EMERGENCY OPERATION DEVELOPMENT PROJECTS (EODP)

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

FOR

Drinking Water Network, Street Lighting,

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Drain Project, Mosul, Ninawa Governorate

Component 10

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Abbreviation List

BOD	Biological Oxygen Demand
BR	Branch
Ca	Calcium
Cl	Chloride
Cm	Centi-meter
CO	Carbon Monoxide
CO	Carbon Oxide
COD	Chemical Oxygen Demand
CSO	Central Statistical Organization
E&S	Environmental and Social
EC	Electric Conductivity
EODP	Emergency Operation for Development Project
EODP-AF	Emergency Operation for Development Project-Additional Finance
EPID	Environment Protection and Improvement Directorate
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
F	Fluoride
Fe	Iron
GBV	Gender Base Violence
GIS	geographic information systems
GoI	Government of Iraq
GRM	Grievance Redress Mechanism
H	High
H&S	Health and Safety
HC	Hydro-Carbon
HSE	Health, Safety and Environment
IBRD	International Bank for Reconstruction and Development
ID	Identification Card
IFC	International Finance Cooperation
IN	Insignificant
ISIS	Islamic State of Iraq and Syria
Km	Kilometer
L	Low
M	meter
M	Moderate
MA	Major
MDGs	Millennium Development Goals
Mg	Magnesium

MI	Minor
Mm	Millimeter
MO	Moderate
MoHE	Ministry of Health and Environment
MOI	Ministries of Interior
MoWR	Ministry of Water Resources
Mw	Mega Watt
N	Nil
NGOs	Non- Governmental Organizations
No.	Number
NO_x	Nitrogen Oxides
OHSA	Occupational Health and Safety Administration
OP	Operational Policy
PAPs	Project Affected Persons
PCR	Polymerase Chain Reaction
PCU	Project Coordination Unit
PE	Poly Ethylene
PhD	Doctor of Philosophy
PM_{10}	Particulate Matter (10)
$PM_{2.5}$	Particulate Matter (2.5)
PMT	Project Management Team
PVC	Poly Vinyl Chloride
REFAATO	Reconstruction Fund for Areas Affected by Terroristic Operations
RPF	Resettlement Policy Framework
SO_4	Sulphate
SO_x	Sulfure Oxides
TDS	Total Dissolved Solid
ToR	Terms of Reference
TOT	Training of Trainers
UNCBD	UN Convention for Biological Diversity
UNCCD	UN Convention to Combat Desertification
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollars
UXO	Unexploded Ordinance
VH	Very High
VL	Very Low
VOCs	Volatile Organic Carbons
WB	World Bank
WHO	World Health Organization

الملخص التنفيذي

1. المقدمة

يعرض هذا التقرير خطة الإدارة البيئية والاجتماعية التي تم إعدادها من أجل مشروعات (W01) : والخاصة بعملية إعادة تأهيل وإعادة بناء شبكة تصريف مياه الأمطار ، ترميم البربخ (القناة) ، رصف الطرق وخطين لنقل المياه في الطريق 60 في منطقة الهريمات (W02) إعادة تأهيل شبكة توزيع مياه الشرب و (W05) إعادة تأهيل شبكات إنارة الشوارع بالضفة الغربيه لنهر دجلة غرب مدينة الموصل.

- تستهدف شبكة إمدادات مياه الشرب منطقة تغطي حوالي 12 كيلومتر مربع بإجمالي 20 خط أنابيب ماراً بعدة أحياء.
- يستهدف مشروع إعادة تأهيل الطرق إعادة إعمار ورصف "شارع 60" غرب أحياء الإقتصاديين العربيي والمأمون والشهداء وأقل من كيلومتر واحد جنوب نهر دجلة .يبلغ طول الطريق 3.75 كيلومتر وبعرض 60 متر .كما سيشمل المشروع الفرعي لإعادة تأهيل شبكة تصريف مياه الأمطار بما في ذلك قناة واحدة ، وإصلاح خطين لمياه الشرب.
- تغطي شبكات الإضاءة وأعمدتها منطقة أوسع حيث تعبر 35 طريقًا في الضفة الغربيه لنهر دجلة غرب مدينة الموصل.

تم تفعيل السياسة التنفيذية للبنك الدولي رقم 4.01 الخاصة بالتقييم البيئي حيث أن المشروعات المقترحة لديها بعض التأثيرات السلبية المحتملة من الناحية البيئية والاجتماعية .وبناءً على ذلك ، فإن خطة الإدارة البيئية والاجتماعية تعتبر من المتطلبات لتنفيذ المشروعات وفقًا لمتطلبات الإجراءات التشغيلية للبنك الدولي والتشريعات العراقية ذات الصلة .

2. وصف المشروع

- **إعادة تأهيل الطرق**

يحتوي هذا الجزء من المشروع على ثلاث مكونات رئيسية :ترميم الطرق ورصفها ، تأهيل شبكة تصريف مياه الأمطار بما في ذلك المجرى الرئيسي ، وتأهيل خطين لمياه الشرب.

- يشمل مشروع إعادة رصف وترميم الطرق بناء طبقات متعدده: السطح والقاعدة والقاعدة الفرعية والطبقة السفلية.
- يتم بناء مجرى صندوقي ثلاثي القنوات (بربخ) من الخرسانة المسلحة باستخدام أسمنت مقاوم للملوحة من النوع الخامس، وبأبعاد داخلية 2 × 3 م وسمك جدار 35 سم .يتطلب المجرى أعمال الهندسة المدنية ، بما في ذلك ؛ أعمال الصرف الصحي والطرق .تغطي شبكة تصريف مياه الأمطار حفر ووضع أنابيب GRP و UPVC.
- سيتم تغيير خطوط أنابيب مياه الشرب في شارع 60 باستخدام أنابيب من الصلب والحديد بطول 100 م و 440 م على التوالي.

- **شبكة توزيع مياه الشرب**

سيتم استخدام ثلاثة أقطار مختلفة لخطوط الأنابيب .ويبلغ إجمالي طول هذه الأنابيب 9.63 كم، من الحديد اللدن والبولي اثيلين .

- **شبكات الإضاءة**

المكونات الرئيسية لشبكات الإضاءة هي 1) كابينة التحكم ، 2) أعمدة الإنارة ، 3) قواعد خرسانية ، 4) محولات التوزيع ، 5) المرتكزات و 6) قواعد خرسانية

لا ينطوي هذا المشروع على أى أنشطة استحواذ على الأراضي أو إجراءات إعادة التوطين حيث أن الشبكات سوف تمر من خلال الطرق / الشوارع الحضرية الرئيسية والطرق الجانبية دون أن تسبب أي ضرر على الممتلكات الخاصة أو الأراضي.

سيشمل المشروع أنشطة محددة خلال مراحل الإنشاءات والتشغيل على النحو التالي:

- **أثناء مرحلة ما قبل الإنشاءات و مرحلة الإنشاءات :**أنشطة الإزاله والتسوية ونقل المكونات وتخزينها ، وإعداد الموقع، والحفر ، ومد الأنابيب ، واللحام ، وإعادة الردم وإصلاح الطرق ، واختبار التسرب ، والاختبار الهوائي ، وتركيب الصمامات ، وعدادات التدفق ، ومعالجة طبقات الرصف ، و التبليط ، والتكسية ، وصب غرف التفتيش الخرسانية المسلحة ، وتركيب أعمدة الإنارة ، وتركيب أنابيب تحت الأرض ، و تركيب وتوصيل كابينة التحكم .
- **خلال مرحلة التشغيل :**توصيل و صيانة الخدمات للمنازل، تنظيم تدفق مياه الشرب وأعمال الصيانة لخطوط الأنابيب ، والمتابعة المستمرة لتدهور الطرق وإزالة الأنقاض والرواسب من شبكة صرف مياه الأمطار، وإصلاح أو استبدال جميع المكونات المعيبة أو التالفة أو البالية لشبكة الإضاءة ، مصابيح الإنارة الإلكترونية عالية الضغط على مدار اربع-خمس سنوات ، وأنشطة التفتيش والصيانة.

سيحتاج المشروع إلى الماء والوقود أثناء الإنشاءات .ومع ذلك ، من المتوقع استخدام موارد أقل أثناء مرحلة التشغيل.

3. الإطار التشريعي والتنظيمي

سوف يلتزم المشروع بالتشريعات العراقية وسياسات البنك الدولي الوقائية وأي اتفاقيات ومعاهدات دولية ذات صلة .

تنطبق البيئة والتشريعات الاجتماعية ط ن العراق:

- القانون رقم 27 لسنة 2009: قانون حماية وتحسين البيئة
- القانون رقم 37 لسنة 2008: قانون وزارة البيئة
- القانون رقم 12 لسنة 1981: قانون الإستملاك الخاص بالأراضى
- اللائحة التنفيذية رقم 4 من عام 2012: الخاصة بجودة الهواء المحيط
- القانون رقم 21 من عام 1966: قانون منع الضوضاء
- القانون رقم 50 من العام 2008 : قانون وزارة الموارد المائيه
- القانون رقم 89 لسنة 1981 المعدل بالقرار رقم 54 لسنة 2001: قانون الصحة العامة
- نظام رقم 2 لسنة 2001: نظام الحفاظ على الموارد المائية
- نظام رقم 25 لسنة 1967: نظام صيانة الانهار و المياه العمومية من التلوث
- قانون لتعديل قانون رقم (67) لسنة :1986 تنظيم مناطق تجميع الانقاض
- تعليمات رقم (12) لسنة 2016 بشأن متطلبات الصحة والسلامة المهنية.
- قانون رقم (6) لسنة 1988 بشأن الهيئة الوطنية للصحة والسلامة المهنية
- التعليمات رقم (4) لسنة 1993 بشأن الصحة المهنية ، وحماية العمال من الاهتزازات ، طبقاً للمادتين 3 و 105 من قانون الصحة العامة (رقم 89 لعام 1981)
- قانون رقم 37 لسنة 2015: قانون العمل العراقي

الاتفاقيات الدولية ذات الصلة :

- اتفاقية الأمم المتحدة للتنوع البيولوجي (UNCBD) ؛
- اتفاقية الأمم المتحدة لمكافحة التصحر (UNCCD) ؛
- اتفاقية رامسار بشأن المناطق الرطبة ؛
- اتفاقية اليونسكو للتراث العالمي ؛
- اتفاقية الأمم المتحدة الإطارية بشأن تغير المناخ (UNFCCC) وبروتوكول كيوتو
- اتفاقيات منظمة العمل الدولية المتعلقة بالعمل

سياسات البنك الدولي الوقائية

حدد البنك الدولي 10 سياسات للحماية البيئية والاجتماعية والتى ينبغي مراعاتها في المشروعات التى يقوم بتمويلها. وقد تم تصنيف المشروع المقترح على أنه من الفئة (ب) طبقاً لتصنيف البنك الدولي .وهذا يقتضي إجراء تقييم محدود للأثر البيئي والاجتماعي

تنطبق إجراءات التشغيل التالية على هذا المشروع

- التقييم البيئي – OP 4.01
- سياسة البنك الدولي بشأن الوصول إلى المعلومات

4. الوضع البيئي والاجتماعي والاقتصادي الراهن

منهجية خطة الإدارة البيئية والاجتماعية

تم تصنيف مواقع المشروع كمناطق حضرية سكنية بنفس الظروف البيئية والاجتماعية الاقتصادية .وبالتالي ، فإن الظروف البيئية والاجتماعية لمواقع المشروع تتسم بخصائص متجانسة.

- **وصف البيئة**

تقع جميع مكونات المشروع في الضفة الغربيه لنهر دجلة في مدينة الموصل .

أ. المناخ

يصنف مناخ الموصل على أنه دافئ ومعتدل .أشهر الشتاء أكثر أمطارًا من أشهر الصيف في الموصل.

ب. جودة الهواء المحيط ومستوى الضوضاء

المتوسط السنوي لمؤشر جودة الهواء للموصل هو 41 لعام 2019 مع تقدير قدره 245 يومًا في السنة على هذا المستوى .في الوقت الحاضر ، لا توجد معلومات حول جودة الهواء المحيط في منطقة المشروع ؛كم أنه لم يتم إجراء أي قياسات على جودة الهواء حتى الآن .سيتم رصد بيانات عن جودة الهواء المحيط من خلال جمع عينات من قبل المقاول قبل بدء أعمال الإنشاءات.

بالنسبة لطبيعة منطقة المشروع فهى منطقة سكنية حضرية ، وتقتصر الضوضاء على حركة وسائل المواصلات ، لذا تعتبر مستويات الضوضاء بالقرب من موقع المشروع ضمن الحدود القصوى المسموح بها بسبب عدم وجود مصادر مهمة بخلاف حركة المرور العادية.

ج. الجيولوجيا

بالنسبة للتكوين الجيولوجي لمناطق المشروع فهو متجاورا "المنطقة الفتحة" التي تحتوي على الجبس والكالسيت التي يمكن أن تذوب في الماء.

د. المياه السطحية

مواقع المشروع تبعد حوالي 1-5 كم من نهر دجلة .

ه. المياه الجوفية

لا تتوفر بيانات عن المياه الجوفية في مواقع المشروع .ومع ذلك، المياه الجوفية يتراوح عمقها في مدينة الموصل بين 30- 40متر تحت سطح الأرض ، وبها درجة قليلة من الملوحة 1000-3000 جزء في المليون.[1]

و. البيئة البيولوجية

لا تحتوي منطقة المشروع على أي نظام بيئي مهم عالميًا، حيث أنه لا توجد محميات طبيعية أو مناطق محمية أخرى بالقرب من المشروع.

- **وصف الوضع الاجتماعي الاقتصادي**

تقع محافظة نينوى في شمال غرب العراق .وتعتبر نينوى ثالث أكبر محافظة من حيث الحجم ، حيث تبلغ مساحتها الإجمالية ما يقدر بـ 37320 كيلومتر مربع(8.6 ٪ من إجمالي مساحة العراق). وفقًا للدراسة الاستقصائية العنقودية متعددة المؤشرات الصادر عن الجهاز المركزي للإحصاء (2018) ، يبلغ عدد سكان نينوى حوالي 3,730,000 نسمة ، وهو ما يمثل حوالي 9٪ من إجمالي سكان العراق[2].عاصمة نينوى هي مدينة الموصل وتقع في المنطقة الشمالية الشرقية.

مدينة الموصل هي عاصمة منطقة تحمل نفس الاسم تقع في محافظة نينوى .ويقدر عدد سكان مدينة الموصل بـ 1,377,00 نسمة ، وهي ثالث أكبر مدينة من حيث عدد السكان في العراق بعد بغداد والبصرة[3]. وتقع مدينة الموصل حوالي 400 كيلومترا من العاصمة العراقية بغداد و تتكون من 8 دوائر فرعية. وتنقسم المدينة إلى جزئين، وهما الضفة الشرقيه والضفة الغربيه، يفصلهما نهر دجلة.

منطقة تأثير المشروع هي الضفة الغربيه من الموصل (أي غرب الموصل) ككل ، مع المنطقة المجاورة مباشرة لأنشطة المشروع في حي اليرموك والهرمات .تصنف غالبية الأراضي في الضفة الغربيه على أنها سكنية .بناءً على الاجتماع الذي تم إجراؤه مع الجهاز المركزي للإحصاء (CSO) ، يبلغ إجمالي عدد سكان الضفة الغربيه للموصل حوالى .200,000 نسمة .علاوة على ذلك ، كما ذكرنا سابقًا ، فإن الضفة الغربيه لنهر دجلة تستضيف الأقليات ، مثل الأكراد أو التركمان أو المسيحيين .ومع ذلك ، كشف مسؤولو حكومة الموصل أنه عندما حاصر داعش المدينة في عام 2014 ، هربت الأقليات .ونتيجة لذلك ، فإن الأغلبية الحالية من السكان في الموصل من المسلمين السنة ، مع عودة بعض الأقليات الكردية والتركمانية ببطء إلى المدينة.

تأثرت التنمية الاقتصادية في الموصل وكذلك جودة حياة سكانها سلبًا بالنزاع الأخير .وأدى انقطاع الخدمات العامة ونقص الوظائف المتاحة إلى صعوبة استئناف الأنشطة الاقتصادية .وبحسب أنشطة التشاور المجتمعي التي أجريت في المجلس المحلي لمدينة الموصل ، فإن معدل الفقر في الضفة الغربيه بشكل خاص يبلغ 30٪ من السكان .وهذا يعني أن 11000 أسرة تحت خط الفقر .علاوة على ذلك ، فإن سكان الضفة الغربيه هم من الشباب ، وبالتالي هناك حاجة متزايدة لفرص العمل.

- **التراث الثقافي**

في مدينة الموصل ، أفادت المشاورات مع السكان المحليين أن معظم مواقع التراث الأثري والثقافي في المدينة قد دمرها النزاع الأخير .ومع ذلك ، وقد ذكروا أن أقرب موقع تراثي للمشروع هو جدار حصن نينوى .وبناءً على ذلك ، نظرًا لتاريخ العراق الذي

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[1] دراسة تقييم الأثر البيئي و الإجتماعي لإعادة تأهيل جسر الموصل الثاني (جسر الحرية) في محافظة نينوى ، ديسمبر 2018

[2] الدراسة الإستقصائية متعددة المؤشرات طورته الجهاز المركزي للإحصاء العراقي (2018) - محافظة نينوى

[3] لمحة عن مدينة الموصل ، العراق" (2016) الأمم المتحدة .متاح عبر الرابط
: https://reliefweb.int/sites/reliefweb.int/files/resources/UN-Habitat_MosulCityProfile_V5.pdf

يمتد لآلاف السنين ، يُتوقع العثور على قطع أثرية في المنطقة .لذلك ، بالرغم من عدم تواجد مواقع معروفة ذات أهمية تاريخية وأثرية في المنطقة المجاورة مباشرة للمشروع ، يجب توخي الحذر أثناء مرحلة التنفيذ.

5. الآثار البيئية والاجتماعية

أ.الآثار الإيجابية المحتملة

أ.1 الآثار الإيجابية المحتملة أثناء مرحلة الإنشاءات

توفير فرص عمل مباشرة للعمال المهرة وشبه المهرة

- من المتوقع أن يؤدي المشروع إلى توفير فرص عمل مباشرة مختلفة .استنادًا إلى الخبرة السابقة في المشاريع المماثلة التي تم تنفيذها مؤخرًا من قبل صاحب المشروع والمقاول ، فإن المتوسط اليومي لعدد العمال خلال فترة الذروة سيكون حوالي 300 عامل للمشاريع الفرعية الثلاثة .هذا الرقم مرن ويمكن تغييره في حالة الحاجة للعمل في جميع مواقع المشروع بالتوازي.
- توفير فرص عمل غير مباشرة ، من خلال توفير الخدمات للعمال والمقاولين الذين سيعملون في مواقع مختلفة .يمكن أن يشمل ذلك ، على سبيل المثال لا الحصر ؛ السكن ، الأغذية ، النقل ، التجارة ، الأمن ، التصنيع ... إلخ.

أ -2 التأثيرات الإيجابية المحتملة خلال مرحلة التشغيل

التأثيرات البيئية

- تقليل الغبار(PM10 ، PM2.5) بسبب رصف الطرق
- الحد من برك المياه الراكدة التي تتجمع في المواسم الممطرة نتيجة إنشاء نظام تصريف مياه الأمطار
- الحد من الإفراط في الاستغلال غير المخطط له لموارد المياه من خلال توفير شبكات مياه الشرب
- الحد من تآكل التربة من خلال تنظيم ورصف الطرق

الآثار الاجتماعية

- توفير بنية تحتية جيدة للسكان
- تقليل الحوادث المحتملة على الطرق بعد توفير الإضاءة
- تسهيل النقل والحركة المرورية بعد رصف الطرق
- الحد من الأمراض المنقولة عن طريق المياه بعد توفير مصدر مناسب لمياه الشرب
- زيادة النظافة العامة للمجتمع
- تجنب الحوادث والانزلاق بعد تركيب مصارف مياه الأمطار

B. الآثار السلبية المحتملة

يعتمد تقييم التأثيرات السلبية المحتملة على المستقبلات المختلفة على تصنيف الأهمية .يلخص الجدول التالي تقييم الآثار السلبية المحتملة خلال مرحلتي الإنشاءات والتشغيل:

المستقبلات ذات الحساسية	الآثار المحتملة	أهمية التأثير
اثناء فترة الإنشاءات		
انبعاثات الغازات والأتربة	• **انبعاثات الأتربة** سيتم توليد انبعاثات الغبار($PM_{2.5}$ و PM_{10}) نتيجة الحفر والردم والتسوية. يمكن أن تكون المركبات والشاحنات المستخدمة لنقل مواد البناء أيضًا مصدرًا رئيسيًا لانبعاثات الغبار إذا لم يتم تغطيتها بشكل مناسب وإذا لم تكن مقيدة بحد السرعة. • **انبعاثات الغازات** سيتم إنتاج انبعاثات العادم التي تحتوي على أكاسيد النيتروجين وأكاسيد الكبريت وأول أكسيد الكربون من معدات البناء .وقد تكون هناك أيضًا انبعاثات من المركبات الخطرة المتطايرة التي سيتم استخدامها في الموقع	**متوسط**
الضوضاء والاهتزازات	• من المرجح أن تؤدي أنشطة الإنشاءات والهدم لجميع مكونات المشروع إلى زيادة مستويات الضوضاء والاهتزاز بسبب أنشطة التوصيلات مثل الحفر ، والدق ، وتشغيل بعض الآلات والمعدات ، وحركة الشاحنات والمركبات في الموقع ولكنها لا تتجاوز المعايير التوجيهية للبنك الدولي / مؤسسة التمويل الدولية والمعايير المحلية العراقيه لشدة الضوضاء • و بالإضافه لذلك ، ستكون الأنشطة ذات طبيعة مؤقتة ولفترة قصيرة.	**متوسط**
النفايات الصلبة والمواد و النفايات الخطره	• تشمل النفايات الناتجة خلال أنشطة الإنشاءات ما يلي: التربة و النباتات التى تمت إزالتها، قطع من الصلب والأنابيب ، المعادن، الخشب، أكياس الأسمنت والرمل والحصى وقطع الكابلات، والقمامة الناتجة من الأنشطة اليومية للعمال ، المواد المهدره أو المعيبه بما في ذلك الموصلات والعوازل ، النفايات الناتجة عن عمال الإنشاءات ، بما في ذلك مياه الصرف الصحي والقمامة التي تم جمعها من موقع مخيم العمل • النفايات الخطرة ، مثل الزيوت المنسكبة الناتجة عن تشغيل وصيانة الآلات والحاويات الفارغة والدهانات وانسكابات الخرسانة وما إلى ذلك.	**متوسط**
التربة	• زيادة تآكل التربة في موقع المشروع بسبب أعمال الحفر ، خاصة خلال موسم الأمطار .تلوث التربة بسبب سوء إدارة النفايات والتخلص منها بطريقة غير منظمة / غير سليمة .التلوث الناتج عن الانسكابات وتسرب الكيماويات والزيوت ... الخ • . وبما أن الغطاء النباتي للمشروع يقتصر فقط على بعض الحشائش، وبالتالي فإن الأثر المتعلق بتآكل التربة بسبب إزالة الغطاء النباتي ليس له أهمية.	**ضئيل**
المياه السطحيه	قد تكون المياه السطحية بما في ذلك نهر دجلة عرضة للتلوث الناجم عن إلقاء النفايات بشكل غير سليم.	**متوسط**
استهلاك الطاقة	• استهلاك الوقود الأحفوري (بشكل رئيسي ديزل) لمركبات وآلات الإنشاءات وتشغيل المولدات.	**ضئيل**

المستقبلات ذات الحساسية	الآثار المحتملة	أهمية التأثير
اثناء فترة الإنشاءات		
	• الطاقة الأحفورية غير متجددة ، وقد يكون لاستخدامها المفرط آثار بيئية خطيرة على توافرها وسعرها واستدامتها	
استخراج الموارد الطبيعية	سيكون لاستخراج المواد الخام ، مثل الحصى والرمل تأثير سلبي على توفر تلك الموارد الطبيعية ، لأنها غير قابلة للتجدد على المدى القصير	**ضئيل**
الصحة والسلامة المهنية	• قبل البدء في أعمال الإنشاءات ، تمت إزالة الذخائرغير المنفجرة بواسطة وزاراة الداخلية. هذه قضية مهمة لأن منطقة المشروع قد تضررت خلال الحرب ثم تم تحريرها بمساعدة الجيش .ولذا يجب التأكد من أمان موقع المشروع بعد تطهيره من الذخائر غير المنفجرة على النحو المنصوص عليه في الملحق (4)من قبل الجيش ، وبالتالي يعتبر آمنًا للعمال الذين سيقومون بأنشطة إعادة التأهيل. • عند ارتفاع درجات الحرارة اليومية ، يمكن أن يتعرض العمال للإجهاد الحراري والجفاف .قد تكون حوادث وإصابات العمال والجمهور ناجمة عن حوادث النقل والصدمات الكهربائية وسوء التعامل مع الآلات وغيرها من حوادث إعادة التأهيل والإنشاءات .يمكن أن تؤثر مستويات الضوضاء العاليه الناتجه عن الآلات على سمع العمال بالإضافه إلى زيادة انبعاثات الأتربه من أنشطة إعادة التأهيل والإنشاءات المختلفة ، وقد تتسبب التحركات والنقل في حدوث مشاكل في الجهاز التنفسي للعمال في الموقع إذا لم يتم استخدام معدات الحماية الشخصية المناسبة. • تعتبر الأنشطة الإنشائيه من بين الأنشطة الأكثر خطورة وتعرضًا للحوادث في أي بيئة عمل. التعرض لمخاطر موقع الإنشاءات يمكن أن يعرض العمال للإصابات. لتجنب مثل هذه المواقف ، يجب على المقاول تحديد والتعرف على جميع المخاطر التي يمكن مواجهتها أثناء العمل العادي. وفقًا للمعايير ، يجب أن يكون لدى كل عامل معلومات دقيقة حول تعرضهم للمخاطر أو الإصابات في مكان العمل.	**كبير**
عمالة الأطفال	• عمالة الأطفال والتسرب من المدرسة: وفقًا لقانون العمل الوطني العراقي رقم 2015/12 ، يجب حظر عمل الأطفال خاصة في الأعمال الخطرة وكما هو مذكور في وصف الوضع الإجتماعي ، فإن عمالة الأطفال هي ممارسة شائعة في مجتمعات المشروع في الموصل .يعمل الأطفال دون سن 18 عامًا في جميع المشاريع تقريبًا حيث يحصلون على رواتب منخفضة وهم أقل تطلبًا • .يجب معالجة هذه المخاطر بعناية في خطة الإدارة البيئية والاجتماعية وتشديد الالتزامات والرصد في التزامات المقاول.	**كبير**
صحة وسلامة المجتمع	بشكل عام ، يمكن أن يؤثر المشروع على سلامة المجتمع من حيث الآتي: • من المتوقع أن تنجم آثار على صحة وسلامة المجتمع من انبعاثات الملوثات والغبار والغازات ، وزيادة مستويات الضوضاء ، وإلقاء نفايات الإنشاءات في غير اماكنها ، والسقوط في المسارات المحفورة المؤقتة ، و التعرض للمعدات ، وسقوط المعدات بسبب العمل على ارتفاعات وما إلى ذلك. • انبعاث الملوثات الغازية والغبار من المعدات والآلات المستخدمة. • زيادة مستويات الضوضاء في الخلفية الناتجة عن تشغيل الآلات ، والتي تتجاوز الحدود المسموح بها للمناطق السكنية في محيط المناطق التجارية خلال ساعات النهار • تراكم النفايات و التخلص الغير مشروع منها وحرق مخلفات الإنشاءات ، والتي ستتكون بشكل رئيسي من التربة المحفورة وبقايا الأنابيب.	**متوسط**

المستقبلات ذات الحساسية	الآثار المحتملة	أهمية التأثير
اثناء فترة الإنشاءات		
	• ستشمل أعمال الإنشاءات استخدام معدات مثل الكسارات وآلات اللحام ، والتي يمكن أن تسبب إصابات للمجتمع المحلي بالخطأ.	
تدفق العمالة المؤقتة	• حدوث خلافات مع المجتمع المحلي • زيادة خطر السلوك غير المشروع والجريمة • زيادة خطر الإصابة بالأمراض المعدية وزيادة العبء على الخدمات الصحية المحلية • تضخم الأسعار المحلية	**متوسط**
العنف القائم على النوع الإجتماعي	هناك احتمال لحدوث آثار تتعلق بقضايا العنف القائم على النوع الاجتماعي مثل التحرش الجنسي والتمييز والحرمان من الفرص و الاستبعاد الاقتصادي	**متوسط**
حركة المرور	• يمكن أن تحدث التأثيرات المرورية بسبب زيادة تدفق حركة المرور وذلك نتيجة لحركة شاحنات نقل العمال ونقل المواد الخام ومعدات الإنشاءات والتخلص من نفايات الإنشاءات (أو ما قبل الإنشاءات) .لكن هذا التأثير ذو طبيعة مؤقتة ويمكن التحكم في مواعيد حركة المركبات والشاحنات • سيكون التأثير الرئيسي هو إزعاج السكان في الوصول إلى المباني السكنية	**متوسط**
التراث الثقافي	• تقع مناطق المشروع بالقرب من بعض المستقبلات ذات القيمة الثقافية مثل متحف الموصل. ومن ثم يجب أن يطبق المشروع كلاً من إجراءات العمل عند مصادفة المواد ذات القيمة التراثية بالإضافة إلى إحترام كل ما له صلة بالموروثات الثقافية . • الملحق رقم (2) يوضح الإجراءات المتبعه عند العثور على أى من المواد ذات القيمة التراثيه.	**ضئيل**
البنية التحتية والمرافق	قد يؤثر تجديد البنية التحتية سلبًا على المناطق غير المتضررة إذا لم يتم عزلها بشكل صحيح.	**ضئيل**
المناظر الطبيعية	بالنسبة لأعمال الإنشاءات والحفر ، فإنه من المتوقع حدوث تأثيرات على المنظر الجمالى بشكل مؤقت ، وذلك بسبب تخزين مخرجات الحفر والمواد الخام (أكياس الأسمنت ، خلاطات الخرسانة ، نفايات الإنشاءات ، إلخ) .ومع ذلك ، بسبب قصر مدة التعرض والطبيعة الانعكاسية لهذا التأثير ، يجب اعتبارها ذات أهمية ثانوية.	**ضئيل**
اثناء فترة التشغيل		
انبعاثات الغازات والأتربة	• ستستمر حركة مرور المركبات والآلات في إنتاج كميات صغيرة من الغبار المنبعث وانبعاثات العادم • زيادة في استهلاك الكهرباء مما سيؤدي بدوره إلى زيادة انبعاثات الهواء.	**ضئيل**
الضوضاء والاهتزازات	• الضوضاء والاهتزاز الناتجه عن حركة مركبات الموظفين ومحولات الكهرباء. • صيانة الأنابيب التالفه التي قد تتطلب أعمال الحفر	**ضئيل**

المستقبلات ذات الحساسية	الآثار المحتملة	أهمية التأثير
اثناء فترة الإنشاءات		
التربه	• في حالة حدوث تسرب من الأنابيب أو التحميل الثقيل على الطرق التى تم رصفها	**ضئيل**
استهلاك الكهرباء	• يستخدم المشروع الطاقة لضخ المياه من خلال شبكات التوزيع و في شبكات الإنارة.	**ضئيل**
المخلفات الصلبه و الخطره	• النفايات الخطرة: انسكابات مادة الأسفلت والخرسانة ونفايات الكابلات التي يمكن استبدالها على طول خطوط التوزيع, العوازل البلاستيكيه والمصابيح المكسورة. • الخردة ، ومواد العزل ، والموصلات ، والخردة الأخرى التي من المتوقع أن تكون مصنوعة من مواد خاملة لا تسبب مخاطر عالية في إجراءات التخلص منها أو إعادة التدوير.	**متوسط**
الصحة والسلامة المهنية	• تعرض أنشطة الصيانة العمال للحوادث والأخطار التي قد تؤدي إلى إصابات. لتجنب مثل هذه المواقف ، يجب تحديد جميع المخاطر التي يمكن مواجهتها أثناء أنشطة الصيانة والتعرف عليها. وتشمل الأسباب الرئيسية لمثل هذه الحوادث إصابة العمال عند استخدام المعدات الثقيلة أو السقوط من المرتفعات أو الانزلاق. كما تمثل الكهرباء خطرًا كبيرًا على جميع العمال أثناء أنشطة الصيانة	**متوسط**
صحة و سلامة المجتمع	• إزعاج مؤقت نتيجة لأنشطة الصيانة. • قد تنجم حوادث الطرق عن زيادة حجم حركة المرور. • تشكل أعمدة الانارة خطر الاصطدام على سائقي السيارات والمشاة ، وخاصة أولئك الذين يعانون من ضعف البصر. كما قد تسقط الرياح القوية أحيانًا أعمدة الإنارة و المصابيح. يمكن أن تتسبب المعدات المعيبة أو الكابلات المكشوفة في مخاطر الصعق بالكهرباء	**متوسط**

6. خطة الإدارة والرصد البيئي والاجتماعي

الهدف من خطة الإدارة والرصد البيئي والاجتماعي ، هو تحديد الإجراءات اللازمة للحد من الآثار السلبية المحتملة أو القضاء عليها ومراقبة تطبيق وأداء تدابير التخفيف .يعرض الفصل 6 من هذا التقرير خطة الإدارة البيئية والاجتماعية لمختلف المستقبلات ، ويحدد الأدوار والمسؤوليات المتعلقة بتنفيذ ورصد عمليات التخفيف أثناء مرحلتي الإنشاءات والتشغيل للمشروع.

7. المشاركة المجتمعية والتشاور العام

أثناء إعداد خطة الإدارة البيئية والاجتماعية، تم إجراء أنشطة التشاور على مدار ثلاث جولات منفصلة من أنشطة التشاور المنظمة مع المواطنين والجهات المعنية المختلفة .وفقًا لذلك ، زار فريق الدراسة التابع لإيكوكنسيرف منطقة الضفة الغربيه لمدينة الموصل ومحيطها (مثل حي اليرموك وحي الهرمات) خلال شهركانون الأول (ديسمبر) 2019 لإجراء عدة جولات من أنشطة إشراك الفئات المعنية .تضمنت الجولة الأولى الاطلاع على منطقة المشروع والاجتماعات التمهيدية مع الجهات الحكومية .تضمنت الجولة الثانية التعرف على أقرب مجتمع محلي وتحليل احتياجاتهم من خلال مجموعات المناقشة البؤرية (منفصلة بين الذكور والإناث) .وتضمن الثالث الحصول على مزيد من المعلومات حول الموقع من خلال مقابلات مع المنظمات غير الحكومية المحلية وأفراد المجتمع.

كل من تمت مقابلتهم عبروا عن دعمهم للمشروع .كما أعرب جميع من أجريت معهم المقابلات عن أملهم في أن يؤدي استكمال المشروع إلى انتقال المزيد من السلع عبر منطقتهم .لذلك ، فهم يربطون مكونات المشروع بتحسين ظروفهم المعيشية وتنمية المنطقة اقتصاديًا .كما شددوا على أهمية توفير جدول زمني لإنجاز المشروع لأنهم سمعوا عن العديد من المشاريع المخطط لها في منطقتهم ولكنهم لم يشهدوا اكتمالها. وأكد المشاركون أنهم يعرفون أن فوائد المشروع أكبر بكثير من آثاره السلبية وأكدوا استعدادهم للتعاون مع المشروع.

1 INTRODUCTION

1.1 Project Background

Due to the recent liberation of Mosul City in Ninawa Governorate, the Emergency Operation for Development- Additional Finance (EOPD-AF) is expanding the scope of the original EODP to cover the rehabilitation of the damaged infrastructure. The scope of the EODP consists of ten components, the proposed project falls under component 10.

The project addressed in the ESMP is composed of three sub projects:

- **EODP-AF-NIN-W04-A**: Rehabilitation and reconstruction of the electricity distribution and street lighting networks in Al-Samah and Yarimcha districts.
- **EODP-AF-NIN-W04-B**: Storm water drainage network and road rehabilitation in the east side of Al-Samah district.
- **EODP-AF-NIN-W04-C**: Storm water drainage network and road rehabilitation in the west side of Al-Samah district.

Figure 1-1: Location of Nineveh Governorate within Iraq

1.2 Objectives of the ESMP

The key objectives of the ESMP are the following:

- Describe the Subproject's components and activities of relevance to the environmental and social assessments;
- Identify relevant national and international legal requirements and guidelines;
- Assess the baseline status of environmental and social conditions;
- Evaluate potential site-specific environmental and social impacts of the project;
- Develop environmental & social management and monitoring plans in compliance with the relevant national and international legislation;
- Establish the roles and responsibilities of all parties involved in the project's environmental and social management;
- Document key environmental and social concerns raised by stakeholders during public consultation activities; and
- Ensure the existence of a grievance redressal mechanism (GRM) for the lodging and handling of complaints.

1.3 Scope of Work

The scope of the EODP consists of ten components, the proposed project in this study falls under **Component 10:** Restoring Municipal Infrastructure and Services and Preserving Cultural Heritage Assets

This document is guided by the available ESMF. The information drawn from the ESMF was supplemented by additional literature research, field data collection, as well as consultations and close collaboration with the institutional stakeholders and members of the local community. Therefore, the potential impacts and associated mitigation measures and management procedures presented in this ESMP are based on the baseline information and E&S assessments.

The ESMP is designed in such a way as to form a binding document to the contractors who will then hold the responsibility for integrating the ESMP in their daily work. However, the contractors as well as the Proponent are also required to monitor environmental and social parameters and ensure the full adherence to the ESMP. Hence, the prepared monitoring plan provides information for periodic review to ensure that environmental and social protection is optimized in all project phases through early detection and effective remediation of unwanted environmental and social impacts.

The ESMP outlines the environmental and social management processes and procedures applicable to the sub-project. Accordingly, the structure of this document is as follows:

- Chapter Two: Institutional and Legal Framework
- Chapter Three: Project/Activities Description
- Chapter Four: Environmental and Social Baseline Conditions
- Chapter Five: Assessment of Potential Risk, Impacts, and Alternatives
- Chapter Six: Environmental and Social Management and Monitoring Plans
- Chapter Seven: Stakeholders Engagement and Public Consultation

2 INSTITUATIONAL AND LEGAL FRAMEWORK

2.1 Preface

This Chapter describes the legal and administrative framework for the proposed project. It lists the national laws and the international requirements pertinent to the project. The WB has defined 10 environmental and social safeguard policies that must be considered for its financed projects. The applicability of such policies to this project are overviewed and discussed in subsequent sections.

In case of any discrepancy between the requirements of Iraqi legislations and the requirements of the WB, the more restricted requirements will be applied. In the case that national requirements are non-existent for specific issues, or pollutants, then the WB requirements will be adopted.

2.2 National Policy, Legal, Regulatory and Administrative Frameworks

2.2.1 General Environmental Legislations

Law no. 27 for the year 2009: Protection and Improvement of Environment

The law aims at protecting and improving the environment through mitigating of existing damages or damages likely to be caused. 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.

Law no. 37 for the year 2008: The Ministry of Environment

This Law was legislated to define the institutional arrangements of the Ministry of Environment and outlines policies and roles and responsibilities towards protecting the environment.

Law no. 48 of the year 1976: Regulating Exploitation and Protection of Aquatic Life:

This law regulates breeding and protection of aquatic life, fishing seasons, fishing methods and gear, prohibits the use of chemicals and explosives for fishing.

2.2.2 Applicable Environmental, Social and Antiquities Legislations in Iraq

Air Quality

- **Regulation no. 4 of the year 2012: Ambient Air Quality**

  This regulation aims to protect ambient air quality and control sources of pollution. The regulation necessitates that sources emitting air pollutants abide by national limits and use monitoring equipment to ensure compliance with standards. It also prohibits the burning of all types of wastes indoors or in open air, or next to a residential region or near water bodies.

Noise

- **Law no. 41 of the year 2015: Noise Protection and Control**

  This Law identifies maximum permissible noise limits during day and nighttime for the industrial, commercial and industrial zones as follows

Table 2-1: Noise Limits for Different Working Zones

Industrial	70	65
Commercial	65	60
Residential	55	45

- **Law no. 21 of the year 1966: Noise Prevention:**

  This Law 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 8 a.m.

Water Resources

- **Law no. 50 of the year 2008:** 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."
- **Law no. 89 of the year 1981, amended by Decree No.54 of 2001: Public Health:**

  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.

- **Law no. 2 of the year 2001: Water Systems Protection**

  It prohibits the discharge of effluent into public water, unless it meets the criteria and specifications set out by the Environment Protection and Improvement Directorate (EPID). EPID is also allowed to issue environmental restrictions pertaining to the quality of public water as well as the quality of water discharged into public water, sewage systems, or rainwater.

- **Act no. 25 of the year 1967: The Regulation for the Protection of Rivers:**

  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.

Waste Management

- **Instructions no. 2 of 2014 on Environmental Protection from Municipal 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 of special bags for waste producers; and for identifying waste collection dates. The aforementioned Ministry and Municipality have to decide on how to treat the reusable materials and dispose of others through landfills.

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

2.2.2.1 Occupational Health and Safety

Law No. 6 of 1988 concerning the National Commission for Occupational Hygiene and Safety

This Law governs the enforcement of occupational health and safety regulations. Provides for inspections of places of employment and inspections reports. Establishes the duties and responsibilities of employers 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.

Instructions No. 12 of 2016 on Occupational Health and Safety Requirements.

These instructions provide guidance on the Occupational Health and Safety procedures to be adopted.

- Provides for the enforcement of occupational health and safety provisions at places of work.
- Establishes the functions and duties of employers and employees with regard to occupational health and safety.

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)

- It establishes work place procedures designed to minimize vibration and any harmful effects that workers might be exposed to. It also stipulates the maximum total daily limits for occupational

Labor Laws

Iraq recently enacted Law 37/2015 (the Iraqi Labor Law), which governs employment relationships in most of Iraq. To date, no known reforms are being considered for Iraq. In addition to this law, the respective government ministries may issue instructions or regulations that affect employment law. The law covers all aspects of employment, including:

- the definition of 'workers';
- hiring and termination;
- health and safety;
- leave;
- wages;
- collective bargaining; and
- avenues for complaints and redress.

The law distinguishes foreign workers from Iraqi workers, but all workers must be fully documented in order to legally work in Iraq. The Iraqi Labour Law does not distinguish between employees and contractors. The law applies to all 'workers', which is anyone working under the supervision of an employer in return for a wage. The law does distinguish between permanent work and work for a defined period, but there are certain requirements that must be met under the law in order to ensure that a contract for a determined period does not convert to a permanent contract.

2.2.3 Relevant International Conventions and Treaties

The following lists the international conventions and treaties that have been signed and ratified by the Iraqi Government.

- UN Convention for Biological Diversity (UNCBD);
- UNESCO World Heritage Convention;
- United Nations Framework Convention on Climate Change (UNFCCC) and Kyoto Protocol.
- International Labor Organization Conventions related to labor
    - The ILO sets international labor standards with Conventions, which are ratified by member states. Iraq has ratified the eight fundamental ILO Conventions and so accepts them as a legally binding instrument. These Conventions enshrine fundamental principles and rights in four categories, which are the following:
        - freedom of association and the right to collective bargaining (Conventions No. 87 and No. 98)

- the elimination of forced or compulsory labor (Conventions No. 29 and No. 105)
- the abolition of child labor (Conventions No. 138 and No. 182)
- the elimination of discrimination in respect of employment and occupation (Conventions No. 100 and No. 111)

2.3 World Bank Safeguard Policies

International funding agencies, such as the WB requires that the projects they finance to be in compliance with both the country's national standards as well as their own environmental and social policies.

The World Bank (WB) has identified 10 environmental and social safeguard policies that should be considered in its financed projects. The proposed project is classified as Category B according to the World Bank. This mandates a limited Environmental and Social Impact Assessment (ESMP).

Table 2-2: World Bank safeguard operational policies and their applicability to the project

Safeguard Policy	Triggered	Justifications
Environmental Assessment (OP/BP 4.01)	Yes	The project is classified as Category B which requires an environmental & social management plan (ESMP)
Natural Habitats (OP/BP 4.04)	No	Location and alignment of project components is mainly along (or close to) previously paved paths. Protected Areas, if encountered, will be avoided.
Forests (OP/BP 4.36)	No	Proposed project areas contain no forests.
Pest Management (OP 4.09)	Yes	The proposed project will not involve purchasing or using pesticides.
Physical Cultural Resources (OP/BP 4.11)	Yes	This OP does not apply to this project, but if these opportunities occur, cultural property management plans will be prepared for the subprojects.
Indigenous Peoples (OP/BP 4.10)	No	No indigenous people are identified in Iraq.
Involuntary Resettlement (OP/BP 4.12)	No	The whole construction activities will be carried out in the site of already existing facilities.
Safety of Dams (OP/BP 4.37)	No	Not relevant to the proposed project
Projects on International Waterways (OP/BP 7.50)	Yes	Not relevant to the proposed project
Projects in Disputed Areas (OP/BP 7.60)	No	Not relevant to the proposed project

2.3.1 OP 4.01 – Environmental Assessment

According to the World Bank Operational Policy OP 4.01, the Rehabilitation of infrastructure is classified among the projects that are likely to have potential, limited adverse environmental and social impacts for which the development of a full-scale ESIA is not required. The proposed project will not have significant adverse environmental impacts that are sensitive[4], diverse, or unprecedented.

[4] A potential impact is considered "sensitive" if it may be irreversible (e.g., lead to loss of a major natural habitat) or raise issues covered by OP 4.10, *Indigenous People*; OP 4.04, *Natural Habitats*; OP 4.11*, Physical Cultural Resources;* or OP 4.12*, Involuntary Resettlement.*

Environmental impacts of the project shall be analyzed, and mitigation measures proposed for expected negative impacts, along with an Environmental Management and Monitoring Plan.

2.3.2 Bank Directives related to Disclosure

The World Bank directives related to "Disclosure" details the Banks requirements for making operational information available to the public. The Bank reaffirms its recognition and endorsement of the fundamental importance of transparency and accountability to the development process. In addition, timely dissemination of information to local groups affected by the projects and programs supported by the Bank, including nongovernmental organizations, is essential for the effective implementation and sustainability of projects.

3 PROJECT / ACTIVITIES DESCRIPTION

3.1 Overview

Due to the invasive terroristic acts, military operations and sabotage in Nineveh Governorate, all areas of development including delivery of basic services and commercial activities have been significantly affected. Drinking water supply networks, roads, rainfall drainages and culverts, and lighting networks are suffering from severe damage reaching up to 60% in some areas making them a priority for consideration. The proposed project consists of the following:

1. Water supply distribution network: The drinking water networks project targets an area covering approximately 12 km^2 and is located 1 km west of Tigris River on the outskirts of Mosul city.

2. Roads rehabilitation: The road rehabilitation project targets reconstruction and pavement of "Road 60" with a total length of 3.75 km and width of 60m, in addition to restoration of storm water (rainfall) drainage network including one culvert, and restoration of two drinking water pipelines.

3. The lighting networks and poles cover a wider area crossing 35 roads distributed around Al-Rabee, 17 Tamouz, Al Rifaee, Al Urabyl, Al Zangili, Al Amel, Al Yarmouk, Al Mosul Jadida, Al Shohadaa and Al Eqtsadyeen areas in Mosul city.

Figure 3-1 Damaged Water Infrastructure

Figure 3-2 Damaged Lighting Poles

Figure 3-3 Damaged Roads

3.2 Project Area

This project targets the Ninawa Governorate, situated in Northwest Iraq on the right bank of Tigris River as shown in the following figure.

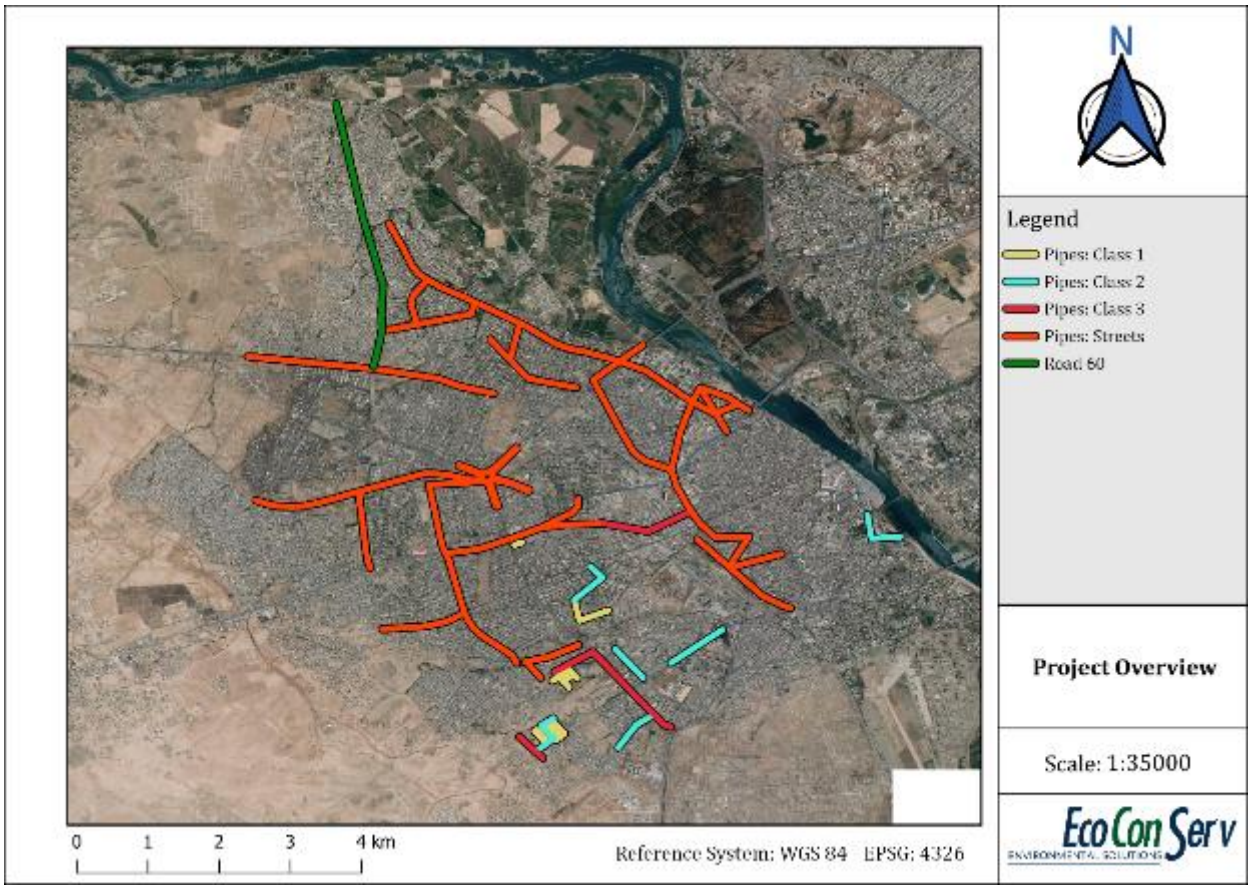

Figure 3-4 Overview of Project Area

The drinking water supply network targets an area covering approximately 12 km^2 in Mosul city. A total of 20 pipelines will pass through several locations including:

- Al-Ma'moon-1
- Al-Danadan
- Al-Shuhda
- Al-Ma'moon-2
- Al-Mansour-1
- Al-Mansour-near water tank
- Al-Hamamel cycle
- Baghdad street
- Baghdad street-cubes cycles
- Wadi Al-Ain the southern-cycle 19
- Wadi Al-Ain the southern-left of cycle 19

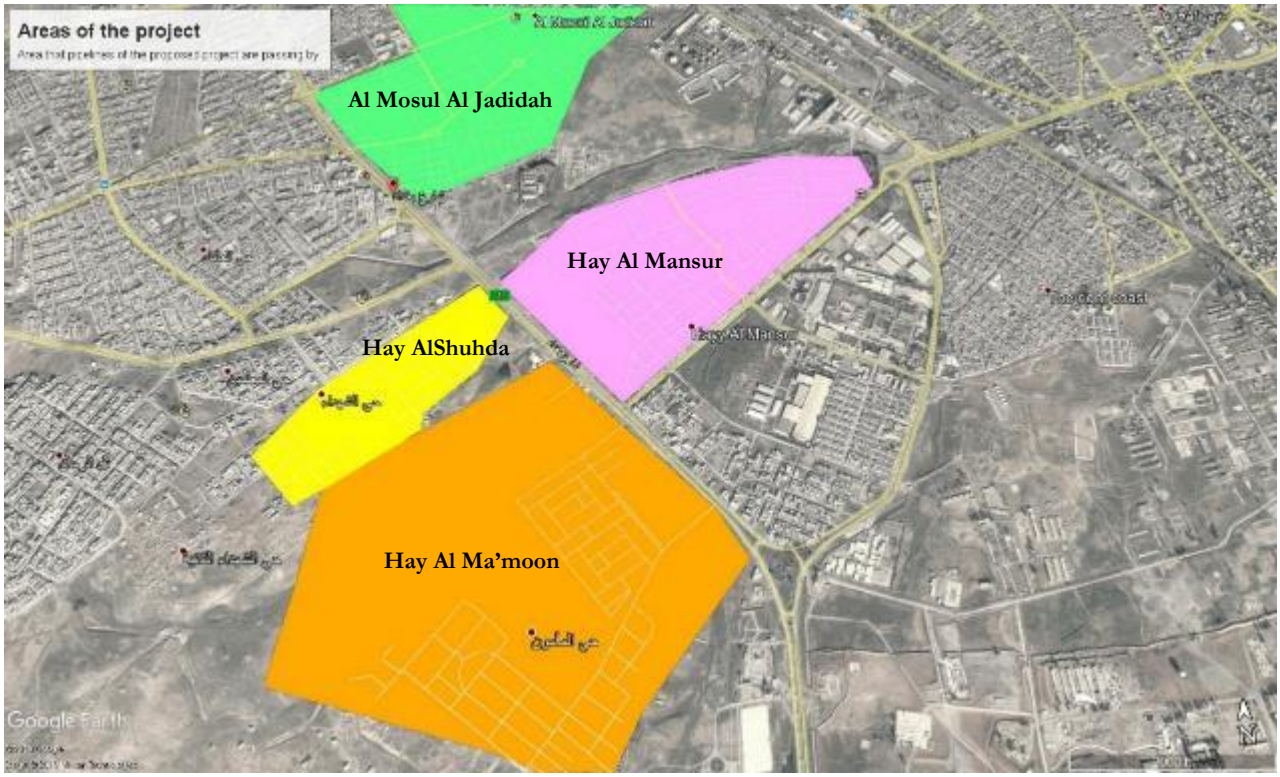

Figure 3-5 Areas of drinking water network project

One of the twenty drinking water pipelines is located less than 200 m west of the Tigris River, whereas the rest of the pipelines are distributed over the right bank of the River at longer distances. Water distribution pipelines will be serving important buildings including Mosul museum and Mosul court in addition to supporting educational services, industrial facilities, public hospitals and recreational activities at various parks as shown in the following figures.

Figure 3-6 Location of Tigris River and important buildings near project area

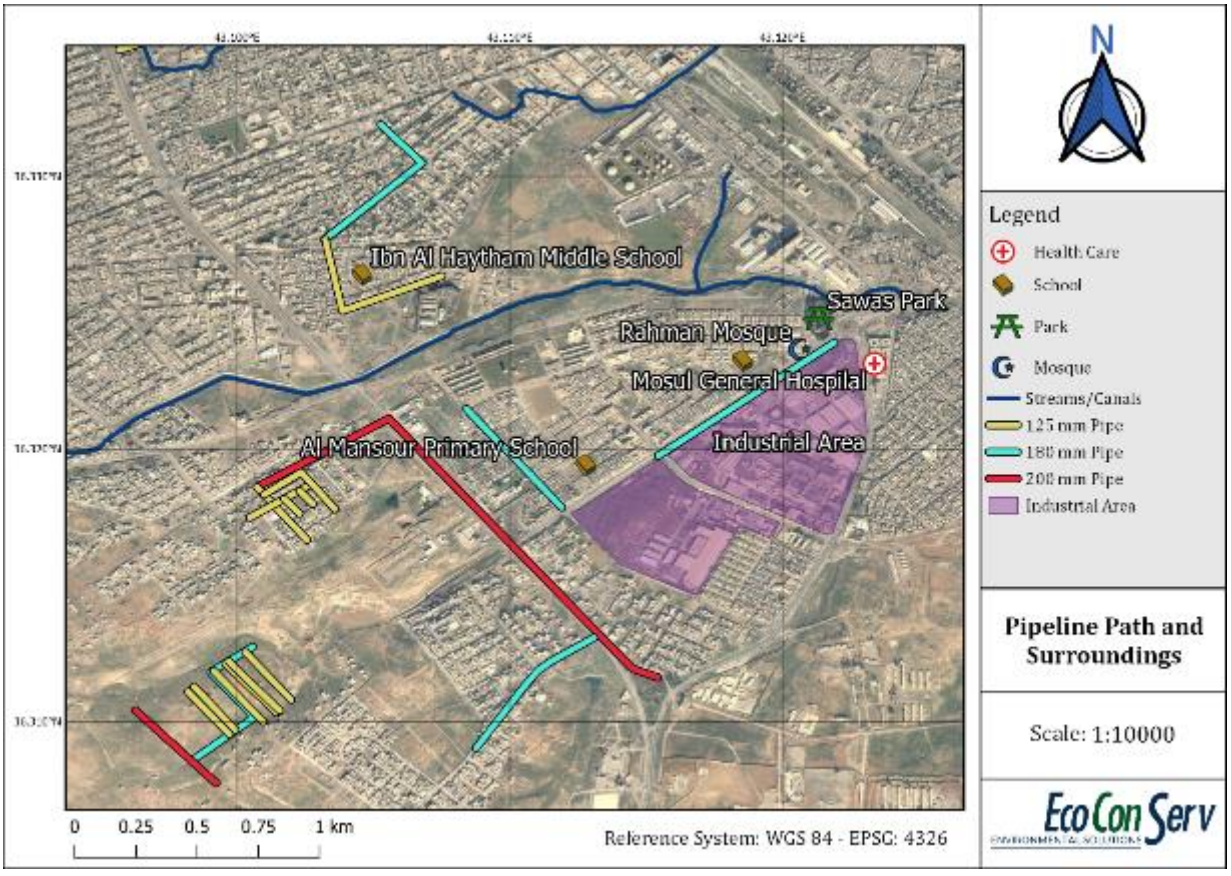

Figure 3-7 Location of hospitals, schools and industrial areas near project area

Road rehabilitation project targets reconstruction and pavement of "Road 60" located west of Hay Al-Eqtsadyen, Hay Al Uraybi, 17 Tamouz, Harimat neighborhood and less than 1km south of Tigris River. The road has a total length of 3.75 km and width of 60 m. The road rehabilitation project will also include restoration of rainfall drainage network including one culvert, and restoration of two drinking water pipelines. The area surrounding the road rehabilitation project is mainly residential. However, the land use in the east side of road 60 is mainly agriculture area with higher population density than the west side which comprises more of barren areas.

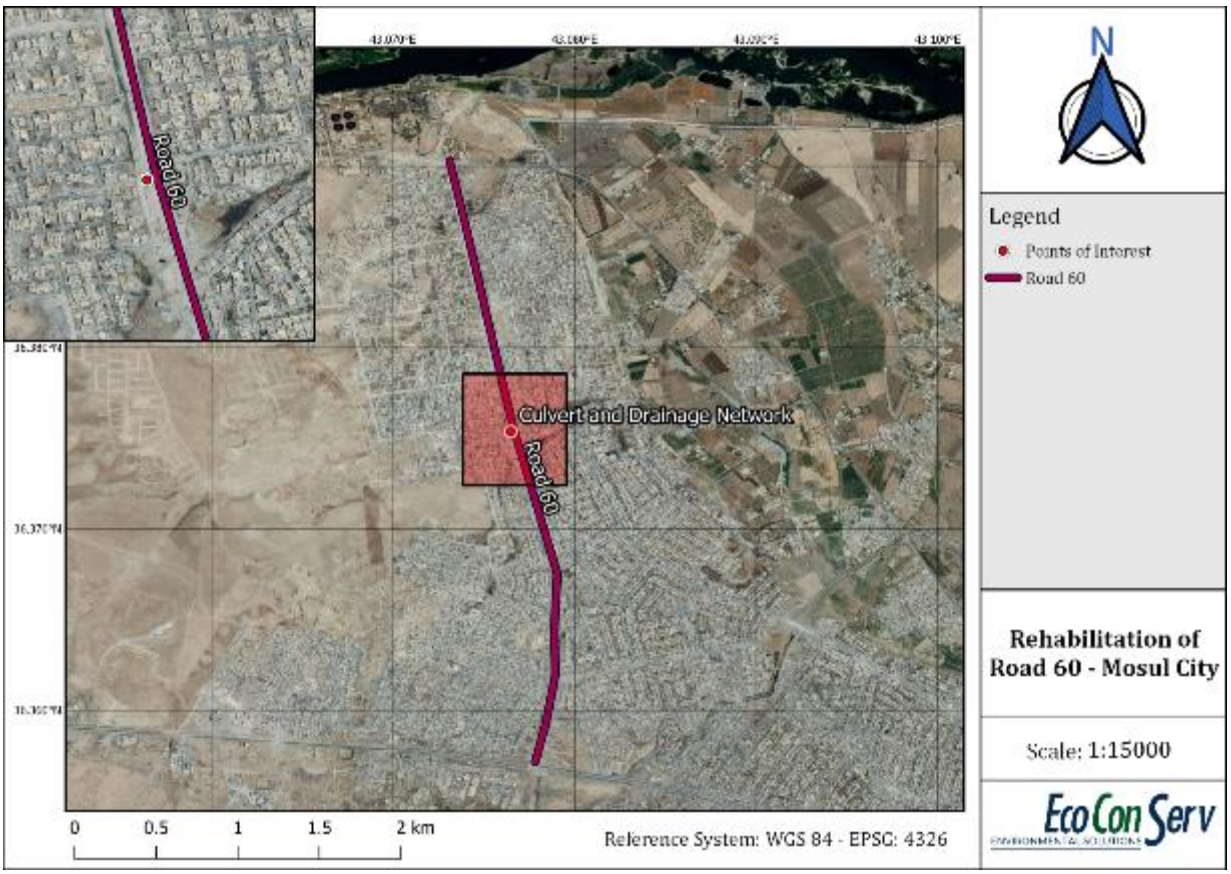

Figure 3-8 Areas surrounding Road 60

The lighting networks and poles cover a wider area crossing a total of 35 roads distributed in the right bank of Tigris River west of Mosul city. The following figure shows the coverage of the lighting networks.

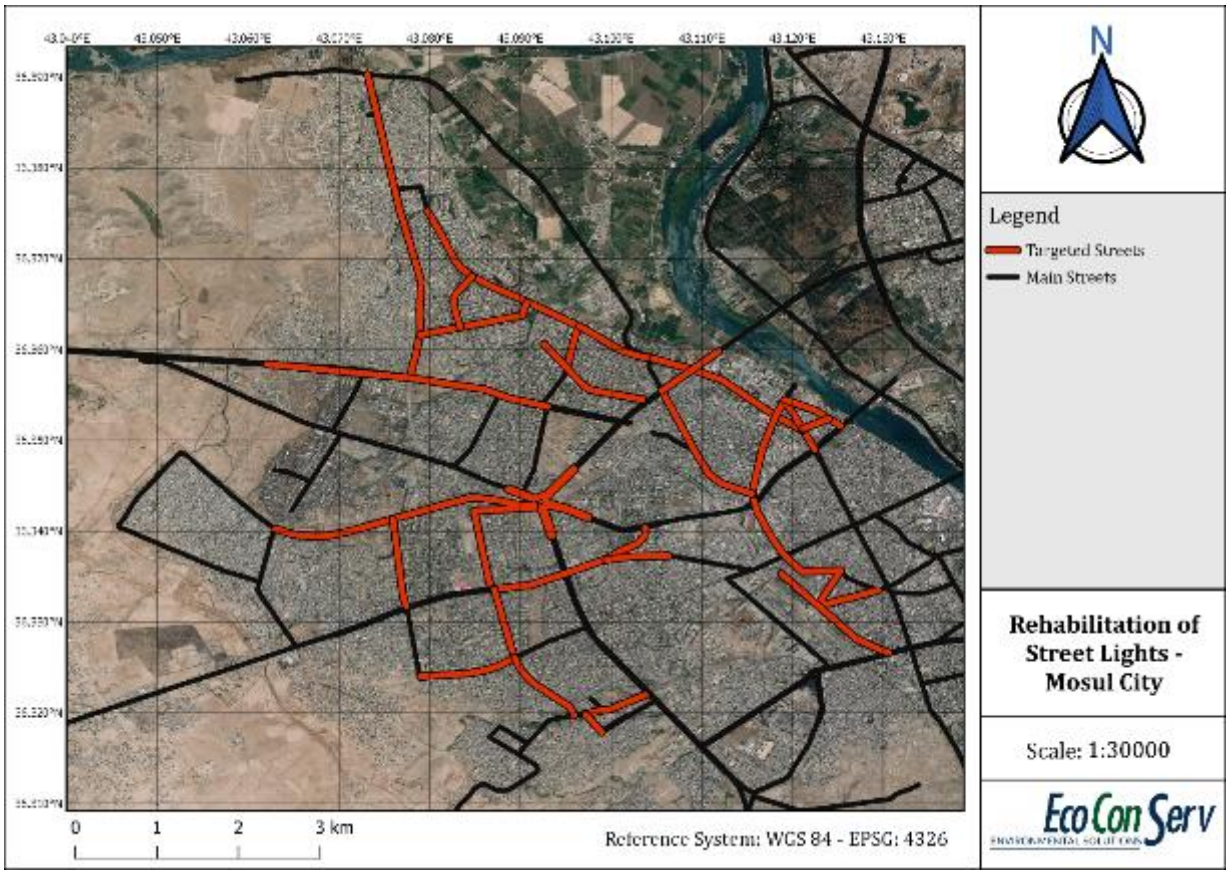

Figure 3-9 Lighting networks distribution in west of Mosul city

3.3 Project Duration

The three sub-projects are expected to begin on January 2020 and end by the end of July 2020.

3.4 Project Elements

3.4.1 EODP-AF-NIN-W01: Rehabilitation and reconstruction of storm water drainage network, culvert, road pavement and two water transport pipelines in road 60 in Al Harimat area

This part of the project has three main major components; road reconstruction and pavement, restoration of rainfall drainage network including main culvert, and restoration of two drinking water pipelines. Road 60 is a highway that connects 4 neighborhoods; Al Msherefa, Hay Al- Eqtesadeen, Al-Harimat and 17 Tamooz

3.4.1.1 Road Reconstruction and Pavement

Road reconstruction and pavement of this project includes construction of multiple layers, surface, base, sub-base and subgrade layers. It also includes curbs[5] and sidewalks[6] . The materials used for each layer of the carriageway and their dimensions are listed in detail in the project activities subsection.

3.4.1.2 Box Culvert

A three-channel box culvert will be constructed from reinforced concrete using salt-resistant cement of type V, and with inner dimensions of 2x3 m and wall thickness of 35 cm. The three-channel box culvert will be used in civil engineering works, including drainage and road works.

3.4.1.3 Rainfall Drain

Glass Reinforced Plastic (GRP) Pipes

The GRP pipes that will be installed of diameter 1m and a total length of 286 m. The pipes will be used for the culvert section and the storm drain network.

Un-plasticized Polyvinyl Chloride (UPVC) Pipes

Three different sizes of UPVC pipes will be used for different purposes. UPVC pipes with diameter of 152 mm and pressure rating of 6 bars will be used for the curbs of the road. Bigger pipe sizes of diameters 315 mm and 600 mm will be used for the storm drain network with lengths 1000 m and 900 m, respectively.

3.4.1.4 Water Supply Pipelines

Steel Pipes

A total length of 100 m steel pipes will be used with diameter of 400 mm for changing the route of the conveyor pipeline.

Ductile Iron Pipes

Two different diameters of ductile iron pipes will be used with a total length of 220 m each for changing the route of the conveyor pipelines.

Fittings and connections

Rubber Ring Joints: will be used for the connections of the 450mm and 500 mm diameters ductile iron pipelines.

Johnson Coupling: a total of 2 couplings will be used with a diameter of 450 mm.

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[5] A curb is the edge where raised sidewalks meets a street or other roadway. Curbs separate the road from the roadside and discourage drivers from parking or driving on sidewalks and lawns. They also provide structural support to the pavement edge. Curbs can be used to channel runoff water from rain into storm drains.

[6] A sidewalk is a path along the side of a road. A sidewalk may accommodate moderate changes in grade (height) and is normally separated from the vehicular section by a curb. They provide a safe path for people to walk along that is separated from the motorized traffic.

Collar plates: iron collar plates will be used with a thickness of 8 mm for both the 400 mm and 500 mm pipes with a total number of 4 collars for each.

3.4.2 EODP-AF-NIN-W02 Drinking water networks (Al-Ghizlani, Mosul Al-Jadeda, Mamoon, Shohadaa, and Mansour Neighbourhoods)

The project targets distributed areas in Mosul Al-Jadeda district and a pipeline 1 km away from Tigris River. The project main components are pipelines, fittings, connections and valves.

Pipelines

Pipelines are classified into three categories based on their diameters. The diameters of pipelines vary according to the amount of water flow rate which is calculated based on the population consumption estimates. The manufacturing materials of the pipelines are ductile iron and polyethylene.

Primary Pipelines (200 mm)

Primary pipelines are the biggest in diameter, 200 mm, and are usually used as the main pipeline for water supply. The total length of the 200 mm pipelines is 3.39 km distributed over several sections. The manufacturing material used for these pipelines is ductile iron and it must be complying with standards of ISO 2531.

Secondary Pipelines (180 mm)

Secondary pipelines are the connection pipes between primary and distribution pipelines. Their diameters are smaller than that of primary pipelines as they are expected to carry less water flow. The diameter of the secondary pipes in this project is 180 mm and of total length 2.88 km. The manufacturing material used for these pipelines is polyethylene and must be ISO certified and complying with German standards or their equivalent (PE 100 RC/SDR 11, TW, PASS 1075, and PN10).

Tertiary Pipelines (150 mm)

Tertiary pipelines carry the least water flow and are used for distribution of water to buildings. The diameter of the tertiary pipelines is 125 mm and of total length 3.36 km. The manufacturing material used for these pipelines is polyethylene and has to be ISO certified and complying with German standards or their equivalent (PE 100 RC/SDR 11, TW, PASS 1075, and PN10).

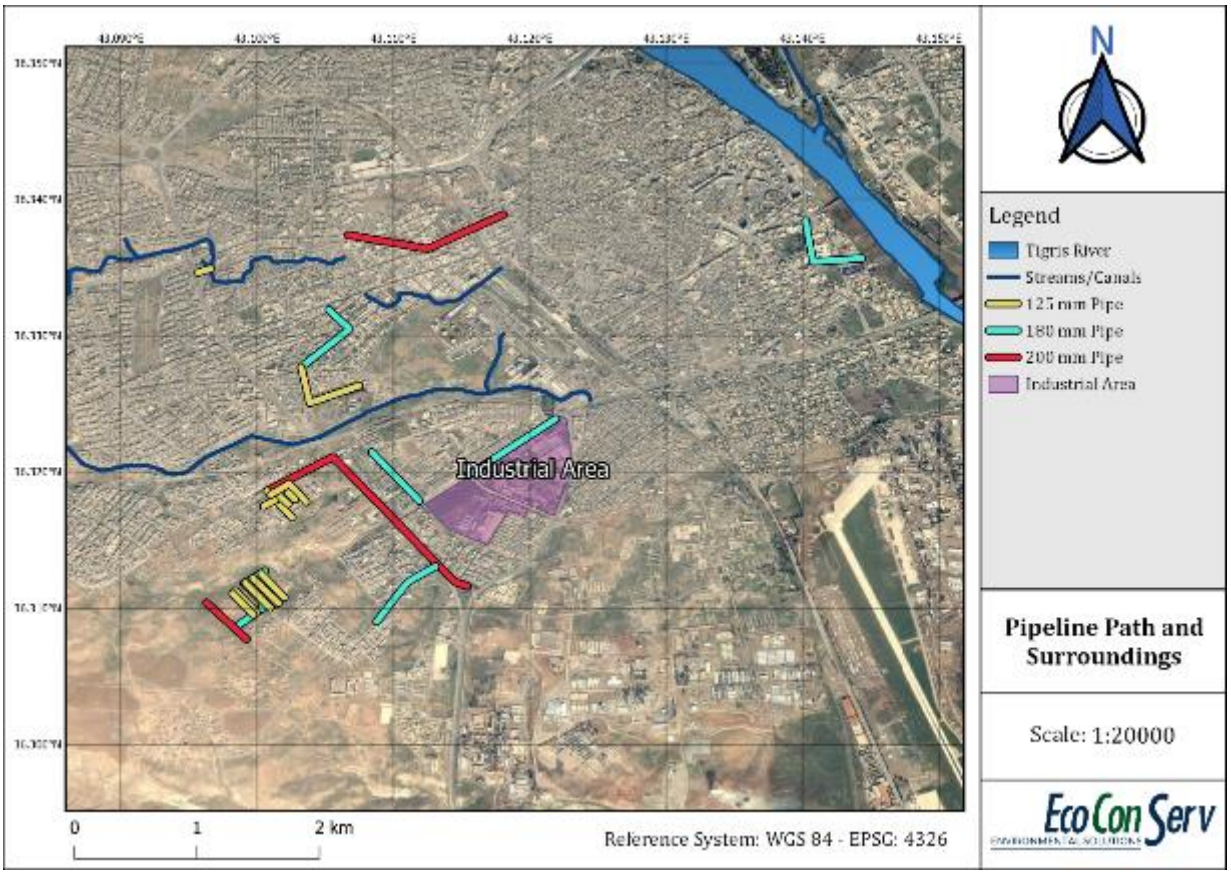

Figure 3-10 Different classes of pipelines

Valves[7]

The following presents the types of valves and its functions that will be used in this project.

Air Valves

Air valves are hydro-mechanical devices designed to automatically collect and release air and gases or admit air during the filling, draining or operation of liquid piping systems for water services. This air can cause inefficiencies and serious operating problems.

Scour Valves

Scour valves are located at low points or between valve sections of the pipeline. Their function is to allow periodic flushing to remove sediment and to allow the pipeline to be drained for maintenance and repair work. The scour valve should be sized to allow a minimum scour velocity of 0.6 m/s to be achieved in the main pipe.

Bulk Water Meters

Bulk water meters can be used for flow rates higher than 15 m^3/hr., while ensuring low head losses offering outstanding measuring accuracy even under extreme conditions. They are used for monitoring the flow rates and are quite helpful in leakage detection.

[7] A valve is a device that regulates, directs or controls the flow of a fluid (gases, liquids, fluidized solids, or slurries) by opening, closing, or partially obstructing various passageways.

Thrust/ Anchor Blocks

Thrust blocking prevents main pipeline from moving when the pressure load is applied. The thrust block transfers the load from the pipe to a wider load bearing surface. Thrust blocks are required where fittings are used to change the direction.

3.4.3 EODP-AF-NIN-W05 Lighting Networks

Lighting networks and poles are distributed over the west side of Mosul City. The major components of lighting networks are 1) Control cabinets, 2) Lighting columns, 3) Concrete bases, 4) Distribution transformers, 5) Anchors and 6) Plinth.

Control Cabinets

Structure

72 electrical control cabinet structures will be implemented in accordance with the directorate's code

Electrical Details and Supply Switch Board

Three Phases Time Switch Electrical board of 125 Amperes will be structured with all the associated cabling, wiring, fuses, meters, and fittings.

Well insulated and sheathed lighting system cables 4c x 25 mm^2 are prepared to cover and serve 34,500 meters. Aluminum conductor wires of 120/20 mm^2 specs are installed to cover 2,000 meters. Preparation and installation of iron belt (steel band) to cover 927 meters long is also implemented. Eight 250A circuit breakers will be assembled and installed to ensure safety of cabling and lighting system. In addition, overhead cables to cover 1,000 meters long.

Lighting Columns

Columns

All old columns will be discarded, and new lighting columns will be implemented of 10 meters height. The columns used are made of galvanized steel. The light columns are specified to withstand 400 watt of sodium lighting. Distance between each two light columns will be 35 meters.

New installed lighting columns will be divided into two groups. The first group includes 190 columns and will be utilized in supporting single outreach luminaire arms, while the second group includes 360 columns supporting the double version of outreach luminaire arms.

Luminaires

Total of 1,481 sodium luminaires (400 watts) will be installed in compliance with technical specifications of Lighting Works Executions and under the supervision of the overseeing committee.

Lamps

The required lamps based on the desired specifications will be high pressure sodium vapor discharge lamps of 400 watts. Lamp control gear units will be suitable for usage with high pressure sodium vapor discharge lamps of 400 watts.

Concrete Base

A total of 532 concrete base structures will be implemented in addition to any relevant work.

Distribution Transformers

Four distribution transformers will be installed of 11 kV/0.4 – 250 V specifications and conforming in all respects to high standards of engineering design. All associated and relevant work will be executed and implemented including 11 V fuses, switches, wiring cables, 1c x 95 mm^2 cables, earthling cables, iron rods, and required insulation.

Plinth

Concrete plinths are to be constructed at adjacent location to power supply for control cabinets and light columns. Eight plinths of 11 meters long are to be constructed together with all the wiring cables.

3.5 Project Activities

3.5.1 Pre-construction Activities

The preparation of the site and decommissioning of the existing infrastructure for the installation of the new water supply and rainfall drain pipelines, culvert and lighting networks is an essential step. However, special attention must be paid towards the residential areas and commercial activities.

Site preparation

Preparation of the site includes setting the project site boundaries, installing fences around the facilities, and clearing the site of unwanted bushes, weeds and plants. The project site must also be cleared of any obstacles to facilitate the accessibility to the roads and inside the working area. Camp offices and workshops are to be installed and the mobilization of heavy machinery and sophisticated equipment is planned prior the start of excavation works.

3.5.1.1 Drinking water network

The decommissioning work will include the preparation of the site by digging the tracks of the damaged network and conveyor lines, removal of debris, and transport to the landfill site specified by the municipality of Mosul.

3.5.1.2 Road Rehabilitation

The rehabilitation of road 66 has three subcomponents: road reconstruction and pavement, restoration of rainfall drainage network including main culvert, and restoration of two drinking water transmission pipelines. The decommissioning phases for this project entails cutting and removal of pavement using cutters to cut the asphalt layer with a total length of 300 m and removal of rubbles outside the working site with an estimated work area of 60,000m^2.

The decommissioning of the rainfall drainage network and the two drinking water pipelines will be the same as mentioned above in the drinking water pipelines section.

3.5.1.3 Lighting Network

The decommissioning of the lighting network comprises of obtaining approvals for work commencement and commissioning. Dismantling, storage, transportation, treatment of old and existing lamps. Removing the power supply wiring. Disconnecting existing power leads and remove energy source wiring from poles. Dissociation of old control cabinets, and power transformers. Perform an inspection to identify any defects before full replacements.

Dissociation and removal of old wiring, cabling and anchoring systems. Dismantling of old lighting columns and transportation to specified stores. Demolition and storage of old concrete bases. Removal and transportation of any demolition waste. Excavation of 532 new locations for installation of new lighting poles. Assembly of new wiring and cables for the electrical control cabinets and new lighting columns. Assembly of new hooks, hanging, and mounting clamps. Inspections on distribution transformers.

3.5.2 Construction Activities

3.5.2.1 Drinking water network

This phase of the project entails the rehabilitation and replacement of the old and damaged pipes, excavation of pipelines' tracks, supplying and laying of distribution pipelines, installation of valves, flow meters and thrust blocks.

Pipelines

The work includes the following activities:

- Cracking the concrete or asphalt with a width of 70-80 cm using compressor or Jake hammer and cutting the path of drilling from both sides using a cutter. The estimated surface area is 7,669 m^2.
- Carry out earthworks with a width of at least 60-70 cm and a depth of not less than 1 m above the pipes (where the rubble of the excavation is loaded by the excavator to the back of the tipper directly outside the work site being a rocky area and need to replace the soil). The excavated volume is estimated to be 6,591 m^3.
- The supply and laying of pipelines include transporting of the 200 mm ductile pipes, 180 mm and 125 mm polyethylene to the work site, distributing them along the trench path, extending them, pressing them, connecting polyethylene pipes using thermal machines, and inspecting them properly in addition to the main and sub-jointing works and water attachments, as well as preparing materials and pouring concrete supports (thrust blocks) and installing locks and valves.
- Materials processing and burial of pipelines from all sides with clean fine sand with thickness of 80 cm and backfilling the path with good sub-base material. Casting works for an area of 3,112 m^2 using normal concrete with 20 cm thickness along the pipe path when needed and returning the streets to their original condition.
- Construction of a reinforced concrete manholes with outer dimensions 1m x 1m and 1m depth. The installation of heavy manhole will be covered with a base. Burial of pipelines from all sides with clean fine sand and backfilling the path with good subbase material.

3.5.2.2 Road Rehabilitation

Road reconstruction and pavement

The activities anticipated for road reconstruction and pavement include the following:

- Removal of the damaged sand-gravel layer of 5,000 m^2 and lowering the street level with a depth not less than 1m to reach the solid layer. Transport the rubble generated outside of the work site. Carrying out burial works with sand- gravel in the form of layers and giving the necessary side inclinations by 2-6% and brush a layer of fine gravel of area 63,000 m^2 with a thickness of 15 cm.

- Building side molds of municipality type with casting of the plain concrete layer supporting kerb stones. Seaming of molds with cement and sand mortar. Tiling of 68,000 m^2 with asphalt concrete (stabilizer) and spraying of prime coating with a ratio of 1 liter/m^2. Cladding of 125,000 m^2 concrete based asphalt (binder) and spraying of coating with a ratio of 0.5 liter/m^2 before cladding.

- Concrete casting of sidewalks covering an area of 11,700 m^2. Laying of gravel with thickness of 15 cm. Casting of reinforced concrete bases using 8 reinforcement steel rods with diameter 16 mm and rings for every 25 cm with diameter 10 mm. Construction of supports with total volume of 370 m^3 made of natural bricks using cement and sand. Laying of plastic pipes (3" diameter) for water drainage.

- Cutting of 60m long road with width of 40 cm and depth of 60 cm and removal of debris off site. Laying of UPVC pipe with diameter of 6 inch and pressure rating of 6 bars. Packing of the pipes with sand of thickness 5 cm and reburial with gravels. Casting of road with regular concrete layer. Construction of manhole with dimensions (50x50) cm and depth of 60 cm.

Storm drainage network and culvert

Culvert

- Soil excavation along the path of culvert following a V-shape with a depth of 10 m and width of 15-20 m. Cracking of the old culvert and lifting of excavation debris and withdrawal of groundwater that might show during work. Treatment and diversion of obstruction and fracturing of water pipes and cables. Diversion of water coming from the areas connected to the culvert by pipes or pumps. Laying of boulders with volume of 810m^3 on both sides of the culvert and beneath. Casting of lean concrete (type V) layer with total volume of 90 m^3.

- Placement of steel supports underneath the network. Connecting old drainage networks with manholes to the culvert. Preparation of sub-base of Class A for burying of the stream path for the sides and ceiling of the stream in the form of layers and extending of 1,000 mm diameter GRP pipes and burying them with properly compacted sub-base along the length of the pipes (36 m).

Drainage network

- Soil excavation with depth ranges of 3-4 m and width 1.1-1.6 m and extraction of old damaged path. Extraction of groundwater 50 cm below excavation level and lifting of excavation debris. The length of excavation is 1,750 m. Extending of pipes and covering with

soft sand and burying them with properly compacted cement reinforced sub-base in the form of 25 cm layers.

- Casting of 61 concrete manholes using salt-resistant cement type V casting enforced with reinforcement steel. Soil excavation of total volume 193 m^3 to explore the locations of buried manholes for the 1,000 mm GRP pipes. Cleaning and drainage of the storm water lines and removal of debris and waste to the dedicated area outside the site in collaboration with the municipality

Water network

Rerouting of Transmission line

- Soil excavation with maximum depth of 1.2 m and width of 80 cm to expose ductile pipelines and connecting old and new pipelines via electric welding using steel rings and burying the pipelines with stones-free excavation dust. Casting of concrete manhole enforced with reinforcement steel nets with diameter 0.5 inch.

Extending of Transmission line

- Soil excavation with depth of 1.5 m and width of 70 cm and levering excavation debris to a dedicated area outside the work site. Lowering and laying of 500 mm pipelines and distribution along the line path. Burying the pipelines with stones-free excavation dust. Casting of concrete manhole enforced with reinforcement steel nets with diameter 0.5 inch.

3.5.2.3 Lighting Networks

- Installing and assembly through erection of lighting columns, assembly of outreach arms, luminaires and lamps, location of aperture on single and double outreach columns, assembly and connecting lamps to the lamp control gear and tighten screws, bolts and nuts.
- Installment of control cabinets on concrete plinths adjacent to power supply points and connecting control cabinet to power supply point and install all necessary meters, links, fuses and circuit breakers with assembly of all wiring boxes and associated accessories to facilitate ready servicing and filling gaps under mounting bases with cement.

3.5.3 Operation and Maintenance Activities

3.5.3.1 Drinking water network[8]

The operation and maintenance activities include providing and fixing house service connections, regulations of flow and maintenance work for the pipelines.

Operation will include providing adequate pressure to protect water quality in the system as well as sizing and adequate maintenance to assure reliable delivery of water of suitable quality.

[8] World Bank. 2007. *Environmental, health, and safety for water and sanitation (English)*. IFC E&S. Washington, D.C. : World Bank Group.

The most significant environmental issues associated with operation of water distribution systems include:

- Water system leaks and loss of pressure

  Water system leaks can reduce the pressure of the water system compromising its integrity and ability to protect water quality (by allowing contaminated water to leak into the system) and increasing the demands on the source water supply, the quantity of chemicals, and the amount of power used for pumping and treatment. Leaks in the distribution system can result from improper installation or maintenance, inadequate corrosion protection, settlement, stress from traffic and vibrations, frost loads, overloading, and other factors. Thus, the following are the recommended measures to prevent and minimize water losses from the water distribution system include:

  - Conduct regular inspection and maintenance.
  - Implement a leak detection and repair program (including records of past leaks and unaccounted-for water to identify potential problem areas).

- Water discharges

  Water lines may be periodically flushed to remove accumulated sediments or other impurities that have accumulated in the pipe. Flushing is performed by isolating sections of the distribution system and opening flushing valves or, more commonly, fire hydrants to cause a large volume of flow to pass through the isolated pipeline and suspend the settled sediment. The major environmental aspect of water pipe flushing is the discharge of flushed water, which may be high in suspended solids, residual chlorine, and other contaminants that can harm surface water bodies.

3.5.3.2 Road Rehabilitation[9]

A) Roads:

Streets surfaces should be reworked only as necessary to provide a smooth-running surface and a good slope for drainage. During all seasons, roads will require continual monitoring for surface and subgrade wear or deterioration, especially during rainy seasons, as rutting and loss of ballast often occur during the rainy season.

B) Storm water drainage:

The impairment of individual components of the drain system can compromise the functionality of the larger system. Generally, the frequency at which storm water drainage network components should be inspected depends on the age of the asset, the type and its location (near a water body, for example). Drainage systems are subject to functional impairment by a variety of conditions, including:

- Cracks and/or joint separation
- Corrosion

[9] Storm water Operations & Maintenance Plan, Nevada Department of Transportation, August 2017

- Scour, undermining or erosion at the inlet or outlet
- Obstruction due to vegetation, debris, or other objects
- Capacity reduction due to excessive sediment accumulation
- Site specific conditions

Inspection and Maintenance Activities

- Inspection shall be carried out after a storm event (post-storm).
- Inspections should occur before the winter season prior to any runoff event to ensure the drain system is in good functioning condition.
- Maintenance includes emergency repairs as a result of accidents, weather conditions or other unexpected damage
- Routine/preventive maintenance include:

Trash and Debris Removal

Trash will be removed on a routine basis as part of maintenance activities from the area surrounding the drain network to reduce the potential for clogging during storm events.

Mechanical/Structural Component Maintenance

Mechanical and structural components will be maintained regularly in accordance with manufacturer's or design recommendations to ensure that they remain functional at all times. Valves, sluice gates, pumps, filters, cartridges, fences, gates, trash racks, and access hatches or locks should be operated during each inspection to ensure that they function properly.

Sediment Removal

The degree to which sediment accumulates will depend on the upstream sediment source, rainfall intensity, and the amount of runoff. Sediment that has accumulated that is affecting the function of the stormwater control must be removed. In general, sediment should be removed when it exceeds 50% of storage capacity or the original design sediment storage depth. The sediment removed must be transferred to an appropriate facility for dewatering or disposal.

C) Two drinking water pipelines

Same as Drinking water network section.

3.5.3.3 Lighting Networks

- Periodical inspection to ensure safety and normal operational conditions
- Fixed Operation and Maintenance
  - Repair and/or replacement of all defective, damaged or worn-out components or parts thereof to ensure the proper operation of the lights

- Re-lamping high-pressure sodium streetlights occur on a four or five-year cycle or as outage frequency dictates
- Repairing physical damage includes knockdowns of streetlights or controllers and unintentional damage from dig-ups of the distribution conduits. Repairs may take minutes or days depending on the extent of the damage.
- Maintain any outage in cabling and wiring system

3.6 Equipment

During the decommission and construction phases of the project, the machinery and equipment used on site includes

- Compressors
- Jack hammer
- Dredgers
- Excavators
- Power generators and fuel tanks
- Chlorination station (if needed)
- Tractors
- Pipelines (200mm, 180 mm, 125 mm)
- Valves and fittings
- Pipeline Pressure Testing Equipment

Roads Rehabilitation and Reconstruction[10]

All equipment, tools and machines used in the performance of the work shall be either new or in the top-grade secondhand condition or be subject to the approval of the Engineer and shall be maintained in satisfactory working condition at all times.

Equipment that will be used for the roads rehabilitation and construction include:

- *Blade Graders*
  Blade Graders shall have an adjustable blade for slopes and shall be self-propelled. Other approved suitable spreading equipment may be used.
- *Sprinkling equipment:*
  Sprinkling equipment shall be suitable for applying water uniformly and at controlled quantities to variable widths of surface.

[10] Standard Specifications for Roads and Bridges of Iraq (2003)

- *Transporting and mixing equipment*.
  The mixing equipment shall be of an approved type that that will collect and thoroughly mix the material that has been spread on the subgrade or the material transported to the spreader mixer.
- *Compaction Equipment:*
  Compaction equipment shall be of the most suitable type for compacting the sub-base material to the density specified and can comprise smooth-wheeled power rollers, pneumatic-tyred rollers, rubber-tyred compactors, vibratory rollers, vibrating - plate compactors or vibro tampers, all operated to the specified number of passes to achieve the maximum specified density obtained in trials on the materials.

3.7 Resources

3.7.1 During Construction phase

3.7.1.1 Water

The Water needed for construction will be provided from sources near the project. The estimate water quantity required is 200-250 liters for every m^3 of concrete.

3.7.1.2 Energy (Fuel/Electricity)

Electricity is provided by the National Company or by diesel generators to supply electricity to the different construction activities including welding. In addition, diesel will be the fuel used by the trucks and excavators. Diesel fuel, bitumen or asphalt needed must be stored at a distance of at least 500m away from any water surface.

3.7.2 During operation phase

3.7.2.1 Electricity

The electricity consumption in the operation phase is expected to be sourced from the national grid for the purposes of lighting. The electricity consumption during the operation phase is expected to be minimal.

3.7.3 Construction materials

Pipelines will be imported from outside of Iraq according to the technical specifications provided in the tender documents. The Contractor will partly use sophisticated equipment and machinery, which will afterward be retrieved when, needed onsite, while construction materials will be injected into the site in quantities relevant to work loads. Storage in the site will be pursuit at minimum due to security precautions.

Rubbles used for burial layers will be sourced from a nearby quarry certified by the municipality whereas the finishing paving materials as well as sand and gravels for concrete mixtures will be prepared by official certified laboratories. Cement will be prepared from the governmental cement laboratory of Badoush. Wood, steel, painting materials, and electrical supplies will be provided from the local market in the vicinity of the project area by 2 km.

Laboratory	Latitude	Longitude
Quarry Center	36° 22' 20"	43° 03' 57"
Badoush Cement Lab	36° 26' 30"	42° 55' 50"

3.8 Working Camps/Number of Expected workers

Each sub-project has a camp office for project management supplied with drinking water and electricity. The camp office is allocated in a governmental owned land thus no land acquisition is anticipated. The office consists of several caravans for rest, clothes changing, storing of equipment and parking lots. Domestic wastewater will be discharged in underground septic tanks that are going to be transported by special trucks and disposed in a sanitary facility licensed by Mosul municipality.

The following table shows the geographical coordinates of the camp offices.

Table 3-1 Location of Camp Offices

Project	Latitude	Longitude
EODP-AF-NIN-W01	36° 20' 30" N	43° 04' 30" E
EODP-AF-NIN-W02	36° 20' 30" N	43° 05' 30" E
EODP-AF-NIN-W05	36° 19' 08" N	43° 06' 55" E

In terms of workforce, this will be pursuit from local market as much as possible. No accommodation is offered onsite for non-skilled workers, except for resident engineers, few people from the contractor side, services men and site guards.

Table 3-2 No. of Workers anticipated

Type of project	Type of Work	No. of Workers
Drinking water network	Civil	100-150
	Electrical	10-20
	Mechanical	20-25
	Pipework	20-30
Road Rehabilitation	Civil	80
	Electrical	10
	Mechanical	10
	Pipework	15
Lighting Network	Civil and Electrical	25-40

3.9 Waste Generation

3.9.1 During Pre-Construction and Construction Phase

Waste generated from the dismantling of existing facilities should be reused as much as possible in the backfilling. Solid waste generated during the construction phase will comprise construction waste, which will be generated for a relatively short period, domestic waste, and some hazardous wastes from the project activities. The waste is expected to include the following waste streams:

Hazardous wastes: Bitumen, Used oil waste, Asphalt and Miscellaneous containers, paint cans, solvent containers, aerosol cans, adhesive, and lubricant containers.

Non-hazardous wastes: Soil (excavated or surplus), Packaging materials, Damaged products (pipes, etc.), Packing timber, Paving materials, Electrical cable off-cuts and Concrete.

3.9.2 During Operation Phase

The project components are expected to dispose relatively small amount of solid waste during the operation and maintenance phases. However, stormwater drainage network will carry the collected rainwater during rainy seasons.

1.2 Waste Disposal

All wastes generated during the construction phase (excavated soils and other waste materials during excavation) will be managed and disposed of in accordance with applicable regulations and established best management practices. Following common practice, the wastes are loaded onto trucks, which transfer it to dumping sites. Loading waste trucks shall be done upon excavation, whenever possible, in order to avoid stockpiling waste on site.

In case of disposal of any garbage, construction waste, or silt in a neighboring land, the contractor shall immediately remove it, clean the damaged area, and return it to its original condition according to the satisfaction of the supervising engineer.

Domestic wastewater will be collected from the offices' septic tanks and transported in special vehicles to the sanitary landfill area designated by the Mosul municipality.

Water collected from stormwater drainage network is directed to valleys outside the city.

4 ENVIRONMENTAL AND SOCIAL BASELINE CONDITIONS

4.1 Introduction

As mentioned in the Project Description, Ninawa Project comprises the following sub-projects:

- **EODP-AF-NIN-W01**: Rehabilitation and reconstruction of stormwater drainage network and culvert, road pavment and two twater transport pieplines of road 60 in Al-Harimat area
- **EODP-AF-NIN-W02**: Rehabilitation of the drinking water distribution network
- **EODP-AF-NIN-W05**: Rehabilitation street lighting networks.

All three sub-projects are located on the right bank of Tigris river, west of Mosul City. Mosul is a major city located in Ninawa Governorate in the Northern part of Iraq, approximately 400 km north of Baghdad. Mosul stands on the west bank of the Tigris River.

4.2 Sensitive Receptors

Most of the sensitive receptors are near the sites of Drinking Water Network project - W02. One of the proposed locations of the pipelines is near the Tigris River within 200 m. The same pipeline passes near some culturally valuable and important buildings including Mosul Museum and Mosul Court. None the less, other pipelines are in areas having education and health facilities and overlooks parks and industrial areas. The areas surrounding Road 60 from both sides are mainly residential with no major sensitive receptors except for the Tigris River at approximately 900 m while the lighting network extends in some roads located near sensitive receptors including higher educational facility and Tigris River. area lists the sensitive receptors near the project areas.

Table 4-1 Sensitive Receptors in the project area

Project	Receptor	Distance
W01 Road Rehabilitation	Tigris River	520 m
W02 Drinking Water Network	Mosul Museum and Court	Adjacent
	Ibn Al-Haitham Middle School and Al-Mansour Primary School	50 m and 85 m
	General Hospital	150 m
	Mansour Health Center	50 m
	Tigris River	120 m
	Sawas Park	Adjacent
	Al-Shuhdaa' Park	Adjacent
	Industrial Area	Adjacent
W05 Lighting Network	Faculty of Medicine	Adjacent
	Tigris River	150 m

Figure 4-1 Location of sensitive receptors in the pipeline paths

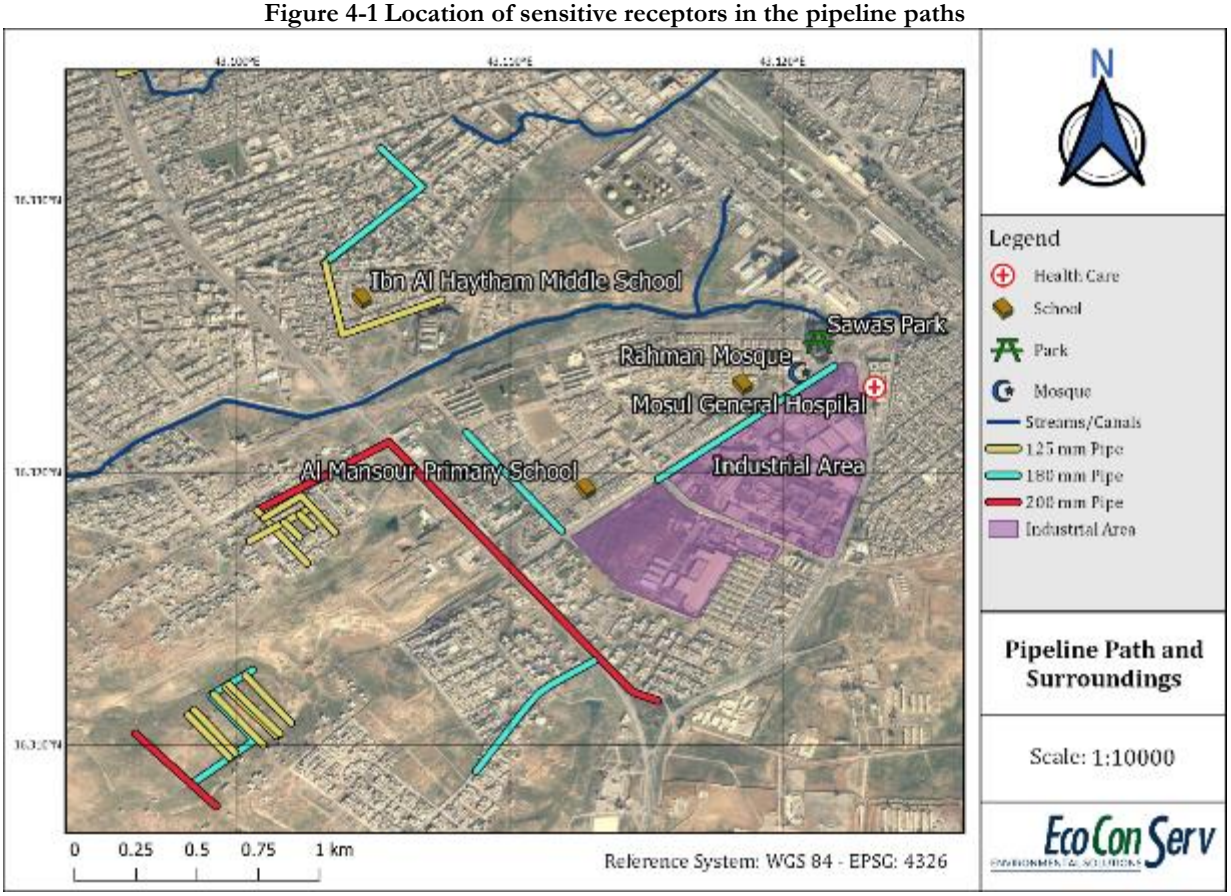

Figure 4-2 Pipeline Path and Surroundings

4.3 Physical Environment

This section presents a brief description of the existing environment, including its physical, ecological resources, and socio-economic development. Broad aspects on various environmental parameters such as geography, climate and meteorology, physiography, geology, seismology, ecology, socio-cultural and economic development parameters that are likely to be affected by the proposed rehabilitation of water supply system are presented.

4.3.1 Climate/Meteorology

For the climate in Mosul city, it is dry as it is hot in summer and cold in winter and the temperature exceeds 50 degrees Celsius in summer and drops to below zero degrees Celsius sometimes in winter and as previously mentioned wind speed is 26 meter per second.

Mosul's climate is classified as warm and temperate. The winter months are much rainier than the summer months in Mosul. This climate is 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.

The windiest months of the year are June and July 22, the calmer time of year lasts for 7.5 months, from September to mid-May. The prevailing wind direction in Mosul is in the North-North-East direction with maximum wind speed of 19 km/hr.

4.3.2 Ambient Air quality and Noise Level

The annual average AQI for Mosul is 41 for the year of 2019 with an estimate of 245 days per year at this level. The maximum reached AQI is 192 in June, the following table shows the pollution load at the peak day.

Table 4-2 Pollution load at 25th of June in Mosul

PM2.5	PM10	NO_2	O_3
142 μg/m³	195 μg/m³	29 μg/m³	53 μg/m³

Source: https://air.plumelabs.com/air-quality-in-mosul-pLW

This area is mainly a residential/rural area, so the main sources of the air pollution are dust generated by moving of the passenger vehicles on unpaved surfaces, in dry condition and natural dusty conditions, especially with the wind gusts. Also, dust from military and construction activities. The roads in the area are in rather bad conditions partially destroyed due to the recent war conditions.

At present, there is no information on ambient air quality in the project area; no measurements on air quality are performed until now. Data on ambient air quality will be generated by collection of representative samples by the contractor before commencement of construction works. The selection of sampling location will be representative of residential, commercial, institutional, industrial and sensitive locations.

The proposed locations are

1. Location of the construction of pipelines, culvert, road pavement

2. Within the city limits where construction works will be done

3. Residential Area near the location of Tigris River

4. Near Construction Camps

Noise Level

The area is residential/rural and noise is limited to the passenger vehicles' movement so 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 should be an average noise level of 45-55 db in residential areas and 70 db in industrial areas according to the EHS Noise guidelines.

4.3.3 Geology and Soils

The geological formation of the project areas was adjacent Al- Fatha formation, which contains gypsum, and calcite that can dissolve in water. For 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.

4.3.4 Surface water and Groundwater

Surface water

Iraq has the majority share of the Tigris River basin with a share of 56.1%[11]. The project is located near the Tigris River 1-5 km away. The river flows south from the mountains of southeastern Turkey through Iraq and discharges into the Arabian Gulf. At Mosul, the maximum discharge can reach 1,629 m^3 /s in April and its minimum mean discharge can reach 219 m3 /s in September.

With reference to recent assessments of Water Quality Index (WQI) for Tigris River in Mosul city, there is a general progressive decline in WQI values along the downstream that indicated an increase in pollution. Based on WQI, the water of Tigris River was classified as class III. Consequently, it requires treatment before use for water supply.[12]

Groundwater

An ESMP, posted on the World Bank's website, carried out for Mosul's second bridge (Al-Huriya bridge) located at coordinates 36°20'25"N 43°8'36"E, stated that the groundwater depth in the project area ranged from 30-40 m below surface, which is slightly brackish with a salinity of 1000-3000 ppm. Generally, the salinity of the groundwater increases from north to south of Iraq. It increases from the

[11] Adapted from UN-ESCWA, 2013

[12] 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. 82-9

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 bicarbonate at the recharge areas and contains sulphates at the discharge areas[13].

A study of the groundwater quality was carried out in the right bank of Mosul city in 2018, concluded that the tested groundwater was unsuitable for drinking and domestic uses, as the water quality index (WQI) ranged from 24.49 to 31.90 (poor water quality). Those low values of WQI was found to be mainly from the higher values of EC25, Total Hardness, Na, SO4 and bacterial contamination in the groundwater. The Analysis revealed that the studied groundwater needs some degree of treatment before consumption.

4.4 Biological Environment

The surrounding area of the project is classified as urban habitat[14]. There are no Natural Reserves or other legally protected areas near the project or in its 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.

4.4.1 Flora and Fauna

Literature review and site investigations resulted in the identification of very common species of flora and fauna so the impacts on flora is insignificant due to the nature of the surrounding area, near the river grows only common rush and reeds. The impacts on fauna is considered insignificant there are no species of importance in the project site.

The proposed projects are less likely to negatively affect the physical environment on the long term. However, some negative impacts might arise during the construction phase in case the proposed mitigation measures aren't well implemented. Construction activities might cause temporary deterioration of air and water quality, but no effect is anticipated on the surrounding habitat as it is originally poor in biodiversity.

4.5 Socioeconomic Baseline

This section contains a description of the social environment at the proposed project area. It will highlight the following: basic information on the project area, demographic characteristics, economic profile, access to basic services, public safety and security, and cultural heritage.

4.5.1 Basic Information on the Project Area

4.5.1.1 Nineveh Governorate

[13] http://documents.worldbank.org/curated/en/136081544683943554/pdf/AL-MOSUL-SECOND-BRIDGE-ALHURIYA-IN-NINEVEH-GOVERNORATE-FINAL-ESIA-DOCUMENT-ilovepdf-compressed-1.pdf

[14] Urban habitats are essentially altered by human use and are predominantly occupied by constructions or infrastructure.

The governorate of Nineveh is located in northwestern Iraq. Nineveh is the third largest governorate in terms of size, with a total land area at an estimated 37,320 km^2 (8.6% the total size of Iraq). The governorate shares borders with Syria, Turkey, and the Kurdish Region of Iraq (KRI). On a closer level, Nineveh shares its borders with the governorates of Dohuk, Erbil, Salah El Din, and Anbar. According to the Central Statistical Organization's Multiple Indicator Cluster Survey (2018), the population of Nineveh comes to around 3,730,000 inhabitants, which constitutes around 9% of Iraq's total population.[15] The capital of Nineveh is Mosul city, located in the northeastern region. The Tigris River runs from the Turkish border through the eastern portion of the governorate, bisecting Mosul along the way.

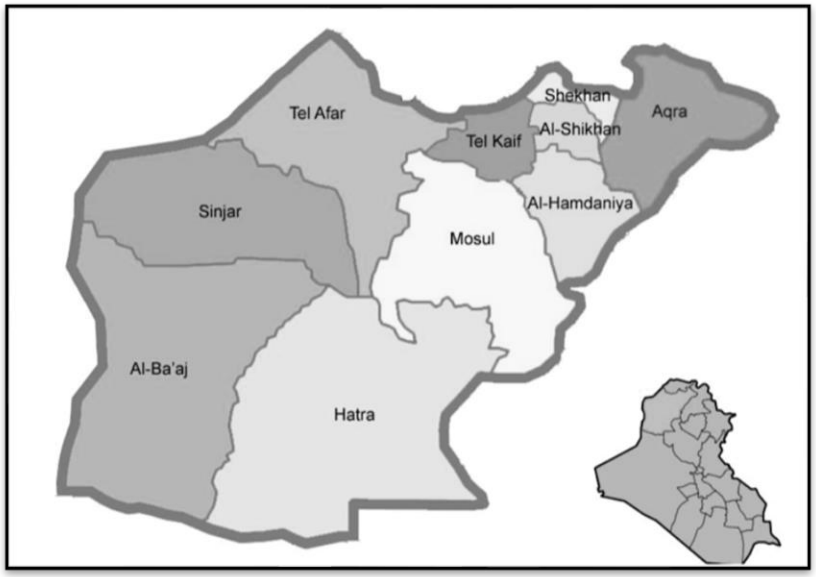

Figure 4-3 Map of Nineveh Governorate

4.5.1.2 Land Use

The Nineveh governorate's economy is mostly dependent on agriculture. Nineveh's arable land constitutes around 46 percent of the total arable land in Iraq.[16] The land is responsible for yielding around 40% of Iraq's annual wheat and barley production.[17] Food production is a central industry in the governorate since it contains a number of factories that produce grain and wheat for export to other countries. Vegetables and fruits are also cultivated in the governorate for national consumption. Nineveh has also been explored for oil and multiple oil fields has been excavated. Lastly, the

[15] Multiple Indicator Cluster Survey developed by the Central Statistical Organization of Iraq (2018) – Nineveh Governorate

[16] Official governorate of Nineveh website - https://ninava.gov.iq/about-ninava.php

[17] Ibid.

governorate is known for its archeological and religious tourism due to multiple Assyrian artifacts and the presence of shrines of Abrahamic prophets.

4.5.1.3 Administrative Division

There are three levels of administration in Iraq: governorates, districts, and sub-districts. Each governorate is subdivided into districts (*qhadas*) and sub-districts (*nahiyas*). The district is usually named after the district's major city. The governorate includes the eight districts of Mosul, Telafar, Hamdaniya, Shikhan, Tilkaif, Hatre, Sinjar, Makhmour and Ba'aj.[18] Each district is divided into several sub-districts. Furthermore, at the most local level of governance, each sub-district has a community leader (*mukhtar*) who is appointed by local councils and serves as a primary intermediary between residents and government service providers within their area of responsibility. The *mukhtar* is responsible for keeping and maintaining records of the households living within his sub-district, assigning households to Public Distribution System (PDS) government officials and addressing community concerns to the relevant authorities.[19]

There are disputed boundaries to Nineveh. The governorate is the most ethnically diverse in Iraq. In addition to the sizeable Arab Sunni population, Arab Shias, Kurds, Assyrians, Chaldeans, Turkmen, Yezidis, Shabak and other minorities live in the governorate.[20] Consequently, Nineveh's ethnic diversity resulted in much of its land receiving formal classification as "disputed territory" under Article 140 of the 2005 Iraqi constitution.[21] Therefore, control over the area bordering the Kurdish Region of Iraq in the northern and eastern portions of the governorate remains contested between the Iraqi and KRI government. That being said, officially, Nineveh is administered by the Iraqi central government.[22]

4.5.1.4 Mosul City

The city of Mosul is a capital of the district of the same name located in the Nineveh governorate. With an estimated population of 1,377,000 Mosul city is the third most populous city in Iraq, after Baghdad and Basra.[23] Mosul city is around 400 kilometers from the Iraqi capital of Baghdad and

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[18] Akre was a district of Nineveh before 2000. However, ever since the establishment of the Kurdish Region of Iraq, Akre has been considered a district of Duhok governorate.

19 The Iraqi Public Distribution System (PDS) is run by the Ministry of Trade and provides government-subsidized food and fuel rations to all Iraqi citizens. The system is Iraq's biggest social safety net reaching almost 39 million people.

[20] Due to a lack of national census, no precise ethnic or sectarian population estimates exist for Nineveh.

[21] "The Politics of Security in Ninewa" (2018) Harvard Kennedy School. Available at: https://www.hks.harvard.edu/sites/default/files/degree%20programs/MPP/files/Finalized%20PAE_Ahn_Campbell_Knoetgen.pdf

[22] Ibid

[23] "City Profile of Mosul, Iraq" (2016) UN Habitat. Available at: https://reliefweb.int/sites/reliefweb.int/files/resources/UN-Habitat_MosulCityProfile_V5.pdf

consists of 8 sub-districts. The city is largely perceived to consist of two parts, a right bank and a left bank, separated by the Tigris River.

Overall, Mosul city has 251 neighborhoods (*mahalas*) spread along both sides of the river with five main connecting bridges. The right bank has 91 neighborhoods, while the left bank has 160 neighborhoods.[24]

The right bank of the Tigris, hosts most of Nineveh's minorities, whether Kurdish, Turkoman or Christian. Most areas of the left bank have Sunni Arabs as constituting the majority. The majority of land in the right and left bank is classified as residential.

As noted, the area of influence of the project is the Right Bank of Mosul (i.e. West Mosul) as a whole, with the immediate vicinity of project activities is in Yarmouk neighborhood and the Harimat area.

[24] "The Politics of Security in Ninewa" (2018) Harvard Kennedy School. Available at: https://www.hks.harvard.edu/sites/default/files/degree%20programs/MPP/files/Finalized%20PAE_Ahn_Campbell_Knoetgen.pdf

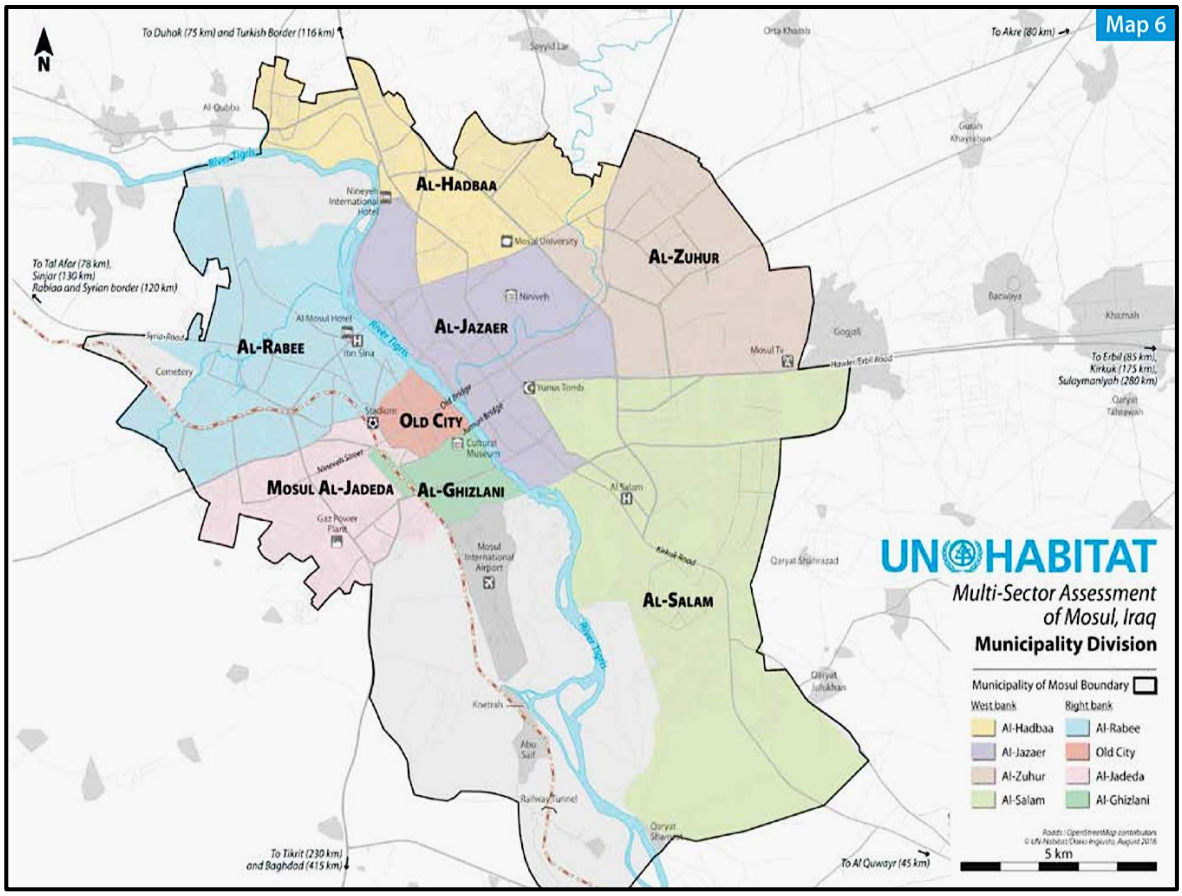


Figure 4-4 Division of Mosul City - Right and Left Bank

4.5.2 Demographic Overview

Based on the meeting conducted with the Central Statistics Organization (CSO), the total number of inhabitants in the Right Bank of Mosul is 200,000. Government officials noted that the population of the Right Bank is fairly young, accordingly there is a growing need for employment opportunities. Furthermore, as stated earlier, the right bank of the Tigris traditionally hosts minorities, such as Kurdish, Turkoman or Christian. However, Mosul government officials revealed that when ISIL besieged the city in 2014, minorities fled. As a result, the current majority of residents in Mosul are Sunni Muslim, with some of the Kurdish and Turkoman minorities slowly returning to the city.

Table 4-3 Demographic Figure for the Right Bank of Mosul

Demographic Figures for Right Bank of Mosul City	
Demographic Trends	**Persons**
Total Population	200,000
Number of Males	102,000
Number of Females	98,000
Total Number of Households	35,000
Average Size of Households	6

4.5.2.1 Household Characteristics

A household consists of all individuals under one roof who share their income and food, while a family consists of all individuals related by birth, marriage, and adoption under one roof. The majority of residents reside in houses of one to two story's high. Furthermore, consultations with government officials revealed that the average household size in the right bank of Mosul city was six individuals.

It should be noted that Mosul city suffers from scarcity of buildable plots that can be allocated for housing. As a result, affordable housing is uncommon and so there is rise of informal settlements and squatters in the city.[25] One of the biggest challenges facing inhabitants of the city is to either repair and maintain their household or find a newer place that is not too costly.

4.5.2.2 Gender Relations

Local communities of Mosul are considered conservative societies, even by Iraqi standards. The communities living near the project area are in a patriarchal society; therefore, this informs their gender relations. Men are the main breadwinners and their livelihoods are outside the house. While women play a crucial role in their communities- they are responsible for maintaining the family affairs, managing the household income and many other related issues- they tend to be financially dependent on men and due to security and cultural reasons they are limited in their mobility. These limits can be summarized as having the following consequences:

1) Female mobility is restricted as they are not to leave the house to go long distances unless they are accompanied by a male. This is for their security and also because officials inquire about their spouses at checkpoints. Furthermore, women dislike walking on unpaved roads and fear being harassed when out in public.

2) Rates of female school achievement were limited to basic education. The main obstacle for female school enrolment is the lack of transportation since schools are located far away. Therefore, they could not go to school unless accompanied by a male family member.

4.5.2.3 Vulnerable Groups

Vulnerable groups are composed of people who are typically excluded, disadvantaged or marginalized based on their socio-economic position. Hence, low-income households with a female head of household and children tend to be financially disadvantaged. Moreover, low-income households taking care of a sick or elderly member of the family is also vulnerable.

The group most fitting to this definition in Mosul are female heads of households, in particular, widowed, unmarried, and divorced women who returned back to the city after displacement. Vulnerable households are those in Mosul that have reported having family members with disability.

[25] "City Profile of Mosul, Iraq" (2016) UN Habitat. Available at: https://reliefweb.int/sites/reliefweb.int/files/resources/UN-Habitat_MosulCityProfile_V5.pdf

4.5.3 Economic Overview

Mosul's economic development as well as the quality of life of its residents were negatively affected by the recent conflict. The interruption of public services and the lack of available jobs made it difficult to restart economic activities. According to consultations conducted at the Mosul Local Council, the Right Bank in particular has a poverty rate of 30% of the population; meaning that 11000 households are below the poverty line.

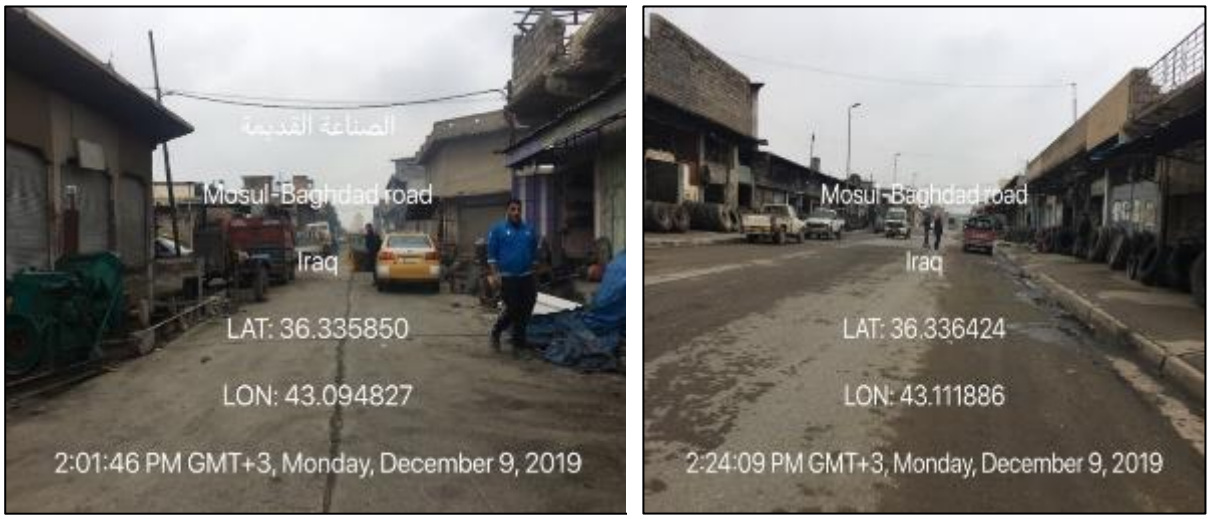


Figure 4-5 Car Maintenance Workshop on Right Bank of Mosul

4.5.3.1 Employment and Unemployment

The rate of unemployment in the Nineveh governorate is high, ranging at about 19.2%.[26] Employment rates have been affected by the lack of economic development in the area, especially since the agricultural sector has been hurt by the recent conflict. Furthermore, wages were reported to be lower than before the arrival of ISIL, especially wages for daily jobs. Employment rates were also found to be affected by demographics. According to meetings with Mosul government officials, there is a considerable gap between men and women, with around 35% of males are employed, whereas only 20% of females are employed. Furthermore, average unemployment rate in the Right Bank of Mosul is about 30% among males and 10% among females.[27] It is worth mentioning that the majority of females are not willing to work. Therefore, they are not identified as unemployed.

Additionally, in terms of livelihood opportunities for women, female members of the community require jobs in line with prescribed gender roles in Iraq: as teachers, doctors, nurses, and positions with the government or at home. Shops were considered inappropriate unless these were located in women's homes, which is in line with social norms prevailing in Iraq.

[26] Multiple Indicator Cluster Survey developed by the Central Statistical Organization of Iraq (2018) – Nineveh Governorate

[27] The Ministry of Labor provided these figures.

4.5.3.2 Economic Activities

The following table presents the main economic activities pursued by Mosul residents.[28] The main reported employment sectors were: agriculture, industry, military, civil society (NGOs), small business ownership, public sector, and daily work. Each of these employment sectors are elaborated upon below. Additionally, it is worth mentioning that many residents of the Right Bank of Mosul migrate for work, either abroad to Turkey, and within Iraq to both Erbil and Baghdad.

Table 4-4 Description of Economic Activities in Mosul

Employment Sector	Description of Economic Activity
Agriculture	Local authorities indicated that the agricultural sector was of great importance to the city, but that this employment sector was damaged heavily during the recent conflict. In addition, they reported agricultural work had not resumed, as the security situation did not allow farmers to return to the fields. Barriers to resuming work in the agricultural sector included reported damage to equipment and irrigation systems. However, the agricultural sector did not entirely collapse in Mosul. Reliant on rain rather than irrigation, grains continue to be produced in the area, which as mentioned earlier is a major crop in the Nineveh governorate.
Industries	Destruction of the industrial area has had a major negative effect on job availability in Mosul. The financial means necessary to repair the area and restart factories is not available. Food production has historically been one of the main contributors to the economy of Mosul. There are several grain silos in Mosul city as well as a number of flour factories that are both private and government-owned.
Civil Society	A common source of current employment among Mosul residents was non-governmental and humanitarian response organizations, like the UN agencies. However, while desirable, working for NGOs was considered as short term and not seen as a sustainable source of income.
Military	A high rate of youth unemployment causes youth to look at military career opportunities more than they might otherwise if other opportunities were available. The military serves as an avenue for stable income for young adults.
Small Businesses	Businesses related to construction, metalworking, and retail are possible avenues for private investors and entrepreneurs. However, investors and business owners are having difficulty in finding qualified workers and skilled laborers.

[28] "Labor Market Opportunities and Challenges, Mosul, Nineveh Governorate" (2019) IOM Iraq. Available at: https://iraq.iom.int/files/Al-Shifaa%2C%20Ninewa.pdf

Employment Sector	Description of Economic Activity
Public Sector	Public sector employment (i.e. teachers, lawyers, engineers, and doctors) is sought by residents because public sector workers are paid on time. However, the Government of Iraq is not hiring new employees as much and so there is a decrease in the number of government jobs.
Daily Work	Daily work is also a common income source. However, it was reported that fewer daily jobs were available and wages had decreased. Daily work wages tend to be unstable and unreliable and residents tend to seek and ask the government to introduce more stable job opportunities.

4.5.3.3 Education

Educational facilities in the city of Mosul city are functional, but their performance is affected by multiple reasons. Interviewed government representatives and community members identified the most critical issues relating to education to be the following:

1) Lack of teachers and supplies at the facilities;
2) Increased cost for education services;
3) Overcrowded classrooms with around 60 students per class in West Mosul;
4) While there are facilities available for all age groups (pre-school, primary, secondary, and graduate schools) the number of educational facilities is not sufficient for the young growing population of the Right Bank;
5) School children have missed on average one year of formal education as a result of the reasons stated above as well as political events and/or weather conditions.

Furthermore, prior to ISIL, Mosul had three universities and two technical institutions. After ISIL occupied the city, all higher education institutions were shut down. However, the University of Mosul (which is considered as one of Iraq's top universities) reopened its doors in mid-2014. However, students from other governorates are enrolling in the University in Mosul at significantly lower numbers. It is believed that the primary reason for this is Mosul's severe security deterioration since 2005.[29]

[29] "City Profile of Mosul, Iraq" (2016) UN Habitat. Available at: https://reliefweb.int/sites/reliefweb.int/files/resources/UN-Habitat_MosulCityProfile_V5.pdf

Figure 4-6 Schools on the Right Bank of Mosul

4.5.3.4 Health Facilities

Healthcare is considered an expensive expenditure for the local community because they need to calculate transportation to the health facility, buying medication, and all necessary medical fees. Furthermore, health services have been negatively affected by the ISIL occupation, and so a number of issues remain:[30]

1) Lack of medical staff because many have fled during the occupation
2) Medical fees for services and operations have increased significantly
3) Poor sanitation in hospitals due to lack of maintenance and need for repair
4) The low availability of maternal and natal care in the city of Mosul

Table 4-5 Health Facilities in Nineveh Governorate and Mosul City[31]

Health Facilities (2018/2019)		
Type of Health Facility	**Nineveh Governorate**	**Mosul City**
No. of hospitals (public and private)	19	6
Primary Healthcare Units	178	20

Although many pharmacies are still open, their stock is limited. Medicine, when available, is largely unaffordable due to the limited supply. As a result, community members reported difficulties in accessing medication.

[30] Ibid.

[31] Multiple Indicator Cluster Survey developed by the Central Statistical Organization of Iraq (2018) – Nineveh Governorate as well as consultation with Mosul Local Council

4.5.4 Access to Basic Services

4.5.4.1 Electricity

All household are reportedly connected to the grid, but the electricity network is in poor condition. Mosul government officials stated that most households receive of around 8 hours of public grid provided electricity per day, but electricity is infrequent due to power cuts that occur throughout the day. Therefore, residents rely on generators to compensate. Furthermore, community members reported that the weak supply of electricity limits the number of home electrical appliances that they can use and increases the need for transformers to convert the electrical output of the power source to match the voltage of their appliances (i.e. convert the available 180 Volt to 220 Volt).

Figure 4-7 Electricity station and network on the Right Bank

4.5.4.2 Potable Water

The water provision was reported by community members to be similar to pre-ISIL levels, both in terms of quality and quantity. All households had access to piped water and use it as their primary water source. However, due to the need of general maintenance of the network, consultations revealed that many people believe that piped water is not clean enough to drink. Accordingly, they depend on bottled water for drinking.

4.5.4.3 Sanitation

There is no sewage system in the Mosul Right Bank and hence residents use septic tanks to store wastewater. Wastewater removal services are contacted once the tank is full and the residents pay fee for its removal. The cost per evacuation is 40 USD and evacuations occur either once or twice per year.

Table 4-6 Sanitation Figures of Nineveh Governorate[32]

Sanitation Figures 2017/2018	
Total pumping stations	**7**
Proportion of population served by public and shared sewerage networks	**2.3%**
Proportion of the population served by septic tanks	**97.7%**

4.5.5 Public Safety and Security

The security situation in Mosul is reported as good by community members given that several security measures are taken by the government. In general, the main roads leading to Baghdad, Kirkuk, Erbil, Dohuk and Syria are secure.

4.5.5.1 Mobility and Transportation

Movement and transportation are considered especially difficult in Mosul city because of the number a checkpoints and other security measures set-up and controlled by the Iraqi police and security forces. These checkpoints are a point of concern for the local community because passing through these checkpoints takes hours and uses up energy resulting in time poverty. Specifically, Road 60 in Harimat area has three checkpoints alone, making it a challenge for residents to go from place to place. Additionally, there is also no public transportation system, therefore, transportation services are taxis and microbuses. Significantly, in the Harimat area, there is an exposed water distribution pipe that makes it unable for residents to cross Road 60.

Government officials and local authorities confirmed that the project's construction and rehabilitation will not have negative effects on the surrounding community in regard to traffic and access to roads. The project management team plan to work on certain areas of Road 60 in Harimat area, Mosul-Baghdad Road in Yarmouk neighborhood so not to disturb traffic. Road 60 serves as an important crossway for transporting good and fuel commodities between 4 neighborhoods (Masrafeya, Eqtesadeen, Harimat area, and Tamooz).

[32] Multiple Indicator Cluster Survey developed by the Central Statistical Organization of Iraq (2018) – Nineveh Governorate

Figure 4-8 Damaged water pipeline by in Harimat area by Road 60

Furthermore, it was flagged by local business owners in Yarmouk neighborhood along Mosul-Baghdad Road that they worry about residents being unable to reach their stores during project implementation. They added stating that they are willing to cooperate with the project team in order to find solutions because they are in full support of the project taking place. The consulted Nineveh Municipality officials responded that construction work is expected to be done by sections to avoid road closure and by extent loss of income to for small business owners. They noted that the various shops gather on the main streets surrounding the neighborhood, but there are no economic activities in the streets inside the neighborhood. Furthermore, the duration of construction work per section will be temporary and limited to a few days. The extensiveness of construction work will differ from road to road so construction action activities will not automatically cause restriction of access

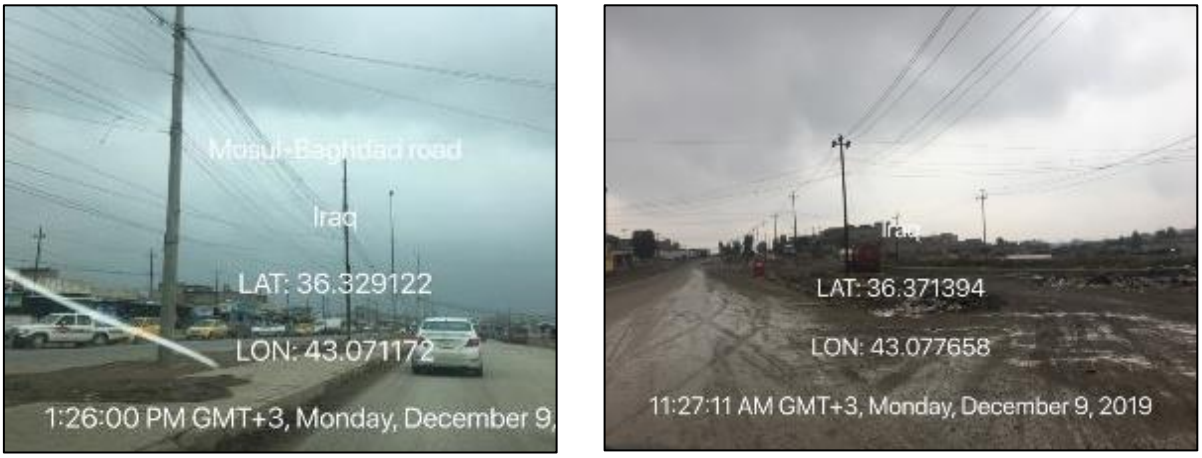


Figure 4-9 Shows Mosul-Baghdad Road (left) and crossways at Road 60 in Harimat area (right)

Another reason affecting difficulty in mobility is the bad condition of streets and roads. Community members remarked that there are many unpaved and flooded or damaged roads in the Right Bank, which makes it challenging for them to move around. Importantly, female members of the community stated that the condition of these roads means that they are unable to walk on foot and hence they pay a lot of money on local transportation. Moreover, children in the community are faced with difficulty in going to school during severe weather conditions and so many of them do not attend school on bad weather days.

Figure 4-10 Condition of roads and streets on Right Bank

4.5.6 Cultural Heritage

The Nineveh governorates includes multiple ruins from various historical periods, many of which have not been properly excavated, or remain to be discovered, due to security and political conditions. In Mosul city, in particular, consultations with the local population determined that much of the city's archaeological and cultural heritage sites have been destroyed by the recent conflict. However, they stated that the closest heritage site to the project is the Nineveh Fortification Wall. Accordingly, given Iraq's multi-millennia history, artifacts are expected to be found in the area. Therefore, while there are no known sites of historical and archeological importance within the immediate vicinity of the project, caution should be exercised during the implementation phase.

In regard to the immediate vicinity of the project area, there are two mosques by Road 60 in Harimat area that will be affected by project activities. That is, residents will be unable to access these religious sites during project implementation, consequently alternative means to access these mosques are required and/or the sectioning of construction works is to be implemented.

Figure 4-11 Mosques on either side of Road 60 in Harimat Area

5 ASSESSMENT OF POTENTIAL RISKS AND IMPACTS

The assessment focuses on identifying the environmental and social issues. The ESMP includes collecting data from previous reports and studies for obtaining background data about environmental and socio-economic characteristics of the project area.

At an early stage, baseline surveys have been carried out to obtain information as well as site visits to fill in gaps in data and information on the characteristics of the existing environment of the proposed project area. The identified potential environmental impacts on the physical environment are then evaluated against baseline conditions at the proposed location, and the reasonable performance standards which are assumed to be set during the construction and operational phases of the project. Positive and negative potential impacts on the environment during the project phases will be presented in this section.

The environmental and social impacts assessment is based on both quantitative and qualitative data available, as well as the consultant's experience.

The assessment is based on the methodology presented in the ESMF document

5.1 Summary of Positive Potential Impacts during Pre-construction and construction phases

5.1.1 Direct job opportunities to skilled and semi-skilled laborers

The project is anticipated to result in creation of various direct job opportunities. Based on previous experience in similar projects implemented recently by the Project owner (Ministry of Electricity, the municipality) and the contractor, the daily average number of workers during the peak time will be about 300 workers for the three sub-projects.

In order to maximize employment opportunities in the local communities it is anticipated that on the job capacity building activities will be required for currently unskilled workers. On-the-job training will also supplement opportunities for the local workforce for both temporary construction roles and for long-term employment during the operation phase, where these are available.

5.1.2 Indirect job opportunities

As part of the construction stage, several indirect job opportunities are expected to arise, due to the need for more supporting services to the workers and contractors who will be working in the various locations.

5.2 Summary of Negative potential impacts during Pre-construction and Construction phases

5.2.1 Environmental Impacts

5.2.1.1 Air Emission

Decommissioning of damaged infrastructure, construction and installation of new infrastructure will include several activities such as excavation, land clearing, transportation of construction material and equipment, backfilling, concrete casting, etc. Those activities in consequence are expected to emit air pollutants to the ambient air, however it will be conducted for short periods.

The following air pollutants are foreseeable for most of the construction activities:

- Particulate matter and suspended solids from excavation/backfilling operations
- Possible dispersion from stockpiles of waste or sand used for filling trenches.
- Exhaust from excavation equipment and heavy machinery (excavators, trenchers, loaders, trucks) containing SOx, NOx, CO, VOCs, etc.
- Fugitive dust emissions (PM10, PM2.5)

Dust

The impact of dust generation (particulate matter) will be limited to the working hours as movement of trucks, excavation and backfilling are carried out within the same day. At the project site, dust emissions will negatively impact the ambient air quality, particularly during the initial phases of construction.

Excavation on dusty or rocky roads such as local roads and some urban roads are likely to generate more dust compared to asphalted streets due to the dusty status of those roads.

Gaseous pollutants emissions

Machineries used during construction such as excavator, generators, boring machine must be certified and maintained as per guidelines, the increase in emissions stemming from the exhaust of machinery is unlikely to increase ambient levels beyond national and WB permissible levels. However, machineries working in parallel will result in cumulative emissions that may exceed permissible levels.

On urban roads, traffic congestion may lead to increase exhaust emissions. Traffic management with local authority will reduce the impact of works on road congestion and associated emissions. The emissions will be mostly limited to the construction phase and therefore are temporary.

Air emissions impacts are expected to be temporary, local, and of moderate magnitude.

Air emissions, dust and Gaseous pollutants impacts are expected to be of moderate significance

5.2.1.2 Noise

Sources of noise during construction would primarily occur from heavy equipment or other resources such as vehicular/trucks traffic. However, the activities will be intermittent and extend for only a limited time.

Normally, construction works include noisy activities related to the operation of construction equipment, possible hammering and drilling works in addition to the noise generated from construction related trucks. Noise impacts related to excavation, hammering and drilling works will differ from one area to another according to the population, time of excavation work, the nearby of excavation place to the places crowded with people such as: schools and markets.

On the construction site, these major sources exhibit many different types of noise such as background noise, idling noise, blast noise, impact noise, rattling noise, intermittent noise.

In addition to the British standard for general construction noise, the table below lists the major expected noise generated from different construction equipment according to Society of Automotive Engineers SAE.

Table 5-1 Expected construction equipment and sound levels

Equipment	Sound Level at operator dB (20 feet from the equipment)	
	Average	Range
Earth Moving		
Front End Loader	88	85-91
Back Hoe	86.5	79-89
Bull Dozer	96	89-103
Roller	90	79-93
Grader	<85	
Truck	96	89-103
Material Handling:		
Concrete Mixer	<85	
Concrete Pump	< 85	
Crane	100	97-102
Derrick	<85	
Power Units:		
Generators	<85	
Compressors	<85	
Other Equipment:		
Poker Vibrator	94.5	87-98
Power Saw	88.5	78-95

For noise impact on workers, within the work site, it is possible that workers could be exposed to relatively high levels of noise. This could be mitigated through application of the normal precautions normally taken by construction labour. Noise impacts are expected to be temporary, local, and of moderate magnitude.

Noise impacts are expected to be of moderate significance

5.2.1.3 Soil

The excavation activities will result in disturbance of the soil as well as removal of some common flora species like rush and reeds. This will be more pronounced in the trenches where excavation, pipeline laying, and soil compaction as a result of heavy equipment take place.

In addition, potential soil contamination may take place as a result of spillage or leaks of oils, chemicals during mixing processes or from equipment… etc. as well as uncontrolled waste (solid, liquid and hazardous) management and disposal. The impact on soil is expected to last for long duration but it is local and of medium magnitude.

The impact on soil is expected to be of moderate significance

5.2.1.4 Groundwater

Considering that the project areas are residential, and that excavation will be carried out in lands that have previously been excavated for other underground utilities installation, effects on groundwater are not anticipated. Yet, standard prevention or precaution measures shall be prepared by the contractor prior to the construction.

Impact assessment on groundwater is insignificant

5.2.1.5 Surface water

Surface waters including Tigris River, located at less than 200 m from some of the project site locations, may be susceptible to pollution resulting from uncontrolled dumping of wastes generated, leakage or spills of chemicals. An increase in the water consumption for construction purposes, such as concrete mixes, dust suppression and washing concrete mixers is expected as well as an increase in the water consumption for domestic use by workers. The rate of drinking water consumption by workers is 50 litres per person per day supplied by the water network in the area.

The impact on surface water pollution is expected to be of moderate significance

5.2.1.6 Energy Consumption

The project will consume fossil fuels (mainly diesel) for the construction vehicles and machinery and for running generators. Fossil energy is non-renewable, and its excessive use may have serious environmental implications on its availability, price and sustainability. The energy consumption impact is considered Minor since the project duration Very Low (VL); less than one year.

Accordingly, the impact of Energy Consumption is expected to be of minor significance

5.2.1.7 Ecological impact (fauna or flora)

As mentioned in baseline section, project site is not characterized by the presence of endangered species (fauna or flora) as practically. Only some non-significant exotic species such as grasses recorded at project area. Additionally, the project is a rehabilitation of an already existing network, so the project activities are not expected to destroy or alter any terrestrial habitats.

The impact on fauna and flora is insignificant

5.2.1.8 Extraction of Natural Resources

The extraction of raw materials, such as gravel and sand are going to have a negative impact on the availability of those natural resources, as they are not renewable in the short term. Additionally, the extraction process might disturb the land scape of the source of the materials and the natural habitat. This impact is considered Minor, since it would take place only during the project duration, which is less than a year.

Accordingly, the impact is expected to be of minor significance

5.2.1.9 Waste generation

The waste generated could be categorized as follows:

- Normal construction wastes including scrap, concrete residuals, steel, bricks, wood, etc.,
- Miscellaneous non-hazardous solid wastes, including packaging waste, used drums, wood, scrap metal, and building rubble will be generated during the construction phase of the project
- Hazardous wastes generated include empty containers, spent welding materials, solvents, adhesives, and other hazardous wastes resulting from operation and maintenance of the equipment and vehicles, i.e. spent oils, spent lube, waste oil filters, batteries, etc. Among the hazardous wastes also are the wasted or faulted materials including conductors and insulators.

Human or domestic wastes generated by construction labour, including sewage and garbage collected from the labour camp location. The wastes generated during construction phase will be minimal and will largely consist of municipal waste (e.g. food; packaging) and over time potentially defunct parts and spare parts, cabling and control equipment etc. Waste management arrangements for the construction phase should be continued (proper control of collection, storage and final disposal via licensed contractors).

For hazardous solid and liquid wastes, proper waste collection and storage plus regular (preferably twice a week) waste collection by licensed contractors will need to be arranged by site management. To co-ordinate and control this. For the non-hazardous solid wastes, those that cannot be recycled will be disposed in a sanitary landfill periodically (weekly or monthly depending on the volume of waste generated). Regarding the domestic waste, as the existing collection is already established and the amount to be expected is considered small.

The domestic wastes (wastewater and solid waste) generated are relatively small as only small number of workers will be employed during the operation and will be collected by a licensed contractor.

Adverse impacts on the environment from the possible improper disposal of the solid wastes and hazardous waste. Waste contractors and recycling/disposal sites will benefit from waste disposal contracts. If waste is not managed properly, it will result in health problems to the surrounding communities.

The impact has moderate magnitude and it affects the local area of the project as well as the surrounding communities however, for short duration.

Therefore, Waste generation impact is expected to be of moderate significance

5.2.2 Occupational health and safety

Pre-Construction and construction activities are relatively dangerous, as workers could be exposed to accidents in any work environment. Exposure to construction site hazards can lead to injuries. To avoid such situations, all risks that can be encountered during normal work must be identified and recognized. According to OHS standards, each worker must have accurate information about their vulnerability to hazards or injuries in the workplace.

Following are the six key risks at the construction site as defined by the Occupational Health and Safety Administration (OSHA):

1. **Excavation and trenching** - drilling and trenching are considered the most dangerous works on construction sites.
2. **Fall** - The usual cause of this accident is slipping or foot stumbling, or using a loose ladder. There are many reasons to be at risk of falling. To get rid of them, the employer must have a fall protection program as part of the occupational health and safety program in the workplace.
3. **Stable and mobile stairs** - Fixed and mobile stairs are important causes of injuries and disasters among construction workers.
4. **Heavy construction equipment**. The main causes of such accidents include the injury of workers when the equipment is returning reverse or when the direction of the equipment is changed or when the brakes do not work properly, the flipping equipment injuring its operator, the equipment falling from the excavator, bucket and other mobile construction equipment.

5. **Electricity** - electrification is a major risk to all workers in the workplace involved in stretching wires. As well as, there is a probability of electricity shock among workers who do excavation works during the construction of storm drainage network.

Occupational health and safety impacts are considered of **high** significance

5.2.3 Community health and safety

The majority of community health and safety impacts focus around the disturbance of public health and quietness due to construction/rehabilitation activities. Impacts on community health and safety are expected to be the following:

- Temporary nuisance and inconvenience as a result of the construction activities including noise emissions, and road traffic.
    - Emissions of gaseous pollutants and dust from equipment and machinery used.
    - Increased background noise levels resulting from the operation of jackhammers, which surpasses permissible limits for residential areas;
- Obstructing access to amenities due to construction/rehabilitation activities.
    - potential of restriction of access to certain stores, mosques, etc.
- Community safety considerations around the construction site.
    - Potential child labor employment by local subcontractors.
    - Pedestrian safety, especially in regard to people with disabilities.
    - Construction works will involve the use of equipment such as jackhammers and welding machines, which can cause injuries to local community as a consequence of contact. This is a major risk especially if there is open access to rehabilitation/reconstruction activities.
- The impacts on community health and safety will be of moderate severity of accidents on the road leading to the project due to traffic and the passage of equipment and heavy vehicles.

Community health and safety impact is considered of **moderate** significance

5.2.4 Social Impacts

5.2.4.1 Traffic Flow (disruption of traffic) and road access

Mobilization of heavy machinery, asphalt breaking, and excavation, placement of piping and culverts, and backfill activities are bound to limit traffic and accessibility to the areas. The impact of works on traffic flow and local access will be dependent on the type of road accessed during project activity, as detailed below.

Main roads (Yarmouk Road and Road 60)

Pre-construction works are planned on the main road in Yarmouk (Mosul-Baghdad Road) and 60 Road. These works are temporary and will last for a limited working days. Therefore, the project will not directly impact circulation on this road. As the work on these roads will likely restrict pedestrians (especially females) from walking around. On other hand, traffic congestion of regular sized vehicles will be insignificant. The main impact will be inconveniencing local community members (along Mosul-Baghdad Road in Yarmouk neighborhood) by temporarily obstructing access to local amenities and this will be likely of moderate severity.

Traffic flow and road access impact is considered of **moderate** significance

5.2.4.2 Child labor and School Dropout

Child labor is a common practice in the project communities in Mosul. Children work in construction projects as they accept lower salaries and are less demanding. This risk should be carefully addressed in the ESMP and strict obligations and monitoring should be applied in the contractual agreements of the contractors.

The impact of child labor and school dropout is considered of **Major significance**.

5.2.4.3 Visual and landscape impacts

For pre-construction and excavation works, the visual impacts are temporary, mainly from storage of drilling products and raw materials (cement bags, concrete mixers, construction waste, etc.). However, because of the short duration of exposure, they are regarded as of minor significance.

Impacts pertaining to landscape are expected to be of **minor** significance

5.2.4.4 Cultural heritage and monuments

Based on numerous previous studies conducted for the area of Mosul, there is a significant probability to encounter impacts related to cultural heritage, particularly, during the process of storm drainage network construction. Accordingly, a chance find procedures will be implemented.

Impacts on cultural heritage are expected to be of **minor** significance

5.2.4.5 Underground utilities

As a result of the pre-construction and construction works, existing underground utilities might be accidently damaged.

Damaging sanitary pipes, electricity underground cables and water pipelines result in severe disturbance to community people. Breaking a water supply pipe may result in cutting the supply to several residential units, which may lead residents to use other sources of water which may be either expensive or unsafe.

However, the time needed to resolve problems with damaged utilities is relatively short (no more than 4-8 hours). Additionally, the contractor will be responsible of compensating for damaged pipes

Impacts on underground utilities are expected to be of **moderate** significance.

5.2.4.6 Temporary Labor Influx

The contractors rely on recruiting workers and technicians during the pre-construction and construction works. The temporary labor influx and presence of additional workers may have impacts on the project areas in terms of:

- **Risk of social conflict:** There are no potential effects of temporary labor influx on the culture of the society in the project areas; this is due to the focus of the implementing companies on the labor, whom are often from areas adjacent to the project areas. This helps in the reduction of the hours of their presence in the project areas, as well as their limitation to the working hours only;

as such laborers are not permanently resident during the project duration. Moreover, the temporary workers share the same culture and values as those in the study areas.

- **Increased risk of illicit behavior and crime:** the implementation companies and the contractors should revise the criminal records of the workers, in order to avoid the risk of illicit behavior and crime in the project areas.
- **Increased risk of communicable diseases and burden on local health services:** the implementation companies should take care of the workers' health in order to avoid the spread of the communicable diseases.
- **Local inflation of prices:** The prices of some food commodities and services may rise

The impacts of temporary labor influx are temporary and of **moderate** significance

5.2.4.7 Gender Based Violence (GBV)

There are many types of Gender Based Violence that are not applicable to the project activities and construction sites. Therefore, the consultant focused on the GBV issues that might be detected in the project site. They are as follows[33]:

1- Sexual harassment that includes rape, sodomy, attempted rape, sexual abuse, child sex abuse, forced prostitution (willing – but involuntary), and child prostitution;
2- Emotional, mental and social: verbal / emotional abuse, humiliation, discrimination among workers, and deprivation of opportunities and /or services;
3- Economic: salaries and opportunities deprivation and harmful traditional practices.

Given the fact that all workers will adhere to the code of conduct, this impacts tends to be of moderate severity

The impacts GBV will be, local, and of **moderate** severity

Table 5-2 Summary of impacts during Pre-construction and Construction

Receptor/ EHS Aspect	Duration	Spatial	Magnitude	Basic Impact Index	Sensitivity of Receptor	Impact Significance
Air Quality	Very Low	Low	Moderate	Moderate	Medium	Moderate
Noise and vibration	Very Low	Low	Moderate	Moderate	Medium	Moderate
Soil quality	Very Low	low	Low	Low	Medium	Minor
Groundwater quality	Very low	Very low	Very low	Very low	low	Insignificant
Surface water quality	Very low	Moderate	low	Moderate	Medium	Moderate
Energy Consumption	Very low	Very low	low	low	Medium	Minor

[33] Source: file:///E:/IT/Downloads/GBV_humanitarian_settings%20(1).pdf

Receptor/ EHS Aspect	Duration	Spatial	Magnitude	Basic Impact Index	Sensitivity of Receptor	Impact Significance
Extraction of Natural Resources	Very low	Very low	low	low	Medium	Minor
Fauna & Flora	Very low	Very low	Very low	Very low	low	Insignificant
Solid and hazardous wastes	Very low	low	Moderate	Moderate	Medium	Moderate
Traffic	Very low	low	Moderate	Moderate	Medium	Moderate
Occupational Health and Safety	Very low	low	Moderate	Moderate	High	Major
Community Health and Safety	Very low	low	Moderate	Moderate	Medium	Moderate
Child labor and School Dropout	Very low	low	Moderate	Moderate	High	Major
Visual and landscape impacts	Very low	Very low	low	low	Medium	Minor
Cultural heritage and monuments	Very low	Very low	low	low	Medium	Minor
underground utilities	Very low	low	Moderate	Moderate	Medium	Moderate
Temporary Labor Influx	Very low	low	Moderate	Moderate	Medium	Moderate
Gender Based Violence	Very low	Moderate	Moderate	Moderate	Medium	Moderate

5.3 Summary of Positive potential impacts during Operation

The project is expected to have potential positive environmental and social impacts, as follows:

5.3.1 Environmental Impacts

- Reducing dust (PM10, PM2.5) because of roads paving
- Reducing unplanned overexploiting of water resources by supplying drinking water networks
- Reducing uncontrolled soil erosion through supplying roads pavement

5.3.2 Social Impacts

- Providing reliable infrastructure for residents
- Reduce potential accidents on roads after lighting
- Increase the accessibility to clean water and provide street lighting as well as keep roads safe for vehicles and pedestrians and deflect storm runoff off the roads.
- Facilitate transportation and traffic movements after road pavment and culvert
- Reduce waterborne diseases after supplying adequate source of drinking water
- Increase the hygiene profile of the community

- Avoid accidents and slips after supplying stormwater drains

5.4 Summary of Negative potential impacts during Operation

During the operation of the proposed infrastructure components, beside the managerial and administration activities, the most important activities are operation and maintenance.

5.4.1 Environmental Impacts

5.4.1.1 Air Emission

Operation of drinking water pipelines and storm drainage isn't expected to result in any source of air emissions during normal operation. However, maintenance of pipelines will result in dust emissions if excavation works are necessary.

Road pavement will increase vehicular traffic and machinery which in turn would produce small amounts of dust and exhaust emissions (SO_x, NO_x, CO, VOCs, etc.) during operation.

Maintenance activities is going lead to an increase in the fugitive dust emissions (PM10, PM2.5) and gaseous emissions (SO_x, NO_x, CO, VOCs, etc.) produced by the construction machinery and vehicles.

Also, there is an increase in electricity consumption from the pump used for water flow as well as street lighting which in turn will increase air emissions.

Air emissions impacts are expected to be of minor significance

5.4.1.2 Noise

Sources of noise during the operation and maintenance phase would include staff vehicles and electricity transformers. Noise is expected during the maintenance of failed pipes that may require excavation works, however, these events will be intermittent and for short periods.

However, Rehabilitation of the roads will lead to an increase in the traffic; consequently, elevating the noise and vibration level produced by traffic.

Noise impacts are expected to be of minor significance

5.4.1.3 Soil

Soil can be affected in case of leakages/corrosions of pipes, salts/sludge accumulation or heavy loading on the paved roads which may cause cracking of asphalt. However, these impacts have low expectancy. On the other side, road pavement will reduce uncontrolled soil erosion caused by traffic and the formation of stagnant ponds after rainstorms. Oil/grease contamination of the valleys where stormwater will be directed.

The impact on soil is expected to be of minor significance

5.4.1.4 Energy Consumption

The project will use energy for pumping of water through distribution networks and the lighting networks. The energy consumption impact is considered minor since the project anticipated consumption isn't high.

Accordingly, the impact on energy consumption is expected to be of minor significance

5.4.1.5 Extraction of Natural Resources

The operation of water networks results in higher consumption and use of water; however, the project is mainly a rehabilitation of the already existing infrastructure so increasing the consumption isn't significant.

Accordingly, the impact is expected to be insignificant

5.4.1.6 Waste generation

There shall be different types of wastes generated during the operation phase of the project resulting either from maintenance, repair and/ or replacement activities. Among these wastes are the following:

- Hazardous Waste; Asphalt spills, concrete spills and waste cables that maybe be replaced along the distribution lines. Some of these cables may be covered with PVC insulators, which, if burned, cause harmful emissions including dioxins. Accordingly, waste cables could be of high risk if PVC cables were disposed in open dumps, where it could be exposed to open burning.
- Scrap fittings, insulators, cross arms, conductors, and other scrap which are expected to be made of inert materials that does not cause high risk in disposal/recycling procedures.
- Replaced Asphalt
- Domestic waste from the workers
- lamps bulbs replacements

Therefore, impact is expected to be of moderate significance

5.4.2 Occupational health and safety

Maintenance activities expose workers to accidents and hazards that may lead to injuries. To avoid such situations, all risks that can be encountered during maintenance activities must be identified and recognized. The main causes of such accidents include the injury of workers when using heavy equipment or falling from height or slipping. Also, electrification is a major risk to all workers during maintenance activities

Occupational health and safety are of **moderate** significance

5.4.3 Community health and safety

- Temporary nuisance and inconvenience as a result of the maintenance activities. Road accidents may result from the operation and increased traffic volume.

- Streetlight stanchions (lampposts) pose a collision risk to motorists and pedestrians, particularly those affected by poor eyesight. High winds or accumulated metal fatigue also occasionally topple streetlights. Faulty equipment or exposed cables can cause risks of electrocution

Occupational health and safety are of **moderate** significance

5.4.4 Social Impacts

5.4.4.1 Traffic

Traffic flow will increase after the rehabilitation and pavement of roads which would ease the access and enable residents to have a more reliable way of transportation. However, pavement of roads would reduce the congestion and would facilitate the regulation of traffic.
Additionally, for road maintenance, activities is limited to specific parts and not anticipated to be carried out on bigger scale. Therefore, the traffic impacts will be of no significance.

Traffic impacts are considered **insignificant** during operation.

Table 5-3 Summary of impacts during Operation

Receptor/ EHS Aspect	Duration	Spatial	Magnitude	Basic Impact Index	Sensitivity of Receptor	Impact Significance
Air Quality	**Moderate**	**Very Low**	**Very Low**	**Low**	**Medium**	**Minor**
Noise	**Moderate**	**Very Low**	**Very Low**	**Low**	**Medium**	**Minor**
Soil	**Low**	**Low**	**Very Low**	**Low**	**Medium**	**Minor**
Energy Consumption	**Moderate**	**Very Low**	**Low**	**Low**	**Medium**	**Minor**
Solid and hazardous wastes	**Very low**	**low**	**Moderate**	**Moderate**	**Medium**	**Moderate**
Traffic	**Low**	**Low**	**Low**	**Low**	**Medium**	**Minor**
Occupational Health and Safety	**Low**	**Low**	**Moderate**	**Moderate**	**Medium**	**Moderate**

6 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN

The objective of the Environmental and Social Management Plan (ESMP) is to outline a mechanism for mitigating potential negative impacts which the project imposes on the environment and the residents of the project areas. Additionally, the ESMP is a vital tool that is utilized for monitoring the application and performance of the proposed mitigation measures. The ESMP identifies roles and responsibilities of different stakeholders for the proper implementation and efficient monitoring of the mitigation actions. Table 6-1 Environmental and Social Management Plan for the Pre-construction and Construction Phases sums up the proposed mitigation measures and the responsible entity for each during the pre-construction and construction phases, Environmental and Social Monitoring Plan for the Preconstruction and the Construction Phases, **Error! Reference source not found.**, Table 6-2 Environmental and Social Management Plan for the Operation Phase, Table 6-4 Environmental and Social Monitoring Plan for the Operation Phase.

6.1 Environmental and Social Management Plan for the Pre-construction and Construction Phases

Table 6-1 Environmental and Social Management Plan for the Pre-construction and Construction Phases

EHS Aspect / Receptor	Topic/ Potential Impact	Mitigation[34]	Means of Supervision	Responsibility		Estimated Cost
				Implementation	Supervision	
Gaseous and dust emissions	- Gaseous emissions from engines of construction machinery and equipment. - Dust emissions due to earthwork and movement of construction trucks and equipment on unpaved roads	**Mitigation of gaseous emissions[35]** • Appropriate maintenance, engine tuning and servicing of construction equipment to minimize exhaust emissions. • Minimize unnecessary journeys and switching off machinery and equipment when not in use (idle mode). **Mitigation of dust[42]** • Monitoring of wind speed and direction to manage dust-generating activities during undesirable conditions. • Minimize dust from materials (such as sand, cement) and construction activities (such as excavation) by using covers, storage, control equipment, and increasing moisture content.	• Field visits during the construction activities to ensure effectiveness in reducing gas and dust emissions. • Review the air quality measurements and monitoring reports. • Review the equipment, trucks and	• Site Engineer • Contractor	Resident Engineer from PMT	Contractor costs

[34] WBG Environmental, Health, and Safety (EHS) Guidelines GENERAL EHS GUIDELINES: CONSTRUCTION AND DECOMMISSIONING

[35] WBG Environmental, Health, and Safety Guidelines GENERAL EHS GUIDELINES: ENVIRONMENTAL AIR EMISSIONS AND AMBIENT AIR QUALITY

EHS Aspect / Receptor	Topic/ Potential Impact	Mitigation[34]	Means of Supervision	Responsibility		Estimated Cost
				Implementation	Supervision	
		• Controlled wetting and compaction of excavation/backfilling surrounding area • Excavated soil stockpiles and stored sand should be covered with appropriate covering material[36], such as polyethylene or textile sheets to avoid soil dispersion. • Transportation of excavation/construction waste should be through licensed and sufficiently equipped vehicles with a suitable special box or provided with a cover to prevent loose particles of waste and debris from escaping into the air or dropping on the road. • Cover trucks with canvas to avoid dust blow	vehicles maintenance reports • Review the complaints reports			
Noise and Vibration	• Noise and vibration during the operation of construction equipment, possible hammering and drilling works in	• Compliance with national noise law No.41 • Planning activities with the greatest potential noise during periods of the day that will result in least disturbance • Minimize unnecessary journeys or equipment use and minimize project transportation through community areas • Regular maintenance of all equipment and vehicles	• Site • Review the equipment maintenance records. • Review complaints/ grievance log.	Site Engineer Contractor	Resident Engineer from PMT	Contractor costs

[36] Enough sheets should accompany work groups during the construction phase.

EHS Aspect / Receptor	Topic/ Potential Impact	Mitigation[34]	Means of Supervision	Responsibility		Estimated Cost
				Implementation	Supervision	
	addition to the noise generated from construction related trucks • Different types of noise such as background noise, idling noise, blast noise, rotating noise, intermittent noise from different equipment	• Earmuffs/protective hearing equipment shall be made available to all workers in noise critical areas • Place visually clear instructions in areas where noise emissions are significant. • Adopt a policy of switching off machinery and equipment when not in use (idle mode). • Ensure use of modern and well-maintained equipment				
Soil	• Large-scale excavation activities for the construction. • Spills	• 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 • Marking excavation with physical boundaries (barriers, tape or fence) • Follow the solid and hazardous waste mitigation measures presented in this ESMP to minimize the possibility of leakages to the soil.	Field investigation	Site Engineer Contractor	• Resident Engineer from PMT	Contractor costs

EHS Aspect / Receptor	Topic/ Potential Impact	Mitigation[34]	Means of Supervision	Responsibility		Estimated Cost
				Implementation	Supervision	
		• Restoration of topsoil and damaged areas must take place after construction phase end. • Ensure appropriate and safe storage of containments such as fuels, construction materials and wastes.				
Surface Water Quality	• Surface water including Tigris River may be susceptible to pollution resulting from uncontrolled dumping of wastes generated.	• The contractor must follow the solid and hazardous waste mitigation measures presented in this ESMP to limit the possibility of water pollution that may result from inappropriate handling of waste. • Construction material and stockpiles should be covered to avoid run-off to water bodies. • Road curb inlets must be checked and cleaned to ensure no demolition waste is falling with the water runoff flowing into the 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 wastewater trucks • 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.	Field Investigation	Site Engineer Contractor	Resident Engineer from PMT	Contractor costs

EHS Aspect / Receptor	Topic/ Potential Impact	Mitigation[34]	Means of Supervision	Responsibility		Estimated Cost
				Implementation	Supervision	
Energy Consumption	• Consumption of fossil fuels for the construction vehicles and machinery and generators • Excessive use may have serious environmental implications on its availability, price and sustainability	• Proper planning of transportation of materials to ensure optimum consumption of fossil fuels (diesel, petrol) • Use machines with high efficiency engines • Adopt a policy of switching off machinery and equipment when not in use (idle mode). • Apply regular maintenance to the machinery • Monitor energy use during construction and set targets for reduction of energy use	Field Investigation	Site Engineer Contractor	Resident Engineer from PMT	Contractor costs
Extraction of Natural Resources	Extraction of natural materials, such as sand and gravel from borrow pits, imposes a negative impact on their availability and sustainability	• Deciding the quantities according to accurate budgeting and estimation of actual construction requirements. This will ensure that materials are not extracted or purchased in excessive quantities. • Minimizing damage or loss (by run-off, wind, etc.) of materials at the construction site by covering the storage areas to avoid extracting more materials • Consider the reuse of construction natural materials and use of recycled materials.	Field Investigation	Site Engineer Contractor	Resident Engineer from PMT	Contractor costs

EHS Aspect / Receptor	Topic/ Potential Impact	Mitigation[34]	Means of Supervision	Responsibility		Estimated Cost
				Implementation	Supervision	
Waste Generation[37]	Solid Waste Disposal (Construction wastes/ demolition debris, camps,etc)	• On site segragation of stored solid wastes into hazardous, non hazardous recyclable construction material, plastic, paper, etc • Onsite trash bings within each construction site to prevent littering • Construction debris to be disposed of at an approved site • Temporarily dispose solid waste in the WAA. The WAA has to be protected from washing out, it could be a sufficiently deep pit covered with impermeable material	• Review local authority approvals • Site supervision • Occasional inspection and auditing of the WAA	Contractor's site engineers	Resident Engineer from PMT	Contractor costs
	Liquid waste disposal	• Storage and collection of sanitary wastes in septic tanks for regular disposal at approved locations				
	Hazardous wastes, such as fuel, solvents, paints, concrete washout water, spilled oils from the operation	• Provide adequate secondary contaminant with labeling for fuel storgae tanks and for the temporary storage of fluids • Proper handling of lubricants, fuel and solvents and provide secured storage				

[37] Environmental, Health, and Safety (EHS) Guidelines GENERAL EHS GUIDELINES: ENVIRONMENTAL WASTE MANAGEMENT

EHS Aspect / Receptor	Topic/ Potential Impact	Mitigation[34]	Means of Supervision	Responsibility		Estimated Cost
				Implementation	Supervision	
	and maintenance of machinery, etc.	• Ensure proper loading of fuel and maintenance of equipment through using impervious surface for refueling areas and training workers on the correct transfer and handling of fuel and chemicals and response to spills • Keep hazardous waste in marked leak proof containers and temporarily dispose in a secured area for hazardous waste in the WAA • Limiting access to hazardous waste storage areas to trained employees • Finally, dispose hazardous waste in a permitted waste recovery facility by a licensed contractor • Re-use concrete washwater in washing the concrete mixing equipment or in the concrete mix • Collect and retain all the concrete washout water and solids in leak proof containers, so that this caustic material does not reach the soil surface and then migrate to surface waters, stormwater drains or into the ground water				
Occupational health and safety	General risks associated with construction sites and anticipated include slips and falls; moving	• Provide H&S training to the construction workforce (including sub contractors, temporary workers and drivers) • The contractor shall prepare and adopt an Occupational Health and Safety Plan (OHSP) in compliance with WBG EHS Guidelines	Contractual clauses + Field supervision	Contractor's site engineers	Resident Engineer from PMT	Contractor costs

EHS Aspect / Receptor	Topic/ Potential Impact	Mitigation[34]	Means of Supervision	Responsibility		Estimated Cost
				Implementation	Supervision	
	Lorries and machinery; exposure to chemicals and other hazardous materials.	• Provide adequate signage to prevent accidental falling into open areas • Fencing of the work areas • Deployment of HSE procedures for the construction personnel • Ensure the use of personal protective equipment for workers (PPE) • Ensure provision of health and safety facilities at the project site including bathrooms and potable water • Ensure the workers camp and construction areas are open only to formal employees • Provide necessary fire prevention equipment on site				
Community Health and Safety	Traffic Flow	• Target signage and outreach activites to improve public awareness of traffic changes and potential hazards • Ensure vehicle safety and regular maintenance	• Accidents log • Community grievance mechanism	Contractor's site engineers	Resident Engineer from PMT	Contractor costs
Local Community	Community health and safety	• Ensure all contractors implement Code of Conduct and corresponding training concerning employment and workforce behavior (including but not limited to safety rules, zero tolerance for substance abuse, environmental sensitivity of the area, dangers of sexually transmissible	• Workers code of conduct	Contractor's site engineers	Resident Engineer from PMT	Contractor costs

EHS Aspect / Receptor	Topic/ Potential Impact	Mitigation[34]	Means of Supervision	Responsibility		Estimated Cost
				Implementation	Supervision	
		diseases and HIV/AIDS, gender based violence and sexual harassment, respect for the beliefs and customs of the populations and community relations in general). • Ensure safety for pedestrians, including the disabled and school children, such as walkways with adequate lighting, sign posts, and curb ramps. • Ensure an efficient grievance mechanism is put in place. The grievance mechanism is discussed in the stakeholder engagement chapter.				
Local Community	Temporary labour influx & Gender Based Violence	• Preparation of appropriate code of conduct that stipulates the commitments by workers when interacting with community members and the behaviors that should be avoided such as the prevention of sexual harassment and GBV • All workers should be trained on the Code of Conduct to ensure the proper interaction of workers with community members and the avoidance of behaviors such as the prevention of sexual harassment and GBV • Code of conduct to be signed by sub-contractor • Code of conduct induction to be done every 2 weeks for the recurrent workers and the new comers before starting work.	• Site visit • Monthly reporting • GRM • Meetings with surroundingc ommunities	Contractor's site engineers	Resident Engineer from PMT	Contractor costs

EHS Aspect / Receptor	Topic/ Potential Impact	Mitigation[34]	Means of Supervision	Responsibility		Estimated Cost
				Implementation	Supervision	
		• Apply the full requirements related to operating the grievance mechanism including anonymous channels • Raising awareness of the local populations about the project commitment towards communities' and the measures taken for that through public consultation and focus group discussions • Apply Penalties to workers violating the code of conduct				
Workforce	Child Labour and school dropout	• Ensure minimum legal labour standards as per ILO regulations (child/ forces labour, no discrimination, working hours, minimum wages) are met • Ensure workers has access to primary healthcare onsite	Grievance mechanism records	Contractor's site engineers	Resident Engineer from PMT	Contractor' costs
Local Community	Obstructing access to amenities, homes, religious sites etc.	• In case the project obstructs access to amenities due to construction and rehabilitation activities, the following mitigation measures shall be followed: • Section roads for construction and rehabilitation work in order to ensure that the restriction of access is temporary and will be limited to a few days.	• Site visit • Monthly reporting • GRM records • Meetings with local communities	Contractor	Resident Engineer from PMT	Contractors' cost

EHS Aspect / Receptor	Topic/ Potential Impact	Mitigation[34]	Means of Supervision	Responsibility		Estimated Cost
				Implementation	Supervision	
		• Discuss with local officials means to create alternative routes when possible to these obstructed amenities • Local civil society organizations can develop awareness raising activities to engage the local community and inform them of the schedule for construction of activities and the measures implemented to ensure safety for pedestrians, including the disabled and school children, such as walkways with adequate lightning, sign posts, and curb ramps. • Ensure an efficient grievance mechanism is put in place. The grievance mechanism is discussed in the stakeholder engagement chapter.				
Local Community	Infrastructure and underground utility	Coordination with departments of potable water, wastewater, electricity, and telecom authorities to obtain maps/ data on underground utilities, whenever available Mitigation measures for avoiding breaking underground utilities and infrastructure pipes: - Collecting most accurate maps for underground utilities and infrastructure routes from Information Centres in the various Governorates and asking them for site markings, whenever available, and making such data available to the contractor prior to commencing the works.	Infrastructure accidents	Contractor's site engineers	Resident Engineer from PMT	No added cost

EHS Aspect / Receptor	Topic/ Potential Impact	Mitigation[34]	Means of Supervision	Responsibility		Estimated Cost
				Implementation	Supervision	
		- Boreholes to locate underground utilities before using mechanical excavation. - Once underground utilities are mapped or uncovered, horizontal and vertical clearances between natural gas lines and electricity lines must be respected for safety considerations. In case an underground utility and infrastructure pipe has been damaged, standard procedures should be followed, as described before, in addition to preparing a documentation report for the accident. The documentation report should include: - Time and place of accident; - Name of contractor; - Type of underground utilities and infrastructure line; - Description of accident circumstances and causes; - Actions taken and responses of different parties, such as infrastructure company; - Duration of fixing the damage; and - Damage caused (description shall be according to observation, expertise judgment, reports of infrastructure company).				

EHS Aspect / Receptor	Topic/ Potential Impact	Mitigation[34]	Means of Supervision	Responsibility		Estimated Cost
				Implementation	Supervision	
Archaeological Cultural Heritage	Damage of cultural heritage	• Ensure all chance finds of cultural hertiage are reported immedtiately to the relevant authority and follow chance find procedures attached in Annex 2	Site Visit/ reporting of chance finds	Contractor's site engineers	Resident Engineer from PMT	Contractor's cost
Street Conditions	Delays in street restoration may lead to varying degrees of damage to vehicles, loss of access and business, traffic congestions with associated delays and emissions, and a potentially significant public discontentment.	• Quick restoration and effective communication with regarding work and restoration schedule	Site visit Monthly reporting GRM Meetings with surrounding communities	Contractor's site engineers	Resident Engineer from PMT	Contractors' cost

6.2 Environmental and Social Management Plan for the Operation Phase

Table 6-2 Environmental and Social Management Plan for the Operation Phase

EHS Aspect / Receptor	Topic/ Potential Impact	Mitigation	Means of Supervision	Responsibility		Estimated Cost
				Implementation	Supervision	
Air Emission	• Dust and exhaust emissions • An increase in electricity consumption from the pump used for water flow as well as street lighting which in turn will increase air emissions	• Installing road signs to set the speed limit and minimize dust emissions during maintenance activities. • Use pumping schedules to obtain optimum operation and frequent maintenance of pumps • Switching off street lightings during day light to reduce electric consumption • In case of excavation for pipes maintenance, the mititgation measures of the construction phase should be followed	Mosul municipality	Mosul municipality	Site supervision	Operation costs
Noise	• High noise levels due to increased traffic and periodic maintenance works • Noise & vibrations to local community and workers during maintenance and repair	• Enforce laws related to noise emissions • Ensure that any equipment or machines used during maintenance are adequately maintained and release the lowest possible noise. • Minimize noise generating activities near residential units.	Mosul municipality	Mosul municipality	Site supervision	Operation costs
Soil and Groundwater	• Road pavement will reduce uncontrolled soil erosion caused	• Restoration of topsoil and damaged areas must take place after any	Mosul municipality	Mosul municipality	Site supervision	Operation costs

EHS Aspect / Receptor	Topic/ Potential Impact	Mitigation	Means of Supervision	Responsibility		Estimated Cost
				Implementation	Supervision	
	by traffic and the formation of stagnant ponds after rainstorms. • Oil/grease contamination of the valleys where stormwater will be directed to	operation and maintenance phases end. • Ensure the supply of oil/grease traps along the drainage network • Based on the rainwater quality, make use of the rainwater by using harvesting equipment and systems on site				
Energy Consumption	An increase in electric consumption for the use of pumps in water networks and lighting networks	• Regulate the use of pumps through pumping schedules for best efficiency • Regular maintenance of pumps and pipelines to reduce friction losses • Only use lighting poles for the night time	Mosul municipality	Mosul municipality	Site supervision	Operation costs
Waste generation	Wastes (hazardous & non-hazardous) are generated during the operation phase resulting from maintenance, repair and replacement activities	• Temporary disposal of waste in the designated waste area on-site • After the work is done, dispose all the waste in the nearest landfill by a licensed contractor • Keep hazardous waste in labeled leak proof containers and temporarily dispose in a secured area for hazardous waste on site • Allow only trained workers in the vacinity of hazardous waste storage	• Iraq Electricity Company • Mosul municipality	• Iraq Electricity Company • Mosul municipality	• Review local authority approvals • Site supervision	Operation costs

EHS Aspect / Receptor	Topic/ Potential Impact	Mitigation	Means of Supervision	Responsibility		Estimated Cost
				Implementation	Supervision	
		• Collect all Hazardous waste and dispose in a licensed waste recovery facility by a licensed contractor				
Workers	Occupational Health and Safety	The Ministry of Construction, Housing, Municipalities & Public Works will: • Develop an OHS Plan during operation • Organization of work shifts and movement of trucks. • Develop emergency plans.	Incidents and accidents reports Site visit reports	Resident engineer	PMT	Operation cost
Local Community	Community health and safety	• Follow the mitigation measures mentioned earlier in section 6.1 • Provide a complaint mechanism for the community. • Conduct quarterly community meetings to observe any concerns they may have.	Incidents and accidents reports GRM	Resident engineer	PMT	Operation Cost

6.3 Environmental and Social Monitoring Plan for the Pre-construction and Construction Phases

Table 6-3 Environmental and Social Monitoring Plan for the Pre-construction and Construction Phases

Receptor/EHS Aspect	Monitoring Indicators	Responsibility of Monitoring	Frequency of Monitoring	Location of Monitoring	Methods of Monitoring	Estimated Cost of Monitoring
Air Quality	• Number of complaints related to air quality • Compliance with dust abatement measures	PMT resident engineer and Mosul municipality	• Monthly	• On site near excavation and demolition activities • Offsite at the nearest receptor	• Random site inspection • Reviewing equipment and trucks maintenance report	PMT management costs
Noise	Noise intensity and vibration levels	PMT resident engineer and Mosul municipality	• Monthly	• On site near operating heavy equipment, • Nearest Sensitive receptors • Temporary offices	• Random site inspection • Equipment and trucks maintenance report	PMT management costs
Soil	Evidence of spills of fuels and lubricants	PMT resident engineer and Mosul municipality	• Twice during the construction phase • During material delivery • In the event of rainfall	• WAA • Materials storage areas, • Runoff from site wash down areas of equipment	• Visual observation • Recording and documenting spillage	PMT management costs
Water resources	▪ Weekly site inspection ▪ Debris accumulation in water drainage areas	PMT resident engineer and Mosul municipality	• Monthly	• Drains and waste areas,	Record and monitor quantities	PMT management costs

Receptor/EHS Aspect	Monitoring Indicators	Responsibility of Monitoring	Frequency of Monitoring	Location of Monitoring	Methods of Monitoring	Estimated Cost of Monitoring
	▪ Alteration of water courses ▪ Signs of spillage of hazardous materials					
Energy Consumption	Quantity of fossil fuels utilized	PMT resident engineer and Mosul municipality	Twice during the construction phase	Construction sites	Record and monitor quantities	PMT management costs
Extraction of Natural Resources	• Quantities actually extracted Vs. quantities planned to be extracted • ESMP and community approval	Construction contractor/ consultant	Before exploitation/ work begins	Sand & gravel borrow pits	Documents and quantities inspection/ consultation	PMT management costs
Waste Generation	• Disposal of waste in the designated waste area (WAA) • Cleanliness of the construction site • Waste segragation	PMT resident engineer and Mosul municipality	Monthly	• WAA • Construction Sites	• Inspection and recording of items disposed in the WAA • Inspection of cleanliness of the construction site and the handling process of waste	PMT management costs
Occupational Health and Safety	• OHS Plans • Trainings performed and recorded • PPE used by workers	PMT resident engineer and Mosul municipality	Monthly	Construction sites	• Inspection and recording • Maintaining records of of injuries and	PMT management costs

Receptor/EHS Aspect	Monitoring Indicators	Responsibility of Monitoring	Frequency of Monitoring	Location of Monitoring	Methods of Monitoring	Estimated Cost of Monitoring
	• Fire prevention equipment in place • Number of accidents on site				accidents with cause and location	
Traffic	• Comments and notifications from Traffic Department • Complaints raised by community people	Construction contractor/ consultant	Once a month	Construction sites	Monthly reports and grievance log	PMT management costs
Community Health and Safety	• Regular reporting of any accidents, as well as records and reports on health, safety and welfare of workers • Continuous monitoring of all hazardous events. • Regular inspection of workers against pathogenic agents and provision of immunization when needed	Construction contractor/ consultant	Once a month	Construction sites	Monthly reports and grievance log	PMT management costs
Workforce	The monitoring of child labor will be intensively presented in the OHS manual to be implemented during construction phase.	Construction contractor/ consultant	Once a month	Construction sites	Interviews with workers and grievance log	PMT management costs

Receptor/EHS Aspect	Monitoring Indicators	Responsibility of Monitoring	Frequency of Monitoring	Location of Monitoring	Methods of Monitoring	Estimated Cost of Monitoring
	The monitoring of workers' compliance to the Code of Conduct when interacting with the surrounding communities to avoid behaviors such as sexual harassment and GBV					
Labor Influx	Complaints raised due to labor influx Corrective measures adopted	Construction contractor/ consultant	On quarterly basis	Construction sites	Periodic reports and grievance log	PMT management costs
Local Community/ Obstructing access to amenities, homes, religious sites etc.	Complaints raised by local officials and community people	Construction contractor/ consultant	Monthly	Construction sites	Reporting of any accidents and/or issues related to pedestrian safety	PMT management costs
Infrastructure and Utilities	Documentation of affected infrastructure and corrective procedures taken	Construction contractor/ consultant	On quarterly basis	Construction sites	Periodic reports and grievance log	PMT management costs

Receptor/EHS Aspect	Monitoring Indicators	Responsibility of Monitoring	Frequency of Monitoring	Location of Monitoring	Methods of Monitoring	Estimated Cost of Monitoring
Archaeological and Cultural Heritage	Review documentation of chance find procedures	Construction contractor/ consultant	Upon finding any cultural heritage	Construction sites	Monthly reports	PMT management costs

6.4 Environmental and Social Monitoring Plan for the Operation Phase

Table 6-4 Environmental and Social Monitoring Plan for the Operation Phase

Receptor /EHS Aspect	Monitoring indicators	Responsibility of monitoring	Frequency of monitoring	Location of monitoring	Methods of monitoring	Estimated Cost of monitoring
Air Quality	▪ Number of complaints related to air quality ▪ Compliance with dust abatement measures	Mosul Municipality	• During maintenance	Sensitive receptors and nearby houses in the project areas	Measuring and monitoring gaseous emissions by a certified laboratory	Operation cost
Noise	Noise intensity	Mosul Municipality	• During maintenance	Sensitive receptors and nearby houses in the project areas	Measuring and monitoring noise and vibration levels by a certified laboratory	Operation cost
Solid and Hazardous wastes	• Disposal of waste in the designated	▪ Mosul Municipality	During maintenance	Subproject areas	Site supervision	Operation cost

Receptor /EHS Aspect	Monitoring indicators	Responsibility of monitoring	Frequency of monitoring	Location of monitoring	Methods of monitoring	Estimated Cost of monitoring
	temporary waste area on-site and final disposal in the nearest landfill by a licensed contractor • Cleanliness of the project area					
Occupational health and safety	• Incidents • Occupational diseases	• Mosul Municipality	Bi-annual report	Project areas	• Inspection and recording • Maintaining records of injuries and	
Community health and safety	• Accidents, incidents and complaints • Complaints from local community	• Mosul Municipality	Bi-annual report	• Roads • Close settlements round the project area	Biannual report and GRM	PMT management costs

6.5 Capacity Development

To ensure that the mitigation and monitoring measures are 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 culvert 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

6.6 Institutional Framework

6.6.1 Environmental Management Structures

Roles and responsibilities of the ESMP are divided between two main entities, namely the Municipality of Nineveh and the Contractor. The Municipality of Nineveh is mainly responsible for high level monitoring and the implementation of an overall supervision and ensuring that the measures are adhered to.

- The HSE unit at the Municipality of Nineveh is the central level of the supervisory body for the rehabilitation activities of this subproject.

The second entity is the Contractor who is responsible for full implementation of mitigation measures in full cooperation with the Municipality staff.

6.6.2 Roles and responsibilities of the Contractor's Environmental Health and Safety (EHS) Officers

The Contractor is responsible for full implementation of mitigation measures in full cooperation with the Municipality staff. The Contractor's mandates are as follows:

- Ensure that workers comply to EHS manuals and procedures
- Management of waste generated
- Management of liquid waste
- Checking that handling of hazardous waste is done according to the requirements of the Environmental Law

- Other tasks as outlined in Environmental and Social Management Plan
- Daily reports are to be compiled and sent to the governorate EHS officers for preparation of monthly summary reports.

Monthly reports are sent to EHS officer at the municipality of Nineveh for compilation into quarterly reports.

6.6.3 Roles and responsibilities of the Environmental and Social Project Management Team (PMT) in Nineveh Municipality

6.6.3.1 Compliance with World Bank safeguards

- Preparing internal guidelines for the preparation, implementation, monitoring and reporting of environmental and social documents required by various safeguard instruments;
- Reviewing, as applicable, ESMP and other safeguard documents prepared by consultants to ensure compliance with relevant safeguard policies of the National laws and the World Bank;
- Providing recommendations to contractors accordingly and make necessary changes prior to submission of relevant documents to the World Bank – ensure consistency in the level of proficiency and presentation of the documentation;
- Carrying out documentation review pertaining to environmental and social compliance (including bidding documents, reviews on-site, reports from contractors etc.) throughout project implementation;
- Coordinating and facilitating the work of consultants engaged to carry out environmental and social impact assessments and resettlement planning and external monitoring of safeguard instruments implementation;

6.6.3.2 Monitoring and reporting

- Conducting internal monitoring of the implementation of the environmental and social component of the ESMP in matters pertaining to timely payments and the provision of temporary measures to affected persons;
- Contributing to project progress reports pertaining to overall implementation of environmental and social requirements of the project.
- Reporting accidents resulting in fatalities to ReFAATO within 24 hours of their occurrence and to the World Bank within 48 hours.

6.6.3.3 Communication with and responsiveness to targeted communities

- Adhere to the designed community friendly grievance redress mechanism with clear and timely bound tiers and responsibilities and ensure dissemination on the local level.
- Develop quarterly grievance and redress report
- Conducting field visits to ensure that the established grievance redress mechanisms are functioning properly and that the individual projects are implemented in a socially sustainable manner;

- Participate in the process of disbursing compensations and keep track record of the compensation process documentation if exists.
- Reach out to local communities, including PAPs if exists, to raise awareness about the project and the implementation schedule.
- Build the capacity and provide support to the field staff as needed.

6.6.4 Roles and responsibilities of the Project Coordination Unit (PCU), which is under ReFAATO

- Coordinate with all ministries and stakeholders.
- Consolidate and disseminate all reports from the PMTs and reflect the work progress to higher officials.
- Coordinate all monitoring and assume responsibility for internal and external independent evaluations.
- Coordinate the citizen's engagement program.
- Coordinate the communications and sensitization program.
- Coordinate training activities and capacity building programs.
- Ensure compliance with all legal obligations and instruments.
- Participate in Bank support missions.

6.6.5 Required Resources

Municipalities and contractors in Iraq have wide experience in terms of contracting and technical works. However, they tend to have less capacity in terms of environmental, occupational health and safety and social requirements in accordance to WB operational polices.

Following are recommended training programs for the Nineveh municipality staff and the resident engineer to build their capacity for managing the project:

Table 6-5: Recommended training courses for municipality staff and resident engineer

Training course	Type of training	Particpating parties	Proposed Scheduling
Tailored training on Environmental Management and monitoring for the project	Class room + on job training	• Selected members from the municipality staff • Resident engineer	Prior to project implementation
Occupational health and safety	Classroom + on Job training	• Selected members from the municipality staff • Resident engineer	Prior to project implmentation

Defensive driving and machinery operation safety	Classroom + on job training	Drivers and operators	Periodical
Monitoring and evaluation (activities and tools)	Classroom + on Job training	• Selected members from the municipality staff • Resident engineer	Prior to project implmentation

Table 6-6: Recommended training courses for social staff

Training course	Type of training	Particpating Parties	Proposed Scheduling
• **WB operational policies OP 4.12 with emphasis on involuntary actions and grievances**	One day Workshop + on the job training	Contractor's Social Development Officers and selected members from the municipality staff	- One workshop during the beginning of the project implementation
• **Communication Skills**	Two days' Workshop + on the job training	Contractor's Social Development Officers and selected members from the municipality staff	- One workshop during the beginning of the project implementation
• **Promotion of Awareness Raising Activities**	Workshop + on the job training	Contractor's Social Development Officers and selected members from the municipality staff	- Once before the project implementation - Refreshment course during the implementation of the project
• **Community Participation Tools**	One day Workshop + on the job training	Contractor's Social Development Officers and selected members from the municipality staff	- One workshop during the beginning of the project implementation
• **Monitoring and Evaluation mechanisms (M&E)**	Two days' Workshop + on the job training	Contractor's Social Development Officers and selected members from the municipality staff	- One workshop during the beginning of the project implementation

7 STAKEHOLDERS ENGAGMENT AND PUBLIC CONSULTATION

This chapter describes the stakeholder engagement and consultation activities that have been undertaken to inform this ESMP. It aims to focus on key stakeholder interactions and analyze their outcomes. Accordingly, the information and findings of these consultations are integrated into the contents of this report.

In terms of methodology, consultation activities were conducted in the form of in-depth face-to-face interviews and focus group discussions. These activities were performed in compliance with all national regulations relevant to public consultation as well as World Bank policies relevant to disclosure and public consultation (namely, WB ESS 10 and the WB Policy on Access to Information). As a result, the key principles of effective engagement that guided stakeholder consultations include:

- Ensuring that all interactions are free of intimidation or coercion;
- Providing meaningful information in a format and language that is understandable and tailored to the needs of the target stakeholder group(s);
- Being inclusive in the representation of views, i.e. including different ages, genders, and incorporating vulnerable and/or minority groups;
- Respecting local traditions in the decision-making processes.

7.1 Rounds of Stakeholder Consultations

In the preparation of this ESMP, consultation activities have taken place over the course of three separate rounds of structured consultation activities with different stakeholder groups. Disclosure of relevant project information helped stakeholders understand the risks, impacts and opportunities of the project. Significantly, the study team was keen to responding to all questions posed by stakeholders and provide information about the project. The topics discussed with stakeholders are outlined below:

- The purpose, nature, scale and duration of the Project activities;
- Risks to, and potential impacts on, stakeholders and proposed mitigation plans;
- The availability and procedure of the grievance redressal mechanism;
- The process by which meetings are notified, summarized and reported.

EcoConServ's study team visited the Right Bank of Mosul City and its vicinity (i.e. Yarmouk neighborhood and Harimat area) during the month of December 2019 to conduct several rounds of stakeholder engagement activities. The first round involved getting to see the project area and introductory meetings with governmental stakeholders. The second round involved getting to know the nearest community and analysing their needs through focus group discussions (separate male and female). The third involved getting more information on the location through interviews with local NGOs and community members.

7.1.1 ROUND 1

Introductions with Local Stakeholders

The first round sought to introduce, and to raise stakeholder awareness of, the ESMP process and to announce objectives if the EODP project. The method of consultation mostly relied on in-depth face-to-face meeting with key government representatives, namely the local council of the City of Mosul as well as with police officers at Mosul station (they refused to be photographed). Overall, initial issues of concern to stakeholders were identified, and detailed information concerning the project area was collected.

7.1.2 ROUND 2

Focus-Group-Discussions with communities surrounding project area

The second round of consultations sought to identify further environmental and social issues to assist in developing the baseline for impact assessment. The social impact assessment specific consultation was undertaken to understand the existing community values, how the community operates, what the potential impacts of the barrage rehabilitation might be and to obtain mitigations suggested by the community. Accordingly, the second site visit involved EcoConServ's social team conducting two focus group discussions with community members the surrounding of the project area. The first FGD was all male and they were mainly the shopkeepers along Mosul-Baghdad road in Yarmouk neighbourhood, who were worried about maintaining their business during project implementation. They were assured that mitigation measures will be put in place in case their business was negatively affected, and they were encouraged to put forward ideas and suggestions about how the potential impacts could be minimised. The participants emphasized that they know that the project's benefits are far greater than its negative impacts and confirmed their willingness to cooperate with the project.

The second FGD was mixed between males and females community members. A discussion was held to determine any concerns they had towards the project. All those interviewed expressed their support to the project. All interviewees expressed their hope that rehabilitation of the roads will lead to more goods moving through their area. Therefore, they link the project with the development of the village economically. They also stressed the importance of providing a timetable for the completion of the project because they heard of many planned projects in their district but have not seen them being completed.

Figure 7-1 Focus Group Discussions with community members

7.1.3 ROUND 3

Interviews with local community members

The third round of consultations focused on getting a more in-depth understanding of the local context and community needs through interviewing local community members (at the local market and at NGOs). Discussions involved providing: 1) introduction about EODP; 2) the proposed project design and its corresponding routes and activities; 3) anticipated environmental and social impacts and mitigation measures.

Figure 7-2 Interviews with NGO workers (left) and worker in the industrial area (right)

Figure 7-3 Interviews with residents at the market

7.2 Results of Stakeholder Engagement Activities

Based on the above-mentioned engagement activities with stakeholders, this analysis classifies the most discussed topics and highlighted concerns (listed below) and identifies their primary interests in the project. Such an analysis provides a more in-depth understanding of these groups and should inform future stakeholder engagement throughout the project's duration. Accordingly, the following table displays the interests of select target groups.

Table 7-1 Overview of consultations and discussions

Topic	Questions/Remarks by Attendees	Proposed Mitigation
Employment Opportunities	An official request from the responsible authorities and community members to prioritize the employment of the city's youth in this project.	As per the directives of the Council of Ministers, all work will be done depending on the local market, including manpower and specialized workshops. The project will also provide employment for unskilled workers from the surrounding areas. It is understood that employing the young people of the community is the best option for the project. Therefore, project management will coordinate with the local government units so to publicize available vacancies.

Negative Environmental and Social Impacts	Concern was over expected negative environmental and social impacts since construction will result in noise, vibrations and volatilization of dust due to the movement of machinery and activities as well as an increase in traffic.	Community members were assured that the project will have minimal negative impacts due to the application of mitigation measures. It is expected that the work will result in noise, vibrations and volatilization of dust due to the movement of machinery and construction work, but the residents will not be affected much because of the distance of residential areas from the work area. Additionally, given that the routes designated for project activities do not have heavy traffic, then it is unlikely that residents will be affected because these routes have the capacity to take on construction vehicles. Lastly, consulted individuals were informed that a Grievance Redress Mechanism is put in place in order to receive and address any complaints from the local population in a timely manner.
Access to Local Amenities	Local business owners (owning shops along Mosul-Baghdad Road in Yarmouk neighborhood) expressed their worry about residents being unable to reach their stores during project implementation Two mosques were identified on either side of the Road 60 in Harimat area whose access may be affected during project implementation..	Local business owners were assured that the project will have minimal negative impacts due to the application of mitigation measures. Local community were also informed that a Grievance Redress Mechanism is put in place in order to receive and address any complaints from the local population in a timely manner. The responses reassured them and they stated that they are willing to cooperate with the project team in order to find solutions because they are in full support of the project taking place. Residents were assured that alternative means to access the mosques will be identified when necessary. Furthermore, they were told that the project owner is committed to safeguard all cultural heritage and religious sites in the area. Therefore, these mosques will not be damaged as a result to project activities. The consulted Nineveh Municipality officials responded that construction work is expected to be done by sections to avoid road closure and by extent loss of income to for small business owners. They

		noted that the various shops gather on the main streets surrounding the neighborhood, but there are no economic activities in the streets inside the neighborhood. Furthermore, the duration of construction work per section will be temporary and limited to a few days. The extensiveness of construction work will differ from road to road so construction action activities will not automatically cause restriction of access.
Responsiveness from the Government	Success of the project means that the Iraqi government is better able at developing the country and responding to the needs of the population.	Community members expressed their happiness in realizing that the success of this project will mean more stable conditions, greater local development (in terms of economic development as well as safety due to better roads). Project success will also mean that the Iraqi government is more responsive to the needs of the local population and so the country is capable of fulfilling its developmental promises. Residents expressed their worry about the fact that they were previously informed about projects taking place in the area, but they did not get to see these projects actualize.
Timeliness in Conducting Project Activities	Necessity of completing the project as quickly as possible	The project is categorized as highly necessary. The lack of paved roads negatively affects the local community's activities and mobility on a daily basis. Accordingly, the rehabilitation of roads is important because it connects the local communities with a wider economy. Hence, residents link the project with greater economic development in the future.
Transportation Services	Community members are awaiting benefits in the movement of goods and the presence of a public transportation system.	In addition to providing job opportunities in the local market, community members expect multiple wide-scale benefits as a result of this project. Therefore, people are anticipating start of work. However, after the completion of the project, local community members are hoping that the government addresses other gaps in services. Significantly, the most highlighted concern was the lack of public transportation. Community members

		complain that the lack of public transportation translates to transportation fees becoming a financial burden on local households. Hence, the anticipation is that the project will increase the importance of West Mosul since goods will pass through the area again and this will in turn encourage the government in providing transportation services to further aid local economic development.
Information Disclosure	The residents of the community were all interested in being kept up to date about project activities.	Civil society members explained that one of the best ways to disclose information about the project is the Facebook page of the governmental pages or pages of professional associations. In the city people follow the social networking pages of the circles that interest them. Therefore, farmers follow the agriculture page, the teachers follow the Ministry of Education pages and so on. Accordingly, these pages are a good way to transmit information as people share information on their own pages and thus spread. It is possible to use advertising screens spread in the city as well. In the villages, the best way is through the *mukhtar* or the sheikh of the mosque. People meet daily there and spend time discussing different things so the men would know about the project from the mosque and thus pass it on to their families. Women in the community also recommended for information to be distributed in schools so that children may get to learn about these projects and their importance for local development

7.3 Grievance Redressal Mechanism (GRM)

7.3.1 GRM objectives

The objective of a grievance procedure is to ensure that all comments and complaints from any project stakeholder are considered and addressed in an appropriate and timely manner. The effective grievance management can help in:

- Identification, channelling and impartial, timely and effective resolution of issues related to the implementation of **Emergency Operation for Development Project** (EODP) and its additional fund;

- Strengthening accountability and responsiveness towards beneficiaries, affected persons and the public regarding EODP and EODP AF implementation; and
- Serving as an important feedback and management mechanism for the PCU and PMTs to deduce challenges and risks for EODP implementation.

7.3.2 Communication channels for sharing information about GRM

Due to the diversity of the context in different Governorates and the socioeconomic characteristics of the beneficiaries, the communication channels to receive grievances were locally tailored to address all petitioner's concerns and complaints.

A range of channels will be available for submission of feedback including complaint boxes that will be installed in locations that are easily accessible to the public, a free of charge phone line, regular mail, an email account, and even on the social media application WhatsApp. In addition, hard copies of GRM uptake forms will be available at the PMT offices and project site. The main GRM uptake channels are summarized in the table below.

Table 2: GRM uptake channels for submission of feedback

REFAATO	PMT	Sub-Project Engineers
▪ Email: grm.wb@refaato.iq ▪ Online complaint system: refaato.net/form/ ▪ REFAATO hotline: **80011111** GRM users can call between Sunday-Thursday from 10 AM to 2 PM	▪ Letters to the PCU and/or relevant PMTs ▪ Phone calls to PMTs using telephone or WhatsApp ▪ In-person feedback to resident engineers on sub project sites and documented in GRM uptake form	▪ Feedback boxes on sub project sites ▪ In-person feedback to resident engineers on sub project sites and PMTs and documented in GRM uptake form ▪ Contact: Engineer Fouad Saleh – Mobile number: +9647724261455

As stated above, REFAATO has an online complaint system, available at: refaato.net/form/.[38] Furthermore, on a more local level, community people should be informed about the GRM using the snowball method, which enables the verbal exchange of information. Accordingly, the most effective outreach channels to do this verbal exchange is by:

- *Mukhtars* (community leaders);

[38] A sample of the online form (in Arabic and English) is included in Annex 3.

- Religious leaders;
- Social media;
- NGOs in the project area; and
- Some government officials in the local units.

7.3.3 Registration of GRM

After receiving the comments and complaints, they will be summarized and listed in a Complaints/Comments Log Book, containing the name/group of commenter/complainant, date the comment was received, brief description of issues, information on proposed corrective actions to be implemented (if appropriate), and the date of response sent to the commenter/complainant.

7.3.4 Feedback to grievances

The grievance note should be signed and dated by the aggrieved person. Where the affected person is unable to write, s/he should obtain assistance from the community to write the note and mark the letter with his/her thumbprint. Individuals who submit their comments or grievances have the right to request that their name be kept confidential, though this may mean that the social officer in charge of the GRM is unable to provide feedback on how the grievance is to be addressed. However, an anonymous complaint can receive a code and should be investigated appropriately and treated courteously.

Significantly, the GRM classifies feedback in two categories high-level and standard, each has its own procedure as explained further below.

High-Level Feedback

Feedback received to be categorized as 'high' level instances will include issues that meet the following criteria:

- Incidents that caused or may potentially cause significant or great harm to the environment, workers, communities, or natural resources, including issues of gender-based violence;
- Incidents which entail failure to implement environmental and social measures with significant impacts or repeated non-compliance with E&S policies;
- Incidents for which failure to address may potentially cause significant impacts that are complex and/or costly to reverse; and
- Incidents that may result in fatality or some level of lasting damage or injury.

This type of feedback will be acknowledged, and an investigation will be launched by the PCU/PMT and any other relevant stakeholders with 24 hours during work days and within 48 hours if the feedback was received over the weekend. It should be noted that some types of incidents, including

accidents and fatalities need to be reported to the World Bank. This guidance is provided in the Environment & Social Incident Response Procedures.

Standard-Level Feedback

If the identity of the aggrieved person is known and the grievance is classified as 'standard', the acknowledgement of grievance will be **within 3 business days.** At the **20 business-day mark,** if a complaint/question is still pending, the GRM focal point for the PMTs and the PCU will provide an update to the non-anonymous GRM user, inform them if there will be delays in resolving their case, and provide the date for which they will be able to provide a response.

7.3.5 Procedure for Appeal

Aggrieved persons who are dissatisfied with the outcome of their complaint can appeal the decision by resubmitting their complaint to the GRM focal point within 30 working-days of receiving a response to the original submitted grievance. Subsequently, the GRM focal point and other relevant personnel have 30 working-days to investigate and address the issue. Additionally, the GRM focal point has 10 working-days to prepare a comprehensive response, including the findings of the investigation and the rationale of the determination. Accordingly, within a maximum of 40 working-days, the appeal case should be closed.

Lastly, if the aggrieved person is still not satisfied with the solution provided, s/he has the option to go to court.

The grievance mechanism cycle for feedback categorized as 'standard' is presented in the figure below.

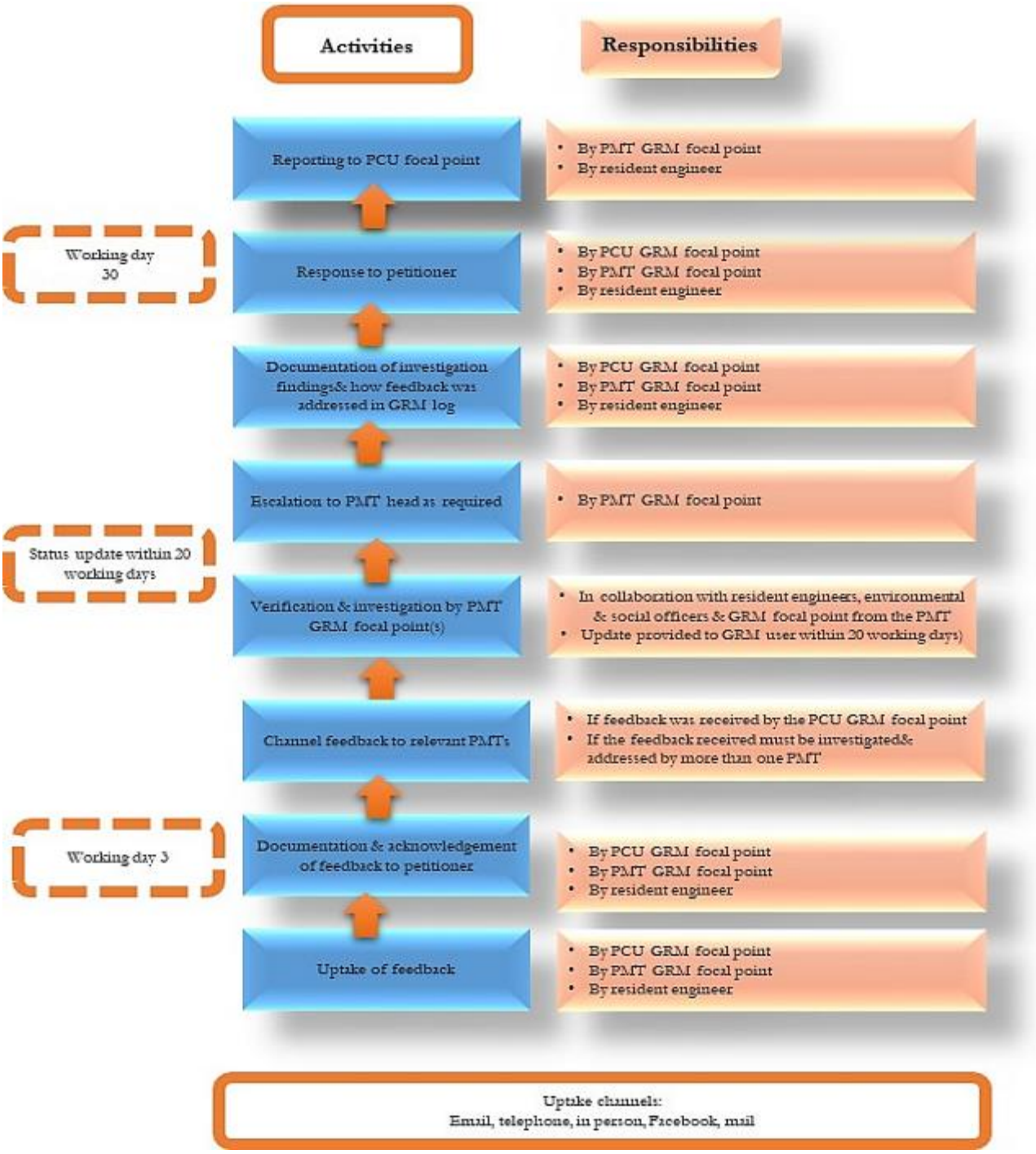


Figure 7-4: Grievance cycle

7.3.6 Confidentiality

Individuals who submit their comments or grievances have the right to request that their name be kept confidential, though this may mean that the PMT is unable to provide feedback on how the grievance is to be addressed. However, an anonymous complaint can receive a code and should be investigated appropriately and treated courteously.

7.3.7 Institutional Responsibility for the Grievances

During construction and operation phases, the persons below will be responsible for grievance management:

- Resident Engineer and Contractors
- PMT GRM Focal Point or Social Development Officer
- PMT Head or Coordinator
- PCU GRM Focal Point
- President of REFAATO

7.3.8 Monitoring of Grievances

Monitoring

Monitoring refers to the process of tracking grievances and assessing the extent to which progress is being made to resolve them. All grievances activities should be monitored in order to verify the process. The monitoring process should be implemented as follows:

All information related to contact, cases, tracking and monitoring of feedback cases shall be tracked through a database created for this purpose. The database shall be managed by the PCU GRM focal point and updated and shared by GRM focal points of the PMTs on a monthly basis. All files shall be protected to ensure no loss of data and information.

Ultimately, the PCU's GRM focal point will be responsible for consolidating, monitoring and reporting on the total number of complaints, enquiries and other feedback that have been received, resolved or are pending at the subproject, PMT and PCU levels. As part of this system, the higher levels of the EODP GRM are responsible for monitoring complaints handling performance at the lower levels at any given point during the implementation of this project.

Information compiled by the PCU GRM focal point will be essential for reporting on progress on the EODP's grievance indicators, "number and percentage of grievances registered that are addressed", that are included in the Project Results Framework on a quarterly basis.

Reporting

GRM focal points for all PMTs will report to the PCU GRM focal point on the second Monday of each month. The PCU GRM focal point will make consolidated reports available to the REFAATO President on a monthly basis, and to the World Bank on a quarterly basis and on request.

The reports should provide an overview of feedback received that is related to EODP implementation. Additional information should include:

1. Nature of the feedback
2. Aggregate information on the GRM users (including demographic – student, parent, gender, etc.)
3. Information on where the feedback was received and in what format.
4. Information on the status of complaints and queries (resolved, under review, etc.).
5. Information on how complaints and queries were resolved.
6. Information on unresolved complaints/queries and why they are not yet resolved.

Such reports may also include recommendations for improving the GRM or the EODP design. These recommendations should be based on the monitoring of the GRM, specifically the extent of the GRM's functionality and the types of feedback that have emerged.

Disclosure activities

As soon as the site-specific ESMPs gets clearance from the World Bank and approval from the Ministry of Environment, the following disclosure procedures will be adapted:

- A final report, in English and Arabic, will be published on the WB, EODP and Ministry of Water Resources websites.
- A copy of the ESIA report in English and a summary in Arabic will be made available in the MOWR branch office in Anbar Governorate. Additionally, an Arabic executive summary will be made available in the regional branch.
- An A3 poster will be installed in the entrance of the regional branch office informing about the results of the study and the website link for the full ESIA report.
- It will be useful also to maintain leaflets of the project impacts, GRM and contact office in the regional branch.

8 ANNEX 1: CONTRACTOR'S RESPONSIBILITES

إجراءات وقائية لإدراجها في المواصفات الفنية للعقود

i. **إجراءات عامة**

أ) يجب ان يتعهد المقاول و موظفيه بتنفيذ اجراءات الوقاية المذكورة وان يتخذ كافة الاحتياطات التي يطلبها المهندس لمنع الضرر نتيجة والحد من اثار اعماله على البيئة بمحاذاة الطريق والتاكد من ان موظفيه وعماله يلتزمون بهذه الاجراءات والاحتياطات.

ب) لا يجب السماح للمقاول باشغال الطريق دون ضرورة, يجب على المقاول استخدام العرض الادنى للطريق الموجود.

ت) اعمال الازالة التي لا يمكن القيام بها بكفاءة خلال انشاء الطريق يجب القيام بها عند اكتمال كل جزء من الطريق (اعمال الحفر والتسوية والصرف) وقبل اصدار شهادة استلام الاعمال :-

- يجب تجميل هذه الاجزاء والقيام باي اعمال اصلاحية دون تاخير وتشمل التشجير .
- يجب تنظيف المجاري المائية والمصارف والترع من العوائق لضمان انسياب المياه .
- يجب استخدام حفر الاستعارة كمزارع سميكة او تصريفها وتامينها حسب الاتفاق مع مالك الارض.

ث) يجب على المقاول ان يقصر اعمال الإنشاءات بين الساعة (6) صباحا حتى (7) مساءا اذا كانت تتم في منطقة سمنية او قريبة منها.

ج) يجب على المقاول تجنب استخدام معدات ثقيلة او مزعجة في مناطق معينة اثناء الليل او في مناطق حساسة مثل القريبة من المستشفيات .

ح) يجب على المقاول ان يقوم باعمال رش المياه بصفة منتظمة للتراب والحصى من اجل منع التلوث بالغبار خلال فترات الجفاف وان يقوم بتغطية سيارات نقل مواد الإنشاءات لمنع سقوطها.

ii. **النقـــــــــل**

أ) يجب على المقاول استخدام طرق مختارة بالاتفاق مع المهندس وسيارات ذات حجم مناسب لنوع الطريق وتحديد الحمولة لمنع تلف الطرق والجسور المستخدمة في عملية النقل لموقع المشروع , المقاول يتحمل المسؤلية عن اي تلف للطرق والجسور بسبب نقل حمولات زائدة ويجب ان يطلب منه اصلاح هذه التلفيات بالاتفاق مع المهندس.

ب) لايجب ان يستخدم المقاول اي سيارات , سواء على الطريق او خارجه , ينتج عنها تلوث زائد من ماسورة العادم او ضوضاء وائدة , ويجب تركيب عوازل للضوضاء وصيانتها في جميع السيارات الخاضعة للمقاول التي تستخدم في المناطق السكنية .

ت) يجب ان يستخدم المقاول ضوابط مناسبة لسلامة حركة المرور طوال مدة تنفيذ العقد وتخضع هذه الضوابط للموافقة المسبقة من المهندس.

iii. **العمـــــــالة**

أ) يجب على المقاول ان يستخدم اكبر قدر ممكن من العمالة المحلية وان يوفر لهم التدريب اللازم عند الضرورة .

ب) يجب على المقاول تركيب وصيانة نظام خزانات مؤقت لتجميع الصرف الصحي لمخلفات معسكرات العمال السكنية وضمان عدم تلويث هذا النظام للمجاري المائية القريبة.

ت) يجب على المقاول انشاء وسائل ونظام لتخزين والتخلص من كافة المخلفات الصلبة الناتجة عن معسكر العمال و / او معسكر الادارة .

ث) يجب على المقاول ان لايسمح باستخدام خشب الاشجار كوقود للطهي او التدفئة في اي معسكر للعمال او الادارة ولكن يجب استخدام بدائل اخرى.

ج) يجب على المقاول ضمان ان مكاتب ومستودعات الموقع وخصوصا مواقع تخزين وقود الديزل والبيتومين والاسفلت , تقع على مسافة (500) متر على الاقل من المجاري المائية وتدار بحيث لا ينتج عنها ملوثات تصل للمجاري المائية سواء السطحية والجوفية , وخاصة خلال فترات المطر. وهذا يتطلب اعادة تدوير الشحومات وحفر خندق حول المنطقة به مصايد للزيوت عند المخارج.

ح) لن يستخدم المقاول خشب وقود في التدفئة خلال تصنيع او اعداد اي مواد تشكل جزء من العمل.

iv. المحاجر وحفر الاستعارة

أ) يجب ان يخضع تشغيل منطقة استعارة جديدة سواء على الارض في النهر او في منطقة موجودة لموافقة مسبقة من المهندس ويجب ان يتوقف العمل اذا اصدر المهندس تعليمات بذلك ويجب حضر حفر الاستعارة اذا تعارضت مع مسارات الصرف الطبيعي او المخططة. يجب حضر هذه المواقع على النهر حيث يمكن ان تؤدي لهبوط او تدمير ضفاف النهر او تسبب سقوط كميات كبيرة من المواد الناعمة في مجرى المياه.

ب) يجب ان يضمن المقاول ان حفر الاستعارة المستخدمة قد تركت في حالة ثبات وجوانبها المائلة مستقرة وجافة لضمان عدم تراكم مياه آسنة تؤدي لتكاثر الناموس.

ت) يجب اخذ الصخور او الحصى من النهر من مسافات متباعدة بحيث يقتصر عرض المواد المأخوذة على واحد على عشرة من عرض النهر في اي موقع واحد وبحيث لا يعوض انسياب النهر او يتلف او يضر بضفتي النهر.

ث) يجب ان يخضع موقع الكسارات لموافقة المهندس والا يكون قريبا من المناطق الحساسة بيئيا او المناطق السكنية القائمة وتشغيلها بوسائل معتمدة للتحكم في الغبار.

v. الاعمال الترابية

أ) يجب التحكم بطريقة مناسبة في الاعمال الترابية وخصوصا خلال موسم سقوط الامطار .

ب) يجب على المقاول ان يحافظ على الجوانب المائلة في مناطق الحفر والردم مستقرة في جميع الاوقات والحد قدر المستطاع من تاثر المناطق المجاورة لمنطقة العمل .

ت) يجب على المفاول الانتهاء من اعمال الحفر والردم للمقاطع العرضية النهائية في اي موقع باسرع وقت ممكن ومن الافضل في عملية واحدة مستمرة وان لايترك جزء غير مكتمل من هذه الاعمال وخصوصا في موسم سقوط الامطار

ث) يجب توفير المصارف علوية وسفلية اعلى واسفل المنحدرات من اجل حماية اي ميول للحفر والردم من التآكل ,طبقا للتصميمات وزراعتها بالحشائش او غيرها من الغطاء الاخضر. يجب توفير مصارف علوية فوق تلال الحفر العالية لتقليل جريان المياه وتآكل الميل .

ج) يجب التخلص من اي ناتج حفر او مواد غير مناسبة في مقالب مخصصة لذلك بالاتفاق مع المهندس.

ح) يجب عدم اختيار موقع هذه المقالب بحيث تشكل منزلقات في المستقبل او تتعاض مع الاراضي الزراعية او الانشطة الاخرى او تجرف تربة المقلب في مجرى المياه. قد تنشأ حاجة لعمل مصارف داخل وحول المقالب وحسب توجيهات المهندس.

vi. المواقع التاريخية والأثرية

اذا اكتشف المقاول خلال اعمال الحفر او الإنشاءات مواقع او مقتنيات اثرية او ثقافية او تاريخية , يجب على المقاول:

أ) وقف اعمال الإنشاءات في المنطقة المكتشفة.

ب) عمل كردون (تصوير) حول الموقع اوالمنطقة المكتشفة .

ت) تامين الموقع لمنع تلف او فقدان المقتنيات التي يمكن نقلها. في حالة وجود مقتنيات اثرية او حساسة يمكن نقلها, يجب تواجد حارس ليلي حتى يتم تسليم الموقع للسلطة المحلية ووزارة الثقافة.

ث) اخطار المهندس المشرف الذي يقوم بدوره باخطار السلطة المحلية المسئولة ووزارة الثقافة فورا (اقل من 24 ساعة).

ج) الاتصال بالجهة المحلية المسئولة ووزارة الثقافة لمباشرة مسئولية حماية والحفاظ على الموقع قبل اتخاذ قرار بالاجراءات المناسبة التي سيتم تنفيذها . قد يتطلب ذلك عمل تقييم مبدئي للموجودات بواسطة خبراء الاثار في وزارة الثقافة (خلال 72 ساعة) . يجب تقييم اهمية الموجودات طبقا للمعايير المختلفة الخاصة بالتراث الثقافي وتشمل القيمة الجمالية والتاريخية والعلمية والبحثية والاجتماعية والاقتصادية.

ح) ضمان ان تتخذ السلطة المحلية المسئولة ووزارة الثقافة قرار كيفية التعامل مع الموجـودات . وقد يشمل ذلك تغيير التصميم (على سبيل المثال عندما تكون الموجودات آثار لا يمكن نقلها) , وطرق المحافظة والاستعادة والترميم.

خ) تنفيذ قرار السلطة المحلية الخاص بادارة الموجودات يجب توزيعه مكتوبا بواسطة وزارة الثقافة.

د) تستانف الاعمال فقط بعد استلام تصريح كتابي بذلك من الجهة المحلية المسئولة ووزارة الثقافة بخصوص اجراءات تامين الآثار المكتشفة.

vii. **التخلص من مخلفات الإنشاءات ومخلفات السيارات**

أ) يجب اعادة استخدام المخلفات الناتجة من تفكيك المنشآت الحالية قدر الامكان في الانشاءات المقترحة (مثل استعمالها كمواد ردم) يجب التخلص من مخلفات الإنشاءات المتبقية في مواقع يحددها ويوافق عليها مهندس المشروع فقط. يجب على المقاول ان يضمن ان هذه المواقع (أ) لا توجد في مناطق غابات , (ب) لا تؤثر على مسارات الصرف الطبيعي , (ج) لا تؤثر على الحياة البرية النادرة والمهددة بالانقراض . يجب تحت اي ظرف من الظروف ان يقوم المقاول بالتخلص من اي مخلفات او مواد في المناطق البيئية الحساسة.

ب) في حالة التخلص من اي قمامة او مخلفات بناء او طمي في ارض مجاورة , يجب على المقاول ان يقوم فورا بازالتها وتنظيف المنطقة المتضررة واعادتها لحالتها الاصلية طبقا لرضا المشرف / المهندس.

ت) يجب التخلص من المواد الطينية او المختلفات المشابهة المتولدة من الحفر او انشطة الإنشاءات الاخرى بحيث لا تنساب في المياه السطحية او تشكل كتل طينية في المنطقة.

ث) كافة ترتيبات النقل خلال اعمال الإنشاءات وتشمل التوريد والصيانة والتفكيك وازالة المخلفات عند الضرورة , سوف تعتبر مكملة للعمل ويجب ان يتم تخطيطها وتنفيذها بواسطة المقاول حسب موافقة وتعليمات المهندس.

ج) يجب القيام بتشغيل وصيانة واعادة التزود بالوقود للسيارات / الالات ومعدات التشغسل بطريقة لا تؤدي الى انسكاب الوقود والشحومات وتلويث الارض . سوف يتم توفير مصدات للزيوت في مناطق الغسيل واعادة التزود بالوقود . يجب ان تكون مستودعات الوقود في مكان مناسب ومعزول.

ح) يجب التخلص من كافة الانسكابات والمنتجات البترولية المجمعة طبقا للاجراءات / الارشادات البيئية القياسية . يجب ان تقع مناطق تخزين الوقود ومناطق التزود بالوقود على مسافة (300) متر على الاقل من منشآت الصرف ومصادر المياه المهمة او حسب تعليمات المهندس.

9 ANNEX 2: CULTURAL HERITAGE CHANCE FIND PROCEDURE

Cultural property includes monuments, structures, works of art, or sites of significance points of view, and are defined as sites and structures having archaeological, historical, architectural, or religious significance, and natural sites with cultural values. This includes cemeteries, graveyards, and graves. During the project induction meeting, all contractors will be made aware of the presence of an on-site archaeologist who will monitor earthmoving and excavation activities.

The initial phase of the proposed emergency reconstruction operations pose limited risks in damaging cultural property since sub-projects will largely consist of small investments in community infrastructure and income generating activities, reconstruction of existing structures, and minor public works. Further, it is understood by the Consultant that any activity that would adversely impact cultural property would make a subproject ineligible. Nevertheless, the Consultant will check that the following procedures for identification, protection from theft, and treatment of discovered artifacts should be followed in the event that archaeological material is discovered:

- Stop all construction activities in the area of the chance find.
- Delineate the discovered site or area.
- Record the find location, and all remains are to be left in place.
- 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 immediately (within 24 hours or less);
- Notify the supervisory Engineer who in turn will notify the responsible local authorities 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 findings shall be taken by the responsible authorities and the Ministry of Culture. This could include changes in the layout (such as when finding an irremovable remain of cultural or archaeological 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.
- The Consultant will ensure that during project supervision, the Site engineer will monitor the above regulations relating to the treatment of any chance find encountered and observed. Relevant findings will be recorded in World Bank Project Supervision Reports (PSRs), and Implementation Completion Reports (ICRs) will assess the overall effectiveness of the project's cultural property mitigation, management, and activities, as appropriate.

10 ANNEX 3: STAKEHOLDERS IDENTIFICATION

Stakeholder Identification

The first step in the process of stakeholder engagement is stakeholder identification; that is, determining who the project stakeholders are and what they should be grouped under. According to the World Bank's Standard 10, a stakeholder refers to "individuals or groups who: (a) are affected or likely to be affected by the project (project-affected parties); and (b) may have an interest in the project (other interested parties)".[39] Therefore, aiming at understanding surrounding social context of the proposed project area, the Consultant conducted site investigation visits for the proposed project activities to map out all the relevant stakeholders.

Following stakeholder identification, a primary analysis is applied to distinguish each stakeholder's impact on project development so to plan their respective level of engagement in the future. This stakeholder mapping and analysis exercise is used to group stakeholders according to their role and influence pertaining to the project. Accordingly, the following table lists the identified stakeholders and states their effect over the project:

Table 10-1 Mapping of Project Stakeholders

Categories	Stakeholder Groups	Role
Primary Stakeholders		
Project Owner	Nineveh Municipality	• Implementing agency of the safeguard documents • Oversees activities of environmental and social planning • Supports the project by providing requested services such as data related to climate change, temperature, humidity…etc. In addition, they aid in preparing various permits required and infrastructure maps, when requested. • Resolves conflicts that may arise over agricultural lands and road access for example. • Allocates the necessary security measures • Educates the population on and implementing the GRM.
Local Governmental Entities	Environmental Office within the Governorates	• Responsible for monitoring compliance with environmental requirements. • Conducts consultation activities with stakeholders • Supports the project by providing requested services such as data and maps, when requested.
	Mosul District	• These entities have high authority for the delivery of services in the geographic boundaries of the district.

[39] World Bank ESS 10. Available at: http://documents.worldbank.org/curated/en/476161530217390609/ESF-Guidance-Note-10-Stakeholder-Engagement-and-Information-Disclosure-English.pdf

Categories	Stakeholder Groups	Role
	Local Governmental Units	• Processes and implements permissions for road access and pavement during implementation. • Prepares permissions for the lands needed for the project, rehabilitation of roads, which is one of the major issues raised by the community, will be performed by the local governmental unit.
Contractors	Direct Implementation Contractor and Sub-contractors	• Direct implementation contractors are responsible for providing all of the material, labor, equipment (such as engineering vehicles and tools) and services necessary for the construction of the project. • Responsible for the implementation of the approved environmental and social plans. • Specialized subcontractors to perform all or portions of the construction work.
Funding Agencies	The World Bank (WB)	• Financiers and regulators because their safeguards will influence the implementation of the project. • Responsible for reviewing and approving safeguard documents
Coordination Unit	REFAATO - EODP	• REFAATO is the coordination unit of the umbrella project, as well as the main authority concerned with supervising the project activities and implementation of the project. • It oversees activities of the Environmental and Social Management Plan
Other Governmental Entities	Ministry of Construction, Housing, Municipalities & Public Works Roads and Bridges Directorate	• The Ministry of Construction, Housing, Municipalities & Public Works is responsible for the maintenance of public work, construction, and infrastructure in the municipalities, as well as all relevant work permits. • Involved in coordinating construction of the project activates.
	The Ministry of Health and Environment	• Develops public policies related to the protection of environment and improving its quality. • Issues regulations for environmental determinants and monitoring their implementation.
	Ministry of Electricity	• Responsible for the maintenance of electricity network and supply in the municipalities, as well as all relevant work permits. • Involved in coordinating construction of the project activates.
	Sewage Department in Mosul	• Concerned with the treatment and discharge of wastewater

Categories	Stakeholder Groups	Role
	Water Department in Mosul	• Responsible for the operation of drinking water treatment plants.
	Ministry of Agriculture Agricultural Department in the Governorates	• Determining the ownership of agricultural lands and contracts. • Determining the prices of agricultural crops and trees. Developing the annual agricultural strategy and plans after consultation with the Ministry of Water Resources.
	Security forces	• Their cooperation is needed in order to allow for the safe and timely transit of materials and workers. • Providing civil protection during the project phases.
Potential Affected Communities	Community Leaders *Mukhtars* Religious Leaders	• Responsible for delivering important information to and from community members. • Allocates Iraqi Public Distribution System rations for both fuel and food among members of the community. • To be consulted, if needed, when processing grievances • Act as an important source of information on the project's area of influence by providing detailed information about the local context.
	Residents of communities within the project site Mosul District	• They are the direct receptors of the project impacts. Thus, they are ranked as one of the most important stakeholders. • Residents of local communities will also potentially benefit from job opportunities or other positive economic outcomes.
	Vulnerable groups	• Vulnerable groups may likely be adversely affected by environmental and social impacts, while also being least likely to benefit from the project. • Women in the context of the Project suffer a lack of proper social and economic inclusion. Therefore, they should be included as an important group to be promoted. The elderly and disabled need to be appropriately engaged and accommodated by the project, if needed.
Secondary Stakeholders		
Civil Society	Local NGOs Professional Associations	• They can consult with the local communities during the project implementation and act on their behalf. • They can also provide information to poor and marginalized groups. • They provide support to facilitate project implementation.

Categories	Stakeholder Groups	Role
Media	Paper-based and online news outlets Social networking sites	• Disclosure of information about the project on the website of the Ministry of Electricity. • Disclosure of information about the project on the Facebook pages of the local government, agriculture directorate, and of the Roads and Bridges Directorate.
Small Businesses	Private companies	• Mainly potential tenderers for construction work.
	Suppliers and traders	• They will benefit from supplies contracts for the project side. This includes providing food supplies, transportation, materials, craftsmen, artisans, etc.

11 ANNEX 4: LIST OF PARTICIPANTS

No.	Name of Participant	Male/Female	Level of Education	Position
Government Official				
1	Rakan Mohamed Saleh	Male	Bachelor Degree	Government Official
2	Hamed Awad Saleh	Male	Bachelor Degree	Government Official
3	Ahmed Aboud Nawaf	Male	Bachelor Degree	Government Official
4	Fares Khaleel Khaled	Male	Bachelor Degree	Government Official
5	Mohamed Dawaj Khaled	Male	Bachelor Degree	Government Official
6	Younes Obaid Shalash	Male	Bachelor Degree	Government Official
Civil Society Members				
10	Donya Muwafek	Female	Bachelor Degree	Coordinator at Women's Center (Italian UPP)
11	Doaa Luqman	Female	Bachelor Degree	Caseworker at Women's Center (Italian UPP)
12	Nawal Mahmoud	Female	Bachelor Degree	Social Researcher at Women's Center (Italian UPP)
Local Community Members				
7	Arkeya Fi'aly	Female	Illiterate	House Wife
8	Uthman Zafer Ghanem	Male	Primary	Restaurant Waiter
9	Mashgal Youssef Abdullah	Male	Diploma	Retired/Shop Owner
13	(Refused to share)	Male	Unknown	Lieutenant at Nineveh Station
14	Ahmed Mohamed Salah	Male	Secondary	Unemployed
15	Abdullah Ahmed Sallam	Male	Primary	Unemployed
16	Ahmed Jassem Mohamed	Male	Bachelor Degree	Retired
17	Shaker Mahmoud Aboud	Male	Primary	Unemployed
18	Ahmed Mohamed Sultan	Male	Dentistry Degree	Dentist
19	Kuhtan Adnan	Male	Nursing Degree	Nurse
20	Ahmed Ali Mohamed	Male	Diploma	Warehouse Manager

No.	Name of Participant	Male/Female	Level of Education	Position
21	Mohamed Mahmoud Hussein	Male	Primary	Volunteer
22	Mahfouz Younes	Male	Bachelor Degree	Administrative Support
23	Nour Jan Jassem	Female	Nursing Degree	Nurse
24	Saadiya Fandi	Female	Primary	Services worker
25	Abdeljabar Ahmed	Male	Diploma	Paramedic

Arabic

مقابلة جماعية FGD

الموقع: الموصل - الجانب الايمن - شارع 60

رقم	الاسم	العمر	المهنة	التعليم	مدة الإقامة في المجتمع المحلي	الجوال
1	احمد محمد صالح	51	عاطل عن العمل	اعدادية	8 سنوات	07701846816
2	عبد الله احمد سلام	40	عاطل عن العمل	ابتدائية	10 سنوات	07513234313
3	احمد جاسم محمد	52	متقاعد	بكلوريوس علوم عسكرية	15 سنة	07705233039
4	شاكر محمود عبود	32	عاطل عن العمل	ابتدائي	15 سنة	07511835154

الموقع: الموصل - الجانب الايمن – منطقة الهريمات قرب شارع 60 – المركز الصحي

رقم	الاسم	العمر	المهنة	التعليم	مدة الإقامة في المجتمع المحلي	الجوال
1	احمد محمد سلطان	39	طبيب اسنان و مدير المركز الطبي	طب اسنان	موظف من سنة في المركز الطبي	07702005741
2	قحطان عدنان	32	ممرض	معهد تمريض	10 سنوات	07701738824
3	احمد علي محمد	50	امين مخزن	دبلوم	6 سنوات	07502337706
4	محمد محمود حسين	39	متطوع	ابتدائية	سنة	07707703261
5	محفوظ يونس	48	معاون اداري	بكلوريوس ادارة	6 سنوات	07511570060
6	نور جان جاسم	26	ممرضة	معهد تمريض	6 سنوات	07511371789
7	سعدية فندي	50	موظف خدمة	ابتدائية	4 سنوات	07515398351
8	عبد الجبار احمد	43	معاون طبي	دبلوم	9 سنوات	07719743133

الموقع: الموصل - الجانب الايمن المنظمة الايطالية UPP

رقم	الاسم	العمر	المهنة	التعليم	مدة الإقامة في المجتمع المحلي	الجوال
1	دنيا موفق	32	منسقة في مركز النساء التابع الى منظمة UPPالايطالية	بكلوريوس	تعمل في المنطقة من سنة	07517736813
2	دعاء لقمان	30	مديرة حالة في مركز النساء التابع الى منظمة UPPالايطالية	بكلوريوس هندسة	تعمل في المنطقة من سنة	07705255288
3	نوال محمود	36	باحثة اجتماعية في مركز النساء التابع الى منظمة UPPالايطالية	بكلوريوس ادارة	تعمل في المنطقة من سنة	07518658501

12 ANNEX 5: OFFICIAL LETTER FOR AREA CLEARANCE FROM UXOS

Ninawa Governorate
Reconstruction
Governor Assistant Office
NO. :
Date : / /2020

محافظة نينوى
مكتب معاون المحافظ
لشؤون الاعمار
العـــــدد: ٢١٦
التاريخ : / /٢٠٢٠

الى / مديرية الدفاع المدني في محافظة نينوى
م/ تأييد

تحية طيبة ...

لغرض الموافقة على تنفيذ المشاريع المدرجة في ادناه , لتزويدنا بتأييد خلو مواقع هذه المشاريع من الذخائر غير المنفجرة . علما ان المواقع في الجانب الايمن داخل حدود البلدية و خارج حدود المدينة القديمة ونخول السيدين (عمر نظير بشير) و(حمدون يونس خلف) للمتابعة .

.. مع التقدير

المشاريع :

١- تطوير وتأهيل شارع ٦٠ في منطقة الهرمات / الجانب الايمن لمدينة الموصل (من تقاطع صناعة الابواب والشبابيك الى نهاية مشيرفة) .
٢- تأهيل وتوسيع شبكات وخطوط ناقلة للماء في احياء من الجانب الايمن لمدينة الموصل (دورة الحمامين و حي الاغوات و دورة ١٩ في وادي العين) .
٣- تأهيل انارة الشوارع لاحياء من الجانب الايمن في مدينة الموصل (سايدين سوق المعاش و سايدين محطة كهرباء اليرموك و الشارع الممتد من تقاطع اليرموك الى فندق الموصل) .

المهندس
عبدالوهاب سلطان احمد
معاون المحافظ لشؤون الاعمار
٢٠٢٠/٤/٢

صوره عنه الى :
- مكتب السيد المحافظ / للتفضل بالاطلاع .. مع التقدير
- فريق نينوى لمشاريع الممولة من البنك الدولي / للتفضل بالاطلاع .. مع التقدير
- المكتب/ اضبارة الصادر

E-mail : Construction.nin.iq@gmail.com
EA2030B2*2020/2/2F

جمهورية العراق
وزارة الداخلية
مديرية الدفاع المدني
مديرية دفاع مدني نينوى
شعبة معالجة القنابل الغير منفلقة
العدد / ١١٥٠ / ٨٠
التاريخ / ٥ /٢/ ٢٠٢٠

بسم الله الرحمن الرحيم

إلى /محافظة نينوى / مكتب معاون المحافظ لشؤون الاعمار

م/تأييد

****

كتابكم ذي العدد ٢١٦ في ٢٠٢٠/٢/٣

بتأريخ ٢٠٢٠/٢/٤ تم ارسال مفرزة معالجة القنابل غير المنفلقة الى المواقع المذكورة في موضوع بحث كتابكم اعلاه حيث تم اجراء المسح الميداني فوق مستوى سطح الارض ولم يتم العثور على اي مخلف حربي بالوقت الحاضر .

للتفضل بالعلم مع التقدير .

العميد الحقوقي
حسام خليل عبد
مدير دفاع مدني نينوى /وكالة
٥ /٢/ ٢٠٢٠

13 ANNEX 6: FEEDBACK UPTAKE FORM ON REFAATO'S WEBSITE (ARABIC AND ENGLISH)


صندوق إعادة إعمار المناطق المتضررة من العمليات الإرهابية
الصفحه الرئيسيه
ARABIC
ENGLISH
تفاصيل الحالة
تفاصيل عن حاله الشكوى
نوع المشروع
المحافظة
المنطقه
اسم المشروع (اذا كان معروفا)
وصف مفصل للحالة
صندوق إعادة إعمار المناطق المتضررة من العمليات الإرهابية
الصفحه الرئيسيه
ARABIC
ENGLISH
تفاصيل الاتصال
إذا تم تقديم الملاحظات نيابة عن شخص آخر
ما هي علاقتك بالشخص الذي يتم تقديم الملاحظات نيابة عنه؟
تفاصيل الشخص الذي يتم تقديم الملاحظات نيابة عنه
الاسم الأول
أسم الأب
أسم العائلة
العنوان
رقم المنزل
رقم الشارع
القضاء او القريه أو المدينة
ما هي وسيلة الاتصال المفضلة لديك؟ (اختياري)
هل يواجه هذا الشخص أيًا من التحديات التالية التي يجب مراعاتها أثناء الاتصال به أو الرد عليه؟

الأدلة التي يمكنك مشاركتها مع الصندوق لتوثيق الحالة

اختر احدى الخيارات

+ أرفع الملف الخاص بك

إذا كانت شكوى، هل اتخذت أي إجراء لمعالجة مشكلة الشكوى؛ إذا كانت الإجابة نعم، بمن اتصلت؟ وماهي الخطوات التي اتخذتها بهذا الصدد؟

هل لديك أية اعتراضات على ما يلي

- [ ] تلقي اتصال من فريق إدارة المشروع لمزيد من التوضيح والمناقشة حول القضية؟
- [ ] إجراء مقابلة مع المختص في وحدة تلقي الشكاوى في صندوق اعادة اعمار المناطق المتضررة من العمليات الارهابية بعد حصولك على الرد للحالة المقدمة من قبلك (شكوى – مقترح – استفسار) لقياس مدى رضاك عن النتائج؟

يرجى ملاحظة/ أنه يحق لجميع المواطنين الطعن في قرار نتيجة الشكوى التي قدمت الى EOPD GRM . يحق لمستخدمي الية تلقي الشكاوى الغير راضين عن نتيجة شكواهم اعادة تقديم شكواهم الى المختص في وحدة تلقي الشكاوى (REFATTO GRM Coordinator) في غضون 30 يوم من تلقي الرد على الحالة السابقة. الخيار الاخر هو التوجه للقضاء عبر المحاكم المختصة.

أرسال البيانات

صندوق إعادة إعمار المناطق المتضررة من العمليات الإرهابية

ENGLISH ARABIC الصفحة الرئيسية

FEEDBACK UPTAKE FORM FOR GRIEVANCE REDRESS MECHANISM

Please answer the following questions

Do you wish to remain anonymous

- Yes or No -

Contact Details

If you do not wish to remain anonymous, then please fill out the following information [Please fill in your details even if you are complaining on behalf of someone else]

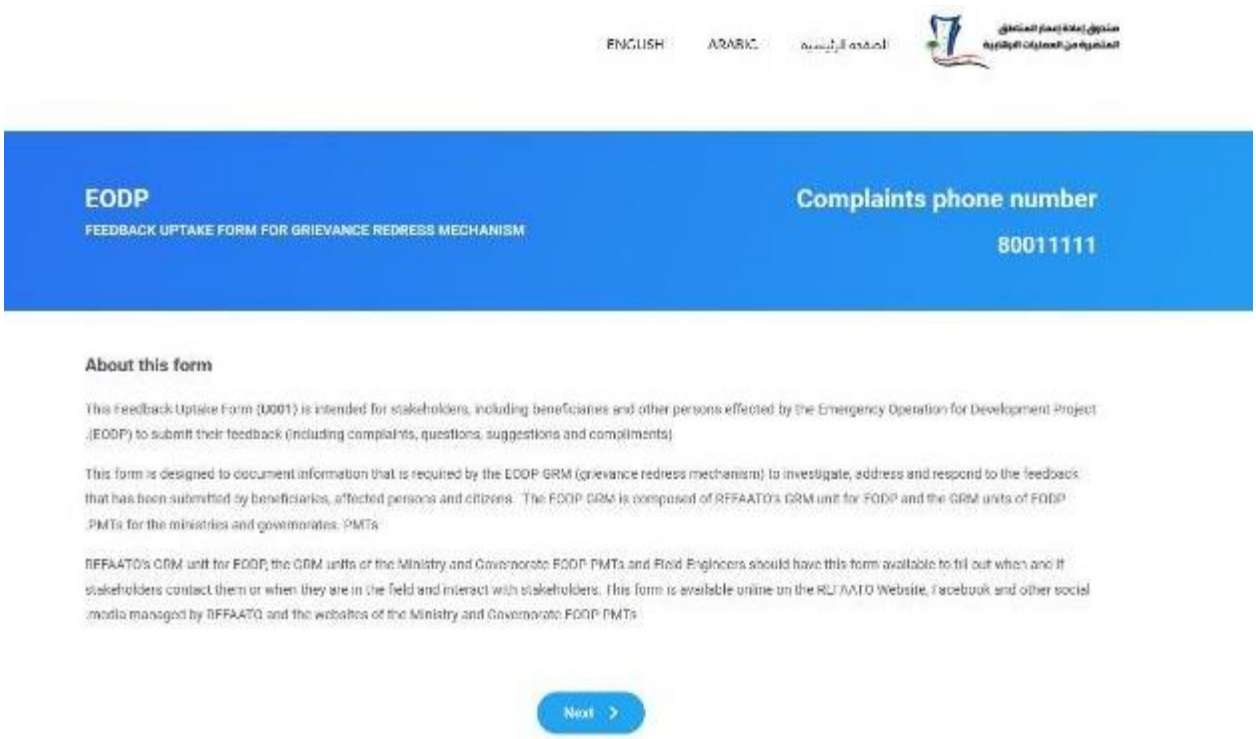
First Name | Father's name | Family Name

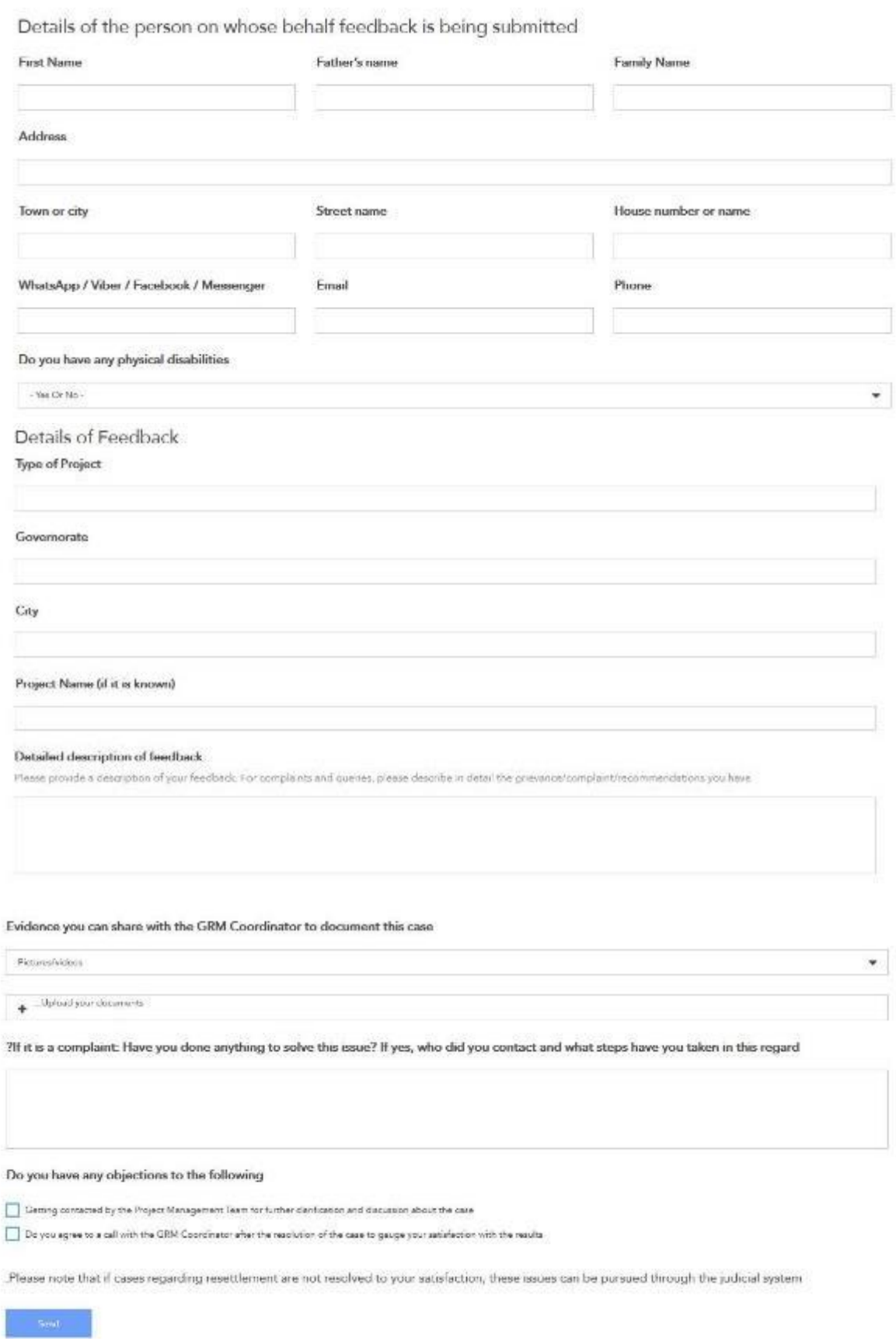
Address

Town or city | Street name | House number or name

What is your preferred mean of communication

- optional -


ENGLISH
ARABIC
EODP
FEEDBACK UPTAKE FORM FOR GRIEVANCE REDRESS MECHANISM
Complaints phone number
80011111
About this form
This Feedback Uptake Form (U001) is intended for stakeholders, including beneficiaries and other persons effected by the Emergency Operation for Development Project (EODP) to submit their feedback (including complaints, questions, suggestions and compliments)
This form is designed to document information that is required by the EODP GRM (grievance redress mechanism) to investigate, address and respond to the feedback that has been submitted by beneficiaries, affected persons and citizens. The EODP GRM is composed of RFFAATO's GRM unit for EODP and the GRM units of EODP PMTs for the ministries and governorates. PMTs
RFFAATO's GRM unit for EODP, the GRM units of the Ministry and Governorate EODP PMTs and Field Engineers should have this form available to fill out when and if stakeholders contact them or when they are in the field and interact with stakeholders. This form is available online on the RLFAATO Website, Facebook and other social media managed by RFFAATO and the websites of the Ministry and Governorate EODP PMTs
Next



Details of the person on whose behalf feedback is being submitted

First Name | Father's name | Family Name

Address

Town or city | Street name | House number or name

WhatsApp / Viber / Facebook / Messenger | Email | Phone

Do you have any physical disabilities

- Yes Or No -

Details of Feedback

Type of Project

Governorate

City

Project Name (if it is known)

Detailed description of feedback

Please provide a description of your feedback. For complaints and queries, please describe in detail the grievance/complaint/recommendations you have

Evidence you can share with the GRM Coordinator to document this case

Pictures/Videos

Upload your documents

?If it is a complaint: Have you done anything to solve this issue? If yes, who did you contact and what steps have you taken in this regard

Do you have any objections to the following

Getting contacted by the Project Management Team for further clarification and discussion about the case

Do you agree to a call with the GRM Coordinator after the resolution of the case to gauge your satisfaction with the results

Please note that if cases regarding resettlement are not resolved to your satisfaction, these issues can be pursued through the judicial system

Send