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MINISTRY OF CONSTRUCTION, HOUSING, MUNICIPALITIES & PUBLIC WORKS

ROADS AND BRIDGES DIRECTORATE

SITE SPECIFIC

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (LIMITED ESIA)

For the Rehabilitation of Al Mosul Second Bridge (Al Huriya Bridge) In Nineveh Governorate

December 2018

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LIST OF ABBREVIATIONS AND ACRONYMS

AIM	Audit and Inspection Manager
AADT	Annual Average Daily Traffic
AXO	Abandoned Explosive Ordnance
BP	Bank Procedure
°C	Celsius
CO	Carbone monoxide
dbA	Decibels
EN	Endangered (IUCN List)
EODP	Emergency Operation Development Projects
ESMF	Environmental and Social Management Framework
ERM	Explosive Remnant of war
EHS	Environmental Health and Safety
ESMP	Environmental and Social Management Plan
ESIA	Environmental and social impact assessment
GOI	Government of Iraq
GRM	Grievance Redress Mechanism
IBAs	Important bird areas
IEODP	Iraqi Emergency Operation Development Project
IFC	International Finance Corporation
IDP	Internally Displaced People
Km	Kilometer
LC	Least Concern (IUCN List)
M	Meter
Mm	Millimeter
MOCHPM	Ministry of Construction Housing and Public Municipalities
MOE	Ministry of Environment
MOHE	Ministry of Higher Education and Scientific Research
MSDS	Material Safety Data Sheets
MM	Modified Mercalli
NGO	Non-Governmental Organization
NO2	Nitrogen Dioxide
NT	Near Threatened (IUCN List)
IBAs	Important bird areas
OP	World Bank Operational Policy
PAPs	Project Affected Peoples
PMT	Procurement Management Team
PPE	Personal Protective Equipment
ppm	parts per million
ROW	Right of way
RBD	Road and Bridges Directorate
SO2	Sulfur dioxide
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
TOR	Terms of Reference
UNCBD	United Nations Convention on Biological Diversity
UXO	Unexploded ordnance
WB	World Bank
WBG	World Bank Group
WHO	World Health Organization
WQI	Water Quality Index

EXECUTIVE SUMMARY

Introduction

According to the Environmental and Social Management Framework (ESMF) which was prepared for the Emergency Operation for Development Project (EODP) and disclosed locally in Iraq and on the World Bank's External Website, a limited site specific Environmental and Social Impact Assessment (ESIA) should be prepared, cleared, publically consulted and disclosed prior to the commencement of any construction activities for bridges crossing a permanent water course.

This limited Environmental and Social Impact Assessment (ESIA) is prepared in accordance to the Terms of Reference for Rehabilitation of al Mosul second bridge also known as Al Huriya Bridge in Nineveh Governorate in accordance with the current requirements of the World Bank (WB) environmental safeguards and the Iraqi regulations. As per WB current safeguards, the project is categorized as Category B.

Project Location

The Mosul second bridge is located on the Tigris River it connects between the right bank (near Bab Al Tob that used to be a shopping center and residential areas) and the left bank (Al-Faisaliah residential and commercial areas). It is considered one of the most important bridges in Al Mosul city.

The bridge is located at coordinates (36°20'25"N 43°8'36"E). The general location of the bridge can be seen in the following Figure i.

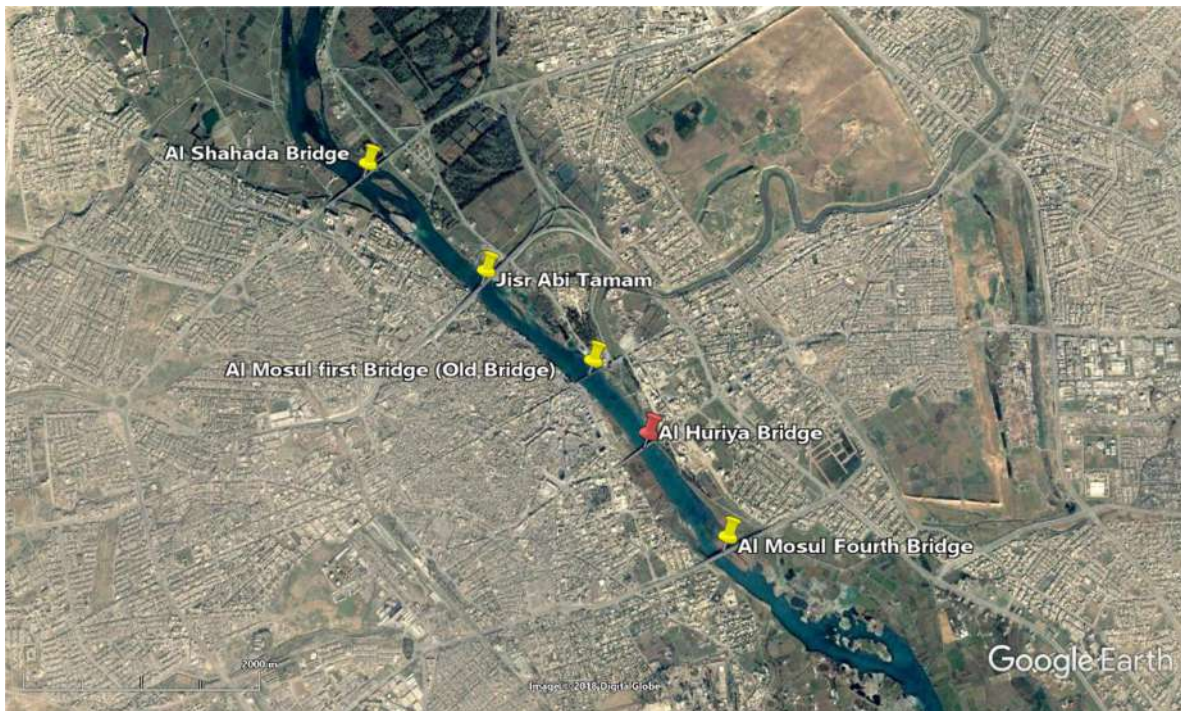


Figure i: Location of The Mosul second (Al Huriya) Bridge (Google Earth)

Description of the Bridge

The Mosul second Bridge (also called Al Huriya) crosses over Tigris river. It is used for travel and commerce and gives the area access to essential services including fuel, movement of agriculture products and education. Mosul second bridge facilitates the access to healthcare centers that are mainly located on the left bank. In fact, last war did not leave any efficient operational healthcare center on the right bank.

The rehabilitation of Mosul second bridge will also help people internally displaced due to war, return to their houses and lands.

Mosul second bridge is a steel bridge with concrete supports. It was constructed between 1955-1958 by German, French and Dutch companies. It consists of **6** spans with a total length of **340m** as follows:

- First and sixth spans are **46m** long each,
- Second and fifth spans are **56m** each,
- Third and fourth spans **63m** each.

The width of the bridge is **15m** (**9m** for the 2- lane single 2-direction carriageway, and **3m** side walk, 1.5 m on each side).

Current Condition

On 16/10/2016, a US air strike led to the destruction of the first span and approaches on the left bank. Later on, the left bank was subjected to bombing by ISIS that led to destruction of the fourth, fifth and sixth spans and multiple damages to the second and third spans. The bridge cross beam, concrete pads, girders, expansion joints and service lines were also damaged. At present, the bridge is not accessible (Refer to following Figure).



Figure ii: Current condition of Al Mosul second bridge

Project Activities

Following are the anticipated construction activities that are expected to take place during the Rehabilitation of Al Mosul second bridge:

- Completely lifting the concrete bridge deck while maintaining the steel sections intact.
- Disassembling the sections of the right tributaries, girders and their accessories which constitute 60% of the total length of the bridge.
- Manufacturing steel torsions, reinforcement supports, and extension joints similar to the properties and dimensions of the damaged parts.
- Reassembling and installing steel supports and steel treads with steel plates and accessories using sheet metal, bolts and welding.
- Implementation of the concrete bridge deck, lateral walkways, cladding, and joints of the rectangular steel expansion joints.
- Repairing damages in shoulders, concrete posts and bridge approaches.

All construction works can take place safely as the area has received clearance from the Iraqi Armed Forces for the absence of UXO/REW. (See annex 4).

A construction camp will be installed far from residential area in order to avoid any disturbance that may arise from the maintenance activities that may bother the local community. The camp will comprise the operational center, with prefabricated offices and parking areas for administration and technical staff. It will also include areas for materials testing and storage, and equipment cleaning and maintenance. The construction camp is envisioned to be located within the ROW, on governmental property. The area of the construction camp will not exceed 300m².

The need for residential accommodation on the working site is not required as personnel will be from the inhabitants of the area and will return to their houses daily. Only accommodation for 1-2 night guards on site might be required. The construction camp should have independent sources of water and electricity, and septic tank for the effluent disposal. Wastes will be collected and disposed-off in an authorized waste dumping site agreed upon with the concerned municipality of Nineveh Governorate.

The personnel requirements including administrative and technical staff, skilled and unskilled labor is 20-30 persons with priority given to the employment of national and local staff. Due to the geographical location of the project, no influx of workers is expected to the project area.

The total project duration is 12 months (calendar days), as many works will be performed in parallel.

Baseline Conditions

Land Use

The area adjacent to the project site is characterized as commercial area with some residential units.

On the left bank of the bridge, Al-Faisaliah residential and commercial areas can be found. The nearest distance between the bridge and residential units is approximately 400m. The non-residential buildings such as governmental facilities, Iraqi Army camp, Intelligence service office courthouse, schools and casinos are in their majority empty and abandoned. The nearest ones are at 200-300 m distance from the bridge.

On the right bank of the bridge, there is the known area of Bab Al Tob which used to be a shopping center and residential area. It now suffers from massive destruction in infrastructures and buildings. The nearest housing units is about 200 m from the bridge.

Topography

The Tigris River runs through the province in a wavy way from north to south and divides it into two almost equal parts. "Left bank and right bank. Nineveh's topography is divided into three sections: the mountainous region (mountains ranging from 200 to 1500 meters), the hills, the undulating region and the plateaus. The area near Al Mosul second bridge is almost flat with an altitude ranging from 215 to 230m amsl.

Seismic Activity

The project area is located in the minor damage zone with the seismic activity of II on Modified Mercalli scale.

Water Resources

Surface water

The project is located on the Tigris River. The Tigris is the eastern member of the two great rivers that define Mesopotamia, the other being the Euphrates. The river flows south from the mountains of southeastern Turkey through Iraq and discharges into the Arabian Gulf. It's the largest in terms of water volume in Iraq (Recent Turkish damming of the river was subject of some controversy, for both its environmental effects and its potential to reduce the flow of water downstream.). In Iraq, there are no major surface water contributions to the Tigris except for rare runoff events generated by rain.

Flow Measurement

At Mosul, the annual average discharge of the Tigris River for the period 2000–2013 is estimated at (522 m³/s)¹. Its maximum mean discharge can reach 1,629 m³/s in April and its minimum mean discharge can reach 219 m³/s in September ².

Water Quality

With reference to recent assessments of Water Quality Index (WQI) for Tigris river in Mosul city³, there is a general progressive decline in WQI values along the downstream that indicated an increase in pollution. This is attributed to the effluent discharged from the factories, hospitals and mainly to the wastewater discharges which pours directly into the river. The water quality data for all the sampling stations are categorized as Medium. Dissolved oxygen (%), E. coli, Total Dissolved Solids and Temperature are the main parameters which lower the overall WQI value in all stations. Based on WQI, the water of Tigris river was classified as class III. Consequently, it requires treatment before use for water supply.

Ground Water

Generally, the salinity of the groundwater increases from north to south of Iraq. It increases from the recharge sources at the high land areas (less than 1000 mg/l), towards the discharge areas along the Mesopotamia Zone and Al-Jazira Zone (more than 10000 mg/l). Groundwater quality is mainly bicarbonated at the recharge areas, and contains sulphates at the discharge areas. The groundwater quality in the project area is slightly brackish with the salinity of 1000-3000 ppm. The groundwater depth in the project area ranges from 30-40 m below surface.

Soils

The lands that are not built up consist of potentially fertile soils characterized as heavy alluvial soils, with some organic content and a high proportion of clays.

Climate

Mosul's climate is classified as warm and temperate. The winter months are much rainier than the summer months in Mosul. This climate is considered to be Csa according to the Köppen-Geiger climate classification. The average temperature in Mosul is 20 °C. During the year the highest rainfall is 102 mm in February. The driest months are June - September, with 0 mm of rain. The average yearly rainfall is 450mm.

¹Nadhir Al-Ansari, Ammar A.Ali, Qusay Al-Suhail and Sven Knutsson, Flow of River Tigris and its Effect on the Bed Sediment within Baghdad, Iraq, Oct 08,2015

² Saleh, D.K., 2010, Stream gage descriptions and streamflow statistics for sites in the Tigris River and Euphrates River Basins, Iraq: U.S. Geological Survey Data Series 540, 146 p.

³ Taha Hussein Al-Salim, Zakyaria Nafea Mahmood Shehab, Assessments of Water Quality index (WQI) For Tigris River in Mosul City/North of Iraq, International Journal of Latest Research in Engineering and Technology (IJLRET) ISSN: 2454-5031 www.ijlret.com || Volume 02 - Issue 08 || August 2016 || PP. 82-93

Air Quality

At present, there is no information on ambient air quality in the project area; no measurements on air quality were performed previously neither. The roads in the area are in rather bad conditions partially destroyed due to the recent war conditions. One main source of pollution is dust generated by wind, military, construction activities, and emissions generated by traffic. The other source of pollution are toxic fumes and black smoke from the burning oil wells. This is a major worry to the population as the number of bronchitis cases up surged in the city while the population has limited access to medicines and minimal emergency medical aid.

Noise

Noise levels near the project site are considered within the maximum allowable limits due to absence of significant sources other than the normal traffic. Measurement conducted at the site by PMT resulted in an average noise level of 34 db.

Biological Environment

The project area does not contain any globally important habitat or ecosystem (see Annex 5). There are no Natural Reserves or other legally protected areas near the project or in its close proximity. It is also distanced from “leading lines” that identify migration routes, and distant from Important Bird Areas (IBAs). No conservation practices are exercised in the project area apart from the control of hunting to the extent they are controlled and monitored throughout the country. The habitats both terrestrial and aquatic are modified habitats due to human exploitation for extended period.

Land Acquisition

As the works consist of the rehabilitation of an existing bridge, there will be no need to purchase additional land. Therefore, the project will not require any permanent or temporary land acquisition nor voluntary or involuntary resettlement at any stage of its stages. Accordingly, OP 4.12 does not apply. Furthermore, there are no livelihoods in the project vicinity that are likely to be adversely affected by the project.

Socio-Economic Baseline Conditions

- Nineveh is a governorate located in northern Iraq. Its capital is Al- Mosul. Nineveh Governorate has an area of 37,323 km².
- The total population of Nineveh Governorate is 3,612,300 persons (2015 UN projection), the population of Al- Mosul is approximately 1,320,700 persons for the year 2015.
- According to the UN office in Iraq, the number of Al-Mosul internally displaced people reached over 670,000 since the start of the liberation of the city. According to the Ministry of Immigration and Displaced more than 60% of them have returned to their homes. The rest are trying to, but the destruction and the lack of transport and services are still a main obstacle.
- The main demographic indicators in the Governorate Capital are:

- Gender Distribution: Male: 50%; Female: 50%
- Geo Distribution: Rural: 48%; Urban: 52%
- High proportions of households in Mosul (15%) get their drinking water straight from a stream, river or lake;
- Illiteracy rate for aged 10 and over is almost 11%. Most of them are females. Nineveh ranked first among the other provinces in illiteracy eradication.
- The number of households in Mosul living below the poverty line (2.2 US \$ per day) was 20% before ISIS invasion and 60% during ISIS invasion. This number is dropping with the gradual return of internally displaced people. However, recent percentage of people living below poverty line remain unknown.
- Access to sanitary network is 85%. There are no sanitary landfills in the area but only authorized dumping sites; municipal waste collection rate was 80% before ISIS invasion. Nowadays it ranges between 40-60%.
- Unemployment in Mosul was 15% before ISIS invasion and increased to reach 60% during ISIS occupation. Currently, the unemployment rate is around 40%.

Nearby Medical facilities.

- According to the assessment of the Ministry of Health of Iraq only 20% of the existing healthcare facilities are still operational in Al-Mosul city. Referring to the health directorate of Nineveh, there are 19 main health centers and 4 sub-health care centers on the left bank of Al-Mosul and 13 health care centers on the right bank of Al-Mosul.
- Regarding hospitals, because the major hospitals were completely destroyed, the Ministry of Health in coordination with the Health Directorate of Nineveh designated some alternative buildings be used as temporary hospitals. Some medical care centers were also converted to temporary locations for the governmental hospital. The surgeries operations are taking place in some of the non-governmental (private) hospitals like Al-Zahrawy and Al-Raby hospitals located about 5 km away from the bridge. For major surgeries, the patients have to travel to Erbil or Baghdad.

Traffic Level

Currently there is no traffic on the bridge due to the severely damaged spans. As estimated by the Roads and Bridges Directorate, the total annual traffic flow crossing the bridge prior to its destruction was 3,830,675 vehicles. There are four alternative roads to Al Mosul second bridge:

- 1- Temporary Pontoon (floating bridge) that was installed by the Iraqi Army, located about 200 m north of the bridge.
- 2- Temporary solution of Al Mosul 4th bridge (opened to public service in January 18th, 2018), located about 1 km south east of the bridge.

- 3- Al Mosul 1st bridge (opened to public service on March 14th 2018), located about 800m northern the bridge.
- 4- Temporary solution of Al Mosul 5th bridge (Aby Tamam) installed by the Iraqi Army, located about 2 km north of the bridge.

Heritage Environment

Further to site survey and consultation with the relevant authorities, there are no sites of historical or cultural importance in the area of the bridge and its surroundings. Therefore, the rehabilitation and operation of the bridge will not have any impact on archaeology or cultural.

Legal aspects

The applicable national legislation is as following:

- The Law for the Protection and Improvement of Environment No. 27, 2009;
- Protection of Wild Animals and Birds No. 21 of 1979;
- Regulating Exploitation and Protection of Aquatic Life No. 46 of 1976;
- Ministry of Water Resources Law No. 50 of 2008;
- Public Health Law No. 89 of 1981, amended by Resolution No.54 of 2001;
- Regulation for the Provision of Water Resources, No. 2, 2001;
- Regulation for the Protection of Rivers No. 25, 1967;
- Law No. 27 of 1999 concerning the establishment of the General Authority for Water and Sewage;
- Instructions No. 2 of 2014 on Environmental Protection from Municipal Waste;
- Directive No. (67) of 1986 Regulating the Debris Collection Areas;
- Clean Air Act No. 1 of 2004; and Ambient Air Protection System No. 4 of 2012
- Noise Prevention Law No. 21 of 1966;
- Directive No. 4 of 1993 concerning occupational health, protection of workers against vibration;
- Instructions No. 3/1985 Concerning Occupational Safety;
- Law No. 6 of 1988 concerning the National Commission for Occupational Hygiene and Safety;
- Law No. 55 of 2002 for The Antiquities & Heritage of Iraq;
- Acquisition Law No.12. of 1981

At present, there is no national Building Code in Iraq and the most commonly used are the ACI 318 codes.

The main WB safeguard policies triggered by this project is OP/BP 4.01 Environmental Assessment

Additionally, Bank's Access to Information Policy is deployed.

In case of the difference between the National Legislation and WB Safeguard Guidelines, it has been agreed that the WB instructions will prevail over the national legislation provisions.

Impacts Assessment

This section of the report describes the environmental and social impacts that are likely to result from the rehabilitation of Mosul Second Bridge (Al Huriya), and the 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 and the WB.

The construction contractor(s) will be responsible for compliance with the ESIA provisions during the rehabilitation 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 following table presents the impacts assessment matrix during rehabilitation phase.

Table E1: Summary of Impact Assessment Matrix – During Rehabilitation

	Environmental Receptor	Impact Significance
1	Air Quality	Low
2	Noise	Low
3	Water Resources	Medium
4	Soil	Medium
5	Solid and hazardous wastes	Medium
6	Flora & Fauna	Insignificant
7	Topography and landforms	Insignificant
8	Impacts on local traffic	Low
9	Health and Safety	Low
10	Socio-Economic impacts	High Positive
11	Land	Insignificant

No significant negative environmental or social impacts are anticipated during the operation phase.

Environmental and Social Management Plan

In order to manage the Environmental & Social impacts in line with Iraqi Government policies and policies of WB, an Environmental and Social Management Plan (ESMP) was prepared. The ESMP contains management measures avoidance, mitigation, as well as enhancements that should be implemented during the rehabilitation and operation/maintenance phase of the project.

The ESMP matrices are prepared for the proposed project during rehabilitation and operation /maintenance phases. The main element of ESMP is the cost of implementation which shall be integrated into the contractor's cost.

Environmental and Social Monitoring Plan

In order to ensure full compliance of the performed activities to the environmental and social requirements, regular monitoring should be performed. For this purpose, an environmental and social monitoring plan has been established for the construction and for the operational phase. It includes monitoring indicators, frequency, responsibility for implementation and supervision and estimated cost.

ESMP Institutional Arrangements

RBD PMT nominated a qualified engineer to act as the focal point for environmental and social affairs at the central level. On the field level, RBD PMT nominated engineers to act as environmental and social officers. Those engineers will be trained on monitoring and reporting of environmental and social impacts and how to fill the checklist to be used during field visits before implementation starts (See Annex 7) .

RBD Resident Engineer will be the officially responsible staff member for ensuring environmental and social compliance. S/He will be assisted by the designated environmental and social field officers.

In addition, a qualified consultant is recruited by the PMT to provide technical assistance and capacity building to the environmental and social team both at the central level and at the field level

Public Consultations

Objectives of the Consultations

WB policies require that broad and open public consultations be held with the project-affected peoples (PAPs) on the project. These consultations are to ensure that PAPs are provided with the opportunity to engage in the rehabilitation planning process, to raise questions and receive input and responses to their concerns. However, due to the current security situation in the project area and taking into utmost consideration the safety of the people as public meetings may be targeted by terrorist, the public meeting approach was not achievable.

Consultation Process

In order to fulfill WB objectives, individual interviews were conducted with the residents of the area to obtain sound information on the possible impacts on the local communities. Accordingly, a questionnaire was prepared in order to cover the key environmental and social aspects related to the project. The questionnaire was then addressed to the local individuals in the surrounding community randomly to have their opinions and thoughts regarding the rehabilitation activities.

The interviews were conducted on the 31st of January and 13th of September 2018. People interviewed were the passersby living in close proximity to the project area; the total number of the interviewed people is (9) males and (4) female. The filled questionnaires and photos from the interviews are presented in Annex 3.

In addition, the draft ESIA and its translated executive summary were published on the RBD's website to allow for feedback and wider dissemination of information related to the planned activities under this project. A translated summary of the ESMP will be disclosed at the project site for feedback and comments if any.

Findings of the Consultations

1. All respondents agreed that the reconstruction activities will have a strong positive impact from the social perspectives on the locals.
2. No claims from any locals were recorded or alleged regarding the ownership of the land where the rehabilitation activities to take place; all agreed that is governmental land property.
3. No vegetation covers, crops, plants, trees, etc. will be removed in order to execute the rehabilitation activities.
4. No infrastructure will be affected negatively due the reconstruction activities.
5. No deportation, dislocation of any of the local community will be needed due to these activities.
6. Information about a grievance mechanism was introduced to interviewed individuals and a translated GRM form was also provided. All interviewed people were informed that they can submit their complaint to either site engineer, or to community leader or to PMT during construction.
7. The respondents do not anticipate any damage to the buildings or infrastructure during the rehabilitation activities;
8. No change to demographics or social structure will be induced by the project activities;
9. Local residents do not use any part of the land required for the project for personal purposes.
10. The respondents interpreted the question of relocation as their improved mobility rather than physical relocation of people.

Grievance Redress Mechanism

Objectives of the GRM

Procedures require that Grievance Redress Mechanisms (GRMs) be established and operational prior to commencement of the project, and that they continue to operate for one year following completion of the works for third party settlement of disputes. This GRM should take into account the availability of judicial recourse as well as traditional and community dispute resolution mechanisms.

Distribution of GRM Forms

Accordingly, during individual interview, a hard copy of the translated application of the GRM was provided to interviewed people and informed them that the same application will be posted at the project site to ensure any grievance can be addressed in an amicable manner. Resolving complaints at community level is always encouraged to address the problem that a person may have during implementation and/or operational phase. The community leaders' information (mobile phone number) and PMT contact information (office and mobile phone numbers) will be available before implementation starts. There will be signs posted at the entrance of the bridges. Please refer to Annex (2) for more details.

In any case, the PMT must maintain records of grievances and complaints, including minutes of discussions, recommendations and resolutions made.

Conclusion and Recommendations

The ESIA concludes that the proposed rehabilitation of Al Mosul second bridge (Al Huriya) in Nineveh Governorate will have an overall significant beneficial impact on the environment and affected population. The implementation and the monitoring of the recommended mitigation measures especially during the Rehabilitation phase will ensure that potential negative environmental and social impacts are addressed.

MAIN REPORT

1. INTRODUCTION

According to the Environmental and Social Management Framework (ESMF) which was prepared for the Emergency Operation for Development Project (EODP) and disclosed locally in Iraq and on the World Bank's External Website, a limited site specific and simplified Environmental and Social Impact Assessment (ESIA) should be prepared, cleared and publically consulted upon prior to the commencement of any construction activities for bridges crossing permanent surface waters such as rivers and lakes as part of the roads and bridges component

This Environmental and Social Impact Assessment (ESIA) was prepared in accordance to the Terms of Reference for Rehabilitation of Al Mosul second bridge (Al Huriya bridge) in Nineveh Governorate. According to the WB environmental safeguards the project is categorized as Category **B**.

This ESIA identifies key environmental and social impacts of the project activities during both the rehabilitation and the operational phases, and defines the necessary mitigation measures addressing potential negative impacts, as well as monitoring procedures during construction and operation. An Environmental and Social Management Plan (ESMP) is prepared and embedded in this Limited ESIA which should be followed and implemented by all relevant parties.

The objectives of the ESIA are:

- Identify the baseline environmental and social conditions;
- Identify the potential adverse impacts during the rehabilitation/construction and operational phases of the project related to the specific project activities;
- Propose mitigation measures in order to minimize the adverse impacts identified;
- Prepare the ESMP that will allow the adequate implementation of the proposed mitigation measures.
- Hold consultation with the communities to get their input on the project activities.
- Inform the local community about the revised project activities and the environmental measures, socio-economic measures, information on residents' rights who might be negatively affected by some project activities and bridge operations.
- Inform the local community of the existence of a Grievance Redresses Mechanism (GRM) system through which they might lodge complaints and expect prompt and fair consideration

2. PROJECT DESCRIPTION

2.1 Project Goal

The main goal of this project is to help the internally displaced people return to their areas. The rehabilitation of Al Mosul second bridge (Al Huriya) will facilitate travel, commerce and access to essential services including, education, fuel, movement of agriculture products and especially access to healthcare centers on the left bank. It will also reduce the traffic congestions on the temporary bridges that were installed as alternative routes to Al Mosul 4th and 5th bridges that are not trafficable at the moment. Furthermore, when rehabilitated, Al Mosul 2nd bridge can be used as alternative road to Al Mosul 4th and 5th bridges during their rehabilitation.

During PMT environmental unit visit to Al Mosul second bridge (Al Huriya), surrounding communities expressed their urgent and desperate need for the rehabilitation of the Bridge.

2.2 Location of the Bridge

Al Mosul second bridge is located in Nineveh Governorate in the center of Al Mosul city at coordinates (36°20'25"N 43°8'36"E). It crosses over Tigris River. It connects between the right bank (near Bab Al Tob that used to be a shopping center and residential areas) and the left bank (Al-Faisaliah residential and commercial areas). It is considered one of the most important bridges in Al Mosul city.

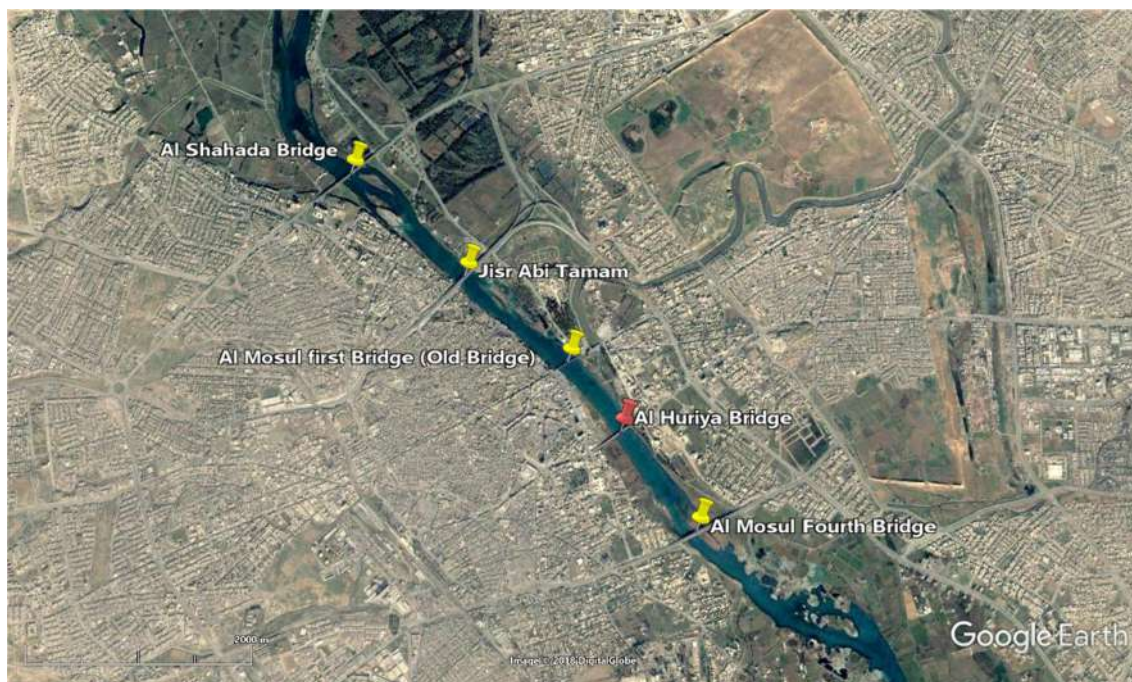


Figure 1: General Location of Al Mosul second bridge (Al Huriya)

The area is predominantly commercial and residential and comprises governmental buildings.

2.3 Technical Description of the Bridge

Mosul second bridge is a steel bridge with concrete supports. It was constructed between 1955-1958 by German, French and Dutch companies. It consists of 6 spans with a total length of **340m** as follows:

- First and sixth spans are **46m** long each,
- Second and fifth spans are **56m** each,
- Third and fourth spans **63m** each.

The width of the bridge is **15m** (**9m** for the 2- lane single 2-direction carriageway, and **3m** side walk 1.5 m on each side).

2.4 Current Condition of the Bridge

On 16/10/2016, a US air strike led to the destruction of the first span and approaches on the left bank. Later on, the left bank was subjected to bombing by ISIS that led to destruction of the fourth, fifth and sixth spans and multiple damages to the second and third spans. The bridge cross beam, concrete pads, girders, expansion joints and service lines were also damaged. At present, the bridge is not accessible as can be seen in the figure below.



Figure 2: Current condition of Al Mosul second bridge

2.5 Project Activities

Following are the anticipated construction activities that are expected to take place during the Rehabilitation of Al Mosul second bridge:

- Completely lifting the concrete bridge deck while maintaining the steel sections intact.
- Disassembling the sections of the right tributaries, Girders and their accessories which constitute 60% of the total length of the bridge.
- Manufacturing steel torsions, reinforcement supports, and extension joints similar to the properties and dimensions of the damaged parts.
- Reassembling and installing steel supports and steel treads with steel plates and accessories using sheet metal, bolts and welding.
- Implementation of the concrete bridge deck, lateral walkways, cladding, and joints of the rectangular steel expansion joints.
- Repairing damages in shoulders, concrete posts and bridge approaches.

It is worth mentioning that the sources of sand and gravel are from existing, commercially operating quarries and borrow pits located at 20-30 km distance from the Project's location. The project will not include an asphalt plant as asphalt works will be awarded to 2 State-owned enterprises that have authorized asphalt factories in Ninawa governorate.

2.6 Clearance of UXO/ERW

The area has received clearance from the Iraqi Armed Forces for the absence of UXO/REW (see Annex 4). However, accidental discovery is still possible. In such case, the personnel should be immediately evacuated and armed forces contacted. The works could be resumed only after removal of the munitions.

2.7 Construction Equipment

The following table presents the types and numbers of construction equipment that are expected to be used during the rehabilitation of Al Mosul second bridge.

Table 1: Equipment expected to be used during rehabilitation

Item No.	Type of Equipment	Quantity
1	30 – ton land-based crane	2
2	Compressor (diesel) 370 Airman	2
3	Jack – hammer (low noise)	2
4	Shovel (Kawasaki 70) or equivalent	2
5	Typical lorry with tipping, skipping Body to load of transport the demolished material	4
6	Truck mixer	4
7	Asphalt grinder	1
8	Bitumen tanker	1
9	Asphalt finisher	1
10	Compactor (steel & rubber tube)	2
11	Welding machine (set)	2
12	Diesel generator 30 K.V.A	2
13	Grader (Komatsu)	1
14	Pickups & sedan cars	3
15	Air shot, bell, bugger	3

2.8 Construction Site Facilities

Construction camp will be installed far from residential area in order to avoid any disturbance that may arise from the maintenance activities that may bother the local community. The camp will comprise the operational center, with prefabricated offices and parking areas for administration and technical staff. It will also include areas for materials testing and storage, and equipment cleaning and maintenance. The construction camp is envisioned to be located within the ROW, on governmental property. The area of the construction camp will not exceed 300m².

The need for residential accommodation on the working site is not required as personnel will be from the inhabitants of the area and will return to their houses daily. Only accommodation for 1-2 night guards on site might be required. The construction camp should have independent sources of water and electricity, and septic tank for the effluent disposal. Wastes will be collected and disposed-off in an authorized waste dumping site agreed upon with the concerned municipality of Nineveh Governorate.

The personnel requirements including administrative and technical staff, skilled and unskilled labor is 20-30 persons with priority given to the employment of national and local staff. Due to the geographical location of the project, no influx of workers is expected to the project area. The project will be awarded directly to two state-owned companies whom are already stationed in Mosul in proximity of the Bridge area as shown in the figure below.



Figure 3: Location of the 2 state-owned contracting companies to whom the rehabilitation works will be awarded

2.9 Land Acquisition

As the works consist of the rehabilitation of an existing bridge, there will be no need to purchase additional land. Therefore, the project will not require any permanent or temporary land acquisition nor voluntary or involuntary resettlement at any stage of its stages. Accordingly, OP 4.12 does not apply. Furthermore, there are no livelihoods in the project vicinity that are likely to be adversely affected by the project,

2.10 Project Duration

The total project duration is 12 months (calendar days).

3. BASELINE CONDITIONS

This chapter presents the comprehensive description of the existing baseline conditions in the vicinity and adjacent areas of Al Mosul second bridge (Al Huriya).

3.1 Physical Environment

3.1.1 Land Use

The area adjacent to the project site is characterized as commercial area with some residential units.

On the left bank of the bridge, Al-Faisaliah residential and commercial areas can be found. The nearest distance between the bridge and residential units is approximately 400m. The non-residential buildings such as governmental facilities, Iraqi Army camp, Intelligence service office courthouse, schools and casinos are in their majority empty and abandoned. The nearest ones are at 200-300 m distance from the bridge.

On the right bank of the bridge, there is the known area of Bab Al Tob which used to be a shopping center and residential area. It now suffers from massive destruction in infrastructures and buildings. The nearest housing unit is about 200 m from the bridge.

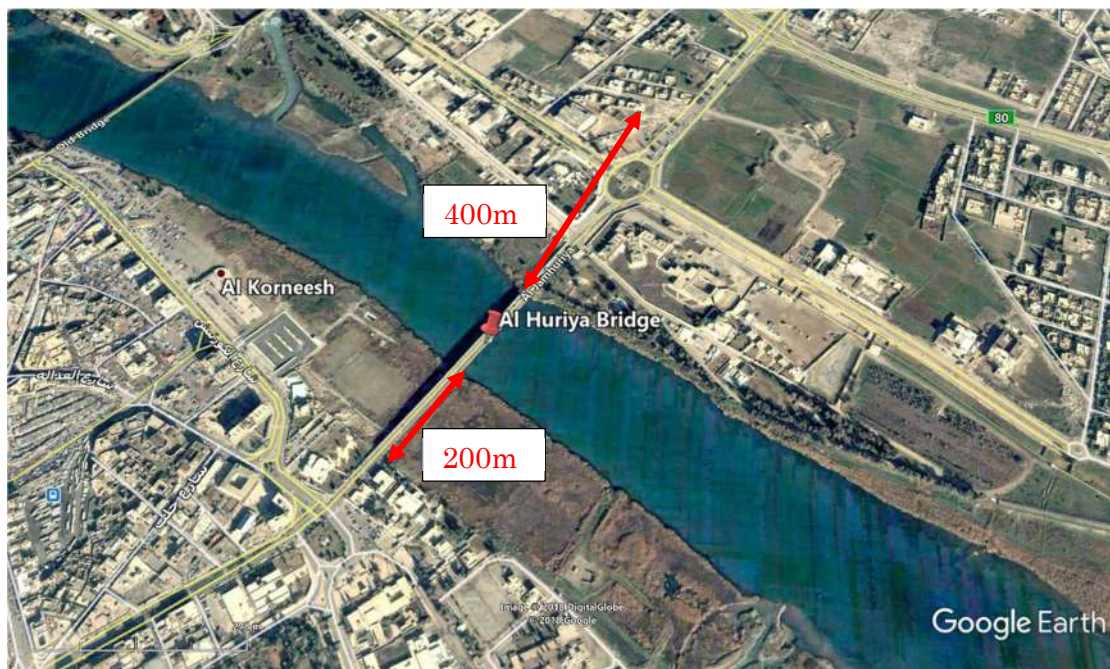


Figure 4: Land use around Al-Huriya bridge and distances to residential units (Google Earth)

3.1.2 Topography

The Tigris River runs through the province in a wavy way from north to south and divides it into two almost equal parts. "Left bank and right bank. Nineveh's topography is divided into three sections: the mountainous region (mountains ranging from 200 to 1500 meters), the hills, the undulating region and the plateaus. The area near Al Mosul second bridge is almost flat with an altitude ranging from 215 to 230m amsl.

3.1.3 Seismology

Tectonically Iraq is located in a relatively active seismic zone at the northeastern boundaries of the Arabian Plate. Seismic zoning of Iraq is divided into four zones:

- The areas of no damage zone of Modified Mercalli (MM) scale \leq III covering mainly the stable shelf region.
- The minor damage zone, which covers the intensities IV- V covering the Zagros Foothills and the Mesopotamian Geosyncline.
- The moderate damage zone with intensity range of VI-VII, which actually covers the Zagros Tauros, thrust zones.
- The major damage zone with intensity of VIII located on the Zagros thrust outside the Iraqi borders.

The project area is located in the minor damage zone with the seismic activity of II on MM scale as shown in the following Figure.



Figure 5: Seismic Map of the Project Area

3.1.4 Water Resources

Surface water

The project is located on the Tigris River. The Tigris is the eastern member of the two great rivers that define Mesopotamia, the other being the Euphrates. The river flows south from the mountains of southeastern Turkey through Iraq and discharges into the Arabian Gulf. It's the largest in terms of water volume in Iraq (Recent Turkish damming of the river has been the subject of some controversy, for both its environmental effects and its potential to reduce the flow of water downstream.). In Iraq, there are no major surface water contributions to the Tigris except for rare runoff events generated by rain.

Flow Measurement

At Mosul, the annual average discharge of the Tigris River for the period 2000–2013 is estimated at (522 m³/s)⁴. Its maximum mean discharge can reach 1,629 m³/s in April and its minimum mean discharge can reach 219 m³/s in September⁵.

Water Quality

With reference to recent assessments of Water Quality Index (WQI) for Tigris river in Mosul city⁶, there is a general progressive decline in WQI values along the downstream that indicated an increase in pollution. This is attributed to the effluent discharged from the factories, hospitals and mainly to the wastewater discharges which pours directly into the river. The water quality data for all the sampling stations were categorized as Medium. Dissolved oxygen (%), E. coli, Total Dissolved Solids and Temperature are the main parameters which lower the overall WQI value in all stations. Based on WQI, the water of Tigris river was classified as class III. Consequently, it requires treatment before use for water supply.

The following Table provides the results of water quality analysis conducted near Al Mosul 4th Bridge (South of Al Mosul Second bridge) in January 2018. Results show that water quality to the exception of turbidity is within Maximum Permissible Levels as per Iraqi legislations.

4Nadhir Al-Ansari, Ammar A.Ali, Qusay Al-Suhail and Sven Knutsson, Flow of River Tigris and its Effect on the Bed Sediment within Baghdad, Iraq, Oct 08,2015

5 Saleh, D.K., 2010, Stream gage descriptions and streamflow statistics for sites in the Tigris River and Euphrates River Basins, Iraq: U.S. Geological Survey Data Series 540, 146 p.

6 Taha Hussein Al-Salim, Zakyaria Nafea Mahmood Shehab, Assessments of Water Quality index (WQI) For Tigris River in Mosul City/North of Iraq, International Journal of Latest Research in Engineering and Technology (IJLRET) ISSN: 2454-5031 www.ijlret.com || Volume 02 - Issue 08 || August 2016 || PP. 82-93

Table 2: Results of water quality analysis as per Nineveh water resources directorate

Governorate	Nineveh		
Date of sampling	January 2018		
Sampling location	Near al-Mosul 4th bridge		
Parameters in mg/l unless otherwise stated	Edge of the River	Middle of the River	Maximum Permissible Levels
Turbidity, NTU	10	7	5
Temperature C°	21	21	ACC
PH	7.6	7.7	6.5-8.5
E.C μ s/ CM25 C	697	636	
Alkalinity as (Ca Co₃)	98	104	125-200
Hardness as (Ca Co₃)	313	298	500
Calcium as Ca	80	81	150
Magnesium as Mg	30	30	100
Chloride as Cl	101	103	350
Iron as Fe	-	-	0.3
Aluminum as Al	-	-	0.2
Soleplate as So₄	210	218	400
Sodium as Na	58	61	200
Potassium as K	3.1	3	
T.D.S	611	629	1000
T.S.S	109	105	
Nitrate as No₃	2.1	2.7	50
Silica as Sio₄	-	-	5

Ground Water

Generally, the salinity of the groundwater increases from north to south of Iraq. It increases from the recharge sources at the high land areas (less than 1000 mg/l), towards the discharge areas along the Mesopotamia Zone and Al-Jazira Zone (more than 10000 mg/l). Groundwater quality is mainly bicarbonated at the recharge areas, and contains sulphates at the discharge areas. The groundwater quality in the project area is slightly brackish with the salinity of 1000-3000 ppm. The groundwater depth in the project area ranges from 30-40 m below surface as can be seen in the Figure below.

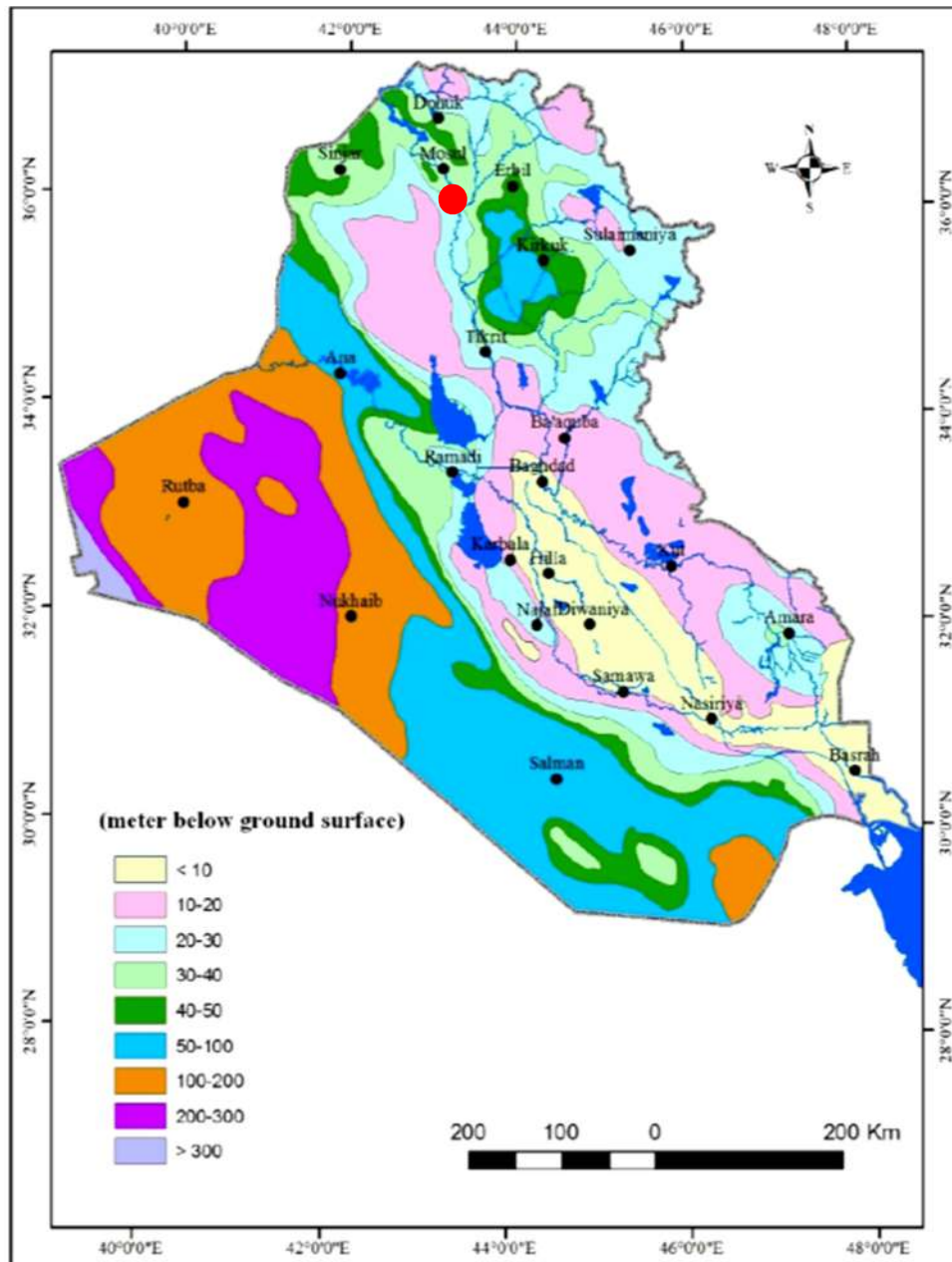


Figure 6: Depth to Groundwater in the Project Area

3.1.5 Soils

The soil consists of potentially fertile soils characterized as heavy alluvial soils, with some organic content and a high proportion of clays. It is made up of approximately 70% silty loam, the rest are silty clay loam and clay soil. The channel bed contains fine sand, silt and clays with rather high sedimentation load.

3.1.6 Climate

Mosul's climate is classified as warm and temperate. The winter months are much rainier than the summer months. This climate is considered to be Csa "hot dry-summer" according to the Köppen-Geiger climate classification.

The temperatures are highest on average in July and reach around 46 °C. January is the coldest month, with temperatures averaging 8 °C. Details are shown in the following figures⁷.

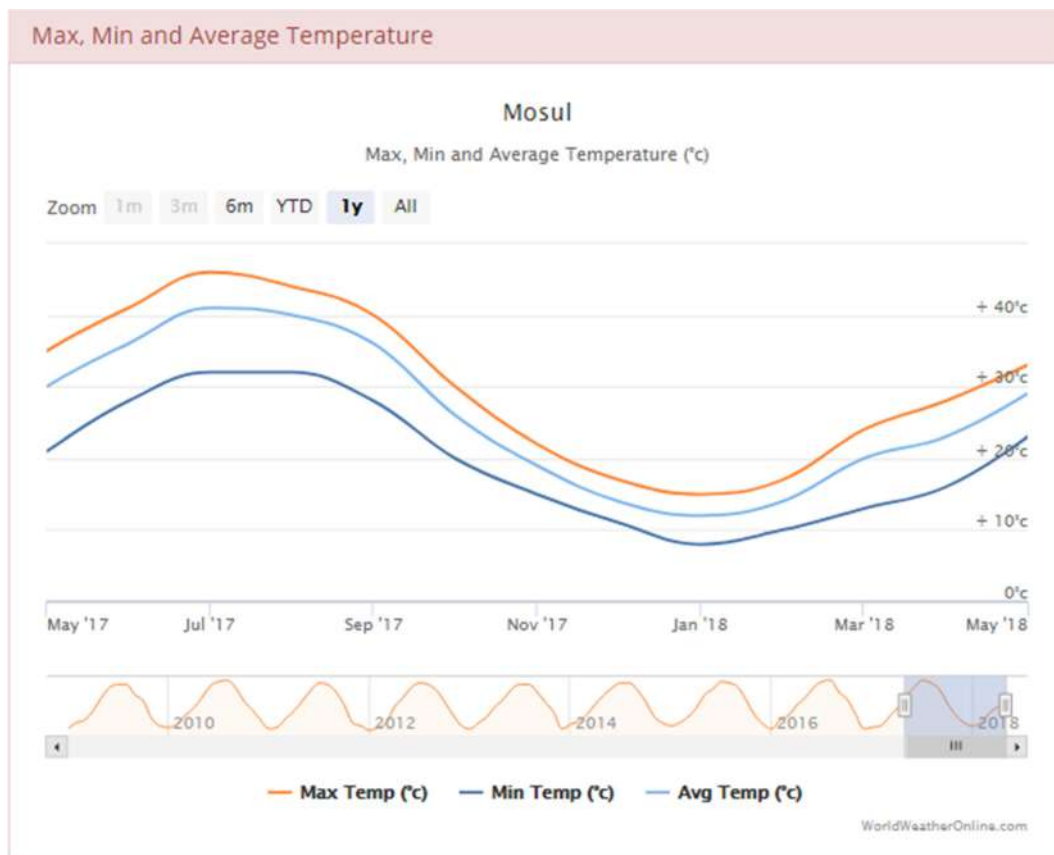


Figure 7: Yearly variation of temperature in Al Mosul city

During a year, the highest intensity of rainfall take place in February and cumulates around 102 mm. The driest months are June thru September, with 0 mm of rain. The average yearly rainfall is 450mm.

⁷ www.worldweatheronline.com

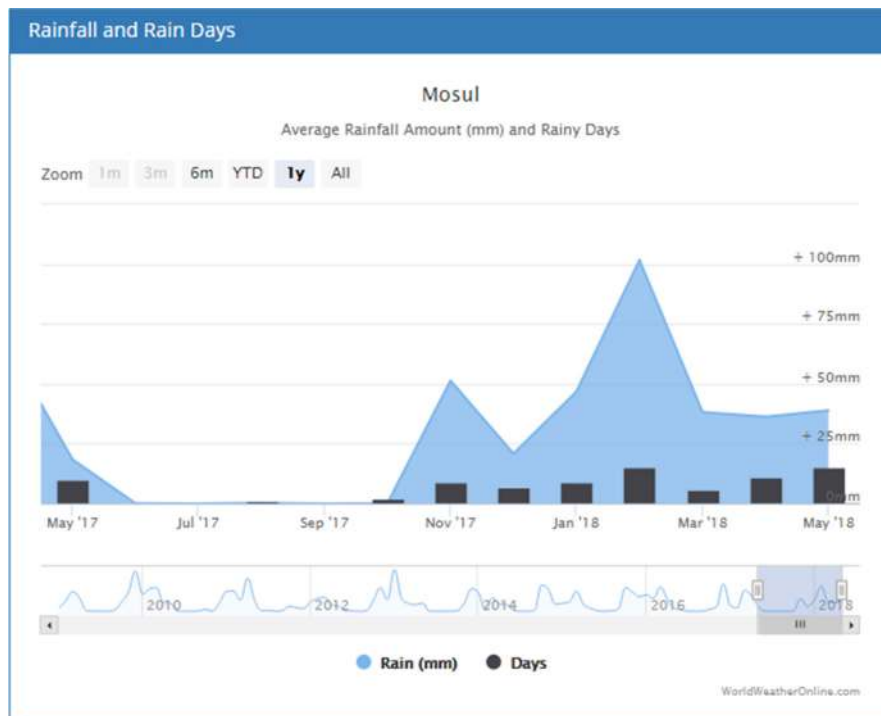


Figure 8: Yearly variation of rainfall in Al Mosul city

The maximum wind velocity occurs in July with value reaching 13.4 mph and averaging 12.8 mph. The lowest wind velocity values happen in February and have values of 3.6 mph on average.



Figure 9: Yearly variation of wind velocity in Al Mosul city

3.1.7 Air Quality

At present, there is no information on ambient air quality in the project area; no measurements on air quality were performed previously. The roads in the area are in rather bad conditions partially destroyed due to the latest war conditions. The main source of pollution is dust, generated by wind, military and construction activities, and emissions generated by traffic. The other source of pollution are toxic fumes and black smoke from the burning oil wells. This is a major worry to the population as the number of bronchitis cases up surged in the city while the population has limited access to medicines and minimal emergency medical aid.

3.1.8 Noise

Noise levels near the project site are considered within the maximum allowable limits due to absence of significant sources other than the normal traffic. Measurement conducted by PMT near the Project site revealed in an average level of 34 db.

3.2 Biological Environment

3.2.1 Terrestrial Ecosystems

Literature review and site investigations resulted in the identification of very common species of flora and fauna only in the project area. Furthermore, a letter from the Ministry of Environment confirms the latter. (see photos below and Annex 5)



Figure 10: View on Al Mosul second bridge showing the type of flora encountered

3.2.2 Status of Habitats

The project area does not contain any globally important habitat or ecosystem. There are no Nature Reserves or other legally protected areas in the vicinity of the project or in a close proximity. The area is well away from any sites of special ecological value. It is also distanced from “leading lines” that identify migration routes, and distant from Important Bird Areas (IBAs).

No conservation practices are exercised in the project area apart from the control of hunting to the extent they are controlled and monitored throughout the country.

The habitats both terrestrial and aquatic are modified habitats due to human exploitation for extended period of time.

At present, there are no endangered species within the eco-region of the project.

3.3 Land Acquisition

As the works consist of the rehabilitation of an existing bridge, there will be no need to purchase additional land. Therefore, the project will not require any permanent or temporary land acquisition nor voluntary or involuntary resettlement at any stage of its stages. Accordingly, OP 4.12 does not apply. Furthermore, there are no livelihoods in the project vicinity that are likely to be adversely affected by the project.

3.4 Socio-Economic Baseline Conditions

- Nineveh is a governorate located in northern Iraq. Its capital is Al- Mosul. Nineveh Governorate has an area of 37,323 km².
- The total population of Nineveh Governorate is 3,612,300 persons (2015 UN projection), the population of Al- Mosul is approximately 1,320,700 persons for the year 2015.
- According to the UN office in Iraq, the number of Al-Mosul internally displaced people reached over 670,000 since the start of the liberation of the city. According to the Ministry of Immigration and Displaced more than 60% of them have returned to their homes. The rest are trying to, but the destruction and the lack of transport and services are still a main obstacle to it.
- The main demographic indicators in the Governorate Capital are:
 - o Gender Distribution: Male: 50%; Female: 50%
 - o Geo Distribution: Rural: 48%; Urban: 52%
 - o High proportions of households in Mosul (15%) get their drinking water straight from a stream, river or lake;

- Illiteracy rate for aged 10 and over is almost 11%. Most of them are females. Nineveh ranked first among the other provinces in illiteracy eradication.
- The number of households in Mosul living below the poverty line (2.2 US \$ per day) was 20% before ISIS invasion and 60% during ISIS invasion. This number is dropping with the gradual return of internally displaced people. However, recent percentage of people living below poverty line remain unknown.
- Access to sanitary network is 85%. There are no sanitary landfills in the area but only authorized dumping sites; municipal waste collection rate was 80% before ISIS invasion. Nowadays it ranges between 40-60%.
- Unemployment in Mosul was 15% before ISIS invasion and increased to reach 60% during ISIS occupation. Currently, the unemployment rate is around 40%.

Nearby Medical facilities.

- According to the assessment of the Ministry of Health of Iraq only 20% of the existing healthcare facilities are still operational in Al-Mosul city. Referring to the health directorate of Nineveh, there are 19 main health centers and 4 sub-health care centers on the left bank of Al-Mosul and 13 health care centers on the right bank of Al-Mosul.
- Regarding hospitals, because the major hospitals were completely destroyed, the Ministry of Health in coordination with the Health Directorate of Nineveh designated some alternative buildings be used as temporary hospitals. Some medical care centers were also converted to temporary locations for the governmental hospital. The surgeries operations are taking place in some of the non-governmental (private) hospitals like Al-Zahrawy and Al-Raby hospitals located about 5 km away from the bridge. For major surgeries, the patients have to travel to Erbil or Baghdad.

3.5 Traffic

3.5.1 Traffic Flow

Currently, Al Mosul second bridge is not in service. As estimated by the Roads and Bridges Directorate, the total annual traffic flow crossing the bridge prior to its destruction was 3,830,675 vehicles as detailed in the following table.

Table 3: Traffic data before the terrorist attack according to Nineveh traffic directorate

NO.	VEHICLE TYPE	DAILY TRAFFIC	ANNUAL TRAFFIC	NO.OF WHEELS	NO.OF AXLES	NOTE
1	Articulated Truck	450	164,250	22	6	
2	Delivery Truck	900	328,500	6	2	Goods Vehicle Light
3	Heavy Truck	1050	383,250	18	5	
4	Medium Truck	1500	547,500	10	3	
5	Medium Bus	1950	711,750	6	2	
6	Mini Bus	2100	766,500	6	2	
7	Medium Car	2450	894,250	4	2	Passenger car
8	Motor Cycles	95	34,675	2	-	
$\Sigma=$		10,495	3,830,675			

3.5.2 Alternative roads

Al Mosul second bridge (Al Huriya) is considered a vital and important infrastructure asset to the surrounding communities due to the geographical nature of Al Mosul city. At the moment, there are (4) alternative routes that are being used. They are listed below:

- 1- Temporary Pontoon (floating bridge) installed by the Iraqi Army, located about 200 m north of the bridge as shown in the following Figure.



Figure 11: Temporary Pontoon (floating bridge

- 2- Temporary solution of Al Mosul 4th bridge (opened to public service in January 18th 2018) located about 1 km south east of the bridge (see Figure below).



Figure 12: Al Mosul 4th bridge

- 3- Al Mosul 1st bridge (opened to public service on march 14th 2018), located about 800m north of the bridge (see Figure below).



Figure 13: Al Mosul 1st bridge

- 4- Temporary solution of Al Mosul 5th bridge (Aby Tamam Bridge) installed by the Iraqi Army, located about 2 km north of the bridge.



Figure 14: Al Mosul 5th bridge (Aby Tamam Bridge)

Figure 15: General aerial view showing the alternative routes

3.6 Heritage Environment

Further to site survey and consultation with the Ministry of Culture, Tourism



and Antiquities, it was noted that there are no sites of historical or cultural importance in the area of the bridge and its surroundings, and therefore the rehabilitation and operation of the bridge will not have any impact on archaeology or cultural heritage. No cemeteries, historical-cultural monuments, churches, mosques that exist in the area need to be removed in order to rehabilitate the bridge.

4 LEGAL ASPECTS

4.1 National Legislation

Legislation comprises the laws and legal acts referring to different aspects of the environmental protection; legislation most relevant to the project scope is presented below.

4.1.1 General Environmental Legislation

The Law for the Protection and Improvement of Environment No. 27, 2009: The Law necessitates the provision of the Environmental Impact Assessment (Article 18) for any new developmental project in the country. The Law addresses the issues of regulation of air pollution and noise reduction, protection of soils, biodiversity conservation, management of hazardous waste, protection of the environment from pollution resulting from exploration and extraction of oil and natural gas, establishment of an environmental protection fund. Additionally, the law specifies the necessity of protection of water resources from pollution and regulates the discharge of effluents independently of their origin. Under the Law No. 27 of 2009, the project is classified as Category B project.

Protection of Wild Animals and Birds No. 21 of 1979 states that Ministry of Agriculture issues the list of protected species of animals and birds, prohibited zones, hunting seasons, hunting gears and methods (Article 5).

Regulating Exploitation and Protection of Aquatic Life No. 46 of 1976 regulates breeding and protection of aquatic life, fishing seasons, fishing methods and gear, prohibits the use of chemicals and explosives for fishing.

4.1.2 Water Resources

Ministry of Water Resources Law No. 50 of 2008: The Law provisions for establishing the Ministry of Water Resources and creating the legal and technical framework for institutionalization of water resources management in the country. Article 2 states “preserve ground and surface water from pollution, giving priority to the environmental aspect, and revive and maintain marshlands and other water surfaces.”

Public Health Law No. 89 of 1981, amended by Resolution No.54 of 2001: In addition to addressing various issues related to the population health, the Law stipulates the provision of the safety of drinking water and drinking water quality standards.

Regulation for the Provision of Water Resources, No. 2, 2001. Chapter 2 provides instructions on disposal of or recycling of wastewater. It also prohibits either discharge of effluent by private or public into public water.

The Regulation for the Protection of Rivers No. 25, 1967: the act regulates wastewater discharges and provides physical, biological, and chemical guidelines for water quality. Also, the regulation provisions for protection of public water bodies from pollution.

Law No. 27 of 1999 concerning the establishment of the General Authority for Water and Sewage provides instructions to the local authorities on provision of drinking and processing of raw water and the discharge of sewage and rainwater in all parts of Iraq beyond the boundaries of the Municipality of Baghdad.

The regulations define the permissible discharge limits to both natural waters and sewers. Some of the values are presented in the Table below:

Table 4: Effluent Discharge Parameters

Pollutant	Limits for Discharge into Water Bodies	Limits to discharge into Sewer
Color	N/A	N/A
Temperature	<35°C	45°C
Suspended Solids	60 mg/L	750 mg/L
pH	6 -9.5	6 -9.5
BOD	<40	1000
COD	<100	N/A
Nitrate	50 mg/L	N/A
Phosphate	3 mg/L	N/A
Free Chlorine	Trace	100 mg/L
Lead	0.1 mg/L	0.1 mg/L
Copper	0.2 mg/L	N/A
Mercury	0.005 mg/L	0.001 mg/L
Sulphate	if the ratio of the discharge is to the amount of source water is 1:1000 or less, the sulphate concentration should not exceed 400 mg/L	300 mg/L
Total hydrocarbons & derivatives	For the river with continuous flow, 5mg/L provided the ratio of discharge to source water is 1:500	N/A

4.1.3 Waste Management

Instructions No. 2 of 2014 on Environmental Protection from Municipal Waste:

These Instructions, consisting of 5 articles, aim at protecting the urban environment with a proper management of wastes, such as solid materials, recyclable and non-recyclable derived from domestic, commercial and professional activities, from the cleaning of streets, gardens, farms and public places, and construction waste. The Ministry of Municipalities and Public Works and the Municipality of Baghdad are responsible for collecting and transporting

waste materials in places for the treatment and disposal; for creating the necessary supplies and equipment; for identifying appropriate locations and the development of containers to throw municipal waste; for distributing special bags for waste producers; and for identifying waste collection dates.

Directive No. (67) of 1986 Regulating the Debris Collection Areas: debris disposable should be done in areas with stable geology and avoid siting near particularly vulnerable or sensitive ecosystems and groundwater and surface water resources.

4.1.4 Air Quality

Clean Air Act No. 1 of 2004 provides the guidelines for prevention and control of air pollution, as well as the applicable national standards of the most common air pollutants.

Table 5: Ambient Air Quality Standard

Pollutant	Iraqi Standard		WHO Standard
	Concentration	Averaging Time	Concentration
CO	10 ppm	8 hours	N/A
	35 ppm	1 hour	N/A
SO ₂	0.1 ppm	1 hour	500 µg/m ³
	0.04 ppm	24 hours	20 µg/m ³
	0.018 ppm	1 year	N/A
NO ₂	0.05 ppm	24 hours	200 µg/m ³
	0.04 ppm	1 year	40 µg/m ³
O ₃	0.06 ppm	1 hour	100 µg/m ³
PM ₁₀	150 µg/m ³	24 hours	50 µg/m ³
PM _{2.5}	65 µg/m ³	24 hours	50 µg/m ³
	15 µg/m ³	1 year	15 µg/m ³
Total Suspended Particles	350 µg/m ³	24 hours	N/A
	150 µg/m ³	1 year	N/A
Falling Dust	10 t/km ² /month - residential zone	30 days	N/A
	20 t/km ² /month - industrial zone	30 calendar days	N/A
Hydrocarbons	0.24 ppm	3 hours	N/A
Pb	2 µg/m ³	24 hours	N/A
	1.5 µg/m ³	3 months	N/A
	1 µg/m ³	1 year	N/A
Benzene	0.003 µg/m ³	1 year	N/A
Dioxin	0.6 pico g/m ³	1 year	N/A

4.1.5 Ambient Noise and Vibration

Noise Prevention Law No. 21 of 1966 aims to prevent the excessive noise in public places. The regulations prevent broadcasting in public places that may disturb peace between 10 p.m. and 7 a.m.

Instruction No. 2 of 1993 details the levels of noise emitted from sound equipment in tourist facilities. Additionally, it sets the maximum permissible noise limits of 70 dB(A) for industrial and commercial activities and 55 dB(A) for residential activities.

Directive No. 4 of 1993 concerning occupational health, protection of workers against vibration: Pursuant to Sections 3 and 105 of the Public Health Act (No. 89 of 1981), establishes work place procedures designed to minimize vibration and any harmful effects that it might have on workers. Stipulates maximum total daily limits for exposure to vibration.

Table 6: EHS Maximum Acceptable Leq (2005)

Receptor	One Hour Lacq (dBA)	
	Daytime 07.00-22.00	Nighttime 22.00-07.00
Residential, institutional, educational	55	45
Industrial, commercial	70	70

4.1.6 Occupational Health and Safety

Instructions No. 3/1985 Concerning Occupational Safety: Provides for the enforcement of occupational safety provisions at places of work.

- Regulates that all work places are to appoint a person in charge of occupational safety and an occupational safety committee.
- Provides for the appointment and duties of the person responsible for occupational safety and for the occupational safety committee at each workplace.
- Establishes the functions and duties of employers and employees with regard to occupational safety.

Law No. 6 of 1988 concerning the National Commission for Occupational Hygiene and Safety governs the enforcement of occupational health and safety regulations.

- Provides for inspections of places of employment and inspections reports.
- Establishes the duties and employer's responsibilities of vis-a-vis occupational health and safety.
- Establishes the functions of safety commissions at places of work.
- Regulates the responsibilities and duties of workers with respect to occupational health and safety.

4.1.7 Cultural resources

Law No. 55 of 2002 for The Antiquities & Heritage of Iraq defines all movable and immovable antiquities, archeological properties, and artifacts. The Law provides regulations on communication channels upon discovery of the unregistered antiquities and the measures to be undertaken for the preservation of the historical and archeological sites.

4.1.8 Land acquisition

Acquisition Law No.12 of 1981 governs the expropriation of property through acquisition and entitlement for compensation and replacement costs, cancellation of legal rights and other issues of acquisition for the public benefit.

4.2 International Conventions and Treaties

The number of international conventions and treaties have been signed and ratified by the Iraqi Government.

- UN Convention for Biological Diversity (UNCBD);
- UN Convention to Combat Desertification (UNCCD);
- RAMSAR Convention on Wetlands;
- UNESCO World Heritage Convention;
- United Nations Framework Convention on Climate Change (UNFCCC) and Kyoto Protocol.

4.3 Applicable Engineering Standards

At present, there is no national Building Code in Iraq and the most commonly used are the ACI 318 codes comprising:

- General requirements.
- Inspection.
- Materials.
- Durability requirements.
- Concrete quality, mixing and placing.
- Formwork, embedment and construction joints.
- Details of reinforcement.
- Analysis and design—general considerations.
- Strength and serviceability requirements.
- Flexure and axial loads.
- Shear and torsion.
- Development and splices of reinforcement.
- Two-way slab systems.
- Walls.
- Footings.
- Precast concrete.
- Composite concrete flexural members.

- Pre-stressed concrete.
- Shells and folded plate members.
- Strength evaluation of existing structures.
- Earthquake-resistant structures.
- Structural plain concrete.
- Appendix A: Strut and tie models.
- Appendix B: Alternative provisions for reinforce and pre-stressed concrete flexural and compression members.
- Appendix C: Alternative load and strength reduction factors.
- Appendix D: Anchoring to be concrete.
- Appendix E: Steel reinforcement information.
- Appendix F: Equivalence between SI-metric, MKS-metric and U.S. customary units of nonhomogeneous equations in the code

Geotechnical requirements are taken from IBC code:

- Geotechnical investigations (1803): Classification and identification of soil are conforming to ASTM D2487, ASTM D4318, ASTM D422 and ASTM D4829 standards respectively.
- Excavation, grading and fill (1804): They are defined according to ASTM D1557 standards and the Controlled Low-Strength Material (CLSM).
- Damp-proofing and waterproofing (1085): The requirements of the story of above a grade plane, under floor spaces, follow the requirements of FEMA/FIA-TB-11. Ground water control, Damp-proofing the mortar used comply with ASTM C887.
- Presumptive load-bearing values of soil (1806): It concerns determining the load combinations, presumptive load-bearing values and lateral load resistance.
- Foundation walls, retaining walls and embedded posts and poles (1807): Masonry foundation walls with reinforcement and the concrete masonry comply with ASTM C90. While, clay masonry complies with ASTM C62 or ASTM C216.
- Foundations (1808): The criteria for foundation design, design for expansive soils, slab-on-ground foundation, stabilization, and foundation on or adjacent to slopes, pools, and concrete foundations are presented in this section.
- Shallow foundation (1809): All requirements for design and construction for shallow foundations (such as supporting soils, stepped footings, depth and width of footings, frost protection and location of footings) are listed. Moreover, plain concrete footings, masonry-unit footings, steel grillage footings, timber footings, and footing seismic ties are also listed.
- Deep foundations (1810): The analyses and design details and installations of deep foundations are given. These details include geotechnical investigation, use of existing deep foundation elements, and special type of deep foundations.

Materials: Testing must be done to any materials used in concrete constructions to define if the materials are of the specified quality. Materials are:

- Cement: Different types of cement are used in buildings (such as Portland, blended hydraulic, expansive hydraulic, hydraulic, flash and natural pozzolan, slag and silica fume). All types of cement must conform to the relevant specifications of ASTM C150, ASTM C595, ASTM C845, ASTM C1157, ASTM C618, ASTM C989 and ASTM C1240 respectively
- Aggregates added to cement to produce concrete of adequate strength and durability. Aggregates are conformed to each of the following specifications: normal weight (ASTM C33) or lightweight (ASTM C330). Coarse aggregate must have maximum size due to one of the following: 1/5 the narrowest dimension between sides of forms, or 1/3 the depth of slabs, or 3/4 the minimum clear spacing between individual reinforcing wires or bars, bundled tendons, bundles of bars, or ducts
- Water used in mixing concrete must conform to (ASTM C1602). Drinking water is also suitable to be used for mixing concrete. Water has excessive impurities that may not affect the setting time, volume stability and concrete strength and may cause corrosion of reinforcement. Water use in mixing concrete must have limited quantities for sulfates, chlorides, solids and alkalis
- Admixtures that are used to reduce water and time setting modifications must conform to (ASTM C494). Types of admixture are air-entraining (must conform to ASTM C260), flowing concrete (must conform to ASTM C1017) and expansive cement use in concrete (must conform to ASTM C845)
- Steel reinforcement includes deformed and plain reinforcements. Deformed reinforcement bars have different types such as: Carbon steel conforms to ASTM A615; Low-alloy steel conforms to ASTM A706; Stainless steel conforms to ASTM A955 and Roll steel and axel steel conforms to ASTM A996. While, plain reinforcement types are plain bars for spiral reinforcement must conform to (ASTM A615, A706, A955, or A1035); plain wire for spiral reinforcement must conform to (ASTM A1064), and headed studs and its assemblies must conform to (ASTM A1044) [24].

4.4 WB Safeguard Policies

The main safeguard policy triggered by this project is OP/BP 4.01 Environmental Assessment

This specific site does not have any important physical cultural resources and no excavations on land are planned. Therefore, OP/BP 4.11 is not triggered.

The project does not require permanent or temporary land acquisition. Therefore, OP/BP 4.12 Involuntary Resettlement is not triggered.

4.1.1 OP/BP 4.01 Environmental Assessment

This policy is triggered if a project is likely to have significant adverse environmental impacts in its area of influence. According to the World Bank WB OP 4.01 the project is classified as Category B. Category B projects have mostly site-specific adverse environmental impacts. The examples include:

- Small scale irrigation and drainage projects
- Small-scale, relatively clean (gas or light diesel oil fired) thermal power plants, micro hydro power plants, and small sanitary landfills;
- Rehabilitating or maintaining an existing infrastructure (e.g., roads, power, transmission and irrigation networks)

For all Category A and B projects proposed for IBRD or IDA financing, during the EA process, the borrower consults project affected groups and local nongovernmental organizations (NGOs) about the project's environmental and social aspects and takes their views into account.

Any separate Category B report for a project proposed for IDA financing is made available to project-affected groups and local NGOs. Public availability in the borrowing country and official receipt by the Bank of Category A reports for projects proposed for IBRD or IDA financing, and of any Category B EA report for projects proposed for IDA funding, are prerequisites to Bank appraisal of these projects.

The Environmental Assessment takes into account the natural environment (air, water, and land); human health and safety; and social aspects (involuntary resettlement, physical cultural resources, etc.) in addition to trans-boundary and global environmental aspects.

This operational policy states the roles of the Bank and the Borrower:

The Bank mainly screens and sets the environmental assessment category and advises the borrower in terms of the Environmental and social Assessment requirements. The Bank reviews the findings and recommendations of the EA to determine whether they provide an adequate basis for processing the project for Bank financing. When the borrower has completed or partially completed EA work prior to the Bank's involvement in a project, the Bank reviews the EA to ensure its consistency with this policy. The Bank may, if appropriate, require additional EA work, including public consultation and disclosure.

The Borrower assists the bank in proper screening and will be responsible for carrying out environment assessment in compliance with the Bank's rules and national laws. The Borrower will also be responsible in consulting project affected persons and local Non-Governmental Organizations. The Borrower will disclose the draft/final documents and respond to any feedback provided from the Bank and/or the Public/stakeholders.

4.5 WB Disclosure Policies

This WB Policy supports decision making process by the Borrower and WB through allowing public access to information on environmental and social aspects of projects. Disclosure of key project documents, including executive summaries in English and the local language, is mandated:

- In Country – prior to project appraisal in local language and in English
- In the WB external website before project appraisal in English with the Executive Summary in English and in the local language

4.6 Environmental, Health, and Safety Guidelines

The EHS Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP). The EHS Guidelines contain the performance levels and measures that are normally acceptable to IFC, and that are generally considered to be achievable in new facilities at reasonable costs by existing technology. For IFC-financed projects, application of the EHS Guidelines to existing facilities may involve the establishment of site-specific targets with an appropriate timetable for achieving them. The environmental assessment process may recommend alternative (higher or lower) levels or measures, which, if acceptable to IFC, become project- or site-specific requirements. The guidelines applicable to the project are:

- Environmental, Health, and Safety General Guidelines
- EHS recommend adopting the WHO standards for acceptable emission levels as presented in the Table 15 in Section 4.1.4:

When host country regulations differ from the levels and measures presented in the EHS Guidelines, projects will be required to achieve whichever is more stringent.

5 ENVIRONMENT AND SOCIAL IMPACT ASSESSMENT

5.1 Impacts Significance Evaluation during Rehabilitation Phase

This section of the report describes the environmental and social impacts that are likely to result from the rehabilitation of Al Mosul second bridge (Al Huriya), and the 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 MOE. The construction contractor(s) will be responsible for compliance with the ESIA provisions during the rehabilitation phase of the project. The contractor will be also in charge of undertaking work in a manner that 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.

- 5.1.1 Impacts on Air Quality

Impacts

The main impacts on air quality will result from the emissions of the construction equipment and trucks used to transport construction materials. In addition, dust will be generated from the movement of vehicles and equipment on unpaved roads as well as the demolition and removal of concrete blocks.

The surrounding of the bridge is an open area characterized as commercial and residential. However, residential houses especially on the right bank are either empty or destroyed. The impacts on air quality will be very limited and will be reversed once the rehabilitation works are completed. The dust and particulate matters could arise from accumulated piles of stored inert waste material at or near the site prior to removal for disposal of stockpiles, ground asphalt, rubble, gravel, and sand that may result from rehabilitation activities.

Therefore, the impacts on air quality are assessed to be of **low significance**.

Mitigation measures

Mitigation measures should include, but not limited to, the following practices and actions:

- Engines of vehicles and other machinery are kept turned on only if necessary, avoiding any unnecessary emission;

- Machines and equipment are periodically checked and maintained to ensure their good working condition;
- All equipment and machines must be maintained and tested for compliance with standards and technical regulations for the protection of the environment and have appropriate certifications;
- Activities are carried out using the minimum required number of means at the same time; and
- Electric small-scale mechanization and technical tools are used when available and feasible;

Concerning dust control methods and measures, the following actions are to be taken into account to reduce the generation of dust:

- Unpaved roads, e.g. detours to access the construction site, which may be utilized for construction vehicles movement or transportation of construction materials should be prepared in a way to avoid dust emissions. A sub base layer of 15 cm and wet compaction should take place to get sufficient compaction to avoid dust emissions.
- The detour(s) should always be maintained in good conditions.
- Watering or increase of the moisture level of the open materials storage piles to reduce dust levels;
- Enclosure or covering of inactive piles to reduce wind erosion;
- Loads in all trucks transporting dust-generating materials have to be sprayed with water to suppress dust, as well as wheels of means moving inside and outside of the construction-site; and
- Speed reduction for vehicles approaching the site to less than 40 km/hr. On site, speed should not exceed 20 km/hr.

- **5.1.2 Noise impacts**

- **Impacts**

Currently there is no significant source of noise. Once the rehabilitation works start, the nearest sensitive receptors are the workers and contractor staff. On-site the noise level will expect to exceed the permissible limits.

However, the noise will not be continuous and noisy activities will not be allowed to take place at night to prevent any inconvenience for the nearest community. As for on-site workers, the personal protective

equipment should be used in order to reduce the impact of the noise and for the all period of work. Therefore, the noise level will have minimal impacts on the workers and contractor staff from the emission sources identified and it will be expected to be between 66 db-112 db. The following will be expected to be the main sources for noise impacts on the surrounding receptors:

- Noise emissions from the equipment engines used during the construction activities (earth works, breaking of damaged blocks, use of jack hammers, cutting of steel,...etc.); and
- Movement of trucks and other equipment from and to the construction site.

5.1.2.1 Sound Pressure Levels from Construction-Site Equipment

Noise impact was evaluated considering the equipment that could operate simultaneously in the construction site. In the following Table, equipment typologies and sound power levels L_w (dBA) are reported.

Table 7: Equipment typology and sound power levels (dBA)

Clearing		Structure Construction	
Bulldozer	80	Crane	75-77
Front End Loader	72-84	Welding Generator	71-82
Jack Hammer	81-98	Concrete Mixer	74-88
Crane with Ball	75-87	Concrete Pump	81-84
		Concrete Vibrator	76
Excavation & Earth Moving		Air Compressor	74-87
Bulldozer	80	Pneumatic Tools	81-98
Backhoe	72-93	Bulldozer	80
Front End Loader	72-84	Cement and Dump Trucks	83-94
Dump truck	83-94	Front End Loader	72-84
Jack Hammer	81-98	Dump truck	83-94
Scraper	80-93	Paver	86-88
Grading and Compacting		Landscaping & Clean-Up	
Grader	80-93	Bulldozer	80

Table 8: Equipment typology and relevant sound power levels (dBA) at different distances

Type	Distance between Equipment and Recipient		
	5m	20m	50m
Loader	90	78	70
Grader	90	78	70
Vibration Roller	86	74	66
Bulldozer	86	74	66
Sprayer	87	75	67
Generator	98	86	78
Impact drill	87	75	67
Impact piling	112	100	92
Concrete mixer	91	79	71
Concrete pump	85	70	62
Pneumatic hammer	84	86	78

The sound power levels (L_w) values were determined based on the equipment model with similar features and comparable power.

Noise impacts will mainly affect the construction workers. The noise impacts will be temporary, short term and localized therefore it is assessed to be of **low significance**.

5.1.2.1 Mitigation measures

Mitigation measures should include, but not limited to, the following practices and actions:

- Noise and vibration management
- Avoid or minimize transport through community areas.
- Switch off any engine as soon as it is not used.
- Working at night is prohibited, acceptable working hours shall be between 7 AM and 7 PM.
- Contractor to minimize unnecessary vehicle idling
- Muffling of the equipment;
- The noise sources should be placed in a concealed area with respect to acoustic receptors, consistent with the needs of the construction site.

- Personal protection equipment for workers should be used of especially those who use jackhammers or work near noisy engines or compressors.
- Additional health check-ups for personnel handling the vibrating and noisy equipment

- **5.1.3 Impacts on water resources**

Impacts

The potential impacts on the water environment derived from construction activities and Equipment are presented in this section with particular reference to:

Impacts related to surface and ground water

- The construction sites will be equipped with worker/engineer caravans, which will be fitted out with lavatory facilities (toilets and sinks). Improper wastewater disposal on soils may percolate to ground water and thus causing contamination of subsurface/ground water table.
- If wastewater is collected and discharged into the water stream, it will cause pollution to the river surface water.
- Contaminated wastewater by engine oils or lubricant after washing of equipment or by accidental spills may also find its way to the river stream thus polluting its waters and affecting its ecosystem.
- If the damaged concrete blocks, currently immersed in the river stream, are broken into small pieces to be able to lift them out of the river, the generated dust will fall into the water stream and will increase the suspended solids which will in turn affect the surface water quality.
- In addition, improper disposal of any liquid or solid wastes into the river may pollute its waters or block the water flow.

Although the rehabilitation activities are temporary, the pollution of the river water and underground water is assessed to be of medium significance.

5.1.3.3 Mitigation measures

Mitigation measures should include, but not limited to, the following practices and actions:

- In the event when sediment is transported onto the road, it should be cleaned using a street sweeper or by physically sweeping the street in cases of small areas to ensure the sediment is not washed into the drainage system with water runoff.

- Raw materials used in construction, which can be carried by water runoff, must be located and stored away from paths for water runoff.
- Road curb inlets must be checked and cleaned to ensure the water runoff is flowing into the drainage system.
- Where possible or appropriate, schedule works to avoid heavy rainfall periods (i.e. during the dry season) and modify activities during extreme rainfall and high winds.
- Carry out any activities that could cause pollution in designated areas away from rivers, boreholes or other water courses.
- Use topsoil to fill up potential pools to avoid stagnant water
- If surface drainage is disturbing the construction process, utilizing ditches, dikes and/or sandbags to divert this drainage from entering excavations
- Damaged sections of the bridge, which are immersed in the river, should be carefully removed without polluting the river water.
- In case of using septic tanks on site, the engineering drawings of these tanks should be presented to the Resident Engineer for approval.
- No solid wastes are to be thrown into the river.
- Paints or chemicals should be used away from the river. However, if non-avoidable, excessive precautions should be undertaken to avoid spillages into the river water and the ground water.
- Construction vehicles and machinery shall be washed only in designated areas where runoff will not pollute natural water bodies
- Wastewater from the worker rest areas or construction offices should be contained in septic tank and should be removed regularly from site by the authorized waste water trucks of the municipality of Nineveh to an authorized disposal location.

In case of the need to change engine oils or refuel some construction equipment, a proper maintenance workshop or shelter should be installed to ensure containment of any fuel or oil spills.

- 5.1.4 Impacts on soil

Impacts

The increase of soil erosion could be caused by the removal of vegetation and large-scale excavation activities for the construction. Site for the Project has no vegetation; hence impact related to soil erosion owing to removal of vegetation is insignificant.

The construction activities will not cause harmful changes in geomorphologic landforms and site setting.

Improper disposal of solid or liquid wastes may pollute the surrounding soils. Accidental oil and fuel spills may also result in contaminating soils.

Due to the temporary and limited rehabilitation activities, soil contamination impacts are assessed to be of **Medium significance**.

Mitigation measures

Mitigation measures should include, but not limited to, the following practices and actions:

- Excavated soil (and/or topsoil) is appropriately stored, and reused for back filling in holes or trenches whenever possible.
- Marking excavation with physical boundaries (barriers, tape or fence)
- Preventing loose material (soil and equipment) from falling or rolling into the excavation by removing this material to a minimum of 0.5 meter from the edge of the excavation
- Disposal of contaminated soil by truck to nearest authorized dumping areas located at about 13km to the East of the Project's site.
- Use topsoil to fill up potential pools to avoid stagnant water
- If surface drainage is disturbing the construction process, utilizing ditches dikes and/or sandbags to divert this drainage from entering excavations.
- Adverse weather: Site engineer is to monitor weather on a daily basis. No construction activities to be undertaken in strong winds or rains.
- Contractor to present accidents and spill response and clean-up plan to the resident Engineer for approval prior to construction works activities.
- Soil contamination by oil/grease spills, leakages or releases, all manipulations of oil derivatives in the process of construction are to be prevented.
- Provision of the fuel to the machines should be performed with maximum care.
- Leak proof containers should be used for storage and transportation of oil/grease and wash off from the oil/grease handling area shall be drained through drains and treated appropriately before disposal.
- Construction waste and debris shall be collected on a regular basis and disposed at nearest authorized dumping areas located at around 13 km East of the site.
- Only authorized quarries shall be used for purchasing soil to be used for embankment, padding, bedding, backfilling during construction (there are many quarries within 3-7 km radius).
- Operation of equipment and vehicles outside the designated work areas and roads must be prohibited.

- No hazardous waste storage shall take place directly on soils. Appropriate and enclosed containers should be utilized and disposed of in designated locations in cooperation with MOST who in charge for hazard waste disposal.
- **5.1.5 Solid and hazardous wastes**

Impacts

The present section discusses the potential environmental and social impacts of waste associated with the Project construction phase throughout the following stages of the waste management process:

- Temporary storage on the site area.
- Management and disposal of wastes.

The construction phase will be carried out through different activities as civil, mechanical, piping electrical, etc. which in turn will generate volumes of waste with typology characteristic of the nature of each activity.

In general, waste generated during construction phase shall be divided into:

- Debris and Construction waste;
- Municipal solid waste; and
- Other waste related to the maintenance activities of machines.

Solid construction waste typically includes concrete, asphalt, wood, plastic, glass, metals and other composite materials.

Hazardous waste potentially generated during construction activities includes empty paints/chemical containers, equipment batteries, and trash such as oil contaminated material, and similar. Removed asphalt will also be considered as hazardous wastes.

The quantities of solid and hazardous wastes are expected to be moderate but due to the weaknesses in the capacity of the local authorities in managing solid and hazardous wastes and lack of waste management facilities, the impacts of solid and hazardous wastes are assessed to be of **medium significance**.

Mitigation measures

- Keeping the site clean and tidy;
- Ensure there is no loose materials or debris lying around the site including the perimeter;
- Vehicles are regularly checked for cleanliness (general aspect and making sure no leaks are occurring)

- Simple waste management plan for specific waste streams must be developed.
- General waste must be collected and transported to local council approved disposal sites.
- Burning of waste is prohibited
- Reducing construction waste related to on-site construction and off-site manufacture or fabrication.
- Reusing the material on site (in situ or for new applications) whenever it is possible
- Monitoring the amount of site construction waste created to make sure it does not affect the surrounding and the adjacent areas.
 - Waste is not blocking pathways
 - Construction waste will be gathered in a specific zone of the construction site
- Contractor to evacuate any construction waste that are not possible to reuse, by truck to nearest authorized dumping site pre-agreed with the local authorities and distanced from the environmentally sensitive receptors and on a regular basis to avoid accumulation. Authorized construction waste dumping site is located about 13 km away from the bridge location at coordinates (36°20'17.00"N, 43°17'13.00" E) .
- All used motor oil, lubricants, etc. are to be collected in closed bins to avoid leakage and transferred to the refinery for processing.
- All staff will avoid littering in the open. Workers to use bins to throw garbage.
- Prepare and follow an accidental spill response and clean-up plan.
- Hazardous materials:
 - Provide adequate secondary containment for fuel storage tanks and for the temporary storage of other fluids such as lubricating oils and hydraulic fluids.
 - Hazardous wastes such as empty paint cans ,fillers ,chemicals (if needed) and construction materials Etc. should be stored in safe locked up place surrounded by caution tape and warning signs.
 - Safety measures should be fitted in the hazardous wastes storage place like fire extinguisher ball and smoke alarm.
 - Hazardous wastes should be collected as soon as possible by close / covered truck and transported to the designated landfill as determined by the Municipality of Nineveh at coordinates (36°20'17.00"N, 43°17'13.00" E).
 - The lubricants, motor oil, oil filters and are to be transported to the nearest refinery for disposal
 - Use impervious surfaces for refueling areas and other fluid transfer areas.

- Provide portable spill containment and clean-up equipment on site, and train staff in the safe use of it.
 - There should be a hazardous waste delivery report to prevent the reuse of the hazardous material containers. In case of hazardous material spillage on soil, the contaminated soil should be stripped and transported carefully to the designated landfill. The excavated soil should be replaced with clean soil of the same characteristics.
 - An accidental spill response and cleanup plan with measures to address both terrestrial and aquatic situations should be elaborated.
- Provide adequate sanitation facilities serving all workers (mentioned in HSE).
 - Paints with toxic ingredients or solvents or lead-based paints will not be used

- **5.1.6 Flora & Fauna**

The impacts on flora is considered to be **insignificant** due to the nature of the surrounding area, near the river grows only common rush and reeds.

The **impacts on fauna** is considered to be **insignificant**. With reference to the Ministry of Environment, there are no specie of particular importance in the Project site.

- **5.1.7 Topography and landforms**

The project will not include extensive excavation in undisturbed areas and only for the replacement of the existing communications; therefore, the impact on topography is considered **insignificant**

- **5.1.8 Impacts on local traffic**

- **Impacts**

Since the bridge was already not in use and the traffic is already diverted to the 4 alternative routes in the area (mentioned above), there will be no increase in the traffic levels. Therefore, it is expected that air pollution and noise levels will not increase in the alternative route. Therefore, the overall impacts of the rehabilitation activities on the local traffic are expected to be of **low significance**.

Mitigation measures

In order to minimize impacts associated with traffic generated by the project's traffic, the following measures must be implemented:

- Set up warning signs in the workplace:
 - All safe footpaths are marked; construction materials are not blocking pathways
 - Site entrances and exits are clearly marked for visitors and delivery drivers to see; and
 - If present, site reception is clearly signposted OR all visitors are escorted to the reception.
- Providing separate traffic routes for pedestrians and vehicles, where possible
- Designating specific parking areas for workers and visitors' vehicles outside the construction area.
- Avoid or minimize transport through community areas.
- In compliance with national regulations the Contractor will ensure that the construction site is properly secured and construction related traffic regulated.
- The site will be clearly visible and the public warned of all potential hazards by signposting and barriers / fencing
- Traffic management system and staff training, especially for site access and near-site heavy traffic. Provision of safe passages and crossings for pedestrians where construction traffic interferes.
- Adjustment of working hours to local traffic patterns, e.g. avoiding major transport activities during rush hours or times of livestock movement
- If required, active traffic management by trained and visible staff at the site for safe passage for the public

Ensuring safe and continuous access to all adjacent office facilities, shops and residences during construction

- **5.1.9 Health and Safety**

- **Impacts**

Impacts During the rehabilitation phase of the project, there are risks to human health Potential hazards for workers in construction include:

- Falls (from heights);
- Trench collapse;
- Scaffold collapse;
- Electric shock and arc flash/arc blast;
- Failure to use proper personal protective equipment; and

- Repetitive motion injuries.

The above risks are considered of high importance and need appropriate mitigation measures. As for the emission of pollutants in the air, the potential impact of rehabilitation activities was found to be low. If compared to the regulation limits, the expected concentrations of the various pollutants that could be generated from the site, are not expected to overcome the limits overcoming has occurred.

Similarly, the levels of noise that are expected from the site works are expected to be within acceptable limits and the impact is expected to be low.

There are no risks or impacts related to workers' accommodation, public health/communicable disease, or working at heights that are expected as all the needed logistics for the proper and healthy working environment will be provided by the contractor on-site.

The overall impact is considered to be **Low**.

5.1.9.1 Mitigation measures

- There is posted material indicating the nearest police station and hospital (with accident and emergency facilities).
- The contractor must take reasonable steps to prevent unauthorized people accessing the site.
- Training on handling of UXO/ERW
- Avoid the burning of materials on site.
- Provide a first aid kits in different places of the work site with the appropriate number of materials given the number of workers on site. The locations of the first aid kits will be provided to all workers.
- Providing extinguishers on work site.
- If work involving the use of flammable materials is being carried out, stop people smoking and do not allow other work activities involving potential ignition sources to take place nearby.
- Providing site boundaries by installing suitable physical boundaries (barriers, tape or fence).
- Marking excavation holes with physical boundaries (barriers, tape or fence)
- The contractor should put up barriers or covers in the area of openings and excavations.
- Store building materials (such as pipes, manhole rings, and cement bags) so that they cannot topple or roll over.
- Keep walkways and stairways free of tripping hazards such as trailing cables, building materials, and debris.
- Everyone who works on any site must have access to adequate toilet and washing facilities, a place for preparing and consuming refreshments,

and an area for storing and drying clothing and personal protective equipment (PPE).

- Contractor to ensure PPE (personal protective equipment) is used by all workers on site.
- Materials and equipment are tidily stacked, protected and covered where necessary. Additionally, there is adequate space for new materials to be stored in secured covered areas to avoid damage, theft, and to protect these items from weather conditions.
- Scaffolding for work in elevated areas such as ceiling painting should comply with the OSHA “General Requirements for Scaffolds §1926.451”
- Prepare the evacuation plan for the workers in case of acts of terrorism and violence in the area that threaten the safety of the personnel;
- Establish the evacuation routes and agreement with the authorities and army for evacuation and transferring injured personnel to the hospitals

- **5.1.10 Socio – Economic Impacts**

It is expected that the Local community members overwhelmingly support the bridge rehabilitation because of its potentially very significant contribution to local transportation, marketing of local produce, and stimulation of local business opportunities from new passing traffic. During the rehabilitation 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. However, in case of any negative aspects which may have not been identified at this stage, the local community will be able to communicate their complaints through a Grievance Redress Mechanism (GRM) which will be developed by the project and will be easily accessible (see Annex 2).

Summary of the expected positive social impact during rehabilitation phase (observed from the previous Projects):

- Providing job opportunities for the people of the region.
- Providing job opportunities for the state owned Enterprises and private sector companies after the recession due to the security situation (ISIS Crisis).
- Reviving the surrounding areas which are abandoned due to the recent events.
- Increase in movement of supply and demand for building materials and consumer goods (food,water,...etc.).
- Indirect effects such as enhancing the trust between the citizens and the government which will create stable working and living environment.
- Increasing the activities of the local media thus the movement of advertising and job opportunities.
- The impact is considered **High (positive impact)**.

- 5.1.11 Land Acquisition

No land acquisition will be required at any stage of the project. No additional or extra land will be needed to be rent or owned by the contractor for any purpose as there is a sufficient land area (owned by the government) surrounding the project that can be used by the contractor for any reason. Detours and construction site offices will be placed in the buffer zone of the roads approaching the bridge and free from any beneficiaries and not currently occupied or utilized. the **impact is insignificant.**

Following is the summary of impacts during rehabilitation phase.

Table 9: Summary of Impact Assessment Matrix – During Rehabilitation

	Environmental Receptor	Impact Significance
1	Air Quality	Low
2	Noise	Low
3	Water Resources	Medium
4	Soil	Medium
5	Solid and hazardous wastes	Medium
6	Flora & Fauna	Insignificant
7	Topography and landforms	Insignificant
8	Impacts on local traffic	Low
9	Health and Safety	Low
10	Socio-Economic impacts	High positive
11	Land	Insignificant

5.2 Potential Adverse Impacts during Operational Phase

Assessment of the potential adverse impacts on different environmental parameters during the operational phase.

5.2.1 Air Quality

Impacts

The operation of the bridge after rehabilitation will increase the traffic volume which in turn will increase air emissions from vehicles.

Mitigation measures

- During the license issuance or renewal process of vehicles, traffic authorities should ensure that all vehicle engines are in good conditions.

5.2.2 Noise

Impact

The operation of the bridge after rehabilitation will increase the traffic volume which in turn will increase noise levels from vehicles.

Mitigation measures

- During the license issuance or renewal process of vehicles, traffic authorities should ensure that all vehicle engines are in good conditions.
- Speed limits should be reduced especially near residential buildings.
- Limit trucks movement especially at night in coordination with the local traffic authorities.

5.2.3 Water resources

- During rainy season, runoff water contaminated with oil and grease may cause pollution of the river
- Since maintenance of broken vehicles on the bridge is unlikely, the generation of pollution unless in the case of extreme emergency such as oil spills from tankers would be minimal
- However, the installed drains (conduits and pipes) for run-off water should be regularly cleaned especially prior to and during the rainy season.

No impacts are expected on the fresh water resources during operation.

5.2.4 Soil

No impacts are expected on soil during operation.

5.2.5 Solid and hazardous wastes

Impact

Some littering and waste generation might result from the maintenance activities. Littering may occur due to wind action.

Mitigation measures

All the above solid waste must be collected and disposed by the municipality trucks and vehicles.

5.2.6 Flora & Fauna

No impacts are expected on flora or fauna during operation.

5.2.7 Topography and landforms

The local topography will not be altered by the project activities.

5.2.8 Impacts on local traffic

It is expected that the local traffic conditions in al Mosul city will significantly improve during the operation phase of the bridge.

5.2.9 Health and Safety

Impacts

Road accidents may result from the operation of the bridge and increased traffic volume.

Mitigation measures

- Speed limits and road signs should be in place to prevent or minimize the road accidents.
- The bridge must be provided with suitable post lighting at night to reduce the probability of road accidents.

5.2.10 Socio-Economic impacts

During the operational period, the project is expected to result in positive socio-economic outcomes for the local communities. The rehabilitation of this bridge is highly requested by the local communities. It is estimated that more than 100,000 people from the near surrounding area and the whole government of Nineveh will benefit from the bridge. 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.

In general, the impacts during operational phase are considered to be insignificant.

5.3 Indirect, Cumulative, and Residual Impacts

Indirect impacts are considered to be minor due to the limited duration of the construction activities. Nevertheless, transportation of materials, excavation and clearance contribute to dust generation and vehicle and equipment emissions which settle on soils and in runoff valleys during dry season contributing to the transport of sediments and pollutants to the main water bodies and infiltration into the shallow aquifer. Additionally, inadequate waste management and accidental spills of hazardous materials could potentially have an impact on the groundwater quality. The impact is exacerbated by inadequate waste management practices in the project area.

The main cumulative impact anticipated through implementation of this project is the incremental effect of construction waste disposal on the waste management in the area already suffering from the lack of disposal facilities.

Residual or irreversible impacts are considered to be very minor and mostly concern the use of the construction debris dumping sites as permanent municipal waste disposal areas. Another residual impact will be the increased level of noise due to traffic movement.

6 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

6.1 Responsibilities for implementation of mitigation measures

In order to manage the Environmental & Social impacts in line with Iraqi Government policies, and policies of funding agencies for the project, an Environmental and Social Management Plan (ESMP) was prepared. The ESMP contains management measures avoidance, mitigation, as well as enhancements that would be implemented during the construction and operation/maintenance phase of the project.

The responsibility for implementation of the mitigation measures will be mostly upon the contractor. However, the supervision and assurance that the mitigation measures are implemented will be the responsibility of the Resident Engineer (RE) who represents the Roads and Bridges Directorate (RBD) as the Project owner.

The RE will be assisted by a team of environmental and social officers who will be responsible for supervising the daily activities of the contractor and will report non-compliances to the RE in order to take necessary actions towards the contractor. Regular supervision site visits will also be conducted by the RBD Project Management Team (PMT) environmental/social officer in association with a qualified environmental and social consultant who will provide technical advice in case there is a need to modify or add new mitigation measures as work necessitates.

The costs of mitigation measures are estimated based on the average market rates for similar activities in Iraq and can be used as indicative costs. It is the sole responsibility of the contractor to estimate the costs associated with the recommended mitigation measures based on his work experience.

The following tables summarize the mitigation measures which are required to be undertaken to avoid any negative impacts on the environment. Responsibilities and estimated costs are also presented

6.2 Cost of mitigation measures

The costs of mitigation measures are estimated based on the average market rates for similar activities in Iraq and can be used as indicative costs. It is the sole responsibility of the contractor to estimate the costs associated with the recommended mitigation measures based on his work experience. The estimated cost of the mitigation measures for the rehabilitation phase is 33,000 US\$ and of the maintenance phase is nil as shown in the following Tables.

6.3 ESMP

The following tables summarize the mitigation measures which are required to be undertaken to avoid any negative impacts on the environment. Responsibilities and estimated costs are also presented.

Table 10: Mitigation Measures during Rehabilitation Phase

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US\$
1	Air quality	<p><u>Vehicle emissions</u></p> <ul style="list-style-type: none"> Contractor to keep vehicles and machinery properly operated and maintained. Contractor to minimize unnecessary vehicle idling. Switch off any engine as soon as it is not used. <p><u>Dust</u></p> <ul style="list-style-type: none"> Minimize dust from materials (such as sand, cement) and construction activities (such as excavation) by using covers, storage, control equipment, and increasing moisture content. Prepare concrete before going to the site to avoid movement of materials (gravel, sand, cement) if possible Minimize dust from vehicle movements, using water sprays. Avoid the burning of materials on site. Switch off any engine as soon as it is not used. Signs and speed reduction bumps should be installed for vehicles approaching the site and near residential buildings and farmlands to reduce their speed below 40 km/hr. On site, speed should not exceed 20 km/hr. All trucks carrying debris and construction materials are required to cover their loads. <p><u>Hazardous Emissions</u></p> <ul style="list-style-type: none"> Avoid storage of hazardous materials in open areas without proper covering; Provide adequate ventilation for work areas 	Contractor	Resident Engineer PMT	3000 \$
2	Noise	<p><u>Noise and vibration management</u></p> <ul style="list-style-type: none"> Avoid or minimize transport through community areas. Switch off any engine as soon as it is not used. Working at night is prohibited, acceptable working hours shall be between 7 AM and 7 PM. Contractor to minimize unnecessary vehicle idling Muffling of the equipment; The noise sources should be placed in a concealed area with respect to acoustic receptors, consistent with the needs of the construction site. Personal protection equipment for workers should be used especially those who 	Contractor	Resident Engineer PMT	2000 \$

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US\$
		<ul style="list-style-type: none"> use jackhammers or work near noisy engines or compressors. Additional health check-ups for personnel handling the vibrating and noisy equipment 			
3	Water resources	<ul style="list-style-type: none"> In the event that sediment is transported onto the road, it should be cleaned using a street sweeper or by physically sweeping the street in cases of small areas to ensure the sediment is not washed into the drainage system with water runoff. Raw materials used in construction, which can be carried by water runoff, must be located and stored away from paths for water runoff. Road curb inlets must be checked and cleaned to ensure the water runoff is flowing into the drainage system. Where possible or appropriate, schedule works to avoid heavy rainfall periods (i.e. during the dry season) and modify activities during extreme rainfall and high winds. Carry out any activities that could cause pollution in designated areas away from rivers, boreholes or other water courses. Use topsoil to fill up potential pools to avoid stagnant water If surface drainage is disturbing the construction process, utilizing ditches, dikes and/or sandbags to divert this drainage from entering excavations Damaged sections of the bridge, which are immersed in the river, should be carefully removed without polluting the river water. In case of using septic tanks on site, the engineering drawings of these tanks should be presented to the Resident Engineer for approval. No solid wastes are to be thrown into the river. Paints or chemicals should be used away from the river. However, if non-avoidable, excessive precautions should be undertaken to avoid spillages into the river water and the ground water. Construction vehicles and machinery shall be washed only in designated areas where runoff will not pollute natural water bodies Wastewater from the worker rest areas or construction offices should be contained in septic tank and should be removed regularly from site by the authorized waste water trucks of the municipality of Nineveh. In case of the need to change engine oils or refuel some construction 	Contractor	Resident Engineer PMT	8000\$

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US\$
		equipment, a proper maintenance workshop or shelter should be installed to ensure containment of any fuel or oil spills.			
4	Soil	<ul style="list-style-type: none"> ▪ Excavated soil (and/or topsoil) is appropriately stored, and reused for back filling in holes or trenches whenever possible. ▪ Marking excavation with physical boundaries (barriers, tape or fence) ▪ Preventing loose material (soil and equipment) from falling or rolling into the excavation by removing this material to a minimum of 0.5 metre from the edge of the excavation ▪ Disposal of contaminated soil by truck to nearest authorized dumping areas located at about 13km to the east of the site annex 6. ▪ Use topsoil to fill up potential pools to avoid stagnant water ▪ If surface drainage is disturbing the construction process, utilizing ditches dikes and/or sandbags to divert this drainage from entering excavations during adverse weather ▪ Site engineer is to monitor weather on a daily basis. No construction activities to be undertaken in strong winds or rains. ▪ Contractor to present accidents and spill response and cleanup plan to the resident Engineer for approval prior to construction works activities. ▪ Soil contamination by oil/grease spills, leakages or releases, all manipulations of oil derivatives in the process of construction are to be prevented. ▪ Provision of the fuel to the machines should be performed with maximum care. ▪ Leak proof containers should be used for storage and transportation of oil/grease and wash off from the oil/grease handling area shall be drained through drains and treated appropriately before disposal. ▪ Construction waste and debris shall be collected on a regular basis and disposed at nearest authorized dumping areas located at around 13km from the site. ▪ Only authorized quarries shall be used for purchasing soil to be used for embankment, padding, bedding, backfilling during construction (there are many quarries within 3-7 km distance from the site). ▪ Operation of equipment and vehicles outside the designated work areas and roads must be prohibited. ▪ No hazardous waste storage shall take place directly on soils. Appropriate and 	Contractor	Resident Engineer PMT	8000 \$

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US\$
		enclosed containers should be utilized and disposed of in designated locations in cooperation with MOST who in charge for hazard waste disposal.			
5	Construction Camp	<ul style="list-style-type: none"> Location of the camp should be agreed upon with the local beneficiaries Location of the camp outside known aquifer recharge zones Provision of adequate infrastructure for effluent collection; Timely disposal of effluent (weekly) Timely disposal of solid waste (weekly) Provision of collection pits for collection of used machinery oils; Adequate vehicle maintenance Transporting wastes to the designated disposal sites (by the municipality waste collecting trucks to their designated waste disposal site. The site will be determined later and will be included in the first monthly report) 	Contractor	Resident Engineer PMT	No additional costs
6	Solid and hazardous wastes	<ul style="list-style-type: none"> Keeping the site clean and tidy; Ensure there is no loose materials or debris lying around the site including the perimeter; Vehicles are regularly checked for cleanliness (general aspect and making sure no leaks are occurring) Simple waste management plan for specific waste streams must be developed. General waste must be collected and transported to local council approved disposal sites. Burning of waste is prohibited Reducing construction waste related to on-site construction and off-site manufacture or fabrication. Reusing the material on site (in situ or for new applications) whenever it is possible Monitoring the amount of site construction waste created to make sure it does not affect the surrounding and the adjacent areas. Waste is not blocking pathways Construction waste will be gathered in a specific zone of the construction site Contractor to evacuate any construction waste that are not possible to reuse, by truck to nearest authorized dumping site pre-agreed with the local authorities and distanced from the environmentally sensitive receptors and on a regular basis to avoid accumulation. Authorized construction waste dumping 	Contractor	Resident Engineer PMT	6000 \$

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US\$
		<p>site is located about 13 km away from the bridge location at coordinates (36°20'17.00"N, 43°17'13.00" E) .</p> <ul style="list-style-type: none"> ▪ All used motor oil, lubricants, etc. are to be collected in closed bins to avoid leakage and transferred to the refinery for processing. ▪ All staff will avoid littering in the open. Workers to use bins to throw garbage. ▪ Prepare and follow an accidental spill response and clean-up plan. ▪ Hazardous materials: <ul style="list-style-type: none"> ○ Provide adequate secondary containment for fuel storage tanks and for the temporary storage of other fluids such as lubricating oils and hydraulic fluids. ○ Hazardous wastes such as empty paint cans ,fillers ,chemicals (if needed) and construction materials Etc. should be stored in safe locked up place surrounded by caution tape and warning signs. ○ Safety measures should be fitted in the hazardous wastes storage place like fire extinguisher ball and smoke alarm. ○ Hazardous wastes should be collected as soon as possible by close / covered truck and transported to the designated landfill as determined by the Municipality of Nineveh at coordinates (36°20'17.00"N, 43°17'13.00" E). ○ The lubricants, motor oil, oil filters and are to be transported to the nearest refinery for disposal ○ Use impervious surfaces for refueling areas and other fluid transfer areas. ○ Provide portable spill containment and clean-up equipment on site, and train staff in the safe use of it. ○ There should be a hazardous waste delivery report to prevent the reuse of the hazardous material containers. In case of hazardous material spillage on soil, the contaminated soil should be stripped and transported carefully to the designated landfill. The excavated soil should be replaced with clean soil of the same characteristics. ○ An accidental spill response and cleanup plan with measures to address both terrestrial and aquatic situations should be elaborated. 			

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US\$
		<ul style="list-style-type: none"> Provide adequate sanitation facilities serving all workers (mentioned in HSE). Paints with toxic ingredients or solvents or lead-based paints will not be used Prepare an emergency preparedness and response plan 			
7	Flora & Fauna	<ul style="list-style-type: none"> Provide training to the construction crew on the impact of disturbance and damage to habitats; Monitor the construction crew and provide punitive measures for illegal hunting and/or fishing; Provide the crew with fuel for cooking to avoid burning of natural materials; Apply waste management plan; Avoid cutting of the reeds or any other riparian vegetation; Apply the accidental spill-response and cleanup plan to protect terrestrial and aquatic flora and fauna. 	Contractor	Resident Engineer PMT	No additional costs
8	Topography and surface drainage	<ul style="list-style-type: none"> Storage areas for construction materials should be located at sites that do not permit direct runoff into watercourses and are on land sloping at less than 1.5 %. Time limitation on works during rainy events; Regular maintenance of the equipment and machinery to avoid spillage of hazardous materials; Re-vegetation of cleared areas Timely and adequate disposal of liquid and solid waste in authorized areas. 	Contractor	Resident Engineer PMT	No additional costs
9	Access and traffic	<ul style="list-style-type: none"> Set up warning signs in the workplace: <ul style="list-style-type: none"> All safe footpaths are marked; construction materials are not blocking pathways Site entrances and exits are clearly marked for visitors and delivery drivers to see; and If present, site reception is clearly signposted OR all visitors are escorted to the reception. Providing separate traffic routes for pedestrians and vehicles, where possible Designating specific parking areas for workers and visitors' vehicles outside the construction area. Avoid or minimize transport through community areas. In compliance with national regulations the Contractor will ensure that the 	Contractor	Resident Engineer PMT	Additional costs for marking and signage: 2000 \$

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US\$
		<p>construction site is properly secured and construction related traffic regulated.</p> <ul style="list-style-type: none"> ▪ The site will be clearly visible and the public warned of all potential hazards by signposting and barriers / fencing ▪ Traffic management system and staff training, especially for site access and near-site heavy traffic. Provision of safe passages and crossings for pedestrians where construction traffic interferes. ▪ Adjustment of working hours to local traffic patterns, e.g. avoiding major transport activities during rush hours or times of livestock movement ▪ If required, active traffic management by trained and visible staff at the site for safe passage for the public ▪ Ensuring safe and continuous access to all adjacent office facilities, shops and residences during construction 			
10	Health and Safety	<ul style="list-style-type: none"> ▪ There is posted material indicating the nearest police station and hospital (with accident and emergency facilities). ▪ The contractor must take reasonable steps to prevent unauthorized people accessing the site. ▪ Training on handling of UXO/ERW ▪ Avoid the burning of materials on site. ▪ Provide a first aid kits in different places of the work site with the appropriate number of materials given the number of workers on site. The locations of the first aid kits will be provided to all workers. ▪ Providing extinguishers on work site. ▪ If work involving the use of flammable materials is being carried out, stop people smoking and do not allow other work activities involving potential ignition sources to take place nearby. ▪ Providing site boundaries by installing suitable physical boundaries (barriers, tape or fence). ▪ Marking excavation holes with physical boundaries (barriers, tape or fence) ▪ The contractor should put up barriers or covers in the area of openings and excavations. ▪ Store building materials (such as pipes, manhole rings, and cement bags) so that they cannot topple or roll over. ▪ Keep walkways and stairways free of tripping hazards such as trailing cables, 	Contractor	Resident Engineer PMT	4000\$

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US\$
		<ul style="list-style-type: none"> building materials, and debris. Everyone who works on any site must have access to adequate toilet and washing facilities, a place for preparing and consuming refreshments, and an area for storing and drying clothing and personal protective equipment (PPE). Contractor to ensure PPE (personal protective equipment) is used by all workers on site. Materials and equipment are tidily stacked, protected and covered where necessary. Additionally, there is adequate space for new materials to be stored in secured covered areas to avoid damage, theft, and to protect these items from weather conditions. Scaffolding for work in elevated areas such as ceiling painting should comply with the OSHA “General Requirements for Scaffolds §1926.451” Prepare the evacuation plan for the workers in case of acts of terrorism and violence in the area that threaten the safety of the personnel; Establish the evacuation routes and agreement with the authorities and army for evacuation and transferring injured personnel to the hospitals 			
11	Handling Complaints	<ul style="list-style-type: none"> Reducing impacts on the community through community and neighbour engagement. In cases there are minority communities speaking a different language in the area or working on site, notices are printed in the common local language. Provide the proper GRM for handling complaints 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 	Resident Engineer	PMT	No additional costs
12	Physical cultural resources	<ul style="list-style-type: none"> In case of accidental discovery stop all works and contact the responsible authority within 24 hours; refer to annex 1 Provide training to the construction crew on the mode of conduct in case of accidental findings 	Resident Engineer	PMT	No additional costs
Total cost US\$ (rehabilitation phase)					33,000 \$

Table 11: Mitigation Measures during Operation Phase

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US\$
1	Air quality including odors	<ul style="list-style-type: none"> Water spraying for dust control in maintenance areas; Draining of ponds to prevent stagnation; Provide traffic regulation measures to avoid traffic congestion. 	Operator	RBD/PMT	No additional costs
2	Noise	<ul style="list-style-type: none"> Advance warning to public ahead of planned maintenance and repair activities; Restriction on working hours to 7 AM to 7 PM during working days and avoidance of works during holidays unless needed on emergency basis. Provide traffic regulation measures to avoid traffic congestion. 	Operator	RBD/PMT	No additional costs
3	Water resources	<ul style="list-style-type: none"> Timely and adequate disposal of debris generated by maintenance activities and solid and liquid waste; Maintaining the drainage ditches and manholes unblocked on the river banks. 	Operator	RBD/PMT	No additional costs
4	Soil	<ul style="list-style-type: none"> Maintaining the drainage channels unblocked; Draining of ponds; Adequate disposal of waste 	Operator	RBD/PMT	No additional costs
5	Solid and hazardous wastes	<ul style="list-style-type: none"> Use of non-toxic paints for repairs; Storage of hazardous materials used for repairs in sealed containers; Disposal of waste to authorized disposal sites; Avoid disposal of effluent into the river. 	Operator	RBD/PMT	No additional costs
6	Traffic	<ul style="list-style-type: none"> Informing the public about schedule of repair and maintenance works Provision of temporary alternative access roads/ by-passes On the spot traffic management Ensure traffic safety 	Operator	RBD/PMT	No additional costs
7	Flora & Fauna	<ul style="list-style-type: none"> Keeping the manholes and ditches clean; Adequate waste disposal; Draining of ponds; Re-vegetation with the plants native to the area 	Operator	RBD/PMT	No additional costs
8	Handling	<ul style="list-style-type: none"> Compliance with GRM for one year following opening of the bridge for use will ensure that local community members have an accessible, fair and transparent 	Operator	RBD/PMT	No additional costs

Receptor		Mitigation Measures	Responsibility	Supervision	Total estimated Cost in US\$
	Complains	means of reporting any emerging adverse impacts, and a means of obtaining mitigation.			costs
9	Public hygiene and quality of water	<ul style="list-style-type: none"> Adequate waste disposal; Timely draining of ponds to avoid breeding of insects which could be the source of vector breeding diseases 	Operator	RBD/PMT	No additional costs
Total cost US\$ (Operation phase)					No additional costs

7 ENVIRONMENTAL AND SOCIAL MONITORING PLAN

7.1 Environmental and Social Monitoring

The ESMP will be shared with the contractor who will be contractually obligated to abide by it, with financial clauses associated to this obligation. Impacts are mitigated by detailed mitigation measures.

The following tables present monitoring measures in order to perform a non-harmful implementation of the project works to the environment and to reduce the risk of negative environmental and social impacts as far as possible.

In order to ensure full compliance of the performed activities to the environmental and social requirements, regular monitoring should be performed.

In this section, the environmental and social monitoring activities will be presented, the institutional responsibilities will be determined in addition to the necessary resources which need to be in place to perform the monitoring activities. 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 and social 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 as shown in the Table below.

Table 12: Monitoring Activities during Rehabilitation Phase

Receptor		Monitoring Activities	Monitoring Indicators	Frequency	Responsibility	Supervision	Total estimated Cost in US\$
1	Air quality including odors	<p>Site inspection with the photo documentation:</p> <ul style="list-style-type: none"> - Open material storage piles are to be inspected - Visual inspection of vehicles and equipment operating or entering the site - Investigate dust complaints from workers and residents - Signs and speed reduction bumps installed near the site and near residential buildings and farmlands <p>Air quality testing <u>if available</u>.</p>	<ul style="list-style-type: none"> • Compliance with dust abatement measures • Visual Inspections • Air quality parameters: PM₁₀, PM_{2.5}, SO₂, NO_x, CO, Ozone and HC 	<p>Inspection: Monthly (photos)</p> <p>Testing: Once prior to the start of construction works to establish the baseline, then monthly</p>	Contractor	Resident engineer	<p>Camera: 250 US \$</p> <p>Testing done by accredited laboratories. Additional cost 2000 US \$</p>
2	Noise	<p>Investigate noise complaints from workers and neighboring communities in the affected locations</p> <p>Silencers checked and placement of noise sourced in concealed area</p> <p>Use of personal protection equipment effective</p> <p>Site inspection measuring the level of noise</p>	<p>Visual Inspection and Recorded and documented complaints</p> <p>Recorded measurements results</p>	Weekly	Contractor	Resident engineer	No additional costs
3	Water resources	<p>Site inspection with photo documentation:</p> <ul style="list-style-type: none"> • Implementation of mitigation measures • Removal of Damaged immersed 	Inspection:	<p>Inspection:</p> <ul style="list-style-type: none"> • Bi-weekly during the rainy season, and after 	Contractor	Resident engineer	

Receptor		Monitoring Activities	Monitoring Indicators	Frequency	Responsibility	Supervision	Total estimated Cost in US\$
		sections with care <ul style="list-style-type: none"> Investigate some wastewater disposal like measures Installation of litter bins Investigate any wastes disposal in the river Installation of a proper maintenance shelter for paints and chemicals and observe any oil or fuel spills. Debris accumulation in water drainage Alteration of water courses (Monthly photo documentation) <ul style="list-style-type: none"> Water testing if <u>available</u>. 	Color, Total Suspended Solids (TSS), Total Dissolved Solids (TDS), Chemicals, carbon.	sporadic rains <ul style="list-style-type: none"> Once a month during the dry periods Water testing: in case of accidental spillage of hazardous materials			Testing done by accredited laboratories. Additional cost 3000 US \$
4	Soil	Site inspection with photo documentation; <ul style="list-style-type: none"> Monitor the filling up machine with oil Monitor the oil/grease containers and hazardous waste location and disposal Monitor the disposal of waste and debris Assure the origin of purchased soil is from an authorized quarry Forbid the operation of machinery outside the designated area 	Inspection:	Inspection: bi-weekly;	Contractor	Resident engineer	

Receptor		Monitoring Activities	Monitoring Indicators	Frequency	Responsibility	Supervision	Total estimated Cost in US\$
		<ul style="list-style-type: none"> Observe any soil contamination with oil or fuel Observe any accumulation of wastes Observe any soil erosion <p>Soil testing <u>if available</u>.</p>	pH, temperature, organic content, poly-aromatic hydrocarbons (PAHs); Fecal coliforms and Total coliforms	Soil testing in case of accidental spills			Testing done by accredited laboratories. Additional cost 3000 US \$
5	Solid and hazardous wastes	<ul style="list-style-type: none"> Site inspections Maintaining a record of type, quantity, and disposal location of solid and liquid waste generation; Observe any waste accumulation in un approved locations 	<ul style="list-style-type: none"> Storage conditions of hazardous materials; Disposal at designated sites 	Inspection: bi-weekly	Contractor	Resident engineer	No additional costs
6	Traffic	<p>Site inspections:</p> <p>Site surveillance for the presence of fencing/barriers and warning signs, and traffic speed limitations</p>		Monthly	Contractor	Resident engineer	No additional costs
7	Flora & Fauna	<p>Site inspections:</p> <ul style="list-style-type: none"> Cutting of reeds and other aquatic vegetation; Evidence of burning of wood; Evidence of vehicles moving beyond designated areas; <p>Site restoration after work completion</p>		Inspection: bi-weekly	Contractor	Resident engineer	No additional costs
8	Topography and surface drainage	<ul style="list-style-type: none"> Inspection and photo evidence 	<ul style="list-style-type: none"> Location of storage areas; Ceasing construction activities during 	Inspection: bi-weekly	Contractor	Resident engineer	No additional costs

Receptor		Monitoring Activities	Monitoring Indicators	Frequency	Responsibility	Supervision	Total estimated Cost in US\$
			rainy events; <ul style="list-style-type: none"> Re-vegetation of cleared areas Records of waste disposal. 				
9	Handling Complains	<ul style="list-style-type: none"> Ensure that the GRM is effective and well communicated 	<ul style="list-style-type: none"> Time of response to the complaint; Number of complaints 	Monthly	Contractor	Resident engineer	No additional costs
10	Public health and safety	Inspection and photo evidence: <ul style="list-style-type: none"> Speed limit and directional signs installed Personnel trained for health and safety issues Ensure compliance of workers to Health and Safety requirements and responsibilities assigned EHS performance; regularly inspected, reviewed and recorded Monitor the good housekeeping Maintain log on accidents Firefighting and safety equipment regularly checked Installing construction and warning signs First aid kit items regularly checked <ul style="list-style-type: none"> Maintaining records of injuries and accidents with cause and location 	<ul style="list-style-type: none"> 	Inspection: bi-weekly	Contractor	Resident engineer	No additional costs
Total cost US\$ (Operation/Maintenance phase)							8,450 US \$

Table 13: Monitoring during Operation Phase

Receptor		Monitoring Activities	Monitoring Indicators	Frequency	Responsibility	Supervision	Total estimated Cost in US\$
1	Air quality	Surveillance	Ensure the bridge in the operational condition and there are no hold ups of traffic that can produce excessive exhaust emissions; Inspection on the dust generation by the vehicles	Monthly	Operator	RBD	No additional costs
2	Noise	Noise level monitoring	Ensure the noise levels are within the acceptable limits	During maintenance and repairs	Operator	RBD	No additional costs
3	Water resources	<ul style="list-style-type: none"> • Surveillance; • Water testing if available. 	<ul style="list-style-type: none"> • Ensure the drainage channels and culverts are clear of debris • Water quality testing: for chemicals and carbon. 	Surveillance: <ul style="list-style-type: none"> • Bi-weekly during the rainy season • Monthly during the dry season Water testing: in case of accidental spills	Operator	RBD	500 for water testing
4	Soil	<ul style="list-style-type: none"> • Surveillance; • Soil testing if available. 	<ul style="list-style-type: none"> • Ensure the drainage channels and culverts are clear of debris • Soil testing: pH, temperature, organic content, poly-aromatic hydrocarbons (PAHs) 	Surveillance: <ul style="list-style-type: none"> • Bi-weekly during the rainy season • Monthly during the dry season Soil testing in areas of the accidental spills	Operator	RBD	300 for soil testing
5	Solid and hazardous wastes	<ul style="list-style-type: none"> • Surveillance; • Maintaining records of 	Waste disposed at	Monthly	Operator	RBD	No additional

Receptor		Monitoring Activities	Monitoring Indicators	Frequency	Responsibility	Supervision	Total estimated Cost in US\$
		quantities of waste and location of its disposal	designated areas				costs
6	Flora & Fauna	<ul style="list-style-type: none"> • Surveillance 	<ul style="list-style-type: none"> • Condition of the manholes and ditches; • Level of re-vegetation; • Absence of ponds 	Surveillance: <ul style="list-style-type: none"> • Bi-weekly during the rainy season • Monthly during the dry season 	Operator	RBD	No additional costs
7	Topography and surface drainage	<ul style="list-style-type: none"> • Surveillance 	Disposal of debris during maintenance and repairs	Monthly	Operator	RBD	No additional costs
8	Access and traffic	<ul style="list-style-type: none"> • Surveillance 	Presence of warning signs at maintenance site	During maintenance and repair works	Operator	RBD	No additional costs
9	Health and Safety	<ul style="list-style-type: none"> • Surveillance; • Maintaining records of quantities of waste and location of its disposal 	<ul style="list-style-type: none"> • Adequate warning about scheduled maintenance works; • Timely and adequate disposal of waste 	Monthly	Operator	RBD	No additional costs
10	Handling Complaints	Record keeping on received complaints	Number of complaints and responses	Quarterly	Operator	RBD	No additional costs
11	Physical cultural resources	N/A	N/A	N/A	N/A	N/A	
Total cost US\$ (Operation/Maintenance phase)							800 US \$ per year

7.2 ESMP Institutional Arrangements

In order to ensure full compliance with the environmental and social requirements which are described above, RBD PMT nominated a consultant to act as the focal point for environmental and social affairs at the central level. On the field level, RBD PMT nominated two engineers to act as environmental and social officers. Those engineers will be trained on monitoring and reporting of environmental and social impacts and how to fill the checklist (Annex 7) to be used during field visits before implementation starts. RBD Resident Engineer will be the officially responsible staff member for ensuring environmental and social compliance. S/He will be assisted by the designated environmental and social field officers.

In addition, a qualified consultant is recruited by the PMT to provide technical assistance and capacity building to the environmental and social team both at the central level and at the field level.

PMT has responsibility/authority to stop work in case of non-conformance with E&S requirements and/or dangerous work conditions.

7.3 Capacity Development

To ensure that the mitigation and monitoring measures are being carried out effectively with the required frequency, a clearly defined and regular (monthly) 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 rehabilitation should be reported immediately to relevant authorities.
- 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 and social monitoring report and other inspections reports must be produced periodically.

The RBD PMT engineers will provide the Resident Engineer with a weekly report briefing their observations and recommendations for action. Whereas the Resident Engineer shall prepare an environmental and social management progress report on monthly basis to RBD PMT in Baghdad. The environmental and social consultant will prepare a monthly environmental and social supervision report after conducting monthly site supervision visits. RBD PMT shall prepare a quarter environmental and social progress report which will be submitted to the WB for review and disclosure.

7.4 Required Resources

In order to ensure full compliance of the environmental and social requirements, regular site visits should be conducted. Dedicated office spaces, office equipment and supplies in addition to adequate means of transportation should be made available for the environmental and social management team at the central level and most importantly on the field level. RBD PMT should ensure the allocation of sufficient budget resources to ensure availing the required resources to achieve the required tasks.

8 PUBLIC CONSULTATIONS

8.1 Objectives of the Consultations

WB policies require that broad and open public consultations be held with the project affected peoples PAPs on the project. These consultations are to ensure that (PAPs) are provided with the opportunity to engage in the rehabilitation planning process, to raise questions and receive input and responses to their concerns. However, due to the current security situation in the project area and taking into consideration the safety of the people as public meetings may be targeted by terrorists, the public approach was not achievable.

8.2 Consultation Process

In order to fulfill the WB requirements, a one on one interview was adopted with the residents of the area to obtain sound information on the possible impacts on the local communities. Accordingly, a questionnaire was prepared in order to cover the key environmental and social aspects related to the project. The questionnaire was then addressed to vehicle-road users and to the local individuals in the surrounding community randomly to have their opinions and thoughts regarding the rehabilitation activities. In addition, the translated executive summary of the draft Limited/Simplified ESIA has been published on the RBD's website to allow for feedback and wider dissemination of information related to the planned activities under this project.

8.3 Findings of the Consultations

Individual interviews were conducted with the residents of the area to obtain sound information on the possible impacts on the local communities. The interviews were conducted on the 31th of January , 13th of September and 2nd of December 2018. People interviewed were the passersby living in close proximity to the project area; the total number of the interviewed people is 9 males and 4 female. The filled questionnaires and photos from the interviews are presented in Annex 3.

A translated summary of the ESMP will be provided on demand for any related party in this project.

1. All respondents agreed that the reconstruction activities will have a strong positive impact from the social perspectives on the locals.

2. No claims from any locals were recorded or alleged regarding the ownership of the land where the rehabilitation activities to take place; all agreed that is governmental land property.
3. No vegetation covers, crops, plants, trees, etc. will be removed in order to execute the rehabilitation activities.
4. No infrastructure will be affected negatively due the reconstruction activities.
5. No deportation, dislocation of any of the local community will be needed due to these activities.
6. Information about a grievance mechanism was introduced to interviewed individuals and a translated GRM form was also provided. All interviewed people were informed that they can submit their complaint to either site engineer, or to community leader or to PMT during construction.
7. The respondents do not anticipate any damage to the buildings or infrastructure during the rehabilitation activities;
8. No change to demographics or social structure will be induced by the project activities;
9. Local residents do not use any part of the land required for the project for personal purposes.
10. The respondents interpreted the question of relocation as their improved mobility rather than physical relocation of people.

8.4 Distribution of the GRM Forms

During individual interviews, information about a grievance mechanism was introduced to interviewed individuals and a translated GRM form was also provided. All interviewed people were informed that they can submit their complaint to either site engineer, or to community leader or to PMT during construction. The community leaders' information (mobile phone number) and PMT contact information (office and mobile phone numbers) will be available before implementation starts. There will be signs posted at the entrance of the bridges (Refer to Annex 2 for more details).

9 GRIEVANCE REDRESS MECHANISM

Bank procedures require that Grievance Redress Mechanisms (GRMs) be established and operational prior to commencement of the project, and that they continue to operate for one year following completion of the works for third party settlement of disputes arising from resettlement. This GRM should take into account the availability of judicial recourse as well as traditional and community dispute resolution mechanisms.

Accordingly, a GRM will be established at the project level to ensure any grievance can be addressed in an amicable manner. Resolving complaints at community level is always encouraged to address the problem that a person may encounter during implementation and/or operational phase.

The people wishing to lodge the complaint can contact the community leader, or the contractor, or the RBD. The contact information will be provided in Arabic language on the board near the construction site. The community leaders and PMT contact information is as follows:

-
-

The project grievance redressed system should be developed in consultation with communities immediately after starting the operational phase. The existing GRM of the parent Project will be followed. The GRM shall be as per the procedure shown below:

1. When the rehabilitation works starts (big instructional sign) with project environmental and social engineer AKA Liaison officer phone number , local roads and bridges directorate contact info and local community leaders contact⁸ info if possible will be fitted at the entrance of the bridge during the rehabilitation and operation period.
2. The affected person should report his/her complaints / grievances to the project environmental and social engineer AKA Liaison officer.
3. GRM forums in Arabic will be in possession of the project environmental and social engineer AKA Liaison officer.
4. The affected person fills her/his grievance. The grievance note should be signed and dated by the aggrieved person. Where the affected person is unable to write,

⁸ Local RBD and Community leaders will direct the affected person to the project environmental and social engineer.

s/he should obtain assistance from the community to write the note and mark the letter with his/her thumbprint.

5. The project environmental and social engineer AKA Liaison officer should check the validity of the complaint. If its valid the complaints / grievance process will continue if not the engineer should report the invalid complaint / grievance to the affected person, Local RBD, contractor and the community leaders.
6. If the project environmental and social engineer could reach an immediate solution that satisfies the affected person then the complaint should be solved and all parties⁹ should sign settlement agreement and the process should be documented and archived for future references.
7. If the project environmental and social engineer could not reach an immediate solution that satisfy the affected person, the project environmental and social engineer should lodge the complaint /grievance to RBD headquarter in Baghdad / EODP PMT / Citizens Complaints Unit.
8. The EODP PMT / Citizens Complaints Unit will provide a solution after studying and checking the complaint with local authorities and site visit.
9. The EODP PMT / Citizens Complaints Unit will reach the affected person if the affected person is satisfied with the solution provided by The EODP PMT / Citizens Complaints Unit then all parties should sign settlement agreement and the process should be documented and archived for future references.
10. If the affected person is not satisfied with the solution provided by The EODP PMT / Citizens Complaints Unit then the affected person can go to court of law.

In any case, the PMT / Citizens Complaints Unit must maintain records of grievances and complaints, including minutes of discussions, recommendations, agreements and resolutions made including those resolved by community's/community leaders.

It is worth mentioning that information about a grievance mechanism was introduced to interviewed individuals and a translated GRM form was also provided. All interviewed people were informed that they can submit their complaint to either site engineer/environmental and social engineer whose phone number will be posted on the entrance of the project site, and to community leader or to PMT during construction.

⁹ All parties include (the affected person, RBD/PMT , project environmental and social engineer, Contractor and other related stakeholders.

10 CONCLUSION AND RECOMMENDATIONS

The ESIA concludes that the proposed repair of Al Mosul second bridge (Al Huriya bridge) will have an overall significant positive impact on the affected population. The implementation of the recommended mitigation measures especially during the construction phase will ensure that potential negative environmental and social impacts are addressed.

ANNEXES

Annex 1: Chance Find Procedures

Chance find procedures will be used as follows:

Stop the construction activities in the area of the chance find;

- Delineate the discovered site or area;
- Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be present until the responsible local authorities and the Ministry of Culture take over;
- Notify the supervisory Engineer who in turn will notify the responsible local authorities and the Ministry of Culture immediately (within 24 hours or less);
- Responsible local authorities and the Ministry of Culture would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed by the archeologists from the Department of Antiquities and the Ministry of Culture (within 72 hours). The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage; those include the aesthetic, historic, scientific or research, social and economic values;
- Decisions on how to handle the finding shall be taken by the responsible authorities from DA and the Ministry of Culture. This could include changes in the layout (such as when finding an irremovable remain of cultural or archeological importance) conservation, preservation, restoration and salvage;
- Implementation for the authority decision concerning the management of the finding shall be communicated in writing by the Ministry of Culture; and
- Construction work could resume only after permission is given from the responsible local authorities and the Ministry of Culture concerning safeguard of the heritage.

These procedures must be referred to as standard provisions in construction contracts, when applicable. During project supervision, the Site Engineer shall monitor the above regulations relating to the treatment of any chance find encountered are observed.

Requirements on disclosure and translation of safeguards documentation

The Bank allows access to any information in its possession that is not on a list of exceptions.

This Bank Policy supports decision-making process by the Borrower and Bank through allowing public access to information on environmental and social aspects of projects.

Disclosure of key project documents, including Executive summaries in English and the local language, is mandated:

- In Country – prior to project appraisal in local language and in English;
- In the WB external website before project appraisal in English with the Executive Summary in English and in the local language.
- Translation: National/local languages as appropriate—for example, the national language of a country, local languages used within a country, and/or language(s) understood by the people affected by, or likely to be affected by, a project.
- Most information disclosed by the Bank, including publications and reports, is disseminated through the Bank’s external website. Ensuring the online availability of updated content in languages other than English is therefore key to maximizing access to the Bank’s work by borrowers and other members of the global audience

Annex 2: Grievance Form

Reference No:	
Full Name	My first name _____
<i>Note: you can remain anonymous if you prefer or request not to disclose your identity to the third parties without your consent</i>	My last name _____
	I wish to raise my grievance anonymously
	I request not to disclose my identity without my consent
Contact information	By Post: Please provide mailing address:
Please mark how you wish to be contacted (mail, telephone, e-mail).	_____

	By Telephone: _____
	By E-mail _____
Description of Incident or Grievance:	
What happened? Where did it happen? Who did it happen to? What is the result of the problem?	
Date of Incident/Grievance	
	One time incident/grievance (date_____)
	Happened more than once (how many times?___)
	On-going (currently experiencing problem)
What would you like to see happen to resolve the problem?	
Signature:_____	
Date: _____	
Please return this form to: [name], _____[company name] _____	
Address_____: Tel.:_____ or E-mail: _____	

Annex 3: Individual Consultations Questionnaire

1	In your opinion, would the rehabilitation of the bridge/road have positive impact on the residents of the area?	yes	no
2	Are there any claims on private land ownership in the project area?	yes	no
3	Would there be any damages to income generating crops, trees, and vegetation due to the rehabilitation activities?	yes	no
4	Would there be any losses of income of local residents due to the rehabilitation activities?	yes	no
5	Would there be any damages whether permanent or temporary which would affect the livelihood of the residents due to the rehabilitation activities?	yes	no
6	Would the rehabilitation activities require relocation of the residents of the area, whether permanent or temporary?	yes	no
7	Is there any usage by local residents of the facilities or land of the facilities by the local residents?	yes	no
8	In your opinion, would there be any negative social impacts due to the rehabilitation activities?	yes	no
9	Would there be any changes to the demographics or social structure in the project area induced by the rehabilitation activities?	yes	no
10	Would there be any damages to the structures or houses induced by the rehabilitation activities?	yes	no
11	Will the project improve the operations of transportation and reduce the isolation of the communities adjacent to the bridge/road?	yes	no
12	Is there any need for warning and directional signage during the rehabilitation activities?	yes	no
Name of the respondent:			
Occupation of the respondent:			
Date of interview:			

Name of the Project:	Rehabilitation of Al Mosul second bridge (Al Huriya) in Nineveh Governorate
Date:	31.01.2018
Name of the Respondent	Mohamed Salem Mohamed

س١: هل تعتقد ان عملية اعادة بناء الجسر / الطريق له اثار ايجابية من الناحية الاجتماعية على السكان القاطنين في المناطق المحيطة بالجسر / الطريق؟

نعم ☒ كلا ☐

س٢: هل هناك ادعاءات او مطالبات من قبل السكان المحليين بعائدية الارض المقام عليها الجسر / الطريق؟

نعم ☒ كلا ☐

س٣: بسبب اعمال اعادة البناء للجسر / الطريق هل تمت عملية ازالة لمحاصيل زراعية او اشجار او اي غطاء نباتي تعود عائلته لمواطنين او السكان المحليين؟

نعم ☒ كلا ☐

س٤: هل تضررت مصالح المواطنين القاطنين بالقرب من الجسر / الطريق بسبب اعمال اعادة البناء؟

نعم ☒ كلا ☐

س٥: هل هناك اي بنى تحتية مؤقتة او دائمية تلعب دورا اساسيا في النشاطات الحياتية اليومية للسكان ستتأثر بعملية تاهيل الجسر / الطريق؟

نعم ☒ كلا ☐

س٦: هل ان اعمال اعادة اعمار الجسر / الطريق ستتسبب باجراءات اعادة لتوطين لشخص او لاشخاص الى مناطق جديدة؟

نعم ☒ كلا ☐

س٧: هل تمت عملية استخدام منطقة بناء الجسر / الطريق بطريقة ما من قبل السكان المحليين ، علما ان الارض تابعة للدولة؟

نعم ☒ كلا ☐

س٨: هل تتوقع وجود تأثيرات اجتماعية سلبية بالمنطقة نتيجة اعمال اعادة التاهيل؟ ماهي؟

نعم ☒ كلا ☐

س٩: هل هناك تغييرات ديموغرافية او ضرر في النسيج الاجتماعي من جراء اعمال اعادة التاهيل؟

نعم ☒ كلا ☐

س١٠: هل توجد مجاميع ضعيفة من المحتمل ان تتأثر باعمال اعادة الاعمار؟

نعم ☒ كلا ☐

س١١: هل سيعزز المشروع من عمليات النقل و يقلل من العزالية المجتمعات الموجودة بالقرب من منطقة الجسر / الطريق؟

نعم ☒ كلا ☐

س١٢: هل يحتاج المواطنون المقيمون بالقرب من الجسر / الطريق الى وضع اعلامات تحذيرية او استدلاية لزيادة معدلات الامن و الامان لمستخدمي الجسر / الطريق

نعم ☒ كلا ☐

الاسم: محمد سالم محمد
المهنة: مهندس
تاريخ الزيارة: ٢١ / ٧ / ٢٠١٨



Name of the Project:	Rehabilitation of Al Mosul second bridge (Al Huriya) in Nineveh Governorate.
Date:	31.01.2018
Name of the Respondent	Younis Atalla

س١: هل تعتقد ان عملية اعادة بناء الجسر / الطريق له اثار ايجابية من الناحية الاجتماعية على السكان القاطنين في المناطق المحيطة بالجسر / الطريق؟

نعم ☒ كلا ☐

س٢: هل هنالك ادعاءات او مطالبات من قبل السكان المحليين بعادية الارض المقام عليها الجسر / الطريق؟

نعم ☒ كلا ☐

س٣: بسبب اعمال اعادة البناء للجسر / الطريق هل تمت عملية ازالة لمحاصيل زراعية او اشجار او اي غطاء نباتي تعود عائدته لمواطنين او السكان المحليين؟

نعم ☒ كلا ☐

س٤: هل تضررت مصالح المواطنين القاطنين بالقرب من الجسر / الطريق بسبب اعمال اعادة البناء؟

نعم ☒ كلا ☐

س٥: هل هنالك اي بنى تحتية مؤقتة او دائمية تلعب دورا اساسيا في النشاطات الحياتية اليومية للسكان ستتأثر بعملية تاهيل الجسر / الطريق؟

نعم ☒ كلا ☐

س٦: هل ان اعمال اعادة اعمار الجسر / الطريق ستتسبب باجراءات اعادة لتوطين لشخص او لاشخاص الى مناطق جديدة؟

نعم ☒ كلا ☐

س٧: هل تمت عملية استخدام منطقة بناء الجسر / الطريق بطريقة ما من قبل السكان المحليين ، علما ان الارض تابعة للدولة؟

نعم ☒ كلا ☐

س٨: هل تتوقع وجود تأثيرات اجتماعية سلبية بالمنطقة نتيجة اعمال اعادة التاهيل؟ ما هي؟

نعم ☒ كلا ☐

س٩: هل هنالك تغييرات ديموغرافية او ضرر في النسيج الاجتماعي من جراء اعمال اعادة التاهيل؟

نعم ☒ كلا ☐

س١٠: هل توجد مجاميع ضعيفة من المحتمل ان تتأثر باعمال اعادة الاعمار؟

نعم ☒ كلا ☐

س١١: هل سيعزز المشروع من عمليات النقل و يقلل من العزالية المجتمعات الموجودة بالقرب من منطقة الجسر / الطريق؟

نعم ☒ كلا ☐

س١٢: هل يحتاج المواطنون المقيمون بالقرب من الجسر / الطريق الى وضع اعلامات تحذيرية او استدلالية لزيادة معدلات الامن و الامان لمستخدمي الجسر / الطريق

نعم ☒ كلا ☐

الاسم: **يونس عطالله**
المهنة: **كاسه**
تاريخ الزيارة: **٢٠١٨/١/٣١**



Name of the Project:	Rehabilitation of Al Mosul second bridge (Al Huriya) in Nineveh Governorate.
Date:	31.01.2018
Name of the Respondent	Fatema Hamed Salman

س١: هل تعتقد ان عملية اعادة بناء الجسر / الطريق له اثار ايجابية من الناحية الاجتماعية على السكان القاطنين في المناطق المحيطة بالجسر / الطريق؟

نعم ☒ كلا ☐

س٢: هل هنالك ادعاءات او مطالبات من قبل السكان المحليين بعادية الارض المقام عليها الجسر / الطريق؟

نعم ☐ كلا ☒

س٣: بسبب اعمال اعادة البناء للجسر / الطريق هل تمت عملية ازالة لمحاصيل زراعية او اشجار او اي غطاء نباتي تعود عائدته لمواطنين او السكان المحليين؟

نعم ☐ كلا ☒

س٤: هل تضررت مصالح المواطنين القاطنين بالقرب من الجسر / الطريق بسبب اعمال اعادة البناء؟

نعم ☐ كلا ☒

س٥: هل هنالك اي بنى تحتية مؤقتة او دائمية تلعب دورا اساسيا في النشاطات الحياتية اليومية للسكان ستتأثر بعملية تاهيل الجسر / الطريق؟

نعم ☐ كلا ☒

س٦: هل ان اعمال اعادة اعمار الجسر / الطريق ستتسبب باجراءات اعادة لتوطين لشخص او لاشخاص الى مناطق جديدة؟

نعم ☐ كلا ☒

س٧: هل تمت عملية استخدام منطقة بناء الجسر / الطريق بطريقة ما من قبل السكان المحليين ، علما ان الارض تابعة للدولة؟

نعم ☐ كلا ☒

س٨: هل تتوقع وجود تأثيرات اجتماعية سلبية بالمنطقة نتيجة اعمال اعادة التاهيل؟

نعم ☐ كلا ☒

س٩: هل هنالك تغييرات ديموغرافية او ضرر في النسيج الاجتماعي من جراء اعمال اعادة التاهيل؟

نعم ☐ كلا ☒

س١٠: ماهي المجاميع الأكثر ضعفا و هشاشة التي من المحتمل ان تتأثر باعمال اعادة الاعمار؟

نعم ☐ كلا ☒

س١١: هل سيعزز المشروع من عمليات النقل و يقلل من انعزالية المجتمعات الموجودة بالقرب من منطقة الجسر / الطريق؟

نعم ☒ كلا ☐

س١٢: هل يحتاج المواطنون المقيمون بالقرب من الجسر / الطريق الى وضع اعلامات تحذيرية او استدلائية لزيادة معاللة الامن و الامان لمستخدمي الجسر / الطريق

نعم ☒ كلا ☐

الاسم: فاطمة همد سلمان
المهنة: ربة بيت
تاريخ الزيارة: ٢٨/٧/٢٠١٨



Name of the Project:	Rehabilitation of Al Mosul second bridge (Al Huriya) in Nineveh Governorate.
Date:	31.01.2018
Name of the Respondent	Momen Akram Mohamed Ali

س1: هل تعتقد ان عملية اعادة بناء الجسر / الطريق له اثار ايجابية من الناحية الاجتماعية على السكان القاطنين في المناطق المحيطة بالجسر / الطريق؟

نعم ☒ كلا ☐

س2: هل هنالك ادعاءات او مطالبات من قبل السكان المحليين بعادية الارض المقام عليها الجسر / الطريق؟

نعم ☒ كلا ☐

س3: بسبب اعمال اعادة البناء للجسر / الطريق هل تمت عملية ازالة لمحاصيل زراعية او اشجار او اي غطاء نباتي تعود عائلته لمواطنين او السكان المحليين؟

نعم ☒ كلا ☐

س4: هل تضررت مصالح المواطنين القاطنين بالقرب من الجسر / الطريق بسبب اعمال اعادة البناء؟

نعم ☒ كلا ☐

س5: هل هنالك اي بنى تحتية مؤقتة او دائمية تلعب دورا اساسيا في النشاطات الحياتية اليومية للسكان ستتأثر بعملية تاهيل الجسر / الطريق؟

نعم ☒ كلا ☐

س6: هل ان اعمال اعادة اعمار الجسر / الطريق ستتسبب باجراءات اعادة لتوطين لشخص او لاشخاص الى مناطق جديدة؟

نعم ☒ كلا ☐

س7: هل تمت عملية استخدام منطقة بناء الجسر / الطريق بطريقة ما من قبل السكان المحليين ، علما ان الارض تابعة للدولة؟

نعم ☒ كلا ☐

س8: هل تتوقع وجود تأثيرات اجتماعية سلبية بالمنطقة نتيجة اعمال اعادة التاهيل؟ ماهي؟

نعم ☒ كلا ☐

س9: هل هنالك تغييرات ديموغرافية او ضرر في النسيج الاجتماعي من جراء اعمال اعادة التاهيل؟

نعم ☒ كلا ☐

س10: هل توجد مجاميع ضعيفة من المحتمل ان تتأثر باعمال اعادة الاعمار؟

نعم ☒ كلا ☐

س11: هل سيعزز المشروع من عمليات النقل و يقلل من العزالية المجتمعات الموجودة بالقرب من منطقة الجسر / الطريق؟

نعم ☒ كلا ☐

س12: هل يحتاج المواطنون المقيمون بالقرب من الجسر / الطريق الى وضع اعلامات تحذيرية او استدلائية لزيادة معدلات الامن و الامان لمستخدمي الجسر / الطريق

نعم ☒ كلا ☐

الاسم: مؤمن اكرم محمد علي
المهنة: كاتب
تاريخ الزيارة: ٢٠١٨ / ١ / ٣١



Name of the Project:	Rehabilitation of Al Mosul second bridge (Al Huriya) in Nineveh Governorate.
Date:	13.09.2018
Name of the Respondent	Mal alluah atya

من ١: هل تعتقد ان عملية اعادة بناء الجسر / الطريق له اثر ايجابية من الناحية الاجتماعية على السكان القاطنين في المناطق المحيطة بالجسر / الطريق؟

نعم ☒ كلا ☐

من ٢: هل هناك ادعاءات او مظاهرات من قبل السكان المحليين بعتقيد الأرض المقام عليها الجسر / الطريق؟

نعم ☒ كلا ☐

من ٣: بسبب اضرار اعادة البناء للجسر / الطريق هل تمت عملية إزالة لمحاصيل زراعية او اشجار او اي غطاء نباتي تعود عتقيدته لمواطنين او السكان المحليين؟

نعم ☒ كلا ☐

من ٤: هل تضررت مصالح المواطنين القاطنين بالقرب من الجسر / الطريق بسبب اضرار اعادة البناء؟

نعم ☒ كلا ☐

من ٥: هل هناك اي بنى تحتية مؤقتة او دائمية تلعب دورا اساسيا في النشاطات الحياتية اليومية للسكان مستأثر بعملية تاهيل الجسر / الطريق؟

نعم ☒ كلا ☐

من ٦: هل ان اضرار اعادة اعمار الجسر / الطريق مستتسبب باجراءات اعادة لتوطين لشخص او لاشخاص الى مناطق جديدة؟

نعم ☒ كلا ☐

من ٧: هل تمت عملية استخدام منطقة بناء الجسر / الطريق بطريقة ما من قبل السكان المحليين ، علما ان الأرض تابعة للدولة؟

نعم ☒ كلا ☐

من ٨: هل تتوقع وجود تأثيرات اجتماعية سلبية بالمنطقة نتيجة اضرار اعادة التاهيل؟

نعم ☒ كلا ☐

من ٩: هل هناك تغيرات ديموغرافية او ضرر في التماسك الاجتماعي من جراء اضرار اعادة التاهيل؟

نعم ☒ كلا ☐

من ١٠: هل توجد مجاميع ضعيفة من المحتمل ان تتأثر باضرار اعادة الاعمار؟

نعم ☒ كلا ☐


من ١١: هل سيعزز المشروع من صليات النقل و يقلل من انزالية المجتمعات الموجودة بالقرب من منطقة الجسر / الطريق؟

نعم ☒ كلا ☐

من ١٢: هل يحتاج المواطنون المقيمون بالقرب من الجسر / الطريق الى وضع اعلانات تحذيرية او استدلالية لزيادة معدلات الامن و الامان لمستخدمي الجسر / الطريق

نعم ☒ كلا ☐

الاسم: **مال الله عطا**
المهنة: **كاسب**
تاريخ الزيارة: **١٣/٩/٢٠١٨**



Name of the Project:	Rehabilitation of Al Mosul second bridge (Al Huriya) in Nineveh Governorate.
Date:	13.09.2018
Name of the Respondent	Ashraf Mohammed Ameen

من: هل تعتقد ان عملية اعادة بناء الجسر / الطريق له اثر ايجابية من الناحية الاجتماعية على السكان القاطنين في المناطق المجاورة بالجسر / الطريق؟

نعم ☒ كلا ☐

من: هل هناك ادعاءات او مظاهرات من قبل السكان المحليين بعادية الارض المقام عليها الجسر / الطريق؟

نعم ☒ كلا ☐

من: بسبب اضرار اعادة البناء للجسر / الطريق هل تمت عملية إزالة لمخاضيل زراعية او اشجار او اي طعام نباتي تعود عائلته لمواطنين او السكان المحليين؟

نعم ☒ كلا ☐

من: هل تضررت مصالح المواطنين القاطنين بالقرب من الجسر / الطريق بسبب اضرار اعادة البناء؟

نعم ☒ كلا ☐

من: هل هناك اي بنى تحتية مؤقتة او دائمية تلعب دورا اساسيا في النشاطات الحياتية اليومية للسكان مستأثر بعملية تاهيل الجسر / الطريق؟

نعم ☒ كلا ☐

من: هل ان اضرار اعادة اعمار الجسر / الطريق مستتسبب باجراءات اعادة لتوطين لشخص او لاشخاص الى مناطق جديدة؟

نعم ☒ كلا ☐

من: هل تمت عملية استخدام منطقة بناء الجسر / الطريق بطريقة ما من قبل السكان المحليين، علما ان الارض تابعة للدولة؟

نعم ☒ كلا ☐

من: هل تتوقع وجود تأثيرات اجتماعية سلبية بالمنطقة نتيجة اضرار اعادة التاهيل؟

نعم ☒ كلا ☐

من: هل هناك تغييرات ايموغرافية او ضرر في النسيج الاجتماعي من جراء اضرار اعادة التاهيل؟

نعم ☒ كلا ☐

من: هل توجد مجاميع ضعيفة من المحتمل ان تتأثر باضرار اعادة الاضرار؟

نعم ☒ كلا ☐


من: هل سيعزز المشروع من صليات النقل و يقلل من العزالية المجتمعات الموجودة بالقرب من منطقة الجسر / الطريق؟

نعم ☒ كلا ☐

من: هل يحتاج المواطنون المقيمون بالقرب من الجسر / الطريق الى وضع اعلامات تحذيرية او استدلالية لزيادة معدلات الامن و الامان لمستلكني الجسر / الطريق؟

نعم ☒ كلا ☐

الاسم: اشرف محمد امين
المهنة: بايع خنظروان
تاريخ الزيارة: ١٣ / ٩ / ٢٠١٨



Name of the Project:	Rehabilitation of Al Mosul second bridge (Al Huriya) in Nineveh Governorate.
Date:	13.09.2018
Name of the Respondent	Mutaz Sady Hamid

س١: هل تعتقد ان عملية اعادة بناء الجسر / الطريق له اثر ايجابية من الناحية الاجتماعية على السكان القاطنين في المناطق المحيطة بالجسر / الطريق؟

نعم ☒ كلا ☐

س٢: هل هناك ادعاءات او مطالبات من قبل السكان المحليين بعقدية الارض المقام عليها الجسر / الطريق؟

نعم ☒ كلا ☐

س٣: بسبب احوال اعادة البناء للجسر / الطريق هل تمت عملية ازالة لمخاضيل زراعية او اشجار او اي غطاء نباتي تعود عقديته لمواطنين او السكان المحليين؟

نعم ☒ كلا ☐

س٤: هل تضررت مصالح المواطنين القاطنين بالقرب من الجسر / الطريق بسبب احوال اعادة البناء؟

نعم ☒ كلا ☐

س٥: هل هناك اي بني تحتية مؤقتة او دائمية تلعب دورا اساسيا في النشاطات الحياتية اليومية للسكان ستتأثر بعملية تاهيل الجسر / الطريق؟

نعم ☒ كلا ☐

س٦: هل ان احوال اعادة اعمار الجسر / الطريق ستسبب بانجازات اعادة لتوطين لشخص او لاشخاص الى مناطق جديدة؟

نعم ☒ كلا ☐

س٧: هل تمت عملية استخدام منطقة بناء الجسر / الطريق بطريقة ما من قبل السكان المحليين ، علما ان الارض تابعة للدولة؟

نعم ☒ كلا ☐

س٨: هل تتوقع وجود تأثيرات اجتماعية سلبية بالمنطقة نتيجة احوال اعادة التاهيل؟

نعم ☒ كلا ☐

س٩: هل هناك تغييرات ديموغرافية او ضرر في التسويج الاجتماعي من جراء احوال اعادة التاهيل؟

نعم ☒ كلا ☐

س١٠: هل توجد مخاطر ضعيفة من المحتمل ان تتأثر باحوال اعادة الاعمار؟

نعم ☒ كلا ☐


س١١: هل سيعزز المشروع من صلوات النقل و يقلل من النزالية المجتمعات الموجودة بالقرب من منطقة الجسر / الطريق؟

نعم ☒ كلا ☐

س١٢: هل يحتاج المواطنون المقيمون بالقرب من الجسر / الطريق الى وضع اعلانات تحذيرية او استدلالية لزيادة معدلات الامن و الامان لمستخدمي الجسر / الطريق

نعم ☒ كلا ☐

الاسم: **مقتدر سعد ب. ه. ر.**
المهنة: **مهندس مدني**
تاريخ الزيارة: **٢٠١٨ / ٩ / ١٣**



Name of the Project:	Rehabilitation of Al Mosul second bridge (Al Huriya) in Nineveh Governorate.
Date:	13.09.2018
Name of the Respondent	Qassem Mohammed Fayad

س: ١: هل تعتقد ان عملية اعادة بناء الجسر / الطريق له اثار ايجابية من الناحية الاجتماعية على السكان القاطنين في المناطق المحيطة بالجسر / الطريق؟

نعم ☒ كلا ☐

س: ٢: هل هناك ادعاءات او مطالبات من قبل السكان المحليين بمعدنية الارض المقام عليها الجسر / الطريق؟

نعم ☒ كلا ☐

س: ٣: بسبب اضرار اعادة البناء للجسر / الطريق هل تمت عملية ازالة لمخاضيل زراعية او اشجار او اي غطاء نباتي تعود عائلته لمواطنين او السكان المحليين؟

نعم ☒ كلا ☐

س: ٤: هل تضررت مصالح المواطنين القاطنين بالقرب من الجسر / الطريق بسبب اضرار اعادة البناء؟

نعم ☒ كلا ☐

س: ٥: هل هناك اي بنى تحتية مؤقتة او دائمية تلعب دورا اساسيا في النشاطات الحياتية اليومية للسكان ستتأثر بعنتية تاهيل الجسر / الطريق؟

نعم ☒ كلا ☐

س: ٦: هل ان اضرار اعادة اعمار الجسر / الطريق ستتسبب باجراءات اعادة لتوطين لشخص او لاشخاص الى مناطق جديدة؟

نعم ☒ كلا ☐

س: ٧: هل تمت عملية استخدام منطقة بناء الجسر / الطريق بطريقة ما من قبل السكان المحليين، علما ان الارض تابعة للدولة؟

نعم ☒ كلا ☐

س: ٨: هل تتوقع وجود تأثيرات اجتماعية سلبية بالمنطقة نتيجة اضرار اعادة التاهيل؟

نعم ☒ كلا ☐

س: ٩: هل هناك تغييرات ديموغرافية او ضرر في النسيج الاجتماعي من جراء اضرار اعادة التاهيل؟

نعم ☒ كلا ☐

س: ١٠: هل توجد مجاميع ضعيفة من المجتمع ان تتأثر باضرار اعادة الاضرار؟

نعم ☒ كلا ☐


س: ١١: هل سيعزز المشروع من صليات النقل و يقلل من النزالية المجتمعات الموجودة بالقرب من منطقة الجسر / الطريق؟

نعم ☒ كلا ☐

س: ١٢: هل يحتاج المواطنون المقومون بالقرب من الجسر / الطريق الى وضع اعلانات تحذيرية او استدلالية لزيادة معدلات الامن والامن لمستخدمي الجسر / الطريق

نعم ☒ كلا ☐

الاسم: قاسم محمد حنين
المهنة: شرطة شينوك
تاريخ الزيارة: ٢٠١٨/٩/١٣



Name of the Project:	Rehabilitation of Al Mosul second bridge (Al Huriya) in Nineveh Governorate.
Date:	13.09.2018
Name of the Respondent	Nwar Mohammed Hassen

س: هل تعتقد ان عملية اعادة بناء الجسر / الطريق له اثر ايجابية من الناحية الاجتماعية على السكان القاطنين في المناطق المحيطة بالجسر / الطريق؟

نعم ☒ كلا ☐

س: هل هناك ادعاءات او مطالبات من قبل السكان المحليين بعقدية الارض المقام عليها الجسر / الطريق؟

نعم ☒ كلا ☐

س: بسبب اضرار اعادة البناء للجسر / الطريق هل تمت عملية ازالة لمخاضيل زراعية او اشجار او اي غطاء نباتي تعود عقديته لمواطنين او السكان المحليين؟

نعم ☒ كلا ☐

س: هل تضررت مصالح المواطنين القاطنين بالقرب من الجسر / الطريق بسبب اضرار اعادة البناء؟

نعم ☒ كلا ☐

س: هل هناك اي بني تحتية مؤقتة او دائمية تلعب دورا اساسيا في النشاطات الحياتية اليومية للسكان مستأثر بعملية تاهيل الجسر / الطريق؟

نعم ☒ كلا ☐

س: هل ان اضرار اعادة اعمار الجسر / الطريق ستتسبب باجراءات اعادة تنوطين للشخص او لاشخاص الى مناطق جديدة؟

نعم ☒ كلا ☐

س: هل تمت عملية استخدام منطقة بناء الجسر / الطريق بطريقة ما من قبل السكان المحليين ، علما ان الارض تابعة للدولة؟

نعم ☒ كلا ☐

س: هل تتوقع وجود تكتيرات اجتماعية سلبية بالمنطقة نتيجة اضرار اعادة التاهيل؟

نعم ☒ كلا ☐

س: هل هناك تغييرات تيموجرافية او ضرر في التنسج الاجتماعي من جراء اضرار التاهيل؟

نعم ☒ كلا ☐

س: هل توجد مجاميع ضعيفة من المحتمل ان تتأثر باضرار اعادة الاضرار؟

نعم ☒ كلا ☐


س: هل سيعزز المشروع من صلاحيات النقل و يقلل من العزالية المجتمعات الموجودة بالقرب من منطقة الجسر / الطريق؟

نعم ☒ كلا ☐

س: هل يحتاج المواطنون المعيقون بالقرب من الجسر / الطريق الى وضع اعلانات تحذيرية او استدلالية لزيادة معدلات الامن و الامان لمستخدمي الجسر / الطريق

نعم ☒ كلا ☐

الاسم: **نوار محمد حسن**
المهنة: **جامع هند**
تاريخ الزيارة: **2018/9/13**



Name of the Project:	Rehabilitation of Al Mosul second bridge (Al Huriya) in Nineveh Governorate.
Date:	13.09.2018
Name of the Respondent	Karar Ali

س١: هل تعتقد ان عملية اعادة بناء الجسر / الطريق له اثر ايجابية من الناحية الاجتماعية على السكان القاطنين في المناطق المحيطة بالجسر / الطريق؟

نعم ☒ كلا ☐

س٢: هل هناك ادعاءات او مظاهرات من قبل السكان المحليين بعتقيد الارض المقام عليها الجسر / الطريق؟

نعم ☒ كلا ☐

س٣: بسبب اضرار اعادة البناء للجسر / الطريق هل تمت عملية إزالة لمحاصيل زراعية او اشجار او اي غطاء نباتي تعود عقديته لمواطنين او السكان المحليين؟

نعم ☒ كلا ☐

س٤: هل تضررت مصالح المواطنين القاطنين بالقرب من الجسر / الطريق بسبب اضرار اعادة البناء؟

نعم ☒ كلا ☐

س٥: هل هناك اي بنى تحتية مؤقتة او دائمية تلعب دورا اساسيا في النشاطات الحياتية اليومية للسكان مستأثر بعملية تاهيل الجسر / الطريق؟

نعم ☒ كلا ☐

س٦: هل ان اضرار اعادة اعمار الجسر / الطريق ستتسبب باجراءات اعادة تنوطين لشخص او لاشخاص الى مناطق جديدة؟

نعم ☒ كلا ☐

س٧: هل تمت عملية استخدام منطقة بناء الجسر / الطريق بطريقة ما من قبل السكان المحليين ، علما ان الارض تابعة للدولة؟

نعم ☒ كلا ☐

س٨: هل تتوقع وجود تأثيرات اجتماعية سلبية بالمنطقة نتيجة اضرار اعادة التاهيل؟

نعم ☒ كلا ☐

س٩: هل هناك تغييرات ديموغرافية او ضرر في النسيج الاجتماعي من جراء اضرار اعادة التاهيل؟

نعم ☒ كلا ☐

س١٠: هل توجد مخاطر شعلة من المحتمل ان تتكرر باضرار اعادة الاضرار؟

نعم ☒ كلا ☐


س١١: هل سيعزز المشروع من مستويات النقل و يقلل من التعزلة المجتمعات الموجودة بالقرب من منطقة الجسر / الطريق؟

نعم ☒ كلا ☐

س١٢: هل يحتاج المواطنون المقيمون بالقرب من الجسر / الطريق الى وضع اعلانات تحذيرية او استدلالية لزيادة معدلات الامن و الامان لمستخدمي الجسر / الطريق

نعم ☒ كلا ☐

الاسم: **كارار علي**
المهنة: **موظف حكومي**
تاريخ الزيارة: **٢٠١٨ / ٩ / ١٣**



Name of the Project:	Rehabilitation of Al Mosul second bridge (Al Huriya) in Nineveh Governorate.
Date:	2/12/2018
Name of the Respondent	Sahra Yousif

س١: هل تعتقد ان عملية اعادة بناء الجسر / الطريق له اثار ايجابية من الناحية الاجتماعية على السكان القاطنين في المناطق المحيطة بالجسر / الطريق؟

نعم ☒ كلا ☐

س٢: هل هناك ادعاءات او مطالبات من قبل السكان المحليين بعائدية الارض المقام عليها الجسر / الطريق؟

نعم ☐ كلا ☒

س٣: بسبب افعال اعادة البناء للجسر / الطريق هل تمت عملية ازالة لمحاصيل زراعية او اشجار او اي غطاء نباتي تعود عائدته لمواطنين او السكان المحليين؟

نعم ☐ كلا ☒

س٤: هل تضررت مصالح المواطنين القاطنين بالقرب من الجسر / الطريق بسبب افعال اعادة البناء؟

نعم ☐ كلا ☒

س٥: هل هناك اي بنى تحتية مؤقتة او دائمية تلعب دورا اساسيا في النشاطات الحياتية اليومية للسكان ستتأثر بعملية تاهيل الجسر / الطريق؟

نعم ☐ كلا ☒

س٦: هل ان افعال اعادة اعمار الجسر / الطريق مستتسبب باجراءات اعادة توظيفين للشخص او لاشخاص الى مناطق جديدة؟

نعم ☐ كلا ☒

س٧: هل تمت عملية استخدام منطقة بناء الجسر / الطريق بطريقة ما من قبل السكان المحليين ، علما ان الارض تابعة للدولة؟

نعم ☐ كلا ☒

س٨: هل تتوقع وجود تكتلات اجتماعية سلبية بالمنطقة نتيجة افعال اعادة التاهيل؟ماهي؟

نعم ☐ كلا ☒

س٩: هل هناك تغييرات ديموغرافية او ضرر في النسيج الاجتماعي من جراء افعال اعادة التاهيل؟

نعم ☐ كلا ☒

س١٠: هل توجد مجاميع ضعيفة من المحتمل ان تتأثر بافعال اعادة الاعمار؟

نعم ☐ كلا ☒

س١١: هل سيعزز المشروع من صليات النقل و يقلل من العزالية المجتمعات الموجودة بالقرب من منطقة الجسر / الطريق؟

نعم ☒ كلا ☐

س١٢: هل يحتاج المواطنون المقيمون بالقرب من الجسر / الطريق الى وضع اعلامات تحذيرية او استدلالية لزيادة معدلات الامن و الامان لمستخدمي الجسر / الطريق

نعم ☒ كلا ☐

الاسم: صالح محمد
المهنة: معلم
تاريخ الزيارة: ٢٠١٨/٢٣/٢



Name of the Project:	Rehabilitation of Al Mosul second bridge (Al Huriya) in Nineveh Governorate.
Date:	2/12/2018
Name of the Respondent	Reem Abdul Satar

س١: هل تعتقد ان عملية اعادة بناء الجسر / الطريق له اثار ايجابية من الناحية الاجتماعية على السكان القاطنين في المناطق المحيطة بالجسر / الطريق؟

نعم ☒ كلا ☐

س٢: هل هناك ادعاءات او مطالبات من قبل السكان المحليين بعادية الارض المقام عليها الجسر / الطريق؟

نعم ☐ كلا ☒

س٣: بسبب اصال اعادة البناء للجسر / الطريق هل تمت عملية ازالة لمخاضيل زراعية او اشجار او اي غطاء نباتي تعود عقديته لمواطنين او السكان المحليين؟

نعم ☐ كلا ☒

س٤: هل تضررت مصالح المواطنين القاطنين بالقرب من الجسر / الطريق بسبب اصال اعادة البناء؟

نعم ☐ كلا ☒

س٥: هل هناك اي بني تحتية مؤقتة او دائمية تلعب دورا اساسيا في النشاطات الحياتية اليومية للسكان مستائل بعملية تاهيل الجسر / الطريق؟

نعم ☐ كلا ☒

س٦: هل ان اصال اعادة اصار الجسر / الطريق مستتسبب باجراءات اعادة لتوطين للشخص او لاشخاص الى مناطق جديدة؟

نعم ☐ كلا ☒

س٧: هل تمت عملية استخدام منطقة بناء الجسر / الطريق بطريقة ما من قبل السكان المحليين ، علما ان الارض تابعة للدولة؟

نعم ☐ كلا ☒

س٨: هل تتوقع وجود تأثيرات اجتماعية سلبية بالمنطقة نتيجة اصال اعادة للتاهيل؟ماهي؟

نعم ☐ كلا ☒

س٩: هل هناك تغييرات ديموغرافية او ضرر في النسيج الاجتماعي من جراء اصال اعادة للتاهيل؟

نعم ☐ كلا ☒

س١٠: هل توجد مجاميع ضعيفة من المحتمل ان تتأثر باصال اعادة الاصار؟

نعم ☐ كلا ☒

س١١: هل سيعزز المشروع من عمليات النقل و يقلل من النزالية المجتمعات الموجودة بالقرب من منطقة الجسر / الطريق؟

نعم ☒ كلا ☐

س١٢: هل يحتاج المواطنون المقيمون بالقرب من الجسر / الطريق الى وضع اعلانات تحذيرية او استدلالية لزيادة معدلات الامن و الامن لمستخدمي الجسر / الطريق

نعم ☒ كلا ☐

الاسم: محمد النور

المهنة: مهندس

تاريخ الزيارة: ٢٠١٨ / ١٢ / ٢



Name of the Project:	Rehabilitation of Al Mosul second bridge (Al Huriya) in Nineveh Governorate.
Date:	2/12/2018
Name of the Respondent	Hala Mofeq Saeed

س ١: هل تعتقد ان عملية اعادة بناء الجسر / الطريق له اثار ايجابية من الناحية الاجتماعية على السكان القاطنين في المناطق المحيطة بالجسر / الطريق؟

نعم ☒ كلا ☐

س ٢: هل هنالك ادعاءات او مطالبات من قبل السكان المحليين بعادية الارض المقام عليها الجسر / الطريق؟

نعم ☒ كلا ☐

س ٣: بسبب افعال اعادة البناء للجسر / الطريق هل تمت عملية ازالة لمحاصيل زراعية او اشجار او اي غطاء نباتي تعود عائدته لمواطنين او السكان المحليين؟

نعم ☒ كلا ☐

س ٤: هل تضررت مصالح المواطنين القاطنين بالقرب من الجسر / الطريق بسبب افعال اعادة البناء؟

نعم ☒ كلا ☐

س ٥: هل هنالك اي بنى تحتية مؤقتة او دائمية تلعب دورا اساسيا في النشاطات الحياتية اليومية للسكان مستتار بعملية تاهيل الجسر / الطريق؟

نعم ☒ كلا ☐

س ٦: هل ان افعال اعادة اعمار الجسر / الطريق ستسبب باجراءات اعادة لتوطين لشخص او لاشخاص الى مناطق جديدة؟

نعم ☒ كلا ☐

س ٧: هل تمت عملية استخدام منطقة بناء الجسر / الطريق بطريقة ما من قبل السكان المحليين ، علما ان الارض تابعة للدولة؟

نعم ☒ كلا ☐

س ٨: هل تتوقع وجود تأثيرات اجتماعية سلبية بالمنطقة نتيجة افعال اعادة التاهيل؟ ماهي؟

نعم ☒ كلا ☐

س ٩: هل هنالك تغييرات ديموغرافية او ضرر في النسيج الاجتماعي من جراء افعال اعادة التاهيل؟

نعم ☒ كلا ☐

س ١٠: هل توجد مجاميع ضعيفة من المحتمل ان تتأثر بافعال اعادة الاعمار؟

نعم ☒ كلا ☐

س ١١: هل سيعزز المشروع من عمليات النقل و يقلل من انعزالية المجتمعات الموجودة بالقرب من منطقة الجسر / الطريق؟

نعم ☒ كلا ☐

س ١٢: هل يحتاج المواطنون المقيمون بالقرب من الجسر / الطريق الى وضع اعلانات تحذيرية او استدلاية لزيادة معدلات الامن و الامان لمستخدمي الجسر / الطريق

نعم ☒ كلا ☐

الاسم: هالة موفيق سعيد

المهنة: موهنة

تاريخ الزيارة: ٢٠١٨ / ١٢ / ٢٠



Annex 4: Official Letter issued by the Ministry of Interior confirming clearance of Al Mosul second bridge area from UXO

The Republic of Iraq
Ministry of Construction, Housing
and Public Municipalities
Roads & Bridges Department
Directorate of roads and bridges
Nineveh

العدد : ١٢٧٩
التاريخ : ٢٠١٨/٨/٥
١٤٣٩ / /

دائرة الطرق والجسور
مديرية طرق وجسور نينوى

جمهورية العراق
وزارة الاعمار والاسكان والبلديات
والاشغال العامة
دائرة الطرق والجسور
مديرية طرق وجسور نينوى
السلامة المهنية والبيئية

السيد / دائرة الطرق والجسور / ادارة مشاريع القرض الطارئ / وحدة البيئة
م/جسر الموصل الثاني (الحرية)

كتابكم المرقم ق/ط/٦٥٥ في ٢٠١٨/٧/١٩

نرسل لكم شهادة سلامة من المخلفات الحربية والالغام لموقع جسر الموصل الثاني (الحرية) بالكتاب المرفق طيا والمرقم بالعدد ١٢٠٣٣/١٧٢ في ٢٠١٨/٧/٢٤ و كتاب مديرية بيئة نينوى بعدم وجود نباتات او حيوانات نادرة او مهددة بالانقراض بالكتاب المرقم ١٤٤٩ في ٢٠١٨/٧/٢٩.

للتفضل بالعلم.....مع الامتنان

دائرة الطرق والجسور
مديرية طرق وجسور نينوى

المهندس
ياسمين ابراهيم خليل
مدير طرق وجسور نينوى / وكالة
٢٠١٨/٨/٥

المرفقات:
صورة الكتاب المرقم ١٢٠٣٣/١٧٢ في ٢٠١٨/٧/٢٤
صورة الكتاب المرقم ١٤٤٩ في ٢٠١٨/٧/٢٩

نسخة منه الى:
لجنة الادر البيئي
الاضمار المقتصة

يرسل بالانترنيت

العنوان : الموصل - الفصيلة - قرب مديرية تربية نينوى
e mail: ninevahscrib2018@gmail.com

بسم الله الرحمن الرحيم

جمهورية العراق
وزارة الداخلية
مديرية الدفاع المدني
مديرية دفاع مدني نينوى
قسم الشؤون الفنية
شعبة معالجة القنابل غير المنفلقة
العدد / ١٧٤ / ٢٢
التاريخ / ٢٠١٨ / ٧ / ٢٤



١٨٢٤
٨٤٤

إلى / مديرية طرق وجسور نينوى/ السلامة المهنية والبيئة
م/جسر الموصل الثاني(الحرية)

كتابكم الرقم ١٥٥٧ في ٢٠١٨/٧/١٩

بتاريخ ٢٠١٨/٧/٢٤ تم توجية مفرزة معالجة القنابل الغير منفلقة التابعة لمديرتنا الى جسر الحرية وتم اجراء الكشف والمسح الميداني على ضفتي جسر الحرية والمنطقة المحيطة للجسر من الجانبين الايمن والايسر وتبين خلو المنطقة من المتفجرات والمخلفات الحربية .

للتفضل بالعلم الاطلاع مع التقدير .

العقيد الحقوقي

حسام خليل عبد

مدير دفاع مدني نينوى/وكالة

٢٠١٨/٧/ ٢٤



م.م. امير
لاجراء العمل م

المخاتبة
الواردة - الصادرة
٢٠١ / /

نسخة منه
الاضابة الخاصة

Annex 5: Official Letter issued by the Ministry of Environment confirming absence of rare or endangered species in Al Mosul second Bridge area

REPUBLIC OF IRAQ
MINISTRY OF ENVIRONMENT
DEPARTMENT TO PROTECT AND
IMPROVE THE ENVIRONMENT
IN THE NORTHERN REGION

جمهورية العراق
وزارة البيئة
دائرة حماية وتحسين البيئة في
المنطقة الشمالية
مديرية بيئة نينوى

المعد: ب ن ط / ١٤٢٩
التاريخ: ٢٠١٨ / ٨ / ٢٩

١٩٢٠
٨٨٥

م/جسر الموصل الثاني

مديرية بيئة نينوى
الصادر
المعد /
التاريخ: ٢٠ / ١ / ٢٠١٩

تحية طيبة ...

كتابكم المرقم ١٥٥٨ في ٢٠١٨/٧/١٩ وبخصوص مضمونه نود اعلامكم بعدم وجود نباتات او حيوانات نادرة او مهددة بالانقراض في المنطقة المحيطة بالجسر الثاني .

....مع التقدير

معاون رئيس جيولوجيين
خالدة محمود صالح
مدير بيئة نينوى
٢٠١٨ / ٨ / ٢٩

وزارة البيئة
مديرية بيئة نينوى

نسخة منه الى /

- شعبة النظم البيئية الطبيعية / للمتابعة
- التوثيق

E-MAIL : mosul.env@yahoo.com

Annex 6: Location of authorized concrete and hazardous wastes landfill by the municipality of Nineveh

Authorized construction waste dumping site about 13 km away from the bridge location at coordinates (36°20'17.00"N , 43°17'13.00" E) .



As for the waste water it will be collected from thee septic tanks by the municipality of Nineveh sanitary pump truck and disposed inlands in authorized location determined by them.

Annex 7: Monthly Report Checklist Template

Environmental Para.		Impacts				Mitigations	Notes	Photo
		Low	Medium	High	Non			
Air Quality	a. Dust							
	b. Orders							
Noise	a. Equipment							
	b. Generators							
	c. Jackhammers							
Surface Water								
Ground Water								
Soil								
Flora & Fauna								
Solid Waste	a. Domestic waste							
	b. Hazardous waste							
	c. Construction & demolition waste							

Health & Safety	a. Safety measures							
	b. Health plan							
Socio. economy								
Cultural & heritage								