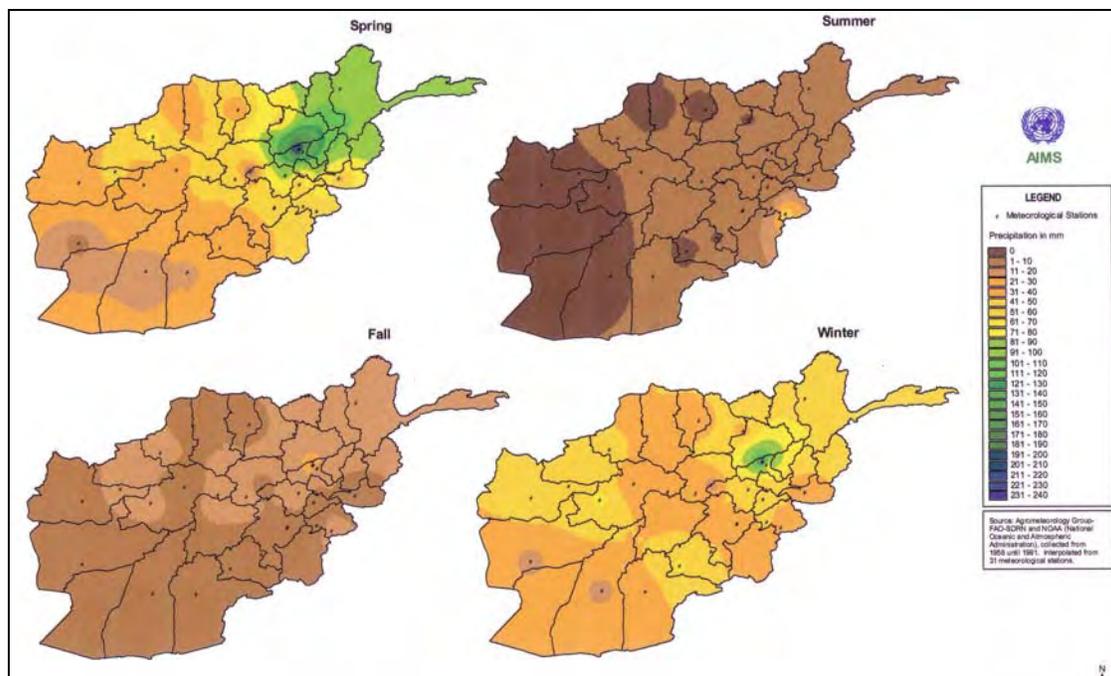


EXHIBIT 3-6. AVERAGE MONTHLY PRECIPITATION BY SEASON

Potential Impacts and Planned Avoidance/Mitigation Actions. Potential air quality impacts are can be hypothesized in both the rehabilitation and operational stages of the Project are as follows:

- Rehabilitation Stage. Minor impacts to local air quality during rehabilitation can be anticipated due to fugitive dust generation in and around rehabilitation activities and related activities. The generation of dust due to rehabilitation activities will be mitigated through avoidance strategies and monitoring. Contract documents will specify that:
 - Sub-Contractors will be required to spray excavation and rehabilitation sites to keep them moist for dust control.
 - Trucks carrying earth, sand or stone will be covered with tarps to avoid spilling.
 - Potential significant adverse impacts to adjacent residents or site employees during project works will be mitigated by either discontinuing until favorable conditions are restored, or, if warranted, sites may be watered to prevent dust generation.
 - Machinery and equipment will be fitted with pollution control devices, which will be checked at regular intervals to ensure that they are in working order. Best practical pollution control technologies will be required.
 - Open burning will be prohibited in populated areas and requirements for spraying and related dust control measures and the proper use of solvents and volatile materials will be in incorporated in the contract provisions.
 - Pre-construction monitoring of existing ambient air quality may be undertaken to provide a baseline for the measurement of air quality impacts during the rehabilitation period if considered warranted by the USAID/GC.
 - Routine air quality monitoring may also be required in areas of high potential impact (construction camps, etc) during the life of the Project if considered warranted by the USAID/GC.

Operational Stage. Once completed, the air quality impacts due to the proposed rehabilitation of the Jalalabad - Asmar Road will be overwhelmingly positive. Current severe

high levels of suspended particulate matter (SPM) in areas in which road conditions prompt traffic to use unpaved areas adjacent to the highway (e.g., in areas of bridge or road collapses) will be substantially reduced. Other air quality impacts due to increasing levels of vehicular traffic are most appropriately measured against a "base case" that estimates the likely ambient air quality without the project (but taking all other foreseeable changes into account) versus the most likely situation with the project. In this instance the proposed road improvement activities are unlikely to have any substantial impact due to diverted or generated traffic resulting from the improvement activities. Economic recovery in Afghanistan may lead to increased vehicular travel, and, if so, the improvements will facilitate the flow of the increased traffic - but will not have induced it. The foreseeable levels of traffic are unlikely to result in significant adverse impacts to air quality in the Project Area. Measured against a base case that takes economic growth and related factors into account, the net air quality impacts of the Project will lessen the additional pollutant emissions that would have resulted from use of poorly paved and unimproved roads. Improvements in road surface condition and traffic capacity will alleviate local congestion that might have otherwise occurred. It will improve traffic flow, thereby reducing engine idling and the resulting local air quality degradation. Improved vehicle performance on a new better road surface will serve to alleviate potential air pollution levels to a modest degree. The improvement activities will allow the traffic generated by the improved economic conditions to flow more smoothly and efficiently and will thus be beneficial.

3.2.6 Mines and Unexploded Ordnance

Existing Conditions. Special provisions have been made by USAID for the clearance of mines and UXO by the United Nations Mine Action Center (UNMAC).⁶ A certificate has been received from UNMAC that there are no mines or UXO in the Project Area.

Potential Impacts and Planned Avoidance/Mitigation Actions. None.

Additional Recommendations. None warranted.

3.3 NATURAL/BIOLOGICAL RESOURCES

3.3.1 Flora

Existing Conditions. Located at the confluence of two biogeographic realms – the Palaeoarctic and Indo-Malayan – Afghanistan has the unique distinction of being the original home of a very large number of plant and animal species, a majority of which are endemic. Afghanistan was renowned for its rich wildlife and with its diversity of habitats and still retains a wide variety of fauna. However, most of the country is subject to some degree of land degradation, notably that resulting from some 20 years of war, deforestation and desertification.

Kunar Province contains some of the best examples of flora within Afghanistan. Between 1,500 m and 2,500 m thick stands of Oak (*Quercus Baloot*) can be observed. Above this belt, up to 3,500 m lies a coniferous forest belt comprising Cedar (*Cedrus Deodara*), Spruce (*Picea smithiana*), fir (*Abies Spectabilis*), pine (*Pinus gerardiana*), Juniper (*Juniperus semiglobosa*) and Yew (*Taxus wallichiana*). Above the coniferous forests there is Alpine shrubland dominated by rhododendron (*Rhododendron colletianum*), dwarf juniper (*Juniperus Nana*), alpine heath and meadowland all of which provides excellent land for summer grazing. Within the lower valleys walnut (*Juglans regia*) and birch (*Betula*

Kunaresis) can be observed. However, the Forests of eastern Afghanistan and Kunar in particular are currently under threat from deforestation. **Exhibit 3-7** illustrates the forest cover in 1977 and 2002 within the three provinces of Nangahar, Kunar and Nuristan. As can be seen forest cover had decreased dramatically during the 25 year period (note that the Project Road corridor is generally void of forest cover in both years). The reasons for the depletion of the forest resources are numerous, as such the reader is referred to the Country Environmental Assessment prepared by the UNEP for further details.

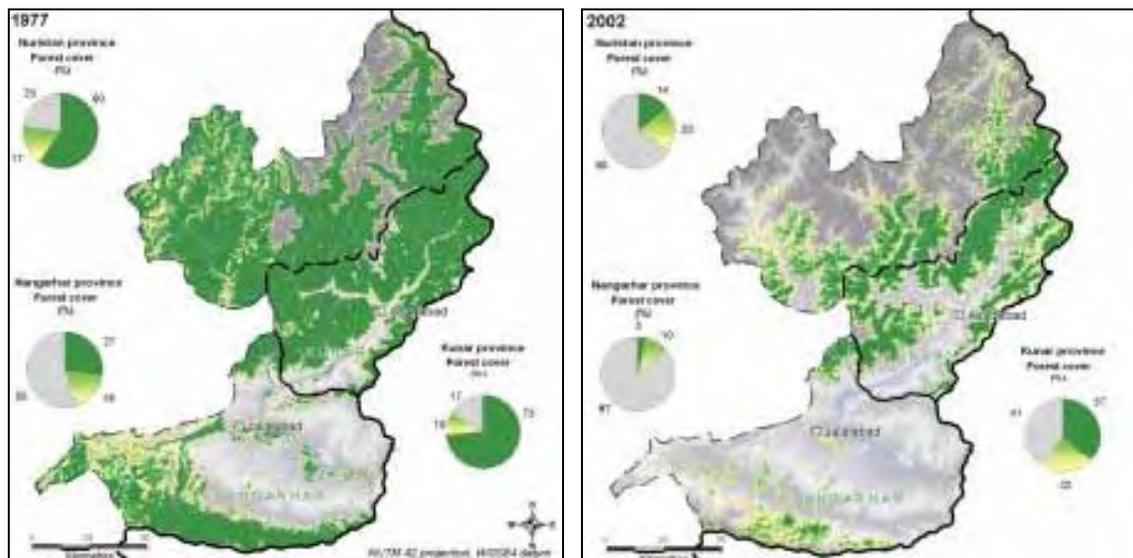


Exhibit 3-7. Eastern Afghanistan Forest Cover, 1977 & 2002

Deforestation has been occurring at a depressingly regular rate during the past 30 years and it is likely to continue whilst these resources continue to be unprotected. A roadside wood market was observed adjacent to the Project Road in Asadabad (see **Exhibit 3-8**). It is likely that the wood was harvested from the mountain slopes of Kunar and that such logging is uncontrolled and unsustainable. The rehabilitated road may indirectly increase access to these vulnerable areas and may also indirectly induce development pressures in the region. Accordingly, the need to develop appropriate management systems to protect these fragile resources is of the up most importance.

Further towards Jalalabad the land within the immediate vicinity of the Project Road becomes dominated by agricultural processes. However, one or two areas of flora deserve mention. The first is the NGO run agriculture program located a few kilometers south of Asadabad (see **Exhibit 3-9**). A small area has been set aside adjacent to the road and contains a beautifully kept nursery comprising a variety of fruit trees, vegetables and flowers. The nursery grows fruit tree saplings which are then distributed into the community enabling fruit growing to become further established within the region.

Approximately 18km from Jalalabad an area of pine forest sits within the fertile agricultural delta of the Kunar River (see **Exhibits 3-10 & 3-11**). The pine forest, which is bisected by the Project Road, provides shade and an excellent area for travelers to stop and picnic. In fact the valley provides some excellent vistas and would make an excellent location for tourists wishing to travel to northern Pakistan from Kabul. Unfortunately the security situation in the region limits such activities and looks likely to for the foreseeable future.



Exhibit 3-8. Wood Market in Asadabad.



Exhibit 3-9. NGO Funded Agriculture Program (KM88)



Exhibit 3-10. Pine Forest (KM18)



Exhibit 3-11. Pine Forest (KM19)

As mentioned above, areas within or adjacent to the ROW have been heavily disturbed by human activities and are highly unlikely to provide habitat for rare or endangered plant species.

Potential Impacts and Planned Avoidance/Mitigation Actions. In general construction activities will impact only a narrow band of vegetation adjacent to the existing highway none of which is of ecological significance. Most of this vegetation takes the form of agricultural produce and is unlikely to be significantly affected by project works. However, any changes to the roads alignment may trigger compensation claims by Project Affected Persons (PAPs). Compensation issues are discussed in more detail under **Item 3.4.1** below. In some instances there may be the need to cut some mature roadside trees, however the tree felling is unlikely to occur in significant numbers or considerably alter vistas or affect wildlife habitat. Flora could also be affected by the improper locations of roadside activities such as asphalt plants, construction camps and other ancillary features. Impacts to plant life during construction will be mitigated through the appropriate construction supervision activities to ensure that ancillary features are properly sited.

Additional Recommendations. Given the lack of environmental protection in this part of Afghanistan it is recommended that NEPA develop a forest protection program to promote sustainable forestry within the provinces of Nangahar, Kunar and Nuristan.

3.3.2 Fauna

Existing Conditions. Afghanistan is home to 119 species of mammals, 460 species of birds, four species of reptiles, and hundreds of species of insects and fish⁷. Thirty five species of animals have been listed as either vulnerable or endangered on the ICUN Red List, however, the number of threatened species may be higher as essentially no wildlife research has been undertaken in Afghanistan for many years.

Consultation with local residents revealed that the most prominent animal species within the vicinity of the Project Road were fox, wolf, and rabbit. The surrounding mountains possess rich fauna including snow leopard, markhor, ibex, Himalayan black bear and two species of flying squirrel. Rehabilitation of the Project Road may indirectly increase access to the habitats of these species.

Potential Impacts and Planned Avoidance/Mitigation Actions. The Project Road area has been heavily disturbed by human activity, as such the only fauna of note within its immediate vicinity are fox, wolf and rabbit. Rehabilitation of the road may induce secondary impacts such as increasing access to sensitive habitats in the mountains. However, such impacts are likely to be fairly limited, and are not anticipated to result in significant changes to wildlife populations etc.

Additional Recommendations. Protection of rare and endangered species in Afghanistan is practically negligible. Attempts are being made to rectify this issue through various NGOs and international organizations such as UNEP. Project activities may indirectly induce small scale exploitation of these areas and as such it is considered prudent that the Government of Afghanistan, through NEPA, seek to fast track programs to protect these regions from harm caused by poachers.

3.3.3 Protected Areas

Existing Conditions. Six protected areas have been identified in the country. They are described below and indicated by **Exhibit 3-12**.

- **Ab-I-Estada Waterfowl Sanctuary.** Established in 1977, Ab-I-Estada Waterfowl Sanctuary (27,000 hectares) is located in conjunction with *Istadeh-ye Mogor*, a large lake north of the town of Nawah. The sanctuary is more than 200 kilometers from the Project Road.
- **Ajar Valley Wildlife Reserve.** Established in 1978, the Ajar Valley Wildlife Reserve (40,000 hectares) is a former royal hunting ground located in Bamyan Province in the central part of the country. The Reserve is more than 200 kilometers from the Project Road and will not be affected by project works.
- **Bande Amir National Park.** Established in 1973, the Bande Amir National Park (41,000 hectares) is also located in Bamyan Province near the Ajar Valley Wildlife Reserve in the central part of the country. The Park is located more than 200 kilometers from the Project Road and will not be affected by project works.
- **Dashte-Nawar Waterfowl Sanctuary.** Established in 1977, the Dashte-Nawar Waterfowl Sanctuary (7,500 hectares) is located in Ghazni Province. The sanctuary is located more than 200 kilometers from the Project Road.

- **Pamir Buzurg Wildlife Sanctuary.** Established in 1978, the Pamir Buzurg Wildlife Sanctuary (67,938 hectares) is located in the extreme northeastern part of the country in a separate watershed.
- **Kole Hashmat Khan Waterfowl Sanctuary (established 1973).** Established in 1973, the Kote Hashmat Khan Waterfowl Sanctuary (191 hectares) is a former royal hunting ground located south of Kabul.

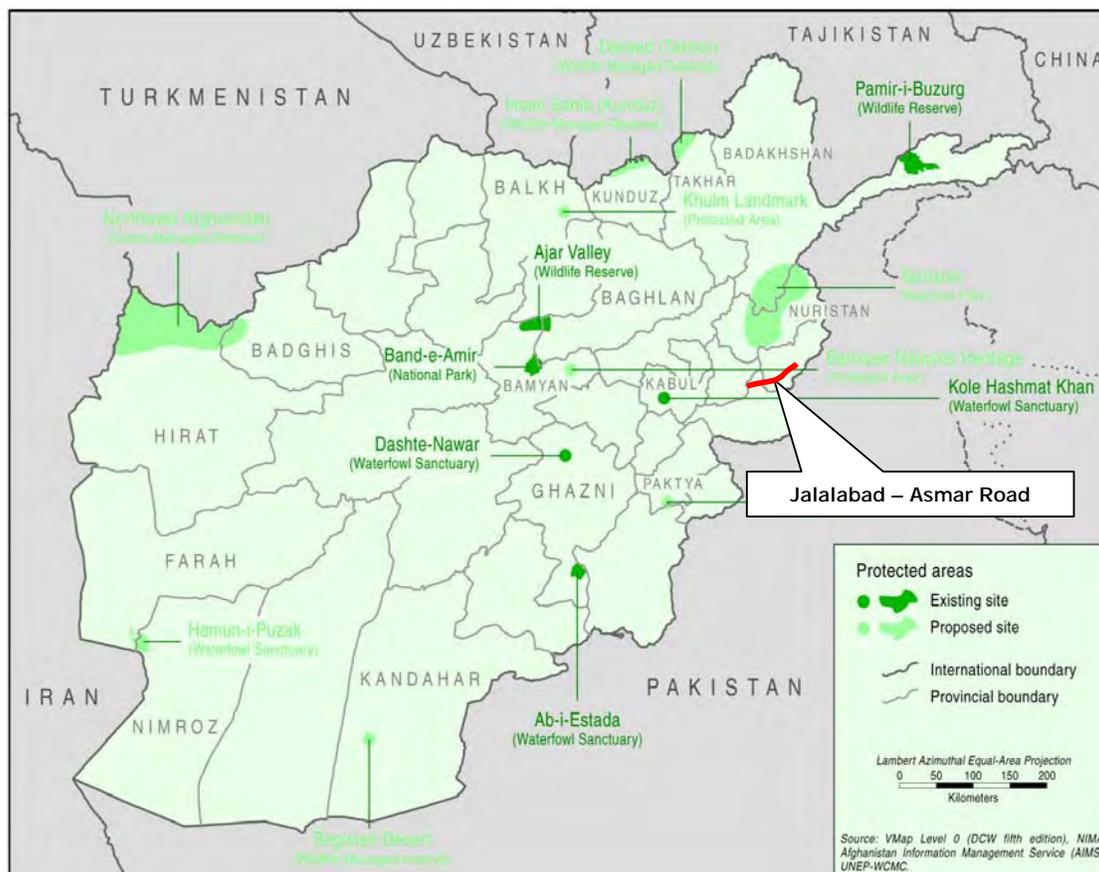


EXHIBIT 3-12. PROTECTED AREAS OF AFGHANISTAN

Potential Impacts and Planned Avoidance/Mitigation Actions. Given that the Project Road is located more than 150km from the nearest protected area the potential for impacts to such sites is negligible.

Additional Recommendations. None

3.3.4 Aquatic Environment

Existing Conditions. The fresh-water fish of Afghanistan have been little studied, but many are believed to be endemic. The total fish production in Afghanistan was estimated to be 1300 tons in 1995, but no concrete statistical data exist for the country for over 10 years. Therefore the true figure may be considerably different from the estimate.

None of the fish of the Kunar River are considered to be of biological significance.

Potential Impacts and Planned Avoidance/Mitigation Actions. Impacts to the aquatic environment are not likely to be significant. However, contract provisions regarding the siting of construction camps and the proper disposal of solid and liquid wastes should apply to prevent construction phase impacts to the aquatic environment.

Additional Recommendations. None warranted.

3.4 OTHER ENVIRONMENTAL CONCERNS NOTED BY 22 CFR 216

As noted in the introductory remarks, issues addressed in this section are discussed under the following headings:

- Land Use and Development Policies & Controls (3.4.1)
- Use of Natural/Depletable Resources (3.4.2)
- Urban Quality/Design of the Built Environment (3.4.3)
- Historic and Cultural Resources (3.4.4)
- Energy & Conservation (3.4.5)

3.4.1 Land Use and Development Policies & Controls

Existing Conditions. Land uses within the vicinity of the Project Area can be characterized as follows:

- Rangeland. As mentioned above the alpine heath and meadowland in the mountains provides excellent land for summer grazing and shepherds can often be observed with their flocks of sheep and herds of Goat across the mountainsides.

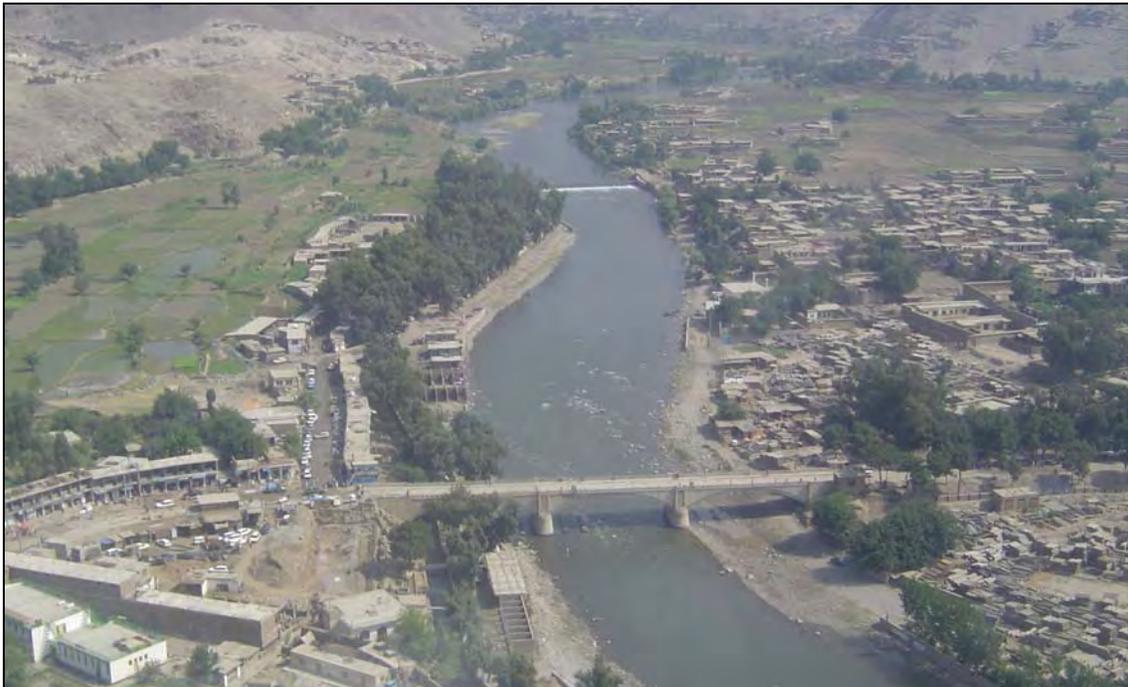


Exhibit 3-13. Asadabad.

- Urban. Several large urban areas are located within the Project area including Jalalabad

(163,600), Asadabad (107,000) and Asmar. Numerous small villages line the project route.

- Forests. Forest cover represents 39% of the total land area of the Kunar watershed. Within the vicinity of the project road forest cover is relatively sparse with most of the forest cover present higher up in the mountains. A discussion of potential impacts to these areas can be found under **Item 3.3.1.**
- Agricultural Land. The extensively irrigated lands adjacent to much of the Project Road are cultivated for a variety of crops. Towards Jalalabad the land is flat and fertile, towards Asmar the steeper valley slopes have been formed into terraces growing rice and wheat.

Land use and development policies and controls are largely within the purview of the Ministry of the Interior (MOI) as the agency responsible for municipal governance and oversight. No policies or controls have been identified which will impact upon the rehabilitation works.

Potential Impacts and Planned Avoidance/Mitigation Actions. Potential land use impacts vary between the rehabilitation and operational phases of the Project as follows:

- Potential PAPs / Compensation Issues. The assessment indicates that there is likely to be little if any impact to residences along the ROW as a result of the Proposed Action and as such the Project may not require the acquisition or use of lands, dislocation or other impacts of current land uses (e.g., significant interruptions of water availability) possibly creating "project-affected persons" or PAPs (as that term is generally defined by the international assistance community, i.e., persons whose livelihood is directly or indirectly affected by a project). Contingency provisions are recommended as indicated below, however, in the event that such impacts do occur due to circumstances currently unforeseen.
- Potential Impacts Due to Rehabilitation Activities. Potential impacts to land uses during the construction stage include:
 - Creation of Construction Camps. Construction workers camps constitute a temporary land use change and raise issues related to activities such as unauthorized tree felling to get fuel-wood even when alternative fuel is made available; poaching of edible animals and birds of the locality in spite of prohibitions; poor sanitation arrangement and improper methods used for disposal of solid wastes and effluent; and transmission of communicable diseases to the local people by the construction
 - Impacts of Traffic Disruptions and Detours on Existing Land Uses.

The Sub-Contractor will be required to coordinate all rehabilitation activities with neighboring land uses. Contracts for the Project activities will also require construction operators to attend to the health and safety of their workers, maintain and cleanup campsites, and respect the rights of local landowners.

- Operational Phase. Once the project works are completed no changes of neighboring land uses are expected. The viability and productivity of existing agricultural uses will be enhanced.

Additional Recommendations. To provide for the possibility of unforeseen impacts to PAPs, it is recommended that the bid and contract documents specify that lands required for the improvements are free of any squatters, encroachers or other claims and that such documentation will be required from the Government of Afghanistan. To mitigate the potential PAPs impacts it is recommended that the documentation certify that any claims have been settled in conformance with international practice as indicated by the Guidelines for Land and Asset Acquisition, Entitlement and Compensation (the Guidelines) attached hereto as **Appendix B**.

It is recommended that the certifying agency be required to ensure that all occupants of land and owners of land and other assets in the Project Area have been consulted in the compensation process. Gender-separate meetings are recommended consistent with the Guidelines to inform local populations about their rights to compensation and available options. Requirements for minutes of community meetings are recommended to reflect discussions, agreements reached and verifiable documentation of details of the agreement. It is also recommended that the certifying agency be required to provide a copy of the Minutes to the PAPs and to maintain all necessary documentation indicating adherence to the Guidelines.

3.4.2 Energy & Conservation

Existing Conditions. Within the Project Area as with the vast majority of Afghanistan, the population relies on traditional household fuels (wood, bushes, crop residues and animal waste) for its energy needs. There are reports of over-exploitation of forestry resources and non-sustainable production and use of fuel wood leading to deforestation and severe environmental degradation in many areas⁸, particularly in Kunar province as discussed under **Item 3.3.1**. However, wood fuel will not be required during the construction phase of the project, all power requirements will be met using diesel fuel generators.

Potential Impacts and Planned Avoidance/Mitigation Actions. All energy requirements will be met by importing fuel. No significant impacts to forests are anticipated to result from fuel requirements.

Additional Recommendations. No additional analysis is considered warranted.

3.4.3 Use of Natural/Depletable Resources

Existing Conditions. Rehabilitation of the Project Road will require the use of certain natural resources. The most economically significant of the available resources in Afghanistan are identified as natural gas, petroleum, coal, copper, chromite, talc, barites, sulfur, lead, zinc, iron ore, salt, precious and semiprecious stones.⁹ The country is also well supplied with rock, sand and other quarried construction materials as required for the proposed rehabilitation activities. A variety of stone and rock is readily available in this region, so much so that many of the buildings along the extent of the Project Road are constructed entirely from this material. **Exhibit 3-14** illustrates a rock built property at approximately km 78. Many skilled workers can be observed within the valley constructing these intricate buildings.

Two quarries have been established to meet the aggregate needs for the Project Road. Both sites were developed after consultation with the relevant District Governors.

Potential Impacts and Planned Avoidance/Mitigation Actions. Both quarries set up

for project use have been established after consultation with the relevant authorities. As such potential impacts resulting from such activities are likely to be low.

Additional Recommendations. None warranted.

3.4.4 Urban Quality/Design of the Built Environment

Existing Conditions. For virtually all urban areas of Afghanistan, urban infrastructure investments in recent years failed to match the increasing demands and deteriorated due to a lack of maintenance and war-related destruction. Public buildings are reported to have been looted of tools and equipment. Approximately 25 percent of urban housing was reported as seriously damaged or destroyed as of May 2002 and approximately 40 percent of housing units are reported to be located in unplanned areas.¹⁰ Urban management capacity has been severely undermined. Urban water supply and sanitation, solid waste management and storm water drainage facilities are in need of urgent repair.



Exhibit 3-14. Stone Built Property (KM78)

Urban management capacity has been severely undermined. Urban water supply and sanitation, solid waste management and storm water drainage facilities are in need of urgent repair.

Available data and observed conditions within the significantly urbanized areas traversed by the ROW can be summarized as follows:

Jalalabad. (Formerly Jalalakot) capital of Nangahar province, eastern Afghanistan, on the Kabul River, at an altitude of 1,940 ft (590 m). It lies on the route from Kabul via the Khyber Pass to Peshawar, Pakistan, and handles much of Afghanistan's trade with Pakistan and India. The town stands at an important strategic position, commanding the entrances to the Laghman and Kunar valleys. It is a military centre, with an airfield.

The site of Jalalabad has been occupied since the 2nd century BC, and Akbar (1542-1605),



Exhibit 3-15. Asadabad Town Center

regarded as the greatest Mughal ruler of India, started the modern town as early as the 1560s. It came under Afghan rule in 1834. During the First (1839-42) and Second (1879-80) Anglo-Afghan wars, Jalalabad was occupied by the British. After their military intervention in 1979, Soviet forces established a military command near Jalalabad and gained control of the town in early 1980. Afghan guerrillas maintained control of the province, and fighting continued intermittently. Several million Afghan refugees and the headquarters of several Afghan

guerrilla groups were across the Pakistan border in nearby Peshawar. The town is surrounded by a large irrigated plain, producing fruit, almonds, rice, and grain. Light industries include a sugarcane refinery and handicraft shops. An urban modernization program to improve water systems and pave the roads has been undertaken.

Asadabad. This town is a small trading center (see **Exhibit 3-15**). The town suffers, like most towns of a similar size in Afghanistan, from a lack of water supply or sanitation systems. Small electricity networks were observed within the town center, probably resulting from NGO activity in this region.

Asmar. Asmar is a small town located at the end point of the Project Road.

Potential Impacts and Planned Avoidance/Mitigation Actions. The Project can be expected to have a beneficial impact on the overall urban quality of the cities it serves by contributing to their economic recovery. Details of land uses and potential impacts in immediate proximity to the road are discussed in **Item 3.4.1** above.

Additional Recommendations. Other than ensuring that provisions are incorporated in contract documents to avoid impact to neighboring land uses and potential cultural resources in the impact area, none warranted.

3.4.5 Historic and Cultural Resources

Existing Conditions. Historic and cultural resources include monuments, structures, works of art, the sites of outstanding universal value from historical, aesthetic, scientific ethnological and/or anthropological points of view, including unrecorded graveyards and burial sites. Afghanistan is rich in historic and cultural resources. The responsibility for preservation, maintenance and assessment of historical and cultural monuments in Afghanistan rests with the Archaeological Committee under the Ministry of Information and Culture (MOIC).

The odd shrine and graveyard can be observed along the road from Jalalabad to Asmar, none of which appear to be of any significant cultural or historical note. This area of Afghanistan forms part of the 'Silk Route' but the years of wanton destruction have taken their toll in this region and nothing of any cultural note remains. A number of small graveyards are located close to the right of way, although not close enough to be disturbed by project works.

Potential Impacts & Planned Avoidance/Mitigation Actions. As noted, there are several shrines within close proximity to the Project Road. To avoid potential adverse impacts to historic and cultural resources, the Project specifications will state that the Sub-Contractor shall:

- Consult with provincial-level representatives of the Archaeological Committee under the Ministry of Information and Culture, obtain any necessary clearances in regard to historic and cultural resources prior, and provide written documentation of these consultations to the Contractor prior to the initiation of the Work.
- Protect sites of known antiquities, historic and cultural resources by the placement of suitable fencing and barriers;

- Adhere to accepted international practice and all applicable historic and cultural preservation requirements of the Government of Afghanistan, 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 Sub-Contractor shall take all necessary measures to protect the findings and shall notify the Contractor and provincial-level representatives of the Archaeological Committee and the Ministry of Information and Culture. 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.

As noted, there are several graveyards within close proximity to the Project Road. Care should be taken to ensure that none of the graveyards are impacted upon during construction works.

Additional Recommendations. None warranted.

3.5 ADDITIONAL ENVIRONMENTAL CONCERNS

3.5.1 Socio-Economic Considerations

Existing Conditions. Within the Project Area, as with most of Afghanistan, economic considerations have been overshadowed by political and military upheavals during two decades of war. Gross domestic product fell substantially because of the loss of labor and capital and the disruption of trade and transport; severe drought added to the nation's difficulties in 1998-2001. The majority of the population continues to suffer from insufficient food, clothing, housing, and medical care, problems exacerbated by military operations and political uncertainties. Inflation remains a serious problem.

Following the US-led coalition war that led to the defeat of the Taliban in November 2001 and the formulation of the Afghan Interim Authority (AIA) resulting from the December 2001 Bonn Agreement, International efforts to rebuild Afghanistan were addressed at the Tokyo Donors Conference for Afghan Reconstruction in January 2002 resulting in the creation of a trust fund to be administered by the World Bank. Priority areas for reconstruction include the construction of education, health, and sanitation facilities, enhancement of administrative capacity, the development of the agricultural sector, and the rebuilding of road, energy, and telecommunication links.

As of 1990, approximately 80 percent of Afghanistan's ten million person labor force was employed in agriculture, ten percent in the service sector and ten percent in industry. Industries are generally small-scale production of textiles, soap, furniture, shoes, fertilizer, and cement; hand-woven carpets; natural gas, coal, and copper.¹¹

Within the urban areas of Jalalabad, Asadabad, Asmar and other small villages, commercial activities predominate on the roadsides. Out of the urban areas a variety of activities can be observed mainly relating to agricultural practices. No up to date socio-economic data of note is available for this region of Afghanistan.

Potential Impacts and Planned Avoidance/Mitigation Actions. The Project is expected to have a beneficial impact on the economy of the affected area by increasing access to markets and reducing journey times to Kabul and to Pakistan.

Additional Recommendations. None.

3.5.2 Public Health & Safety

Existing Conditions. Public health facilities and services in Afghanistan suffered due to civil unrest and severe economic problems. Within the country as a whole, access to adequate and safe water and sanitation facilities is limited. It is estimated that 23 percent of the population has access to safe water. Many provincial and secondary towns have no networked services. Water borne diseases are a major cause of the prevailing high infant and mortality rates. Approximately 85,000 children under the age of five die annually from diarrheal diseases.

Few residential or public buildings in Afghan cities have sewerage facilities and those that do discharge their wastewater directly into rivers without treatment. The World Bank reports that in 1997, sanitation coverage was estimated to be 23 percent of the urban population (versus eight percent of the rural population).¹² Little data exists relating to health conditions in this region of the country. It is assumed however, that access to health facilities is poor and that poor water and sanitation conditions prevail.

Potential Impacts and Planned Avoidance/Mitigation Actions. Given the general lack of health facilities in the region the provision of improved transport routes may not result in the enhancement of access to health facilities rather resume the status quo. Potential negative impacts of the Project can be identified as:

- Air pollution. Potential air quality impacts during rehabilitation include those related to fugitive dust generation in and around rehabilitation activities and related activities such as plants for crushing rocks, hot-mix and asphalt plants.
- Noise levels with health consequences. Potential noise issues are discussed in **Item 3.5.4** below.
- Disease transmission. Increases in sexually transmitted diseases (STDs) are often associated with construction and rehabilitation projects. Contract documents will require Sub-Contractors to provide basic emergency health facilities for workers; and encourage programs aimed at the prevention of sexually transmitted diseases as a part of all construction employee orientation programs.

Additional Recommendations. Although mitigation of such impacts is beyond the scope of the proposed Project, the establishment of STD awareness programs is recommended.

3.5.3 Gender & Disabled Persons Issues

Existing Conditions. The terms of reference for REFS specifically note that "*all projects will take into consideration gender issues and accessibility for disabled persons*".¹³

It has been noted that the last twenty years of social upheaval have greatly affected the overall gender situation in Afghanistan, resulting in very restrictive policies vis-à-vis women's participation in public life, access to education, other services and employment opportunities. Women and girls were effectively excluded from any participation in public life during the Taliban regime. With the replacement of the Taliban regime, women have regained the right to education, employment opportunities and services, but the prevailing

social norms are still very conservative and restrictive regarding women's participation in the national development effort. There are huge differences between Kabul and the much smaller secondary cities and the rural areas. There are also considerable regional differences with the more restrictive and conservative south and southeastern parts of the country, and the western and northern areas. There are also reported to be great differences between returning refugees and those who remained in the country.¹⁴ No legislation in regard to discrimination against, or incentives for, the employment of the disabled is known to be in place in Afghanistan.

Potential Impacts and Planned Avoidance/Mitigation Actions. Women and disabled persons are not specifically targeted as a part of the Project. Recruitment of local labor has been identified as an objective of the Project and in other circumstances (e.g., Bangladesh, India, China and elsewhere) similar projects have included specific provisions for gender equity employment opportunities. The types of rehabilitation activities are not expected to generate labor opportunities for women in the Afghanistan context, however, due to the prevailing social norms or the disabled due to the nature of the work.

Additional Recommendations. None warranted.

3.5.4 Noise

Existing Conditions. Ambient noise levels on the Project Area are low. Field investigations did not reveal the presence of any "sensitive receptors", i.e., recipients of sound for whom exposures to excessive sound levels are detrimental - hospitals, for example. Several schools were observed within 50 meters of the Project Road, but are unlikely to be affected by significant noise levels due to the relatively low volume of traffic using the road.

Potential Impacts and Planned Avoidance/Mitigation Actions. Mitigation of noise impacts in the rehabilitation and operational phases of the Project will include:

- **Rehabilitation Stage.** Contracts will contain provisions to mitigate potential noise and vibration impacts during rehabilitation is recommended through the use of:
 - *Source Controls*, 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.
 - *Site Controls*, 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.
 - *Time and Activity Constraints*, 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. Rehabilitation activities will be strictly prohibited between 10 PM and 6 AM in the residential areas. When operating close to sensitive areas such as residential, nursery, or medical facilities, the Sub-Contractor's hours of working shall be limited to 8 AM to 6 PM.
 - *Community Awareness*, i.e., public notification of project works 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.

- **Baseline and Routine Noise Monitoring as Part of Construction Supervision.** Pre-construction monitor of existing noise and vibration may be undertaken to provide a baseline for the measurement of impacts during the rehabilitation period if determined to be warranted by the USAID/GC. Routine monitoring may also be required in areas of high potential impact (e.g., pile-driving sites and areas of intensive noise-generating activities) if considered warranted by the USAID/GC.
- **Operational Stage.** No significant sources of noise are anticipated to result during the operational phase of the Project. Accordingly no mitigation of operational noise is considered warranted.

Additional Recommendations. None warranted.

3.5.5 Other Infrastructure Systems

Existing Conditions. It is anticipated that piped water supply and wastewater collection systems exist only in the urban areas. Irrigation systems and other infrastructure may exist in the rural areas in the form of electrical power lines and pipelines. The formal infrastructure sector in Afghanistan is largely owned and operated through centralized ministries with some operational and production functions delegated to government enterprises. The reach of formal services, however, is very limited. In the urban water supply and sanitation sectors there is reported to be substantial private participation in

service deliveries mainly through communities, NGOs and UN agencies. In rural areas NGOs and communities have been and are likely to remain the core providers of infrastructure services. Details of the known situation are as follows.



Exhibit 3-16. Japanese Funded Irrigation System

- **Water Supply Systems.** Piped water supply systems exist only in urban areas of Afghanistan and are in need of urgent repair. Coverage is poor and many provincial and secondary towns have no networked services.¹⁵ No piped water supply systems are known to be within the vicinity of the Project, including the urban areas where the road passes.
- **Wastewater Collection Systems.** Virtually no rural areas and few residential or public buildings in Afghan cities have networked wastewater collection sewerage facilities and those that do discharge their wastewater directly into rivers without treatment. The World Bank

reports that in 1997, sanitation coverage was estimated to be 23 percent of the urban population (versus eight percent of the rural population).¹⁶ As above, no piped wastewater collection systems are known to be within the vicinity of the Project.

- Electrical Systems. Some small above ground electrical networks are evident within Jalalabad and Asadabad. It is unlikely that these systems will be affected by project works.
- Irrigation Systems. A number of irrigation systems run parallel to the road and beneath it, most notably at KM37 where a Japanese funded irrigation outlet is located (see **Exhibit 3-16**). Project works may necessitate the temporary diversion of some of these channels.

Potential Impacts and Planned Avoidance/Mitigation Actions. No potentially significant impacts associated with the project are anticipated. However, the contractor should consult with the relevant officials in Jalalabad and Asadabad to ensure that project works do not interfere with infrastructure networks. In addition, consultation with affected farmers should be undertaken to ensure that all diverted irrigation channels are returned to their original status on completion of project works.

Additional Recommendations. None warranted.

3.6 OTHER IMPACT STATEMENTS REQUIRED BY 22 CFR 216

3.6.1 Adverse Impacts That Cannot Be Avoided

Less-than-significant adverse impacts may occur during the rehabilitation activities such as temporary impacts to air quality, noise levels due to rehabilitation. These impacts will be mitigated by the contract provisions as specified herein, including actions such as water spraying to control dust and the restriction of noise-generating activities to daylight hours and the avoidance of such activities in sensitive areas such as the vicinity of hospitals, etc.

3.6.2 Short-Term Use Versus Long-Term Productivity

The Proposed Action will enhance long-term productivity of economic activities in the Project Area by improving agricultural output in the Project Area.

3.6.3 Irreversible Commitments of Resources

Certain natural and human resources will be irreversibly devoted to the Project, including the necessary construction materials and labor. Commitment of these resources will be offset by the Project benefits.

¹ National Atlas of the Democratic Republic of Afghanistan, Organization for Surveying and Cartography and GEOKART Poland, 1995.

² National Atlas of the Democratic Republic of Afghanistan, Organization for Surveying and Cartography and GEOKART Poland, 1995, page VII.

³ Watershed Atlas of Afghanistan. Favre, 2004.

⁴ Geological resources such as coal and gem stones are discussed as part of **Item 3.3.3, Use of Natural and Depletable Resources**.

⁵ Watershed Atlas of Afghanistan. Favre, 2004.

⁶ REFS Contract, page C-8.

⁵ www.icimod.org.np/focus/biodiversity/afgbio.htm

⁸ World Bank, Technical Annex for a Proposed Grant to Afghanistan for an Emergency Infrastructure Reconstruction Project, May 2002, paragraph 8, page 2.

⁹ CIA Profile

¹⁰ World Bank, Technical Annex for a Proposed Grant to Afghanistan for an Emergency Infrastructure Reconstruction Project, May 2002, paragraph 7, page 2.

¹¹ CIA Profile

¹² World Bank, Technical Annex for a Proposed Grant to Afghanistan for an Emergency Infrastructure Reconstruction Project, May 2002, paragraph 7, page 2.

¹³ REFS Contract, Section C, Item B, page C-2.

¹⁴ World Bank, Technical Annex for a Proposed Grant to Afghanistan for an Emergency Infrastructure Reconstruction Project, May 2002, paragraph 79, page 15.

¹⁵ World Bank, Technical Annex for a Proposed Grant... to Afghanistan for an Emergency Infrastructure Reconstruction Project, May 2002, paragraph 7, page 2.

¹⁶ World Bank, Technical Annex for a Proposed Grant... to Afghanistan for an Emergency Infrastructure Reconstruction Project, May 2002, paragraph 7, page 2.

4.0 ENVIRONMENTAL GUIDELINES

For projects such as the Jalalabad - Asmar Road Rehabilitation Project the REFS TOR states that *“the Contractor shall prepare **environmental guidelines** that will be used to minimize and mitigate potential environmental impacts. Included in the guidelines will be an **environmental mitigation checklist** to be completed as a part of final design for each project. Where the analysis indicates that negative environmental effects could occur, the project will be designed to avoid or mitigate those effects. The guidelines will also describe procedures for **monitoring rehabilitation activities** to assure that identified mitigation measures have been implemented as planned”* (Emphasis added). Accordingly, the following presents the examination’s findings in regard to the environmental mitigation final design checklist (**Item 4.1**) and monitoring (**Item 4.2**). Additional recommendations for environmental actions beyond the scope of the Project, but within the scope of REFS, are presented in **Item 4.3**.

4.1 Environmental Mitigation Final Design Checklist

The preferred form of mitigation is avoidance of impacts through the adoption of enforceable measures and precautions rather than amelioration after the fact. This preferred form of mitigation has been incorporated in the recommended contract provisions attached hereto as **Appendix A**.

An environmental and final design checklist is provided by **Exhibit 4-1**.

4.2 Monitoring

Monitoring of projects such as the Jalalabad - Asmar Road Rehabilitation Project generally includes observational monitoring to enforce contract provisions to avoid adverse impacts and may include instrumented monitoring of environmental parameters such as air quality, when warranted.

Monitoring of environmental impacts during the rehabilitation process will be the responsibility of the USAID General Contractor (USAID/GC) as a part of contract supervision procedures. A Supervising Engineer (SE) will be assigned to the Project. Compliance procedures will include routine site visits, including the ancillary facilities associated with that package (labor camps, asphalt plants, etc.).

Major issues to be addressed in the monitoring and compliance reports will include:

- **Air Quality Impacts.** The Supervising Engineer (SE) will be responsible for compliance with contract provisions that specify:
 - Controlled locations of asphalt plants and similar sources of air pollution, use of quarries, etc., as tabulated by **Exhibit 4.1**.
 - Proper use of water sprays and other techniques to lessen dust impacts.
 - Prohibitions against open burning in populated areas.
 - Proper use of solvents and volatile materials.
 - Blasting (if any) to be carried out using small charges.

- Transport of dust-generating items using tarps and other devices to minimize impacts.
- Spraying of road surfaces, excavation and construction sites to keep them moist for dust control as determined advisable by the SE.

EXHIBIT 4-1
ENVIRONMENTAL MITIGATION FINAL DESIGN CHECKLIST
 For Air Quality, Water, Soil, Noise and Social Impacts

AIR QUALITY

Potential Impact Source	Mitigation Objective	Mitigation Measure	Implementation Mechanism & Responsibility
Material Transport	Minimization of dust during transport of fill and construction material	Rock, sand and other dust producing material will be sprayed prior to transport. Trucks must be covered with tarps. Only approved transport routes will be used.	Required by Project Contracts. Enforced by the Supervising Engineer (SE).
Earthwork Activities	Minimization of dust dispersal due to earthworks.	Sub-Contractors are required to spray roadways to minimize dust in dry conditions.	Required by Project Contracts. Enforced by SE.
Concrete Batching and Structural Work	Minimization of airborne particulate and gas emitted during the construction process.	Contracts specify that batch sites shall be located away from human settlements.	Required by Project Contracts. Enforced by SE.
Emissions from Asphalt Plants	Minimization of smoke, soot, airborne particulates and gas emitted due to plant operations.	Asphalt plants may not be located within 500 meters of human settlements. Baseline and periodic air quality monitoring is required.	Required by Project Contracts. Enforced by SE.
Emissions from Construction Equipment & Solvents.	Avoidance of excessive emissions due to poorly maintained equipment.	Contract stipulations require all construction equipment to meet acceptable standards and to be properly maintained. Solvents and volatile materials must be used properly to the satisfaction of the SE.	Required by Project Contracts. Enforced by SE.
On-Site Burning.	Avoidance of smoke and gases which may constitute a nuisance.	On-site burning to be banned in populated areas	Required by Project Contracts. Enforced by SE.

WATER QUALITY

Potential Impact Source	Mitigation Objective	Mitigation Measure	Implementation Mechanism & Responsibility
Uncontrolled Runoff During Construction Activities	Avoidance of inadequately planned runoff due to development of staging areas, labor camps, etc.	Runoff from during construction will be strictly controlled as a part of construction supervision activities. Monitoring will be undertaken as a routine part of construction supervision.	Required by Project Contracts. Enforced by SE.

Disruption of Irrigation	Avoidance of interruptions to irrigation flows due to construction activities.	Irrigation systems have been taken into account in design. Alternative water sources will be developed as warranted due to temporary interruptions.	Required by Project Contracts. Enforced by SE.
Effects of Construction Camps & Staging Areas	Avoidance of inappropriate wastewater disposal and runoff.	Provisions for the location and design standards for land use, drainage, health facilities, etc., are established by construction documents.	Required by Project Contracts. Enforced by SE.

SOILS

Potential Impact Source	Mitigation Objective	Mitigation Measure	Implementation Mechanism & Responsibility
Loss of Agricultural Land	Minimize use of farmland for road improvement purposes.	Loss of agricultural land has been avoided as much as possible. Use of corridors already dedicated to agricultural use minimizes the need for additional agricultural land. All fill material will be obtained from non-agricultural areas.	Avoidance of agricultural land has been incorporated in the decision-making process.
Borrow Pits in Inappropriate Locations	Avoid loss of agricultural land or other resources	Only government sanctioned quarries and construction material sources will be used.	Required by Project Contracts. Enforced by SE.
Inappropriate Exploitation and Restoration of Borrow Pit Areas.	Minimize loss of topsoil and creation of drainage problems and unsightliness.	Topsoil to re-vegetate the pits to the satisfaction of the SE. Borrow pit areas will be graded to ensure drainage and visual uniformity or to create permanent tanks/dams. Additional borrow pits will not be opened without the restoration of those areas no longer in use.	Required by Project Contracts. Enforced by SE.
Inadequate Slope Stabilization	Minimize soil loss during slope creation and due to erosion and slope failure in the longer-term.	Side slopes standards have been established to reduce erosion potential and/or, if necessary, stabilized, covered with rip-rap or other material to prevent soil erosion. Where appropriate embankment slopes and road cuts will be stabilized by re-vegetation with grazing resistant plant species, placement of fiber mats, rip-rap, rock gabions, or other appropriate technologies.	Incorporated in design. Enforced by SE. Operational maintenance by MPW.
Soil Loss Due to Water-Related Erosion.		Discharge zones from drainage structures will be furnished with rip-rap when warranted, particular in instances in which drainage structures are installed and/or road formation levels are raised and create bare slopes that require stabilization. Down drains/chutes will be lined with rip-rap/masonry or concrete to prevent erosion.	Incorporated in design. Enforced by SE. Operational maintenance by MPW.

Uncontrolled Runoff from Construction & Labor Camps	Avoid soil due to poorly designed and/or maintained constructor and labor camps.	Runoff will be controlled by proper siting of construction camps and staging areas.	Required by Project Contracts. Enforced by SE.
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NOISE

Potential Impact Source	Mitigation Objective	Mitigation Measure	Implementation Mechanism & Responsibility
Blasting (if any)	Minimize high noise levels and high stress levels due to unanticipated blasting. Control time.	Blasting and drilling times will be limited. Public notification of blasting will be required.	Required by Project Contracts. Enforced by SE.
Pile Driving	Minimize high noise levels, vibrations and time of occurrence.	To be mitigated through use of : - Time limits for pile-driving activities. - Bored piles in sensitive areas. - Shrouds where warranted.	Required by Project Contracts. Enforced by SE.
Earth Moving	Minimize high noise levels and times of occurrence	Limit earth-moving times. Limit number of working vehicles. Use of low-noise emission vehicles. Proper maintenance of equipment. Use of noise barriers where warranted.	Required by Project Contracts. Enforced by SE.
Paving And Other Construction Activities.	Minimize high noise levels and times of occurrence.	Limit construction hours in sensitive areas. Use of properly maintained equipment. Use of noise barriers where warranted.	Required by Project Contracts. Enforced by SE.

SOCIAL

Potential Impact Source	Mitigation Objective	Mitigation Measure	Implementation Mechanism & Responsibility
Disruption of Economic Activities	Minimize loss of income due to disruptions.	Contractors are required to minimize disruption due to traffic detours and construction activities. Unavoidable disruptions will be compensate per the recommended Guidelines.	GOA and SE.
Dislocation of Homes and Businesses	Minimize loss of social connections and income.	Relocations, resettlement and income restoration will be mitigated per the Guidelines.	GOA.
In-migration of Labor	Avoidance of social tensions. due to competition for resources.	Mitigated by control of labor camps (if any) employee orientation and public information programs.	Construction requirements enforced by SE.
Traffic and Transport Disruption	Avoid social tensions and the opportunity cost of time lost due to traffic delays.	Public information programs to alert the public of detours, etc., are required. Adequate posting and directional assistance at detours will be enforced.	SE.

- **Water Quality Impacts.** Potential water quality impacts during the construction phase will also be mitigated through the controlled location of asphalt plants and similar sources of runoff, erosion controls, proper siting and provision of facilities at construction camps as tabulated by **Exhibit 4.1** with compliance assured through the oversight of the SE.

- **Soils Impacts.** Potential soil impacts will be mitigated through the control of waste disposal practices and runoff as tabulated by **Exhibit 4.1** as a routine part of construction supervision and enforced through the monitoring of the SE.
- Embankment & Erosion Prevention Requirements
- Borrow Pit Restoration Requirements.
- Mining/Quarry Activities – i.e., the requirement that only licensed quarrying operations are to be used for material sources, if available, and the contingency provisions in the contracts if they are not. Selections of quarries used for the rehabilitation of the Project Road will require the approval of the SE.
- Controls of hazardous materials.
- **Social Impacts.** Potential issues related to transport of construction materials, labor camps and other social impacts will be mitigated as a routine part of construction supervision. Compliance with the contract stipulation in regard to the use of local labor to the maximum extent feasibility will also be monitored by the SE.
- **Public Health.** Compliance with contract provisions to control potential contamination of local water supplies during construction; to control air pollution and noise levels; to provide basic emergency health facilities for workers; and encourage programs aimed at the prevention of sexually transmitted diseases as a part of all construction employee orientation programs; and other factors having a potential impact will be assured through the oversight of the SE.
- **Safety.** Detours and traffic re-routing schemes will require the approval of the SE. Contract documents state that *"The Sub-Contractor shall provide the Contractor with a written traffic control plan which is to include when and where flagmen shall be employed and when and where traffic cones or other devices such as barricades and/or lights will be used. Where ... traffic diversions area planned for ...additional areas (will) be de-mined and the diversions clearly defined for travel."* Enforcement of these and related safety provisions during the construction process will be the responsibility of the SE. Safety issues related to the shoulder provisions for the accommodation of NMT are a design rather than a compliance issue and, as previously noted, will require resolution by the funding agencies.
- **Impacts to Other Infrastructure Networks.** Responsibility to ensure compliance with contract provisions to coordinate with all relevant agencies and organizations to avoid disruption of other infrastructure services (water supply, irrigation systems, electricity, etc.) rests with the SE.
- **Noise and Vibration Impacts.** Contract provisions for the control of noise and vibration impacts during the construction phase through the use of site controls, site controls, time and activity constraints and public awareness efforts as tabulated by **Table 4.1** with compliance monitored by the SE.

4.3 Recommended Actions Beyond the Scope of the Project

Recommendations for actions beyond the scope of the Project, but generally within the

scope of the REFS Program, are as follows:

- **Assist MPW in the Establishment of a Traffic Safety Program.** In addition to the safety requirements to be observed during the construction period, safety during the operational phase of the Project is a major concern. Routine monitoring of accident data to ensure that the points of major conflicts are identified as they emerge is recommended. It is also recommended that MPW take the lead in the establishment of a safety enhancement program to include:
 - Use of Lights and Reflectors. Increased use of lights and reflectors should be strongly encouraged for both motorized and non-motorized traffic, particularly bicycles and other slow-moving vehicles. Such a program might include the free or subsidized distribution of reflectors. Such a program could be supported by corporate sponsors or non-governmental organizations (NGOs).
 - Public Awareness Programs. The increased traffic and traffic speed in portions of the rehabilitation corridor will be a major change in the environment for many residents. Programs to heighten awareness are recommended for incorporation in the Project before construction.

Initiatives in this area are recommended for consideration as part of REFS Component 2.

- **Assist Coordination of Future Land Use & Transport Plans.** The long-term impacts of the Project Road could be more significant than the short-term impacts of the construction period and are largely beyond the scope of the Project. REFS Component 2 can assist in the inter-governmental action necessary to monitor these impacts and ensure that they are adequately managed in concert with other concerned agencies.
- **Integrate Road Rehabilitation with REFS Institutional Strengthening Initiatives.** Institutional strengthening actions will be necessary as a part of the Project to ensure that the road is adequately maintained in the future, to ensure that future bidding and tendering procedures are in place and to ensure that environmental issues incorporated in these activities. REFS Component 2 offers an opportunity to provide the necessary institutional initiatives.
- **Assist NEPA to develop a Forestry Protection Initiative.** To prevent further exploitation of the forests and habitats of the mountains in Nangahar, Kunar and Nuristan it is recommended that a program be established by NEPA to manage the forests in a sustainable manner.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Project works are not anticipated to induce any significant impacts on the environmental or social characteristics of the Project Area. However, minor impacts will result from some rehabilitation activities as noted in **Section 3.0**. Notwithstanding the above, all of the identified impacts can be appropriately managed or mitigated by the measures outlined in **Sections 3.0 & 4.0** and provided as Recommended Contract Provisions as **Appendix A**.

In addition to the above, the following recommendations are made:

- Adoption of the Guidelines for the compensation of project-affected persons (PAPs) as provided by **Appendix B** for use in the event that unexpected impacts are encountered.

The EA also recommends actions beyond the scope of the Project, but within the scope of the REFS Program, specifically:

- Assist MPW in the Establishment of a Traffic Safety Program;
- Assist NEPA with the development of Forestry Protection Initiative in Nangahar, Kunar and Nuristan;
- Assist Coordination of Future Land Use & Transport Plans; and
- Integrate Road Rehabilitation with REFS Institutional Strengthening Initiatives.

APPENDIX A

CONDITIONS OF PARTICULAR APPLICATION

ENVIRONMENTAL PROVISIONS

The following has been extracted from the Conditions of Particular Application (COPA) prepared for use in the Jalalabad - Asmar Road Rehabilitation Project.

4.0 ENVIRONMENTAL

4.1 General Provisions and Precautions

The Sub-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 Afghanistan including those established by local governments. The Sub-Contractor shall take all measures and precautions to avoid any nuisance or disturbance arising from the execution of the Work. This shall, wherever possible, be achieved by suppression of the nuisance at source rather than abatement of the nuisance once generated. In the event of any spoil or debris or silt from the Work Sites being deposited on any adjacent land, the Sub-Contractor shall immediately remove all such spoil debris or silt and restore the affected area to its original state to the satisfaction of the responsible authorities.

4.2 Water Quality

The following conditions shall apply to avoid adverse impacts to water quality:

- The Sub-Contractor shall prevent any interference with the supply to, or abstraction from, water resources and the pollution of water resources (including underground percolating water) as a result of the execution of the Works.
- Areas where water is regularly or repetitively used for dust suppression purposes (if any) shall be laid to fall to specially-constructed settlement tanks to permit sedimentation of particulate matter. After settlement, the water may be re-used for dust suppression and rinsing. All water and other liquid waste products arising on the Site shall be collected and disposed of at a location on or off the Site and in a manner that shall not cause either nuisance or pollution.
- The Sub-Contractor shall not discharge or deposit any matter arising from the execution of the Work into any waters except with the permission of the Contractor and regulatory authorities concerned.
- The Sub-Contractor shall at all times ensure that all existing stream courses and drains within and adjacent to the Site are kept safe and free from any debris and any materials arising from the Works.
- The Sub-Contractor shall protect all watercourses, waterways, ditches, canals, drains, lakes and the like from pollution, silting, flooding or erosion as a result of the execution of the Works.

4.3 Air Quality

The following conditions shall apply to avoid adverse impacts to air quality:

- Open burning will be prohibited.
- Solvents and volatile materials will be used and stored in manners satisfactory to the Contractor.
- Blasting (if any) will be carried out using small charges, and dust-generating items will be conveyed under cover.
- In periods of high wind, dust-generating operations shall not be permitted within 200 meters of residential areas having regard to the prevailing direction of the wind.
- Asphalt and hot-mix plants sites shall not be established prior to the approval of the Contractor and shall be located at least 500 meters away from the nearest sensitive receptor (e.g., schools and hospitals). Operators will be required to install emission controls.
- Water sprays shall be used during the delivery and handling of materials when dust is likely to be created and to dampen stored materials during dry and windy weather.
- Stockpiles of materials shall be sited in sheltered areas or within hoarding, away from sensitive areas. Stockpiles of friable material shall be covered with clean tarpaulins, with application of sprayed water during dry and windy weather. Stockpiles of material or debris shall be dampened prior to their movement whenever warranted.
- Vehicle with an open load-carrying area used for transporting potentially dust-producing material shall have properly fitting side and tailboards. Materials having the potential to produce dust shall not be loaded to a level higher than the side and tail boards, and shall be covered with a clean tarpaulin in good condition. The tarpaulin shall be properly secured and extend over the edges of the side and tailboards.
- In periods of adverse weather adverse impacts to adjacent residents or site employees during construction will be mitigated by either discontinuing until favorable conditions are restored, or, if warranted, sites may be watered to prevent dust generation, particularly at crushing plants.
- Machinery and equipment will be fitted with pollution control devices, which will be checked at regular intervals to ensure that they are in working order. Best available pollution control technologies will be required.
- Pre-construction monitor of existing ambient air quality may be undertaken to provide a baseline for the measurement of air quality impacts during the construction period if considered warranted by the Contractor.
- Periodic air quality monitoring may also be required in areas of high potential impact (asphalt plants, construction camps, etc) during the life of the Project if considered warranted by the Contractor.

4.4 Protection of Soils

Cut and Fill Activities. In undertaking cut and fill activities associated with the Works the Sub-Contractor shall:

- Select less erodable 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.

Borrow Pits. The following conditions shall apply to borrow pits:

- Borrow areas will be located outside the ROWs.
- 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 Contractor 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.

Quarries. To ensure adequate mitigation of potential adverse impacts, only licensed quarrying operations are to be used for material sources. If licensed quarries are not available the Sub-Contractors may be made responsible for setting up their dedicated crusher plants at approved quarry sites

Erosion. To avoid potential adverse impacts due to erosion, the Sub-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.
- As noted in elsewhere in these Specifications, ditches shall be designed for the toe of slopes in cut sections with gutters or drainage chutes being employed to carry water down slopes to prevent erosion. Interceptor ditches shall be designed and constructed near the top of the back of slopes or on benches in the cut slopes as well as when there is a slope on adjacent ground toward the fill. When the roadway has a steep longitudinal slope, a drain is to be designed and constructed at the down-slope end of the cut to intercept longitudinal flow and carry it safely away from the fill slopes.

4.5 Avoidance of Social Impacts

To avoid adverse social impacts, the Sub-Contractor shall:

- Coordinate all construction activities with neighboring land uses and respect the rights of local landowners. If located outside the ROW, written agreements with local landowners for temporary use of the property will be required and sites must be restored to a level acceptable to the owner within a predetermined time period.

- Maintain and cleanup campsites.
- Attend to the health and safety of their workers by providing basic emergency health facilities for workers and incorporate programs aimed at the prevention of sexually transmitted diseases as a part of all construction employee orientation programs.
- Obtain approval of all diversions and accommodations of traffic. As stipulated by Section ___ which states that "the Sub-Contractor shall provide the Contractor with a written traffic control plan which is to include when and where flagmen shall be employed and when and where traffic cones or other devices such as barricades and/or lights will be used. Where ... traffic diversions area planned for ...additional areas (will) be de-mined and the diversions clearly defined for travel."
- Construct and maintain by-passes around bridges to be reconstructed until such time as the bridge is open for traffic. By-passes will be removed and the affected areas re-graded so as to blend in with the existing contours when the bridge is opened.

4.6 Noise

To avoid adverse impacts due to noise, the Sub-Contractor shall:

- Consider noise as an environmental constraint in his planning and execution of the Works.
- Use equipment conforming to international standards and directives on noise and vibration emissions.
- Take all necessary measures to ensure that the operation of all mechanical equipment and construction processes on and off the Site shall not cause any unnecessary or excessive noise, taking into account applicable environmental requirements.
- Maintain exhaust systems in good working order; properly design engine enclosures, use intake silencers where appropriate and regularly regular maintain noise-generating equipment.
- Use all necessary measures and shall maintain all plant and silencing equipment in good condition so as to minimize the noise emission during construction works.
- Schedule operations to coincide with periods when people would least likely be affected and limit work hours and work days to less noise-sensitive times. Hours-of-work will be approved by the Contractor 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. When operating close to sensitive areas such as residential, nursery, or medical facilities, the Sub-Contractor's hours of working shall be limited to 8 AM to 6 PM.
- Incorporate noise considerations in public notification of construction operations and specify methods to handle complaints. Disposal sites and haul routes will be coordinated with local officials to avoid adverse traffic noise.
- Undertake pre-construction monitor of existing noise and vibration if determined warranted and requested by the Contractor to provide a baseline for the measurement of impacts during the construction period. Routine monitoring may also be required in areas of high potential impact (e.g., pile-driving sites and areas of intensive noise-generating activities) if considered warranted by the Contractor.

4.7 Fuel and Chemical Storage

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.
- 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.

4.8 Protection of Historic and Cultural Resources

To avoid potential adverse impacts to historic and cultural resources, the Sub-Contractor shall:

- Protect sites of known antiquities, historic and cultural resources by the placement of suitable fencing and barriers;
- Adhere to accepted international practice and all applicable historic and cultural preservation requirements of the Government of Afghanistan, 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 Sub-Contractor shall take all necessary measures to protect the findings and shall notify the Contractor and provincial-level representatives of the Archaeological Committee under the Ministry of Information and Culture. 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.

4.9 Protection of Utilities

To avoid potential adverse impacts to utilities, the Sub-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 effect 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 satisfy himself about the 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 Sub-Contractor will use the services of specialist enterprises with the necessary skills and technology to carry out the work.

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APPENDIX B

GUIDELINES FOR LAND AND ASSET ACQUISITION, ENTITLEMENTS AND COMPENSATION

The following presents the Guidelines for Land and Asset Acquisition, Entitlements and Compensation drafted for use in the World Bank Afghanistan Emergency Infrastructure Project. Adaptation of the guidelines is recommended for incorporation in the Jalalabad - Asmar Road Rehabilitation Project and other projects included in the USAID Afghanistan Rehabilitation of Economic Facilities and Services (REFS) Program.

Guidelines for Land and Asset Acquisition, Entitlements and Compensation

I. Objectives

Land acquisition will be kept to a minimum and no person will be involuntarily displaced under subprojects financed by the proposed emergency reconstruction operations. Subproject proposals that would require demolishing houses or acquiring productive land should be carefully reviewed to minimize or avoid their impacts through alternative alignments. Proposals that require more than minor expansion along rights of way should be reviewed carefully. No land or asset acquisition may take place outside of these guidelines. A format for Land Acquisition Assessment is attached as Attachment 2(i).

These guidelines provide principles and instructions to compensate affected persons to ensure that all such persons negatively affected, regardless of their land tenure status, will be assisted to improve, or at least to restore, their living standards, income earning or production capacity to pre-project levels.

Categorization

Based on the number of persons that may be affected by the project (Project Affected People, PAPs) and the magnitude of impacts, projects may be categorized as S-1, S-2, or S-3 projects:

- S-1 projects are those that will involve the resettlement of more than 200 PAPs and where a full Resettlement Action Plan (RAP) must be produced. Such interventions will be ineligible for support under the proposed emergency reconstruction operations.
- S-2 projects are those which will involve the resettlement of less than 200 persons. In such cases, the following documentation is required:
 - A land acquisition assessment,
 - Minutes or record of consultations which assess the compensation claimed and agreement reached, and
 - A record of the receipt of the compensation, or voluntary donation, by those affected (see below).
- S-3 projects are not expected to have any land acquisition or any other significant adverse social impacts; on the contrary, significant positive social impact and improved livelihoods are expected from such interventions.

II. Eligibility

PAPs are identified as persons whose livelihood is directly or indirectly affected by the project. PAPs deemed eligible for compensation are:

- Those who have formal legal rights to land, water resources or structures/buildings, including recognized customary and traditional rights;
- Those who do not have such formal legal rights but have a claim to usufruct right rooted in customary law;
- Those whose claim to land and water resources or building/structures do not fall within (1) and (2) above, are eligible to assistance to restore their livelihood.

Acquisition of Productive Assets and Compensation

PAPs are eligible for replacement costs for lost assets as described below:

- *Voluntary contributions.* In accordance with traditional practices, individuals may elect to voluntarily contribute land or assets and/or relocate temporarily or permanently from their land without compensation.
- *Contributions against compensation.* A contributor/asset loser considered "affected" will be eligible for compensation from the local community or alternatively from the Government. A PAP shall lodge his/her claim for compensation to the local community representative/shura head and it shall be verified by the implementing agency. The claim shall be lodged within 2 weeks of completion of the consultations with the concerned community, and before project implementation begins.

Voluntary contribution, or contribution against compensation, should be documented. The documentation should specify that the land is free of any squatters, encroachers or other claims. A format is attached in Attachment 2(i), which includes a Schedule to be followed to assess any compensation claimed and the agreement reached.

III. Compensation Principles

The project implementing agencies shall ensure that any of the following means of compensation are provided in a timely manner to affected persons:

- Project affected persons losing access to a portion of their land or other productive assets with the remaining assets being economically viable are entitled to compensation at replacement cost for that portion of land or assets lost to them. Compensation for the lost assets will be according to following principles:
 - replacement land with an equally productive plot, cash or other equivalent productive assets;
 - materials and assistance to fully replace solid structures that will be demolished;
 - replacement of damaged or lost crops and trees, at market value;
 - other acceptable in-kind compensation;
 - in case of cash compensation, the delivery of compensation should be made in public, i.e. at the Community Meeting.
- Project affected persons losing access to a portion of their land or other economic assets rendering the remainder economically non-viable, will have the option of

compensation for the entire asset by provision of alternative land, cash or equivalent productive asset, according to the principles in (1) a-d above.

Consultation Process

The implementing agencies will ensure that all occupants of land and owners of assets located in a proposed subproject area are consulted. There will be gender separate community meetings for each affected mantaqa/gozar (urban infrastructure) or village (other projects) to inform the local population about their rights to compensation and options available in accordance with these guidelines. The minutes of the community meetings shall reflect the discussions held, agreements reached, and include details of the agreement based on the format provided in Attachment 2(ii).

The implementing agency shall provide a copy of the minutes to affected persons and confirm in discussions with each of them their requests and preferences for compensation, agreements reached, and any eventual complaints. Copies will be recorded in the posted project documentation and be available during supervision.

Subproject Approval

In the event that a subproject involves acquisition against compensation, the implementing agency shall:

- Not approve the subproject unless a satisfactory compensation has been agreed between the affected person and the local community;
- Not allow works to start until the compensation has been delivered in a satisfactory manner to the affected persons;
- If more than 200 persons are affected and require compensation, the subproject shall be deemed ineligible for support under the emergency reconstruction operations.

Complaints and Grievances

All complaints should first be negotiated to reach an agreement at the local community/village level. If this fails, complaints and grievances about these guidelines, implementation of the agreements recorded in the community meeting minutes or any alleged irregularity in carrying out the project can also be addressed by the affected persons or their representative at the municipal or district level. If this also fails, the complaint may also be submitted to the relevant implementing agency for a decision.

Verification

The community meeting minutes, including agreements of compensation and evidence of compensation having been made shall be provided to the municipality/district, to the supervising engineers, who will maintain a record hereof, and to auditors and socio-economic monitors when they undertake reviews and project post-assessment. This process shall be specified in all relevant project documents, including details of the relevant authority for complaints at municipal/district or implementing agency level.

Attachment 2(i)

Land Acquisition Assessment Data Sheet

(To be used to record information on all land to be required)

1. Quantities of land/structures/other assets required:
2. Date to be acquired:
3. Locations:
4. Owners:
5. Current Uses:
6. Users:
 - Number of Customary claimants:
 - Number of squatters:
 - Number of encroacher:
 - Number of owners:
 - Number of tenants:
 - Others (specify): Number:
7. How land/structures/other assets will be acquired (identify one):
 - Donation
 - Purchase
8. Transfer of title:
 - Ensure that these lands/structures/other assets free of claims or encumbrances
 - Written proof must be obtained (notarized or witnessed statements) of the voluntary donation, or acceptance of the prices paid, from those affected together with proof of title being vested in the community, or guarantee of public access, by the title holder.
9. Describe grievance mechanisms available:

Attachement 2(ii)

Format to Document Contribution of Assets

The following agreement has been made on.....day of.....between.....resident of(the owner) and(the recipient).

1. That the owner holds the transferable right ofjerib of land/structure/asset in.....
2. That the owner testifies that the land/structure is free of squatters or encroachers and not subject to other claims.
3. That the owner hereby grants to the recipient this asset for the construction and development offor the benefit of villagers and the public at large.

(Either, in case of donation :)
4. That the Owner will not claim any compensation against the grant of this asset

(Or, in case of compensation :)
5. That the Owner will receive compensation against the grant of this asset as per the attached Schedule.
6. That the Recipient agrees to accept this grant of asset for the purposes mentioned.
7. That the Recipient shall construct and develop the and take all possible precautions to avoid damage to adjacent land/structure/other assets.
8. That both the parties agree that the so constructed/developed shall be public premises.
9. That the provisions of this agreement will come into force from the date of signing of this deed.

Signature of the Owner:

Signature of the Recipient:

Witnesses:

1. _____

2. _____

(Signature, name and address)

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APPROVAL OF RECOMMENDED ENVIRONMENTAL ACTIONS:

CLEARANCE:

Deputy Mission Director
Approval:

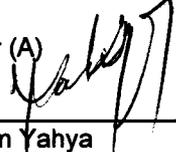


Carl Abdou Rahmaan

5/17/07

Date

Mission Environmental Officer (A)
Approval:

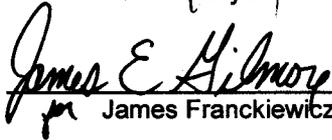


Rahim Yahya

May 10, 2007

Date

Team Leader
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James Franckiewicz

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