USAID
FROM THE AMERICAN PEOPLE

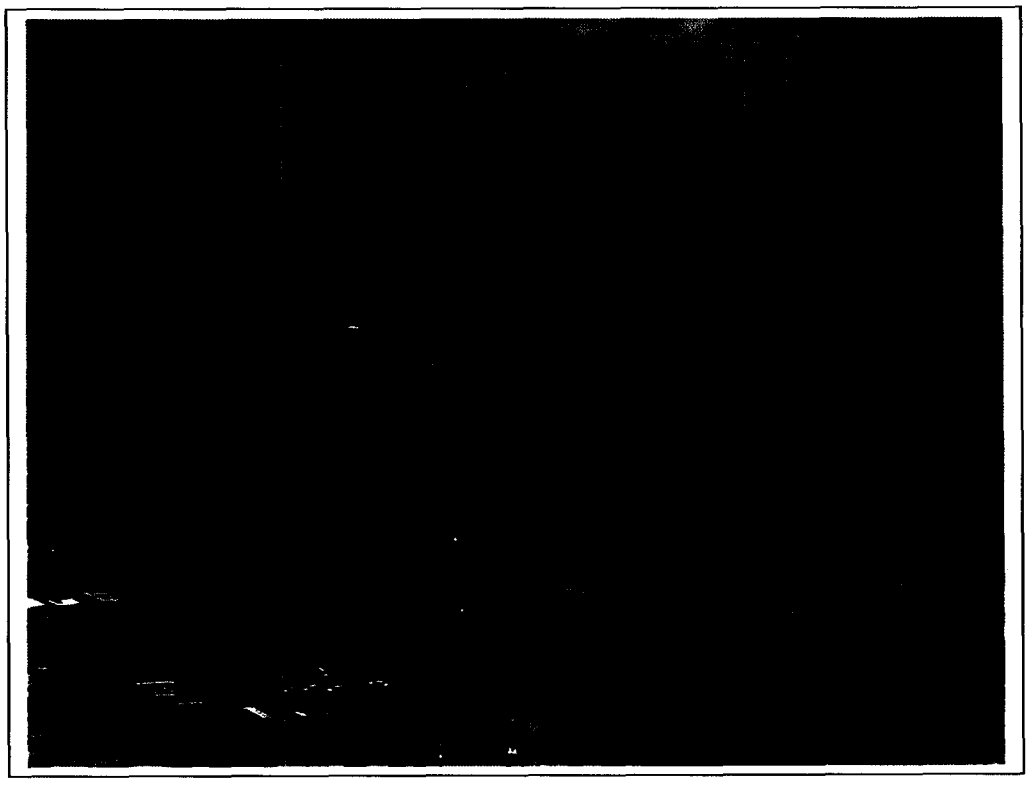
Environmental Assessment

of the

Bibi Mahro (Airport) Road Improvement Project

A part of the Afghanistan Rehabilitation of Economic Facilities and Services (REFS) Program

Contract 306-C-00-02-00500-00



Prepared By:

The Louis Berger Group, Inc.

2300 N Street NW

Washington, DC 20037

EXHIBIT 3-1 EXISTING CONDITIONS, POTENTIAL IMPACTS AND MITIGATION

ENVIRONMENTAL CRITERIA	EXISTING CONDITIONS	POTENTIAL IMPACTS	AVOIDANCE / MITIGATION ACTION	ADDITIONAL RECOMMENDATIONS
1.0 PHYSICAL RESOURCES				
1.1 Topography & Land Forms	The site of the Bibi Mahro Road is central Kabul, which itself is located in the north eastern area of Afghanistan approximately 1800 meters above msl. Kabul is surrounded by mountains generally of a metamorphic nature. In general the topography of the road is flat. The only topography of note is the Bibi Mahro hill which can be seen at approximately KM1+0. No other unusual topographic conditions were identified during field investigations.	Quarry Operations	Only licensed quarrying operations are to be used.	None warranted. Provisions incorporated in the design, contracting process and provisions for contract supervision are such that the potential for adverse impacts to topography is obviated.
		Cut and Fill Requirements	No cut and fill activities are likely to occur on the Project Road	
		Borrow Pit Excavations	No borrow pit excavation works are required.	
		Erosion	Provisions for the control of erosion are discussed as a part of the discussions for soils and hydrology below.	
1.2 Soils	Soils in and around Kabul generally comprise loam, sandy loam or loessy loam. Within the study area itself approximately 20% of land cover is exposed soil. Most open areas comprise agricultural land. No significant geological issues have been identified which may cause problems during construction. The study area is dominated by commercial and agricultural practices. There is no evidence to suggest that there have been activities in this area that would cause persistent and hazardous contamination of the land. Accordingly, it is unlikely that there will be any specific constraints, or more particularly unforeseen clean up costs, in site redevelopment. However, there are no historical records to confirm this.	Contamination Due to Spills	▪ 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. ▪ Filling and refueling shall be strictly controlled and subject to formal procedures. ▪ 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.	None warranted.
		Erosion	No significant erosion impacts are anticipated. No mitigation actions required.	
		Borrow Pits	See **1.1** above.	

1.3 Seismic & Geological Characteristics	There is a history of damaging earthquakes that are most frequent in the northeast of Afghanistan. Kabul is potentially prone to earthquakes varying from 6.5 to 7.3 on the Richter scale.	Seismic Vulnerability	No significant issues identified requiring mitigation	None warranted.
1.4 Hydrology	Surface Hydrology - The nearest surface water feature within the vicinity of the Project Road is the Kabul River, approximately 250 meters south east of the most southerly portion of the Project Road. Rising west of the city of Kabul, it flows east into Pakistan and, after a course of 435 mi (700 km), joins the Indus River northwest of Islamabad. For much of its course, the river is tapped for irrigation most notably within the vicinity of Kabul City itself. As a consequence the river often runs dry during the summer months.. The river is also used informally for the washing of clothes when water levels permit. However contamination of the river is widespread along its entire length mainly as a result of direct sewage and industrial effluent disposal into the river. Within Kabul itself the river is used as an informal dumping ground. Levels of waste on the river-bed are so high the river has been labeled an 'open sewer'. Hydrogeology – Precipitation in Kabul is some 318 mm per year on average, most of which falls in March and April. Groundwater recharge is derived from run-off from mountainsides, direct infiltration from precipitation, irrigation losses and river infiltration. The water table is relatively close to the surface. Groundwater maxima occur in May/June and minima in August/September. The annual fluctuation in the water table is	Surface Hydrology	Potential adverse impacts to surface hydrology and the Kabul River in the construction phase of the Project will be avoided through the enforcement of contract provisions and oversight by the USAID/GC. Road drainage provisions and other rehabilitation activities are not expected to alter the current status of natural water bodies or irrigation structures in the vicinity of the roadway. In addition to adherence to good engineering and construction practices and the enforcement of contract provisions related to drainage during both the construction 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.	None warranted.
		Wetlands	Due to the nature of project works and the location of the Kole Hashmat Khan (more than 5km south east) from the Project Road no significant impacts are anticipated. No mitigation actions are warranted.	
		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	

	3-5 m in the upper Kabul basin and 2-2.5m in the lower Kabul basin. Groundwater seepage is a potential construction issue if not adequately controlled. *Wetlands – The nearest wetlands of ecological importance to the Project Area is the Kole Hashmat Khan Waterfowl Sanctuary approximately 5 km south east of the Project Area. The shallow reed covered lake was long used as a royal hunting area and was designated as a waterfowl reserve in the 1930's by King Zahir Shah. The site was important for approximately 30,000 migratory birds belonging to 157 different species (including ducks, quails and coots). However, since the late 1970's the site has suffered significant degradation including encroachment of houses on the southeastern shores of the lake and uncontrolled reed cutting. In addition to these issues diversion of the lakes waters for alternative uses often leaves the lake completely dry during the summer months.*		*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. 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 and Climate	*Winter in Kabul is cold. Mostly clear weather predominates. Normal temperatures are 2-5ºC in the daytime with light frosts down to -5ºC or below at nighttime. Precipitation generally falls as drizzle, less often as snow. Snow cover usually persists for only 10-15 days per annum. Spring lasts from March through April, the weather can be unstable and wet. Days are warm and nights are cool. Precipitation falls as brief but heavy rain. Summer in Kabul is hot. The weather is mostly clear and dry with prevailing temperatures in the*	*Rehabilitation Impacts, e.g. Impacts during construction can be anticipated due to fugitive dust generation in and around construction activities and related activities such as asphalt*	*The Sub-Contractor will be required to spray road surfaces 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.*	*Other than verification of provisions noted within the contract documents, none warranted.*

	hottest months (June through August) ranging from 25-30ºC in the daytime and 18-22ºC at night. Precipitation in the summer is vary rare (1-2 rainy days June through September). Fall lasts from October through till November. The season begins dry, then turns relatively wet. Winds are predominantly southerly and southeasterly during the year with a mean speed of 1-4 meters per second (m/s). The area is characterized by local mountain-valley winds; blowing up the valleys and mountainsides in the daytime and back at night. The existing traffic volumes along the Project road are moderate; however dust and vehicle emissions in Kabul are the main factors negatively affecting air quality. Most of the cars, trucks and busses within Kabul run on low grade fuel emitting high levels of Polyaromatic Hydrocarbons (PAH).	plants. Operational Impacts	The improvement activities will allow the traffic generated by the improved economic conditions to flow more smoothly and efficiently and will thus be beneficial in terms of air quality. The improved layout is unlikely to significantly increase traffic levels within Kabul. No mitigation related to potential air quality impacts during the operational phase of the Project is considered warranted.	
2.0 NATURAL/BIOLOGICAL RESOURCES				
2.1 Flora	There are no natural habitats within the study area and no areas with natural preservation or conservation values. Similarly, as far as can be gathered from reconnaissance surveys and available data, there are no species of flora and fauna present that would be subject to protection or preservation under national or international law. There are no areas of open space with significant flora within the study corridor. Patches of agricultural land can be observed within the northern section	Destruction of Habitat	The project is not anticipated to have significant negative impacts to flora within the vicinity of the road.	None warranted.

	of the corridor (growing okra, onion, tomato and eggplant) and some landscaped areas were noted around several public buildings in the southern portion of the corridor including the Supreme Court (KM0+200). The only other notable flora exists on the Project Road itself which is tree lined for much of its extent. The status and condition of many of the 800 odd trees is debatable. From KM0+0 to approximately KM0+500 the road is lined on both side by mature trees of varying species including Mulberry, Russian Willow, Poplar & Pines. Many of these mature trees are suffering from neglect and several appear to have been vandalized by youths who seem to enjoy stripping bark from the tree trunks and tearing down branches to play with. Accordingly, although the trees are some of the only remaining mature trees in Kabul City and provide canopy cover for pedestrians and road side businesses, from an aesthetic viewpoint they appear somewhat disjointed and scruffy. From KM0+500 until 2+440 the trees are immature with heights of around 6-8 feet and trunk diameters of only 15-20 cms. These trees appear to have been planted recently and provide no shade or add any aesthetic value to this section of the road. The odd mature mulberry tree can be spotted within this section, but is usually set back from the road side deep into the right of way. In the last sector of the road (KM2+400 – KM3+099) mature Pines dominate both sides of the road. Additionally this sector includes some attempts at landscaping within the right of way. This section of			

	the road is perhaps the most aesthetically pleasing and provides a 'green gateway' to the entrance of Kabul International Airport which is located at the end point of the Project Road.			
2.3 Fauna	Due to the city center location of the Project Road little in the way of fauna is present within the projects vicinity.	Destruction of Habitat	The project is not anticipated to have significant negative impacts to fauna within the vicinity of the Project.	None warranted.
2.3 Aquatic Habitat	No aquatic environments are present within 250 meters of the Project Road.	Destruction of Habitat	The project is not anticipated to have significant negative impacts on the Kabul River.	None warranted.
2.4 Protected Areas	The nearest protected are is Kole Hashmat Khan Waterfowl Sanctuary approximately 5km from the Project Road.	Rehabilitation Impacts	There are no protected areas within 5 kilometers of the Project site.	None warranted.
3.0 OTHER ENVIRONMENTAL CONCERNS NOTED BY 22 CFR 216				
3.1 Land Use/Controls	Commercial – The majority of building along Bibi Mahro Road are commercial in nature (approximately 400 small businesses). The commercial properties range from tailors to flower sellers. Many of these commercial ventures are unregistered illegal businesses. Many of the properties themselves are unique single storey structures constructed from old transport containers with gay facades. Residential – Little residential property can be found along the Project Road. Notwithstanding the above, anecdotal information suggests that many people live and work within the commercial and light industrial properties / containers that exist within the study corridor. Light Industrial – There are several light industrial activities within the study corridor, predominantly vehicle repair shops. Oil and other potential hazardous	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	None warranted.
		Rehabilitation Impacts	Coordination with local land use planning authorities is required. Construction camps/equipment/materials storage 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.	

	liquids are used during the day to day activities on site. There is currently no method of waste disposal in Kabul for hazardous waste or materials, accordingly any hazardous waste generated on site may end up in an open land fill which could lead to serious localized degradation of soils and groundwater within the area of disposal. No land fills or waste disposal sites (legal or otherwise) have been identified within the vicinity of the Study Corridor. *Recreation – Little in the way of recreational facilities exists within the study corridor. There are however, some areas of vacant land that can and are used as makeshift recreation areas (football, kite flying etc). Such sites are not ideal for recreation. They are not designed as such and are not isolated from traffic.*			
3.2 Energy & Conservation	*Afghanistan's power grid has been severely damaged by years of war, and less than 10 percent of its population currently has access to electricity, with Kabul suffering power shortages. Three hydro-electric power dams provide baseload power to Kabul: the 100 MW Naghlu dam, the 66-MW Mahi Par dam, and the 22-MW Sarobi dam. Due to a lack of water flow on the Kabul River, only the Naghlu Dam, which has a sizable reservoir capacity, is operational all-year round to meet the needs of Kabul. The dams are located about 50 miles from Kabul. Prior to the early 1990s, Kabul also had two gas-fired power plants located on the outskirts of the city. ABB recently refurbished one of the plants, which has a 45-MW capacity.*	*Exploitation of Energy Resources*	*Impacts are expected to be minimal. No mitigation actions warranted.*	*None warranted.*

	It is anticipated to be used to meet peaking demand for the foreseeable future. In addition to commercial energy, Afghanistan utilizes such traditional, "non-commercial" energy sources as wood. According to a study by the ADB, more than 85% of Afghanistan's energy needs are met by such traditional fuels.			
3.3 Use of Natural / Depletable Resources	Rehabilitation of the Project Road will require the use of certain natural resources such as rock, sand and other quarried construction materials as required for the proposed rehabilitation activities. Such materials are in plentiful supply within Afghanistan.	Exploitation of Natural Resources	Impacts are expected to be minimal. No mitigation actions warranted.	None warranted.
		Demand for Construction Materials	Impacts are expected to be minimal. No mitigation actions warranted.	
3.4 Urban Quality / Design of the Built Environment	The Project Road is located within the central urban area of Kabul City. Details of land uses and potential impacts in immediate proximity to the road are discussed in **3.1** above.	Impacts to Roadside Structures and Activities	Impacts are expected to be minimal. No mitigation actions warranted.	None warranted.
3.5 Historic & Cultural Resources	Kabul itself has a number of valuable historic and cultural resources, however, the most significant cultural resource within the study corridor is a shrine located in the road itself at KM1+250. The shrine has a number of tombstones, but it is unclear whether the bodies remain in the tombs themselves or have been removed. The main issue is the location of the shrine which is only 4 meters from the centerline of the Project Road. If the road were to be widened this point will become a bottle neck for traffic and may even result in a potential road safety issues with cars swerving to avoid the shrine. Additionally, the shrine attracts a number of mourners, who	Demolition or Damage Due to Rehabilitation	To avoid potential adverse impacts to the tombstone the Sub-Contractor shall protect the site during Project works with the placement of suitable fencing and barriers. 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.	None warranted.

	congregate around all sides of the shrine, often standing in the road itself. This presents an additional pedestrian safety issue.			
4.0 ADDITIONAL ENVIRONMENTAL CONCERNS RAISED BY SIMILAR PROJECTS				
4.1 Socio-Economic Considerations	*Kabul (pop. 2,206,300) is the capital of Afghanistan and the capital of Kabul Province. The city is the countries largest industrial, business, finance and cultural center with the countries only international airport. The industrial factories within the city include machine building and metal working, light industry, woodworking, and food production. However, 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.* *Within the vicinity of the project road activities are predominantly commercial and are unlikely to be affected significantly by project works.*	*Impacts are Deemed Beneficial*	*No mitigation actions warranted.*	*None warranted.*
4.2 Public Health and Safety	*Existing traffic levels on the Project Road are moderate. However, no details are available indicating the level of road traffic accidents on the Project Road. Pedestrian crossings are provided along the roadway, however they are not used as traffic rarely stops to let pedestrians cross at these points. As mentioned above safety is rather lackluster on the Project Road, pedestrians can often be seen casually walking into the road without due care and attention, children can also be observed playing by the*	*Access to Heath Facilities*	*Access to health facilities will not be affected by Project activities. No mitigation actions required.*	*None warranted.*
		Contamination Due to Spills	*See **1.4** above.*	
		Air and Noise Impacts	*See **1.5 & 4.5**.*	
		Conflicts with NMT	*Impacts to safety in circumstances such as Afghanistan's could occur due to the incorporation or absence of provisions for non-motorized traffic (NMT).*	*Traffic Safety Programs are recommended for consideration as part of REFS Component 2.*
		Detours & Diversions	*Diversions and detours are an inevitable impact of road rehabilitation projects*	

	roadside or sometimes in the road itself. Additionally, roadside traders set their stalls in the road itself and cars (notably taxis) double park on both sides of the roadway which can lead to bottlenecking at certain busy sections of the road and reduces road operational efficiency. Vehicle road safety is also very poor in Kabul, as it is in Afghanistan in general. Many people drive without licenses or any kind of formal training in road traffic safety. Standing at any section of the Bibi Mahro Road for five minutes to observe traffic movements will bear testament to this statement.	 Excessive Speeds	and could give rise to safety issues. This section of the road is well policed and vehicles traveling at high speeds on this road are rarely observed. No mitigation actions warranted.	
4.4 Other Infrastructure Networks	Water supply, waste water and electricity supply systems are present in the vicinity of the Project Area. Some systems are poorly maintained and in need of rehabilitation. Indeed, a recent report published by Norwegian Church Aid indicates that water quality from hand pumps is higher than water quality from piped supply systems in Kabul. No irrigation systems are present within the vicinity of the Project Road.	Water Supply WW Collection Networks Electrical Systems	Road rehabilitation activities could impact other infrastructure systems such as water supply and wastewater collection networks, electrical lines, etc. Sub-Contractors are required to coordinate with all relevant officials to avoid significant adverse impact to other infrastructure systems.	None warranted.
4.5 Noise	There is no continuous monitoring program in place for the Project Corridor and available records across the City are patchy and provide no firm basis for analysis. There only appears to be one major point source of noise pollution, Kabul International Airport. Apart from this source, the most potentially significant noise levels are from traffic. Kabul International Airport is located at	Rehabilitation Phase Operational Phase	Contracts will contain provisions to mitigate potential noise and vibration impacts during construction No mitigation actions warranted.	None warranted.

the end of the Project Road. Air traffic is relatively low for an international airport, however noise levels from the ageing Ariana fleet and large soviet designed transporters can be particularly obtrusive over the City itself. Notwithstanding the above, the north – east direction of the main runways precludes any significant noise issues within the study corridor itself. ISAF and independently chartered helicopters also use the airport, but such traffic is infrequent and rarely traverses the study corridor.

Traffic levels on the Project Road are moderate. There are only two noise sensitive receptors within the corridor, they include:

Receptor	***Location***	***Distance from Road***
School	*KM1+300*	*40m from road side ditch*
Girls School	*KM1+800*	*15m from road side ditch*

Given the current levels of traffic on the project road it is not considered likely that either of the schools are significantly affected by existing road traffic noise levels. However, this does not preclude the possibility of traffic volumes rising considerably if the study corridor is developed as a commercial corridor.

There are some elevated noise levels in

	proximity to the various light industrial workshops and warehouses within each sector, but this results from intermittent, short term use of specific equipment during working hours and are not particularly problematic.			

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

AIR QUALITY

Potential Impact Source	**Mitigation Objective**	**Mitigation Checklist** Do designs and bid documents include the following provisions?	**Implementation Mechanism & Responsibility**
Material Transport	Minimization of dust during transport of 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).
Material Storage	Minimization of dust during storage of construction material.	Stockpiles of materials shall be sited in sheltered areas away from sensitive areas and covered with tarps if 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 and located at least 50 meters from the nearest sensitive receptor. Solvents and volatile materials must be used and stored 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.	Required by Project Contracts. Enforced by SE.
Dust Generating Operations	Avoidance of dust generating operations during periods of high wind	In periods of high winds, dust generating options shall not be permitted within 50 meters of sensitive sites given the direction of the prevailing wind.	Required by Project Contracts. Enforced by SE.

WATER QUALITY

Potential Impact Source	**Mitigation Objective**	**Mitigation Checklist** Do designs and bid documents include the following provisions?	**Implementation Mechanism & Responsibility**
Uncontrolled Runoff During Project Works	Avoidance of inadequately planned runoff due to development of staging areas, labor camps, etc.	Runoff from during project works 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.

NOISE

Potential Impact Source	**Mitigation Objective**	**Mitigation Checklist** Do designs and bid documents include the following provisions?	**Implementation Mechanism & Responsibility**
Construction Machinery	Minimize high noise levels, vibrations at time of occurrence	Use equipment conforming to international standards and directives on noise and vibration. Maintain exhaust systems in good working	Required by Project Contracts. Enforced by SE.

		order, properly design engine enclosures, use intake exhaust silencers and regularly maintain noise generating equipment.	
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.
Paving And Other Rehabilitation Activities.	Minimize high noise levels and times of occurrence.	Limited construction hours in sensitive areas. Use of properly maintained equipment. Use of noise barriers where warranted. Public notification of construction activities and timing of activities generating significant noise and vibration levels.	Required by Project Contracts. Enforced by SE.

SOCIAL

Potential Impact Source	**Mitigation Objective**	**Mitigation Checklist** Do designs and bid documents include the following provisions?	**Implementation Mechanism & Responsibility**
Temporary Impacts Due to Rehabilitation Works	Minimize temporary impacts to residents and surrounding environment.	Coordinate all construction activities with neighboring land uses and respect rights of local landowners.	Construction requirements enforced by SE.
Health and Safety Impacts to Workers	Attend to the health and safety of Workers	Provide local, basic emergency health facilities for workers.	Construction requirements enforced by SE.

- **Water Quality Impacts.** Potential water quality impacts during the rehabilitation phase will also be mitigated through the controlled location of asphalt plants and similar sources of runoff, proper siting tabulated by **Exhibit 4.1** with compliance assured through the oversight of the SE.
- **Social Impacts.** Potential social issues 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 rehabilitation; to control air pollution and noise levels; to provide basic emergency heath facilities for workers and other factors having a potential impact will be assured through the oversight of the SE.
- **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 SE.
- **Noise and Vibration Impacts.** Contract provisions for the control of noise and vibration impacts during the rehabilitation phase through the use of site controls and time and activity constraints as tabulated by **Exhibit 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