EMERGENCY ROAD REHABILITATION PROJECT

AI-DARAJI BRIDGE
ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

28 OCTOBER 2013
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**Abbreviations**

AIM: Audit and Inspection Manager
BOD: Biological Oxygen Demand
DO: Dissolved Oxygen
DP: Displaced Persons
ESMP: Environmental –Social Management Plan
GRM: Grievance Redress Mechanism
MAC: Maximum Allowable Concentration
MMPW: Ministry of Municipalities and Public Works
MoCH: Ministry of Construction and Housing
MoE: Ministry of Environment
MSDS: Material Safety Data Sheets
OP: Operational Policy
PAPs: Project Affected Peoples
WB: World Bank
EXECUTIVE SUMMARY

1. Introduction

This executive summary reflects the main issues (project description, baseline conditions, impact analyses, mitigation measures and monitoring arrangements) of the Environmental and Social Management Plan (ESMP) conducted for the construction of a new bridge in Al Daraji (which replaces the temporary bridge with a steel bridge). The main objective of the ESMP is to examine the environmental and socio-economic impacts of the project (both construction and maintenance phase), and to propose mitigation measures.

The wider objective of the project is to improve the condition of rural road networks. The specific objective is to replace the temporary bridge structures (floating bridge rapidly approaching the end of its useful life) in Al Daraji by a new stationary bridge.

The project is expected to result in significant socio-economic benefits for the local communities and surrounding areas as it will improve the speed and ease of transport, including for movement of locally products to markets. Increased traffic flow resulting from the bridge improvements will also increase livelihoods opportunities for local residents through small businesses service passing traffic.

2. Legal and Administrative Framework

For legal aspects, the work during construction and operation must follow the Iraqi laws and regulations for the Environmental Standards. These are laws of the environment protection No.3 issued in 1997 and the published regulations. No environmental regulations for gaseous emissions, noise and other air pollution standards are in force and legally binding. However, limits for water disposal in any surface waters and main sewers are regulated according to the regulations no. (25)/1967 and their update modifications released from the ministry of health and the ministry of the environment. Law of heritage and antiques no. (55) Issued in 2002, while for a sanitary waste (municipal) the regulations of the MOE must be followed, and for the rubbles (construction & demolition waste) the regulations, legislations and instruction of both MoE and MMPW must be followed.

It should be noted that legislation relating to social safeguards issued in Iraq since 2003 has focused primarily on the ratification of international conventions and protocols on issues such as cultural heritage. As yet there are no formally adopted requirements for social assessments relating to road works. Hence, social safeguards issues remain very largely uncovered except to the extent they are referred to under environmental laws.
In addition to the Iraqi laws and regulation the ESMP will comply with key safeguards policies and procedures of the World Bank–specifically OP/BP4.01 Environmental Assessment and OP/BP 4.12 Resettlement.

3. **Project description**

The scope of project consists of a fully paved two lane bridge with a total length of (160m) (with the approaches from both river banks), 9m width and two pedestrian walk of (1.5 m) width. The bridge will be fully lighted with electrical posts. The bridge was under construction with approximately 55% accomplished rate. All board piles, columns, cross beams (except P1), abutments and earth work have been implemented (see annex 1 for photographic evidence). The initial works were guided by ESIA for four bridges issued in July 2012.

The initial scope of work of Al Daraji bridge project was to replace the old pontoon bridge that links Euphrates banks at Al Daraji town by a concrete bridge. Due to slow and unsatisfactory contractor’s implementation, the contract was terminated and then re-tendered to carry out the remaining works of the bridge. However, the design of the bridge was revised and modified to steel superstructure for engineering reasons. This resulted in demolition of some parts of the pre-constructed failed concrete girders. Despite the changes in the design no additional area will need to be taken to cover the new design demands.

While the previously constructed pillars are to be reused as the basis for a steel-based deck, the concrete girders, reinforcing bar and other deteriorated construction material will remain to be disposed of. The shaped and stockpiled steel bar might, after rehabilitation, be suitable for small buildings where structural loading is not a significant consideration. If this is not feasible, the steel should go for recycling. The 20 m long pre-stressed girders might be broken up, the steel recycled and the concrete crushed for use a sub-fill in the new bridge abutments.

Official dumpsite used by the former contractor for construction waste generated by the project is located 6 km south east of the bridge less than 100m from the Euphrates River. The new dumpsite is located 20km south west from the bridge in a distance of more than 15km from the Euphrates. The dumpsite is designated for disposal of the project construction waste including the concrete girders installed by the former contractor. It is an unsanitary dumping site with no technical or environmental provisions. The works require one borrow pit (located 6 km west of the site) and one spoil site.

The former contractor’s and worker’s camp (accommodating about 50 workers) was located about 100 from the northern bank of the Euphrates River. It included two septic tanks in a distance of 150m from the river. New location of the worker’s camp is immediately to the west of the former camp (75m from the river bank). The site will be equipped with two septic tanks located about 150m from the river bank.
4. **Environmental and Social baseline conditions**

The baseline environmental and social data were collected through research, field visits and public consultations.

Land in the vicinity of the bridge is used mainly as farmland and fallow fields. Land being used for bridge construction is all State-owned land (see Annex 3). The villages in the vicinity of the bridge are not close to or adjacent to the bridge or on-ramps. Only seven small buildings are located within 100m of the project site, and these include a small water pumping station and storage shed. None of these buildings are sufficiently close to the bridge construction area that they are likely to be adversely affected by either the construction activities or the operation of the bridge once it is in use.

The climate of the area is dry with the average annual precipitation below 100mm. The ambient air quality is good. The concentration of pollutants is well below allowable standards. The noise levels are elevated due to the traffic congestions on the temporary pontoon bridge. There are no protected areas or endangered species in the site vicinity. The site adjacent area does not include any historical or cultural sites. No additional land is needed to proceed with the project.

The Euphrates is polluted with chemicals from agriculture, industry, and sewage making it an unreliable source for domestic use and restricting it for other usage. The former bridge contractor had in-filled the river for more than 50% of its width, releasing large volumes of sand and silt into the already sediment-laded river. The bund created must be removed on completion of the project and the river width returned to that immediately upstream and downstream of the construction site.

5. **Public Consultations**

Bank policies require that broad and open public consultations be held with PAPs on the project. Ideally, these consultations would commence prior to the launch of project so project affected peoples (PAPs) are provided with the opportunity to engage in the planning process, to raise questions and receive input and responses to their concerns, and so any PAPs likely to be adversely affected by project activities are informed in advance of their rights to mitigation and/or compensation. In the case of the al-Daraji bridge, public consultations were not held prior to the initial commencement of works. However, serious efforts were made to remedy this shortcoming with the cancellation of the initial contractor’s contract and with the redesign of the bridge.

To obtain sound and representative information on the possible socio-economic circumstances of the local community members, and better understand any possible adverse socio-economic effects of project activities on PAPs and the local community, local residents were consulted using two approaches, a structured survey questionnaire that was fielded to 8 randomly selected individuals, and open small group discussions,
conducted over several days to community members in the vicinity of the bridge and in different areas of the community and neighboring agricultural areas in the vicinity of the bridge. Additionally, a few local officials were sought out and asked to respond to the survey questionnaire, while consultations and open small-scale discussion groups were also held around the construction site. It was felt that this multi-faceted approach ensured wider participation and representation by more diverse community groups than would one formal consultation process. The survey questionnaire and the open multiple consultation/discussion sessions gathered information on the public’s impressions, experiences prior to and during construction, and expectations of the new bridge structure. The outcomes of the consultations and discussions revealed widespread support for the project activities which are widely anticipated to have positive impacts on people’s social and economic circumstances. No comments were made during the consultations on issues relating to water quality in the river which was already known to be very poor prior to commencement of bridge construction. The consultations and discussions confirmed that there has been no requirement for any relocation/resettlement of households or businesses/vendors as a result of project activities, and hence no claims for mitigation/compensation for loss of income or income-generating activities made.

6. **Environmental and Social Impact Analysis**

Overall, based on the field surveys and environmental and social assessment, Al-Daraji Bridge is unlikely to have major negative impacts on the environment during the constructional and maintenance phases, and is anticipated to have significant positive social impacts on the local communities. While a number of minor impacts on the environment may occur during the two phases, these minor impacts will have no significant influence on the environmental parameters and conditions. The main environmental impacts of the project will be associated with activities during the construction period. These include soil erosion, river siltation, noise, dust, generation and handling of construction and other waste, and health and safety concerns associated with construction workers. Mitigation measures will be taken to minimize the environmental costs by reducing the identified adverse environmental impacts.

The minor expected negative environmental impacts include:

1. Increased noise level and deterioration of air quality resulting from the construction phase.
2. River siltation by earthworks on the soil bund in the river.
3. Soil erosion of the river banks due to the construction activities.
4. Vegetation cover, flora and fauna affected by the constructional phase.
5. Possible river pollution by the discharge/leakages of oil, chemicals and domestic sewage from the river camp.
6. Contamination of soil and river by construction and municipal waste generated and stored within the site.
From the socio-economic perspective, both the construction and maintenance phases are expected to have positive impacts on the communities living near the area. Transportation will be significantly enhanced which will facilitate movement of locally agricultural production to markets. Additionally, the anticipated increase in through-traffic resulting from ease of movement across the new bridge will create new business and vending opportunities for local residents, improving livelihood opportunities. Moreover, the new bridge will reduce the current traffic congestion and the risk of accidents compared to the previous floating bridge.

7. Mitigation Measures

The required mitigation measures for each of the minor environmental impacts and any adverse socio-economic impacts that arise have been considered. Furthermore, a complete monitoring and auditing system were suggested for each environmental parameter in order to sustain the environmental situation in the area of the projects. These measures should significantly reduce the identified potential minor impacts.

The mitigation measures address the environmental and social impacts of the project. They include:

1. Minimize noisy operations at night.
2. Noisy machines should be replaced by manual workers wherever practicable.
3. Maintain vehicles and machinery in good condition in order to minimize exhaust emissions.
4. Application of water spraying using a daily water tanker during the construction works.
5. Preventing earthworks on the soil bund in the river during rainy days and turbulent river flows.
6. Avoid discharging or leakages of any chemicals in the site or in open spaces.
7. Ensure that construction preparations are located away from populated areas.
8. Confining ad hoc vehicle maintenance and refueling areas within the site.
9. Temporary storage of construction and municipal solid waste in locations agreed with the local community. Disposal of waste in newly designated sites.
10. Domestic sewage from the workers’ camp must be stored in properly sealed septic tanks, and discharged to sewage treatment plants.
11. Any hazardous waste must be collected and stored in sealed containers prior to disposal in a designated area approved by the authorities.
12. Protection of vegetation during the construction works.
13. Operation of a GRM system prior to commencement of works on the steel bridge, and its continued operation for one year subsequent to opening of the bridge to traffic. Any emerging adverse socio-economic impacts of the project can be channeled by the public to this GRM for discussion, resolution and, if appropriate, mitigation.
Emergency Road Rehabilitation Project  
Al-Daraji Bridge Environmental & Social Management Plan

The major issue in this Project is environmental in nature, and concerns the fate of the failed concrete graders that must be managed according to good environmental practice. The proper mitigation measures were identified and explained, and the coordination was made with the official partners and stakeholders (resident engineer, MMPW, MoE, contractor) for safe and proper management and disposal of these items. The designated borrow pit for demolished concrete has been designated by the municipality of the district. The borrow pit is located 6 km to the west of the bridge. Once the works started at the project site a focal point was assigned by the local authorities to overseeing the dumping process.

The proposed mitigation measures are affordable and practical. They will ensure a minimum impact on the environment as it was recorded in the field visits to the sites and meetings with the local population. The proposed measures reflect the expectations of the local communities obtained during the public consultation process.

8. Environmental and Social Management Plan (ESMP)

The measures in the ESMP are based on the assessment of the impacts as stated in this document. The cost of implementing the ESMP will be integrated into the contractor’s cost for each parameter. The total cost of implementing the ESMP is estimated at $42,000, and broken down as follows (see tables 1, 3 and 4 for details):

- Mitigation measures = $9,000 (captured in the construction contract)
- Monitoring = $11,000
- Training and institutional strengthening = $22,000.

9. Monitoring & Institutional Strengthening

A complete monitoring, auditing and reporting program was set forward in order to ensure proper implementation of mitigation measures, and maintain or improve the environmental and the socio-economic characteristics of the area adjacent to the new bridge during the construction and operation phases of the project.

The monitoring program will focus on noise impact, air quality and water quality, plus any emerging socio-economic adverse effects. The monitoring activity will monitor the application of environmental and social mitigation measures and the result of monitoring activities shall be reflected in the monthly reports. An institutional framework and strategy for the involved official institutions were suggested in order to strengthen the capacity buildings in the field of the environmental monitoring and reporting procedures and methodologies.

An approximate estimate of US$ 11,000 will be required to implement the monitoring actions, and US$ 22,000 is envisaged for training and institutional strengthening activities (see tables 3 & 4).
Table 1. Mitigation Measures for Al-Daraji Bridge Project. Construction Phase.

<table>
<thead>
<tr>
<th>Indicator Parameter</th>
<th>Mitigated Parameter</th>
<th>Location</th>
<th>Mitigation Measures</th>
<th>Frequency</th>
<th>Responsibility</th>
<th>Cost US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.Air Quality</td>
<td>Dust arising</td>
<td>Along roads and at intersections</td>
<td>1. Wheel washing and damping on un-surfaced and vegetation free area</td>
<td>Once/day</td>
<td>Contractor with the acceptance of the resident engineer</td>
<td>500</td>
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<tr>
<td></td>
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<td></td>
<td>2. Retention of vegetation where possible will reduce dust movement.</td>
<td>Once</td>
<td>Contractor with the acceptance of the resident engineer</td>
<td>No cost</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>3. Excavations and other clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighboring area.</td>
<td>Daily</td>
<td>Contractor with the acceptance of the resident engineer</td>
<td>No cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4. Spraying all exposed soil surfaces with water when necessary to reduce dust</td>
<td>As required</td>
<td>Contractor with the acceptance of the resident engineer</td>
<td>500</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>5. A speed limit of 40km/h must not be exceeded on dirty access roads.</td>
<td>As possible</td>
<td>Contractor with the acceptance of the resident engineer</td>
<td>No cost</td>
</tr>
<tr>
<td>Odor emissions</td>
<td></td>
<td>Within the whole site</td>
<td>1. Regular servicing of vehicles in order to limit gaseous emissions (to be done off-site)</td>
<td>Once/week</td>
<td>Contractor with the acceptance of the resident engineer</td>
<td>No additional cost</td>
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<tr>
<td></td>
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<td></td>
<td>2. Regular servicing of onsite toilets to avoid potential odors.</td>
<td>As possible</td>
<td>Contractor with the acceptance of the resident engineer</td>
<td>No additional cost</td>
</tr>
<tr>
<td>2.Noise emissions</td>
<td></td>
<td>In the site and around</td>
<td>1. Limit noise to within standard working hours in order to reduce disturbance of residential areas in close proximity</td>
<td>As possible</td>
<td>Contractor with the acceptance of the resident engineer</td>
<td>No cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Construction site yards, workshops, and other noisy fixed facilities should be located well away from noise sensitive areas.</td>
<td>Daily</td>
<td>Contractor with the acceptance of the resident engineer</td>
<td>No cost</td>
</tr>
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<td></td>
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<td></td>
<td>3. Noisy operations should be combined so that they occur where possible at the same time.</td>
<td>Daily</td>
<td>Contractor with the acceptance of the resident engineer</td>
<td>No cost</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>4. Construction activities are to be contained to reasonable hours during the day and early evening. Night-time activates near noise sensitive areas should not be allowed.</td>
<td>Daily</td>
<td>Contractor with the acceptance of the resident engineer</td>
<td>No cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5. Equipment must be kept in good working order.</td>
<td>Daily</td>
<td>Contractor with the acceptance of the resident engineer</td>
<td>No cost</td>
</tr>
<tr>
<td>3.Flora</td>
<td>Damage to vegetation cover, trees</td>
<td>In the site and around</td>
<td>2. Limitation of disturbance to vegetation cover during construction works.</td>
<td>Daily</td>
<td>Contractor with the acceptance of the resident engineer</td>
<td>No cost</td>
</tr>
<tr>
<td>Indicator</td>
<td>Mitigated Parameter</td>
<td>Location</td>
<td>Mitigation Measures</td>
<td>Frequency</td>
<td>Responsibility</td>
<td>Cost US$</td>
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<tr>
<td>4. Fauna</td>
<td>Animals, pets disturbance</td>
<td>In the site and around</td>
<td>1. No interference with the calving and lambing season for most animal species.</td>
<td></td>
<td>Contractor with the acceptance of the resident engineer</td>
<td>No cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Placing speed limit signs</td>
<td></td>
<td>Contractor with the acceptance of the resident engineer</td>
<td>3,000</td>
</tr>
<tr>
<td>5. Waste Management</td>
<td>Generation of Rubble</td>
<td>In the site and around</td>
<td>1. Demolition rubble (failed concrete) must be cut and transported to new designated location (20km from the site) for rubble dumping in coordination with the MOE and MMPW officials.</td>
<td>Daily</td>
<td>Contractor with the approval of the resident engineer, consultant and the environmental directorate authority</td>
<td>2,000</td>
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<td></td>
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<td></td>
<td>2. Construction rubble must be disposed of in pre-agreed dumps that have been approved by the relevant Municipality.</td>
<td>Daily</td>
<td>Contractor with the approval of the resident engineer, consultant and the environmental directorate authority</td>
<td>500</td>
</tr>
<tr>
<td></td>
<td>Generation of general Litter</td>
<td>In the site and around</td>
<td>1. Refuse bins must be placed at strategic position to ensure that litter does not accumulate within the construction site.</td>
<td>Daily routine</td>
<td>Contractor</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Littering by the construction workers shall not be allowed under any circumstances.</td>
<td>Daily routine</td>
<td>Contractor</td>
<td>No cost</td>
</tr>
<tr>
<td></td>
<td>Generation and handling of Hazardous waste</td>
<td>In the site and around</td>
<td>1. All hazardous materials must be carefully stored in sealed containers, and then disposed of offsite at a licensed facility.</td>
<td>As required</td>
<td>Contractor with the approval of the resident engineer</td>
<td>300</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>2. Machinery must be properly maintained to keep oil leaks in check.</td>
<td>Daily routine</td>
<td>Contractor with the approval of the resident engineer</td>
<td>No cost</td>
</tr>
<tr>
<td>6. Health and Safety</td>
<td>Accidents and injuries</td>
<td>In the site and around</td>
<td>1. First aid facilities must be available on site at all times.</td>
<td>Daily</td>
<td>Contractor with the approval of the resident engineer</td>
<td>120</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>2. All equipment is maintained in a safe operating condition.</td>
<td>Daily routine</td>
<td>Contractor with the approval of the resident engineer</td>
<td>No cost</td>
</tr>
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<td></td>
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<td>4. Personal Protective Equipment (PPE) available for all construction staff. Helmets and safety shoes must be worn at all times and other PPE worn were necessary i.e. dust masks, ear plugs etc.</td>
<td>Daily routine</td>
<td>Contractor with the approval of the resident engineer</td>
<td>200</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5. Adequate warning signs of hazardous working areas.</td>
<td>As required</td>
<td>Contractor with the approval of the resident engineer</td>
<td>120</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>6. Emergency numbers for local police and fire department will be placed in a prominent area.</td>
<td>As required</td>
<td>Contractor with the approval of the resident engineer</td>
<td>No cost</td>
</tr>
<tr>
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<td></td>
<td>7. Firefighting equipment will be placed in prominent positions across the site where it is easily accessible. This includes fire extinguishers, a fire blanket as well as a water tank.</td>
<td>As required</td>
<td>Contractor with the approval of the resident engineer</td>
<td>200</td>
</tr>
<tr>
<td>Indicator</td>
<td>Mitigated Parameter</td>
<td>Location</td>
<td>Mitigation Measures</td>
<td>Frequency</td>
<td>Responsibility</td>
<td>Cost US$</td>
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<tr>
<td>7. Water Quality</td>
<td>Siltation and pollution of the river</td>
<td>In the site and along the roads</td>
<td>1. Careful elimination of the river soil bund during low water flow summer to autumn.</td>
<td>As required</td>
<td>Contractor with the approval of the resident engineer</td>
<td>No cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Regular servicing of vehicles and machines to eliminate leakages.</td>
<td>Daily routine</td>
<td>Contractor with the approval of the resident engineer</td>
<td>No additional cost</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>3. Domestic sewage collected in septic tanks and discharged to water treatment plant.</td>
<td>Daily routine</td>
<td>Contractor with the approval of the resident engineer</td>
<td>No additional cost</td>
</tr>
<tr>
<td></td>
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<td>4. Fuel and chemicals must be sealed and stored in sites that will prevent leakages.</td>
<td>As required</td>
<td>Contractor with the approval of the resident engineer</td>
<td>200</td>
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<td></td>
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<td>5. Water from construction site must be discharged to river channel in a manner that does not cause siltation or erosion into the water course.</td>
<td>As required</td>
<td>Contractor with the approval of the resident engineer</td>
<td>160</td>
</tr>
<tr>
<td>8. Traffic</td>
<td>Traffic Congestion</td>
<td>Along bridge and at intersections</td>
<td>1. Good Traffic management</td>
<td>As possible</td>
<td>Contractor with the approval of the resident engineer</td>
<td>No cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Access of the construction and material delivery vehicles should be strictly controlled, especially during wet weather to avoid compaction and damage to the topsoil structure.</td>
<td>As possible</td>
<td>Contractor with the approval of the resident engineer</td>
<td>No cost</td>
</tr>
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<td></td>
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<td>3. Strategic positioning of entry and exit points to ensure as little impact/effect as possible on the traffic flow.</td>
<td>As required</td>
<td>Contractor with the approval of the resident engineer</td>
<td>No cost</td>
</tr>
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<td></td>
<td>4. Clear information sign posts must be installed: speed limits, max. load, safety signs.</td>
<td>Daily</td>
<td>Contractor with the approval of the resident engineer</td>
<td>600</td>
</tr>
<tr>
<td>9. Soil erosion</td>
<td>Soil erosion</td>
<td>Within project area</td>
<td>1. Retention of vegetation where possible to avoid soil erosion.</td>
<td>Continuous</td>
<td>Contractor with the supervision of the resident engineer</td>
<td>No cost</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>2. The use of silt fences and sand bags must be implemented in areas that are susceptible to erosion.</td>
<td>As required</td>
<td>Contractor with the supervision of the resident engineer</td>
<td>500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5. Where feasible, increase the mass thickness of the rock fill to provide additional stability.</td>
<td>As required</td>
<td>Contractor with the supervision of the resident engineer</td>
<td>TBD</td>
</tr>
<tr>
<td>10. Socio-economics</td>
<td>Loss of land, structures, productive plants and livelihoods caused by bridge construction</td>
<td>Project area</td>
<td>1. A complaints register will be kept on site and will feed into the GRM. Details of complaints received will be incorporated into the audits as part of the monitoring process.</td>
<td>Daily routine</td>
<td>Contractor with the supervision of the resident engineer, and the operational entity (MoCH) responsible for overseeing effective operation of the GRM</td>
<td>No cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total cost US$ (construction phase)</td>
<td></td>
<td></td>
<td>9,000</td>
</tr>
<tr>
<td>Indicator</td>
<td>Mitigated parameter</td>
<td>Location</td>
<td>Mitigation Measures</td>
<td>Frequency</td>
<td>Responsibility</td>
<td>Cost USD</td>
</tr>
<tr>
<td>-----------------</td>
<td>---------------------</td>
<td>-----------------------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>------------------------</td>
<td>---------------------------------------------------------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Waste management</td>
<td>Waste storage and disposal</td>
<td>Along roads</td>
<td>- Proper storage and disposal of solid waste.</td>
<td>Periodic, during maintenance work</td>
<td>Contractor in coordination with the Supervising Consultant and the environmental authorities</td>
<td>Included within the contractor’s fees</td>
</tr>
</tbody>
</table>
| Soil            | Soil erosion        | Along roads           | - Cleaning of drainage systems  
- Restoration of vegetative cover                                                   | Periodic, during maintenance work | Contractor in coordination with the Supervising Consultant                        | Included within the contractor’s fees |
| Traffic         | Congestion          | Along roads and at intersections | - Provision of alternative access roads/ by-passes  
- Traffic management                                                              | Periodic, during maintenance work | Contractor in coordination with the Supervising Consultant                        | Included within the contractor’s fees |
| Air quality     | Dust                | Along roads and at intersections | – Usage of well-maintained equipment  
– Water spraying for dust control                                                   | Periodic, during maintenance work | Contractor in coordination with the Supervising Consultant                        | Included within the contractor’s fees |
| Noise           | Hearing noise level | Along roads           | – Limiting noisy activities to normal daylight hours  
– Provision of speed limit signs at critical locations  
– Planting trees in sensitive zones                                                | Periodic, during maintenance work | Contractor in coordination with the Supervising Consultant                        | Included within the contractor’s fees |
| Socio-economics | Adverse effects on PAPs via loss of land, structures, productive plants, or livelihoods as a result of bridge operation. | Within project area | - Maintenance of an active GRM system for one year following opening of the bridge to traffic | Ongoing, with dedicated coverage in all audit reports | MoCH                             | Included within standard operating costs of MoCH |
| Water supply    | Damage to water pipes | Along roads           | – Protecting water supply systems  
– Coordination with land owners on scheduling maintenance activities                | Periodic, during maintenance work | Contractor in coordination with the Supervising Consultant                        | Included within the contractor’s fees |
| Fauna and flora | Vegetation, animals | Along roads           | – Periodic cleaning and maintenance of culverts to facilitate amphibians crossing     | Periodic, during maintenance work | Contractor in coordination with the Supervising Consultant                        | Included within the contractor’s fees |
| Safety          | Accidents and injuries | Along roads          | – Providing contractor’s workers with Personal protection equipment such as eyeglasses, gloves, hard heads and safety | Periodic, during maintenance work | Contractor in coordination with the Supervising Consultant &traffic police authority | Included within the contractor’s fees |
### Table 3. Proposed environmental and social monitoring programs.

<table>
<thead>
<tr>
<th>Mitigated Parameter</th>
<th>Parameters To be Monitored</th>
<th>Location</th>
<th>Measurements (incl. methods &amp; equipment)</th>
<th>Frequency of Measurement</th>
<th>Responsibilities (incl. review and reporting)</th>
<th>Cost (equipment &amp; individuals)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Construction Phase</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air Quality</td>
<td>NO\textsubscript{x}, TSP, CO, dust</td>
<td>Cross the bridge</td>
<td>Portable instruments</td>
<td>Twice a year, monthly for dust</td>
<td>Ministry of the Environment</td>
<td>2000 US$</td>
</tr>
<tr>
<td>Noise</td>
<td>Noise</td>
<td>Cross the bridge</td>
<td>Portable instruments</td>
<td>Monthly</td>
<td>Ministry of the Environment</td>
<td>4000 US$</td>
</tr>
<tr>
<td>Water quality</td>
<td>Suspended Solids, HC</td>
<td>Al-Daraj River Bridge, 2 checking pts. at 100m upstream and 200m downstream</td>
<td>Portable instruments</td>
<td>Twice a year During earthworks on the soil bund in the river</td>
<td>Ministry of the Environment</td>
<td>5000 US$</td>
</tr>
<tr>
<td>Socio-economic</td>
<td>Complaints lodged through GRM</td>
<td>Communities adjacent to the bridge</td>
<td>Number of complaints lodged and resolved</td>
<td>Monthly</td>
<td>MoCH</td>
<td>No direct cost</td>
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<tr>
<td><strong>Total:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>11,000 US$</td>
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</tbody>
</table>

BOD = biochemical oxygen demand, CO=carbon monoxide, NO\textsubscript{x}=nitrogen oxides, pH=an expression of the basic or acid condition, SS=suspended solids, TSP=total suspended

### Table 4. Institutional Strengthening and Training

<table>
<thead>
<tr>
<th>Institutional Strengthening Activity</th>
<th>Position(s) (Institutions, contractors, supervision consultants)</th>
<th>Scheduling</th>
<th>Responsibilities</th>
<th>Cost Estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mitigation (including social)</strong></td>
<td>Contractors, resident engineers; MoCH GRM staff</td>
<td>5 days</td>
<td>MOCH</td>
<td>2,000 US$</td>
</tr>
<tr>
<td><strong>Monitoring</strong></td>
<td>Ministry of Environment, resident engineers, municipalities members</td>
<td>10 days</td>
<td>MOCH, MoE, MMPW</td>
<td>10,000 US$</td>
</tr>
<tr>
<td><strong>Environmental and social assessment (principles, methodology)</strong></td>
<td>Ministry of Environment, MoCH</td>
<td>5 days</td>
<td>MoE</td>
<td>10,000 US$</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
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<td>22,000 US$</td>
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</tbody>
</table>
1. INTRODUCTION

The concept of the Environmental and Social Management Plan (ESMP) is to propose measures to protect the environmental, social and socio-economic situation of the communities that may be adversely affected by development of the project, and to assist the competent authorities in taking decisions regarding the approval conditions for the project. This ESMP was developed to cover the activities associated with the construction and maintenance of the access road and the bridge. The ESMP identifies key environmental and social impacts of the project activities during both the construction and the maintenance phases, and defines the necessary mitigation measures addressing potential negative impacts, as well as monitoring procedures, that should be addressed and implemented during the Al-Daraji Bridge construction and maintenance phases.

The ESMP study was carried out according to requirements of the current environmental regulations of the World Bank (OP 4.01 and OP 4.12) and Iraqi regulations. In this report the WB, and Iraqi environmental and social standards and regulations were followed to ensure the national and international acceptance and compliances of the ESMP.

The ESMP is designed to be dynamic and responsive. It was prepared and revised during the consultation and detailed design phases.

This updated ESMP presents an additional analysis of the conditions due to change in project scope and status. The initial project scope was to replace the temporary pontoon bridge with a more permanent concrete structure. Due to a number of reasons the construction was halted and the contract was terminated. In reviewing the project, a revised designed was considered to construct a steel bridge compared to a concrete one. Therefore, and as results of the previous construction stage some of the elements of the old scope including failed tested concrete beams will need to be properly disposed, within the environmental regulations and standards, in order not to harm the environment and the community and in accordance with mitigation measures presented in this ESMP. This ESMP provides also guidance on the measures to be adopted to discard the old pontoon bridge which will be removed once the new bridge is constructed and open to traffic.

1.1 Objectives

The objectives of this ESMP are to provide:

- Practical and achievable plans to ensure that the project’s adverse environmental and social impacts are properly mitigated.
- An integrated plan for monitoring, assessing and controlling potential impacts.
- Support to Local and State authorities to enable setting approval conditions for the project based on relevant standards and procedures.
Emergency Road Rehabilitation Project
Al-Daraji Bridge Environmental & Social Management Plan

- Concentrate on positive aspects and benefits, mitigate negative impacts and avoid serious and irreversible damage to the environment and people

- An opportunity for holding consultation with the communities to get their input on the changes in the bridge design and to determine whether the bridge construction has, or is likely to, adversely affect the environmental and the local community.

- To inform the local community about the revised project activities and the environmental and socio-economic protection measures that are being followed; provide information on residents’ rights if they are adversely affected by project activities and bridge operation, and inform the local community of the existence of a grievance redress management (GRM) system through which they might lodge complaints and expect prompt and fair consideration.

ESMP establishes a framework for the identification of environmental protection, mitigation, monitoring measures to be taken during construction and maintenance phases of the project. The ESMP includes project description, mitigation measures, monitoring plan, management plans schedule, institutional arrangements, and public consultation. The ESMP will aim to achieve a good environmental and social performance during construction and maintenance. To meet this goal, the following activities, measures and programs must be followed:

(i) Environmental regulations
(ii) Application of all environmental and social mitigation and management measures.
(iii) Environmental and social monitoring plan.
(iv) Emergency and contingency plan.
(v) Institutional plan.
(vi) Environmental and safety measures.
(vii) Effective and open consultations with communities, community representatives and potentially affected persons.

Environmental and social monitoring is an important component of the ESMP. It provides the information for periodic review and refinement modification of the ESMP as necessary, ensuring that environmental and social protection is optimized in all project phases through monitoring and early detection and effective remediation of unwanted environmental and social impacts. Lastly, it will also demonstrate compliance with national and international regulatory requirements.
2. PROJECT DESCRIPTION

The wider objective of the project is to improve the condition of rural road networks. The specific objective of the project is the provision of permanent bridge and its approaches. It will also promote the country’s economic integration, facilitate trade, and support reconstruction efforts across all sectors.

The initial scope of work of Al Daraji bridge project is to replace the old pontoon bridge that links Euphrates banks at Al Daraji town by a concrete bridge.

The new bridge remains partially constructed and has clearly remained so for some months. All board piles, columns, cross beams (except P1), abutments and earth work was implemented. Approximately 55% of the bridge works was completed. These works were guided by ESIA for four bridges issued in July 2012. The aerial view of the project site is shown below. Photographic evidence is provided in annex 1.

For failing to meet contractual schedules and because of poor quality workmanship the original contractor, Khairat Al-Jinoub, was dismissed. The project was re-tendered in May 2013 to carry out the remaining works of the bridge. However, the design of the bridge was revised and modified to steel superstructure for engineering reasons. Location of the project is presented in figure 1. Despite the changes in the design no additional area will need to be taken to cover the new design demands. The demolition and handling of the pre-constructed failed concrete girders will need to be managed in an acceptable environmental approach.

The bridge will consist of a fully paved two lanes with a total length of 245 meters, 200 meters approaches from river banks, 9 meters width and two pedestrian walk of 1.5 meters width, and appropriate safety barriers, signage and lighting.

Figure 1. Location of the project.
3. BASELINE CONDITIONS

3.1 The Project Area

Samawah city and its suburban area have a long historic background of several thousand years as part of the Euphrates civilization. The principle agricultural activity in the area is date palm. Farming is the major economic activity of the surrounding area along the Euphrates River. Samawah is a major core city and has satellite towns and villages located along the river plain. On the left bank of the bridge there are farm land fallow fields. On the right bank, houses are located nearby the project location. Pumping facilities and administration facilities are situated near the likely access to the new bridge.

3.1.1 Existing Buildings

Land in the vicinity of the bridge is used mainly as farmland and fallow fields. There are very few buildings or houses in the vicinity of the project location. The following table shows a summary of existing buildings within 20m of project site (10m both sides of the road center line), within 100m of the project site (50m both sides of the road center line) and within a 500m circular area of the project site. The existing buildings are described in table 5.

<table>
<thead>
<tr>
<th>Table 5. Existing Buildings Located near to the Sub-projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al Daraji bridge</td>
</tr>
<tr>
<td>Within 20m</td>
</tr>
<tr>
<td>Within 100m</td>
</tr>
<tr>
<td>Vicinity</td>
</tr>
</tbody>
</table>

The majority of buildings surrounding the area are houses of the local community, school and a small water pumping station. As per the questionnaire (Annex 2) conducted with local community, the existing buildings of the local community were not adversely affected by the bridge construction activities and operation of the bridge.

In constructing the piers, the contractor infilled a section of river, effectively curtailing flow over more than 50% of its width. While emplacing this bund, primarily with bankside soil and generally fine material, substantial volumes will have been lost to the river, increasing downstream sedimentation. Subsequently, during periods of rain and turbulent flows, material from the bund will have been eroded into the river. Notwithstanding this, Euphrates Basin watercourses are heavily silt-laden and the usual ecological impacts, such as the smothering of river bed flora and bottom feeding fauna, may not have been as severe as might otherwise be expected.
3.1.2 The site Description

The bridge is located 19 km from the main intersection road between Nassirya- Samawah- Basra. When completed, the bridge will provide a crossing of the Euphrates River some 45 km ESE of Samawah, 50 km WNW of Nasiriya.

The surrounding of the bridge is an open area with a flat plateau. The main activities in the area are farming and agricultural activities.

The bridge is under construction with approximately 55% completion rate. The piling of piers has largely been completed. The alignment of the new bridge is marked by the line of six piers constructed prior to contract termination, on which a new steel superstructure is to be placed. The site contains much construction debris, primarily cast pre-stressed concrete girders and abandoned materials, all generally badly corroded, for which a sound plan for reuse or disposal is required.

The alignment of the new bridge is marked by the line of six piers constructed prior to contract termination. The five on the northern bank are all complete, while the sixth, a short distance off the southern bank is clothed in shuttering and remains to be cast.

Also on the northern bank are 10 pre-stressed concrete girders intended to span between the piers and the reinforcing bar for another is shaped in preparation for casting. All reinforcement, whether protruding from the cast girders, pre-shaped, or just stacked on site, is badly corroded and ill-suited to future use. One of the parapet sections has broken due to sub-standard concrete, and elsewhere the finish of the sections appears poor. The concrete in the piers appears to be better quality.

3.1.3 Previous situation of the site

The location was served by a temporary pontoon bridge deck steel plate. With a bridge length of (150 m) and width of (4m), large vehicles such as trucks were not able to cross the bridge. The condition of the pontoon bridge is unstable and rapidly approaching the end of its useful life. Several of the steel plates covering the timber decking are partially detached and lift as traffic passes.

Official dumpsite used by the former contractor for construction waste generated by the project is located 6 km south east of the bridge less than 100m from the Euphrates River. The dumpsite was recently closed by the Samawa municipality that designated another location as municipal dumpsite. The new dumpsite is located 20km south west from the bridge in a distance of more than 15km from the Euphrates (see figure 2). The dumpsite is designated for disposal of the project construction waste including the concrete girders installed by the former contractor. It is an unsanitary dumping site with no technical nor environmental facilities (see photo 1). The works require one borrow pit (located 6km west of the site) and one spoil site.
Figure 2. Location of the former and the new dumping sites where the project’s construction waste will be disposed.

Photo 1. The new dumping site located 20km from the Al Daraji bridge.
The former contractor’s and worker’s camp was located about 100 from the northern bank of the Euphrates River, and about 150m from the road alignment leading to the bridge. It included two septic tanks in a distance of 150m from the river (see figure 3 and photo 2). According to the MOCH PMT, the new location of the worker’s camp is immediately to the west of the former camp (75m from the river bank and 50m from the road alignment). The site will be equipped with two septic tanks located about 150m from the river bank. The expected number of workers accommodated in the camp is about 50.

Figure 3. Drawing showing the location of old and new location of worker’s camps, and the location of septic tanks.
3.2 Environmental and Social Baseline conditions

The environmental baseline section is presented to give clear overview of the environmental and social conditions in the vicinity of the project location prior to commencement of works. The elements of the environment include: climate and meteorology, air quality, surface and groundwater quality, river sediment and soil, topography, noise and vibration levels, traffic, rivers and waterways, biodiversity including flora, fauna, rare or endangered species, and sensitive habitats. It also includes consideration of socio-economic characteristics (such as population, land-use, planned development activities, community structure, employment, distribution of income, goods and services, recreation, cultural properties, customs, and attitudes. The following sections present such information.

3.2.1 Climate

Muthanna governorate is located in the southern part of Iraq and has an arid climate with sparse rainfall during the months of May to October. Highest temperatures in July and August reach over 45 degrees centigrade. Rainfall is normally recorded during the months of December to March. However the area of Muthanna governorate near to the Saudi Arabian border has very low rainfall.
3.2.2 Rainfall, wind velocity and temperature

Muthana area considered one of the arid areas in Iraq (climatologically atlas of Iraq 1998). According to this atlas the average seasonal annual rainfall is less than 100mm. It is characteristic to have rainfall from the end of November to March. According to the (environmental survey statistics/ Ministry of planning 2010) records, in 2010 the annual precipitation in Samawa governorate was 47.5mm.

Monthly wind velocity record in recent years is shown in the table 6. Generally, average wind velocity is approximately 2.3m/sec accordingly.

### Table 6. Monthly Mean Wind Speed

**Observation station: Samawah station Monthly mean wind velocity (m/Sec)**

<table>
<thead>
<tr>
<th>YEAR</th>
<th>JAN.</th>
<th>FEB.</th>
<th>MAR.</th>
<th>APR.</th>
<th>MAY.</th>
<th>JUN.</th>
<th>JUL.</th>
<th>AUG.</th>
<th>SEP.</th>
<th>OCT.</th>
<th>NOV.</th>
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</table>

Recent 12 years observation records of air temperature are shown in the following tables (7&8).

### Table 7. Monthly Mean Max. Temperature

**Observation station: Samawah station monthly mean Max. Temperature (°C)**

<table>
<thead>
<tr>
<th>YEAR</th>
<th>JAN.</th>
<th>FEB.</th>
<th>MAR.</th>
<th>APR.</th>
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<td>18.4</td>
<td>22.4</td>
<td>31.1</td>
<td>40.8</td>
<td>44.4</td>
<td>43.8</td>
<td>41.8</td>
<td>42.0</td>
<td>34.5</td>
<td>24.5</td>
<td>17.6</td>
</tr>
<tr>
<td>1998</td>
<td>15.8</td>
<td>19.8</td>
<td>23.2</td>
<td>31.3</td>
<td>39.0</td>
<td>44.6</td>
<td>45.7</td>
<td>46.3</td>
<td>42.0</td>
<td>35.9</td>
<td>30.0</td>
<td>23.2</td>
</tr>
<tr>
<td>1999</td>
<td>19.8</td>
<td>21.5</td>
<td>26.5</td>
<td>33.1</td>
<td>44.8</td>
<td>44.8</td>
<td>45.9</td>
<td>41.3</td>
<td>36.5</td>
<td>24.6</td>
<td>18.7</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>16.4</td>
<td>19.4</td>
<td>25.1</td>
<td>34.3</td>
<td>39.4</td>
<td>42.6</td>
<td>47.6</td>
<td>46.8</td>
<td>40.8</td>
<td>31.9</td>
<td>23.6</td>
<td>18.3</td>
</tr>
<tr>
<td>2001</td>
<td>17.4</td>
<td>21.2</td>
<td>28.3</td>
<td>33.2</td>
<td>38.2</td>
<td>43.1</td>
<td>45.4</td>
<td>46.9</td>
<td>42.6</td>
<td>35.9</td>
<td>25.6</td>
<td>20.5</td>
</tr>
<tr>
<td>2002</td>
<td>16.0</td>
<td>22.4</td>
<td>27.8</td>
<td>29.9</td>
<td>38.9</td>
<td>43.1</td>
<td>46.0</td>
<td>44.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>17.1</td>
<td>23.1</td>
<td>26.3</td>
<td>28.2</td>
<td>37.9</td>
<td>41.7</td>
<td>46.7</td>
<td>45.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3.2.3 Air Quality

Air quality monitoring data in the site vicinity was not found. The nearest air quality monitoring station is located in Basra – about 200km ESE of the site. The data from Basra show no exceedence of the maximum permissible concentrations for SO₂, NO₂ and CO (table 9). As the Al Daraji site is located in rural surroundings at the edge of the Euphrates that allows good ventilation and dispersion of any air pollutants, it is expected that the ambient air quality values for Al Daraji are at least at the same level of Basra.

<table>
<thead>
<tr>
<th>Time</th>
<th>SO₂ [ppm]</th>
<th>SO₂ EPA MAC 24h</th>
<th>NO₂ [ppm]</th>
<th>NO₂ EPA MAC 1 hour</th>
<th>CO [ppm]</th>
<th>CO EPA MAC 1 hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00:00 AM</td>
<td>0.0055</td>
<td>0.14</td>
<td>0.031</td>
<td>0.25</td>
<td>0.548</td>
<td>35</td>
</tr>
<tr>
<td>10:00:00 AM</td>
<td>0.0031</td>
<td></td>
<td>0.032</td>
<td>1.405</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11:00:00 AM</td>
<td>0.0029</td>
<td></td>
<td>0.024</td>
<td>0.802</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12:00:00 AM</td>
<td>0.0079</td>
<td></td>
<td>0.022</td>
<td>0.626</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1:00:00 PM</td>
<td>0.0067</td>
<td></td>
<td>0.018</td>
<td>0.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2:00:00 PM</td>
<td>0.002</td>
<td></td>
<td>0.076</td>
<td>0.376</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3.2.4 Site Topography

The project sites of Samawah and its suburban area represents an extension of the flat plateau areas that starting from the middle of Iraq till the mid-southern parts of the country. No specific terrains or natural land obstacles are presented in the project area. The area is free of mountains, cliffs, and valleys.

3.2.5 Land use

The land use of area surrounding the project is of agricultural nature. This rich agricultural region provides the governorate and the closest areas with winter and summer agricultural products. A spectrum of the community living in the vicinity of the project depends on the farming activities as major or additional financial revenue.

3.2.6 Geotechnical survey

Samawah city and its suburban area is a lay basin of the lower reaches of the Euphrates River, and alluvial soil is dominant in this region. Geotechnical characteristics of the region are deep silt-clay strata.

3.2.7 Seismic Activity

The site is located in southern of Iraq inside the borders of Governorate within the river Euphrates. No Seismic activities had been recorded for more than 25 years.

3.2.8 Water Quality and Flooding

The Euphrates is polluted with chemicals from agriculture, industry, and sewage making it an unreliable source for domestic use and restricting it for other usage (particularly below Baghdad). There are many sources of the Euphrates water pollution including petroleum fuels and by-products, sewage, solid waste, heavy metals, herbicides, pesticides, radioactive waste, toxic wastes, nutrient and sediments. The water quality in the project area is affected by high suspended solids (above 50 mg/l), BOD (5-10 mg/l) and increased salinity (Temporal and Spatial changes in water quality of the Euphrates river, Iraq; Lund University Sweden; 2011).

The analysis of the water quality in September 2013 from the Khedr city (located in the Al Daraji district) show (see table 10) that the river water is not suitable for irrigation. It is brackish and has high sulfates, calcium and magnesium content. The parameters indicated pollution by municipal sewage and agricultural fertilizers. The site survey found that the local community uses treatment and desalination station (treating water from the Euphrates) for drinking and household water, and does not use groundwater. Nevertheless, the local population uses the river water for irrigation.

Flooding is a possible hazard in the project area. The metrological data & observation station show that the lowest water level in Al-Daraji bridge was found to be (2.6m) and highest water
lend was (8m) with river cross-sectional discharge of (1700 m$^3$/sec) as design reline. However, for the past 40 years no flooding was recorded.

Table 10. Results of the Euphrates water sample analysis taken in Muthanna Governorate in September 2013.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Unit</th>
<th>Results</th>
<th>Iraqi Irrigation Water Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>mg/L</td>
<td>7.9</td>
<td>6.5-8.5</td>
</tr>
<tr>
<td>Temperature</td>
<td>°C</td>
<td>25.8</td>
<td>-------</td>
</tr>
<tr>
<td>DO (dissolved oxygen)</td>
<td>mg/L</td>
<td>6.2</td>
<td>&gt; 5</td>
</tr>
<tr>
<td>PO$_4$ (Phosphates)</td>
<td>mg/L</td>
<td>0.33</td>
<td>&lt; 0.4</td>
</tr>
<tr>
<td>NO$_3$ (Nitrates)</td>
<td>mg/L</td>
<td>3.101</td>
<td>&lt; 15</td>
</tr>
<tr>
<td>Ca (Calcium)</td>
<td>mg/L</td>
<td>261</td>
<td>0-20</td>
</tr>
<tr>
<td>Mg (Magnesium)</td>
<td>mg/L</td>
<td>57.86</td>
<td>0-50</td>
</tr>
<tr>
<td>T.H (Total Hardness)</td>
<td>mg/L</td>
<td>889.1</td>
<td>-------</td>
</tr>
<tr>
<td>K (Potassium)</td>
<td>mg/L</td>
<td>27</td>
<td>0-2</td>
</tr>
<tr>
<td>Na (Sodium)</td>
<td>mg/L</td>
<td>415</td>
<td>0-4</td>
</tr>
<tr>
<td>SO$_4$ (Sulphate)</td>
<td>mg/L</td>
<td>738</td>
<td>&lt; 200</td>
</tr>
<tr>
<td>Cl (Chloride)</td>
<td>mg/L</td>
<td>687.6</td>
<td>&lt; 200</td>
</tr>
<tr>
<td>TDS (Total Dissolved Solid)</td>
<td>mg/L</td>
<td>2635</td>
<td>&lt; 2000 good</td>
</tr>
<tr>
<td>E.C (Electrical Conductivity)</td>
<td>μs/cm</td>
<td>4117</td>
<td>&lt; 2000 permissible</td>
</tr>
<tr>
<td>ALK.(Anaplastic lymphoma kinas)</td>
<td>mg/L</td>
<td>203.8</td>
<td>-------</td>
</tr>
<tr>
<td>O&amp;G (Oil and gas)</td>
<td>mg/L</td>
<td>ND</td>
<td>-------</td>
</tr>
</tbody>
</table>

3.2.9 Traffic Level

The residents prior to the construction of the concrete bridge were dependent on the floated bridge. This caused many traffic problems, as this kind of bridge do not allow vehicles to pass by in two directions. In-turn it causes traffic congestion on the both sides of the bridges the vehicles from one side must wait in order to allow the vehicles from the other side to cross the bridge. Such cases were reported continuously on the bridge causing traffic problems and misunderstandings between the drivers.

3.2.10 Noise

As the result of the traffic congestion on both side of the floating bridge use of horns, shouting, engine noise are reported. These add an extra tension and stress to the bridge users (drivers and pedestrians).
3.2.11 Heritage Environment

The construction site of the bridge does not pass through any historical, cultural sites. There are no sites of historical or cultural importance in the area, and therefore the construction and operation of the plant will have no impact on archaeology or cultural heritage.

No cemeteries, historical-cultural monuments, churches, mosques near the project need to be removed in order to construct the bridge and the access road.

3.2.12 Land Acquisition

In this project and according to the official documents (attached), no additional land needed to be purchased, to allow construction works. The land needed for project implementation is state-owned. There are no livelihoods in the project vicinity that are likely to be adversely affected by the project, hence neither involuntary nor voluntarily relocation of people is necessary or expected.

3.2.13 Social Aspects

There are no villages or community structures in close proximity to the bridge or the on-ramp to the bridge. The bridge is being constructed on state land, and no land or property expropriation has been necessary. No roadside vendors, either licensed or non-licensed were displaced.

Although, bridge construction work was stopped temporarily and the task withdrawn from the previous contractor due to technical construction issues, the area and the approaches areas on either side of the bridge, even the temporary access roads, are not settled on or utilized by any of the local population. All the areas around and within the site remain clear of any settlement or economic use and are ready for continuation of the works, no interference were registered from the local community which is eager for the works to be completed. Also in spite of this stoppage, no new agriculture activities of any kind were initiated the project area, no vendors (licensed or unlicensed) established themselves, and no new buildings, shops, houses etc. were constructed or part-constructed within the project area. One of the major necessities of the locals in the area is to have a good accessible bridge to the other side of the river bank, as the previous floated bridge had many operational and maintenance difficulties that preventing in some cases the locals to ally transport between the river sides, in turn affecting their socio-economic situations.

An unfortunate social consequence of the dismissal of the original contractor has been that many of the local community members he employed have not been paid for the work they performed. Efforts are ongoing by MoCH to recoup these outstanding wages from the contractor.
4. LEGAL ASPECTS

4.1 Iraqi environmental legislation

The work during construction and operation must follow the Iraqi laws and regulations for the environmental standards. These are:

- Laws of the environment protection No.3 issued in 1997 and the published regulations. No environmental regulations for gaseous emissions, noise and other air pollution standards are in force and legally binding. However, limits for water disposal in any surface waters and main sewers are regulated according to the regulations no. (25)/1967 and their update modifications released from the ministry of health and the ministry of the environment.

- Law of heritage and antiques no. (55) Issued in 2002 (this law defines all movable and immovable antiquities, archaeological properties and artifacts in Iraq. It regulates communication channels between the public and the authorities for each type of Contact between the public and the revealed and non-revealed archaeological sites.

- New environmental framework Law No. 27 of 2009 for the Iraqi national government, have been introduced but the executive decrees remain to be prepared. There are as yet no formally adopted requirements for environmental assessment.

- Regulations governing contact with archaeological sites extend also to encompass developmental activities like road construction and rehabilitation wherever these developmental activities lie within archaeological vicinity. Regulations of the MOE on sanitary waste must be followed, and for the rubbles (construction & demolition waste) the regulations, legislations and instruction of both MoE and MMPW.

4.2 Iraqi social legislation

New legislation issued in Iraq since 2003 has focused primarily on the ratification of international conventions and protocols on issues such as biodiversity and cultural heritage. Subsequent to these ratifications, a new Law, No. 27 of 2009, on the Protection and Improvement of the Environment was been introduced, but the executive decrees remain to be prepared. As yet there are no formally adopted requirements for social assessment. Hence, social safeguards issues remain very largely uncovered except to the extent they are referred to under environmental laws.

4.3 The World Bank Safeguards Policies

In addition to the Iraqi laws and regulation the ESMP follows two key policies and procedures of the World Bank:
OP/BP 4.01 - the key Operational Policy describing the environmental assessment procedure. The Bank requires environmental assessment of projects proposed for Bank financing. The objectives of the EA are to:

- Ensure that projects proposed for Bank financing are environmentally and socially sound and sustainable.
- Inform decision makers of the nature of environmental and social risks.
- Increase transparency and participation of stakeholders in the decision-making process.

Involuntary resettlement OP/BP4.12 which focus on the following principles:

- Involuntary resettlement is avoided wherever feasible, or minimized, exploring all viable alternative project designs;
- Where it is not feasible to avoid involuntary resettlement, activities are conceived and executed as sustainable development programs. Displaced persons are to be meaningfully consulted and have opportunities to participate in the planning and implementing of resettlement programs affecting them; and
- Displaced persons are assisted in their efforts to improve their livelihoods and standards of living, or at least to restore them, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher. The mechanism of assisting displaced persons is based on full and prior mitigation and compensation for loss of assets or livelihoods.
- OP 4.12 applies whenever, in a Bank-financed project, land is acquired involuntarily or access is restricted in legally designated parks or protected areas.

Bank procedures for road works require that Grievance Redress Mechanisms (GRMs) be established and operational prior to commencement of the road works, and that they continue to operate for one year following completion of the works. A checklist of issues to be considered in the design of the GRMs includes the following:

- An inventory of any reliable conflict mediation organizations or procedures in the project area be undertaken and an assessment made to determine if any of these entities or procedures might be used instead of having to create new ones. A careful examination of possible existing procedures was undertaken for the al-Daraji bridge work and it was determined that no existing organization or procedure was pre-existing. It was thus decided that a grievance redress mechanism specific to this project activity offered the best means of ensuring that complaints were received and addressed in an effective, timely and transparent manner.
- Good practice is to ensure that PAPs can apply orally and in the local language and to impose explicit time limits for responding to grievances received. Appeal procedures need
to be specified, and this information is made publicly available. The GRM established for this specific project activity will, therefore, allow for both verbal and written grievances to be lodged with the local project authorities, who will transmit these to the local level committee for review, consideration and response.

A GRM has been established and its operation complies with the Bank’s requirements. The objective of the GRM is to respond to the complaints received from PAPs in a timely and transparent manner. The mechanism is designed to be easy, transparent and fair. The procedure will follow the following approach:

- At the first stage, PAPs will register their complaints and grievances to the grievance redress committee which will have to provide a written response to the PAPs, within fifteen calendar days of receiving the complaint.

- If the PAPs are not satisfied with the decision of the RC, the PAPs will present the case to the MOHC within fifteen (15) calendar days of receiving the written response from the RC authorities. The decision of the RC should be sent to PAPs by no later than fifteen calendar days of receipt of the PAP’s appeal.

- If the PAPs are not satisfied with the decision at the second level, the case may be submitted for consideration to the Governorate Council, or Municipality Council.

- PAPs will be exempted from all administrative and legal fees.
5. PUBLIC CONSULTATIONS

Bank policies require that broad and open public consultations be held with PAPs about the project. Ideally, these consultations should commence prior to the launch of project activities so PAPs are provided with the opportunity to engage in the planning process, to raise questions and receive input and responses to their concerns, and so any PAPs that are adversely affected by the project are informed in advance of their rights to mitigation and/or compensation. In the case of the al-Daraji bridge, public consultations were not held prior to the initial commencement of works. However, serious efforts were made to remedy this shortcoming with the cancellation of the initial contractor’s contract and with the redesign of the bridge.

To obtain sound and representative information on the possible socio-economic circumstances of the local community members, and better understand any possible adverse socio-economic effects of project activities on PAPs and the local community, local residents were consulted using two approaches, a structured survey questionnaire and open small group discussions, conducted over several days to community members in the vicinity of the bridge and in different areas of the community and neighboring agricultural areas in the vicinity of the bridge. Additionally, a few local officials were sought out and asked to respond to the survey questionnaire, while consultations and open small-scale discussion groups were also held around the construction site. It was felt that this multi-faceted approach ensured wider participation and representation by more diverse community groups than would one formal consultation process. The survey questionnaire and the open multiple consultation/discussion sessions gathered information on public impressions, experiences prior to and during construction, and expectations of the new bridge structure. The outcomes of both the structured questionnaire survey and the consultations and discussions reveal widespread support for the project activities which are widely anticipated to have positive impacts on people’s social and economic circumstances. The survey and consultations/discussions confirmed that there has been no requirement for any relocation/resettlement of households or businesses/vendors as a result of project activities and hence no claims for mitigation/compensation for loss of income or income-generating activities made. No concerns regarding water quality in the river were raised during the consultations; water quality is well-known to have been of very low quality prior to project activities and local communities do not appear to think that project activities are significantly worsening the situation. The first contractor necessarily built earthen berms in the river in order to install the bridge pillars; interestingly, the few local fishermen in the area have reacted very positively to these berms because they have aided their fishing activities. Attached is the Arabic and English version of the survey questionnaire and summaries of the main responses to questions and issues raised from the consultations. Table 11 refers to the questioner form and the responses of the respondents.
### Table 11. Responses of the residents regarding the bridge construction.

<table>
<thead>
<tr>
<th>Questions</th>
<th>% of respondents answering positively</th>
<th>% of residents answering negatively</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you think the construction and the operation of the bridge in the area have a positive or negative impact from the social perspective on the community living within the area, and adjacent areas?</td>
<td>100</td>
<td>____</td>
</tr>
<tr>
<td>Due to the stoppage in the construction activities, have there been any attempts by individuals, tribes, personnel, groups, NGOs …etc. to occupy the area in which the project is constructed?</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Is there any usage of the area, approaches etc. of the bridge area by the local population in any way that would be adversely affected by the bridge construction?</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Due to the construction activities, has there been any removal of any agricultural plants, trees, vegetation covers owned by the residences or the local community in the project area?</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Are there any claims for the compensation resulting from the bridge construction activities were registered by the local community, whose interests were affected by the construction activities?</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Was any temporary or permanent infrastructure that played a major role in the daily life of the resident affected by the construction activities?</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Due to the change of the bridge design, are there any persons displaced either under the original concrete structure or under the new metal structure?</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Are there any lost income-generating opportunities (loss of agricultural land; crops; trees; vending area; etc.) resulted from the new bridge construction?</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Due to construction of the new bridge, are there any new requirements for relocation or resettlement needed for any person(s), to a new location?</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Are there any vendors or residents who were based on or operating from, the government land areas prior to the initial construction of the bridge ramp ways?</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Are there any possible adverse socio-economic effects likely to result from the new bridge construction?</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>
Table 12 refers to the occupations of the residents from the area who participated in the survey and discussions.

Table 12. Occupations of the randomized residents consulted

<table>
<thead>
<tr>
<th>Occupation of consulted residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural workers</td>
</tr>
<tr>
<td>Official police employee</td>
</tr>
<tr>
<td>Small business owners and workers</td>
</tr>
<tr>
<td>Traders</td>
</tr>
<tr>
<td>Head of the local council</td>
</tr>
</tbody>
</table>

From the consultations all people agreed that the bridge, when finished, will enhance social and economic conditions in the immediate locality and also in adjacent areas. The main conclusion also reached was that no local groups, tribes, clans, or individuals have lodged claims for compensation, and no person’s household, business or livelihood has been adversely affected by the project activities. It was also clear that no removals of any implanted areas (productive trees, palm dates trees, crop production, vegetation cover etc.) have occurred or is likely to be required during construction works on the steel bridge. The construction activities have not crossed (intercepted) any infrastructure in the area, and no re-location, re-settlement or displacement of any individuals or families has been necessary due to the re-design and construction of the bridge. There are no demographic changes, or damage done to community and social networks by the bridge construction. And as an overall conclusion and from the survey, discussions and consultation, the community is strongly supportive of the bridge construction given the enhancements it is expected to bring to the community’s social and economic conditions.
6. IMPACT ASSESSMENT AND MITIGATION MEASURES

6.1 Construction Phase

This section of the report describes the environmental impacts that are likely to result from the construction of the bridge, and mitigation measures addressing them.

The Environmental actions, procedures and responsibilities as required during the construction phase must comply with the available specifications, legislation, laws issued by the MoE.

The construction contractor will be responsible for compliance with the ESMP provisions during the construction phase of the project. The contractor will be also in charge of undertaking work in a manner which complies with all relevant environmental procedures, adheres to all legislative requirements, and ensures that all environmental objectives associated with the contract are achieved.

The key environmental and social impacts are described below.

6.1.1 Soil Erosion

The earthworks to reduce/eliminate the soil bund in the river made during the former construction works may lead to significant erosion and siltation of the river. This impact can be mitigated by preventing such earthworks during the winter rainy season.

The bridge construction will intensify the effects of natural soil erosion that may be due to vegetation removal, soil disturbance, and exposure of bare soil surface. There will be no significant soil disturbances as the site will not need any preparation activities such as blasting. The key problems will be borrowed pits and spoil sites (only one borrow pit and one spoil site are planned), as well as bridge and culvert construction sites, particularly during rainy days. The eroded material may affect aquatic habitats and alter aquatic species’ life cycle events by increasing turbidity, changing the water temperature, changing the depth of water bodies, runoff of nutrients into the river.

These impacts can be mitigated by civil engineering control measures including: slope stabilization, vegetated buffer strips, silt fence. The soil erosion may cause damage to agriculture lands.

6.1.2 Water Quality

The primary impact of the project on the Euphrates is related to the fine material and soil bund established during the former construction of the piers and curtailing river flow over more than 50% of its width. This bund is subject to gradual erosion and associated siltation of the river particularly during periods of rain and turbulent flows. By the end of the construction phase, the bund will have to be eliminated or substantially reduced and this may cause short-term intensive siltation of the river. Notwithstanding this, Euphrates Basin watercourses are heavily silt-laden and hence the significance of this impact is considered low to medium.
The project is predicted to generate small volume of domestic sewage within the workers’ camp located about 100m from the river bank and used by about 50 workers. However, the sewage will be collected in sealed septic tank that will be regularly checked and emptied when filled up. Hence, the impact is considered minor.

Wastewater and hazardous materials (fuel, oil, acids, caustics, etc.) may drain into streams and drainage areas, causing pollution to the river or groundwater. This is particularly true for bridge construction activities, construction campsites, and staging areas where workers, construction equipment, and building materials are most concentrated.

The vehicles and machines used by the contractor will operate in the immediate vicinity of the river. Oil or fuel leakages can impact surface water quality. This impact can be substantially reduced by regular maintenance of vehicles.

There is no available official data and information regarding the ground water quality in the area, as the main dependence of the residences in the area is on the surface water, no monitoring or sampling station for the ground water is available in the area. The impact on the aquatic system of the completed works seems negligible. The fishermen had no complaints about the deficiency of fish species or quantities. No official records for the aquatic ecosystem were recorded for the area.

Other construction activities of the project are predicted to have very minor impact on the river quality and groundwater resources in the project area. Significance of these impacts is low due to relatively poor water quality in the Euphrates.

The mitigation measures: elimination of the soil bund in the river must be take carefully during low water flow and not during the winter rains period; domestic sewage must be collected in sealed septic tanks and discharged to water treatment plan; water from construction site must be discharged to river channel in a manner that does not cause siltation or erosion into the water course; fuels and chemicals must be stored and sealed to avoid leakages; contractor’s vehicles and machines must be regularly serviced to eliminate leakages of oil and fuel.

### 6.1.3 Air Quality Impacts

Construction activities - particularly earthworks, increased traffic, and the use of cement, asphalt, and other building materials will produce excessive airborne dust and toxic asphalt fumes. This will affect local air quality.

To minimize the dust impact, construction fields and major access roads and haul roads must be watered on a set schedule, particularly during the dry season. Construction materials storage and concrete mixing plants must be sited more than 100m away from dwellings. All the mixing equipment must be closed systems with dust extractors. Dust-generating materials must be stored and hauled in bags or containers with appropriate covers. Air quality needs to be monitored periodically.
6.1.4 Noise

Noise impacts are expected to increase during construction due to the use of construction machinery and earth-moving equipment. It is estimated (considering major construction equipment to be used) that the daytime noise levels must be within the applicable standards of 85 dB when the noise receptor is at a distance of 50m or more from the noise source - except for high noise equipment like pneumatic hammers. Due to the fact that most villages and schools are located 300m away or more from the bridge, no significant noise impacts are expected during daytime.

The mitigation measures include:

- Construction site yards, workshops, and other noisy fixed facilities should be located well away from noise sensitive areas.
- Noisy operations should be combined so that they occur where possible at the same time.
- Construction activities are to be contained to reasonable hours during the day and early evening. Night-time activates near noise sensitive areas should not be allowed.
- Equipment must be kept in good working order and where appropriate fitted with silencers which are kept in good working order.
- Use of personal protection equipment for workers.

6.1.5 Solid Waste

Due to the construction activities, various types of solid waste will be generated. Construction materials wastes, cements, bricks, sand, and gravels, as well as food remains, plastic tins, glass, paint cans, and jars may be expected. To manage wastes from construction in such a way that any potential impacts on the environment are minimized or avoided, the following approached should be applied:

- Minimizing waste generation.
- Simple waste management plan for specific waste streams must be developed by the construction contractor prior to construction commencing.
- General waste must be collected and transported to local council approved disposal sites.
- Food wastes must be collected, where practicable, considering health and hygiene issues, for disposal off-site.
- Refuse containers must be located at each worksite.
- Where practical, waste must be segregated and reused / recycled (e.g. scrap metal).
- Containment bunds and/or sumps must be drained periodically to prevent overflow and subsequent pollution of the surrounding land and/or water body.
- Chemical wastes must be collected in 200 liter drums (or similar sealed container), appropriately labeled, for safe transport to an approved chemical waste depot or collection by a liquid waste treatment service.
- Storage, transport and handling of all chemicals must be conducted in accordance with all legislative requirements.
All hazardous wastes must be appropriately stored in bounded areas away from watercourses and in accordance with legislative requirements.

Hazardous waters, such as solvents, rust proofing agents and primer must be managed in accordance with the requirements of relevant legislation and industry standards.

A hazardous materials inventory for the construction period must be prepared.

Material Safety Data Sheets (MSDS) for hazardous materials must be available no-site during construction.

Hydrocarbon wastes, including lube oils, must be collected for safe transport off-site for reuse, recycling, transport or disposal at approved locations.

One of the major issues and arising concerns, are the failed concrete structures, and the panels left by the former contractor. Such materials must be treated with care, as they are not classified as municipal waste. The failed concrete structure, first of all must be cut to a number of separated parts. Popular way to deal with such case is to put these cut parts into the rubble crushers (these are only available in the mayoralty of Baghdad), these crushers will turn these concrete parts into fine particles (coarse powder) that can be re-used as a filler (binder) material in the asphalt industry. However, as there is no such equipment available in the site, the following procedure should be followed.

First, this concrete structure must be cut and then pilled in a designated zone (isolated) within the site. Then an official letter must be sent to the municipality that related to the site (copy to the MOE) in order to inform them that such materials (rubbles) are accumulated on the site, and request designated disposal site for such waste. Transportation of these materials to the new designated disposal site (20km south-west from the project site) must be done under the monitoring of the MOE staff to ensure proper disposal.

6.1.6 Health and Safety

During the construction phase of the project, there are risks posed to human health by industrial accidents resulting from the use of heavy construction equipment. In order to minimize these risks:

- Qualified personnel must be employed for the construction equipment, and personnel must be trained for health and safety issues.
- Working shift of workers of construction activities must be limited.
- Personal protection equipment such as eyeglasses, gloves, hard heads and safety belts must be supplied.
- Personnel must be monitored to assure they use protection equipment.
- Emergency health care and firefighting must be available within the project area.

An emergency plan must be prepared in order to cover all the possible risks that may result from different civil work activities. Such plan must deals with the following items:

- Any accidents to be reported and treated within site as a first aid procedure.
- Safety training for the workers.
Safety posters and brochures instructing the workers for the safe usage of the equipment and machineries.

### 6.1.7 Flora & Fauna

No significant faunal activities were observed in the project site vicinity. The bridge construction is expected to have negligible effects on the natural habitat of the fauna species. Furthermore no impacts are expected on the vegetation.

The following steps should be followed to prevent or minimize any adverse impacts:

- Any disturbance must be restricted to designated work areas.
- Physical barriers must be installed around significant vegetation areas in order to restrict unauthorized access and avoid disturbance.
- Clearing and excavations works must occur progressively to minimize the length of time the ground is exposed or open excavations.
- Clearing and disturbance to the river must be minimized to that necessary construction and safety reasons and meet environmental requirements (e.g. separation of stockpiles, erosion control).
- Removed vegetation should be replanted if possible.
- Controls to prevent temporary barriers to fish and other fauna movement must be implemented.

### 6.1.8 Rare & Endangered Species

There is no evidence of rare (or/and) endangered terrestrial or aquatic species that may be affected by the construction activities of the bridge. The history of the area is not recording any habitats of rare or endangered species. According to the MoE Annual Environment Report (2010) no endangered species were recorded in the vicinity of the area. The most threatened species are found in the Iraqi marshland, which is located in a long distance from the project site.

### 6.1.9 Ecosystem

The most important impact of the project on the ecosystem is the siltation caused by the solid bund made in the Euphrates during the past construction works (especially during its elimination). This impact can be mitigated by preventing major earthworks during the winter rain season. The significance of this impact is low due to the high existing siltation and pollution of the river.

Other impacts of construction works on ecosystem will be negligible since there be:

- No sensitive habitats located in the vicinity of the project site.
- No removal or interference with prey of predators.
- No removal of predatory animals resulting in increased prey populations that exceed the carrying capacity of the local environment.
Emergency Road Rehabilitation Project
Al-Daraji Bridge Environmental & Social Management Plan

- Insignificant effluent discharges.
- Insignificant noise disrupting breeding behavior or use of breeding grounds, resulting in shifts in population dynamics.

6.1.10 **Topography and landforms**
The local topography will not be altered by the project activities.

6.1.11 **Climate and Meteorology**
Impacts on the microclimate of the local area will be negligible. There will be no changes in surface and no aerodynamic disturbances.

6.1.12 **Traffic Management**
In order to minimize air and noise impacts associated with traffic generated by the project’s construction traffic, the following measures must be implemented:

- All heavy vehicles travelling to and from the site must follow previously decided heavy vehicle routes to avoid built-up areas.
- Use of carpooling and bus services must be implemented where practicable where practicable to minimize worker trips during the construction.
- Where practicable, truck deliveries must be restricted to daytime working hours.
- Dangerous goods must be transported along routes preferred for dangerous goods.
- If possible, the transport of oversize loads must be restricted to non-peak periods to minimize traffic disruptions, and will be provided with appropriate escorts and approvals from both the Main Roads Department and the Police.
- Clear traffic signs and signs signals must be installed on-site to provide for safe traffic.

6.1.13 **Socio – Economic Impacts**
As was mentioned above, no adverse socio-economic impacts have been identified as being associated with project activities at this time from site visits and from input received from the public consultation process. Local community members overwhelmingly support the bridge construction because of its potentially very significant contribution to local transportation, marketing of local produce, creation of short-term employment on road and bridge crews, and stimulation of local business opportunities from new passing traffic.

The consultations revealed that there has been no removal of plants, trees etc. from the areas owned by the local community. Hence, no community members have lodged claims for compensation. In this regard also the consultations revealed that no permanent or temporary infrastructure has been, or will be adversely affected, and no displacement or re-settlements of any person(s) were needed. The land required for the bridge and road access is state-owned.
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During the construction phase, the Project will generate additional new employment opportunities for local community residents. These will be for both skilled and unskilled workers. It is agreed that, for both work categories, first preference will be given to local residents who are most needy/poor.

Transmission of diseases, and specifically HIV/AIDS, is common in many countries where road construction is ongoing and where road construction crews live adjacent to communities for some time. The spread of such diseases is anticipated to be a very low probability in the case of this project given very conservative social norms in this locality (as is the case in most of rural Iraq). However, the operation of a GRM during construction, and for one year following completion of the bridge, will keep a line of communication open for receipt of complaints and identification of adverse impacts and any associated mitigation needs.

6.2 Maintenance Phase

6.2.1 Soil Erosion
No impacts are expected during the project maintenance phase.

6.2.2 Water Quality
The maintenance phase of the project will have no impact on the surface- and ground-water quality of the area.

6.2.3 Air Quality
The vehicle emissions and fugitive dust emissions are considered the main air pollutants during the maintenance phase. The concentration of (NOx) is expected to be below the standard limits throughout the operational period. To reduce the air pollution in the sections that are located near residential areas, water spraying must be applied, trees must be planted between the villages and the alignment, and the maintenance vehicles must be kept in good operational conditions.

6.2.4 Noise
The noise levels during the maintenance phase shall not exceed 85 dBA in a distance of few meters off-site (except for extra heavy duty trucks). To control the noise level impacts during the maintenance phase within the permissible standards the following measures should be applied:

- Restricting maintenance works to the day hours.
- Keeping maintenance vehicles in good condition.
- Controlling the type of the heavy truck that allowed to pass over the bridge, this may be done with the coordination of the traffic police in the governorate.
6.2.5 **Solid Waste**
During the maintenance period, some littering and waste generation resulting from the repair activities will occur. Littering may occur due to wind action. All the above solid waste must be collected and disposed by the municipality trucks and vehicles.

6.2.6 **Health and Safety**
During the maintenance period, no impacts of significance are expected other than for the contractor’s workers. Personal protection equipment such as eyeglasses, gloves, hard heads and safety belts must be supplied. The bridge must be provided with suitable post lighting at night to reduce the probability of the accidents.

6.2.7 **Flora and Fauna**
No impacts are expected during the maintenance period. During the operation phase, the effects on flora will be basically from the NO\textsubscript{X} emissions. The NO\textsubscript{X} emissions may be causing discoloration in plant leaves and then to lesions (brown or dark brown spots) if the concentration of the pollutant are high. The loss of carotene and reduction of chlorophyll are the major responses from plant exposed to NO\textsubscript{x} emissions.

6.2.8 **Topography and Landforms**
Local topography will not be affected.

6.2.9 **Climate and Meteorology**
No impacts during the maintenance phase.

6.2.10 **Ecosystem**
No impacts during the maintenance phase are expected.

6.2.11 **Geology and Soils**
No impacts during the maintenance phase are expected.

6.2.12 **Rare &Endangered Species**
No impacts during the maintenance phase are expected.

6.2.13 **Sensitive Habitat**
No impacts are expected during the maintenance phase.

6.2.14 **Socio-Economic impacts**
During the maintenance period, the project is expected to result in very positive socio-economic outcomes for the local communities. Socially harmful consequences of bridge operation are not anticipated. However, the continued operation of a GRM for one year following opening of the bridge for use will ensure that local community members have an accessible, fair and transparent means of reporting any emerging adverse impacts, and a means of obtaining mitigation.
7. ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

This section summarizes the findings of the report. It shows the mitigation measures, frequency of their application; responsibilities and costs (see tables 10 and 11). The total cost of implementing the ESMP is estimated at $42,000, and broken down as follows (see tables 13, 15 and 17 for details):

- Mitigation measures = $9,000 (captured in construction contract)
- Monitoring = $11,000
- Training and institutional strengthening = $22,000.

Table 13. Mitigation Measures for Al-Daraji Bridge. Construction Phase.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Mitigated Parameter</th>
<th>Location</th>
<th>Mitigation Measures</th>
<th>Frequency</th>
<th>Responsibility</th>
<th>Cost US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Air Quality</td>
<td>Dust arising</td>
<td>Along roads and at intersections</td>
<td>1. Wheel washing and damping on un-surfaced and vegetation free area</td>
<td>Once/day</td>
<td>Contractor with the acceptance of the resident engineer</td>
<td>500</td>
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<td></td>
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<td></td>
<td>2. Retention of vegetation where possible will reduce dust movement.</td>
<td>Once</td>
<td>Contractor with the acceptance of the resident engineer</td>
<td>No cost</td>
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<td></td>
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<td>3. Excavations and other clearing activities must only be done during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighboring area.</td>
<td>Daily</td>
<td>Contractor with the acceptance of the resident engineer</td>
<td>No cost</td>
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<td></td>
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<td></td>
<td>4. Spraying all exposed soil surfaces with water when necessary to reduce dust</td>
<td>As required</td>
<td>Contractor with the acceptance of the resident engineer</td>
<td>500</td>
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<tr>
<td></td>
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<td>5. A speed limit of 40km/h must not be exceeded on dirty access roads.</td>
<td>As possible</td>
<td>Contractor with the acceptance of the resident engineer</td>
<td>No cost</td>
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<tr>
<td>Odor emissions</td>
<td>Within the whole site</td>
<td>1. Regular servicing of vehicles in order to limit gaseous emissions (to be done off-site)</td>
<td>Once/week</td>
<td>Contractor with the acceptance of the resident engineer</td>
<td>No additional cost</td>
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<td></td>
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<td></td>
<td>2. Regular servicing of onsite toilets to avoid potential odors.</td>
<td>As possible</td>
<td>Contractor with the acceptance of the resident engineer</td>
<td>No additional cost</td>
</tr>
<tr>
<td>2. Noise emissions</td>
<td>In the site and around</td>
<td>1. Limit noise to within standard working hours in order to reduce disturbance of residential areas in close proximity</td>
<td>As possible</td>
<td>Contractor with the acceptance of the resident engineer</td>
<td>No cost</td>
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<tr>
<td></td>
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<td></td>
<td>2. Construction site yards, workshops, and other noisy fixed facilities should be located well away from noise sensitive areas.</td>
<td>Daily</td>
<td>Contractor with the acceptance of the resident engineer</td>
<td>No cost</td>
</tr>
<tr>
<td>Indicator</td>
<td>Mitigated Parameter</td>
<td>Location</td>
<td>Mitigation Measures</td>
<td>Frequency</td>
<td>Responsibility</td>
<td>Cost US$</td>
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<tr>
<td>3.Flora</td>
<td>Damage to vegetation cover, trees</td>
<td>In the site and around</td>
<td>2. Limitation of disturbance to vegetation cover during construction works.</td>
<td>Daily routine</td>
<td>Contractor with the acceptance of the resident engineer</td>
<td>No cost</td>
</tr>
<tr>
<td>4.Fauna</td>
<td>Animals, pets disturbance</td>
<td>In the site and around</td>
<td>1. No interference with the calving and lambing season for most animal species.</td>
<td></td>
<td>Contractor with the acceptance of the resident engineer</td>
<td>No cost</td>
</tr>
<tr>
<td>5.Waste Management</td>
<td>Generation of Rubble</td>
<td>In the site and around</td>
<td>1. Demolition rubble (failed concrete) must be cut and transported to new designated location (20km from the site) for rubble dumping in coordination with the MOE and MMPW officials.</td>
<td>Daily</td>
<td>Contractor with the approval of the resident engineer, consultant and the environmental directorate authority</td>
<td>2,000</td>
</tr>
<tr>
<td>Generation of general Litter</td>
<td>In the site and around</td>
<td>1. Refuse bins must be placed at strategic position to ensure that litter does not accumulate within the construction site.</td>
<td>Daily routine</td>
<td>Contractor</td>
<td>100</td>
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</tr>
<tr>
<td>Generation and handling of Hazardous waste</td>
<td>In the site and around</td>
<td>1. All hazardous materials must be carefully stored in sealed containers, and then disposed of offsite at a licensed facility.</td>
<td>As required</td>
<td>Contractor with the approval of the resident engineer</td>
<td>300</td>
<td></td>
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<tr>
<td>Indicator</td>
<td>Mitigated Parameter</td>
<td>Location</td>
<td>Mitigation Measures</td>
<td>Frequency</td>
<td>Responsibility</td>
<td>Cost US$</td>
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<tr>
<td><strong>6. Health and Safety</strong></td>
<td>Accidents and injuries</td>
<td>In the site and around</td>
<td>1. First aid facilities must be available on site at all times.</td>
<td>Daily</td>
<td>Contractor with the approval of the resident engineer</td>
<td>120</td>
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<td></td>
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<td>2. All equipment is maintained in a safe operating condition.</td>
<td>Daily routine</td>
<td>Contractor with the approval of the resident engineer</td>
<td>No cost</td>
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<td>4. Personal Protective Equipment (PPE) available for all construction staff. Helmets and safety shoes must be worn at all times and other PPE worn were necessary i.e. dust masks, ear plugs etc.</td>
<td>Daily routine</td>
<td>Contractor with the approval of the resident engineer</td>
<td>200</td>
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<td>5. Adequate warning signs of hazardous working areas.</td>
<td>As required</td>
<td>Contractor with the approval of the resident engineer</td>
<td>120</td>
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<td></td>
<td>6. Emergency numbers for local police and fire department will be placed in a prominent area.</td>
<td>As required</td>
<td>Contractor with the approval of the resident engineer</td>
<td>No cost</td>
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<td>7. Firefighting equipment will be placed in prominent positions across the site where it is easily accessible. This includes fire extinguishers, a fire blanket as well as a water tank.</td>
<td>As required</td>
<td>Contractor with the approval of the resident engineer</td>
<td>200</td>
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<td>8. No open fires will be allowed on site.</td>
<td></td>
<td>Contractor with the approval of the resident engineer</td>
<td>No cost</td>
</tr>
<tr>
<td><strong>7. Water Quality</strong></td>
<td>Siltation and pollution of the river</td>
<td>In the site and along the roads</td>
<td>1. Careful elimination of the river soil bund during low water flow summer to autumn.</td>
<td>As required</td>
<td>Contractor with the approval of the resident engineer</td>
<td>No additional cost</td>
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<tr>
<td></td>
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<td></td>
<td>2. Regular servicing of vehicles and machines to eliminate leakages.</td>
<td>Daily routine</td>
<td>Contractor with the approval of the resident engineer</td>
<td>No additional cost</td>
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<tr>
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<td>3. Domestic sewage collected in sealed septic tanks and discharged to water treatment plant.</td>
<td>Daily routine</td>
<td>Contractor with the approval of the resident engineer</td>
<td>No additional cost</td>
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<td>4. Fuel and chemicals must be sealed and stored in sites that will prevent leakages.</td>
<td>As required</td>
<td>Contractor with the approval of the resident engineer</td>
<td>200</td>
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<td>5. Water from construction site must be discharged to river channel in a manner that does not cause siltation or erosion into the water course.</td>
<td>As required</td>
<td>Contractor with the approval of the resident engineer</td>
<td>160</td>
</tr>
<tr>
<td>Indicator</td>
<td>Mitigated Parameter</td>
<td>Location</td>
<td>Mitigation Measures</td>
<td>Frequency</td>
<td>Responsibility</td>
<td>Cost US$</td>
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<tr>
<td>8. Traffic</td>
<td>Traffic Congestion</td>
<td>Along bridge and at intersections</td>
<td>1. Good Traffic management</td>
<td>As possible</td>
<td>Contractor with the approval of the resident engineer</td>
<td>No cost</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>2. Access of the construction and material delivery vehicles should be strictly controlled, especially during wet weather to avoid compaction and damage to the topsoil structure.</td>
<td>As possible</td>
<td>Contractor with the approval of the resident engineer</td>
<td>No cost</td>
</tr>
<tr>
<td></td>
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<td>3. Strategic positioning of entry and exit points to ensure as little impact/effect as possible on the traffic flow.</td>
<td>As required</td>
<td>Contractor with the approval of the resident engineer</td>
<td>No cost</td>
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<td>4. Clear information sign posts must be installed: speed limits, max. load, safety signs.</td>
<td>Daily</td>
<td>Contractor with the approval of the resident engineer</td>
<td>600</td>
</tr>
<tr>
<td>9. Soil erosion</td>
<td>Soil erosion</td>
<td>Within project area</td>
<td>1. Retention of vegetation where possible to avoid soil erosion.</td>
<td>Continuous</td>
<td>Contractor with the supervision of the resident engineer</td>
<td>No cost</td>
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<td></td>
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<td>2. The use of silt fences and sand bags must be implemented in areas that are susceptible to erosion.</td>
<td>As required</td>
<td>Contractor with the supervision of the resident engineer</td>
<td>500</td>
</tr>
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<td></td>
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<td></td>
<td>5. Where feasible, increase the mass thickness of the rock fill to provide additional stability.</td>
<td>As required</td>
<td>Contractor with the supervision of the resident engineer</td>
<td>TBD</td>
</tr>
<tr>
<td>10. Socio-economics</td>
<td>Loss of land, structures, plants and livelihoods due to bridge construction work</td>
<td>Project area</td>
<td>1. A complaints register will be kept on site and this will feed into the GRM. Details of complaints received will be incorporated into the audits as part of the monitoring process.</td>
<td>Daily routine</td>
<td>Contractor with the supervision of the resident engineer, and operational entity (MoCH) responsible for overseeing effective operation of the GRM</td>
<td>No cost</td>
</tr>
</tbody>
</table>

Total cost US$ (construction phase) 9,000
<table>
<thead>
<tr>
<th>Indicator</th>
<th>Mitigated parameter</th>
<th>Location</th>
<th>Mitigation Measures</th>
<th>Frequency</th>
<th>Responsibility</th>
<th>Cost USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste management</td>
<td>Waste storage and disposal</td>
<td>Along roads</td>
<td>-Proper storage and disposal of solid waste. Periodic, during maintenance work</td>
<td>Contractor in coordination with the Supervising Consultant and the environmental authorities</td>
<td>Included within the contractor’s fees</td>
<td></td>
</tr>
<tr>
<td>Soil</td>
<td>Soil erosion</td>
<td>Along roads</td>
<td>-Cleaning of drainage systems - Restoration of vegetative cover - Traffic management</td>
<td>Periodic, during maintenance work</td>
<td>Contractor in coordination with the Supervising Consultant</td>
<td>Included within the contractor’s fees</td>
</tr>
<tr>
<td>Traffic</td>
<td>Congestion</td>
<td>Along roads and at intersections</td>
<td>- Provision of alternative access roads/ by-passes - Traffic management</td>
<td>Periodic, during maintenance work</td>
<td>Contractor in coordination with the Supervising Consultant</td>
<td>Included within the contractor’s fees</td>
</tr>
<tr>
<td>Air quality</td>
<td>Dust</td>
<td>Along roads and at intersections</td>
<td>- Usage of well-maintained equipment - Water spraying for dust control</td>
<td>Periodic, during maintenance work</td>
<td>Contractor in coordination with the Supervising Consultant</td>
<td>Included within the contractor’s fees</td>
</tr>
<tr>
<td>Noise</td>
<td>Hearing noise level</td>
<td>Along roads</td>
<td>- Limiting noisy activities to normal daylight hours - Provision of speed limit signs at critical locations - Planting trees in sensitive zones</td>
<td>Periodic, during maintenance work</td>
<td>Contractor in coordination with the Supervising Consultant</td>
<td>Included within the contractor’s fees</td>
</tr>
<tr>
<td>Socio-economics</td>
<td>Adverse effects on PAPs via loss of land, structures, plants or livelihoods as a result of bridge operation</td>
<td>Within project area</td>
<td>- Maintenance of an active GRM system for one year following opening of the bridge to traffic</td>
<td>Ongoing</td>
<td>MoCH</td>
<td>Included within standard operating costs of MoCH</td>
</tr>
<tr>
<td>Water supply</td>
<td>Damage to water pipes</td>
<td>Along roads</td>
<td>- Protecting water supply systems - Coordination with land owners on scheduling maintenance activities</td>
<td>Periodic, during maintenance work</td>
<td>Contractor in coordination with the Supervising Consultant</td>
<td>Included within the contractor’s fees</td>
</tr>
<tr>
<td>Fauna and flora</td>
<td>Vegetation, animals</td>
<td>Along roads</td>
<td>- Periodic cleaning and maintenance of culverts to facilitate amphibians crossing</td>
<td>Periodic, during maintenance work</td>
<td>Contractor in coordination with the Supervising Consultant</td>
<td>Included within the contractor’s fees</td>
</tr>
<tr>
<td>Safety</td>
<td>Accidents and injuries</td>
<td>Along roads</td>
<td>-Providing contractor’s workers with Personal protection equipment such as eyeglasses, gloves, hard heads and safety</td>
<td>Periodic, during maintenance work</td>
<td>Contractor in coordination with the Supervising Consultant &amp; traffic police</td>
<td>Included within the contractor’s fees</td>
</tr>
</tbody>
</table>
8. MONITORING

Regular monitoring of all significant environmental and social parameters is essential to ascertain compliance with the project’s mitigation measures and relevant laws and regulations and policies. The objectives of the monitoring are as follows:

- To measure the compliance with the ESMP mitigation measures
- To verify the results of the project’s environmental impact assessment
- To study the trend of construction values of the parameters, which have been identified as critical.
- To ensure that all safety concepts were implemented properly during the bridge operation.
- To ensure no harm is incurred by local communities from bridge operation, including to land, productive plants, infrastructures, and livelihoods.

To ensure the proper implementation of the environmental and social mitigation measures, an environmental and social monitoring program has been established for the construction phase. The monitoring program will focus on noise impact, air quality, and water quality within the project area, as shown in Table 15.

<table>
<thead>
<tr>
<th>Mitigated Parameter</th>
<th>Parameters To be Monitored</th>
<th>Location</th>
<th>Measurements (incl. methods &amp; equipment)</th>
<th>Frequency of Measurement</th>
<th>Responsibilities (incl. review and reporting)</th>
<th>Cost (equipment &amp; individuals)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Quality</td>
<td>NOx, TSP, CO, dust</td>
<td>Cross the bridge</td>
<td>Portable instruments</td>
<td>Twice a year, monthly for dust</td>
<td>Ministry of the Environment</td>
<td>2000US$</td>
</tr>
<tr>
<td>Noise</td>
<td>Noise</td>
<td>Cross the bridge</td>
<td>Portable instruments</td>
<td>Monthly</td>
<td>Ministry of the Environment</td>
<td>4000US$</td>
</tr>
<tr>
<td>Water quality</td>
<td>Suspended Solids, HC</td>
<td>Al-Daraji River Bridge, 2 checking pts. at 100m upstream and 200m downstream</td>
<td>Portable instruments</td>
<td>Twice a year During earth works on the soil bund in the river</td>
<td>Ministry of the Environment</td>
<td>5000US$</td>
</tr>
<tr>
<td>Socio-economic issues</td>
<td>Complaints lodged with GRM</td>
<td>Communities adjacent to the bridge</td>
<td>Number of complaints lodged and resolved</td>
<td>Monthly</td>
<td>MoCH</td>
<td>MoCH monitoring staff (time)</td>
</tr>
</tbody>
</table>

BOD = biochemical oxygen demand, CO=carbon monoxide, NOx-nitrogen oxides, pH=an expression of the basic or acid condition, SS=suspended solids, TSP=total suspended solids

Routine environmental monitoring of the bridge will be conducted to ensure performance standards put in place are met. Monitoring (in coordination with the MoE) will be periodically conducted in accordance with site-specific monitoring plans. Specialist studies to investigate particular aspects of the environment (e.g. flora and fauna, hydrological risk) will be periodically commissioned when needed.
9. REPORTING AND AUDITING

To ensure that the mitigation and monitoring measures are being carried out effectively with the required frequency, a clearly defined and regular reporting and response system must be established.

All inspection and audit reports of environmental performance should be stored in the Audit and Inspection Manager (AIM) system. The AIM is an electronic database that is used to enable corrective actions identified during the inspection/auditing process to be recorded, tracked, and closed out. The information will be made available to the relevant regulatory authorities as required. In addition to the monitoring and reporting requirements documented in the relevant sections of the ESMP, the following reporting regime will be implemented:

- All incidents or accidents during the bridge and road construction should be reported immediately to relevant authorities. Detailed reporting must be provided within days.
- All corrective measures must be discussed to ensure compliance with laws and regulations.
- Reports for personnel training on environmental issues or emergency practices must be produced.
- Progress reports, environmental monitoring reports, and other inspections reports must be produced periodically.
- Reports produced from operation of GRM system, including on numbers of complaints lodged and mitigations/resolutions.

Provision scheduling of reporting is presented in table 16.

Table 16. Scheduling and Reporting

<table>
<thead>
<tr>
<th>Activity</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mitigation Measures</td>
<td>Q1</td>
<td>Q2</td>
<td>Q3</td>
</tr>
<tr>
<td>(including social)</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Monitoring</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Institutional Strengthening</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Training</td>
<td>√</td>
<td>√</td>
<td>√</td>
</tr>
</tbody>
</table>
10. TRAINING AND COMMUNICATIONS

All construction personnel and contractors are required to undertake appropriate environmental training and induction programs including, importantly, on GRM procedures.

All managers and supervisors will be responsible for ensuring that personnel under their control have the requisite competencies, skill and training to carry out their assigned tasks in accordance with the requirements of the ESMP. They will also be responsible for identifying additional training and competency requirements, as well as training on the rights of local PAPs to mitigation if adversely affected by project activities, social mitigation procedures to be applied under the project, and operation of the GRM system.

All staff will complete a comprehensive project induction. The induction will include a comprehensive review of environmental and social requirements and standards, safety, and access protocols, and GRM operation.

All project supervisors and managers will receive additional detailed training on the use and implementation of the ESMP. Table 17 refers to a proposed institutional strengthening program and training.

<table>
<thead>
<tr>
<th>Institutional Strengthening Activity</th>
<th>Position(s) (Institutions, contractors, supervision consultants)</th>
<th>Scheduling</th>
<th>Responsibilities</th>
<th>Cost Estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mitigation</td>
<td>Contractors, resident engineers, MoCH GRM staff</td>
<td>5 days</td>
<td>MOCH</td>
<td>2,000 US$</td>
</tr>
<tr>
<td>Monitoring</td>
<td>Ministry of Environment, resident engineers, municipalities members</td>
<td>10 days</td>
<td>MOCH, MoE, MMPW</td>
<td>10,000 US$</td>
</tr>
<tr>
<td>Environmental and social assessment (principles, methodology)</td>
<td>Ministry of Environment, MoCH</td>
<td>5 days</td>
<td>MoE, MoCH</td>
<td>10,000 US$</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td></td>
<td></td>
<td></td>
<td>22,000 US$</td>
</tr>
</tbody>
</table>
Annex 1. Photographic Evidence

As part of the requirements for the ESMP is to visit the sites as needed, a number of photos were taken for the site to reflect the baseline situation, and to have a good and complete picture regarding the environmental–social assessment for the project. In addition, a number of photos are provided to illustrate meetings with the local community.

Photo (1) Al-Daraji bridge (backlog repair phase)

Photo (2) Failed test girders
Photo (3) Front view for the failed test girder
Emergency Road Rehabilitation Project
Al-Daraji Bridge Environmental & Social Management Plan

Photo (4) The flange section of the failed test girder

Photo (5) Crushed stones and strand wires in the bridge yard area for the floating bridge approaches maintenance, and, for the girder’s tension
Photo (6) Failed test girders

Photo (7) Break-point in the girder during the jacking process

Photo (8) Failed test cross-beam to be demolished and the rubbles to be transported
Photo (9) General view of the site
Annex 2. Samples of the questioner and public feed-back
س/ هل هناك أي بيئة مؤقتة أو دامجة تلعب دوراً أساسياً في النشاطات الاجتماعية اليومية للسكان قد تأثرت بعملية إنشاء الجسر؟
نعم / كلا
كيف:

س/ بسبب تغيير تصميم الجسر هل استوجب المسألة نقل أو ترحيل سكان المنطقة بسبب عملية الاستبدال؟
نعم / كلا

س/ هل هناك نقص في الموارد المادية على سبيل المثال نقص في الأراضي الزراعية في المحايل، الشجار — فل نتحدث عن تغيير تصميم الجسر؟
نعم / كلا
كيف:

س/ بسبب بناء الجسر الجديد هل هناك حاجة إلى إجراءات إعادة التوطين للأشخاص / الأشخاص إلى مناطق جديدة؟
نعم / كلا

س/ هل هناك من السكان المحليين كان قد استخدم منطقة بناء الجسر بطريقة ما علماً أن المنطقة تابعة للحكومة؟
نعم / كلا
س 11/ هل هناك احتمالات انى يكون تصميم الجسر الجديد له تأثيرات اجتماعية سلبية بالمنطقة؟
نعم،
لكن
ما هي الأسباب:

س 12/ هل هناك أي تغيرات جغرافية أو ضرر في التسوية الاجتماعية متوقع حدوثه بسبب التصميم الجديد للجسر؟
نعم،
لكن
ما هذه التغيرات:

س 13/ هل الجسر الجديد سوف يخلق مشاكل تؤثر على المصايف المائية الريفية للسكان؟
نعم،
لكن
كيف:

س 14/ ما هي المجابح الأكثر ضعفًا أو مشاكل التي سوف تتاثر بالمشروع الجديد؟

س 15/ هل سيعزز المشروع عمليات النقل وينقل من انزعاج المجتمعات الموجودة في المنطقة عن المحيط الخارجي؟
نعم،
لكن

الاسم: _______________
التوقيع: _______________
العمل: _______________
الموقع: _______________

الد/ محمد أبو زيد

المواطن: عيسى شريدة زغير
المهنة: حارس
استمارة الأثر والتحليل المجتمعي لمشروع جسر الدراجي في محافظة المتنى

س/ هل ان عملية بناء وتشغيل الجسر الجديد لها أثار إيجابية من الناحية الاجتماعية على السكان القاطنين في موقع الجسر أو بالقرب منه؟

نعم /

لا /

س/ بسبب توقف العمل بالجسر هل هناك محاولات من بعض الأشخاص أو العشائر أو مجموعات المجتمع المدني للإبلاغ عن السكان أو المنطقة المحلية لها؟

نعم /

لا /

س/ هل هناك استخدام لمنطقة الجسر أو مقترباته من الجانبين من قبل أشخاص وبأي مفرطة؟

نعم /

لا /

س/ بسبب أعمال الإشغال الجيدة هل تم عملية إزالة لمصايل زراعية أو شجر أو غطاء نباتي تعود ملكيتها إلى السكان الذين يقطنون منطقة إنشاء الجسر؟

نعم /

لا /

س/ هل هناك مطالبات بالتعويضات بسبب عملية إنشاء الجسر تم تسجيلها من قبل السكان المحليين الذي قد تكون مصلحة قد تضررت بسبب إنشاء الجسر؟

نعم /

لا /
س/؟ هل هناك أي بنى تحتية مؤقتة أو دائمة تلعب دورًا أساسًا في النشاطات البيئية اليومية للمكان قد تتأثر بعملية إنشاء الجسر؟
نعم / كلا
كيف:

س/؟ بسبب تغيير تصميم الجسر هل استوجب المسألة نقل أو ترحيل سكان المنطقة بسبب عملية الاستبدال؟
نعم / كلا

س/؟ هل هناك نقص في الموارد المائية على سبيل المثال نقص في الأراضي الزراعية في المحايل، الاملاحاء——— الخ. نتجت عن تغيير تصميم الجسر؟
نعم / كلا
كيف:

س/؟ بسبب بناء الجسر الجديد هل هناك حاجة إلى إجراءات امدادات التوليد للأشخاص/الأشخاص إلى أماكن جديدة؟
نعم / كلا

س/؟ هل هناك من السكان المحليين كان قد استخدم منطقة بناء الجسر بطريقة ما علمًا أن المنطقة تابعة للحكومة؟
نعم / كلا
س 1 هل هناك احتمالات أن يكون تصميم الجسر الجديد له تأثيرات اجتماعية سلبية بالمنطقة؟

نعم

ماهي الأسباب:

س 2 هل هناك أي تغييرات دراسية أو ضرر في النسيج الاجتماعي متوقع مدعوم بسبب التصميم الجديد للجسر؟

لا

ما هذه التأثيرات:

س 2. هل الجسر الجديد سوف يخلق مشاكل تؤثر على المصالح المالية اليومية للسكان؟

لا

كيف:

س 4 ما هي المجتمع الأكثر ضعفاً أو هشاشة التي سوف تتأثر بالمشروع الجديد؟

لمرجع

س 5 هل سيكون المشروع عمليات النقل ويقلل من النزاعات المجتمعات الموجودة في المنطقة عن المحيط الخارجي؟

لا
Emergency Road Rehabilitation Project
Al-Daraji Bridge Environmental & Social Management Plan

المواطن: يحيى بايش هويدي
المهنة: كاسب
استمارة الأثر والتحليل المجتمعي لمشروع جسر الدراجي في محافظة المثنى

س/هل إن عملية بناء وتشغيل الجسر الجديد لها أثار إيجابية من الناحية الاجتماعية على السكان القاطنين في موقع الجسر، أو بالقرب منه؟
نعم / كلا

س/بسبب توقف العمل بلجسر هل هناك محاولات من بعض الأشخاص أو العشائر أو مجتمعات المجتمع المدني للاشتغال منطقة التنفيذ للجسر أو المناطق المحيطة لها؟
نعم / كلا

س/هل هناك استخدام لمنطقة الجسر أو مقرراته من الجانبين من قبل أشخاص بطريقة؟
نعم / كلا

س/بسبب أعمال الإنشاء الجديدة هل تم تهديم أراضية لمناصب زراعية أو أشجار أو غطاء ديني نور؟
نعم / كلا

س/هل هناك مطالبات بالتعويضات بسبب عملية إنشاء الجسر تم تسجيلها من قبل السكان المحليين الذي قد تكون مصالحهم قد تضررت بسبب إنشاء الجسر؟
نعم / كلا
س/هل هناك أي بني تحتية مؤقتة أو دائمة تلعب دوراً أساسيًا في النشاطات الحياتية اليومية للسكان قد تأثرت بعملية إنشاء الجسر؟
نعم / كلا
كيف:

س/7 بسبب تغيير تصميم الجسر هل استجيبت المسألة نقل أو ترحيل سكان المنطقة بسبب عملية الاستبدال؟
نعم / كلا

س/8 هل هناك تقسيم في الموارد المتاحة على سبيل المثال نقل في الأراضي الزراعية في المحايل، الأشجار ---- الغنيمت عن تغيير تصميم الجسر؟
نعم / كلا
كيف:

س/9 بسبب بناء الجسر الجديد هل هناك حاجة إلى إجراءات إعادة التوطين للأشخاص/الأشخاص إلى مناطق جديدة؟
نعم / كلا

س/1 هل هناك من السكان المحليين كان قد استخدم منطقة بناء الجسر بطريقة ما علما أن المنطقة تابعة للحكومة؟
نعم / كلا
س 11/ هل هناك احتمالات أن يكون تصميم الجسر الجديد له تأثيرات إجتماعية سلبية بالمنطقة؟
نعم    كلا

ما هي الأسباب؟

س 12/ هل هناك أي تغييرات بيئية أو ضرر في النسيج الإجتماعي متوقع حدوثه بسبب التصميم الجديد للجسر؟
نعم    كلا

ما هذه التأثيرات؟

س 13/ هل الجسر الجديد سوف يخلق مشاكل تؤثر على المصالح المالية اليومية للسكان؟
نعم    كلا

كيف؟

س 14/ ما هي المجموع الإتكال ضررها أو هشاشة التي سوف تتأثر بالمشروع الجديد؟

س 15/ هل سيبرز المشروع عمليته القبلية والمناطق من العزلة المجتمعة الموجودة في المنطقة عن المحيط الخارجي؟
نعم    كلا

الاسم:  
التاريخ:  
التوقيع:  
العمل:  

المواطن: موسى شريدة زغير
المهنة: كاسب
استمارة الآثار والتحليل المجتمعي لمشروع جسر الدراجي في محافظة المثنى

س1/ هل إن عملية بناء وتشغيل الجسر الجديد لها أثار إيجابية من الناحية الاجتماعية على السكان القاطنين في موقع الجسر أو بالقرب منه؟
نعم / كلا

س2/ بسبب توقف العمل بالجسر هل هناك محاولات من بعض الأشخاص أو العشائر أو مجتمعات المجتمع المدني — الخ لاستغلال منطقة التنفيذ للجسر أو المناطق المحاذية لها؟
نعم / كلا

س3/ هل هناك استخدام لمنطقة الجسر أو مقترباته من الجانبين من قبل أشخاص وبأي طريقة؟
نعم / كلا

س4/ بسبب أعمال الإنشاء الجديدة هل تم تمت عملية ازالة لمحاصيل زراعية أو أشجار أو غطاء نباتي تعود ملكيتها إلى السكان الذين يقطنون منطقة انشاء الجسر؟
نعم / كلا

س5/ هل هناك مطالبات بالتعويضات بسبب عملية انشاء الجسر تم تسجيلها من قبل السكان المحليين الذي قد تكون مصالحهم قد تضررت بسبب انشاء الجسر؟
نعم / كلا
س: هل هناك أي بنى تحتية مؤقتة أو دائمة تلعب دورا أساسيا في النشاطات اليومية اليومية للسكان قد تأثرت بعملية إنشاء الجسر؟
نعم / 
لا
كيف :

س: بسبب تغيير تصميم الجسر هل استResponseTypeلفت المسألة نقل أو ترحيل سكان المنطقة بسبب عملية الاستبدال؟
نعم / 
لا
كيف :

س: هل هناك نقص في الموارد المالية على سبيل المثال نقص في الأراضي الزراعية في المحاصيل ، 
الإجبار —— الخ نتجت عن تغير تصميم الجسر ؟
نعم / 
لا
كيف :

س: بسبب بناء الجسر الجديد هل هناك حاجة إلى إجراءات إعادة التنظيم للأشخاص / الأشخاص إلى مناطق جديدة ؟
نعم / 
لا

س: هل هناك من السكان المحليين كان قد استخدم منطقة بناء الجسر بطريقة ما علما أن المنطقة تابعة للسوخرة ؟
نعم / 
لا
المواطن: عيسى سعيد جهيد
المهنة: موظف شرطة
استمارة التأثير والتحليل المجتمعي لمشروع جسر النزرا في محافظة المنط٦ي
س/ هل ان عملية بناء وتشغيل الجسر الجديد لها اثار إيجابية من الناحية الاجتماعية على السكان القاطنين في موقع الجسر أو بالقرب منه؟
نعم
كلا
س/2 بسبب نقص العمل بالجسر هل هناك محاولات من بعض الأشخاص أو المدارس أو مجتمعات المجتمع المدني --أخ لا تشتمل منطقة التنفيذ للجسر أو المناطق المجاورة لها؟
نعم
كلا
س/3 هل هناك استخدام لمنطقة الجسر أو مترابطه من الجرفين من قبل أشخاص ولأي طريقة؟
نعم
كلا
س/4 بسبب أعمال الإنشاء الجديدة هل تم ازالة محاصل زراعية أو أشجار أو غطاء نباتي تعود ملكيتها إلى السكان الذين يقطنون منطقة انشاء الجسر؟
نعم
كلا
س/5 هل هناك مطالبات بالتعويضات بسبب عملية انشاء الجسر تم تسجيلها من قبل السكان المحليين الذي قد تكون مصاحبة قد تضررت بسبب انشاء الجسر؟
نعم
كلا
س/3 هل هناك أي بيئة تحتية مؤقتة أو دامية تلعب دوراً أساً في النشاطات الحياتية اليومية للسكان قد تتأثر بعملية انشاء الجسر؟
نعم
لا
كيف:

س/7 هل بسبب تغيير تصميم الجسر هل استوجب المسألة نقل او ترحيل سكان المنطقة بسبب عملية الاستبدال؟
نعم
لا

س/8 هل هناك نقص في الموارد المائية على سبيل المثال نقص في الأراضي الزراعية في المحاصيل، الالجار..... اخ تنتج عن تغيير تصميم الجسر؟
نعم
لا
كيف:

س/9 هل بناء الجسر الجديد هل هناك حاجة الى اجراءات إعادة التوطين للأشخاص/الأشخاص الى منطق جديدة؟
نعم
لا

س/10 هل هناك من السكان المحليين كان قد استخدم منطقة بناء الجسر بطريقة ما اعلنا ان المنطقة تابعة للحكومة؟
نعم
لا
س 1 هل هناك احتمالات ان يكون تصميم الجسر الجديد له تأثيرات اجتماعية سلبية بالمنطقة؟
نعم
لا

ما هي السبب:

س 2 هل هناك أي تغيرات جغرافية أو ضرر في النسيج الاجتماعي متوقع حدوثه بسبب التصميم الجديد للجسر؟
نعم
لا

ما هذه التغيرات:

س 3 هل الجسر الجديد سوف يخلق مشاكل تؤثر على المصالح المالية اليومية للسكان؟
نعم
لا

كيف:

س 4 ما هي المجموعات الأكثر ضعفاً أو معطلة التي سوف تتأثر بالمشروع الجديد؟

س 5 هل سيؤثر المشروع عمليات النقل وحالات من العزلية المجتمعيه الموجودة في المنطقة عن المحط الخارجي؟
نعم
لا

الاسم: 
التاريخ:
العمل:

PDF created with pdfFactory trial version www.pdffactory.com
المواطن: سعد جواد ناجي
المهنة: رئس المجلس المحلي في الناحية
المواطن: إسم المدفوع

استمارة الأثر والتحليل المجتمعي لمشروع جسر الدراجي في محافظة المثنى

س/1 هل هناك علاقة تنامي وتنشيط جسر جديد لها أثار إيجابية في الناحية الاجتماعية على السكان المطلعين في موقع الجسر أو بالقرب منه؟

نعم  
كلا

س/2 بسبب توقف العمل بالجسر هل هناك محاولات من بعض الأفراد أو العائلات أو مجتمعات المجتمع المدني --- خلا للاشغال المنطقة التنفيذية للجسر أو المناطق المجاورة لها؟

نعم  
كلا

س/3 هل هناك استخدام لمنطقة الجسر أو مقترحات من الجانيين من قبل الأشخاص وبأي طريقة؟

نعم  
كلا

س/4 بسبب إعمال الإشارة الجديدة هل تمت عملية إزالة لسماسرة زراعية أو أشجار أو غطاء نباتي تم تعود ملكيتها إلى السكان الذين يقطنون منطقة إنشاء الجسر؟

نعم  
كلا

س/5 هل هناك مطالبات بالتحويضات بسبب عملية إنشاء الجسر تم تسجيلها من قبل السكان المحليين الذي قد تكون مصالحهم قد تضررت بسبب إنشاء الجسر؟

نعم  
كلا
س 7/ هل هناك أي بني تحفية مؤقتة أو دائمة تلعب دورًا أساسيًا في النشاطات اليومية للسكان قد تتأثر بعملية إنشاء الجسر؟
نعم/لا
كيف:

س 8/ يجب تغيير تصميم الجسر هل استوجب المساحة نقل أو ترحيل سكان المنطقة بسبب عملية الاستبدال؟
نعم/لا
كيف:

س 9/ هل هناك نقص في الموارد المادية على سبيل المثال نقص في الإراضي الزراعية في المحاصيل، الاشجار ----, الخ نتيجة تغيير تصميم الجسر؟
نعم/لا
كيف:

س 10/ بسبب بناء الجسر الجديد هل هناك حاجة إلى إجراءات إعادة التوطين للأشخاص/الأشخاص إلى مناطق جديدة؟
نعم/لا

س 11/ هل هناك من السكان المحليين قد استخدم منطقة بناء الجسر بطريقة ما علمًا أن المنطقة تابعة للحكومة؟
نعم/لا
المواطن: سالم ستار حنتول
المهنة: كاسب
الموارد: أدريز، سكان هميس

استشارة الآثار والتحليل المجتمعي لمشروع جسر الدراجي في محافظة المثنى

1/ هل أن عملية بناء وتشغيل الجسر الجديد لها أثار إيجابية من الناحية الاجتماعية على السكان القاطنين في موقع الجسر أو بالقرب منه؟

نعم / كلا

2/ بسبب توقف العمل بالجسر هل هناك محاولات من بعض الأشخاص أو المجتمعا أو مجتمعات المجتمع المحلي للإشغال منطقة التنقيب للجسر أو المناطق المجاورة لها؟

نعم / كلا

3/ هل هناك استخدام لموقع الجسر أو مقترباته من الجانبين قبل إنشائه، وبأي طريقة؟

نعم / كلا

4/ بسبب أعمال الإنشاء الجديدة هل تم تمت عملية ازالة لمحاصيل زراعية أو انشطار أو عطش نباتي تعويض ملكيتها إلى السكان الذين يقطنون منطقة إنشاء الجسر؟

نعم / كلا

5/ هل هناك مطالبات بالتعويضات بسبب عملية إنشاء الجسر تم تسجيلها من قبل السكان المتعلقين، لا تكون مصالحهم قد تضررت بسبب إنشاء الجسر؟

نعم / كلا
س 6 هل هناك أي بنية مؤقتة أو دائمة تلعب دوراً أساسياً في النشاطات الحياتية اليومية للسكان قد تأثرت بعملية إنشاء الجسر؟
نعم
كلا

كيف:

س 7 نسب تغير تصميم الجسر هل استجيبت المسألة نقل أو تحليل سكان المنطقة بسبب عملية الاستبدال؟
نعم
كلا

كيف:

س 8 هل هناك تقصي في الموارد المادية على سبيل المثال نقص في الأراضي الزراعية في المحاصيل أو الأشجار التي تنتج عن نهر تصميم الجسر؟
نعم
كلا

كيف:

س 9 بسبب بناء الجسر الجديد هل هناك حاجة إلى إجراءات إعادة توطين للأشخاص إلى مناطق جديدة؟
نعم
كلا

س 10 هل هناك من السكان المحليين كان قد استخدم منطقة بناء الجسر بطريقة ما علما أن المنطقة تابعة للحكومة؟
نعم
كلا
س 11/ هل هناك احتمالات أن يكون تصميم الجسر الجديد له تأثيرات اجتماعية سلبية بالمنطقة؟

نعم  
لا  

ما هي الإجابة؟

س 12/ هل هناك أي تغييرات ديموغرافية أو صغر في النشاط الاجتماعي متوقع حدوثه بسبب التصميم الجديد للجسر؟

نعم  
لا  

ما هذه التأثيرات؟

س 13/ هل الجسر الجديد سوف يخلق مشاكل تؤثر على المصالح الصحية اليومية للسكان؟

نعم  
لا  

كيف؟

س 14/ ما هي المصالح الأكثر ضعفًا أو مشاكل التي سوف تتأثر بالمشروع الجديد؟

الجذر

س 15/ هل سيؤثر المشروع عمليات النظافة وتنظيم من الرياح المحتملة الموجودة في المنطقة عن المحيط الخارجي؟

نعم  
لا  

ر.م.م

الاسم:
التوقعي:
العمل:
التوقيع:

المواطن: إدريس شنان هويدي
المهنة: كاسب
ستمارة الآثار والتحليل المجتمعي للمشروع جسر الدرجى في محافظة المثنى

1/ هل إن عملية بناء وتشغيل الجسر الجديد لها أثار إيجابية من الناحية الاجتماعية على السكان القاطنين في موقع الجسر أو بالقرب منه؟

نعم
كلا

2/ بسبب توقف العمل بالجسر هل هناك محاولات من بعض الأشخاص أو العاملين أو مجتمعات المجتمع المدني ——— الخ لإغلاق منطقة التنفيذ للجسر أو المناطق المجاورة لها؟

نعم
كلا

3/ هل هناك استخدام لمنطقة الجسر أو مقترباته من الجارين من قبل الشخصين وبأي طريقة؟

نعم
كلا

4/ بسبب أعمال البناء الجديدة هل تمت عملية إزالة لمحاصيل زراعية أو أشجار أو غطاء نباتي تعود ملكيتها إلى السكان الذين يقطنون منطقة إنشاء الجسر؟

نعم
كلا

5/ هل هناك مطالبات بالتعويضات بسبب عملية إنشاء الجسر تم تسجيلها من قبل السكان المحليين الذي قد تكون مصالحهم قد تضررت بسبب إنشاء الجسر؟

نعم
كلا
هل هناك أي بنى تحتية مؤقتة أو دائمة تشبع دوراً أساسياً في النشاطات الجبانية اليومية للسكان قد تأثرت بعملية إنشاء الجسر؟
نعم
كلا

كيف?

هل تغير تصميم الجسر هل استوجب المسألة نقل أو ترحيل سكان المنطقة بسبب عملية الاستبدال؟
نعم
كلا

هل هناك نقص في الموارد المالية على سبيل المثال نقص في الأراضي الزراعية في المحايل، الأشجار—— الخ نتجت عن تغير تصميم الجسر؟
نعم
كلا

كيف?

هل يوجد بناء الجسر الجديد هل هناك حاجة إلى إجراءات إعادة التوطين الشخصي/الأشخاص إلى مناطق جديدة؟
نعم
كلا

هل هناك من السكان المحليين كان قد استخدم منطقة بناء الجسر بطريقة ما علمًا أن المنطقة متاحة للحكومة؟
نعم
كلا
س 11/ هل هناك احتمالات ان يكون تصميم الجسر الجديد له تأثيرات اجتماعية سلبية بالمنطقة؟
نعم / كلا
ماهي السبب :

س 12/ هل هناك أي تغييرات في الديموغرافية أو صرع في البيئات الاجتماعية متوقع حديثًا بسبب التصميم الجديد للجسر؟
نعم / كلا
ما هذه التأثيرات :

س 13/ هل الجسر الجديد سوف يخلق مشاكل تؤثر على المصالح المنزلية اليومية للسكان ؟
نعم / كلا
كيف :

س 14/ ما هي المخاطر التي سوف تتاثر بالمشروع الجديد ؟
لألا

س 15/ هل سيؤثر المشروع عمليات التلقيح ويتقل من التعزالية المجتمعات الموجودة في المنطقة عن المحيط الخارجي؟
نعم / كلا

الاسم: 
التاريخ: 
العمل: 

المواطن: سعيد جهيد
المهنة: حارس
Annex 3: Statement confirming State Ownership of the Land
MOCH

SCRB

Res. Eng. Office

Dated: 19/6/2012

To / PMT

Sub/ land property

Your letter dated 11/6/2012

Pleas find attached letter of muthanna Gov./General and local office / Engineering Department No. 7981 in response to our letter No. 626 on 22/5/2012 to confirm that the land that Al-Darraji Bridge constructed on it belongs to the state. Best regards

Attach.

-the letter mentioned above.
-our letter No. 626 on 22/5/2012.

Res. Eng.

Hashem Qanbar

19/6/2012