2023

Environmental & Social Impact Assessment study for Manah I Solar PV Power Plant

EDF Renewables and KOWEPO

Final Report

HMR#5083
HMR Environmental Engineering Consultants
8/6/2023

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Issue and Revision

Rev	Date	Prepared	Checked	Approved	Description
4	09.08.2023	MP | MZ	MZ	NR	Final Report
3	31.07.2023	MP | MZ	MZ	NR	Addressing AIIB and EA's Comments
2	05.07.2023	TM | MP | IM	MZ	NR	Addressing LTA Comments
1	25.05.2023	ZR | IM | MH	MZ	NR	Draft 1 for Client Review

Executive Summary

Project Background

The Manah Solar I Independent Power Project will be designed as greenfield solar photovoltaic power plants at the Manah I site and will be rated for a maximum power export of 500 MW (AC). The generated power of the Manah I power plant will be exported to the electrical transmission system via the 400 kV Manah switching grid station constructed by OETC in the vicinity of Manah Solar I site.

Manah Solar I site is located in the Ad Dakhiliyah region, about 130 km (linear distance) from the coast. The elevation is between 340 m and 350 m above sea level. The Krooki is located about 30 km south of the town of Manah (road distance). The surface allocated to Manah Solar I site is 775.33 ha.

Manah Solar I Power Plants will generate power using bifacial N-Type modules installed on 1P single axis trackers. DC power will be converted to AC power through string inverters connected to LV/MV transformers that will feed the 33kV internal grid. 33 kV AC power will be transformed into 400kV in the Manah Solar I IPP substation using 2 HV transformers 33 kV/400 kV and exported to Manah OETC substation through two 400 kV underground cables.

Environmental and Social Baseline

The environmental and social baseline study describes the current environmental and social aspects that will be impacted as a result of the project development (refer to chapter 4). It is the intention of this study to use this information in conjunction with the assessment of potential releases, in order to understand and assess the potential impact which may be released as a result of the development.

Environmental Releases

All environmental releases during the construction, operation and decommissioning phases of the proposed project have been identified and discussed based on the provided project information and the typical knowledge of releases from the power station.

Construction Phase

Releases to the environment from the construction phase of the project include air emissions, solid, semi-solid and liquid wastes, accidental releases and noise.

The sources of air emissions and noise during construction phase include various construction equipment, Diesel Generator (DG) units, and vehicles. Major pollutants released from such sources include NOX, SO2, CO, PM and unburned hydrocarbons (HC). Non-hazardous solid wastes will comprise construction debris, excavated soil, packaging materials, scrap metal from construction and equipment fabrication, maintenance wastes and domestic wastes. Solid and liquid hazardous wastes will include waste oil, paints, containers of hazardous materials, contaminated soils from spills etc.

Accidental releases at construction sites may result mostly from any spills during loading / unloading, transportation and use of materials. However, there will be slight releases due to the minor construction activity and they are identified in chapter 6.

Operation Phase

The assessment of environmental releases during operation phase of the project addresses various waste streams generated due to the operation of the solar PV plant in Manah I on Chapter 5.

Considering the project is a renewable energy generation project, the releases during operation phase are minimal.

Decommissioning Phase

The environmental releases during the decommissioning phase will include emissions from the DG units, emissions from demolition equipment and vehicle, dust generation from earthworks. These are very similar to the releases from the construction phase.

Environmental and Social Impacts

The identification and assessment of potential impacts from the proposed project is conducted using suitable matrices and checklists. The expected releases to the environment due to the project activities, the environmental and social aspects (sources of potential environmental and social impacts) associated with the project activities are identified and analysed.

The impact ratings for the project construction, operation and decommissioning phases are presented in this report. No major impacts have been identified. Most range from positive to medium impact.

Environmental and Social Management Plan

Chapter 9 describes various measures that are to be implemented so as to mitigate the environmental and social impacts from the project phases of the project to ALARP levels.

Periodic environmental and social audits are also described that should be conducted by the contractor or an independent consultant to ensure effective implementation of the management plan.

الملخص التنفيذي

الخلفية

سيتم تصميم مشروع منح للطاقه الشمسيه 1المستقل للطاقة كمحطة لتوليد الطاقة الكهروضوئية الشمسية في موقع منح 1 وسيتم تصنيفها لإنتاج طاقة قصوى تبلغ 500 ميجاوات (AC). سيتم تصدير الطاقة المولدة من محطة توليد الكهرباء "منح 1" إلى نظام النقل الكهربائي عبر محطة تحويل "منح" 400 كيلو فولت التي أنشأتها الشركة العمانية لنقل الكهرباء بالقرب من موقع "منح للطاقهالشمسية 1".

يقع موقع منح للطاقه الشمسيه 1 في منطقة الداخلية على بعد حوالي 130 كم (مسافة خطية) من الساحل. الارتفاع ما بين 340 م و 350 م فوق مستوى سطح البحرز المساحة المخصصة لموقع منح للطاقة الشمسية تبلغ 775.33 هكتار.

ستقوم محطة الطاقة الشمسية بتوليد الطاقة باستخدام وحدات ثنائية الاتجاه من النوع N مثبتة على أجهزة تتبع أحادية المحور P1.

سيتم تحويل طاقة التيار المستمر إلى طاقة تيار متردد من خلال محولات سلسلة متصلة بمحولات LV / MV تغذي الشبكة الداخلية 33 كيلو فولت. سيتم تحويل طاقة التيار المتردد 33 كيلوفولت إلى 400 كيلوفولت في محطة Manah Solar I IPP الفرعية باستخدام محولين عاليين 33 كيلوفولت / 400 كيلوفولت وتصديرها إلى محطة Manah OETC من خلال كابلين تحت الأرض بجهد 400 كيلوفولت.

خط الأساس البيئى والاجتماعى

تصف الدراسة الأساسية البيئية والاجتماعية الجوانب البيئية والاجتماعية الحالية التي ستتأثر نتيجة تطوير المشروع (راجع الفصل 4). تهدف هذه الدراسة إلى استخدام هذه المعلومات بالاقتران مع تقييم الإطلاقات المحتملة ، من أجل فهم وتقييم التأثير المحتمل الذي قد ينطلق نتيجة للتطوير.

الإصدارات البيئية

تم تحديد ومناقشة جميع الإصدارات البيئية أثناء مراحل للمشروع المقترح بناءً على معلومات المشروع المقدمة والمعرفة النموذجية للإطلاقات من المحطات.

مرحلة البناء

تشمل الإطلاقات إلى البيئة من مرحلة إنشاء المشروع الانبعاثات الهوائية والنفايات الصلبة وشبه الصلبة والسائلة والإطلاقات العرضية والضوضاء. سيتم اتخاذ تدابير مناسبة لتقليل توليد النفايات ومناولتها وتخزينها ونقلها ومعالجتها والتخلص منها.

تشمل مصادر انبعاثات الهواء والضوضاء أثناء مرحلة البناء معدات البناء المختلفة ووحدات مولدات الديزل (DG) والمركبات. تشمل الملوثات الرئيسية المنبعثة من هذه المصادر أكاسيد النيتروجين ، وثاني أكسيد الكبريت ، وثاني أكسيد الكربون ، والجسيمات ، والهيدروكربونات غير المحترقة (HC). تشتمل النفايات الصلبة غير الخطرة على حطام البناء ، والتربة المحفورة ، ومواد التعبئة والتغليف ، والخردة المعدنية من الإنشاءات وتصنيع المعدات ، ونفايات الصيانة ، والنفايات المنزلية. تشمل النفايات الخطرة الصلبة والسائلة نفايات الزيوت والدهانات وحاويات المواد الخطرة والتربة الملوثة من الحبوب وما إلى ذلك.

قد ينتج عن الإطلاق العرضي في مواقع البناء في الغالب عن أي انسكابات أثناء التحميل / التفريغ ، ونقل واستخدام المواد. ومع ذلك ، ستكون هناك إصدارات طفيفة بسبب نشاط البناء الصغير وتم تحديدها في الفصل 5.

مرحلة التشغيل

لن يكون هناك انبعاثات كبيرة في الهواء حيث لن يكون هناك مصدر انبعاثات مستمر في الموقع. لا توجد إطلاقات كبيرة للنفايات الصلبة الخطرة وتوليد النفايات غير الخطرة من الموقع.

مرحلة إيقاف التشغيل

ستشمل الإطلاقات البيئية خلال مرحلة إيقاف التشغيل انبعاثات من وحدات DG ، وانبعاثات من معدات الهدم والمركبات ، وتوليد الغبار من أعمال الحفر. هذه تشبه إلى حد بعيد الإصدارات من مرحلة البناء.

التأثيرات البيئية والاجتماعية

تم تحديد وتقييم التأثيرات المحتملة من المشروع المقترح باستخدام المصفوفات وقوائم المراجعة المناسبة. تم عرض تصنيفات التأثير لمراحل إنشاء المشروع وتشغيله وإيقاف تشغيله في الفصل 9 من هذا التقرير. يتراوح معظمها من تأثير الإيجابي إلى متوسط التأثير.

خطة الإدارة البيئية والاجتماعية

سوف يلتزم مسؤول الصحة و السلامة و البيئة بإجراءات التحكم ومتطلبات الإدارة البيئية والاجتماعية الموضحة في خطة الإدارة البيئية والاجتماعية الموضحة ف فصل 9 وأي متطلبات إضافية تحددها الجهات التنظيمية عن طريق شروط التصريح البيئي ، وتصاريح البناء ، وما إلى ذلك. سيكون مقاول البناء مسؤولاً عن ضمان أن ينشئ المقاولون من الباطن أيضًا نظام لتنفيذ متطلبات خطة الإدارة البيئية والاجتماعية بشكل فعال

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List of Acronyms

AC	Alternating Current
ALARP	As low As Reasonably Practicable
BAT	Best Available Techniques
BREFS	Best Reference Documents
CH4	Methane
CO	Carbon Monoxide
CO2	Carbon Dioxide
dB	decibels (dB)
DC	Direct Current
DGs	Diesel Generators
DIV	Dutch Intervention Value
EA	Environmental Authority
EBRD	European Bank for Reconstruction and Development
EIA	Environmental Impact Assessment
EP	Environmental Permit
EPFI	Equator Principle Financial Institution
EPFI	Equator Principle Financial Institution
EPs	Equator Principles
ESCP	Environmental and Social Commitment Plan
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management system
ESSs	Environmental and Social Standards
EU	European Union
GBIF	Global Biodiversity Information Facility
GHG	Greenhouse Gases
HC	un-burnt hydrocarbons
HFC	Hydrofluorocarbon
IAM	Impact Assessment Matrices

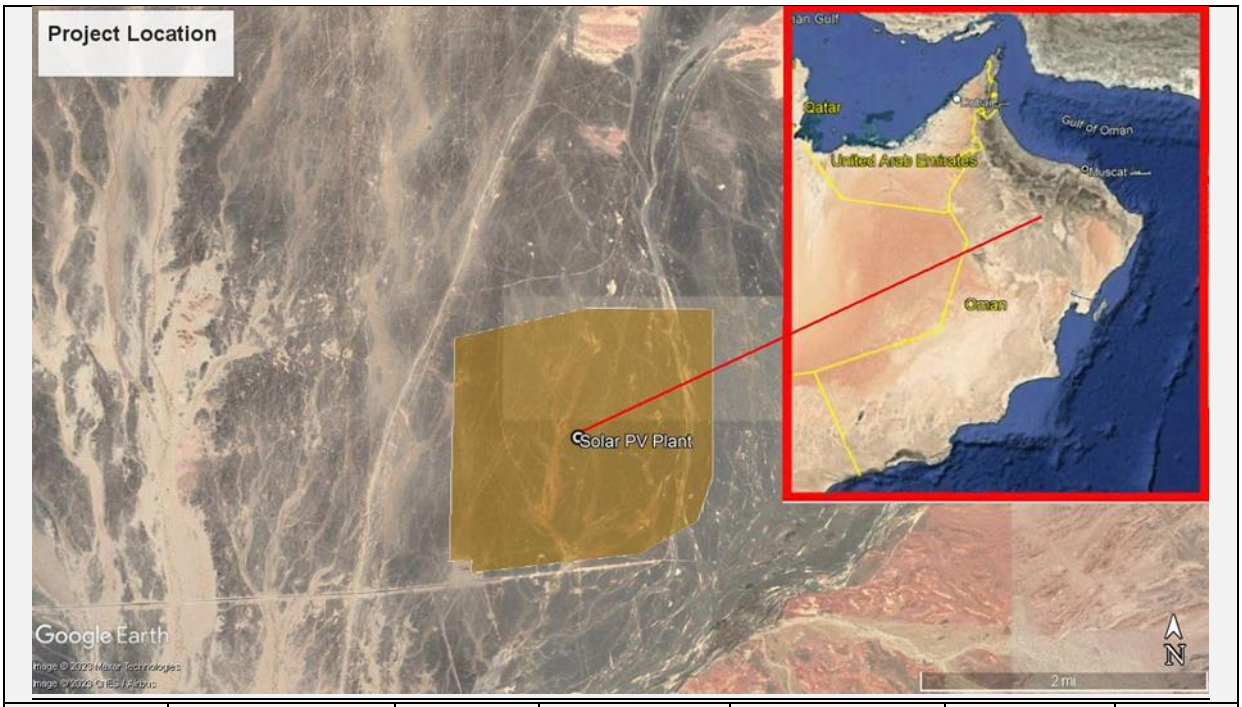
IFC	International Finance Corporation
IPCC	The Intergovernmental Panel on Climate Change
ISO	The International Organization for Standardization
KOWEPO	Korean Western Power
L&FS	Life and Fire Safety
MD	Ministerial Decision
MSDS	Material Safety Data Sheet
NOx	Nitrogen Oxides
ODS	Ozone Depleting Substances
OETC	Oman Electricity Transmission Company
PDR	Personnel Data Ram
PFC	Perfluorinated compound
PM	Particulate Matter
POI	The Point of Interconnection
PPC	Power Plant Controller
PPE	Personal Protective Equipment
PSs	Performance Standards
PV	Photovoltaics
RD	Royal Degree
SF6	Sulfur hexafluoride
SO2	Sulfur Dioxide
STC	Standard Test Conditions,
STP	Sewage Treatment Plants
VOCs	Volatile organic compounds

1 Introduction

1.1 Project Background

EDF Renewables and Korean Western Power CO., Ltd. (KOWEPO) have formed a consortium to develop, finance, design, engineer, construct, own, operate and maintain the 500MW Manah I Solar PV Plant. The project will have a minimum installed DC capacity of 500 MW at Standard Test Conditions (STC). The power plant will be connected to the licensed transmission system operator's new transmission substation at the connection point at a voltage level of 400kV with the OETC sub-station located adjacent to the project site.

The site for the development of the Manah I project is adjacent to the Manah II planned project site and is located in the Ad Dakhiliyah region, approximately 30 km south from the town of Manah, and covers an area of approximately 775ha as illustrated below. The PV Plant will be connected to OETC through a 400kV transmission line, and the interconnection point is the newly built 400kV Manah Switching Grid Station.



Description:	Project:	Area:	Produced For:	Produced by:	Source:	Drawn By:
Manah I Solar PV Power Plant Location	Environmental Impact Assessment for Manah I Solar PV Power Plant	Manah, Sultanate of Oman	EDF Renewables and KOWEPO	HMR Environmental Engineering Consultants	Image extract from Google Earth	Zuhoor Al Rashdi

Figure 1-1 Location of the Project

1.2 Need for ESIA study

The overall objective of the ESIA study is to identify and evaluate all significant impacts from the project activities on the environment and socio-economy. This is to develop appropriate management plans for the mitigation of all potential adverse impacts. . The project activities cover the construction and operation and decommissioning phases of the project.

1.3 Categorization of the Project

As part of the permitting process in the Sultanate of Oman, it is required to conduct an Environmental and Social Impact Assessment (ESIA) study since the project falls under Category A as per MD 48/2017 (Regulations for Organizing Environmental Permitting). However, with reference to IFC standards, the project activity falls under Category B.

MD 48/2017 environmental permitting activities are categorized based on factors such as the materials used in production, production capacity, and their environmental impact, into three categories: A, B, and C. Category A necessitates the inclusion of an environmental impact assessment study with the permit application, Category B offers an exemption from this requirement in certain industrial estates, and Category C determines the permit's environmental requirements based on the evaluation of the application.

Based on the IFC standards, Category A represents business activities with significant adverse environmental or social risks, Category B involves limited risks that can be addressed through mitigation measures, and Category C includes activities with minimal or no adverse risks.

1.4 Consultant Appointed

EDF Renewables and Korean Western Power Company (KOWEPO) have appointed HMR Environmental Engineering Consultants to support the permitting process in Oman, which includes conducting the Environmental & Social Impact Assessment (ESIA) study in order to obtain an Environmental Permit (EP) for the proposed project in compliance with applicable national and international standards.

1.5 Objective and Scope of ESIA Study

The ESIA will identify and estimate the potential environmental impacts arising from the project development phases. The Environmental and Social Management Plan (ESMP), which is part of the ESIA, will propose appropriate measures to prevent and mitigate potential impacts and ensure compliance with applicable regulations. In addition to Omani regulations, the Manah I Project will comply with international guidelines. These are elaborated further in the subsequent chapter.

The scope of work for this ESIA included the following elements:

- Highlight the environmental legislation and standards pertinent to the project activities;
- Desktop reviews and field studies for assessing the current status of the environment and thereby evaluate the impacts from the proposed project development;

- Identification and assessment of potential environmental impacts of the project including climate change aspects, primarily during the construction and operation phases;
- A summary of:
    - The most important stakeholder groups identified;
    - The analysis of stakeholder significance; and
    - The stakeholder engagement activities.
- Environmental analysis of alternatives for the project;
- Environmental review of the project for characterization and quantification of wastes generated, greenhouse gas (GHG) emissions, ozone depleting substances (ODS) used and energy requirements;
- Development of a suitable environmental and social management plans including mitigation measures and monitoring programs during the construction and operation phases of the project; and
- Preparation of an ESIA report for review by Environment Authority (EA) as well as the international project lenders.

1.6 ESIA Methodology

1.6.1 Document Review

Information related to the project provided by the client was reviewed to gather relevant information on the project. The environmental releases of the project were studied in order to identify potential environmental aspects.

Environmental baseline information from previous studies in the area was reviewed against primary data collected near the project area through field studies, considering the interaction of the project components with various environmental elements. Field studies mainly focused on potential areas of significance with regard to the environmental impacts of the project activities.

1.6.2 Environmental and Social Data Collection

Environmental data gathering included primary data collection from field studies and review of secondary data from previous study reports and published documents. Field studies / primary data collection were carried out near the project area for ambient air, noise, dust, soil and terrestrial ecology as part of walk through survey. Collating the social baseline data (both primary and secondary data) for the site based on site survey and published information and other available data for the previous studies conducted as well as a stakeholder engagement was also held with the

community (wali office) to capture/identify any Bedouin communities that may have presided or are present in the area.

1.6.3 Environmental and Social Impact Assessment

Based on the above, the potential environmental and social impacts from the proposed project during the construction and operation phases were identified using qualitative and quantitative assessment techniques. The identified impacts then were assessed using Impact Assessment Matrices (IAM) used for combining the two assessment criteria i.e. the severity of the impact and duration or likelihood of its occurrence. The significance of each impact is determined based on the nature, duration and severity of the impact taking into consideration the sensitivity of the existing environment.

1.6.4 Environmental and Social Management Plan

Based on the environmental and social impacts identified, an Environmental and Social Management Plan (ESMP) has been developed to reduce and mitigate significant impacts to 'As low As Reasonably Practicable' (ALARP) levels as part of the ESIA. An Environmental monitoring system has also been identified and monitoring programs have been developed based on review of feasible alternatives to comply with legislation.

1.6.5 Structure of the Report

The ESIA report is divided into 11 chapters as presented in the table below. A non-technical executive summary is presented ahead of the main report.

Table 1-1 Structure of ESIA report

Chapters	Chapter Name	Content Description
Chapter 1	Introduction	Provides introduction and background of the project with brief ESIA methodology
Chapter 2	Environmental Regulatory Framework	Discusses applicable national and international regulations and standards
Chapter 3	Project Description and Definition of Area of Influence	Presents the description of the project along with brief details of design and layout. It also details the utilities and manpower requirements during construction and operation phases of the project along with details of power plant operation process.
Chapter 4	Analysis of Alternatives	Reviews the need for the project and provides an analysis of alternatives for the critical processes associated with the project development from an environmental standpoint.
Chapter 5	Environmental and Social Baseline	Describes the baseline environmental and social conditions at the project site based on primary and secondary data analysis
Chapter 6	Environmental Releases	Details the releases to the environment from the project activities, primarily during the construction and operational activities of the project along with methods of their collection, storage and disposal.

Chapters	Chapter Name	Content Description
Chapter 7	Climate Affairs	Discusses the effects on climate change due to proposed project activities by identifying type of ODS used and the estimate of emissions of GHG from the project installation and operation.
Chapter 8	Environmental and Social Impact Assessment	Identifies and quantifies the potential impacts to the environment as a result of the project construction and operation phases. The stakeholder engagement is also addressed in this chapter.
Chapter 9	Environment and Social Management Plan (ESMP)	Presents the ESMP including control measures for mitigating significant impacts.
Chapter 10	Environmental Framework	Presents recommendations for Environmental permit condition throughout all phases of the project
Chapter 11	Conclusions	Summarizes the conclusions of the study.
-	Appendices	All data, calculations, basis of calculations and all other additional information used for ESIA studies

2 Applicable Environmental and Social Regulation

2.1 Omani Environmental Legislation

Environmental protection within Oman is primarily governed by the "Law for the Conservation of the Environment and the Prevention of Pollution" (Royal Decree, RD, 114/2001) administered by the Environment Authority (EA). For reference, laws and regulations, including those on environmental and climate protection and pollution control, are issued as Royal Decrees (RDs) and Ministerial Decisions (MDs) as listed in the following table.

RDs typically relate to the provision of environmental law without specific requirements, while MDs typically provide specific requirements that must be met to comply with RDs (with exception of RD 114/2001 as discussed in this section). The project needs to be compliant with these guidelines to minimize the environmental impacts as practicably possible.

Table 2-1 Applicable Omani Regulations

Ref No:	Description	Applicability to Project Activity
Principles of Environmental Management		
MD 187 /2001	Organizing the Issuance of Environmental Approval	Guiding law on issuance of environmental approval (MD 187 /2001, 2012)
RD 114/2001	Law for Conservation of the Environment and Prevention of Pollution	Guiding law on pollution prevention and natural resource conservation (RD 114/2001, 2001)
MD 48/2017	Regulations for Organizing Environmental Permitting	Guides on organising the environmental permit for the project (MD 48/2017, 2017)
-	Environmental Permit Conditions which will be issued by EA after approval of this ESIA	Mandatory fulfilment of conditions of environmental permits to ensure full compliance
Nature Conservation		
MD 101/2002	Prohibition of killing, hunting or capturing of wild animals and birds	Guiding law on Banning the killing or hunting of wild animals and birds (MD 101/2002, 2002)
MD 169/2000	Regulations on cutting of trees	Regulation on protection of trees within the project influence area (MD 169/2000, 2000)
RD 8/2003	Law of Grazing Lands and Animal Resources	Guiding on protecting grazing lands and animal resources (RD 8/2003, 2003)
Ecology		
RD 6/2003	Law on Nature Reserves and Wildlife Conservation (RD 6/2003, 2003)	Guiding law on protecting wildlife and habitat
RD 67/2002	Sanctioning the Conservation of Wildlife and their Habitats in the GCC countries (RD 67/2002, 2002)	

Ref No:	Description	Applicability to Project Activity
MD 110/2007	Regulations of the Law on nature reserves and wildlife conservation (MD 110/2007, 2007)	
Heritage and Culture		
RD 6/ 1980	Heritage Protection	Guiding on protecting the heritage in Oman during project activities (RD 6/1980, 1980)
RD 35/2019	Promulgating the Cultural Heritage Law	Guiding law on Promulgating the Cultural Heritage (RD 35/2019, 2019)
Water		
MD 421/98	Regulations for Septic Tanks, Soakaway Pits and Holding Tanks	Protection the land and water resources from Pollution (MD 421/1998, 1998)
RD 29/2000	Issuing the Law of Water Resources Conservation	Guiding law on sustainable use of water resource (RD 29/2000, 2002)
MD 264/2000 amended by MD 3/2009	Regulations on wells and springs	Sets out procedures for the registration and the licensing of wells and springs. It regulates the registration of the contractors and their duties and provides for penalties and sanctions (MD 3/2009, 2009)
RD 115/2001	Law on Protection of Sources of Potable Water from Pollution	Guiding law on preventing pollution of groundwater resources (RD 115/2001, 2001)
MD 145/93 and amendment MD 55/2002 and MD 12/2017	Regulations for wastewater reuse and discharge	Prohibits discharge of untreated wastewater to the environment, and regulates wastewater treatment (MD 12/2017, 2017)
Waste		
MD 18/93 amended by MD 56/2002 and MD 10/2017	Regulations for the management of hazardous wastes	Handling, storage and disposal of hazardous wastes generated from project activities (MD 10/2017, 2017)
MD 17/1993 amended by MD 57/2002	Regulations for the management of the solid non-hazardous wastes	Handling, storage and disposal of non-hazardous wastes from project activities (MD 57/2002, 2002)
MD 159/2005	Discharge liquid effluent in marine environment	Manage discharge of the liquid effluent in marine environment during all Project phases (MD 159/2005, 2005)
Noise		
MD 79/1994	Regulations for noise pollution in public environment	Ambient noise control (MD 79/1994, 1994)
MD 80/1994	Regulations for noise pollution in the working environment	Workplace noise control (MD 80/1994, 1994)
Air Quality		

Ref No:	Description	Applicability to Project Activity
MD 118/2004	Regulations on controlling air pollutants emanating from stationary sources	Regulates installation and operation of stationary combustion sources (MD 118/2004, 2004)
MD 41/2017	Regulations for ambient air quality standards	Ambient air quality in the project area (MD 41/2017, 2017)
Climate Affairs		
RD 73/1998	Law approving the Ratification by Sultanate of Oman to Vienna Convention for the Protection of Ozone Layer and Montreal Protocol concerning ODS	Guiding law for the protection of ozone layer and control and management of Ozone Depleting Substances (ODS) (RD 73/1998, 1998)
MD 107/2013 amended by MD 67/2015	Regulations for the control and management of ODS	Prohibits the use of ODS (MD 67/2015, 2015)
MD 20/2016	Regulation for management of climate affairs	Estimation, reporting and control of GHG, ODS, energy consumption, etc., during 3D seismic survey and drill exploratory, Consideration of mitigation measures for reducing influence of climate change and minimizing vulnerability of the project to consequences of climate change (MD 20/2016, 2016)
Occupational Health and Safety		
MD 286/2008 amended by MD 322/2011	Regulating Occupational Health & Safety in Organizations	Occupational health and safety of employees (MD 322/2011, 2011)
Local Ordinance No. 1-2006	Public Health Protection	Guiding law in public health
MD 325/2019	Amendments on the Provisions of the Health Conditions Regulations for Activities Related to Public Health	Guiding law with amendments on health conditions regulations for public health (MD 325/2019 , 2019)
Forms and Guidelines		
Form 1	Form No. (1): Guidelines for the Preparation of Climate Affairs Chapter to be Included in the Environmental Impact Assessment (ESIA) Report	This guide is used to prepare climate affairs chapter of the ESIA per EA new requirements.

2.2 Applicable Omani Social Legislation

The table below summarizes the applicable Omani social legislation.

Table 2-2 Omani Environmental Legislation Applicable to Project Activities

Ref No:	Description	Applicability to Project Activity
Heritage and Culture		
RD 6/ 1980	Heritage Protection	Guiding on protecting the heritage in Oman during project activities
RD 35/2019	Promulgating the Cultural Heritage Law	Guiding law on Promulgating the Cultural

Ref No:	Description	Applicability to Project Activity
		Heritage
Labour		
RD 53/2023	Oman Labour Law	Provides the framework for labour law in Oman
Occupational Health and Safety		
MD 35/2023	Regulating Occupational Health & Safety in Organizations	Occupational health and safety of employees
Local Ordinance No. 1 2006	Public Health Protection	Guiding law in public health
MD 325/2019	Amendments on the Provisions of the Health Conditions Regulations for Activities Related to Public Health	Guiding law with amendments on health conditions regulations for public health

2.3 Heritage and Culture Protection

In the application of the provisions of RD 6/1980 National Heritage Protection Law, the national heritage means:

- Artifacts of all kinds;
- Movable cultural property, including the products of archaeological excavations, and pieces that were originally part of antiquities or archaeological sites; and
- Groups of ancient buildings.

The relevant articles within this law are listed below:

- Article (4) of the law refers to Antiquities Protection which states that it is prohibited for any person, whether owner or non-owner of antiquities to demolish, move, completely or partially fragment, deform, modify or damage them, change the shape of the antiquities by any means such as dig, excavate, plow, or make any other change to the surrounding land, or adjacent to the aforementioned antiquity, unless this person obtains a writer approval issued by the ministry.
- Article (11) states that prior licenses must be obtained before laying electrical wires under or above the ground, telephone wires, gas or oil pipelines, whether for expansion, repair or restoration of existing buildings form the inside or outside, and for all the works that require painting, resurfacing, plumbing works or carpentry or water drainage for each registered antiquity.
- Article (21) if construction work or under any other circumstances results in the discovery of antiquities or things of an archaeological nature then whoever found these antiquities or things and the owner of the land in which they were discovered must immediately inform the nearest administrative authority of the news of this discover.

2.4 Oman Labour Law

RD 53/2023 provides the framework for labour law in Oman which applies to all Omani or expatriate employers and employees, public and private establishments, organizations, and their subsidiaries, which practice their activities in the Sultanate of Oman. The relevant sections of the above RD especially with regards to workers' rights are listed below:

Table 2-3 Relevant Articles from RD 53/2023

General and Transitional Provisions	
Article	**Description**
Employment of Citizens and Regulation of Foreigners' Work	
18	An employer is not allowed to bring non-Omani employees into the Sultanate of Oman unless he obtains permits from the Ministry.
Contract of Work	
20	No person will be allowed to practice the business of supplying foreign employees unless he obtains a licence for that purpose from the Ministry. An employer is not allowed to enter into a contract with any person for the purpose of providing foreign employees unless he obtains a licence for that purpose
Salaries, Leaves and Working Hours	
49	Salaries and other amounts due to the employee shall be paid by the currency legally in circulation unless it is agreed that it shall be in kind
51	Salaries shall be paid on one of the working days subject to the following rules: 1. Employees who receive their salaries monthly shall be paid once a month at least. 2. If the salary is paid by piece and the work requires a period which exceeds at least two weeks, the employee must be given each week an advance equal to the job he has performed and the remaining salary shall be given to him in full within the week following the completion of the work assigned to him. 3. In other cases, the salaries of the employees shall be paid once every week, however, the salaries may be paid to them once every two weeks or once every month if they agree in writing to such an arrangement and in all cases the salary must be paid within seven days from the end of the period in which it becomes due.
52	If the employment relationship comes to an end, the employee shall be paid his salary and all amounts due to him immediately, except when the employee abandons the work by himself in which case, the employer shall pay the employee's salary and all his entitlements within seven days from the date he abandons the work.
53	The employer will not be discharged from payment of the employee's salary unless the employee signs the register designed for this purpose acknowledging that he has received his salary, or signs the pay roll or a specific receipt designed for such purpose or unless the salary is transferred into the account of the employee in one of the locally approved banks provided that the particulars of these documents must state the details of the salary

General and Transitional Provisions	
Article	**Description**
61	An employee shall, upon completion of one year of continuous service with the employer, have a right to an annual leave with basic salary, for a period of fifteen days, to be increased to thirty days for every year thereafter. An employee shall have the right to a four day emergency leave with gross salary during the year in emergency cases, and it shall not exceed two days per each case. The duration of the continuous service, which starts before the application of this Law, shall be deemed to be part of the duration of service, which will be considered when determining the leave period to which the employee is entitled and the employee may not waive his leave.
65	The employee is entitled to his gross salary during the holidays of festivals and occasions which will be determined by a decision from the Minister. If an official holiday coincides with a prescribed weekly rest day, it shall be compensated by one other day. However, if the official holiday falls within the period of the employee's annual leave, the employee will not be entitled to any compensation in respect thereof. An employee may, if the circumstances of the work so require, be asked to report to work on an official holiday in which case he will be entitled to either receive his gross salary for the official holiday with an excess of not less than 25%, or take a rest day in lieu of it.
66	Subject to the provisions of the Social Insurance Law, an employee whose sickness is proved shall have the right to a sick leave not exceeding in total ten weeks in one year whether such weeks are continuous or separate and the sick leave shall be granted as follows: • The first and second week, with gross salary. • The third and fourth week, with three quarters of the gross salary. • The fifth and sixth week, with half the gross salary. • The seventh to the tenth week, with a quarter of the gross salary. Proof of sickness shall be by a medical certificate. However, in case there is a dispute, the matter shall be referred to the Medical Committee, provided for in Article (43) of this Law. A sick employee may make use of the remaining annual leave in addition to the sick leave he is entitled to.
67	An employee is entitled to special leave with gross salary, according to the following circumstances: 1. Three days for marriage, which shall not be given more than once, throughout the period of service 2. Three days for the death of a son or a daughter or a mother or a father, or a wife, or a grandfather or a grandmother or a brother or a sister. 3. Two days for a paternal uncle, or an aunt. 4. Fifteen days for performing pilgrimage, which shall be once throughout the period of service, provided that the employee has completed one year of continuous service with the employer. 5. Fifteen days in one year for examinations for Omani employees who study in one of the schools, institutes, colleges or universities. 6. A hundred and thirty days for the Muslim married female-employee, in case of her husband's death. In order to be entitled to the leave provided for in paragraphs 2, 3 and 6, the employee must present proof of death from the relevant authorities.
Employment of Juveniles and Women	

General and Transitional Provisions	
Article	**Description**
68	An employee may not be required to actually work for more than nine hours a day and for a maximum of forty-eight hours a week which shall not include the periods specified for taking food and rest. The maximum hours of work during Ramadan, shall be six hours a day or 36 hours a week for Muslims employees and the time for close of work may be determined by a decision from the Minister.
69	There shall be one or more periods during working hours for taking food and rest, the total of which shall not be less than half an hour provided that the continuous period of work shall not exceed six hours. A decision from the Minister shall determine the cases and works which, for technical reasons and operational circumstances, require continuation of work with no rest period and exhausting and hard labour for which an employee will be granted rest periods which will be considered as part of the actual working hours.
70	If an employee is required to work for more than the hours prescribed for in Article (68) the employer must either give such employee extra payment equivalent to the ordinary salary to which his is entitled for the overtime work, plus at least 25%, or grant him a permission of absence from work in lieu of the extra hours which he has done, provided that the said employee agrees to such an arrangement.
71	An employer must grant the employee not less than twenty-four consecutive hours of rest per week after at most six continuous working days. Accumulation of weekly rest periods for not more than eight weeks may be permitted by the Minister in respect of certain places of work specified by him if the employer and the employee agree to this in writing. The weekly rest shall, in all cases, be payable.
81	Females shall not be employed to work between 6.00 p.m. and 6.00 a.m. save in cases, works, and occasions which will be specified by a decision from the Minister.
82	Females shall not be employed either to perform a work which is harmful to health or hard labour or such other works which will be specified by a decision from the Minister.
Labour Disputes	
105	Any employer employing fifty or more employees must put in conspicuous place procedures for complaints and grievances to be approved by the concerned Directorate..

2.4.1 Occupational Health and Safety

MD 35/2023 provides the framework for Occupational Health and Safety in Oman which applies to all Omani or expatriate employers and employees, public and private establishments, organizations and their subsidiaries, which practice their activities in the Sultanate of Oman. Relevant sections of the above MD especially with regards to employer and employee commitments are listed in the table below:

Table 2-4 Relevant Articles from MD 35/2023

Article	Description
General and Transitional Provisions	
3	Any condition which violates the provisions of this Law shall be null and void, even if it precedes its implementation, unless it is more favourable to the employee. Any discharge or reconciliation or renunciation of the rights emanating from this Law shall be null and void, if it is contrary to its provisions. Any conditions which are considered more favourable to the employee according to the laws, regulations and decisions in force on the date this law comes into force shall be applicable.
Programmes	
28	An employer who employs fifteen employees or more, shall put in a conspicuous place in his establishment, the regulations of work after their approval by the Ministry. These regulations shall consist of: the rules which organise the work in the establishment; the rights and obligations of the employee and the employer; the rules organising the relationship between the employee, his colleagues and his superiors; the rules governing promotion if the nature of the work so requires; and the specification of salary groups, all types of allowance reimbursements and the place where they will be paid.
Work sites	
34	Any employer, who practices work in areas specified by the Minister, shall undertake to provide his employees with suitable means of transport, appropriate accommodation, proper meals and drinking water in places to be prepared for such purpose within easy reach for the employees.
87	Every employer or employer's representative must, before hiring an employee, acquaint him with the hazards of his occupation and the preventive measures, which must be adopted. The employer must take the necessary precautions to protect the employees during the work from injury to their health and dangers of work and machinery by: 1. Providing adequate safety and hygienic conditions in places of work or the tools he delivers to the employees for carrying out their duties. 2. Making sure that places of work are always clean and comply with the conditions of health, safety and occupational health. 3. Making sure that machinery, pieces of equipment and equipment are installed and kept in safe condition. The employer is not allowed to charge the employees or deduct from their salaries any amounts for the provision of such
102	Drinking water must be kept in special containers perfectly sealed to prevent pollution. Such containers must be put in places within easy reach for the employees. The water must be changed daily and containers shall be cleaned at least twice a week in a hygienic approved manner.
Facilities	

Article	Description
89	The following may be determined by a decision from the Minister in coordination with the concerned Governmental entities: - 1. General safety precautions and occupational health which must be applied in all places of work, and especially in respect of, lighting and ventilation , air circulation, drinking water, lavatories, the expulsion of dust and smoke, employees' sleeping places and fire-fighting measures. 2. Special precautions for certain types of work
The Specifications of Work Clothes and Personal Protection Equipment	
99	The employer must provide the employees with protective clothes and equipment.
Medical Care	
33	The employer must provide his employees with access to medical facilities in the establishment and he shall, if the number of his employees in one place or one country exceeds one hundred, employ a qualified nurse for providing medical aid and shall assign a doctor to visit and treat them in the place prepared by him for such purpose. The employer must provide the employees with the medicine required for the treatment, all of which must be free of charge. If the number of the employees is more than five hundred the employer shall, in addition to what is mentioned above, provide his employees with all other means of treatment in cases, the treatment of which call for the assistance of specialist doctors or surgical operations or the like and also required medicine free of any charge, except the costs of dental, ophthalmic and maternity treatment. If the employee is treated in a government hospital or a private clinic, the employer must pay the costs of treatment, medicine and impatient care, in accordance with the regulations and financial rules applied in such hospitals, subject to the provisions of the Social Insurance law.
83	A female employee, who has been working for a year with her employer, shall have the right, upon presenting a medical certificate showing delivery date, to maternity leave before and after delivery for a period not exceeding, in total, six weeks. However such a female will be entitled to choose either to consider her period of absence from work as a maternity leave without pay, or as a sick leave pursuant to Article (66) of this Law.
Occupational Diseases	
18	The employee is medically fit, free from infectious diseases and chronic diseases, which will be specified by the Ministry of Health.

2.5 International Environmental and Social Standards

In addition to Omani regulations, the Manah I Project will comply with the following international guidelines as listed below:

2.5.1 IFC Performance Standards

The table below lists the IFC performance standards (PSs) applicable to the project. PS5 (Land Acquisition and Involuntary Resettlement, (IFC PS 5, 2012)) is not applicable to the project as the 775 ha of land is devoid of any permanent land use, structures. Similarly, PS7 (IFC PS 7, 2012) is not applicable as the project as it does not interface with indigenous people as per baseline review and surveys. Other PSs are applied to this assessment. Whilst there is no presence of Bedouins within the project site, there are Bedouins within the surrounding area[1]. The Bedouins in this case have been considered as part of the local community and not indigenous people for the following reasons:

IFC Performance Standard 7 classifies "indigenous peoples" based on a specific set of criteria:

1. Self-identification as members of a distinct indigenous cultural group and recognition of this identity by others;
2. Collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories;
3. Customary cultural, economic, social, or political institutions that are separate from those of the mainstream society or culture;
4. An indigenous language, often different from the official language of the country or region.

These criteria do not apply to Bedouin people for the following reasons:

1. Self-identification and Recognition: Bedouins in Oman do not self-identify as "indigenous" in a sense that is separate from other Omanis. They consider themselves a part of the wider Omani society. They are also not portrayed as a distinct population by other Omanis. Furthermore, there are no specific laws in Oman that directly address the rights of the Bedouin people (in segregation), they are protected under the general laws of the country.

2. Collective Attachment: Most modern day Bedouins reside in permanent housing instead of the traditional nomadic lifestyle. Young Bedouins have been increasingly pursuing higher education and employment opportunities in urban areas such as Muscat.

3. Distinct Institutions: Bedouins are part of the wider Arab and Islamic cultural sphere. They do not have institutions that are separate from the rest of the Omanis.

4. Language: Bedouins in Oman speak Arabic, which is the official language of Oman. They do not have a separate indigenous language.

Table 2-5 IFC Performance Standards Applicable to the Project

[1] This has been confirmed through meetings with the wali, wali executive, and a representative from the local community. The meeting outcomes are detailed in section 4.6.7.

Ref No:	Context	Description
PS1	Risk Management	Assessment and Management of Environmental and Social Risks and Impacts (IFC PS 1, 2012)
PS2	Labour	Labour and working conditions (IFC PS 2, 2012)
PS3	Resource Efficiency	Resource efficiency and pollution prevention (IFC PS 3, 2012)
PS4	Community	Community Health, Safety and Security (IFC PS 4, 2012)
PS6	Biodiversity	Biodiversity Conservation and Sustainable Management of Living Natural Resources (IFC PS 6, 2012)
PS8	Cultural Heritage	Cultural Heritage (IFC PS 8, 2012)

2.5.1 Asian Infrastructure Investment Bank ES Policies and Standards

The AIIB Environmental and Social Policies and Standards (approved in Feb 2016, last amended in Nov 2022) set out more detailed mandatory environmental and social requirements to be implemented by the Project Proponent, depending on the nature of the Project. These standards cover the following:

ESS 1: Environmental and Social Assessment and Management (ESS 1);

ESS 2: Land Acquisition and Involuntary Resettlement (ESS 2); and

ESS 3: Indigenous Peoples (ESS 3).

Together with AIIB Environmental and Social Exclusion List, ESS1 is the only applicable standard to the project. ~~Similar to the IFC PS,~~ ESS2 and ESS3 are not applicable to the project for the reasons mentioned above.

2.5.2 Equator Principles

The Equator Principles (EPs) is a risk management framework, adopted by financial institutions, for determining, assessing and managing environmental and social risk in projects and is primarily intended to provide a minimum standard for due diligence and monitoring to support responsible risk decision-making (Equator Principles, 2020).

The EPs apply globally to all industry sectors and to four financial products (1) Project Finance Advisory Services (2) Project Finance (3) Project-Related Corporate Loans and (4) Bridge Loans. The relevant thresholds and criteria for application are described in detail in the Scope section of the EPs, summarized below.

Table 2-6 Equator Principles

Ref No:	Context	Summary
Principle 1	Review and categorisation	When a Project is proposed for financing, the EP Financial Institution (EPFI) will, as part of its internal environmental and social review and due diligence, categorize the Project based on the magnitude of potential environmental and social risks and impacts, including those related to Human Rights, climate change, and biodiversity. Such categorization is based on the International Finance Corporation's (IFC) environmental and social categorization process: Category A – Projects with potential significant adverse environmental and social risks and/or impacts that are diverse, irreversible or unprecedented. Category B – Projects with potential limited adverse environmental and social risks and/or impacts that are few in number, generally site-specific, largely reversible and readily addressed through mitigation measures; and Category C – Projects with minimal or no adverse environmental and social risks and/or impacts. The EPFI's environmental and social due diligence is commensurate with the nature, scale and stage of the Project, and with the categorized level of environmental and social risks and impacts.
Principle 2	Environmental and social assessment	An Environmental and Social Impact Assessment (EIA or Assessment) must be developed for all Category A and B projects, providing an evaluation of the environmental and social risks of the project. The EIA is expected to include assessments of potential adverse Human Rights impacts and climate change risks as part of the EIA or other Assessment, with these included in the Assessment Documentation. The EIA should refer to the UNGP when assessing Human Rights risks and impacts, and the Climate Change Risk Assessment should be aligned with Climate Physical Risk and Climate Transition Risk categories of the TCFD which will be considered in climate affairs chapter of this report.
Principle 3	Applicable environmental and social standards	For Projects taking place in what are referred to as "Designated" countries the applicable standard will be host country laws, regulations and permitting requirements that pertain to Environmental and Social matters is the requirement for the EP. For Projects located in Non-Designated Countries (Oman is a non-designated county), compliance with the applicable IFC Performance Standards on Environmental and Social Sustainability (Performance Standards) and the World Bank Group Environmental, Health and Safety Guidelines (EHS Guidelines).

Ref No:	Context	Summary
Principle 4	Environmental and social management system and Action Plan	For all Category A and Category B Projects the EPFI will require NBAA to develop and / or maintain an Environmental and Social Management System (ESMS). Further, an Environmental and Social Management Plan (ESMP) will be prepared by NBAA to address issues raised in the Assessment process and incorporate actions required to comply with the applicable standards.
Principle 5	Stakeholder engagement	For all Category A and Category B Projects the EPFI will require NBAA to demonstrate effective Stakeholder Engagement, as an on-going process in a structured and culturally appropriate manner, with Affected Communities, Workers and, where relevant, Other Stakeholders. For Projects with potentially significant adverse impacts on Affected Communities, NBAA will conduct an Informed Consultation and Participation process. NBAA will tailor its consultation process to the risks and impacts of the Project; the Project's phase of development; the language preferences of the Affected Communities; their decision-making processes; and the needs of disadvantaged and vulnerable groups. This process should be free from external manipulation, interference, coercion and intimidation.
Principle 6	Grievance mechanisms	For all Category A and, as appropriate, Category B Projects, the EPFI will require NBAA, as part of the ESMS, to establish effective grievance mechanisms which are designed for use by Affected Communities and Workers, as appropriate, to receive and facilitate resolution of concerns and grievances about the Project's environmental and social performance. Grievance mechanisms are required to be scaled to the risks and impacts of the Project, and will seek to resolve concerns promptly, using an understandable and transparent consultative process that is culturally appropriate, readily accessible, at no cost, and without retribution to the party that originated the issue or concern. Grievance mechanisms should not impede access to judicial or administrative remedies. NBAA will inform Affected Communities and Workers about the grievance mechanisms in the course of the Stakeholder Engagement process
Principle 7	Independent reviews	For all Category A and, as appropriate, Category B Projects, an Independent Environmental and Social Consultant, will carry out an Independent Review of the Assessment process including the ESMPs, the ESMS, and the Stakeholder Engagement process documentation in order to assist the EPFI's due diligence and determination of Equator Principles compliance. The Independent Environmental and Social Consultant will also propose or opine on a suitable EPAP capable of bringing the Project into compliance with the Equator Principles or indicate where there is a justified deviation from the applicable standards. The Independent Environmental and Social Consultant must be able to demonstrate expertise in evaluating the types of environmental and social risks and impacts relevant to the Project.

Ref No:	Context	Summary
Principle 8	Covenants	For all Projects, where a NBAA is not in compliance with its environmental and social covenants, the EPFI will work with the NBAA on remedial actions to bring the Project back into compliance. If the NBAA fails to re-establish compliance within an agreed grace period, the EPFI reserves the right to exercise remedies, including calling an event of default, as considered appropriate. NBAA will covenant in the financing documentation to comply with all relevant host country environmental and social laws, regulations and permits in all material respects. Furthermore, for all Category A and Category B Projects, the NBAA will covenant in the financial documentation: a) to comply with the ESMPs and EPAP (where applicable) during the construction and operation of the Project in all material respects; and b) to provide periodic reports in a format agreed with the EPFI (with the frequency of these reports proportionate to the severity of impacts, or as required by law, but not less than annually), prepared by in-house staff or third-party experts, that (i) document compliance with the ESMPs and EPAP (where applicable), and (ii) provide representation of compliance with relevant local, state and host country environmental and social laws, regulations and permits; and c) to decommission the facilities, where applicable and appropriate, in accordance with an agreed decommissioning plan.
Principle 9	Independent monitoring and reporting	For all Category A and, as appropriate, Category B Projects, in order to assess Project compliance with the Equator Principles after Financial Close and over the life of the loan, the EPFI will require independent monitoring and reporting. Monitoring and reporting should be provided by an Independent Environmental and Social Consultant; alternatively, the EPFI will require that the NBAA retain qualified and experienced external experts to verify its monitoring information, which will be shared with the EPFI in accordance with the frequency required in Principle 8(b).
Principle 10	Reporting and transparency	The following NBAA reporting requirements are in addition to the disclosure requirements in Principle 5. For all Category A and, as appropriate, Category B Projects: The NBAA will ensure that, at a minimum, a summary of the EIA is accessible and available online and that it includes a summary of Human Rights and climate change risks and impacts when relevant. The NBAA will report publicly on an annual basis, GHG emission levels (combined Scope 1 and Scope 2 Emissions, and, if appropriate, the GHG efficiency ratio) during the operational phase for Projects emitting over 100,000 tonnes of CO2 equivalent annually. The EPFI will encourage the NBAA to share commercially non-sensitive Project-specific biodiversity data with the Global Biodiversity Information Facility (GBIF) and relevant national and global data repositories, using formats and conditions to enable such data to be accessed and re-used in future decisions and research applications.

2.5.3 EHS Standards

Table 2-7 EHS Guideline

Ref No:	Context	Description
1	Environmental	Guidelines in the following areas: • Air Emissions and Ambient Air Quality • Energy Conservation • Wastewater and Ambient Water Quality • Water Conservation • Hazardous Materials Management • Waste Management • Noise • Contaminated Land
2	Occupational Health and Safety	Guidelines in the following areas: • General Facility Design and Operation • Communication and Training • Physical Hazards • Chemical Hazards • Biological Hazards • Radiological Hazards • Personal Protective Equipment (PPE) • Special Hazard Environments • Monitoring
3	Community Health and Safety	Guidelines in the following areas: • Water Quality and Availability • Structural Safety of Project Infrastructure • Life and Fire Safety (L&FS) • Traffic Safety • Transport of Hazardous Materials • Disease Prevention
4	Construction and Decommissioning	Guidelines in the following areas: • Environment • Occupational Health & Safety • Community Health & Safety

3 Project Description

3.1 Project Overview

The Manah Solar I Independent Power Project will be designed as greenfield solar photovoltaic power plants at the Manah I site and will be rated for a maximum power export of 500 MW (AC). The generated power of the Manah I power plant will be exported to the electrical transmission system via the 400 kV Manah switching grid station constructed by OETC in the vicinity of Manah Solar I site. The 400kV substation of OETC, currently under advanced stage of construction, which the project will connect to, is not under the project's scope of work.

Manah Solar I site is located in the Ad Dakhiliyah region, about 130 km (linear distance) from the coast. The elevation is between 340 m and 350 m above sea level. The Krooki is located about 30 km south of the town of Manah (road distance). The surface allocated to Manah Solar I site is 775.33 ha.

Manah Solar I Power Plants will generate power using bifacial N-Type modules installed on 1P single axis trackers. DC power will be converted to AC power through string inverters connected to LV/MV transformers that will feed the 33kV internal grid. 33 kV AC power will be transformed into 400kV in the Manah Solar I IPP substation using 2 HV transformers 33 kV/400 kV and exported to Manah OETC substation through two 400 kV underground cables. An overview of the concept project design is illustrated below, which demonstrates flood drainage aspects integrated to the design as well.

3.2 Existing Infrastructure at the Project Area

3.2.1 Transportation

Manah benefits from a well-developed transportation infrastructure that facilitates smooth movement of people and goods within and beyond the town.

3.2.1.1 Road Networks

Manah is connected to neighbouring towns and cities through a network of well-maintained roads and highways. These road networks provide vital links to major urban centers, such as Nizwa, Muscat, and other regions of Oman. The roads are designed to accommodate various types of vehicles and are regularly maintained to ensure smooth and safe travel. Additionally, directional signage and road markings are in place to guide travelers and promote road safety.

3.2.1.2 Interconnectivity

The transportation infrastructure in Manah promotes interconnectivity within the town and its surrounding areas. Efforts have been made to establish reliable transportation links between residential areas, commercial centers, and public facilities. This ensures that residents have convenient access to essential services, such as healthcare facilities, educational institutions, markets, and government offices.

3.2.2 Utilities

The town of Manah enjoys reliable utility services, including electricity, water supply, and telecommunications. The government has invested in modern infrastructure and technology to ensure uninterrupted power supply, efficient water distribution, and robust communication networks. These utilities contribute to the overall convenience and quality of life in the town.

3.2.2.1 Wastewater Management

Manah area is surrounded by various wastewater treatment plants, including:

- Sewage treatment station – Mahaol (28.4 Km to project area)
- Adam Sewage treatment plant (38.1 Km to project area)
- Sinaw Sewage treatment plant (68.1 Km to project area)

These plants effectively treat and recycle wastewater, ensuring that it is safely discharged or reused for irrigation purposes. This sustainable approach to wastewater management not only preserves water resources but also safeguards the local ecosystem.

3.2.3 Healthcare

Manah is equipped with healthcare facilities that cater to the medical needs of its residents. The town has healthcare centers, clinics, and hospitals that offer a range of medical services, including primary healthcare, specialized treatments, and emergency care. The presence of these healthcare facilities ensures that the community has access to quality medical services within a reasonable distance.

3.2.4 Education

Manah places great emphasis on education, providing its residents with access to quality educational institutions. The town has primary schools, secondary schools, and educational centers that offer a comprehensive curriculum, fostering intellectual growth and skill development among students.

3.2.5 Public Services

Manah is equipped with various public services to meet the needs of its residents. The town has government offices, police stations, post offices, and municipal facilities that provide administrative, security, and postal services.

3.3 Construction Phase Activities

3.3.1 The Early Work Phase

The early work phase mainly includes site preparation work, such as: access of construction water, electricity, communication, roads, etc.; site clearance and levelling; preparation of temporary

facilities, such as site office, camp, warehouse, laydown, fence, internal roads and tracks, etc.; preparation of construction equipment, tools and materials, etc.

3.3.2 The Civil Work Phase

The civil works mainly consist of: earthwork excavation and backfilling, access roads, fence and gates, foundation of PV mounting structure, inverter & transformer foundation, control building, warehouses, workshop, site roads, cable trenches, grounding network, water supply and drainage system, HVAC, lighting, etc.

3.3.3 The Erection Work Phase

The erection work mainly consists of installation of PV mounting structure, PV module, inverter & transformer, combiner box, switchyard, secondary electrical equipment, cables laying & connecting, the grounding and lightning protection system, fire-fighting system, security system, etc.

The figure below shows a summary of the construction activities to be undertaken.

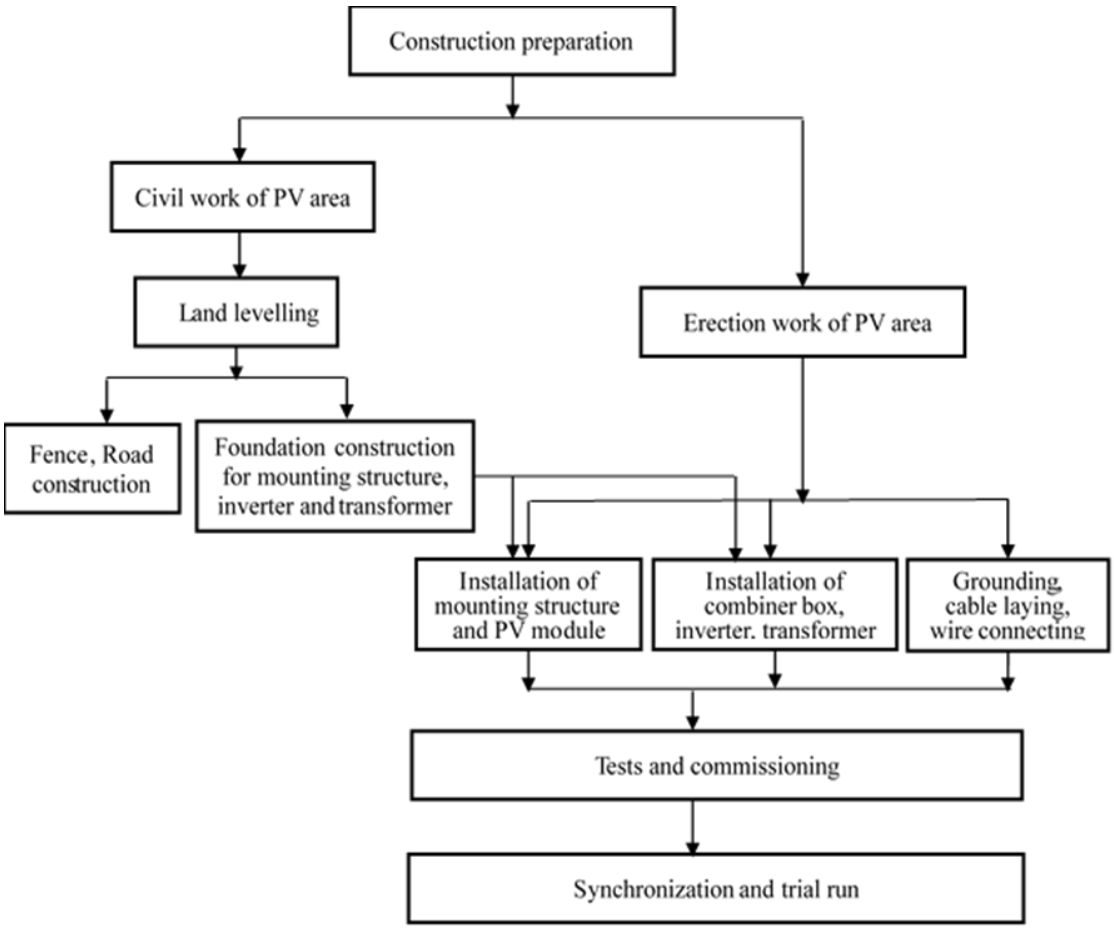


Figure 3-1 Main Construction Procedure and Activities for PV Area

3.4 Construction Equipment and Raw Materials

The equipment used during construction will comprise the following: excavator, loader, grader, dump truck, forklift, crane, compactor, concrete mixer, road roller, and ladder.

The raw materials required during the construction phase are: cement, reinforcement steel, sand, granite, marble, gravel, mortar, Ready mix concrete, and block. Material will be transported by road trucks. The contractor has the responsibility in obtaining the raw materials through a authorized sources/quarries.

3.5 Manpower Requirements

The manpower requirements per month are summarized in the table below. Their accommodation details are yet to be determined at this stage (under EPC contractor).

Month	LNTP			NTP													
	1	2	3	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Onsite Labor amount from EPC	60	120	200	300	400	600	650	650	700	700	700	700	700	650	650	300	100

3.6 Project Components and Design

The following table explains the main components in the project.

Table 3-1 the main components in Manah 1 solar project

Component	Description
Solar Farm Facility	The solar farm facility is a 630 MWdc/513.3MWac photovoltaic (PV) power generation plant on land area of approximately 7,753,000m2. The PV modules are mounted with the 1V tracker bracket and are connected in series to form PV strings. The strings subsequently feed into string inverters.
Solar Interconnection Facility (Solar IF)	The solar interconnection facility is responsible for stepping up the voltage of PV plant's power (from 33kV to 400kV) so that it can be fed into the OETC grid via a 400kV transmission line. Solar IF consists of two HV switchgears (400kV GIS), 2 unit 280 MVA power transformer. One power distribution building will be set for the medium voltage switchgear, control and relay panel, metering panel, telecommunication equipment, etc.
400kV Transmission Line	The Solar IF will be connected to the OETC 400kV substation Manah Solar with two 400kV transmission lines cables. This is illustrated in the figure below.
The Auxiliary System of OETC 400kV Substation	The auxiliary supply of the OETC 400 kV substation will be covered by IPP in parallel. The maximum auxiliary consumption of the OETC 400kV substation will be 1000kVA.

The figure below is a snapshot of the plant layout which highlights the location of the OETC 400kv substation (outside of the project boundary and scope) and the 400kv transmission lines cables (within the project boundary and scope) with a length of around 30m connecting to it.

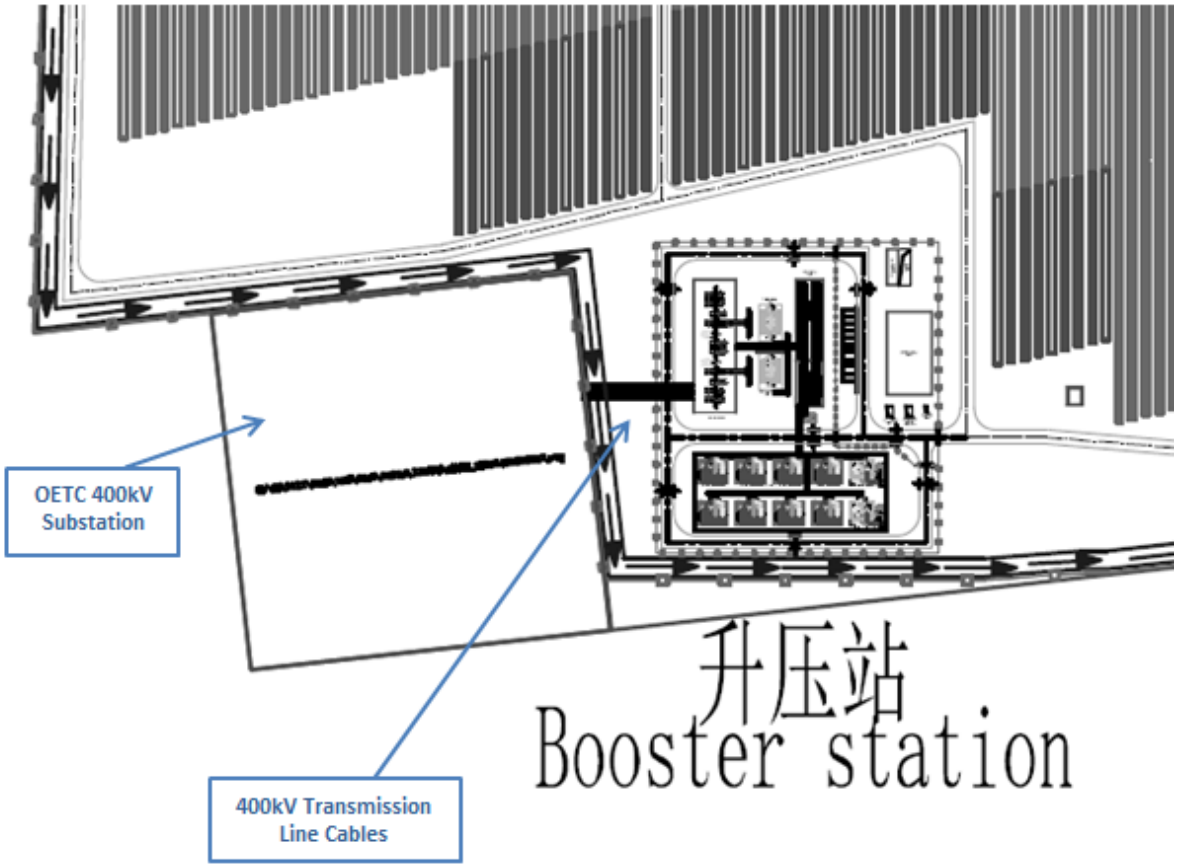


Figure 3-2 Location of OETC Substation and Transmission Lines

3.7 Associated Facilities

According to the IFC PS1, associated facilities are those facilities that are not a component of the project but would not have been constructed or expanded if the project did not exist, and the project would not be viable without them. Such facilities may be funded, owned, managed, constructed and operated by the buyer and/or project sponsor or separately from the project.

Therefore, according to this definition, the 400kV OETC substation (as highlighted in the figure above) is considered an associated facility to the project.

The transmission cables connecting to the OETC substation have not been considered an associated facility because they are a component of the project.

3.8 Electrical Primary Design

The major components used in the PV plant are described below[2]:

- 1,043,911 PV modules, each with a nameplate CV capacity of 600-605Wp leading to a total DC nameplate capacity of 630MWp at STC conditions.
    - 31-32 units PV modules per PV string.
    - 18 – 19 PV strings per inverter giving a total of 33,670 PV strings.

[2] *Please note that the numbers presented are an initial estimation given by the EPC and may be subject to some slight changes.*

- 1740 units inverters with rated capacity of 295kVA (50 degrees Celsius) capable of handling the total DC capacity of the PV arrays in the arrangement and with an AC capacity of 513.3Mva.
- 60 units ITS (Integrated Transformer Station) rated at 8.8MVA 0.80/33kV.
- Each 0.8/33kV ITS unit consists of 30 nos string inverter connected with total input power around 10.5MWp.
- Twenty 33kV PV feeder groups with three ITS for each group are laid along solar farm buoy channel into 33kV switchgears located in MV switchgear room in control building.

3.9 Plant Control Philosophy

3.9.1 Power Plant Controller

The Power Plant Controller is considered to control the plant Active & reactive power with respect to the utility requirements as per grid requirement. The Solar SCADA system takes input from the Substation Control system and then issues set point control to the Power Plant Controller (PPC), which controls the Inverter Active & Reactive Power as per requirement. Power Plant Controller can manage active and reactive power from solar plants. It is developed to be integrated into a power plant as a main governor. The set points can be commanded either remotely or locally once the SCADA is configured.

3.9.2 Reactive Power Control (Q Control)

The Power Plant Controller is capable to command to the inverters the value needed of reactive power in order to achieve a reactive power set point imposed by the On-site operator. The reactive power measures of the Point of interconnection are taken by the plant meter and used by the PPC. With the maximum values of reactive power achievable, i.e., the saturation limits of the PV plant, the reactive power control is performed. The Power Plant calculates the error when a new set point or a variation in the reactive power is given.

3.9.3 Power Factor Control (PF Control)

The power plant controller is able to make the plant follow a power factor set point in the point of interconnection. With the measures of active power in the point of interconnection (POI) and the values of the set point to be followed, the PPC creates a reactive power command to the inverters, resulting on the variation of the power factor in the POI. Once the reactive power set point is internally generated by the PPC based on the measures of active power and the power factor set point, the control algorithm is the same exposed in the reactive power control section.

3.9.4 Voltage Control (V control)

The PPC can control the voltage at the POI by means of the plant reactive power capability. With the measures of the voltage and reactive power at POI, the PPC can perform the voltage control creating

a reactive power command to the inverters. Moreover, the variation on the reactive power exchanged is given by a Droop characteristic. Depending on the voltage measured in the point of interconnection, the PPC reacts following the droop characteristic configured, i.e. if the voltage grows over the nominal value in the measurement point, the plant must respond absorbing a reactive power value following the droop curve.

3.9.5 Active Power Control Functions

The PPC can control the active power exchanged with the grid sending active power commands to the inverters. With the measures of active power at the POI, the PPC can performs active power control and establish a maximum outgoing active power

3.9.6 Frequency Control Functions

The PPC can control the active power plant output. Then, depending on the measures of grid frequency the PPC can reduce the active power exchanged with the grid. Depending on the frequency measured in the point of interconnection, the PPC reacts following the droop characteristic configured, i.e. if the frequency grows over the nominal value and the dead band configured in the measurement point, the plant must respond reducing the active power value injected following the droop curve.

3.10 Operation Phase Activities

The Company will be responsible for the following operation and maintenance activities:

- Operations and monitoring;
- Scheduled maintenance;
- Unscheduled maintenance;
- Predictive maintenance;
- Energy forecasting;
- Performances and reliability continuous improvement;
- Reporting;
- Tools and spare parts management;
- Miscellaneous activities.

The three principles of the O&M can be summed as follows:

- Safe and quality O&M on a daily basis;
- Maximize plant availability and performance;
- Failure and outage prediction and prevention which is the key O&M factor to minimize corrective maintenance.

The maintenance strategy will be organized according to the diagram below:

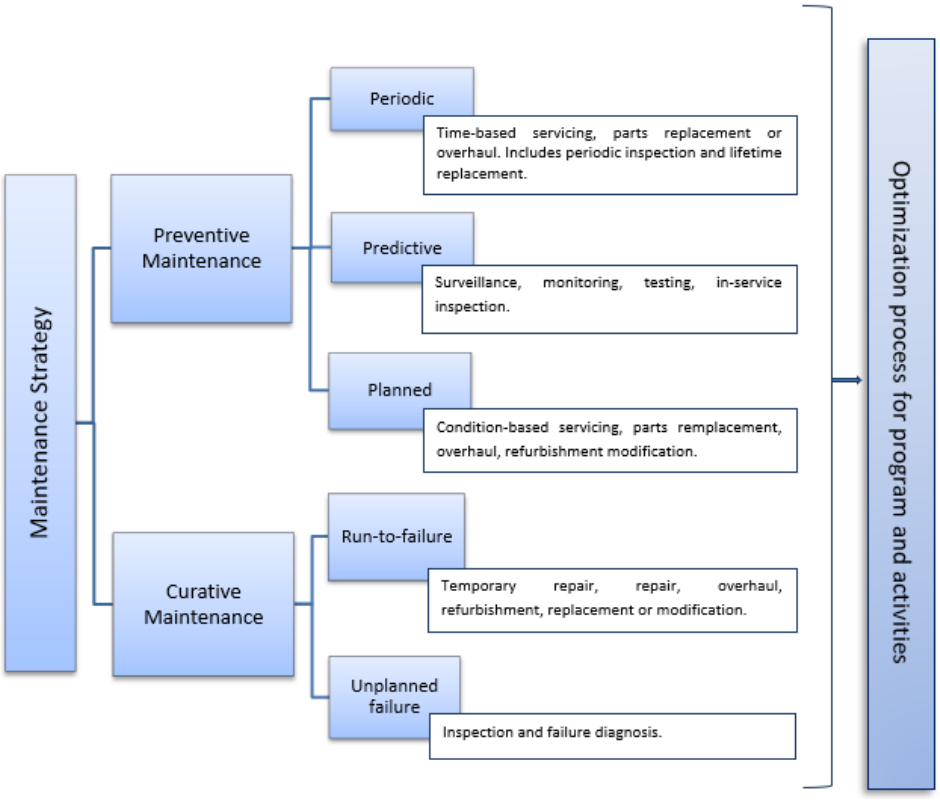


Figure 3-3 maintenance strategy

The Plant will be operated in accordance with applicable international technical rules as per RFP requirements. The Company will develop all operational and budgetary procedures, obtain necessary licenses, establish an O&M center, provide and/or hire staff.

The amount of water needed for plant operations is minimal and it is intended to be brought to site by trucks.

3.11 Design Life

Solar panel lifespan is typically 25 to 35 years. The performance period of the solar panels can be extended through reuse, refurbishment, or repowering of the facility or fully discontinuing operations and decommissioning the project.

3.12 Decommissioning Phase Activities

Full decommissioning indicates the solar facility will be closed, all photovoltaic equipment will be removed, and land will be restored to its original condition. Disassembly of the solar system mirrors assembly, only in reverse. Decommissioning activities include the following:

- Removal of all equipment, structures, fencing, roads, and foundations; and
- Restoration of property to condition prior to solar development.

PV Modules will be recycled for the economic valuation of its components: aluminium (frame), glass, semiconductor and plastic. There are other valuable components to be obtained from the PV Plant decommissioning like cables (copper and aluminium) and trackers (steel).

4 Environmental and Social Baseline

4.1 Area of Influence

The project area of influence is defined through consideration of the project footprint including all ancillary project components and also considering project impacts on various environmental and social components.

An initial screening exercise was undertaken in order to identify social and environmental sensitive receptors surrounding the project boundaries. Sensitive receptors include a mosque, a couple of farmlands, and temporary infrastructure of temporary structure observed for livestock as well as camels and goats (these are further discussed in the subsequent sections). Project activities have also been reviewed to understand the impacts and their extent (these are also detailed in subsequent chapters).

Accordingly, an area of influence of 5km has been identified. This is mainly applicable to the project construction phase. During the operation of the plant, the area of influence will be limited to the project boundaries only. This is because during the construction phase, more environmental impacts are anticipated. However, during the operation, the project will be fenced with no access to the public and no direct releases.

Figure 4-1 Area of Influence

4.1.1 Project Area Sensitivity and Seismicity

Manah is characterized by a relatively low level of seismicity. The area is not vulnerable to frequent or significant earthquakes [38], providing a favorable environment for infrastructure development and urban planning.

4.2 Baseline Approach

The environmental and social baseline studies included a series of onsite surveys in order to compile a baseline for environmental and social conditions at the site. In addition, as a part of this ESIA study, an extensive review of publicly available secondary sources of information and studies was undertaken to determine the conditions in the Study Area. The aspects screened as valued components for the Project and considered in this baseline section include climate and meteorology, ambient noise, ambient air and dust, soil quality, ecology, hydrology, cultural heritage, health and socioeconomics.

With regards to the socio-economic aspects, the National Centre for Statistical Information (NCSI), the official Omani public information database, and statistics derived from this system have been used to inform the baseline conditions of the Study Area (NCSI, 2022).

This chapter presents the available desktop baseline screening data and the primary baseline surveys. HMR submitted a baseline execution plan, and approved by EDF and KOWEPO prior to the site mobilisation. The primary baseline studies focused on the Solar PV location and the 5 km^2 radius surrounding it.

4.2.1 Land Use

A land use survey was undertaken by the team while on site in order to confirm the following:

- No current or previous physical structures or evidences (houses, settlements, unit etc.);
- No current or previous economical activities or structures or evidences (agriculture, plantations, livestock units, nomadic groups, etc.
- Confirm that project site is devoid of any infrastructure and/or utility elements which could include gas pipelines, telecom cables, etc.

Based on the site visit, the team's observations are as follows:

- Camels and goats were observed to be wandering within the site and on the road.
- There was a temporary structure observed for livestock built by the locals within 100m distance of the project boundary.

The land was granted to the project developer through the Ministry of Housing and Urban Planning. The krookie (proof of ownership) is attached in Appendix A.

4.3 Physical Environment

4.3.1 Climate and Meteorology

The climate of Oman is typically hyper-arid with two distinct seasons, winter (November to March) and summer (April to October), and the temperature varies between 3°C in winter (in the mountains) to 37°C in summer affected by various meteorological mechanisms. During the winter period in Oman occasional cold fronts causing widespread cloud and consequently heavy rainfalls do occur on the major mountains and troughs between December and April every year that concentrated in the northwest parts of Oman. In the summer months (May and June), given that Oman is exposed to large spaces of deserts and arid areas, the central parts of the country typically witness prominent sandstorms with various severity degrees.

The quantity of rainfall in the Sultanate of Oman had increased by 2.7% in 2021 with 105.8 mm of rainfall recorded compared to the 103 mm of rainfall recorded in the previous year. October came first in terms of the highest rainfall amount on average in the Sultanate of Oman in 2021 with 22.7 mm of rainfall recorded, while March recorded the lowest amount on average by about 0.9 mm.

The overall weather indicators in Oman are presented in the below figure.

Item		2016	2015	2014	2013	2012
Mean Temperature (C°)	Max.	31.2	31.4	31.7	31.4	31.0
	Min.	22.6	22.8	22.3	21.9	21.8
Mean Humidity (%)	Max.	78.2	75.1	80.2	73.5	73.9
	Min.	32.4	29.1	10.3	33.6	30.5
Mean atmospheric pressure (HPA.)	Max.	1012.9	1014.0	1012.9	1012.9	1013.2
	Min.	1008.8	1009.7	1008.5	1008.9	1009.2
Rainfull Amount (M.M.)		95.3	69.4	89.5	139.2	75.1

Item		2021	2020	2019	2018	2017
Mean Temperature (C°)	Max.	29.8	28.7	35.8	37.8	33.6
	Min.	28.4	27.5	17.6	18.5	23.1
Mean Humidity (%)	Max.	75.7	71.3	87.0	86.0	67.0
	Min.	41.2	34.3	13.0	12.0	29.0
Mean atmospheric pressure (HPA.)	Max.	1009.6	992.8	935.5	958.8	938.8
	Min.	1006.1	988.9	920.8	946.9	926.6
Rainfull Amount (M.M.)		105.8	103.0	94.3	80.8	74.7

Figure 4-2 Weather indicators in Oman, 2021[3]

Considering the Project is located within Ad Dakhiliyah Governorate, meteorological data for temperature, humidity, and rainfall were taken from the nearest meteorological station for Solar PV

[3] *NCSI data issued in 2022 and includes data of 2021.*

Plant, which was recorded at Adam Airport station. Adam airport station is 33km away southwest from the proposed project. The location of the metrological station with respect to Manah I Solar PV is shown in the map below.

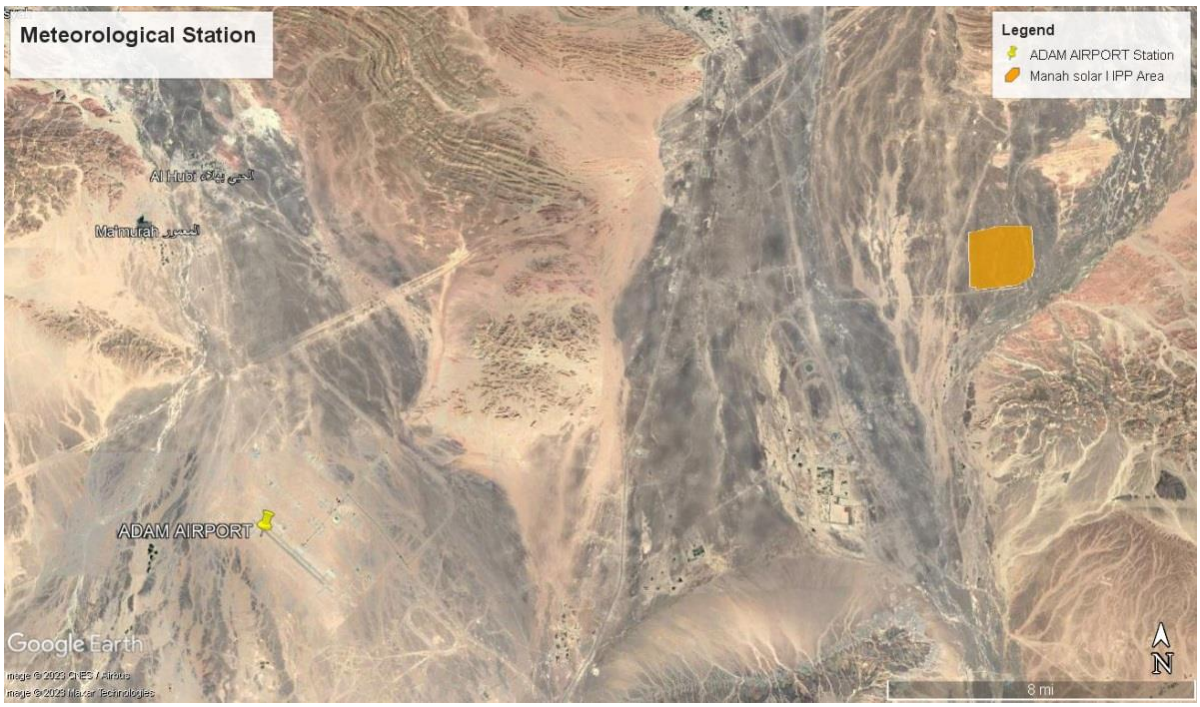


Figure 4-3 Metrological Stations refenced for Solar PV Plant

The current data was taken from the metrological website along with data from the National Centre for Statistics and Information of the Sultanate of Oman which is the main source of meteorology data for 2021 issued in 2022 as the recent published data.

Ad Dakhliyah Governorate experiences two distinct climatic seasons – winter (late November to March) and summer. The region is generally dry but unexpected heavy showers were observed especially during summer months.

Manah experiences abundant solar radiation throughout the year. The region is known for its high solar resource potential, making it an ideal location for solar energy projects. Solar radiation refers to the electromagnetic energy emitted by the Sun, and it plays a crucial role in harnessing solar power for various applications [40].

Manah benefits from a sunny climate characterized by long hours of sunshine and minimal cloud cover [41]. The area's geographical location, with its relatively low latitude and arid desert environment, contributes to the high solar radiation levels experienced in the region. These favorable conditions create a conducive environment for solar energy generation and utilization.

4.3.1.1 Temperature

The table below presents the maximum, minimum and average data in Adam Airport station based on national center for statistics and information (NCSI). The average temperature recorded was

25.10 ºC in 2021. The highest average temperature observed was 35.90 ºC in June, while the lowest average temperature recorded was 20.10 in January.

It should be noted that no readings were recorded at the Adam Airport station in the month of December (NCSI, 2022).

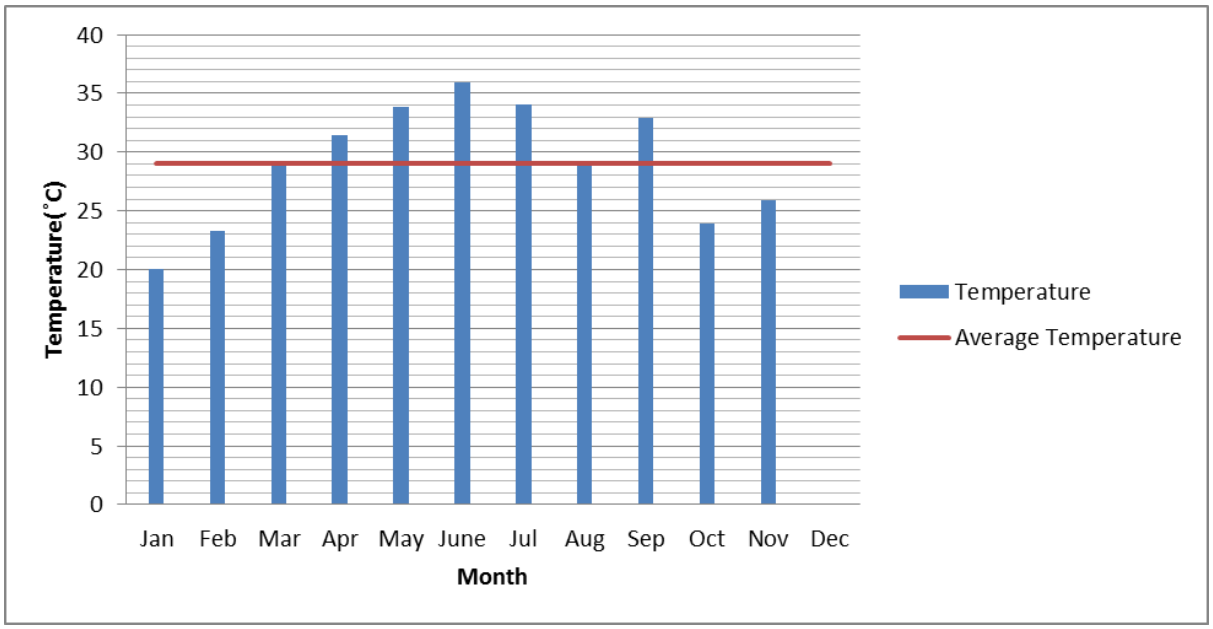


Figure 4-4 Monthly Average Temperature at Adam Airport Station in 2021

4.3.1.2 Humidity

According to latest available data from NCSI (2022), the Average humidity (%) recorded at Adam Airport station in 2021 was 40.06%. The figure below illustrates that the highest average humidity was 60.90% during August and the lowest humidity was 24.20% during May of 2021.

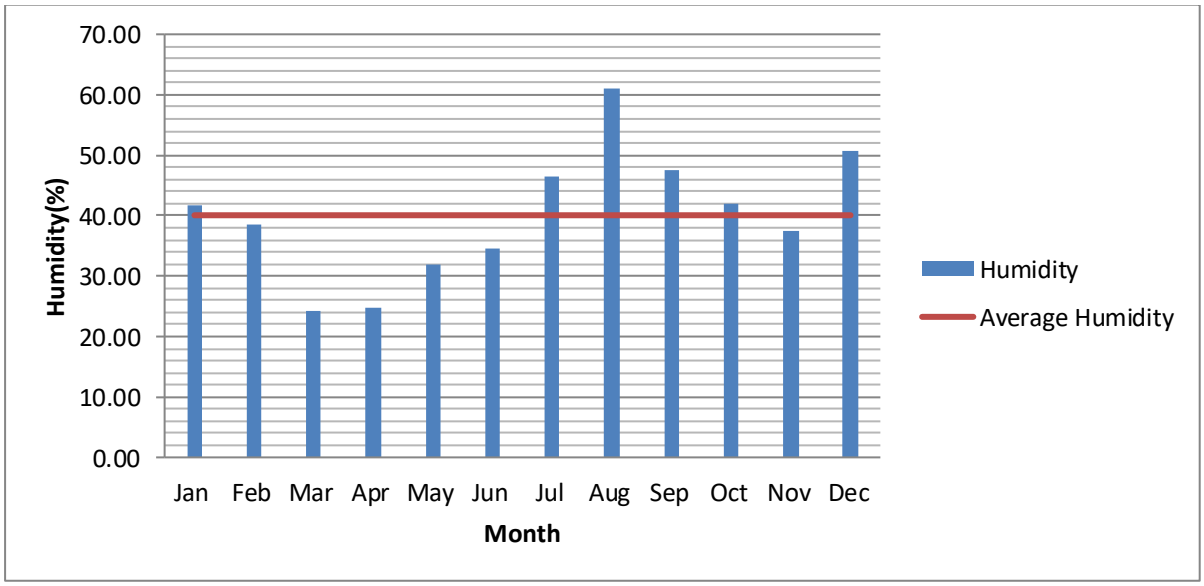


Figure 4-5 Monthly Average Humidity at Adam Airport Station in 2021

4.3.1.3 Rainfall

Rainfall statistics for the project site area indicate that the mean rainfall is low; thus, classified as between arid and hyper arid. The figure below presents precipitation data in 2021.

No readings were recorded at the Adam Airport station in January, February, March, June, July, August, September, November and December.

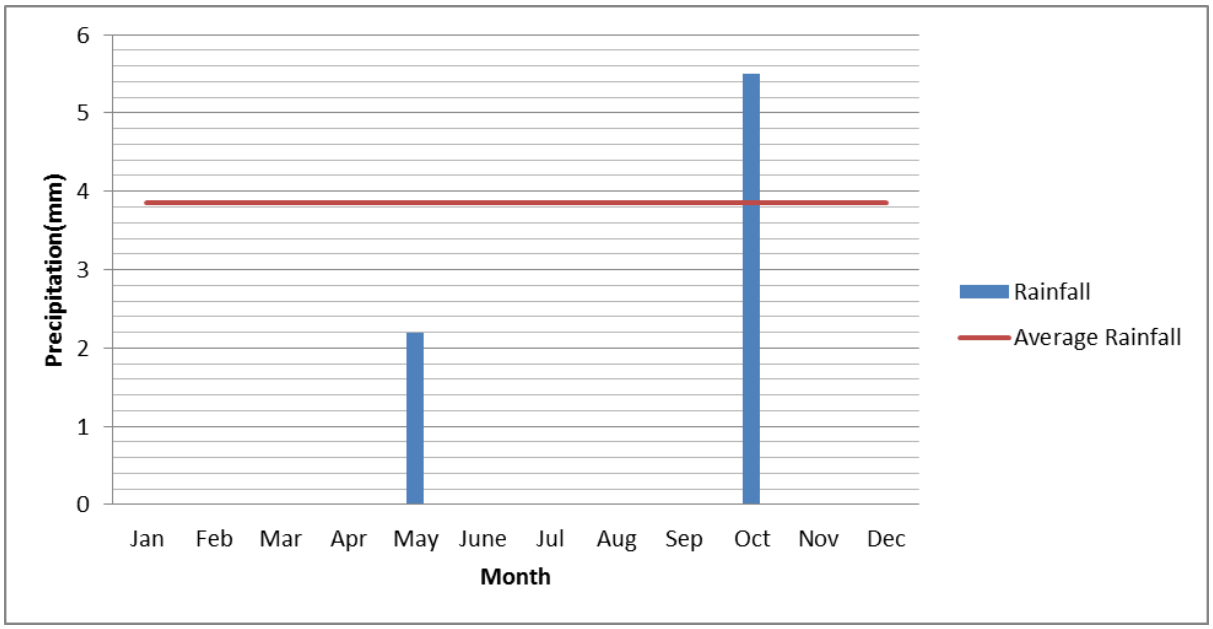


Figure 4-6 Monthly Average Rainfall at Adam Airport Station in 2021

4.3.1.4 Wind

The average annual wind speed recorded at the Adam Airport station was 7.72 Knots in 2021. The maximum wind speed reached 10.00 knots during July, while the minimum average wind speed reached 5.70 knots during January 2021.). According to Meteoblue (2023), the wind blows mostly from the west to east with a maximum wind speed of 19km/h. The likelihood of occurrence is expressed in hours, which signifies that there was a frequency of 256 hours per year when wind speeds are more than 1km/h, 459 hours per year when wind speeds exceed 5km/h, 61 hours per year when wind speeds exceed 12km/h, and 5 hours per year when wind speeds exceed 19km/h.

Annual wind speed and wind rose at Adam Airport station as per Meteoblue are presented in the below figures.

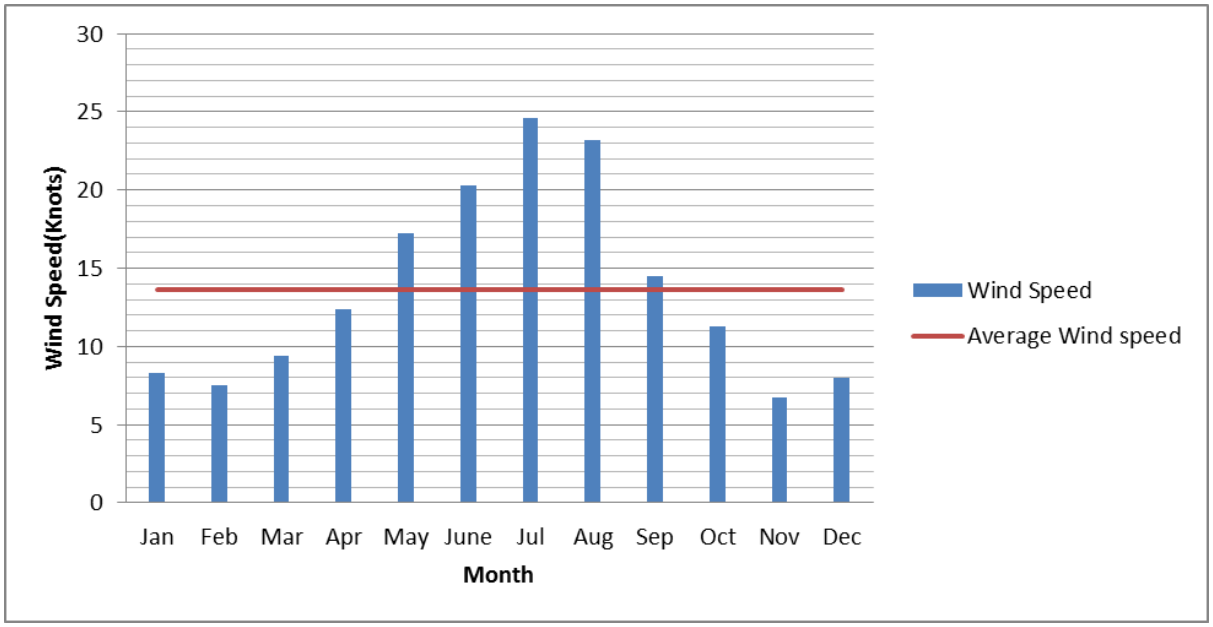


Figure 4-7 Monthly Average Wind Speed at Adam Airport Station in 2021

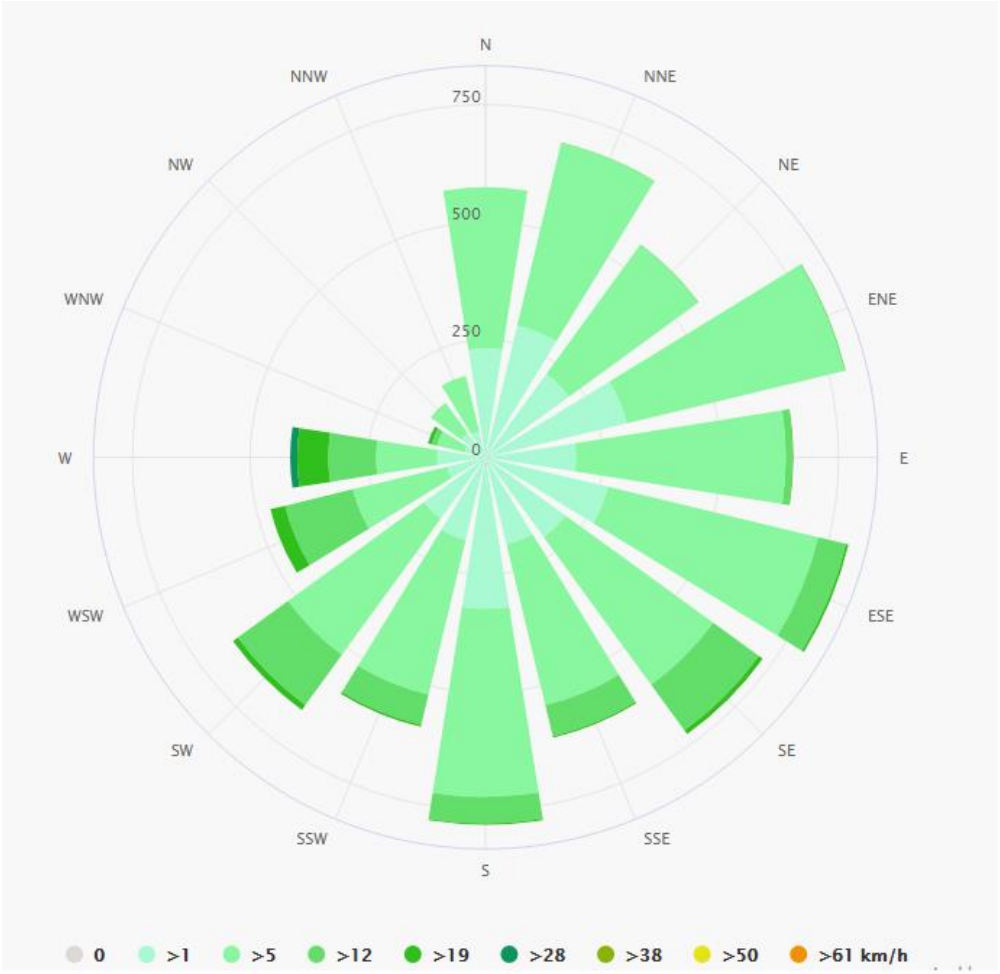


Figure 4-8 Wind Rose for Adam airport (Meteoblue)

4.3.1.5 Extreme Events

An extreme weather event is 'an event that is rare at a particular place and time of year' and an extreme climate event is 'a pattern of extreme weather that persists for some time, such as a season. The definitions of 'rare' are wide ranging, depending on applications. Some studies consider an event as an extreme if it is unprecedented; other studies consider events that occur several times a year as moderate extreme events. Rarity of an event with a fixed magnitude also changes under human-induced climate change, making events that are unprecedented so far rather probable under present conditions, but unique in the observational record – and thus often considered as 'surprises'[4].

Tropical cyclones in Oman are frequent events during the monsoon season from May to August every year. The cyclones are usually considered low-risk events, though they cause torrential rains that frequently lead to flash floods. However, climate change has been affecting the country, with rising sea temperatures causing more frequent and severe tropical cyclones in recent years.

According to research published in a report titled "Initial National Communication under the United Nations Framework Convention on Climate Change[5]", Oman is highly vulnerable to climate change. The October 2013 report was the collaborative work of the Ministry of Environment and Climate Affairs (currently known as Environment Authority as per Royal Decree No. 106/2020[6]) and Sultan Qaboos University (SQU).

The worst storm in terms of fatalities occurred in May 1977, during which 105 Omanis lost their lives. However, in terms of severity, number of people affected and the financial cost, super Cyclone Storm Gonu in June 2007 topped the list, claiming the lives of 49 people and leaving more than 20,000 others homeless. Super Cyclone Gonu developed from a persistent area of convection in the eastern Arabian Sea. With a favourable upper-level environment and warm sea-surface temperatures, Gonu rapidly intensified to attain peak winds of 260 kph on 4 June, making it the most intense Arabian Sea storm on record and the first Category 5 equivalent storm. It made landfall along the coast of Oman, Iran and the UAE. The direct cost of Gonu was almost US$4 billion, of which only around 17% was insured. Three years later, Cyclone Phet hit Oman in June 2010, killing 21 people, and causing an estimated $780 million in damage.

4.3.1.6 Dust and Sandstorm

Sand and dust are common meteorological hazards that occur in arid and semi-arid regions. During an intensive wind flow, the continued spread of dust/dust storms unevenly, with a decrease in the level of horizontal visibility. The seasonality of sandstorm in the Middle East is related generations meteorological which originate over the horn of Africa and it is part of southwest monsoon

[4] https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Chapter11.pdf
[5] https://unfccc.int/resource/docs/natc/omnnc1.pdf
[6] Royal Decree No. 106/2020 : Establishing the Environment Authority, Determining Its Competences, and Adopting Its Organisational Structure Publish (source: https://mjla.gov.om/eng/legislation/decrees/details.aspx?Id=1256&type=L)

circulation. Sandstorms occur in spring and summer seasons experienced off south-eastern Arabian cast from June to August.

Al Shamal wind[7] (north-westerly winds) is distinct feature of the weather in the region, blowing across Iraq, Iran and the whole of the Arabian Peninsula, and in recent days, it has been at play churning out dust storm. Lifestyle can be affected by sandstorms in many ways; the horizontal visibility is often affected, causing health issues, traffic digestion and contaminated rain.

Figure 4-9 Representative Image of Dust Storm

4.3.2 Ambient Noise Quality

Ambient noise level measurements were conducted using integrating and logging sound level meter (Breul & Kjaer) at 6 locations. Data was collected for 1 hour (as per EHS guidelines) at each location during the day and night. Noise monitoring during the evening has been conducted as per MD 79/94 for 15 minutes at each location. These time periods are defined in Article (6) of MD 79/1994.

a. Workdays (daytime) - A : after 7 am and up to 6 pm;
b. Workdays (evenings) - B: after 6 pm and up to 11 pm; and
c. Holidays and nights - C: after 11 pm and up to 7 am.

[7] It is north-westerly wind blowing over Iraq and the Persian Gulf states often strong during the day but decreases at night.

Figure 4-10 Noise Monitoring at Manah I Solar PV undertaken by HMR team on 31th April 2023

The wind speed was frequently checked with a portable wind meter as HMR site team would have stop recording the noise parameter if the wind speed exceeds 5 m/s. During the monitoring period, Leq along with Lmax and Lmin were recorded. If intrusive noise was unavoidable, it would have been recorded as an observation.

The below tables present the UTM locations for noise monitoring which HMR team recorded during the site visit in terms of wind speed and noise records.

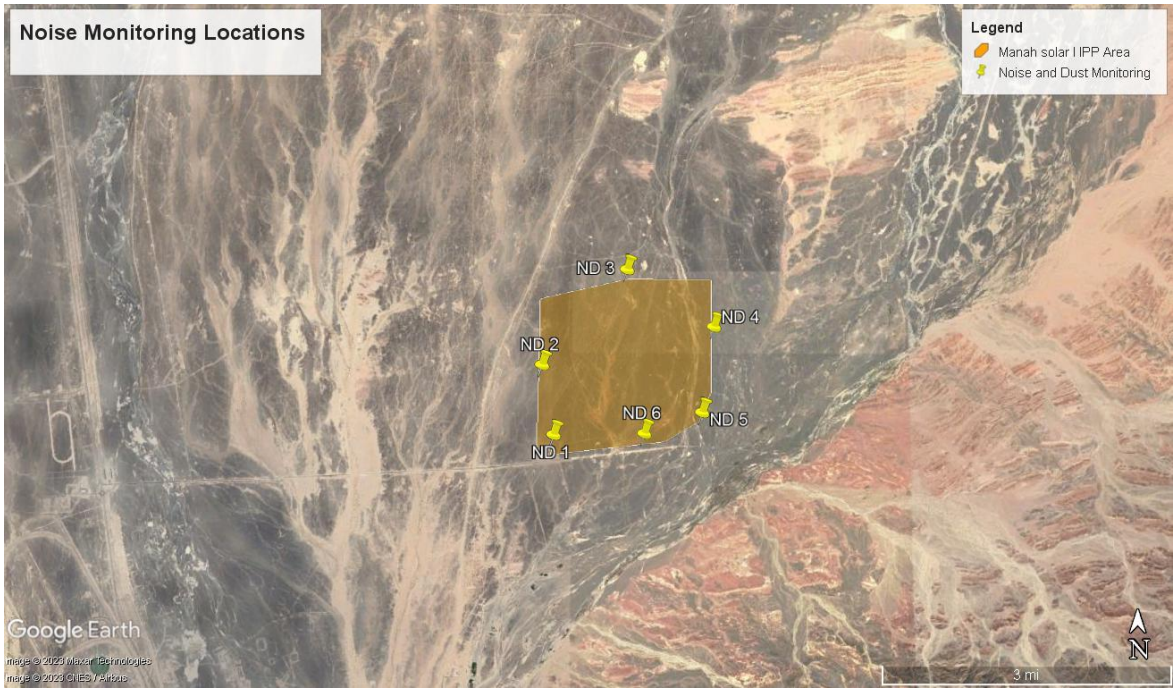


Figure 4-11 Noise Sampling locations

Table 4-1 Recorded wind speed at Project Location during daytime

Noise & Dust	Coordinates		Wind Speed (m/s)
	Easting	Northing	Daytime
ND_1	569204.00	2499184.00	3.1
ND_2	569004.00	2500358.00	3.1
ND_3	570440.00	2501975.00	3.1
ND_4	571915.00	2501010.00	3.1
ND_5	571715.00	2499569.00	3.1
ND_6	570738.00	2499212.00	3.1

Table 4-2 Noise Levels at project location as per Omani standards and EHS guidelines

#	Location	UTM co-ordinates			Noise			Omani Standard/IFC
		Zone	Easting	Northing	Leq	Lmax	Lmin	
Daytime (A) (7:00am to 6:00pm) (1 hr)								
1	ND1	40 Q	569204.00	2499184.00	46.26	68.35	21.32	70
2	ND2	40 Q	569004.00	2500358.00	37.20	60.34	16.96	
3	ND3	40 Q	570440.00	2501975.00	34.1	58.33	17.01	
4	ND4	40 Q	571915.00	2501010.00	33.49	59.96	17.00	
5	ND5	40 Q	571715.00	2499569.00	36.23	65.55	20.35	
6	ND6	40 Q	570738.00	2499212.00	33.82	67.70	17.48	
Evening Time (B) (6:00pm to 11:00pm) (15min)								
1	ND1	40 Q	569204.00	2499184.00	45.45	67.50	23.86	70
2	ND2	40 Q	569004.00	2500358.00	36.24	50.60	18.99	
3	ND3	40 Q	570440.00	2501975.00	25.95	45.20	17.00	

#	Location	UTM co-ordinates			Noise			Omani Standard/IFC
		Zone	Easting	Northing	Leq	Lmax	Lmin	
4	ND4	40 Q	571915.00	2501010.00	35.37	55.00	16.72	
5	ND5	40 Q	571715.00	2499569.00	34.24	58.65	17.80	
6	ND6	40 Q	570738.00	2499212.00	40.62	60.25	17.30	
Night Time(C) (11:00 pm to 7:00 am) (1hr)								
1	ND1	40 Q	569204.00	2499184.00	34.81	66.53	19.41	70
2	ND2	40 Q	569004.00	2500358.00	28.86	52.53	17.42	
3	ND3	40 Q	570440.00	2501975.00	26.26	50.53	16.80	
4	ND4	40 Q	571915.00	2501010.00	38.46	50.79	31.70	
5	ND5	40 Q	571715.00	2499569.00	39.03	56.75	32.71	
6	ND6	40 Q	570738.00	2499212.00	32.28	61.90	26.37	

Based on monitoring data results in the above table, it illustrates that all recorded monitoring results are below the international standards (IFC) during daytime and night time. In addition, data recorded for the six locations during evening time are within applicable limits as per (MD 79/, 1994).

4.3.3 Ambient Air Quality and Dust

The assessment of ambient air quality was conducted for the project site using AQM 60 (Ambient Air Quality Analyser). The data captured is per national and international regulatory guidelines for ambient air quality (i.e. MD 41/2017 and WHO). The air quality monitoring includes measurement of gaseous pollutants (NO_2, SO_2, O_3, PM10, and PM2.5).

The AQM analyser was installed at 1 location for 24 hours in order to enable diffusion of pollutants considering upwind, downwind and crosswind directions to measure the ambient concentration of Nitrogen dioxides (NO_2), Ozone (O_3), Sulphur dioxide (SO_2), and PM10 and $PM_{2.5.}$

The location of the ambient air quality is shown in the figure below. The location was chosen so that there is less than 1.5km distance to the project boundary and within the area the air quality is deemed to be homogenous.

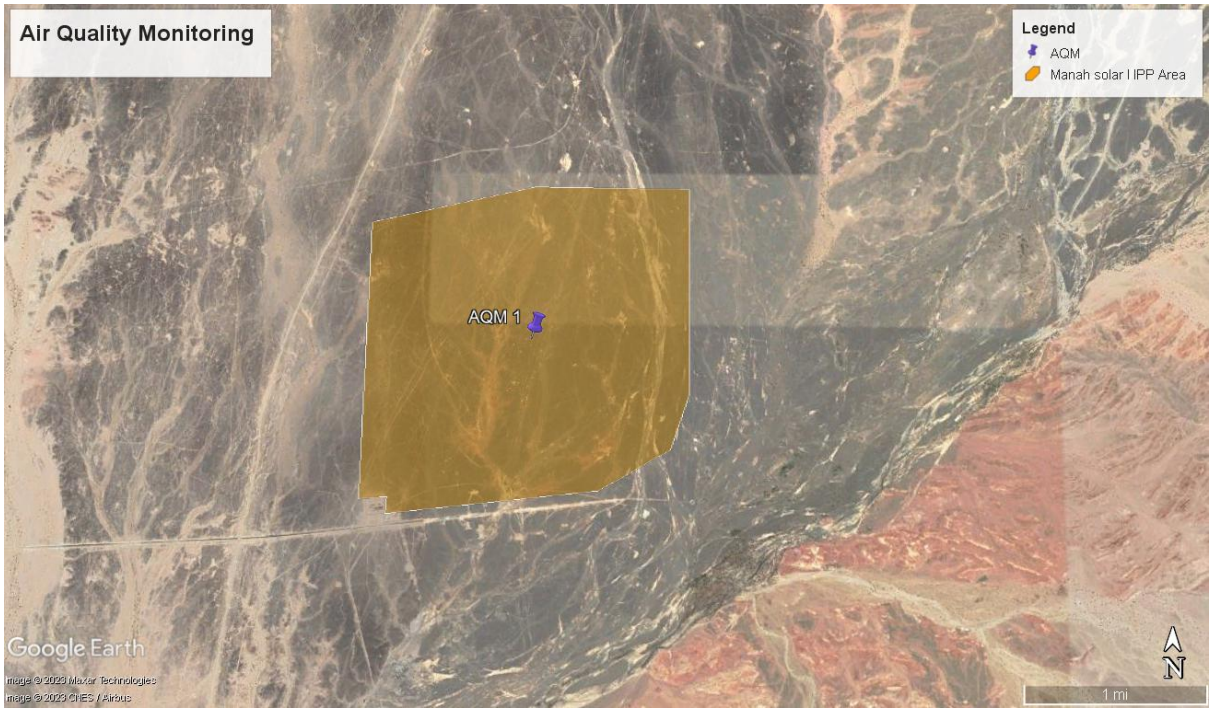


Figure 4-12 AQM Sampling Location Map at project site

Figure 4-13 Air Monitoring at project site

Table 4-3 UTM Coordinate Location of AQM

#	Easting	Northing
AQM 1	570497.00	2500620.00

The results of the 24 hours monitoring records are illustrated in the below table.

Table 4-4 Ambient Air Quality Results

Parameter	NO_2		SO_2		O_3	$PM_{2.5}$	PM_{10}	CO		NH3	VOC
Unit	(µg/m³)										
#	1hr	24hrs	1hr	24hrs	8hrs	24hrs	24hrs	1hr	8hrs	24hrs	3hrs
AQM 1	41.2	38.7	23.3	103.6	147.4	48.4	131.4	3151.5	3534.3	4.5	25.7
MD 41/2017	**250**	**130**	**350**	**150**	**120**	**65**	**150**	**30000**	**10000**	**200**	**-**
WHO AAQS	**200**	**-**	**-**	**20**	**100**	**25**	**50**	**-**	**-**	**-**	**-**

Based on the table above, the results of the AAQ show that all the parameters were within the applicable limits of MD 41/2017 except for the Ozone concentration. Furthermore, the ozone level, SO_2 $PM_{2.5}$ and PM_{10} has an exceedance status in comparison with international limits of WHO AAQS with the same findings that were compared against MD 41/2017.

Despite the general decrease in SO_2 emissions around the world, the Middle East is still one of the worst polluted regions, specifically emissions around the Gulf region which did not witness any significant change. When it comes to $PM_{2.5}$ and PM_{10} the project area is prone o sudden dust storms which will affect the final air quality. These are natural occurrences and cannot be avoided.

Nitrogen oxides (NOx) and volatile organic compounds (VOC) released from vehicles, factories, power plants, and other sources combine chemically to produce ground level ozone when sunlight is present. Therefore, Ozone is most likely to reach high levels on hot, sunny days in urban areas. However, even in remote areas, significant ozone levels are possible due to the wind's ability to transport ozone across great distances.

4.3.4 Regional Geology, Local Landscape and Topography

The geology of Oman has been mapped in detail by BRGM (*Bureau de Recherches Géologiques et Minières*) on behalf of the Ministry of Petroleum and Minerals as shown in Figure 4-14~~Figure 4-14~~.

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The Sultanate is composed of varying topographic areas consisting of plains, wadis and mountains. The terrain is:

- 3% of plains: the most important area overlooking the Gulf of Oman and the Arabian Sea;
- 15% of mountain ranges: the most important of which are 'Al Hajr', extending in the form of an arch from Ras Musandam in the North to Ras Al-Hadd and Al Qara' in the South-Western corner of Oman; and,
- 82% of sand and desert which includes part of Ar Rub Al-Khali.

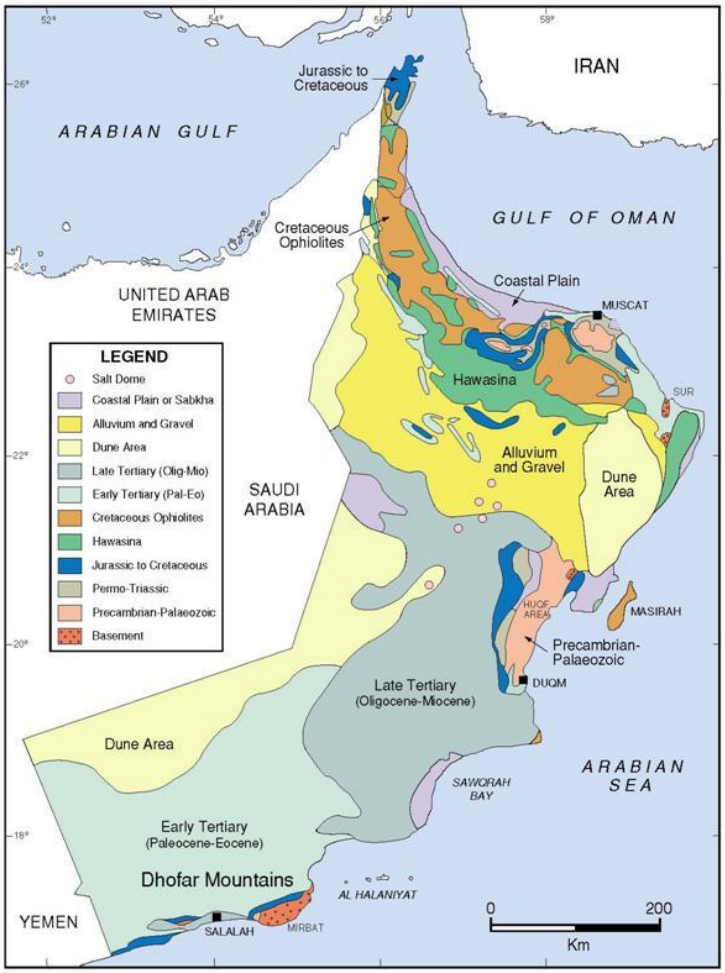
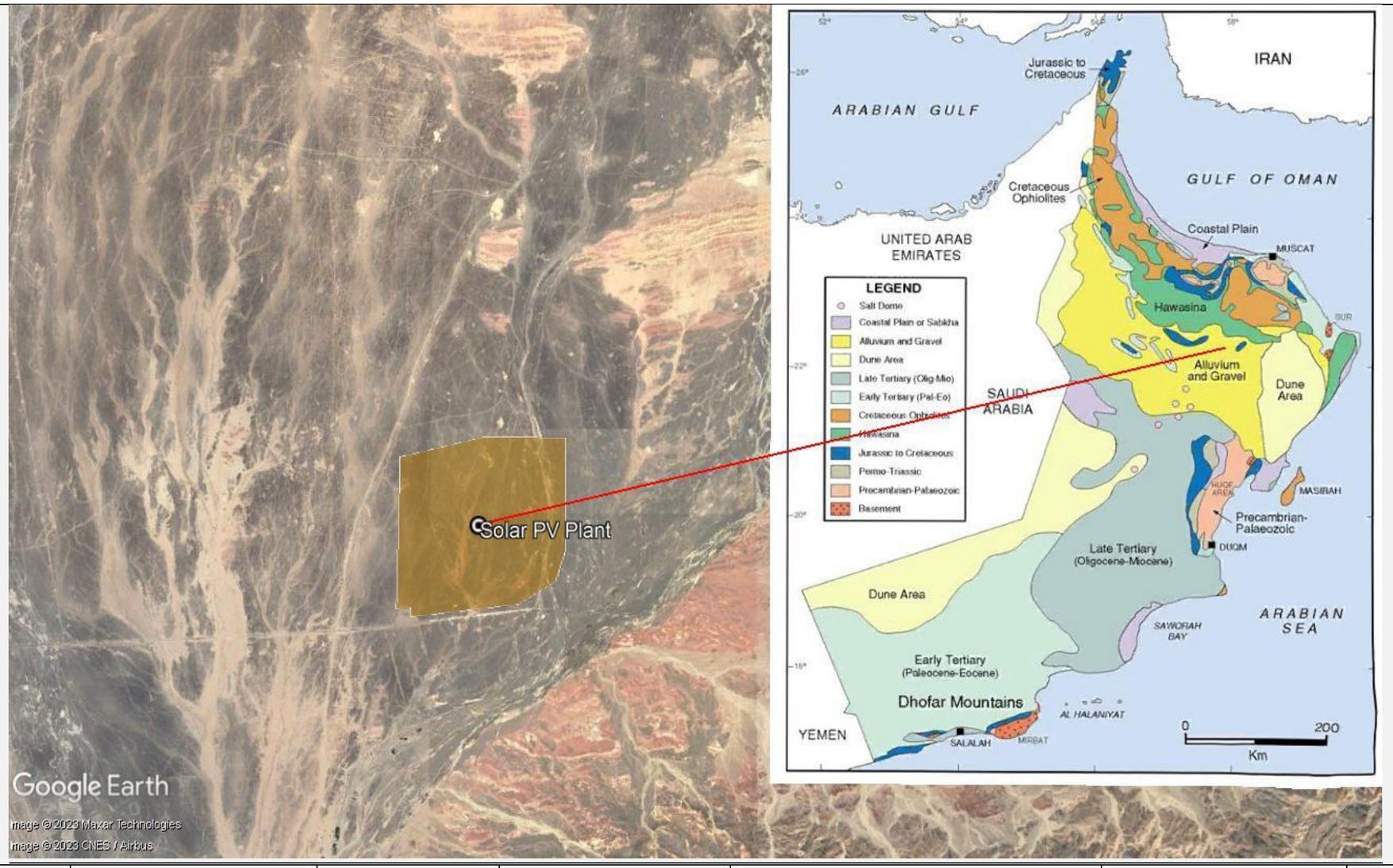


Figure 4-14 Overview of the Geology in Oman

As the proposed solar PV Plant is located in Ad Dakhiliyah governrate, Ad Dakhliyah consists of the geological sequence from Middle-Late Cretaceous to Quaternary and the formations are mainly composed of surficial alluvial deposits, peridotite, gabbro, and gabbronorite.

Quaternary surficial deposits -Alluvial Deposits (QF): These deposits were laid down from the Middle Pleistocene to the present day occurs in the project area as surficial deposits. Channelled alluvial deposits and Piedmont alluvium of the Oman Mountains is incised by more recent wadis. Alluvial fans spread out at the outlets of major wadis where there is an abrupt break of slope.



Description:	Project:	Area:	Produced For:	Produced by:	Source:	Drawn By:
Geology of Oman and project location	Environmental & Social Impact Assessment study for Manah I Solar PV Power Plant	Manah, Ad Dakhiliyah, Sultanate of Oman	EDF Renewables and KOWEPO	HMR Environmental Engineering Consultants	Image extract from Google Earth	Issam Al Mamari

4.3.5 Soil Assessment

4.3.5.1 Overview

The soils in Oman have been classified using the Soil Taxonomy system (1975), which consists of 61 mapping units. These soils are primarily categorized into three orders: Entisols, Inceptsols, and Aridisols, with the dominant soil types in Oman falling into these orders. The general soil map of Oman, shown in Figure 4-15~~Figure 4-15~~, provides an overview of the distribution of these soils. The Ministry of Agriculture and Fisheries has ranked the soils in Oman based on their suitability for agricultural use. Factors such as soil depth, water retention, salinity, gypsum content, drainage characteristics, erosion, and other relevant considerations were taken into account during this assessment. In areas with very low rainfall, characterized by high temperatures, subsurface accumulations of gypsum are commonly found. Gypsum, a key component of the soil formation process in Oman, contributes to the salinity of the soil as a secondary deposit resulting from incomplete leaching from the soil profile.

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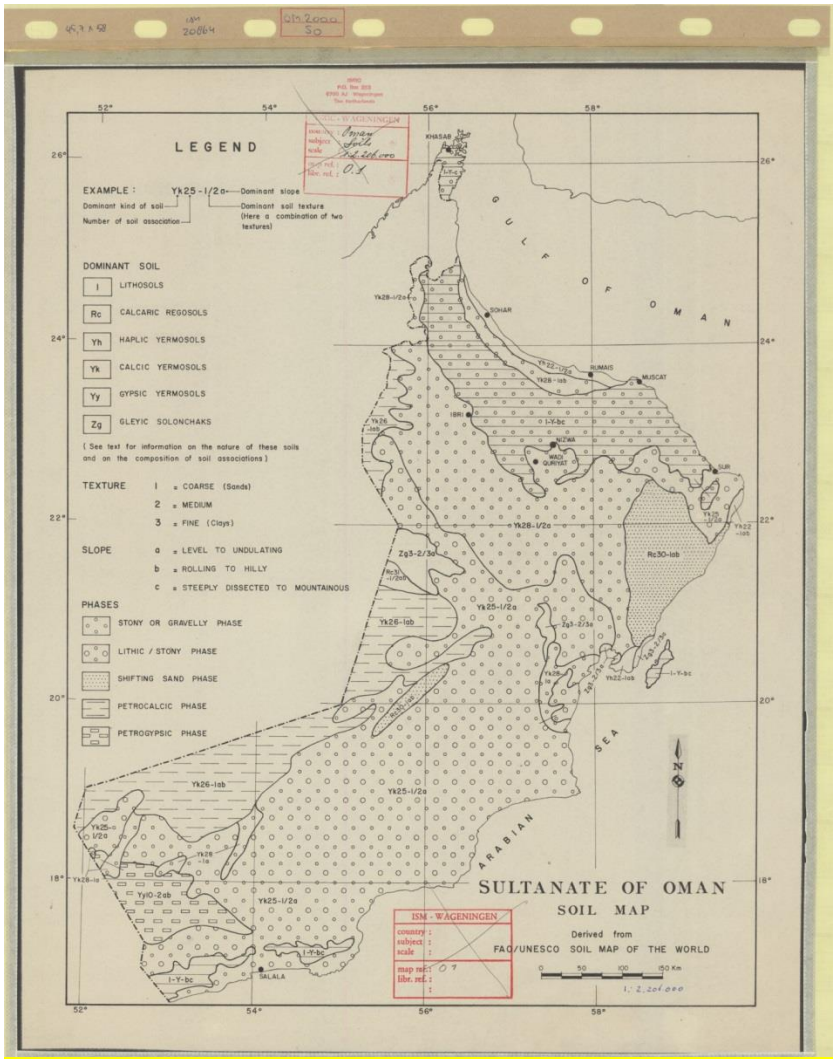

Figure 4-15 General Soil map of Oman

4.3.5.2 Soil sampling

Soil sampling and analysis of up to 5 composite surface samples at a depth of 40cm were taken from the project site, based on the ground conditions that were observed at the five locations.

The survey soil sampling locations are presented in below table and illustrated in Figure 4-16~~Figure 4-16~~ and the soil analysis results are presented in Table 4-5~~Table 4-5~~.

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Table 4-5 Soil Sampling Survey Locations

#	Easting	Northing
SS1	570014.00	2499753.00
SS2	571582.00	2499956.00
SS3	571521.00	2500951.00
SS4	570506.00	2501519.00
SS5	569092.00	2500928.00

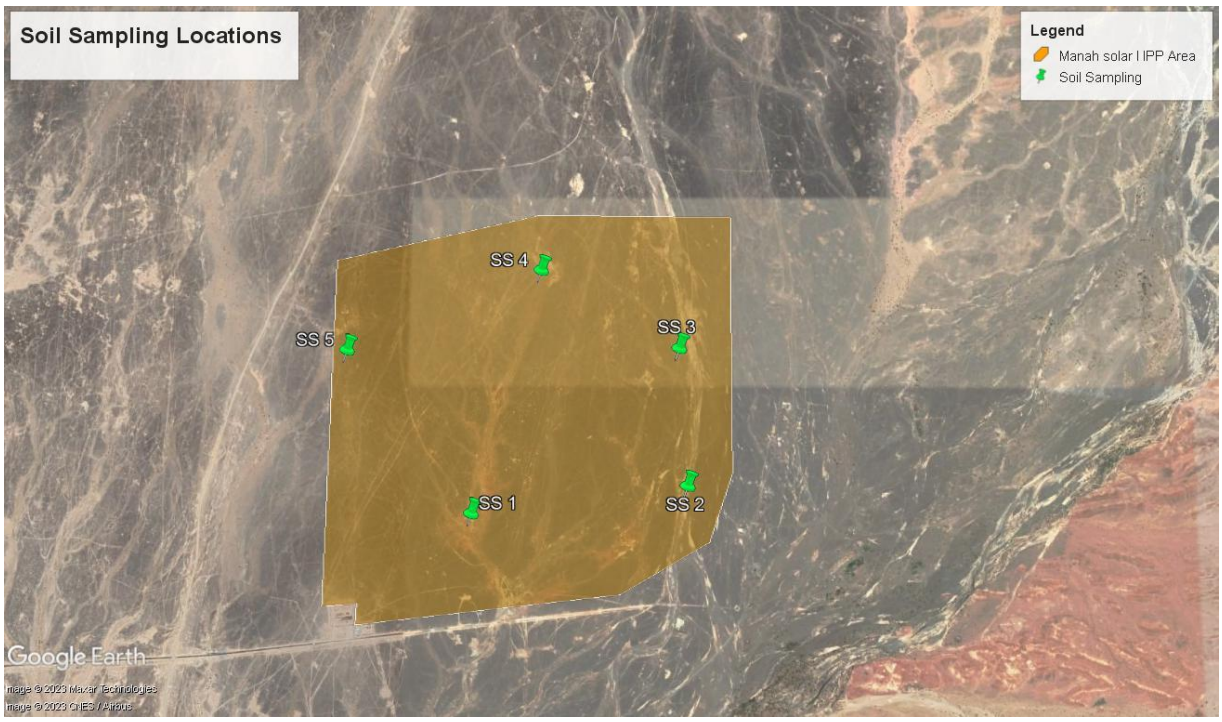


Figure 4-16 Soil Sampling Locations

Figure 4-17 Soil sampling at project site

The soil samples have been sent to an approved lab in Oman for further analysis. Soil sampling results will then be compared to the international standard (Dutch).

Table 4-6 soil samples analysis results

Parameter	unit	Soil sampling locations					Dutch Intervention Value	
		SS 1	SS 2	SS 3	SS 4	SS 5	Target values8 mg/kg]	Intervention values9 mg/kg
Antimony	mg/kg	<10	<10	<10	<10	<10	-	-
Cadmium	mg/kg	<1	<1	<1	<1	<1	0.8	12
Chromium	mg/kg	68.3	77.7	94.4	515	108.9	100	380
Copper	mg/kg	12.1	12.2	9.29	18.3	12.3	36	190
Manganese	mg/kg	497.9	459.9	439.6	500.0	524.8	-	-
Silver	mg/kg	<1	<1	<1	<1	<1	-	-
Zinc	mg/kg	18.2	21.3	21.7	27.4	27.6	140	720

[8] The target values indicate the level at which there is a sustainable soil quality.

[9] The soil remediation intervention values indicate when the functional properties of the soil for humans, plant and animal life, is seriously impaired or threatened.

Parameter	unit	Soil sampling locations					Dutch Intervention Value	
		SS 1	SS 2	SS 3	SS 4	SS 5	Target values8 mg/kg]	Intervention values9 mg/kg
Aluminium	mg/kg	7870	7943.8	8238.5	8374.7	10949.6	-	-
Arsenic	mg/kg	<10	<10	<10	<10	<10	29	55
Cobalt	mg/kg	21.3	18.3	21.7	27.4	24.6	20	240
Iron	mg/kg	16777	21397.9	19310.9	23974.5	25718.4	-	-
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	10
Nickel	mg/kg	185.2	310.7	266.2	350.7	454.2	35	210
Selenium	mg/kg	<10	<10	<10	<10	<10	<10	-
Vanadium	mg/kg	<10	<10	<10	<10	<10	<10	-
Moisture Content (dried @ 103°C)	mg/kg	-	-	-	-	-	-	-
TPH C10-C40 Fraction (sum)	mg/kg	<50	-	-	-	-	-	-
EPH C10-C40	mg/kg	-	<50	<50	<50	<50		
PAH	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	-	-
Benzene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	0.05	2
Toluene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	0.05	130
Ethylbenzene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	0.05	50
p/m-Xylene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	0.05	25
o-Xylene	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	-	-
Methyl Tertiary Butyl Ether	mg/kg	-	-	-	-	-	-	-

Results show that there is an exceedance in the Nickel results. Nickel naturally exists at high concentration levels in Oman.

4.3.6 Hydrology

4.3.6.1 Overview

In the Sultanate of Oman, local rainfall is the main source of all fresh surface and groundwater. The alluvium in northern Oman and the Tertiary limestone in the south of the country contain the nation's fresh groundwater supplies. Aquifers under Nejd, Southern Oman, contain a sizable volume of fossil water. In addition, most of local people of Oman are dependable on the traditional Aflaj systems which originate from gravity flow from underground water channels or surface springs located nearby mountains slopes.

The primary aquifer in Ad Dakhliyah is the UeR Formations of Paleocene-Lower Eocene age. These predominantly carbonate units are separated from one another by intervening shale, marl and clay layers of varying thickness and confining potential. The UeR is a confined to semi-confined aquifer and underlies the Shammer aquitard. The shallow unconfined rain-fed aquifer can represent the wadi beds. The potential yield and quality of this aquifer depends upon wadi surface and sub-surface flows.

The regional groundwater movement is believed to be predominantly from Negd sub-area towards the Northwest and Western direction, and from the Bajada hydrologic area towards Southwest direction. The regional groundwater flow eventually discharges into the Umm as Samim sabkha and Rub al Khali.

Recharge of groundwater takes place by two means namely through the infiltration of direct precipitation and through groundwater flow from the Negd sub-area where the UeR formation outcrops at Jabel al Qamar. The UeR formation in the study area is believed to be recharged by groundwater flow from the Negd sub-area (Dhofar Mountains) and adjacent Bajada hydrologic area (Hajar Mountains). This groundwater flow movement is thought to be substantial and is the main contributor to both quantity and quality of groundwater (HMR Archives, 2018).

4.3.6.2 Wadi Hydrology

Wadi channels in arid regions are parts of a hydrologic cycle, where surface water transport occurs after the evaporation and infiltration losses from the upstream to downstream parts. Connection of different wadi branches toward the downstream with surface water accumulation may cause flood inundation at downstream lower areas. If the region is drained by a single wadi or wadi system, it is then called as a drainage basin or watershed. The surface area of the drainage basin collects the rain-fall water and carries it to the low-lying points within the drainage basin, referred to as a stream or river in humid regions but as wadi in arid regions.

Wadis are the basic transportation system involved with water and rock cycles, leading to erosion, sedimentation, and deposition. These two cycles provide useful services for humanity, but the water cycle can cause occasional disasters due to floods and flash floods.

There are several wadis running through the Project area and most of the wadi area was observed to be dry. . The main wadi with the highest catchment area is demarcated in the project map, because it was identified to be significant in hydrology and flood management.

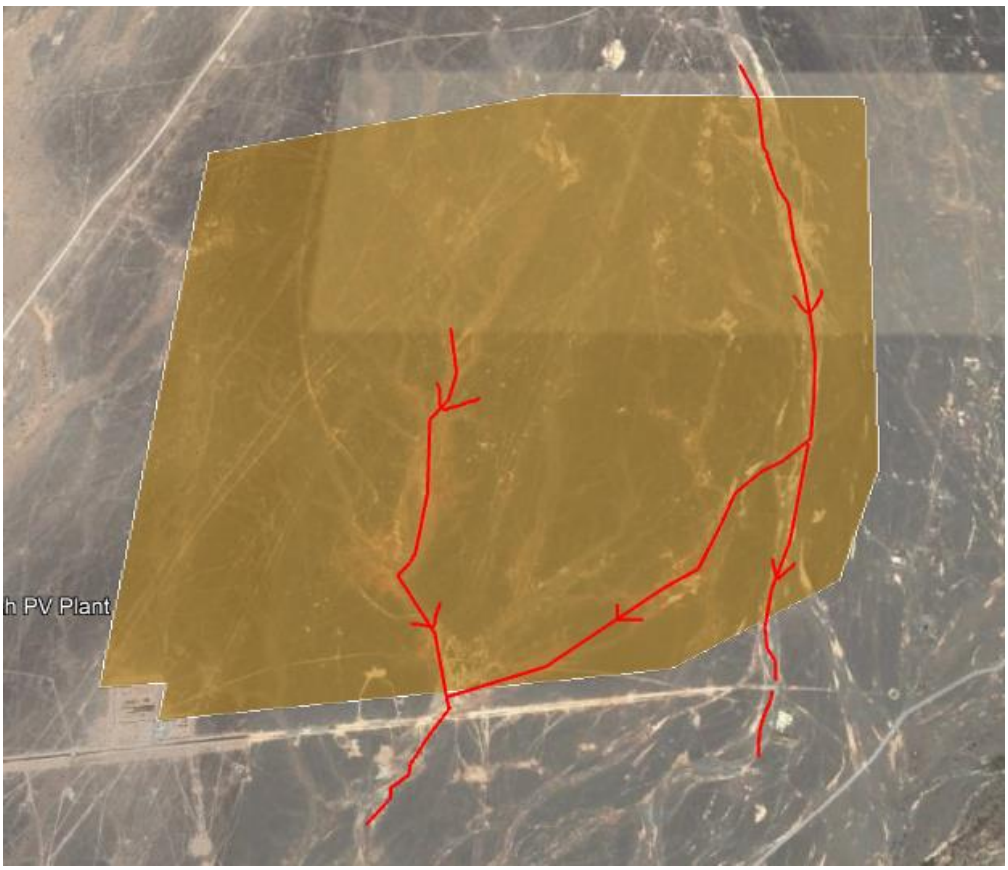


Figure 4-18 The main wadi distribution within the project area

4.3.6.3 Summary of Hydrological and Hydraulic Assessment at the Manah Solar IPPs Project Site Study

A detailed hydrology study and flood risk assessment has been conducted for the project, and outcomes from this study stated that The Manah Solar IPP project site is suitable for PV installations even when looking at a 100-year flooding event. Site leveling and the implementation of suitable drainage systems will allow for an efficient use of the available area. This has been considered in the initial design.

4.3.7 Terrestrial Ecology Survey

Oman is known for its varied landscapes, encompassing deserts, mountains, coastal areas, and wadis (dry riverbeds). These diverse ecosystems contribute to Oman's rich environmental heritage. The country exhibits a wide range of flora, including desert-adapted plants such as acacia trees, thorny shrubs, and aromatic herbs. Fauna in Oman is equally diverse, featuring species like the Arabian oryx, Arabian leopard, humpback whales, green sea turtles, and various bird species.

Oman has taken significant measures to protect its vulnerable species through the establishment of an official list of protected species. This list identifies endangered, vulnerable, and threatened species. A list of endangered species in Oman is attached in the Appendix. [40] [41]

4.3.8 Flora

A total of 17 plant species representing 12 families were recorded at Manah Solar PV site occur throughout area. Of the native plants, one species including: *Zygophyllum qatarense,* is geographically restricted (Regional Endemic) in the Arabian Peninsula. However, this species is commonly dispersed throughout the country. (Patzelt, 2015). The remaining native species are least concern, have wide distribution ranges, distributed from Africa to East Asia. The overall species list is presented in the Table no. 1.

As noticed, *Plocama aucheri* is the most dominant, widespread and common shrub in the site. Trees, such as the samr, *Acacia tortilis*, the sidr, *Ziziphus spina-christi*, and the invasive miskat, *Prosopis juliflora*, as well as shrubs, such as salam, *Acacia ehrenberginana* forming the main woody vegetation in the area, where the *Acacia* sp. considered the dominant tree in the area.

Table 4-7List of plant species recorded in Manah Solar PV site

Species Name	Conservation Status (as per IUCN list)	Relative Abundance in Surveyed Areas
Zygophyllum qatarense	Regional Endemic (RE)	Common
Plocama aucheri	Least Concern (LC)	Dominant
Acacia tortilis	LC	Dominant
Acacia ehrenbergiana	LC	Frequent
Blepharis ciliaris	LC	Frequent
Senna holosericea	LC	Occasional
Cleome droserifolia	LC	Occasional
Ziziphus spina-christi	LC	Occasional
Prosopis juliflora	LC	Occasional
Cleome pallida	LC	Frequent
Trianthema portulacastrum	LC	Occasional
Corchorus depressus	LC	Frequent
Haloxylon salicornicum	LC	Frequent
Pergularia tomentosa	LC	Occasional
Tephrosia purpurea subsp. *apollinea*	LC	Frequent
Cynodon dactylon	LC	Occasional
Euphorbia larica	LC	Frequent

 Plocama aucheri	 Acacia tortilis
 Pulicaria glutinosa subsp. glutinosa	 Acacia ehrenbergiana
 Blepharis ciliaris	 Senna holosericea

 Cleome droserifolia	 Ziziphus spina-christi
 Plocama aucheri	 Zygophyllum qatarense
 Prosopis juliflora	 Cleome pallida

Cleome pallida

Trianthema portulacastrum

Corchorus depressus

Acacia tortilis

Plocama aucheri

Haloxylon salicornicum

Pergularia tomentosa

Acacia ehrenbergiana

Tephrosia purpurea subsp. apollinea

Cynodon dactylon

Euphorbia larica

Figure 4-19 Flora observation at project location

The maps below present the locations of the flora species found.

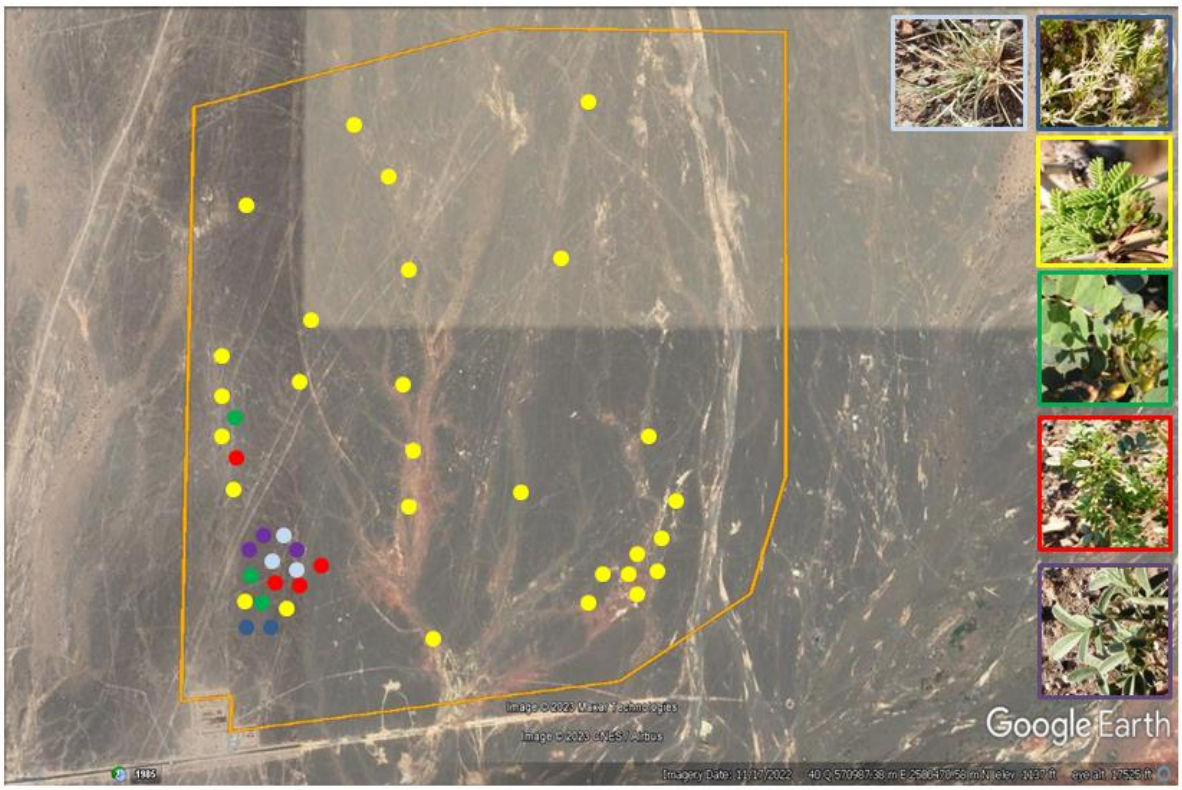


Figure 4-20 Flora species distribution around the site

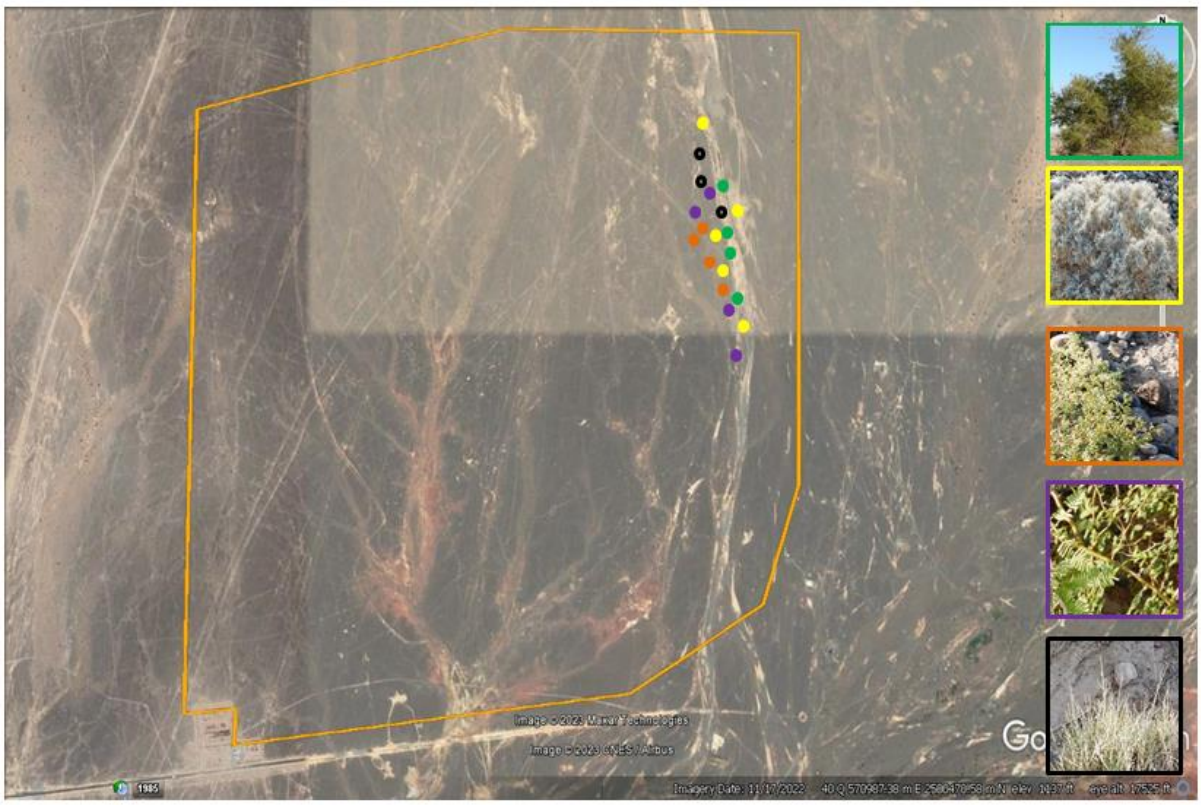


Figure 4-21 Flora species distribution around the site

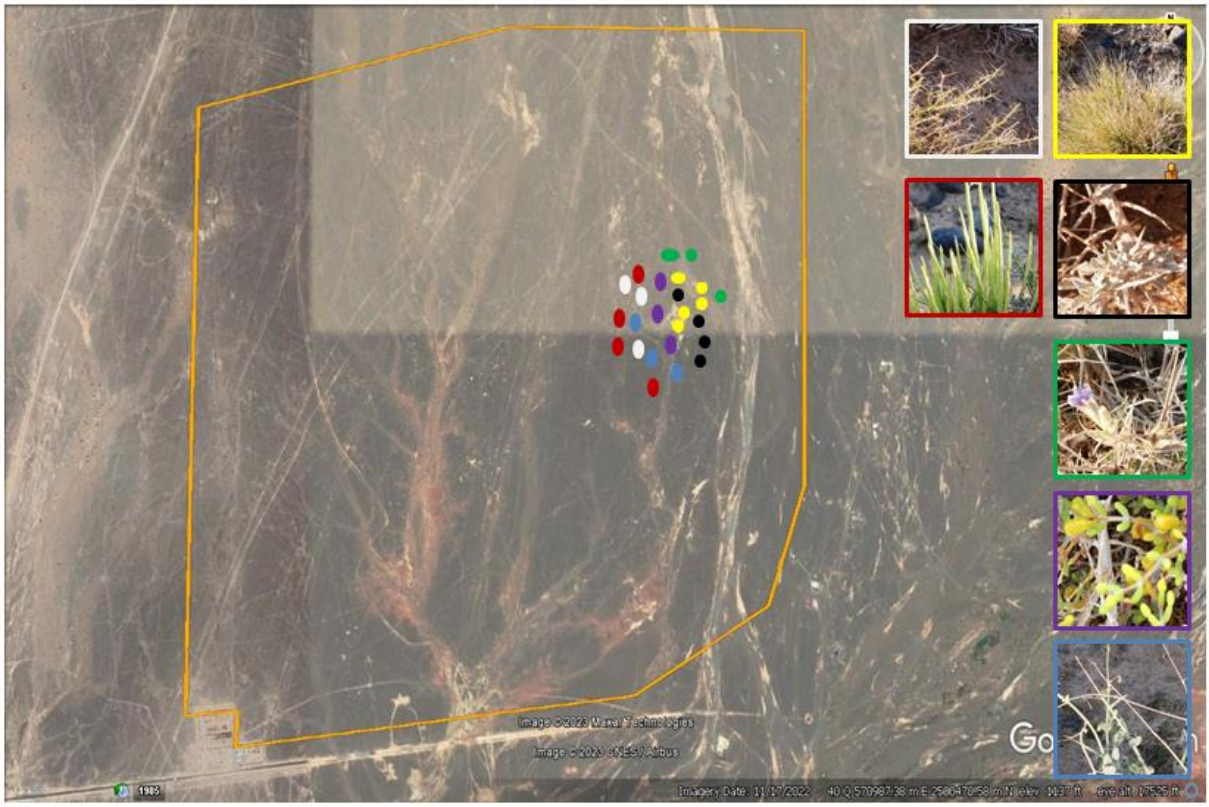


Figure 4-22 Flora species distribution around the site

Figure 4-23 Flora species distribution around the site

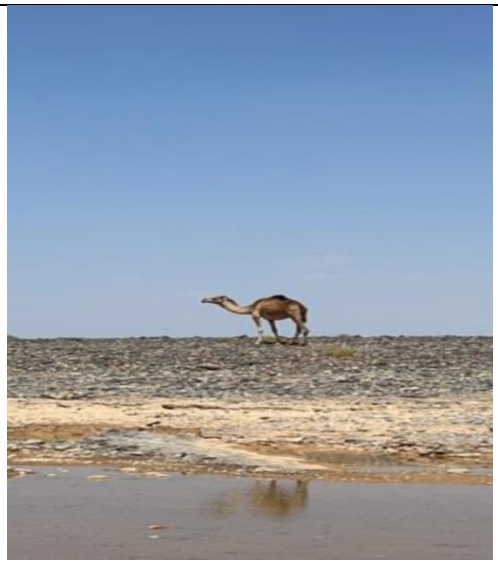
4.3.9 Fauna

Mammals including; the domestic camels (*Camelus dromedarius*) and goats (*Capra hircus*) are the dominant species scattered throughout the area, recorded by individual sightings, trucks or droppings.

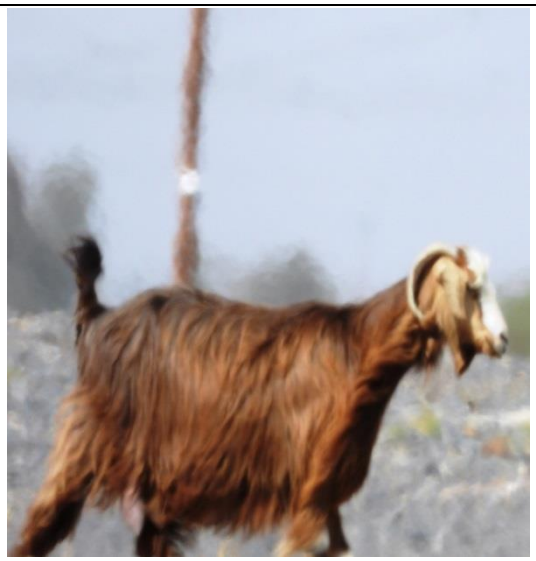
Hadramaut Sand Lizard (*Mesalina adramitan*) and the Arabian toad-headed Agama (*Phrynocephalus arabicus*) as well as the Wadi Racer Snake (*Platyceps rhodorachis*) are observed in the area. Signs of other reptiles were common, particularly footprints of lizard's burrows are observed around the shrubs in the little sandy clumps.

Table 4-8 Fauna recorded in the Manah Solar PV site

Category	Species Name	Common Name	Conservation Status (as per IUCN list)	Presence
Mammals	*Camelus dromedarius*	Camels	Data deficient (DD)	Sighting
	Capra aegagrus hircus	Domestic Goats	Least Concern (LC)	Sighting
Insects	*Julodis euphratica*	Sulphurous Jewel Beetle	LC	Sighting
	Danaus chrysippus	Plain Tiger Butterfly	LC	burrows
Reptiles	*Mesalina adramitan*	Hadramaut Sand Lizard	LC	Sighting
	Phrynocephalus arabicus	Arabian toad-headed Agama	LC	Sighting
	Platyceps rhodorachis	Wadi Racer Snake	LC	Sighting



Camel
(Camelus dromedarius)



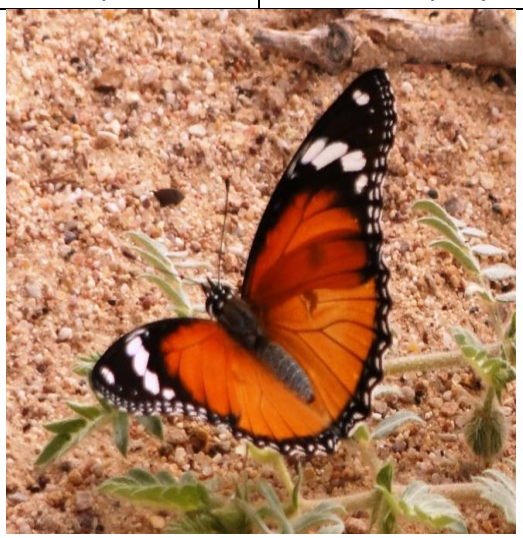
Domestic Goat
(Capra aegagrus hircus)

Hadramaut Sand Lizard
(Mesalina adramitan)

Sulphurous Jewel Beetle
(Julodis euphratica)

Arabian toad-headed Agama
(Phrynocephalus arabicus)

Wadi Racer Snake
(Platyceps rhodorachis)



Plain Tiger Butterfly
(Danaus chrysippus)

4.4 Avifauna

4.4.1 Important Bird Areas (IBA)

There are a total of 531 bird species in Oman, with 19 globally threatened species. There are a total of 72 Important Bird and Biodiversity Areas covering a total area of 74,760 km^2. As presented in the map below, there are no overlaps between the IBA in Oman and the project area (Manah).

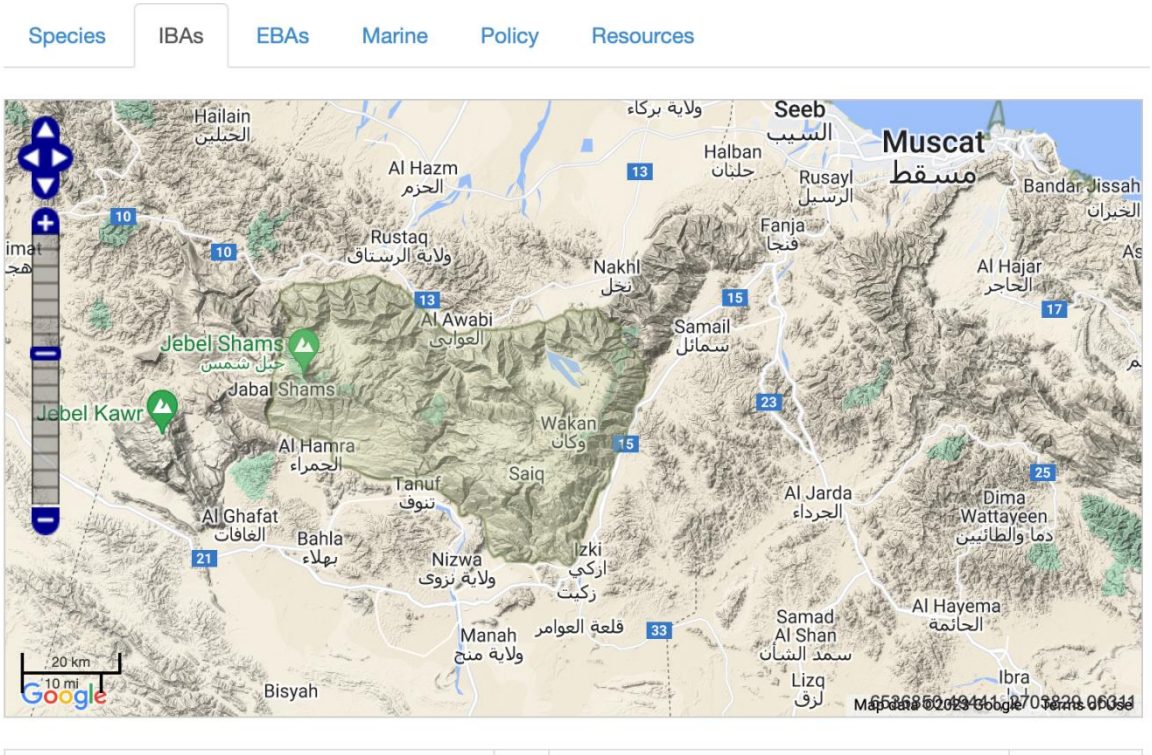


Figure 4-24 IBA and Manah Overlap

4.4.2 Survey Findings

Two bird species have been spotted on site during the walkthrough ecology survey. These are: the Desert Lark (Ammomanes deserti), and the Laughing Dove (Spilopelia senegalensis). An unknown bird;s nest has also been spotted. The conservation status of these bird species based on IUCN, are presented in the table below. Snapshots of these birds on site are also provided in the figures below.

Table 4-9 Avifauna recorded in the Manah Solar PV site

Category	Species Name	Common Name	Conservation Status	Presence
Birds	*Ammomanes deserti*	Desert Lark	LC	Sighting
	Spilopelia senegalensis	Laughing Dove	LC	Sighting

Laughing Dove
(Spilopelia senegalensis)

Desert Lark
(Ammomanes deserti)

Nest of unknown bird

4.5 Archaeology and Cultural Heritage

Archaeological Sites are known as any combination of structural remains, artifacts, human, or ecological elements and may be located entirely beneath, partially above, or entirely above the land or water surface. Archaeological material may be found anywhere on the earth's surface, singly or scattered over large areas. Such material also includes burial areas, human remains, and fossils (The World Bank, 2017).

However, the cultural heritage site is the location in which a tangible cultural heritage, other than heritage buildings, is found, and limited to the area between the two furthest points from this heritage in the shape of a circle, the diameter of which constitutes the distance between these two points with the heritage being inside this circle (RD 35/2019, 2019).

There are a plenty of archaeological sites in wiliyat Manah including castles, forts, mosques and Aflaj. There are two famous castles, Al Faqien and Al-Bilad Castles, and number of forts mainkly is AlMaarii

village fortress. Mosques like the Al-Shara Mosque, the ancient Ezz Mosque, and one of the most famous mosques in Manah Al-Jami', which was founded by the Omani Imam Omar bin Al-Khattab Al-Kharousi. The number of its falajs is estimated to be about thirteen, the most prominent of which is the falaj of Malik al-Mundhiz. These falajs are used in agriculture and crop irrigation.

Preliminary assessment of archaeological sensitivity at Solar PV Plant and vicinity was conducted and no heritage sites were observed. The closest archaeological site is Harat Al Bilad Heriage site which is 22.5 Km away from the project site (highlighted by the blue square).

Figure 4-25 The Archaeological sites in Manah

The desktop study and field survey confirmed that there are no cultural sites within the project area. However, during construction if any other archaeological findings are discovered then the contractor shall stop all the works and inform the Ministry of Heritage and Tourism accordingly to obtain further advice regarding protection or conservation actions necessary. If an article of archaeological significance be discovered then the area will be fenced and access will be prohibited ensuring the compliance with MD 6/80.

4.6 Socio-Economic Baseline

This section outlines the project area's socio-economic profile within influence area of 5 km which was identified during the surveys and through desktop studies. Information on the demography and socio-economic profile of these settlements was collated from MOTC, census reports, published literature and previous reports.

4.6.1 Population Demographics

The project area is located in Manah, Ad Dkhiliayah governonate, with a total project area is 775.33 ha. The table below illustrates the total population in Manah in the years 2020-2021 total population in 2020 was 25,368 and slightly increased to 25,688 in 2021. (NCSI, 2022)

Manah has a larger population of Omanis compared to the expatriate number in both years. This is highlighted in Table 4-10~~Table 4-10~~ below.

Table 4-10 Total Population in Manah

	Expatriate	Omani	Total
2020	6,801	18,567	25,368
2021	6,562	19,126	25,688

4.6.2 Settlements

There are many settlements located in Manah, they are: Bu taylah, Al HaqfAl-Qari,Mitan,Al-Bashair,Qirayhah, Al-Manayif ash-Shamaliyah, Al-Manayif al-Janubiyah.

Table 4-11 Settlements Demographics

Name	Area (km^2)	Population	Population Density (km^2)	Omani	Foreigner
Al-Qari	14.83	350	23.60	281	69
Mitan	22.22	719	32.35	564	155
Al-Bashair	6.041	100	16.55	33	67
Qirayhah	70	116	1.657	74	42
Al-Manayif ash-Shamaliyah	9.04	149	16.48	93	56
Al-Manayif al-Janubiyah	11.13	224	20.13	193	31

4.6.2.1 Bedouins

Bedouins are prominent in Ad Dakhiliyah and regions near Al Wusta Government and desert landscapes.

Few of the Bedouins currently follow the traditional Bedouin pattern and Bedouin life to the fullest extent, most of them nowadays are settled in their places with little mobility.

The Local Bedouin community cannot be quantified as they tend to move around depending on their preference and the season.

4.6.2.2 Camel races

Oman is home to active camel races that take place annually, including shows in Ad Dakhiliyah. Camel racing holds great significance in the nomadic lifestyle of the region and serves as a source of inspiration for poetry and singing. It is deeply rooted in Bedouin society, reflecting the vital role camels play in the desert environment.

In celebration of this cultural tradition, Oman organizes Arabian camel festivals across various governorates and cities. One of the most renowned festivals is the Al Bashayer festival, held in Ad Dakhiliyah at the Al Bashayer Field, located approximately 10.2 km from the project area. This festival carries immense importance within Oman and other Arabian countries, and it is sponsored by a special representative of the Sultan of Oman, Asaad bin Tarik Al Said, who is the brother of the Sultan.

Asaad Al Said emphasized the significance of the Al Bashayer Festival, stating that it stands as one of the most prominent sporting, social, cultural, and tourism events in Oman and the GCC countries. The festival serves as a gathering place for camel owners and showcases the competition among these magnificent animals, highlighting the sporting achievements and the transfer of knowledge on achieving the best performance levels for Omani camels.

Considering the considerable distance between the racing field and the project area, it is expected that there will be no direct impacts on the project activities. Therefore, the project activities can proceed without anticipated interference from the camel races or festivals.

4.6.3 Social infrastructure

4.6.3.1 Healthcare

There is a range of health facilities across Ad Dakhiliya including a number of pharmacies, health clinic and hospitals from the government sector as well as the private sector (NCSI, 2022).

Table 4-12 Health Facilities in Ad Dakhiliya

Private sector				**Governmental sector**			
Pharmacies	Health Clinics	Extended Health Centres	Hospitals	health centres	Health Clinics	Extended Health Centres	Hospitals
72	92	26	1	22	-	4	6

The following table provides an overview of the nearest health facilities to the project area, including their specialties, bed capacity, distance to the project area, driving time, and website:

#	No. of Beds	(Description of Institution)	Specialty	Wilayat	Distance to the Project (Km)	Driving time
1	-	Manah Health Center[10]	General OPD - Diabetic Clinic - Hypertension Clinic - ANC Clinic - Birthspacing Clinic - Geriatric Clinic - Dermatology Clinic - Dental Clinic - Infertility Clinic - Premarital Clinic - Above 40 Clinic - School Health - Immunization (EPI) - Health Education - Dietetion Clinic - Postnatal Clinic - Public Health	Manah	30.3	35 min
2	30	Adam Hospital (Local Hospital)[11]	Infection Control - Communicable Disease - Non-Communicable Disease - AIDS & HIV Disease - Malaria - Eye Health Care - Oral Cavity Health - School Health - Maternal Health - Community Health Care - Prevention of Injuries and Supporting Safty and respond for Emergency an Health Care Sector - Genetic Disease - Geriatric Care - Nutrition - Child Health Care - Laboratory - X- Ray - Pharmacy - Community Support Group - Statistics and Health - Information Technology - Health Care Facility for Private Sector - Primary Health Care - Nursing Care - Health Education and Communication - Adolesence Health Care - Quality Assurance and Patient Safty Care - Asthma Clinic - Dermatology Clinic -	Adam	32.5	35 min
3	25	Izki Hospital (Local Hospital)[12]	Male ward - Female ward - Peadiatric ward - Maternity ward - Accident & Emergency - Labour room - X-Ray - Pharmacy - Laboratory - GERIATRIC CLINIC - PHYSIOTHERAPY CLINIC	Izki	46	49 min
4	-	Izki Extended Health Centre	-	Izki	42.2	50 min

[10] https://www.moh.gov.om/en/web/directorate-general-health-services-dakhliya/-/manah-health-center
[11] https://www.moh.gov.om/en/web/directorate-general-health-services-dakhliya/facilities/-/asset_publisher/071iBeTfNJNW/content/adam-hospital?inheritRedirect=false
[12] https://www.moh.gov.om/en/web/directorate-general-health-services-dakhliya/-/izki-hospital

#	No. of Beds	(Description of Institution)	Specialty	Wilayat	Distance to the Project (Km)	Driving time
5	-	Buldan Al Awamir Health Center	-	Izki	26.9	31 min

4.6.3.2 Schools

There are a total of 155,663 students, 271 schools across Ad Dakhiliyah for both sectors, governmental and private as illustrated in the tables below.

Table 4-13 Schools in Ad Dakhiliyah

	Governmental Schools				Private Schools			
	Students	Teachers	Schools	Classes	Students	Teachers	Schools	Classes
Ad Dakhiliya	141,862	8,014	158	3,513	13,801	1,211	113	992

4.6.3.3 Roads

The government has developed the areas with main facilities that served the Omani citizen in all Oman. The site team observed that Road, electricity and water facilities are provided to all citizens especially who live in center of the villages.

The location of Solar PV Plant is positioned in area where several settlements and many populated places. In addition, Manah is located next to Nizwa(less than 20 km away) which is one of the important cities in Oman historically and present, attracting people from around Ad Dakhiliyah to settle around along with tourists from outside Oman which motivate Oman government to improve the infrastructure in general and particularly the roads of Manah and other Wiliyats in Ad Dakhiliya.

The project site is located near the main route(road 31) which extends from Nizwa in Ad Dakhiliyah region, all the way to Salalah in Dhofar , passing by Adam. There are a range of sub roads(asphalt) extending from the main route. The table below represents the distance and driving time from the project to the main cities. Furthermore, the following map illustrates the location of these cities to the project area.

Figure 4-26 Location of main cities to the project area.

Table 4-14 Distance and driving time from the project to the main cities

City	Distance to the project area (Km)	Driving time
Manah	41.1 Km, North	37 mins
Adam	42.8 Km, South	38 mins
Bisyah	68.5 Km, West	1 hr 7 mins
Sinaw	71.5 Km, Southeast	53 mins
Mudaybi	90.5 Km, Southeast	1 hr 11mins

4.6.4 Public Facilities

Public facilities in the project area include a wide range of amenities and services that serve the community and visitors. Facilities like hospitals, schools, petrol stations, supermarkets accommodations are fairly available in the area. However, it is important to note that these facilities are not situated in immediate proximity to the project area.

As a result, there is no immediate impact on these public facilities or the ongoing project activities. While they may not be in close proximity, their existence within a reasonable distance (around 7 Km to the project area) ensures that the community and project personnel can access the necessary amenities without significant inconvenience.

4.6.5 Physical infrastructure (Electricity and Water)

Production, distribution and connections numbers, both electricity and water, in Ad Dakhiliyah, is presented in the tables below:

Table 4-15 Production, distribution and connections of electrical power in Ad Dakhiliyah in 2021

	Production(Gw/H)	Distribution(Gw/H)	Connections(Gw/H)
Ad Dakhiliyah	170	2,679	140.9

Table 4-16 Production and distribution of Water and No. connections by Ad Dakhiliyah in 2021

	Production[13](Mn.M^3)	Distribution(Mn.M^3)	Connections(Mn.M^3)
Ad Dakhiliyah	3.3	34.4	64,592

4.6.6 Sensitive Receptors

The below table presents the sensitive receptors and the locations coordinates from the proposed Solar PV plant. These receptors have been identified at a 5km radius from the center of the project area as sensitive due to their proximity to the project site and the potential for impacts that may affect their functionality or well-being.

The sensitive receptors listed in the table indicate areas of importance or sensitivity in relation to the proposed Solar PV plant. In this case, the sensitive receptors include farmlands and a mosque. The farmlands are significant due to their agricultural nature, potentially being used for crop cultivation or other farming activities. The mosque holds religious significance within the community.

Table 4-17 Identified Sensitive reports as per desktop screening

Sensitive Receptors List		UTM Coordinates		Distance from the proposed project boundary (km)	Direction
		Easting (m E)	Northing (m N)		
1	Farmlands	572854.00	2499510.00	1.70	SE
		568994.00	2496890.00	2.31	S
2	Mosque	572854.00	2499510.00	1.69	SE

[13] Production=wells + water received from water main network and also small destination plants

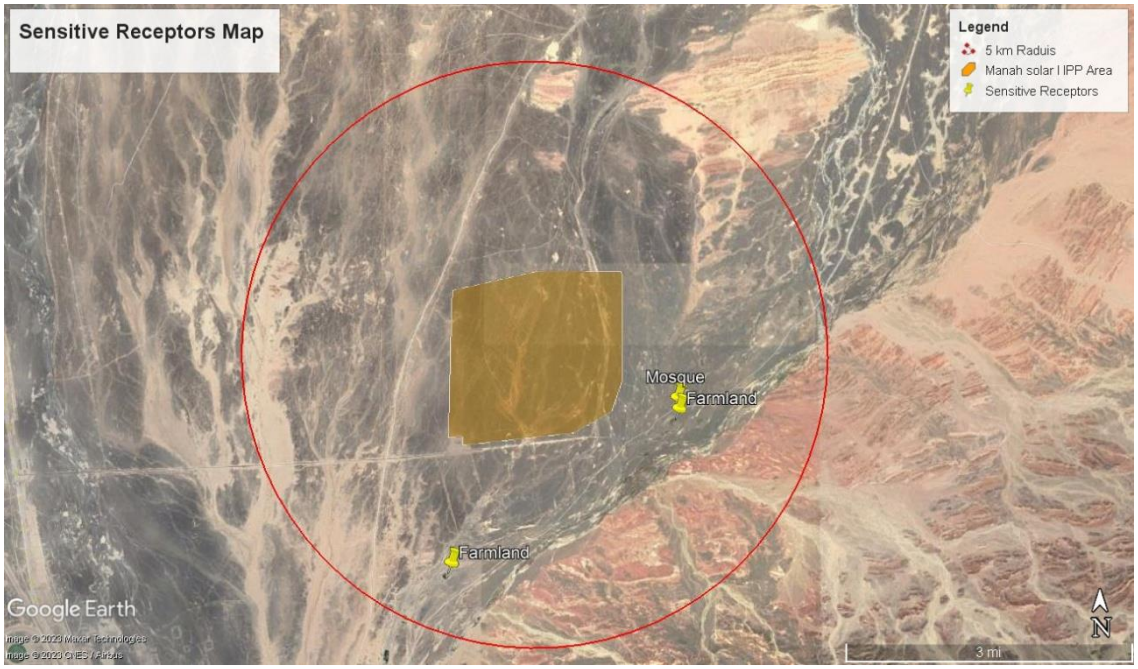


Figure 4-27 Sensitive Receptors map

4.6.7 Stakeholder Engagement

4.6.7.1 Meeting with the Wali of Manah

As a part of the socio-economic baseline development an engagement with Wali of Manah was held. A project manager (Manar Al Hamadani), senior environmental consultant (Maryam Al Zadjali), and the field technician who was part of the baseline surveys (Said Al Riyami) attended a meeting with the Wali of Manah – Dr. Faisal Al Zeedi. The purpose of the meeting was to capture the following:

- Local community (including Bedouins) around the project areas and any expectations;
- Available contractors/SME's that could support and provide services for the project;
- Expectations for training and employment opportunities;
- Any main concerns about the project; and
- Any other expectations from the project during construction to operations.

Findings from the meeting are summarized as below:

- The Wali was well aware of the project prior to the meeting and has been involved during the location selection stage. He has had meetings with several representatives from the project, including the CEO. He is aware that most of the impacts anticipated from the project are from the project construction phase.
- The Wali confirmed that there is a presence of communities including Bedouins in the surrounding area and he understands that the project would be fenced and they would need

to divert around this area once construction starts and through operations due to safety risks. On this point, he highlighted that the Bedouin community would be upset by this. However, in order to offset this, training and employment opportunities during the construction phase mainly to the local community would be highly appreciated. He further emphasized that the area has a low population but with numerous citizens hold a Bachelor's Degree in various engineering disciplines.

- Prior to our meeting, the Wali mentioned that he had received a visit from the one of the house owners close to the project area. The house owner has briefed the Wali that all the neighboring houses got rented for project purposes, except for hers[14]. She does not permanently reside at her house in Manah, so she would like to get it rented as well to benefit from the project. The Wali shared all relevant details for this.
- HMR requested the Wali to share a list of local community service providers as well as eligible citizens for training/ employment after the meeting for consideration by the project company to meet ICV requirements. However, the Wali requested some kind of confirmation that the training/ employment opportunities will be met to ensure that hopes are not falsely raised.
- The Wali mentioned that there are Ministry of Defense vehicles that pass through that area which would cause dust risings that could settle on the solar panels.

The figure below is a snapshot of the meeting held with the Wali.

[14] After a discussion with the project team it was clarified that these houses were rented by another company for a different project. No project activities have commenced for Manah I. However, the project team will take this into consideration once project activities start.

4.6.7.2 Figure 4-28 Stakeholder Engagement with Wali of Manah Meeting with the Wali of Manah Executive, and a Representative of the Local Community

After the meeting with the Wali, concerns were raised regarding the impacts of the project on the local community, specifically Bedouins. Therefore, another meeting was held with the Wali executive (the wali himself was not available and local community representatives.

The main points from the meeting are summarized below:

- The Wali executive provided CVs of those competent in the local community to be hired during the project lifetime. This mainly included security office and truck drivers. The project team also confirmed that they will initiate CSR activities in favor of the local communities.
- A representative of the local community, who is also a member of the municipality, confirmed that the land was previously owned by the Ministry of Defense but was later designated as usufruct land and was awarded to the project owners through the Ministry of Housing and Urban Planning. He also stated that the land was devoid of any local communities with no grazing, herding or temporary housing. Nonetheless, the land was not fenced off. He also confirmed that there is no presence of Bedouins within the project boundaries.
- The Wali executive also confirmed based on his knowledge of the local community that they are generally understanding and would not cause any conflict.
- The Wali executive stated that the project team should approach the Wali office in case of any social issues that might arise in the future and they would provide their support to resolve these issues.

- The project team requested that the local community is informed that the project will take place in this area and ensure that the project runs smoothly.

Figure 4-29 Snapshot from the Meeting

5 Environmental Releases

This chapter presents the description of source and the nature of releases of various environmental releases from Solar PV plant for Manah I, primarily during construction, operation phases of the project. Various classifications and sub-classifications of the waste streams have been done based on the physical and chemical nature of these streams.

5.1 Environmental Releases during construction phase

5.1.1 Overview

The releases during construction phase will depend upon the type of construction activities, construction methods, construction equipment, chemicals / materials used, source / amount of utilities and duration of site work. Releases and related impacts are identified based on available information.

The environmental releases during the construction phase will include emissions from the DG units, emissions from construction equipment and vehicle, dust generation from earthworks, sewage generated at site and camp, waste chemicals generated at site, maintenance wastes, construction wastes, and metal, wooden and plastic scraps, etc. These releases can be discussed in the following table.

Table 5-1 Environmental Releases during Construction Phase

#	Description of Source & associated Release / Waste Stream	Nature of Release / Waste
AIR EMISSIONS		
1	Stationary point sources – Emissions from diesel generators (DG sets) and other stationary machinery	Continuous release during construction activities - Combustion products - NOX, CO, SO2, un-burnt hydrocarbons (HC), and Particulate Matter (PM)
2	Mobile sources – Construction machinery and vehicles run by internal combustion engines	Intermittent release during construction activities - Combustion products (NOX, CO, SO2 , un-burnt HC, and PM)
3	Fugitive emissions from fuel and storage tanks	Continuous emissions of VOCs
4	Dust emissions from earth works, movement of vehicles on unpaved roads	Continuous emissions of airborne dust (PM)
NOISE		
1	Noise generated from construction vehicles and equipment	Continuous generation of noise levels above ambient levels
2	Noise from DG sets	Continuous during construction activities
WASTEWATER		
2	Sanitary wastewater from site project offices & labor camps	Continuous during construction – contain biodegradable organics and suspended solids

#	Description of Source & associated Release / Waste Stream	Nature of Release / Waste
3	Wastewater from construction site	Continuous during construction - contains suspended solids
4	Surface run-offs	Run-offs due to rainfall, which are rare occurrences - typically contains suspended solids
HAZARDOUS WASTES		
1	Oil sludge from diesel storage and lube oil from maintenance workshops	Intermittent – Hydrocarbon wastes
2	Waste cleaning solutions, waste paints, chemicals, etc.	Intermittent – Acids, caustic, detergents, organic solvents, etc.
3	Containers of hazardous materials (oil, paint, chemical etc.)	Intermittent – Empty containers contaminated with hydrocarbons and chemicals residues
4	Unused and off-spec materials	Waste paints, chemicals and solvents
5	Contaminated soils due to accidental spills and leaks of oils and liquid chemicals,	Intermittent - Contaminated soil / sludge
6	Miscellaneous wastes such as spent batteries, waste tyres, waste cables, etc.	Intermittent - Low level hazardous wastes
NON-HAZARDOUS WASTES		
1	Existing construction debris and dug materials from excavations for foundations, pipes and roads	Continuous during excavation activities – Normally uncontaminated
2	Domestic waste, office waste, other general waste and construction wastes;	Intermittent – Domestic refuse and civil works wastes
3	Metal scrap and empty metal drums of non-hazardous materials - Metal work and packaging materials	Intermittent – recyclable, non-biodegradable.
4	Paper & wood scrap – Packaging materials	Intermittent – recyclable, biodegradable.
5	Empty plastic containers of non-hazardous materials	Intermittent – Plastic and related materials
6	Miscellaneous wastes such as waste tyres, waste cables, light fittings, buried structures, cables, etc., from the site, and other construction debris	Intermittent – Non-recyclable, non-biodegradable.
ACCIDENTAL RELEASES		
1	Accidental spills / released of diesel, lube oil, solvents, paints, gases from cylinders, etc.	Rare occurrence - Contaminated soils, liquid and gaseous hydrocarbons releases, etc.

The following sections describe the releases of the construction phase, which are air emissions, noise, wastewater, hazardous and non-hazardous waste, and accidental releases.

5.1.2 Air Emissions

Major sources of air emissions during the construction phase are from the DG's set emission, vehicles movement and fugitive emissions from fuel and storage tanks. Pollutants released from these sources include Particulate Matter (PM), NOX, SO_2, CO and unburnt hydrocarbons (HC).

NOX (a combination of NO and NO_2), PM, SO_2, CO and HC is formed as fuel combustion products/by-products. CO and HC are results of incomplete combustion of fuel, and PM is formed due to the ash content in the fuel as well as any particles (soot, sulphates etc.) formed during combustion. Suspension of PM is highly probable due to movement of vehicles on un-paved road and plant's blocks installation or fixation.

The above releases are short term in nature and will be present only for limited periods when the associated activities, as discussed above, are performed.

5.1.3 Noise

Noise emissions from construction activities of project will occur from use of construction equipment's, vehicles movement, DG sets etc., which will be used at project site. However, the source noise levels during this phase will be maintained in such a way as to comply with applicable regulatory requirements.

5.1.4 Wastewater

The clarified effluent in the sanitary wastewater will be sent to an approved STP for treatment and disposal. The separated biodegradable organics and suspended solids will be skimmed off or removed using alternative approved for organic removal and the collected biodegradable organics and suspended solids will be disposed as hazardous waste which will then be disposed of via EA approved contractor.

Sewage generated from various toilets and washrooms at the project site and project offices will be collected through underground pipes into holding tanks. The sewage from the holding tanks will be removed periodically by vacuum trucks and transferred to the municipal STP for treatment and disposal.

5.1.5 Hazardous waste

The hazardous waste materials during the construction phase of the project include cleaning solvents, paints, fuels, oil, contaminated soil, spent batteries, etc., which will be used for the construction activities. Typically, the pollutants will be hydrocarbons. The contractors will include adequate provisions (as per MSDS) for the safe handling, storage, handle and disposal of such wastes or the hazardous waste will be handed over to transporters licensed by the Ministry to collect, handle, store and dispose hazardous waste outside the waste.

The hazardous waste materials will be segregated and stored in appropriate protected well ventilated/aerated and enclosed areas. Wastes will be segregated in such a way that those, which are explosive, flammable, reactive, corrosive, toxic, etc., will not come in contact with each other. As appropriate, such wastes will be stored on concrete floored with chemical protection coating as applicable is provided, bunded, enclosed and covered areas in order to protect from rains and prevent runoffs.

5.1.6 Non Hazardous Waste

Various wastes will be segregated and collected in appropriate skips, drums, etc. Non-hazardous wastes will be prevented from mixing with hazardous waste materials. The storage skips / areas for each type of waste will be clearly identified and marked. The collected wastes will be periodically disposed-off to local recyclers, as feasible. Non-recyclable waste will be sent to nearby approval waste disposal sites.

5.1.7 Accidental Releases

Accidental releases at the construction site mainly results from spills during routine handling, loading/unloading, transportation and use of fuel/chemicals etc. Leakage from compressed gas cylinders can occur from storage areas or at work site due to improper handling. There is also potential for spill of fuel, lube oil, waste oil and other chemicals such as solvents, adhesives etc. at the site. Quantities of accidental releases are difficult to estimate as inventories and storage details of chemicals were not available at the time of preparation of this report.

The clean-up of accidental spills generates contaminated soils, rags, etc. Contractors typically provide adequate spill containment systems, remediation plans and maintain proper practices of storage and handling of materials, which minimizes accidents.

5.2 Environmental Releases during operation phase

The assessment of environmental releases during operation phase of the project addresses various waste streams generated due to the operation of the solar PV plant in Manah I.

Considering the project is a renewable energy generation project, as it is clear from the following table, the releases during operation phase are minimal. The details can be described in the following sections.

Table 5-2 Environmental Releases during Operation Phase

#	Waste Stream and Source	Nature of Waste Stream
AIR EMISSIONS		
1	**Stationary sources** – Emissions from emergency DG sets (if any)	Rare – Combustion products mainly SO2, NOx, CO, CO2, unburnt HC and PM
ACCIDENTAL RELEASES		
2	Contaminated soils due to accidental spills and leaks of diesel (if any)	Unique occurrence

#	Waste Stream and Source	Nature of Waste Stream
		Soil contaminated with hydrocarbons etc.
3	Wastewater. Generation within the site	During the operational period it is Unmanned except for the mandatory maintenance.

5.2.1 Air Emissions

As mentioned above, the proposed projects is renewable energy project and air emission from the project during the operation phase will be none with the rare occurrence of emissions from emergency DG, and emissions due to any leaks from diesel storage tanks.

5.2.2 Accidental Releases

There is potential for spill of fuel, lube oil, waste oil and other chemicals such as solvents, adhesives etc. at the site. Quantities of accidental releases are difficult to estimate as inventories and storage details of chemicals were not available at the time of preparation of this report. The clean-up of accidental spills generates contaminated soils. Proper practices of storage and handling of materials should be implemented which minimizes the accidents during the operation phase.

5.3 Environmental Releases during decommissioning phase

The environmental releases during the decommissioning phase will include emissions from the DG units, emissions from demolition equipment and vehicle, dust generation from earthworks These releases can be discussed in the following table.

Table 5-3 Environmental Releases during Decommissioning Phase

#	Description of Source & associated Release / Waste Stream	Nature of Release / Waste
AIR EMISSIONS		
1	Stationary point sources – Emissions from diesel generators (DG sets) and other stationary machinery	Continuous release during construction activities - Combustion products - NOX, CO, SO2, un-burnt hydrocarbons (HC), and Particulate Matter (PM)
2	Mobile sources – demolition machinery and vehicles run by internal combustion engines	Intermittent release during construction activities - Combustion products (NOX, CO, SO2 , un-burnt HC, and PM)
3	Fugitive emissions from fuel and storage tanks	Continuous emissions of VOCs
4	Dust emissions from earth works, movement of vehicles on unpaved roads	Continuous emissions of airborne dust (PM)
NOISE		
1	Noise generated from demolition vehicles and equipment	Continuous generation of noise levels above ambient levels
2	Noise from DG sets	Continuous during construction activities
WASTEWATER		
2	Sanitary wastewater from site project offices &	Continuous during construction – contain

#	Description of Source & associated Release / Waste Stream	Nature of Release / Waste
	labor camps	biodegradable organics and suspended solids
3	Wastewater from site	Continuous during construction - contains suspended solids
4	Surface run-offs	Run-offs due to rainfall, which are rare occurrences - typically contains suspended solids
HAZARDOUS WASTES		
1	Oil sludge from diesel storage and lube oil	Intermittent – Hydrocarbon wastes
2	Waste cleaning solutions, waste paints, chemicals, etc.	Intermittent – Acids, caustic, detergents, organic solvents, etc.
3	Containers of hazardous materials (oil, paint, chemical etc.)	Intermittent – Empty containers contaminated with hydrocarbons and chemicals residues
4	Contaminated soils due to accidental spills and leaks of oils and liquid chemicals,	Intermittent - Contaminated soil / sludge
5	Miscellaneous wastes such as spent batteries, waste tyres, waste cables, etc.	Intermittent - Low level hazardous wastes
NON-HAZARDOUS WASTES		
2	Domestic waste, office waste, other general waste and demolition wastes;	Intermittent – Domestic refuse and civil works wastes
3	Metal scrap and empty metal drums of non-hazardous materials - Metal work and packaging materials	Intermittent – recyclable, non-biodegradable.
4	Paper & wood scrap – Packaging materials	Intermittent – recyclable, biodegradable.
5	Empty plastic containers of non-hazardous materials	Intermittent – Plastic and related materials
6	Miscellaneous wastes such as waste tyres, waste cables, light fittings, buried structures, cables, etc., from the site, and other demolition debris	Intermittent – Non-recyclable, non-biodegradable.
ACCIDENTAL RELEASES		
1	Accidental spills / released of diesel, lube oil, gases from cylinders, etc.	Rare occurrence - Contaminated soils, liquid and gaseous hydrocarbons releases, etc.

6 Analysis Alternatives

6.1 Overview

The development, design and construction of the proposed Solar PV plant involves several major management and technical decisions, some of which will have significant influence on the environmental impacts of the project.

In this chapter, the environmentally critical alternatives selected for the project are identified and the justification for their selection is discussed. It should be noted that a comparison between the alternatives and criteria used to select the alternative is not available.

The maximum power generating capacity of the Project will be 500MW (AC) and this will add to the current power generating capacity within Oman and given the requirement for additional energy generation in the Sultanate of Oman.

Looking at the anticipated impacts as a result of the development of this project although the construction phase may likely result in potential temporary negative impacts, the operational phase of the project will likely result in an overall positive impact, particularly due to the development of utilities and socio-economic benefits, and the increase in renewable energy being supplied to the Omani grid.

6.2 Project Technology

The Project will generate electricity using solar energy. As a renewable energy project, the Project will contribute to Oman's vision of diversifying its energy sources and will contribute to reducing the dependence of the Sultanate, which gets freed up for export led income foreign supplies of other conventional sources of energy (fossil fuel). The development of the Solar PV Project will also create employment and training opportunities for Omani nationals in the field of solar and renewable energy.

Several technologies for the development of the Project were proposed;

- Bi-facial type Solar PV Panels which generates energy from both top and rear sides
- Single axis tracker technology mounting system and
- String or central inverters.

Based upon the chosen design it is expected that the bi-facial type solar PV panels will maximize the efficiency of power generation from the Project.

6.3 Project Utilization

6.3.1 Power

Power sourcing options for plants is sourcing from the solar plant itself as it used the solar energy and converted to electrical energy that the plants used for it operation.

DG may be used only for the period of construction phase. Employing DGs to generate the entire power requirement during the construction phase will involve consumption of significant quantities of fuel and will result in air emissions from DG units. Moreover, storage of fuel within the site will cause fugitive emissions and accidental releases that may pose safety hazards.

6.3.2 Water

During site preparatory stage, the project will require portable water supply for the construction facilities & activities. A licensed potable water supply company will supply the water required to cover the water demand of the Project to the site via water tanker trunks.

Water tanker trucks will transport water from outside the Project site to water storage tanks within the Project boundary to cover the water demand of the Project which will include water for PV panel cleaning, as well as raw water for domestic use, firefighting water demand and other non-potable water uses if required. At this stage the total annual volume of water required by the Project has not been finalized, but is expected to be sourced from either a municipal or private supplier. The source is unconfirmed at this stage. Potable drinking water will be provided by a potable water supplier and is expected to be bottled.

6.3.3 Fuel

The fuels for the plant equipment (if required) and vehicles can be stored onsite or can be met by using fuel-dispensing tankers.

The option of using diesel-dispensing tankers for supplying the fuel to all stationary equipment of the project is selected. Such tankers can be supplied and maintained by the central facilities of the contracting companies. This minimizes the need for onsite fuel storage, accidental spillage and related safety protection systems.

7 Climate Affairs

This chapter presents the related information to the potential impact towards the climate as a result from the proposed Project. Specifically, Greenhouse Gas (GHG) releases which are anticipated from the project activities and the subsequent impact on the climate. An estimate of GHG emissions using the emission factors from the Intergovernmental Panel on Climate Change (IPCC) Guideline.

7.1 Energy consumption

Energy sources and the energy consumption during the construction phase of the proposed project are identified and estimates of GHG emissions from these sources are derived using emission factors provided in the 2006 guidelines for National Greenhouse Gas Inventories, Volume 2 by IPCC. The guidelines provide emission factors for GHG emissions from all sources of GHG emission including the stationary, mobile, solid waste and wastewater. The below tables present the annual energy consumption during the construction phase of the proposed project considering the construction duration of the solar PV Plant is 17 months.

As a solar PV project, there will be no GHG emissions from the operational activities. An emergency diesel generator will be located on-site, but is not anticipated that it will be used except during an emergency such as grid blackout. However, this is considered highly unlikely.

Table 7-1 Estimated annual energy consumption during the construction phase of the project

#	Stage of the Project	Liquid fossil fuel (Litre)	Natural Gaseous fuel (Litre/ year)	Solid fuel (Unit)	Electricity (KWh)
1	Construction Phase	127500	-	-	8,000 (3.5 Metric tons of CO_2 equivalent)

7.1.1 Emission Factors

The emissions factors have been selected according to IPPC Guideline for National Greenhouse Gas Inventories (2006) for arriving at potential GHG emissions from the solar PV plant process works and for the release of CH_4 during construction and operation phase. Default CO_2 emission factors assume that 100% of the fuel carbon is oxidized to CO_2. The default emission factors for CO_2 and their uncertainty ranges, and the default emission factors for CH_4 and N_2O for Tier 1 are provided in Table 7-2~~Table 7-2~~ as no country-specific emission factors are available for stationary sources and fuel consumption.

Table 7-2 Emission Factors for stationery and fuel consumption

#	EF (Kg/TJ)			Reference
	CO_2	CH_4	N_2O	
Stationary Combustion processes (Diesel), DG	74100	3.00	0.60	2006 IPPC Guideline for National Greenhouse Gas Inventories, Volume 2 (Energy), Table 2.2, page 472
Heavy Vehicles (Diesel)	74100	4.13	28.60	2006 IPPC Guideline for National Greenhouse Gas Inventories, Volume 2 (Energy), Table 3.3.1, page 472
Mobile Combustion – Cars and buses, (Diesel)	74100	3.90	3.90	2006 IPPC Guideline for National Greenhouse Gas Inventories, Volume 2 (Energy), Table 3.2.1 (form page 452) and Table 3.22 (from page 457)
Mobile Combustion – Cars & Buses (Petrol)	69300	33.00	3.20	2006 IPPC Guideline for National Greenhouse Gas Inventories, Volume 2 (Energy), Table 3.2.1 (form page 452) and Table 3.22 (from page 457)

7.1.2 Assumptions

The assumptions been taken into the emission calculations for the mobile and stationery sources are listed as followed for each phase:

Table 7-3 Assumptions Quantities from mobile and DG during construction phase

Emission Sources	Quantity (L/month)	no. of units	Construction period (month)	Total fuel consumption (L/ total construction period)
Stationary Combustion processes (Diesel), DG	4500	1	17	76500
Heavy Vehicles (Diesel)	1500	1	17	25500
Mobile Combustion – Cars and buses, (Diesel)	1000	1	17	17000
Construction equipment	500	5	17	25500
Total				**144500**

7.2 GHG Emission and Mitigation

7.2.1 Preliminary Assessment of GHG Emission

A preliminary assessment of GHG emission associated with the project and those are likely to exceed Environment Authority thresholds during any phases of the proposed project is carried out as presented in below tables

Table 7-4 Quick assessment of relevant GHG emissions associated with the project

#	Activities/Facilities	CO_2	CH_4	N_2O	PFC	SF_6	HFC
1	construction Phase	399.27	13.27	15.30	-	-	-

Table 7-5 Annual Total Tons CO2e Emission during the Project Phases

#	Activities/Facilities	Scope 1 Fuel	Scope 2 Electricity	Scope 3 Solid waste & wastewater	Total Emissions per phase
1	Construction Phase	408.16	6.93	12.74	427.83

Table 7-6 Comparison of annual GHG Emission with Environment Authority Thresholds

#	Activities/Facilities	Annual Total Tons CO_{2e}	Environment Authority Thresholds
1	Construction Phase	427.83	-

7.2.2 Detailed Inventory of GHG Emission

A detailed GHG emission inventory is not conducted for the proposed project because the GHG emission from the project is lower than the Environment Authority threshold of 2000 tons, so the detailed inventory of GHG emission is not required.

7.2.3 Inventory of Equipment and Appliances Containing ODS/Non ODS

There is no equipment and product which may typically contain ODS/Non ODS that are expected to be used in the lifecycle of the proposed project.

Standard air-conditioners that are commercially available in the local market through authorized distributors will be procured. The air-conditioners will be sourced, serviced and maintained by authorized suppliers and service centres in Oman, which are expected to comply with the requirements of MD 243/2005. Controlled substances listed in MD 243/2005, and equipment, appliances, and products containing such substances will not be used during any stage. Further, standard fire extinguishers will be sourced from approved local suppliers and such fire extinguishers are not expected to contain any ODS.

7.2.4 Plan to phase out ODS

As mentioned above, no ODS equipment will be used for the project.

7.3 GHG Emissions Avoided from the Project

The operating impact of this renewable energy project on the GHGs is virtually neutral. The absence of new emissions will be the cause of this. The installation of such significant renewable energy facilities are advantageous in the long run because they reduce the need to build and run traditional fossil fuel fueled power plants to provide equivalent amounts of power. Thus, decreasing emissions and serving as a key initiative for the Sultanate's long-term switch to a more renewable-based energy mix.

The Plant will produce around 1550GWh of electricity per year, and the Oman power sector mix emits 478 tons of CO2 per GWh (source: IRENA). Therefore, using the equation below, the Plant is then avoiding the emission of 741 thousand tons of CO2 per year.

Annual avoided emissions = annual production x (Oman emission factor – PV emission factor)

Moreover, the cumulative GHG emissions avoided across the project's lifetime are presented in the table below:

	Production (GWh)	Avoided emissions (tCO2)
year 1	1564.7	707,264
year 2	1560.8	705,481
year 3	1557.3	703,898
year 4	1554.2	702,518
year 5	1551.1	701,118
year 6	1538.5	695,412
year 7	1535.3	693,953
year 8	1532.0	692,475
year 9	1528.7	690,977
year 10	1525.3	689,456
year 11	1521.9	687,912
year 12	1518.5	686,347
year 13	1514.9	684,757
year 14	1511.4	683,146
year 15	1507.8	681,519
year 16	1504.1	679,871
year 17	1500.4	678,203
year 18	1496.7	676,514
year 19	1492.9	674,796
year 20	1489.1	673,052
year 21	1485.2	671,289
year 22	1481.2	669,501
year 23	1477.2	667,683
year 24	1473.1	665,841
year 25	1469.0	663,976
year 26	1464.8	662,087
year 27	1460.6	660,179
year 28	1456.3	658,245
year 29	1452.0	656,288
year 30	1447.6	654,316

total lifetime avoided emissions	**20,418,072**

7.4 Climate Risk Vulnerability Assessment (CRVA)

7.4.1 Overview and Objective

Floods, tropical cyclones, severe temperatures, and wildfires threaten and enhance danger to global energy infrastructure. The frequency, severity, and variety of these severe weather events are growing. The intensity of the impact of these severe occurrences has grown in many locations, owing in part to the fact that current infrastructure was not designed to resist the weather extremes of the twenty-first century.

Climatic risk assessments determine the possibility of future climatic hazards as well as their possible implications, both of which contribute to total climate risk. In compliance with AIIB's Paris Alignment requirement as well as IFC performance standards and Equator Principles, this section presents the Climate Risk Vulnerability Assessment (CRVA). The CRVA follows the "Methodology for Assessing the Alignment of AIIB Investment Operations with the Paris Agreement".

7.4.2 Scope and Boundary of the CRVA

Climate risk is widely characterized as the possibility of negative repercussions from climate change affecting people's lives, livelihoods, health and well-being, ecosystems and species, economic, social, and cultural assets, services (including ecosystem services), and infrastructure. Physical risks are associated with the physical effects of climate change, which are caused by acute weather events such as floods and storms, as well as chronic long-term shifts such as temperature increase and sea level rise.

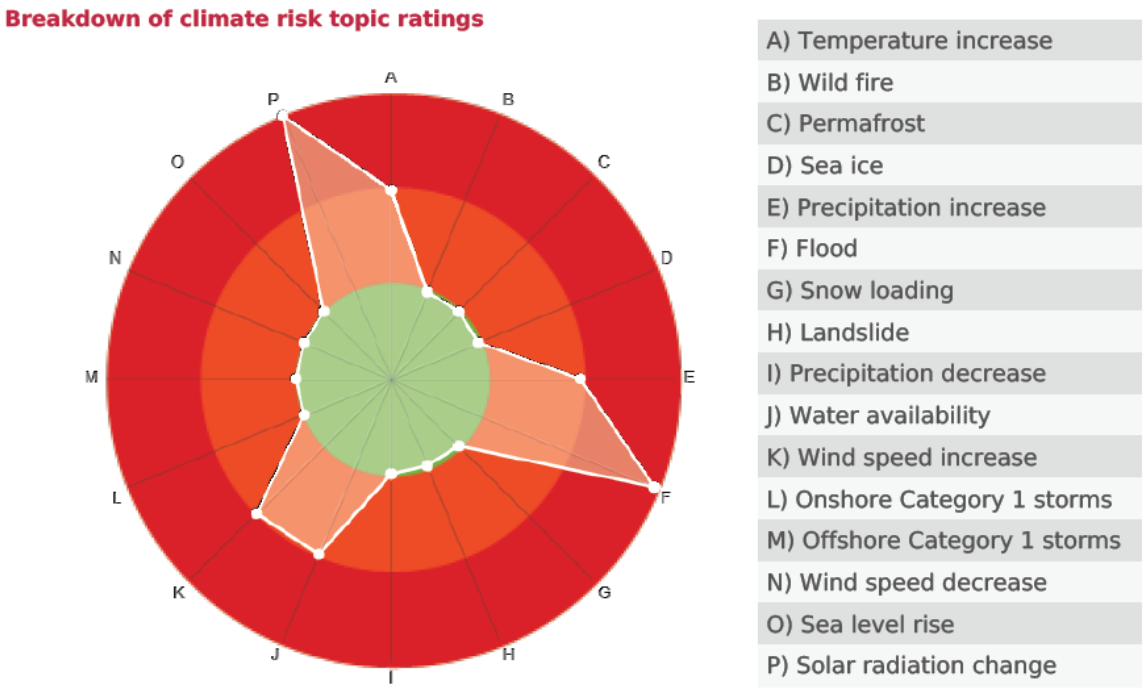
The report assesses the impact of physical climate risks on the design of the project. The temporal boundary of the CRVA will cover the project operation phase. The economic boundary of the project has been scoped out of the CRVA due to the absence of supply chain and other relevant data at this stage. The social boundary of the project is also scoped out because there are no permanent settlements within or around the project area. Moreover, during the operation phase, the plant will be unmanned except for occasional maintenance activities.

7.4.3 Sensitivity Analysis - Identifying Climate Hazards Relevant to the Project

The goal of sensitivity analysis is to determine which climatic risks are relevant to the specific activity and to serve as an initial filter for risks that are not relevant to the operation at hand.

A screening exercise for climatic and geological risks has been undertaken for the Manah I Solar PV project based on the Aware^{TM} geographic data collection. This data is collected from the most recent scientific knowledge on present geology, climatic, and associated dangers, as well as expected future changes when possible. These data are then integrated with the project's sensitivity to hazard factors, yielding information on existing and prospective future hazards that may impact the project's design and planning.

The findings from this screening exercise are summarized in the radar chart below:



The red band (outside circle) indicates a higher level of risk associated with a risk subject. The green band (inner circle) indicates a lower risk level in regard to a risk subject. It is clear that Flooding and Solar Radiation Change have the highest risk levels.

According to Aware TM data, the project is located in an area that has recently undergone periodic large flood disasters. A high exposure in Aware indicates that the region saw at least one severe, large-scale flood event between 1985 and 2016. Flooding can cause damage to the solar PV infrastructure.

Moreover, Medium (yearly, seasonal) or longer term variations in solar radiation at the Earth's surface can affect the Solar power potential.

Therefore, Flooding and Solar Radiation Change have been identified as the highest risks associated with the project and will be further analyzed in the subsequent sections.

7.4.4 Exposure Analysis

After identifying the climate risks that influence the operation of the project, location-specific data will be utilized to determine the amount of exposure to various hazards and how this may change under different climate scenarios.

The Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC AR6) [IPCC 2021] evaluates observed trends and climate model forecasts worldwide and regionally for numerous places across the world. The IPCC reports are based on a thorough study of the scientific literature available before to publication, as well as an examination of global and regional climate model forecasts from various modeling agencies. Since 1995, the Coupled Model Intercomparison Project (CMIP) has coordinated various versions of climate model data created by modeling organizations throughout the world in order to better assess the impacts of changes in our climate.

This section's summary of climate forecasts is based on the most recent CMIP versions, CMIP5 and CMIP6, as well as other sources of data. The observed and projected changes are in reference to the changes across the Arabian Peninsula.

7.4.4.1 Flooding

The table below summarized the water-related observed and projected changes for the Arabian Peninsula as per the IPCC.

Water related - observed vs. projected changes	
Observed	**Projected**
• The Arabian Peninsula (ARP) has a wet season from November to April and a dry season from June to August. Rainfall is largely restricted to the ARP's southwest, and the percentage of severe events to total rainfall ranges from 20-70% depending on area and season. • Annual precipitation trends across the ARP since 1970 are predicted to be -6.3 mm per decade (with a range of -30 mm to 16 mm per decade) for the period 1978-2019 (low confidence), with significant interannual variability across the region. The trend in Oman is -0.01 mm per decade, which is not statistically significant. • The greatest 1-day precipitation across Oman grew at a rate of 0.10 mm per decade from 1971 to 2020, however the trend is not statistically significant.	• For the ARP area, the estimated change in ensemble mean annual precipitation from 30 CMIP6 models varies from 3.8% (-2.6% to 28.8%) to 31.8% (12.0% to 106.5%) for SSP1-2.6 and SSP5-8.5 emissions for the period 2080-2100 compared to 1995-2014. • Precipitation in the northwest ARP is expected to decline by -6% to -27% every decade, while precipitation in the south is expected to increase by up to 8.6% per decade. • CMIP6 forecasts are consistent with CMIP3 and CMIP5, however they are less varied in the central ARP area in CMIP6. • Precipitation uncertainty over ARP is considerable because to relatively low yearly precipitation with substantial variability, resulting in low confidence in model estimates. • There is also a forecast rise in precipitation intensity in the Arabian Peninsula, which is expected to result in increased soil erosion owing to floods, particularly in winter and spring (medium confidence). • When compared to the reference period, a regional climate model simulation demonstrates an increase in the cumulative quantity of simulated precipitation linked with severe occurrences in the future climate [Almazouri et al, 2019]. • This suggests that severe occurrences on the Peninsula will grow more intense in the future.

As summarized in the table above, it is clear that flood events are projected to become more frequent and more intense in the future.

Flooding might cause significant damage to solar installations. The intensity, length, and amount of waterlogging during a flood substantially influence component destruction. Floods have the potential to totally submerge projects and harm equipment. Soil erosion may impact the ground grips of module mounting systems.

Corrosion might speed up, causing damage to module mounting structures. Floods might cover subterranean cables and cables linking control and inverter stations, causing generating outages.

7.4.4.2 Solar Radiation Change

The table below summarized the radiation observed and projected changes for the Arabian Peninsula as per the IPCC.

Radiation – observed vs. projected changes	
Observed	**Observed**
• Observations of radiation show decadal changes, which are largely due to the so-called dimming and brightening phenomena caused by the growth and reduction of aerosols. Brightening has continued in Europe and Northern America during the last two decades, whereas dimming has stabilized across South and East Asia and increased in certain other locations.	• Future regional shortwave radiation estimates are heavily influenced by cloud, aerosol, and water vapour changes. There is little confidence in the direction of radiation change across the ARP area.

As presented above, future projections of regional 'dimming' or 'brightening' is difficult to predict; this is due largely to the large uncertainty surrounding cloud formation under climate change conditions. Climate change influences solar PV production by altering temperature, insolation, and cloudiness. The major effects on the resource base for all forms of solar energy: solar heating, photovoltaic, and concentrated solar power are changes in insolation and cloudiness. Increased cloudiness reduces photovoltaic production.

7.4.5 Vulnerability Analysis

This section combines exposure and sensitivity to determine the overall vulnerability of the operation to a specific hazard.

The project is in a location that has recently suffered periodic catastrophic flood occurrences. Climate change is expected to have an impact on the frequency and severity of flood occurrences. This may have an impact on the project's design, operation, and maintenance.

Future forecasts of regional 'dimming' or 'brightening' are difficult to forecast, owing to the considerable uncertainty surrounding cloud production under climate change circumstances. This is not expected to be significant throughout the solar plant's design life (25 years).

Accordingly, the vulnerability of these hazards is presented in the matrix below:

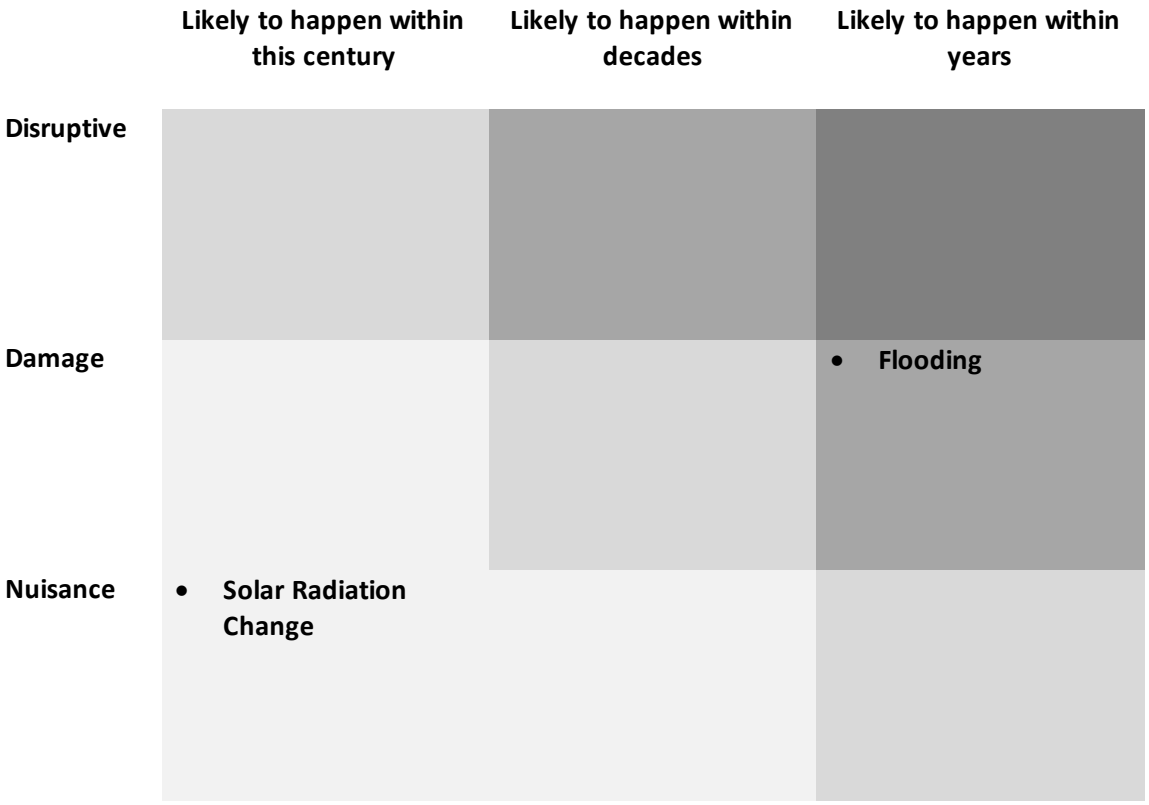


Figure 7-1 Vulnerability Matrix

7.4.6 Identifying Climate Resilience Measures and Potential for Maladaptation

This section lists out appropriate climate resilience measures that can be put in place to manage risks and reduce vulnerability for each of the climate vulnerabilities identified. The potential maladaptation of these climate resilience measures is also discussed in this section.

Since the impacts of solar radiation change are not anticipated to be significant over the design life of the solar plant 25 years, no mitigation measures have been presented.

The climate resilience measures and potential for maladaptation are discussed in the table below.

Climate Resilience Measures	Potential for Maladaptation
Flooding	
• Place solar PVs/ equipment at higher elevations to prevent flooding.	• No potential for malfunction anticipated.
• The hydrology and flooding assessment undertaken for Manah I and Manah II projects propose the construction of a drainage channel at the side of the existing road to prevent flooding.	• Soil erosion and contamination of soil and water caused by channel construction, as well as poor design and installation - channels that are excessively steep or near to exposed terrain can cause significant soil loss. Unlined drainage channels (using soil as a surface) can also lead to soil erosion, particularly in areas of high slopes. They can also cause stagnant water pools to grow on flat land.

7.4.7 Assessing potential inconsistency with broader climate resilience priorities

The final step is to confirm that the activity is "not inconsistent" with national, regional, local, or sectoral plans or priorities for adaptation. Adaptation planning is a process of adjustment to the impacts of climate change, including actions taken to reduce the negative impacts of climate change, or to take advantage of emerging opportunities.

The activity is in line with Oman's National Adaptation Plan where the plan identifies 4 streams going forward to focus on sustained GHG emissions reductions. The stream applicable to this activity is as follows: 'The energy supply stream will focus on incorporating more renewable energy for meeting electricity demand'.

8 Identification and Assessment of Impacts

8.1 Overview

This section outlines the identification and assessment of potential environmental impacts from various components of the project development. The assessment covers the construction and operational and decommissioning phases of the project. The impact associated with the solar PV based on similar considerations in the discussions on environmental releases in Chapter 6.

8.2 ESIA Methodology

The identification and assessment of potential impacts from the proposed project is conducted using suitable matrices and checklists. The expected releases to the environment due to the project activities, the environmental and social aspects (sources of potential environmental and social impacts) associated with the project activities are identified. The identified environmental and social aspects and the environmental and socio-economic sensitivities are listed on a matrix to determine whether an interaction exists between the two elements. Wherever such interaction exists, a further analysed is conducted to determine the environmental and social impacts.

The identification and assessment of environmental and social impacts is based on the guidelines provided in the ISO 14000 series of standards and includes the following steps:

- Identification of major activities during the construction and operational phases of the project;
- Identification of Valued Environmental Components (VECs) associated with the project site based on information developed in the environmental baseline assessment;
- Assessment of potential effects caused from the project considering the interaction between the anticipated activities/ unplanned events and the identified VECs;
- Assessment of environmental and social impacts considering the duration and severity of these effects and likelihood of occurrence; and
- Assessment of the significance of the impacts based on the sensitivity of the VECs and associated receptors related to each.

In order simplify the above; HMR has broken the assessment into two discrete parts, the steps for which are provided below:

- **STEP 1:** Assess the severity and the duration of the activity, in order to determine the level of impact to the receiving environment; and
- **STEP 2:** Assess the significance of the aforementioned impact using the sensitivity of the environmental and socio-economic baseline.

8.2.1 Step 1: Impact Assessment

The impact assessment is intended to determine the likely impact resulting from the anticipated activities, as a function of the severity of the impact (to the receiving environment) and the duration of the effect to the environment. It is important to note that this assessment can apply to both positive and negative impacts resulting from the proposed development. The specific six steps taken are detailed below, and each point is expanded:

1. **Identification of Valued Environmental and Social Components (VECs)**

VECs are defined as quality or physical, biological and socio-economic characteristics of the environment that are conducive to ecological health or public amenity, or safety. Another quality of the environment identified and declared to be an environmental or socio-economic value under an Omani protection policy or regulation. Specific VECs will be identified as part of this process.

2. **Identification of activities that could impact the respective VECs**

The activities within the construction and operation phases which HMR consider could impact the VECs are identified as following:

- Natural Resources
- Air Quality
- Climate affairs
- Ambient and Workplace Noise
- Identification and Impacts on Affected Communities, and disadvantaged or vulnerable groups (if any)
- Consideration of actual or potential adverse Human Rights impacts (if present)

Each activity will be assessed separately to demine the severity and subsequently the level of impact of each activity.

3. **Determine whether the activity will have a Positive or negative impact on the VEC**

Determine whether the activities are likely to result in positive or negative effect on the development.

- Positive Impacts are considered as a beneficial result from the proposed development, in enhancing the baseline environmental or social conditions.
- Negative Impacts are considered as a harmful result from the proposed development, in damaging the baseline environmental or social conditions.

4. **Determine the potential Severity of impact on each VECs**

The various construction activities will determine the 'degree of change relative to the baseline conditions' in order to make an assessment of potential impact of the project on the above VECs. HMR will consider the following attributes of each activity in order to assess the severity of effect from said activities on each respective VEC.

Severity (degree of change relative to the baseline level as a result of the activities), is a function of:

- **Extent:** The area over which an impact occurs; and
- **Frequency:** How often the impact occurs.

The severity of the impact (resulting from the activity) will be linked to either quantified thresholds or qualitative descriptions depending on the nature of the impact and the receptor. The table below represents the guide for the qualitative scale of magnitude that will be used for environmental and socio-economic receptors.

Table 8-1 Description of Severity of Activity

Severity of Effect	Environmental (physical and biological) Definition (function of extent and frequency)	Socio-Economic Definition
Massive	- Persistent severe environmental damage or severe nuisance extending over a large area (irreversible) - Constant, high exceedence of statutory or prescribed limits (representing a threat to ecosystem in both the long and short term) - In terms of commercial or recreational use or nature conservancy, a major loss.	- Highly significant, loss or major damage with long-term or permanent effect on cultural and/or natural resources of national and regional importance which are essential for communities' livelihood. - Highly significant negative impacts on the national and international community (regional, i.e. neighbouring countries). - Immediate intervention by governmental bodies requiring rapid implementation of response measures. - National and International media and community concerns and on-going long term complaints.

Severity of Effect	Environmental (physical and biological) Definition (function of extent and frequency)	Socio-Economic Definition
Major	- Severe environmental damage - Extended exceedence of statutory or prescribed limits - Extensive measures required to restore the impacted environment to its original state.	- Major damage with medium to long-term effect on cultural and/or natural resources of national and regional importance which are essential for communities' livelihood. - Significant negative impacts on the national community - National media and community concerns and on-going long term complaints.
Moderate	- Release of quantifiable discharges of known toxicity - Multiple exceedence of statutory or prescribed limit - Causing localized nuisance both on and of site	- Moderate damage to archaeological, cultural or key natural resources of local or national importance. - Moderate negative impacts on the regional or national population. Vulnerable groups significantly affected. Changes affecting livelihoods, amenity values, convenience and quality of life of study population; - National and potentially international media and community concerns and on-going long-term complaints
Minor	- No permanent effects to the environment - Single exceedence of statutory or prescribed criterion - Causing localized nuisance on site	- An effect will be experienced but they will be Minor, short term effects recoverable within short durations. - Unlikely to result in concerns being raised by governmental bodies or stakeholders. - Measurable negative impacts that are intermittent or affect a small minority of the local population and/or vulnerable groups. May result in concerns from local communities.
Slight	- Local environmental damage (localized and temporary) - Any impact contained within the footprint of the development and without long-lasting effects. - Negligible consequences	- Deemed 'imperceptible' or indistinguishable to current social norms and variations. - No public interest
Positive	- Large scale benefits to individual livelihoods (e.g. large scale employment). - Major improvements to community facilities/utilities. - Notable positive impact on the wider environment	- Large scale benefits to individual livelihoods (e.g. large scale employment). - Major improvements to community facilities/utilities. - Notable positive impact on the wider socio-economic context

5. **Establish the duration for the impact of any activity with regard to how long the impact will remain**

The duration is defined as:

- **Momentary (1 week)** impacts would last for a short duration, are reversible and intermittent or occasional in nature. The resource or receptor would return to the previous state when the effect ceases or after a short period of recovery
- **Short Term (less than 1 year)** impacts would last for the life for the list of the proposed short-term activity and a limited short period thereafter (e.g. less than 1 year). The impact would cease when the effect ceases following a short period of recovery
- **Medium Term (1-10 years)** impacts are likely to occur continuously or intermittently for up to one year (but no every year), or continuously or intermittently over weekly, monthly or seasonally over multiple years within the Project programme
- **Long Term (10-50 years)** impacts would continue for an extended period of time after the Project activity ceased (e.g. ten years), or cause a more permanent change in the affected receptor or resource that endures substantially beyond the Project lifetime
- **Permanent (more than 50 years)** impacts would likely occur for an indefinite period (i.e. permanent and/or irreversible)

6. **Assess magnitude of project impacts**

Using the assessed level of severity for each activity and the duration of the impact, an assessment of the impact's magnitude for each activity can be provided for each activity as shown in the table below.

Table 8-2 Impact Assessment Matrix (planned aspects)

Severity	Duration				
	Momentary 1 week	**Short Term < 1 year**	**Medium Term 1 – 10 years**	**Long Term 10 – 50 years**	**Permanent > 50 years**
Slight Effect	Negligible				
Minor Effect		Low Impact			
Moderate Effect			Medium Impact		
Major Effect				High Impact	
Massive Effect					Very High
Positive					

For impacts resulting from unplanned and accidental events, the assessment is a function of the impact severity and the likelihood of it is occurrence. The impact severity depends on the nature and size of the activity and the likelihood depends on the nature of the activity and the control measures

in place. The definition of likelihood for an unplanned event is provided in the table below and the impact assessment matrix (for unplanned events), is presented below

Table 8-3 Unplanned event likelihood

Category	Definition
Certain	Will occur under normal operating conditions. Impacts will occur based on known factors such as unavailability of preventative measures and definitive historic experience
Very likely	Very likely to occur under normal operational conditions. Impacts are very likely to occur based on known factors such as ineffective preventative measures or strong historic experience
Likely	Likely to occur at some time under normal operating conditions. Impacts are likely to occur based on known factors such as unproven preventative measures or limited historic experience
Unlikely	Unlikely to but may occur at some time under normal operating conditions. Impacts are unlikely to occur based on known factors such as effective preventative measures or historic experience.
Very unlikely	Very unlikely to occur under normal operating conditions but may occur in exceptional circumstances. Impacts are unlikely to occur based on known factors such as proven preventative measures or definitive historic experience.

Table 8-4 Accidental Events Matrix (unplanned aspects)

Severity	Very Unlikely	Unlikely	Likely	Very Likely	Certain
Slight Effect					
Minor Effect	Low Impact				
Moderate Effect			Medium Impact		
Major Effect				High Impact	
Massive					

The outcome of Step 1 will provide an assessment for each activity that could impact each respective VEC. These impacts will be positive or negative and categorized as follows:

- **Negligible impacts** are impacts that are small and trivial and may safely be discarded;
- **Low impacts** are considered to be acceptable or within ALARP levels. Further control measures are not required to mitigate these impacts;
- **Medium impacts** require control measures; management plans need to be implemented to mitigate the impacts to ALARP levels; and
- **High Impacts** require additional research. Alternative activities with lower impacts or alternative locations with lower environmental sensitivities or compensatory measures need to be considered during the detailed design stage of the project.

- **Positive impacts** By reviewing the impact of each separate activity, an overall impact for each VEC can be determined (i.e. an average impact, taking into consideration each of the activities which are likely to affect the VEC).

8.2.2 Step 2: Significance Assessment

The impact will be determined using the severity and duration indicators for expected impacts, and likelihood and severity for unplanned/accidental impacts. The significance to each impact will be assessed by using the defined receptor sensitivity.

The significance (of an impact) is assessed by considering the sensitivity of the VEC and the magnitude of the impact (determined above). The following steps are followed in this process:

- Assess the Sensitivity of each respective VEC
- Use the predetermined impact magnitude from each activity (Step 1) and sensitivity of VEC for the expected impacts, however, likelihood and severity will be considered for unplanned/accidental impacts as applicable
- Determine the Significance of any impact to each receptor

The baseline conditions of each of the VECs will be characterized within the environmental baseline assessment as part of the EIA, which can - in turn - inform the sensitivity of each VEC. The table below details the definitions which will determine the sensitivity.

Table 8-5 VEC sensitivity

Sensitivity	Guide for sensitivity of feature/receptor
Very High	- Changes or impact to receptor would have significant consequences - Has **no capacity** to accommodate physical, biological, chemical or socio-economic changes or influences - Has high value in current state to users (environmental or social or economic)
High	- Changes or impact to receptor would have notable consequences - Has a **very low** capacity to accommodate physical, biological, chemical or socio-economic changes or influences. - Has moderate value in current state to users (environmental or social or economic)
Medium	- Changes or impact to receptor would have some consequences - Has a **low** capacity to accommodate physical, biological, chemical or socio-economic changes or influences.
Low	- Changes or impact to receptor would result in very few consequences - Has a **moderate** capacity to accommodate physical, biological, chemical or socio-economic changes or influences.
Very Low	- Changes or impact to receptor would result in no in insignificant consequences - **Generally tolerant** of and can accommodate physical, biological, chemical or socio-economic changes or influences. - Has very little value in current state to users (environmental or social or economic)

Using the impact assessment derived from Step 1 above, and the sensitivity rating, an assessment of significance can be obtained using below table.

Table 8-6 Impact Significance

Receptor Sensitivity	Impact				
	Very High	**High**	**Medium**	**Low**	**Negligible**
Very High	Major	Major	Moderate	Minor	Minor
High	Major	Moderate	Moderate	Minor	Minor
Medium	Moderate	Moderate	Minor	Minor	Negligible
Low	Minor	Minor	Minor	Negligible	Negligible
Very Low	Minor	Minor	Negligible	Negligible	Negligible

The outcome of Step 2 will be an assessed level of significance of **any** impact, depending on the sensitivity of each VEC.

Table 8-7 Significance definitions

Significance	Description
Major	Very large or large change in environmental or socio-economic conditions. Impacts, both negative and beneficial, which are likely to be important considerations at a national to regional level because they contribute to achieving national / regional objectives, or, which are likely to result in exceedance of statutory objectives and/or breaches of legislation.
Moderate	Intermediate change in environmental or socio-economic conditions. Impacts that are likely to be important considerations at a regional and local level.
Minor	Small change in environmental or socio-economic conditions. These impacts may be raised as local issues but are unlikely to be of importance in the decision making process.
Negligible	No discernible change in environmental or socio-economic conditions. An impact that is likely to have a negligible or neutral influence, irrespective of other effects.

By following the above approach, each of the identified VECs will be provided with an IMPACT based on the activities and SIGNIFICANCE based on the sensitivity of the VEC. The impact and significance of each activity will allow HMR to inform the high risk activities to be included within the EMP and help identify the priorities with regard to the necessary mitigation measures to be included for the construction and operational phase.

8.2.3 Presentation of Impacts

To ensure consistency throughout the ESIA process, impacts will be introduced and presented in tabular format as summarized below. Further detail that may be required to provide further clarification will be discussed separately. The impact summary table provides a consistent manner

for the technical experts and permitting authority to see the rationale behind the impact assessment. Explanatory text will be provided below each for the 2 steps to provide a description.

Table 8-8: Impact Assessment Summary for expected activates

Receptor	Impact summary	Severity	Duration	Impact	Sensitivity	Significance Ranking

Table 8-9: Impact Assessment Summary for unplanned activates

Receptor	Impact summary	Severity	Likelihood	Impact	Sensitivity	Significance Ranking

8.2.4 Cumulative Impacts

A cumulative impact arises when impacts from several developments, which individually might be insignificant, coincide together and produce a significant cumulative effect. The cumulate effects assessment process occurs over time and over space from the local to the regional level. For the purpose of the cumulative effects assessment, the environmental effects of any other development that is already built and operational will be included in the environmental baseline of the EIA and so is excluded from the cumulative effects assessment. Developments that will be included in the cumulative effects assessment include reasonably foreseeable future developments that are in the planning, design or construction phases, but are not yet operational.

The main aspects which will be covered as part of this assessment are land use and social impacts. The understanding of the certainty of anticipated impacts is an essential component of any cumulative impact assessment methodology. The potential for uncertainty will always exist due to several options being carried concurrently in an early design phase, inherent margins of accuracy in quantified approaches, quality and completeness (coverage) of baseline data, uncertainty of risk, and the fact that impacts will occur within complex and dynamic natural and physical systems. Certainty is determined using the below matrix table and is described through an overall rating of High, Moderate, or Low; derived from recommended option on the quality and consistency of available information and possibility of the likely effects that have been quantified. It should be noted that certainty is not a measure of the likelihood or probability of the impact actually happening as all impacts as described are anticipated to occur during project phases. Basically, this analysis aims to provide a professional judgement of the confidence in the quantification of uncertainties due to the above-described variables.

Table 8-10 Assessment of Certainty for Cumulative Impact

Impact certainty	Quality and Coverage of Baseline Information		
	Low (no data)	Medium (data gaps)	High (good quality data)
Certain (>95%)	Low	Moderate	High
Probable (30-95%)	Low	Moderate	Moderate
Unlikely (<30%)	Low	Low	Low

8.3 Identification of Impacts

8.3.1 Environmental and Social Impacts during Construction Phase

The sources of impacts (aspects) and potential environmental impacts for the construction phase of the project are presented in Table 8-11~~Table 8-11~~.

Table 8-11 Potential Impacts during construction Phase

#	Sources of Impact (aspects)	Potential Impacts
Resource use		
1	Consumption of fuels for vehicles, equipment and power generation.	• Depletion of petroleum (non-renewable) resources; • Loss of fuel due to inappropriate storage and handling; and • GHG emissions from exhaust systems.
2	Potential impacts on the biotic environment	• Impact on Flora, Fauna and Habitat
3	Consumption of mineral resources for construction materials.	• Off-site impacts from quarrying for rocks, aggregates and soil.
4	Consumption of other resources such as water, wood, metal, etc.	• Depletion of natural resources.
5	Consumption of foodstuff and other materials for the labor camps.	• Increase in demand for foodstuff and other materials and resulting stress; and • Economic benefits to local businesses (positive impact).
• **Construction Works (direct actions and effects)**		
6	Construction work (excavation, foundation work and concrete & asphalting work) at the project site.	• Visual impacts; • Nuisance due to increased activity and traffic; • Safety risk to workers and people accessing the site and nearby roads and areas; and • Utilization of local services and products and resulting economic benefit (positive impact).
7	Potential impacts on the biotic environment	• Impact on Flora, Fauna and Habitat
• **Releases to the Environment**		
8	Release of air pollutants (dust from construction activities and road traffic, and PM and gaseous emissions from fuel run construction equipment and vehicles).	• Degradation of air quality; and • Health risks to people

#	Sources of Impact (aspects)	Potential Impacts
9	Generation of noise from construction activities, equipment and transport vehicles.	• Increase in construction site and ambient noise levels; • Disturbance to local people; and • Health risk to workers and local people.
10	Industrial and domestic wastewater management (collection, storage, treatment and disposal).	• Onsite and offsite soil and groundwater contamination; • Impacts of foul odor; and • Health risk to workers and local people.
11	Non-hazardous (construction and domestic) and hazardous waste management.	• Onsite and offsite soil and groundwater contamination; and • Impacts of foul odor.
12	Storage & handling of hazardous substances like welding gases, fuels, lube oils, chemicals, radioactive substances, etc., and handling of other construction materials and equipment	• Onsite and offsite soil and groundwater contamination due to accidental releases and contaminated runoffs; • Fire, explosion and health risk to workers and local people; • Risk from electrical failures and falling objects to workers; and • Risk from exposure to radiation.
• Transportation		
13	Unsafe driving.	• Traffic accidents and risk to inhabitants.
14	Accidental spillages of fuels, chemicals, solvents, etc., during transportation.	• Offsite land and groundwater contamination due to spillages; and • Fire and safety risk to public.
• Security and access control		
15	Site fencing and access control for safety and security	• Access restrictions for staff and contractors authorized personnel using / passing through the site
• Social Impacts		
16	Social conflict with local communities due to influx of workers	• Increased demand on goods and services.

8.3.2 Impacts during Operation Phase

The sources of impacts (aspects) and potential environmental impacts for the operation phase of the project are presented in below table and are minor.

Table 8-12 Potential Major Impacts during Operation Phase

#	Sources of Impact (aspect)	Potential Impacts
Releases to environment		
1	Non-hazardous waste management	• Housekeeping issue.
Security and access control		
2	Site fencing and access control for safety and security	Access restrictions for staff and authorized personnel using / passing through the site.

8.4 Assessment of Environmental Impacts during Construction Phase

8.4.1 Overview

The impact sources and the potential impacts on the environment during the construction phase have been identified in Table 8-11~~Table 8-11~~. In this section, such impacts are evaluated for their significance. It may be noted from Table 8-11~~Table 8-11~~ that for a potential impact, there can be more than one source (aspect). Therefore, the net impact on each environmental element due to various sources/aspects (lands take, resource use, releases to environment and transportation as presented in above table is discussed in the following sections.

8.4.2 Natural Resources and Eco System Services

The aspects that may have potential impacts on natural resources are consumption of construction materials such as wood, metal, cement, rocks, aggregates, etc. Further, fuel will be consumed for operation of construction equipment, emergency DGs and vehicles. Foodstuff and other materials will be required for the operation of the labor camp Water will be used for construction as well as for domestic requirements. Considering the general water scarcity in Oman, this would increase the demand for water which would in turn put further stress on the water supply in the country.

The supply of construction materials, water and fuel can be met through authorized suppliers available locally or within the region.

Appropriate storage and handling facilities will be established for water and fuel in order to minimize losses due to leaks and spillages. Further, the consumption of resources will be optimized and minimizing wastage. The foodstuff and other materials required for the construction workforce will be sourced from local suppliers. The usage / consumption of such materials will be optimized and wastage minimized.

Impacts on the ecosystem services include obstruction of animal pathways due to construction activities and impacts on the wadi habitat considering the project area crosses multiple wadi paths. I

Based on the above, the impacts to natural resources and ecosystem services are rated as below.

Impact	Potential Impact	Severity	Duration	Likelihood	Impact rating	Sensitivity	Significant Ranking
Impact on Natural Resources (except water)	Consumption required for construction	Minor Effect	Medium Term	-	Low	Very Low	Negligible

Impact on Water Resources	Consumption of water for construction	Medium Effect	Medium Term	-	Medium	Low	Negligible
Impact on Ecosystem Services	Obstruction of Animal Pathways	Minor Effect	Medium Term	Likely	Low	Low	Negligible
	Increased Impact on Wadi habitat	Medium Effect	Medium Term	Likely	Medium	Low	Negligible

8.4.3 Ambient Air Quality

Major sources of potential impacts on ambient air quality during construction phase of the project are as below:

- Generation of dust due to site preparation, earthwork, excavation, and movement of vehicles;
- Release of NOX, CO, SO2, UHC and PM from diesel engines of construction machineries, vehicles and DG units used for power generation;
- Release of welding fumes and VOCs from welding/metal cutting work, surface cleaning and painting; and
- Fugitive emissions from storage of fuels lube oils and other chemicals releasing VOCs.

However, it is expected that the power required for the construction activities will be tapped from the use of DG sets.

The fumes generated during welding and metal cutting activities and hazardous air pollutants released during spray-painting can cause health hazard to workers. The dust risings from earthwork and vehicle movements could be significant onsite.

Though it is difficult at this stage to quantify the impacts on air quality, it is reasonable to consider that the impacts will be limited to the nearby environment and will be for short term considering the nature of construction activities. Accordingly, the impacts on ambient air quality are rated as follows:

Impact	Potential Impacts	Severity	Duration	Likelihood	Impact rating	Sensitivity	Significant Ranking
Ambient Air Quality	Dust emission	Moderate Effect	Medium Term	-	Medium	Very Low	Negligible
	Gaseous emissions from exhaust of vehicles	Moderate Effect	Medium Term	-	Medium	Low	Minor
	Emissions of VOCs and other hazardous	Minor Effect	Medium Term	-	Low	Low	Negligible

	volatiles						

The control measures to be implemented in order to minimise the adverse impacts on air quality to ALARP levels are discussed in Chapter 9.

8.4.4 Ambient and Workplace Noise

The heavy equipment used for the construction work, fabrication activities, earthwork such as grading and excavation, and the vehicles used for transportation of men and materials to site will have a minor-moderate impact on the noise levels in the workplace as well as ambient environment. Due to the nature and complexity of industrial construction activities and in the absence of specific information on the type, number, location and duration of operation of major noise sources at the construction site, it is difficult to quantity impacts on noise levels during construction. It is likely that at certain locations close to the noise sources within the work site, the noise levels will be in excess of 85dB (A) requiring the personnel on-site to wear ear protection devices.

With regard to the ambient noise levels, since noise is attenuated by distance [typically noise levels drop by about 40 dB (A) over 100m distance from the source], the activities on-site are unlikely to affect the ambient noise levels significantly. However, during night times when the ambient noise levels are low, the level of perception to noise may be more pronounced. Noise from transport vehicles will be only transient for a given location and can be considered as a nuisance during night time through the route which it passes. Accordingly, the impacts on noise levels are rated as below.

Impact	Potential Impacts	Severity	Duration	Likelihood	Impact rating	Sensitivity	Significant Ranking
Ambient Noise	General construction activities	Moderate Effect	Medium Term	-	Medium	Low	Minor
	Movement of construction vehicles	Minor Effect	Medium Term	-	Low	Low	Negligible

Mitigation measures to be implemented in order to minimise impacts on noise levels are described in Chapter 9.

8.4.5 Soil and Groundwater

The activities that can have potential impacts on soil and groundwater during the construction are as below:

- Collection, handling, storage and disposal of wastewaters and contaminated run-offs;

- Collection, handling, storage and disposal of non-hazardous and hazardous wastes; and
- Storage and handling of hazardous substances such as fuel, chemicals, lube oil and radioactive substances (if any), etc.

Collection, handling, storage and disposal or accidental releases of wastewaters, non-hazardous and hazardous wastes and hazardous substances can lead to contamination of soil and/or groundwater, if proper facilities and methods for handling are not established. Accordingly, the impacts on soil and groundwater are rated as below.

Impact	Potential Impact	Severity	Duration	Likelihood	Impact rating	Sensitivity	Significant Ranking
Soil and groundwater	Impacts on soil and groundwater from waste and wastewater	Minor Effect	Medium Term	-	Low	Very Low	Negligible
	Impacts on soil and groundwater due to accidental releases	Moderate Effect	-	Likely	Medium	Low	Minor

The control measures to minimise the above impacts to ALARP levels are discussed in Chapter 9.

8.5 Assessment of Social Impacts during the construction phase

8.5.1 Impacts on the Employment and Economics

The primary economic impact during construction is likely to result from limited project timeline centric employment creation during this phase. This project is expected to create employment opportunities during the construction phase for unskilled and applicably skilled workers. As well as the direct monetary uplift to the families of those employed, money paid to workers will also stimulate the local economy via the multiplier effect, whereby money earned on the project expended locally will re-circulate within the local economy.

Additionally, surrounding suppliers may also be benefited as they may be contracted for the supply of foodstuff, some construction materials, etc., and for certain jobs such as fabrication, transportation of men and materials, etc. Considering the above, beneficial impacts are envisaged from the project on the employment and economy.

However, the influx of workers at the project site would lead to an increased demand on social and health services could put a strain on the available resources. Influx could affect public infrastructure, utilities, housing, sustainable resource management and social dynamics.

Moreover, a safety risk maybe imposed on those accessing the site and using the nearby roads due to increased traffic.

Impact	Potential Impacts	Severity	Duration	Likelihood	Impact Rating	Sensitivity	Significant Ranking
Impact on the Employment and Economy	Employment Opportunities	Positive Effect	Medium Term	-	Positive Low	Medium	Positive Minor
	Purchase of construction materials locally	Positive Effect	Medium Term	-	Positive Medium	Medium	Positive Minor
	Increase in demand for Social and health services	Positive Effect	Medium Term	-	Positive Medium	Medium	Positive Minor
	Increase in demand for Social and health services	Slight Effect	Short Term	-	Low	Low	Minor
	Safety risk to workers and people accessing the site and nearby roads and areas	Slight Effect	Short Term	-	Low	Low	Minor

8.5.2 Impacts on land use

The proposed solar plant will be located in remote area away from the residential. Therefore, it is envisaged that there will be insignificant or no land use conflicts with local communities during construction as well as during the operation phase.

Impact	Potential Impact	Severity	Duration	Likelihood	Impact Rating	Sensitivity	Significant Ranking
Impact on Land Use	Using land previously used by local communities and livestock	Slight Effect	Long Term	-	Low	High	Minor

8.5.3 Impact on Local Communities

After an additional meeting with the wali executive and a representative of the local community, it was confirmed that the land was previously owned by MoD and there are no activities or communities within the project site. However, there are local communities (including Bedouins) in the surrounding area. Therefore, the project activities during construction could lead to nuisance to the local community and potential conflict. However, the meeting with the local community

representative stated that the community are understanding and would not cause any conflict because of the project.

Stakeholder Engagement Plan and Grievance Management Plan have been outlined as mitigation measures for the project. Moreover, he project company will meet the Omanization requirement for this project; and the recruiting policy will provide a preference for hiring workers from the local community (if adequately skilled people are available locally) in order to offset any potential conflict.

Impact	Potential Impact	Severity	Duration	Likelihood	Impact Rating	Sensitivity	Significant Ranking
Impact on Local Community (including Bedouins)	Nuisance to the local community people	Slight Effect	Medium Term	-	Low	High	Minor
	Conflict with local community	Medium	Medium Term	-	Medium	High	Moderate

8.5.4 Traffic and Transportation

The construction period will result in an increase of vehicles entering the Project site. Construction vehicles will include a variety of vehicle classifications, e.g. HGV's, LGV's, trucks, pick-up trucks, excavators and other heavy/light equipment. It is envisaged that all the construction vehicles will connect to the site by using main and external access roads this will lead to have low traffic flows from the construction vehicles.

Impact	Potential Impact	Severity	Duration	Likelihood	Impact Rating	Sensitivity	Significant Ranking
Impact on Traffic and Transportation	Usage of access roads to connect with the site	Slight Effect	Medium Term	-	Low	Medium	Minor

8.6 Construction Phase Impacts Summary

A summary of the impacts for the construction phase is presented in Table 8-13~~Table 8-13~~.

Table 8-13 Assessment of construction Phase Impacts

Impact	Potential Impact	Severity	Duration	Likelihood	Impact rating	Sensitivity	Significant Ranking
Environmental Impacts							
Impact on Natural Resources and Ecosystem Services	Consumption of construction materials	Minor Effect	Medium Term	-	Low	Very Low	Negligible
	Consumption of water for construction	Medium Effect	Medium Term	-	Medium	Low	Negligible

Impact	Potential Impact	Severity	Duration	Likelihood	Impact rating	Sensitivity	Significant Ranking
	Obstruction of Animal Pathways	Moderate Effect	Medium Term	Likely	Low	Very Low	Negligible
	Increased Impact on Wadi habitat	Moderate Effect	Medium Term	Likely	Medium	Low	Negligible
Ambient Air Quality	Dust emission	Moderate Effect	Medium Term	-	Medium	Very Low	Negligible
	Gaseous emissions from exhaust of vehicles	Moderate Effect	Medium Term	-	Medium	Low	Minor
	Emissions of VOCs and other hazardous volatiles	Minor Effect	Medium Term	-	Low	Low	Negligible
Ambient Noise	General construction activities	Moderate Effect	Medium Term	-	Medium	Low	Minor
	Movement of construction vehicles	Minor Effect	Medium Term	-	Low	Low	Negligible
Soil and groundwater	Impacts on soil and groundwater from waste and wastewater	Minor Effect	Medium Term	-	Low	Very Low	Negligible
	Impacts on soil and groundwater due to accidental releases	Moderate Effect	-	Likely	Medium	Low	Minor
Social Impacts							
Impact on the Employment and Economy	Employment Opportunities	Positive Effect	Medium Term	-	Positive Low	Medium	Positive Minor
	Purchas of construction materials locally	Positive Effect	Medium Term	-	Positive Medium	Medium	Positive Minor
	Increase in demand for Social and health	Slight Effect	Short Term	-	Low	Low	Minor

Impact	Potential Impact	Severity	Duration	Likelihood	Impact rating	Sensitivity	Significant Ranking
	services						
	Safety risk to workers and people accessing the site and nearby roads and areas	Slight Effect	Short Term	-	Low	Low	Minor
Impact on Land Use	Usage of land used by local communities and livestock	Slight Effect	Long Term	-	Low	High	Minor
Impact on local community (including Bedouins)	Nuisance to the local community	Slight Effect	Medium Term	-	Low	High	Minor
	Conflict with local community	Medium	Medium Term	-	Medium	High	Moderate
Impact on Traffic and Transportation	Usage of access road to connect with the site	Slight Effect	Medium Term	-	Low	Medium	Minor

8.7 Assessment of Environmental Impacts during Operation Phase

This section discusses the assessment of the potential impacts during operation phase of PV solar plants. The net impact on each environmental element due to various sources / aspects is discussed as the following:

8.7.1 Natural Resources

The solar power plant intends produce electricity from a renewable energy source; solar energy. This is a positive impact as it will conserve natural and conventional fuel resources and indirectly contribute to stabilizing the regional environmental conditions.

During the operation phase, water tanker trucks will transport water from outside the Project site to water storage tanks within the Project boundary to cover the water demand of the Project which will include water for PV panel cleaning. Water consumption in this desert area would increase water demand and could potentially lead to conflict with local communities for water use. However, the regular (daily) cleaning of PV modules is considered a dry method with the mechanical action of the brush of cleaning robots with no water required. Using water to clean will only be required from time to time (around once a year). The annual water consumption for this cleaning is estimated to

be the equivalent of the consumption of 3 households. Therefore, it is a small and manageable amount of water that it will be delivered by truck to the Site from nearby town.

Impact	Potential Impact	Severity	Duration	Likelihood	Impact rating	Sensitivity	Significant Ranking
Impact on Natural Resources (except water)	Reduction in Consumption of fuel	Positive Effect	Long Term	-	Positive High	Very High	Positive Major
Consumption of water	Medium Effect	Low	Medium Term	-	Medium	Medium	Negligible

8.7.2 Air Quality

The adaptation of a sustainable energy source, solar energy, accurately predicts that all the GHG emissions will be avoided during the operation phase. GHG emissions may be exclusively sourced from vehicles during the plant maintenance which is very negligible.

Impact	Potential Impact	Severity	Duration	Likelihood	Impact rating	Sensitivity	Significant Ranking
Impact on Ambient Air Quality	Reduction in GHG emissions	Positive Effect	Long Term	-	Positive High	Very High	Positive Major

8.7.3 Ambient and Workplace Noise

The solar panels don't make any noise. Solar panels are designed to be noise-free, especially at night and there are no noise emissions that are anticipated to impact the plant or the surroundings. The only noise generated is from the inverters. Hence, the impact is detailed below:

Impact	Potential Impact	Severity	Duration	Likelihood	Impact rating	Sensitivity	Significant Ranking
Impact on Ambient Noise Level	Noise from inverters	Slight Effect	Long Term	-	Low	Medium	Minor

8.8 Assessment of Social Impacts during Operation Phase

This section discusses the assessment of the potential social impacts during operation phase of PV solar plants. The net impact on each social element due to various sources / aspects is discussed as the following:

8.8.1 Impacts on the Economy

In addition, the introduction of a new renewable energy project to the region will generate positive environmental impacts and contribute to the stabilization of the local environment by minimizing

degrading activities. The projects recruitment policy will ensure a preference for employing workers from the local population where appropriately skilled workers are available locally. Also, Workers will be encouraged to develop their careers and may be provided with opportunities to attend training courses and other career development processes.

Based on the above, the impacts are rated as below:

Impact	Potential Impact	Severity	Duration	Likelihood	Impact Rating	Sensitivity	Significant Ranking
Impact on Economy and Employment	Introduction of a renewable energy facility	Positive Effect	Long Term	-	Positive High	Very High	Positive Major
	Impact on the Economy and workers	Positive Effect	Long Term	-	Positive High	Very High	Positive Major

8.9 Operations Phase Impacts Summary

A summary of the impacts for the operation phase is presented in

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Table 8-14 Assessment of Operation Phase Impacts

Impact	Potential Impact	Severity	Duration	Likelihood	Impact rating	Sensitivity	Significant Ranking
Environmental Impacts							
Impact on Natural Resources	Reduced Consumption of fuel	Positive Effect	Long Term	-	Positive High	Very High	Positive Major
Impact on Ambient Air Quality	Reduction of GHG emissions	Positive Effect	Long Term	-	Positive High	Very High	Positive Major
Impact on Ambient Noise Level	Minimal Noise from maintenance activities and operation	Positive Effect	Long Term	-	Positive High	Very High	Positive Major
Social Impacts							
Impact on Economy and Employment	Introduction of a renewable energy facility	Positive Effect	Long Term	-	Positive High	Very High	Positive Major
	Impact on the Economy and workers	Positive Effect	Long Term	-	Positive High	Very High	Positive Major

8.9.1 Environmental and Social Impacts during decommissioning Phase

8.9.1.1 Overview

The impact sources and the potential impacts on the environment during the decommissioning phase have been identified. In this section, such impacts are evaluated for their significance. For a potential impact, there can be more than one source (aspect). Therefore, the net impact on each environmental element due to various sources/aspects (lands take, resource use, releases to environment and transportation as presented in above table is discussed in the following sections.

8.9.1.2 Natural Resources and Eco System Services

The consumption of resources will be optimized and minimizing wastage.

Impact	Potential Impact	Severity	Duration	Likelihood	Impact rating	Sensitivity	Significant Ranking
Impact on Natural Resources	Consumption of natural resources	Minor Effect	Medium Term	-	Low	Very Low	Negligible
	Obstruction of Animal Pathways	Minor Effect	Medium Term	Likely	Low	Low	Negligible

8.9.1.3 Ambient Air Quality

Major sources of potential impacts on ambient air quality during decommission phase of the project are as below:

- Generation of dust due to demolition, and movement of vehicles;
- Release of NOX, CO, SO2, UHC and PM from diesel engines of machineries, vehicles and DG units used for power generation;

Though it is difficult at this stage to quantify the impacts on air quality, it is reasonable to consider that the impacts will be limited to the nearby environment and will be for short-term considering the nature of decommissioning activities. Accordingly, the impacts on ambient air quality are rated as follows:

Impact	Potential Impacts	Severity	Duration	Likelihood	Impact rating	Sensitivity	Significant Ranking
Ambient Air Quality	Dust emission	Moderate Effect	Medium Term	-	Medium	Very Low	Negligible
	Gaseous emissions from exhaust of vehicles	Moderate Effect	Medium Term	-	Medium	Low	Minor
	Emissions of VOCs and other hazardous volatiles	Minor Effect	Medium Term	-	Low	Low	Negligible

8.9.2 Ambient and Workplace Noise

The heavy equipment used for the construction work, fabrication activities, earthwork such as grading and excavation, and the vehicles used for transportation of men and materials to site will have a minor-moderate impact on the noise levels in the workplace as well as ambient environment.

With regard to the ambient noise levels, since noise is attenuated by distance [typically noise levels drop by about 40 dB (A) over 100m distance from the source], the activities on-site are unlikely to affect the ambient noise levels significantly. However, during night times when the ambient noise levels are low, the level of perception to noise may be more pronounced. Noise from transport vehicles will be only transient for a given location and can be considered as a nuisance during night time through the route which it passes. Accordingly, the impacts on noise levels are rated as below.

Impact	Potential Impacts	Severity	Duration	Likelihood	Impact rating	Sensitivity	Significant Ranking
Ambient Noise	General decommissioning activities	Moderate Effect	Medium Term	-	Medium	Low	Minor
	Movement of vehicles	Minor Effect	Medium Term	-	Low	Low	Negligible

8.9.3 Soil and Groundwater

The activities that can have potential impacts on soil and groundwater during the decommissioning are as below:

- Collection, handling, storage and disposal of wastewaters and contaminated run-offs;
- Collection, handling, storage and disposal of non-hazardous and hazardous wastes; and
- Storage and handling of hazardous substances such as fuel, chemicals, lube oil and radioactive substances (if any), etc.

Collection, handling, storage and disposal or accidental releases of wastewaters, non-hazardous and hazardous wastes and hazardous substances can lead to contamination of soil and/or groundwater, if proper facilities and methods for handling are not established. Accordingly, the impacts on soil and groundwater are rated as below.

Impact	Potential Impact	Severity	Duration	Likelihood	Impact rating	Sensitivity	Significant Ranking
Soil and groundwater	Impacts on soil and groundwater from waste and wastewater	Minor Effect	Medium Term	-	Low	Very Low	Negligible
	Impacts on soil and groundwater due to accidental releases	Moderate Effect	-	Likely	Medium	Low	Minor

The control measures to minimise the above impacts to ALARP levels are discussed in Chapter 9 and will be same as in construction phase.

8.10 Assessment of Social Impacts during the decommissioning phase

8.10.1 Impacts on the Employment and Economics

The primary economic impact during construction is likely to result from limited project timeline centric employment creation during this phase. This project is expected to create employment opportunities during the construction phase for unskilled and applicably skilled workers. As well as the direct monetary uplift to the families of those employed, money paid to workers will also

stimulate the local economy via the multiplier effect, whereby money earned on the project expended locally will re-circulate within the local economy.

Additionally, surrounding suppliers may also be benefited as they may be contracted for the supply of foodstuff, some construction materials, etc., and for certain jobs such as fabrication, transportation of men and materials, etc. Considering the above, beneficial impacts are envisaged from the project on the employment and economy.

Impact	Potential Impacts	Severity	Duration	Likelihood	Impact Rating	Sensitivity	Significant Ranking
Impact on the Employment and Economy	Employment Opportunities	Slight Effect	Long Term	-	Low	High	Minor

8.10.2 Impacts on land use

The proposed solar plant will be demolished in remote area away from the residential. Therefore, it is envisaged that there will be insignificant or no land use conflicts with local communities during this phase.

Impact	Potential Impact	Severity	Duration	Likelihood	Impact Rating	Sensitivity	Significant Ranking
Impact on Land Use	Using land for a different usage	Slight Effect	Long Term	-	Low	High	Minor

8.10.3 Traffic and Transportation

The decommissioning period will result in an increase of vehicles entering the Project site. Vehicles will include a variety of vehicle classifications It is envisaged that all the vehicles will connect to the site by using main and external access roads this will lead to have low traffic flows from the vehicles.

Impact	Potential Impact	Severity	Duration	Likelihood	Impact Rating	Sensitivity	Significant Ranking
Impact on Traffic and Transportation	Usage of access roads to connect with the site	Slight Effect	Short Term	-	Low	Medium	Minor

8.11 Mitigation, Enhancement and Assessment of Residual Impacts

Where significant impacts are identified, from moderate levels of significance and above, mitigation and enhancement measures will be identified to prevent, reduce or remedy any potentially significant environmental impacts which cannot be avoided or effectively reduced through changes to the construction or operational methodology.

These measures will need to be implemented during the construction phase since all the defined impacts during operations phase were found positive by adopting the control principles as listed below:

- **Eliminate** - Remove the environmental impact;
- **Replace** - Replace the construction activities, procedure or equipment with a safest one in order to reduce the risk category;
- **Reduce** - Reduce the quantity of the hazardous materials and / or the number of sensitive receptors exposed to it;
- **Isolate** - Separate physically the hazard from the sensitive receptors;
- **Engineering Controls** - Use Operational Control Procedures, modify tools or equipment; and
- **Protect** - Use additional physical operational control measures and PPE for individuals when the above action cannot be implemented.

Each environmental receptors of impact assessment detailed the measures recommended to mitigate any identified significant effects and any measures which may provide positive environmental effects. The ESMP is detailed in chapter 9 of this ESIA study.

8.12 Cumulative Impacts Summary and Mitigations Measures

8.12.1 Introduction and Methodology

Cumulative impacts are those that arise as a result of an impact of the Project when added to impacts from other projects or developments. The assessment extends to potential interactions with Project activities and other activities. Cumulative impacts may have the potential to arise during any stage of the Project.

The Area of Influence (AoI) as regards cumulative impacts as defined under IFC PS 1 encompasses:

"…cumulative impacts that result from the incremental impact, on areas or resources used or directly impacted by the project, from other existing, planned or reasonably defined developments at the time the risks and impacts identification process is conducted. Cumulative impacts are limited to those impacts generally recognized as important on the basis of scientific concerns and/or concerns from Affected Communities".

The process for assessing how cumulative impacts from other projects have been assessed is provided in Figure 8-1.

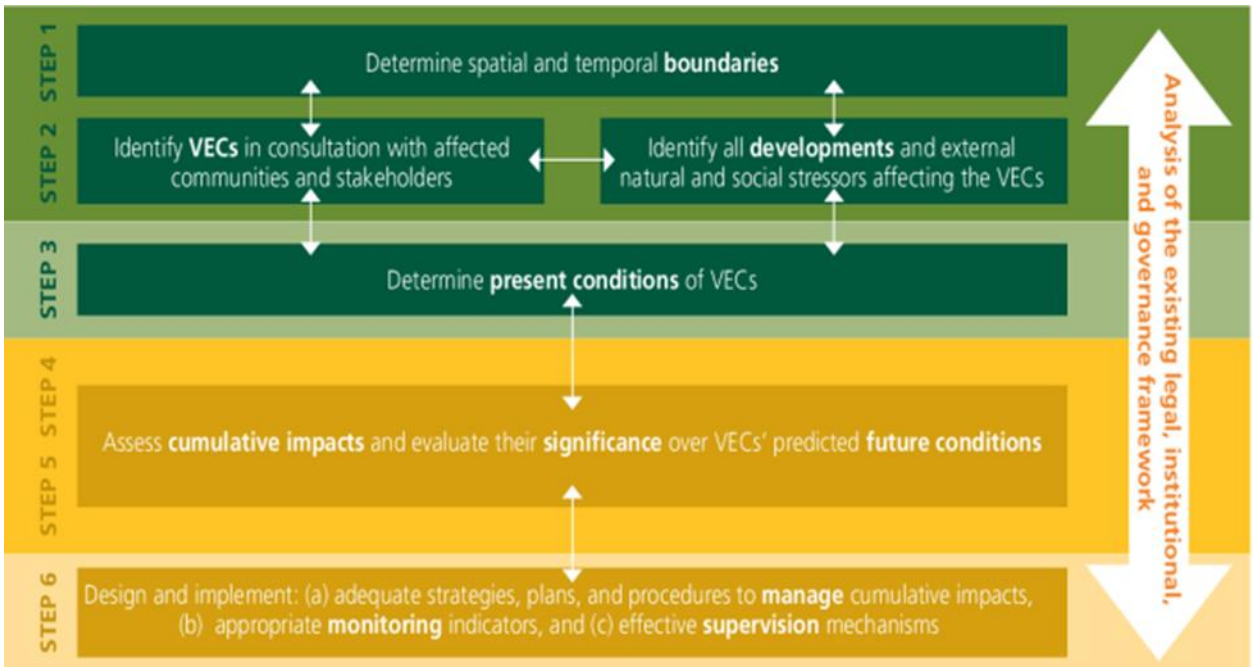


Figure 8-1 How Cumulative Impacts from Other Projects are Considered

The ESIA identified and assessed impacts on a range of topics within the AoI including:

- air quality;
- noise;
- soil and land use;
- surface water;
- groundwater;
- vegetation and wildlife;
- cultural resources;
- visual amenity;
- traffic;
- waste management;
- socioeconomic resources; and
- health and safety.

All the impacts assessed in the ESIA for the above topics occur within the Project's AoI. The ESIA concludes that overall, these impacts of the Project are minimal and will be managed by appropriate mitigation measures so that all residual impacts are managed to as low as reasonably practicable (ALARP) levels.

8.12.2 Cumulative Impact Assessment

The following project was identified as potentially having cumulative impacts with the Project:

- Manah II solar PV power plant

No further projects have been identified from publically available data. It should be noted that except for Manah II solar PV power plant none of the identified projects are within the AoI defined in

the ESIA and are all operational. Considering each of the impacts outlined in the ESIA according to the topics listed above (air, noise, water, etc) and the distance of these projects from the AoI, cumulative impacts from activities that are planned to occur at the Project site are discussed below for each of the identified projects.

8.12.2.1 Manah II solar PV power plant

As per the RFP, the scope of the project includes the development, financing, design, engineering, construction, ownership, operation and maintenance of the Manah II solar PV power plant and the associated MOD Ancillary Road. The Ancillary Road section MOD-4 and MOD-5 (MOD Connection Road) will be a gravel road with an approximate length of 2.5 km. The project will have a minimum installed DC capacity of 500 MWp at STC and dispatch restriction at any time of 500MW at the connection point. The power plant will be connected to the licensed transmission system operator's new transmission substation at the connection point at a voltage level of 400kV with the OETC sub-station located adjacent to the project site. The project company is expected to make full capacity availability by 22nd April 2025.

The site for the development of the Manah II project is adjacent to the planned Manah I project site and is located 30 km south from the town of Manah, which is approximately 180km from the Muscat International Airport and 350 km from the Port of Sohar. The project site is situated between 340m and 350m above sea level in an undeveloped area covering an area of 680ha approximately.

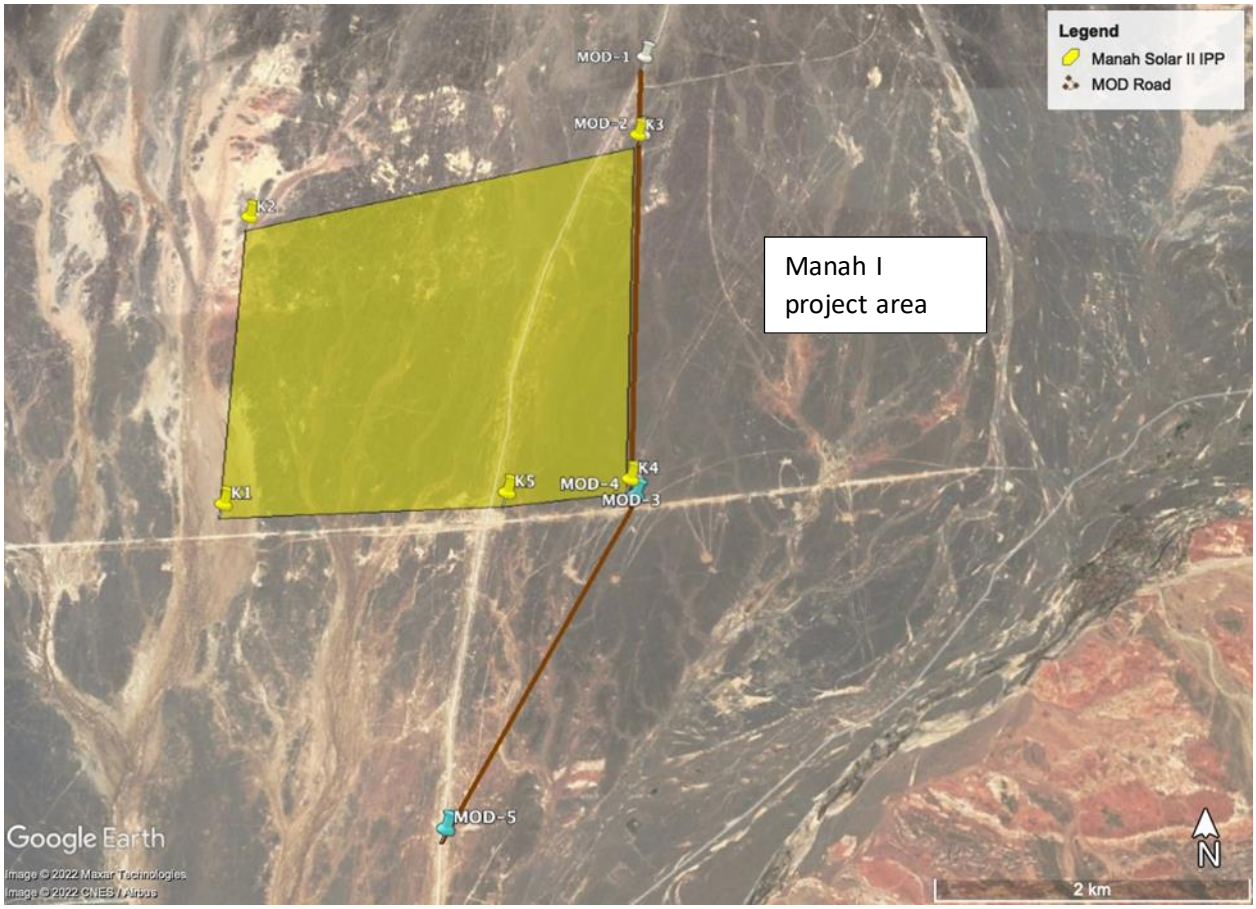


Figure 8-2 Project Location of Manah II solar PV power plant

In this context, it is important to point out that PV projects generally do not pose environmental adverse impacts during operation activities, and the potential impacts during construction are localized and short term and considered insignificant for the individual project. In this respect, the main potential cumulative impacts to be considered by the collective assessment for all projects would include:

8.12.2.1.1 Impact on water resources

Cumulative effects rising from parallel construction activities for all sites in the PV Park will be significantly higher than for one single project. Considering similar water consumption for all sites in the PV park the water requirement for construction and sanitary purposes will result in higher groundwater extraction level or water consumption levels. There will be a higher tendency for wastewater overflow and accidental spills. The impact will be minimized the implementation of the project and associated Waste Management Plan and Procedures, Contractors and sub-contractors training, Emergency Response Plan (ERP) and Spill Response and Contingency. and by Implementing regular maintenance program of vehicles and equipment to minimize leaks or mechanical failures and keep document evidence. If extraction of water is required it will be done in a rate that will not effect the ground water depletion.

8.12.2.1.2 Traffic and logistics management

Workers may be accommodated in nearby local communities. Transport of workers to and from the project sites may be significant in the high peak periods when all developers have ongoing works at site (up to 1,500 workers to be transported each day). Subsequently, air quality in the local community where workers' accommodation is located will be affected. As for air quality, transport of workers to and from their accommodation may cause significant noise in the local communities in high peak periods when all developers have ongoing works at site. These effects can be mitigated by minimize the number of construction road movements as much as practicable, Staggering deliveries to the site will ensure that congestion on local and site roads is minimized, whilst reducing waiting times for drivers and over demand on receiving staff at the site and hiring trained drivers who are fully competent and authorized to drive heavy loads vehicle.

8.12.2.1.3 Stakeholders Engagement plans

With regards to stakeholders' engagement in the context with the project of each developer this will not be considered per separate project. The grievance management and the Health and Safety plans for the two sites should be in Sync and The site managers must ensure that Stakeholder engagement to be considered at every stage of the project.

8.12.2.2 Other Projects

There are several small-scale projects located along the Al Hamra road. but outside of the Project AoI. These include Maydan Al Bashair and agricultural projects. There is the potential for additional projects or enterprises to be built or start near to the Project or for existing projects to be expanded. There is not sufficient information to be able to assess the cumulative impact of these operations. However, should new projects be of a similar scale to those existing or be an incremental growth in capacity, then significant cumulative impacts would not be expected.

8.13 Human Rights Assessment

8.13.1 Objectives

As part of the Equator Principles requirements, this human rights assessment will:

- Present an analysis of the Human Rights risks posed by a project, including any exacerbating contextual factors, and how a client would be potentially connected to such risks;
- Categorizes the various actual or potential impacts for each potentially affected group, i.e., Affected Communities, Workers, or Other Stakeholders within the project's area of influence, with special attention to vulnerable individuals and groups; and
- Outlines the proposed steps for avoiding or mitigating such impacts, or otherwise dealing with them through proper remedies.

8.13.2 Scope and Methodology

This human rights assessment is conducted in line with the Guidance Note on Implementation of Human Rights Assessments under the Equator Principles. The scope of this assessment will cover the following Human Rights Aspects:

Core Human Rights standards: The Universal Declaration of Human Rights and the main instruments through which it has been codified: the International Covenant on Civil and Political Rights and the International Covenant on Economic, Social and Cultural Rights.

Core labor rights standards: The principles concerning fundamental labor rights established in the eight core conventions of the International Labour Organization ("ILO") as set out in the ILO's Declaration on Fundamental Principles and Rights at Work, covering forced labor and worst forms of child labor, freedom of association and collective bargaining and non-discrimination.[3]

Rights of vulnerable people and populations: Human Rights instruments relating to the rights of vulnerable groups, such as Indigenous Peoples; women; national or ethnic, religious and linguistic minorities; children; persons with disabilities; and migrant workers and their families.

8.13.3 Local Context

8.13.3.1 Socio-economic Context

The project is located in a place with no factors that may exacerbate any human rights risks. As presented in section 3.2, in Chapter 3 of this report, Manah has a well-developed transportation infrastructure, ensuring smooth movement of people and goods. Roads are regularly maintained, and directional signage and road markings promote safety. Reliable transportation links connect residential areas, commercial centers, and public facilities, providing convenient access to essential services like healthcare, educational institutions, markets, and government offices. The town also offers reliable utility services, such as electricity, water supply, and telecommunications, contributing to its overall convenience and quality of life. Healthcare facilities cater to residents' needs, and the town places great emphasis on education, offering comprehensive curriculums and government offices for administrative, security, and postal services.

8.13.3.2 Local Legal Context

The framework for labour law in Oman applies to all Omani or expatriate employers and employees, public and private establishments, organizations, and their subsidiaries, which practice their activities in the Sultanate of Oman. It covers the protection of all workers including immigrant workers, women, disabled workers etc. and is consistent with international Human Rights protections. The relevant sections of the above RD especially with regards to workers' rights are listed in Section 2.4, in Chapter 2 of this report.

8.13.3.3 . Ecosystem Loss and Climate Change

Environmental protection within Oman is primarily governed by the "Law for the Conservation of the Environment and the Prevention of Pollution" (Royal Decree, RD, 114/2001) administered by the Environment Authority (EA). For reference, laws and regulations, including those on environmental and climate protection and pollution control, are issued as Royal Decrees (RDs) and Ministerial Decisions (MDs). These are listed in Section 2.1, in Chapter 2 of this report

8.13.4 Identifying Potential Human Rights Risks and their Impacts

The Guidance Note contains a non-exhaustive list of potential project-related Human Rights hazards that may affect various rights-holder groups (e.g., Workers and Affected Communities). These are the most often encountered hazards, organized by the category of Human Rights to which they belong. The list has been compiled from the *UNGP Reporting Framework: How Can Businesses Impact Human Rights?* and *Human Rights Translated 2.0: A Business Reference Guide,* as well as the experience of practitioners conducting Human Rights assessments. The table has been highlighted to identify human rights risks and their impacts based on the project.

Rights category	Human Rights issue	Potential negative impact/risk:	Risk to workers	Risk to Affected Community	Comment
Labour	**Child Labour:** ➢ ILO standards prohibit hazardous work for all persons under 18 years. They also prohibit labour for those under 15, with limited exceptions for developing countries. (Intersects with the rights of children and education).	➢ Business activities that involve hazardous work (such as mining) performed by persons under the age of 18. ➢ Where child labour is discovered, a company can negatively impact other rights (such as the rights to an adequate standard of living, or security of the person) if they fail to take account of the best interests of the child in determining the appropriate response. For example, simply dismissing the child (or cutting the contract with the relevant supplier) may result in the child being exploited in other ways (such as prostitution).			

	Collective bargaining and Freedom of association: ➢ Collective bargaining: Individuals have the right to form or join trade unions of their choice. Trade unions must be permitted to function freely, subject only to limitations that are in line with international Human Rights standards. Workers have the right to strike, in conformity with reasonable legal requirements. These exist in order to promote negotiation between organized workers and their employer or employers to determine wages, hours, rules, and working conditions. ➢ Freedom of Association: Protects the right to form or join all types of associations, including political, religious, sporting/recreational, non-governmental, and trade union associations. This freedom of individuals to associate can be an end in and of itself, or as a means of pursuing common objectives.	➢ Creating barriers to the formation of trade unions among employees or contract workers. ➢ Refusing or failing to recognize legitimate workers' associations with which the company can enter into dialogue in countries that prohibit trade unions. ➢ Operating in an area where the State seeks to undermine a local political party that opposes the company's activities by bringing false accusations against its leaders.			
	Modern Slavery (Forced Labour/Human Trafficking): ➢ Slavery exists when one human effectively owns another. Freedom from servitude covers other forms of severe economic exploitation or degradation, such as in the trafficking of workers or debt bondage. Rights to freedom from slavery and servitude are absolute rights. Forced or compulsory labour is defined by the ILO as all work or service that is extracted under menace of any penalty and for which the person has not voluntarily offered themselves. Providing payment does not mean that work is not forced labour if the other aspects of the	➢ Businesses may unknowingly benefit through their supply chains from the labour of workers who have been trafficked and are forced to work, for example, in factories. Women and children may be subject to particularly severe impacts in such situations. ➢ A company may be involved in the transportation of people or goods that facilitates the trafficking of individuals. ➢ Forced labour can arise in any sector where an			

	definition are met.	employer puts workers in a position of debt.			
	Grievance Mechanism and Remedy: ➢ All people have the right to remedy when their rights have been violated. ➢ Where business enterprises identify that they have caused or contributed to adverse Human Rights impacts, they should provide for or cooperate in their remediation through legitimate processes, whether through the company's own operational-level grievance mechanism or through cooperation with independent (non)judicial mechanisms.	➢ Not providing processes to identify (e.g. grievance mechanism) and then remediate adverse Human Rights impacts which the company causes or contributes to. ➢ Risk that employees do not understand/ trust the grievance mechanism (and therefore will not use it)			
	Job Security/Right to Work: ➢ The termination of an employment relationship is likely to be a traumatic experience for a worker and the loss of income has a direct impact on her or his family's well-being. As more countries seek employment flexibility and globalization destabilizes traditional employment patterns, more workers are likely to face involuntary termination of employment at some point in their professional lifetime. The employment of a worker should not be terminated unless there is a valid reason for such termination connected with the worker's capacity or conduct or based on the operational requirements of the undertaking, establishment, or service. Even where such practice may be legally permissible under local law, many stakeholders now expect companies to exhibit a higher standard of	➢ Arbitrarily or unfairly dismissing a worker, even if permissible under local law. ➢ Hindering or failing to provide for the reasonable career advancement aspirations of workers. ➢ Risk that workers will be on a series of short-term contracts preventing them from enjoying the benefits associated with long term employment.			

	behavior in line with international standards and good practice.				
	Non-discrimination: ➢ The practice of ensuring equal treatment and respect for all individuals regardless of class, race, color, sex, religion, gender, age, political or other opinion, national or social origin, property, sexual orientation, disability, employee status, marital status, familial connection, etc. ➢ Includes ensuring employees are free from harassment.	➢ This can come up in a variety of circumstances. It is the risk that workers may be treated unfairly (either though recruitment, hiring, management, compensation, career progression/ opportunities, or termination practices) due to certain attributes such as on the basis of their disability, religion, health, ethnicity, gender, sexual orientation, gender, age, indigenous origin, migrant worker status, etc. (as such, it intersects with other rights e.g. right to health).			
	Occupational health and safety: ➢ A company should provide safe and healthy working conditions to workers. ILO standards require governments to adopt, in consultation with appropriate employer and employee organizations, a national occupational health and safety ("OHS") policy aimed at reducing accidents and injuries to health arising in the course of employment, and to minimize the causes of inherent workplace hazards. That policy should address, for example, the provision of adequate OHS training regarding the use and maintenance of the 'material elements of work', including workplace environment, tools, machinery and equipment. Workers must be able to remove themselves from work situations where imminent and serious health dangers are	➢ Failing to address a pattern of accidents highlighting inadequate workplace health and safety. ➢ Risk that workers will face physical harm during the work commute.	√		➢ Potential risk that workers will face physical harm during the work commute due to traffic accidents.

	reasonably perceived, without undue consequences (intersects with the right to enjoy just and favorable conditions of work).				
	Wages (pay equity, standard of living): ➢ A company must protect the right to remuneration that provides workers with fair wages and equal remuneration for work of equal value. Remuneration must also be enough to provide workers with a decent living for themselves and their families. A minimum wage should be 'fair' and enable families to enjoy the right to a standard of living that includes adequate food, clothing and housing (connects with the right to adequate standard of living for health and well-being).	➢ Using cleaning staff that are employed by a third- party company and are paid extremely low wages with no or very limited entitlements to sick pay or leave. ➢ Risk that low compensation may undermine worker's ability to have an adequate standard of living.			
	Working Hours: ➢ The degree of flexibility for employees to start and end the work day in order to manage familial and personal obligations, while adequately fulfilling their employment duties.	➢ Mandating unreasonable working hours for employees that are inconsistent with ILO standards, which generally indicate that employees should not be required to work more than 48 hours per week, or ten hours a day, and should have one day off per seven days. ➢ Company practices hinder the ability of workers to adopt a healthy work–life balance that enables them to adequately support their families, such as requiring workers to live on site in dormitories for extended periods of time without providing adequate periods of leave to enable them to spend time with their families (intersects with the rights to family,			

		rest and leisure).			
Civil and Political	**Freedom of expression:** ➢ The right to hold opinions free from outside interference is an absolute right, with narrow restrictions by States only permissible when in line with international Human Rights standards. Individuals have a right to seek, receive and impart ideas in whatever media or form they choose.	➢ Not allowing workers to express their opinions freely, or unfairly punishing them for doing so. ➢ Operating in a country where workers are routinely prevented by law from expressing their opinions in the public domain. ➢ Censoring online or other content at the demand of the State where those requests are illegal under national law and/or not in line with international Human Rights standards. ➢ Engaging in litigation against individual workers, community members or Other Stakeholders who have spoken critically about the company where there is an extreme imbalance in the parties' means to fund a legal case.			
	Right to life and security of person: ➢ Individuals have the right not to be deprived of life arbitrarily or unlawfully. This includes the right to have one's life protected, for example, from physical attacks or health and safety risks.	➢ The lethal use of force by security forces (State or private) to protect company resources, facilities, or personnel. ➢ Operations that pose life-threatening safety risks to workers or neighboring communities through, for example, exposure to toxic chemicals.			

	Privacy: ➢ Individuals have a right to be protected from arbitrary, unreasonable or unlawful interference with their privacy, family, home or correspondence and from attacks on their reputation. The State is allowed to authorize restrictions on privacy in line with international Human Rights standards, but 'arbitrary' restrictions are always prohibited.	➢ Failing to protect the confidentiality of personal data held about employees or contract workers, customers or other individuals. ➢ Requiring pregnancy testing as part of job applications. ➢ Providing information about individuals to State authorities, without that individual's permission, in response to requests that are illegal under national law and/or not in line with international Human Rights standards.			
Economic, Social, and Cultural	**Right to education:** ➢ All children have the right to free and compulsory primary education. The right also includes equal access to education and equal enjoyment of educational facilities, among other aspects.	➢ The presence of child labour in a business or in its supply chain, where those children are unable to attend school (intersects with rights to be free from all forms of slavery). ➢ Limiting access to, or damaging, educational facilities through construction, infrastructure, or other projects.			
	Right to health: ➢ Individuals have a right to the highest attainable standard of physical and mental health. This includes the right to have control over one's health and body, and freedom from interference.	➢ Failure to implement appropriate health and safety standards leads to long-term negative impacts on workers' health. ➢ Pollution from business operations can create negative impacts on the health of workers and/or surrounding communities.	√	√	➢ Potential negative impacts on health workers and/ or surrounding communities due to pollution from

					construction activities.
	Right to participate in the cultural life of the community: ➢ Individuals have a right to take part in the cultural life of society and enjoy the benefits of scientific progress, especially disadvantaged groups.	➢ Activities involving resource extraction or new construction (such as laying a pipeline or installing infrastructure networks) could impact this right by separating groups from areas of cultural importance and knowledge, or by damaging their cultural heritage (intersects with the rights of Indigenous Peoples).			
	Right to Water: ➢ Individuals have the right to water and sanitation	➢ Companies cutting off access to existing water supplies, or making existing supplies non-potable, undermine the right to water (intersects with the right to health).			
	Social Insurance: ➢ This right obliges the State to create and maintain a system of social security that provides adequate benefits for a range of issues (such as injury or unemployment).	➢ Denying workers their contractually agreed employment injury benefits. ➢ Offering a private social security scheme that has discriminatory eligibility criteria.			
Group Rights/ 'Heightened Risk of Vulnerability'	**Children's Rights:** ➢ The Convention on the Rights of the Child establishes global standards to ensure the protection, survival, and development of all children, without discrimination.	➢ Permitting children to work in a manner that is inconsistent with international labour standards (intersects with prohibition on child labour and right to education). ➢ Forcing parents to work excessive hours infringing on their ability properly parent (intersects with the right to family). ➢ Where child labour is discovered, a company			

		can negatively impact other rights (such as the rights to an adequate standard of living, or security of the person) if they fail to take account of the best interests of the child in determining the appropriate response. For example, simply dismissing the child (or cutting the contract with the relevant supplier) may result in the child having to find alternative, more dangerous forms of work (such as prostitution).			
	Disability Rights: ➢ The Convention on the Rights of Persons with Disabilities promotes global standards intended to protect the rights and dignity of people with disabilities in and outside of the workplace.	➢ Refusing to hire workers due to disabilities (intersects with the right to be free from discrimination).			
	Indigenous Peoples: ➢ Indigenous Peoples are afforded unique group rights under international law that permits them to give or withhold their consent to projects that may impact them under certain scenarios.	➢ Engaging in business activities on land or cultural heritage sites that has traditional significance to the Indigenous Peoples that inhabit an area when that land was acquired by Government without due consultation and consent with the local population.			
	Migrants Rights: ➢ The International Convention on the Protection of the Rights of All Migrant Workers and Members of their Families establishes how migrant workers and their families should be protected.	➢ Permitting migrant workers to pay a recruitment fee that places them in debt bondage (intersects with the right to be free from all forms of slavery). ➢ Providing dormitories for migrant workers that lack proper hygienic safety standards (intersects with			

		rights to health, safety, and adequate standard of living).			
	Women's Rights ➢ The Convention on the Elimination of all Forms of Discrimination Against Women exists to promote women's rights and their protection.	➢ Company policy discriminates against women on the basis of their marital or reproductive status (intersects with rights to health and family). ➢ A company offers compensation to men and women in a situation where its operations or products have had negative impacts on their health in a way that discriminates against women (such as by failing to recognize the particular harm to their reproductive health) (intersects with right to free from discrimination). ➢ Business activities pollute or threaten existing water resources in a way that significantly interferes with local communities' ability to access clean drinking water. In such situations, there may be particular negative impacts on women and girls, who are responsible for water collection in many communities (intersects with rights to health and adequate standard of living).			

The identified potential human rights risks that may be imposed from the project activities are related to occupational health and safety and right to health. The identified impacts are as follows:

- Potential risk that workers will face physical harm during the work commute due to traffic accidents.
- Potential negative impacts on health workers and/ or surrounding communities due to pollution from construction activities.

8.13.5 Mitigation Measures to Address Impacts

In order to address these impacts, various management plans and mitigation measures are put in place. These are summarized in the table below.

Table 8-15 Mitigation measures to address impacts

Impact	Mitigation Measures/ Management Plans
Potential risk that workers will face physical harm during the work commute due to traffic accidents.	• Minimize the number of construction road movements as much as practicable. E.g. maximize the capacity of vehicles - Buses should be used and carpooling should be encouraged. • Staggering deliveries to the site will ensure that congestion on local and site roads is minimized, whilst reducing waiting times for drivers and over demand on receiving staff at the site. • Drivers to be fully competent and authorized to drive heavy loads vehicles and to receive specific training. • A traffic management plan will be developed by the contractor to further mitigate travel impacts.
Potential negative impacts on health workers and/ or surrounding communities due to pollution from construction activities.	• Where sand and other dusty materials are transported to the site, trucks will not be overloaded and will be appropriately covered / sheeted to avoid loses en route. • Cement and other fine powders should be sealed or covered after use, stored and transported in enclosed or bunded containers. • Dusty material stockpiles (i.e. any fine sands and powders) dust generating activities (stone cutting) are to be located away from the site boundaries and be contained or covered with suitable netting to avoid dust dispersion during storage or use. • Vehicle routes will be clearly demarcated and appropriate signage displayed around the site. • Occupational Health and Safety Management plan is put in place.

Management plans are further detailed in Chapter 9 of this report.

8.13.6 Assessing Project Level Grievance Mechanisms and Providing Remediation

As per the Guidance Note, for any identified issues, the assessment should assess what the client is doing currently/or could do in the future to address the issue and what gaps might remain.

However, the project activities have not commenced yet, therefore, an assessment cannot be provided on the effectiveness of the mitigation measures and management plans put in place at this stage.

9 Environmental and Social Management Plan

9.1 Overview

This chapter describes various measures that are to be implemented so as to mitigate the environmental and social impacts from the construction phase of the project to ALARP levels. The potential mitigation measures have been discussed in detail in the following sections along with monitoring plans.

The ultimate responsibility for environmental and social management rests with Project Owner. However, the contractor will also bear the responsibility for implementing the ESMP. Periodic environmental and social audits will be conducted by the contractor or an independent consultant to ensure effective implementation of the management plan. Corrective actions will be implemented with due correspondence and consensus with Environmental Authority.

9.2 Construction Phase Organization Management

9.2.1 Organization and Responsibilities

EDF Renewables and Korean Western Power Company (KOWEPO) and other contractor along with their subcontractors will be required to establish an organization structure for environmental and social management including health and safety issues to ensure effective implementation of the mitigation measures and to review the environmental and social management processes.

The contractor will ensure, through its onsite an EHS Coordinator or manager and team that the sub-contractor(s) develop and implement an effective Health, Safety, and Environmental Management System (HSEMS) for the project construction phase. The HSEMS will comply with the control measures and environmental and social management requirements outlined in this ESMP and any additional conditions provided by the regulators. The subcontractors are also to establish an HSEMS to effectively implement the requirements of this ESMP. The HSEMS documents need to include site specific procedures for environmental and social management taking into account the control measures included in this ESMP and requirements of the Environmental Permit (EP), organization structure, responsibilities, resources, control measures, monitoring and auditing plans, review systems, provisions for implementing corrective actions for deviations and training systems.

The HSSE manager of the contractor reporting to the PM will be responsible for day-to-day HSE management on site. The HSE Manager will maintain constant interactions with subcontractor's HSE and Line Managers and other staff throughout the construction period. The Third Party Consultant will assist in periodic audits of the HSEMS to ensure effective implementation of the control and mitigation measures and implementation of corrective actions for any deviations.

9.2.1.1 Environmental & Social Awareness and Training

In order for environmental and social control measures to be effective, staff will need to be aware of specific responsibilities and required actions associated with their element of work. Tailored training requirements relevant to elements of works will be developed and defined as part of the ESMS (i.e. site personnel associated with waste management require training on relevant components of the waste management plan). For a training programme to be successful, it is vital to:

- A trainer with appropriate knowledge, skills and experience (often peer-level training is effective);
- Make training specific to the audience;
- Ensure training is engaging and relevant; and
- Follow up and refresh training to keep abreast of changes in site conditions.

In order to record identified training needs, training type and frequency required for each staff role, commensurate with the requirements of the ESMS, would be identified. Records of associated training should be held to include the following.

- Description of training.
- Purpose of training.
- Date.
- Location.

- Attendee.
- Trainer

9.2.1.2 Induction and Orientation

The CESMP and OESMP will identify the necessary Environmental and Social requirements to be covered by site induction. This will include as a minimum:

- Key Occupational Health & Safety training and information regarding internal incident and emergency response processes.
- Raising awareness for any significant risks and impacts associated with the project.
- Any valuable resources or protection measures that need to considered by all staff.
- The proximity or sensitivity of nearby residents and communities to the project.
- Internal grievance procedures and allowances for worker welfare.

9.2.1.3 Toolbox Talks

Toolbox talks are a useful way of providing on-site training to disseminate good practice and provide regular reminders on induction and training content. It is recommended that toolbox talks are held regularly for site personnel and supervisory staff. Required toolbox talks topics and frequencies should be identified within associated risk assessments, method statements plan or procedures.

9.2.1.4 EPC/O&M: Responsible Person for Environmental & Social Management

The EPC Contractor and O&M Company will delegate the management of environmental and social components to a full-time member of staff at the Project site. This person may be the HSSE/HSE Manager, a member of the HSSE Team or a specific Environmental & Social Engineer. Regardless of the 'title' of this role, this person will be the primary project contact beneath the Project Company to implement the ESMS and will report to the Project Director, who will further report to the Project Company.

It is expected that such a role will be filled by a competent person with ideally 10 years of experience in the environmental & social fields, including at least 3-years of site-based experience. A guide for the applicable Environmental & Social responsibilities of this role are listed below:

- Implement the ESMS and execute the overall environmental and social programme and procedures demonstrating ownership at the Project.
- Ensure requirements and mitigation measures of the CESMP/OESMP are appropriately and efficiently implemented.
- Monitor the workplace to ensure environmental and social compliance (including for subcontractors).
- Liaise with local Government Authorities on environmental & social issues.
- Advise the Project Director on matters pertaining to environmental and social issues.
- Investigate environmental and social issues, incidents and non-conformances, implement corrective actions and report those to the Project Director, and liaise with the management and relevant authorities.
- Maintain and retain an environmental and social grievance and incident register.
- Ensure monitoring programmes in the CESMP/OESMP are implemented by qualified personnel and report the results to the Project Director for review and as a basis for continuous improvement.
- Be responsible for communications regarding environmental and social reporting and third party audits (periodic monitoring as required by the projects lenders).
- Maintain environmental and social records, as a minimum including monitoring records, environmental alerts (following environmental incidents), statistical data and best practice bulletins.
- Display and monitor site bulletin boards to ensure they remain 'live' and 'up-to-date' with relevant environmental & social information.

• Coordinate, plan, formulate and/or deliver environmental and social induction training to all project personnel (including subcontractors) as well as regular toolbox talk environmental training sessions.

• Organise programmes and activities to promote environmentally responsible conduct in the prevention of injury, ill health and environmental impact throughout the workforce.

• Manage the external grievance mechanism, and address inquiries, complaints and other communications received via this mechanism.

• Stop any unsafe activity which is not compliant with environmental legislation or lender requirements, and correct such work practice and/or conditions before allowing work to resume/commence.

• Act as point of contact for any sub-contractor with regard to environmental issues.

• Ensure that each sub-contractor is aware, compliant and implementing the requirements of this CESMP/OESMP.

• Review subcontractor's personnel, qualifications, competency and environmental performance.

• Undertake regular audits to assess compliance with the CESMP/OESMP and implement corrective & preventative actions – audits are to include all sub-contractors at the project.

9.2.1.5 EPC/O&M: Assistant for Environmental & Social Management

The Assistant to the responsible role for Environmental & Social management will be the second level project personnel (during construction and operation) to implement the ESMS and will report to the responsible manager. It is expected that such a role will be filled by a competent person with relevant qualifications and at least 5 years of experience in the environmental & social field, including at least 2-years of site-based experience. A guide for the responsibilities of this role are listed below:

• Ensure implementation of requirements and mitigation measures of the CESMP/OESMP at all times.

• Implement monitoring programmes as per the applicable Environmental & Social Monitoring Plan and report the results to the responsible E&S manager.

• Supervise and ensure personnel and subcontractors comply and adhere to environmental regulations and lender requirements.

• Conduct daily and weekly site inspections and report the outcomes to the responsible manager including information on: sub-contractors on site, observations, noncompliance, environmental incidents, spills, leaks and volumes, internal and external grievances, emergencies, training conducted and number of staff trained and monitoring records.

• Accountable for the overall environmental and social performance of personnel and sub-contractors and working under their charge and supervision.

• Investigate environmental incidents and communicate the investigation results and proposed corrective action to the responsible E&S Engineer.

• Attend EHS meetings to contribute to a safe and healthy working environment.

• Support the responsible E&S manager in delivering environmental and social induction training to all Project personnel (including subcontractors) as well as regular toolbox talk environmental training sessions.

• Check and ensure that the workforce is allocated and provided with adequate training, information and instruction to competently perform work in a safe and controlled manner – specifically in regard to method statement and the required plans and procedures.

• Stop any activity which is not compliant with environmental legislation or project environmental and social requirements and rectify non-compliance environmental and social conditions promptly.

9.3 Environmental Management Plan

9.3.1 Environmental Mitigation Measures

In accordance with the IFC guidelines Assessment and Management of Environmental Risks and Impacts have 3 main objectives;

- To identify and evaluate environmental and social risks and impacts of the project.
- To adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize, 5 and, where residual impacts remain, compensate/offset for risks and impacts to workers, Affected Communities, and the environment.
- To promote improved environmental and social performance through the effective use of management systems.

The mitigation measures identified for significant impacts are presented in the following table.

Table 9-1 Mitigation Measures for construction phase

Impact	Potential Impacts	Impact rating	Mitigation and management measures
Environmental Impacts			
Impact on Natural Resources	Consumption of construction materials	Low	• Using of sustainable materials to reduce the natural resources demand; such as recycled plastic. • Replace high-emitting fuels like coal, oil and gas with nearly "carbon-free" alternatives, such as solar power, wind power, or nuclear power.
	Consumption of water	Medium	• Appropriate storage and handling facilities will be established for water in order to minimize losses due to leaks and spillages. • The consumption of resources will be optimized and minimizing wastage.
Biodiversity	Obstruction of Animal Pathways	Low	• The project site will be fenced on all sides, therefore reducing the risk of animals falling into the drainage canals built around the premises.
	Increased Impact on Wadi habitat	Medium	• The main Wadi with the highest catchment should be kept undisturbed and the hydrology studies should be considered during construction to

			minimize the impact on the Wadi habitat. The Environmental Permit should be obtained by the EPC before construction
Ambient Air Quality	Dust emission	Medium	• Where sand and other dusty materials are transported to the site, trucks will not be overloaded and will be appropriately covered / sheeted to avoid loses en route. • Cement and other fine powders should be sealed or covered after use, stored and transported in enclosed or bunded containers. • Dusty material stockpiles (i.e. any fine sands and powders) dust generating activities (stone cutting) are to be located away from the site boundaries and be contained or covered with suitable netting to avoid dust dispersion during storage or use. • Vehicle routes will be clearly demarcated and appropriate signage displayed around the site.
	Gaseous emissions from exhaust of vehicles	Medium	• Internal roads inside the project site will be compacted as it reduces vehicular power consumption. • Unnecessary usage of vehicles, plant and equipment will be minimized – No unnecessary idling. • Deliveries of equipment/plant to the site will be efficiently managed to reduce the number of trips. • There should be pre-requisite requirements of site vehicles to ensure no black smoke before entering site and that any identified machinery or vehicles with black smoke will require maintenance and re-assessment before it is returned. • Emissions from machinery and equipment should be free from significant black smoke.
	Emissions of VOCs and other hazardous volatiles	Low	• Hazardous materials stored and used on site with potential gas emissions (e.g. Volatile Organic Compounds) will be located in well-ventilated, but secure low-risk areas, away from major transport routes and away from the site boundary.

			• Volatile fuels and chemicals will be stored in sealed containers. On site storage of large quantities of volatile fuels will be avoided, equally prolonged exposure to direct sun and heat will be avoided. • Fires and material burning will not be allowed on the Project site. • Chemical storage areas will be purpose built and well maintained.
Ambient and workplace noise	General Construction activities	Medium	• The Contractor will, at all times, carry out all work in such a manner as to keep any disturbance from noise to a minimum (by phasing noisy works). • All mechanically powered plant, diesel engine vehicles and compression equipment will be fitted with noise control equipment (exhaust silencers, mufflers) as available from the manufacturer. • Consideration shall be given to hours of works during normal day time working hours or during official holidays. • Where appropriate, noise barriers /attenuation to be employed (e.g. for generators) to ensure that the maximum noise level at 1 m distance from a single source will not exceed 85 dB(A). • Where noise levels exceeds 85 dB(A) noise protection devices shall be provided to personnel on-site and the area marked as a high-noise zone where ear protection is mandatory.
	Movement of construction activities	Low	• Limit unnecessary usage of vehicles/equipment – No idling – Equipment to be shut or throttled down when in intermittent use. • The movement of heavy vehicles during the night will be avoided wherever practical.
Soil and groundwater	Waste and Wastewater generation	Low	• The implementation of the project and associated Waste Management Plan and Procedures will ensure that spills are kept to a minimum and are cleaned up quickly using spill kits located in risk areas. • Develop and maintain a hazardous waste inventory to document

			and track hazardous wastes generated, and their disposal route. • Implementation of good housekeeping practices during construction activities including procedures and requirements for proper handling, storage, and transport of hazardous materials and waste. • The Contractors and sub-contractors will provide induction training and TBTs relating to the management, transportation and handling of hazardous materials and wastes. • Concrete washout shall only be undertaken designated and signed areas, with adequate protection to soils, to prevent leaks of spread of wastewater.
	Accidental releases	Medium	• The contractor will develop and maintain an Emergency Response Plan (ERP) and Spill Response and Contingency. • Maintain an inventory of all potentially hazardous materials and chemicals used and stored on-site. • All spills and leaks will be reported promptly to the HSE Manager and Project Company to be investigated to confirm the cause and put in place appropriate corrective/preventative actions. • Availability of suitable containment and spill clean-up materials/equipment at specific locations within the project site (e.g. where refueling is to take place). • Relevant personnel will be trained on emergency and spill response, containment, material handling and storage procedures. • Fuel transport vehicles and equipment will be maintained and routinely inspected to ensure the tank, pumps, pipe work and vehicle itself are free from any leaks and fit for purpose-No equipment will be placed in service until deficiencies are corrected. • Implement regular maintenance program of vehicles and equipment to minimize leaks or mechanical failures and keep

			document evidence. • No storage of hazardous chemicals, materials, oils or fuels within 100 m of the shoreline or unprotected storm water drains/channels.

9.4 Environmental Monitoring during Construction Phase

The proposed monitoring and auditing plan for construction phase is presented in the following table.

Table 9-2 Environmental Monitoring and Auditing Plan for construction Phase

#	Aspect	Scope of Monitoring / Auditing	Frequency	Monitoring Responsibility	Analysis and Evaluation
1	Air	Ambient dust levels which to be recorded for 15 - 20 min at each location using a direct reading particulate matter (PM_{10}) monitor, Personnel Data Ram (pDR) 1000 AN.	Monthly monitoring and Quarterly reporting to Environmental Authority.	HSSE/HSE Manager	Out sourced
		Diesel Generator and Heavy Equipment operating - SO_X, NO_X, CO and HC	Monthly monitoring and Quarterly reporting to Environmental Authority.	HSSE/HSE Manager	Out sourced
2	Noise	Sound pressure levels at work place and fence line as applicable using sound pressure level meter.	Monthly monitoring and Quarterly reporting to Environmental Authority.	HSSE/HSE Manager	Out sourced
3	Waste and Wastewater Management	Quantity of each category of waste stored at site and sent for disposal Inspection and reporting	Monthly logging and Quarterly reporting to Environmental Authority	HSSE/HSE Manager	Out sourced
4	Accidental Spills	Inspection of storage and handling areas	Monthly logging and Quarterly reporting to Environmental Authority	HSSE/HSE Manager	Out sourced
5	Consumption of Utilities	Inspection and reporting amounts of water, fuel, power, etc.	Monthly logging and Quarterly reporting to Environmental Authority	HSSE/HSE Manager	Out sourced

9.5 Environmental Monitoring during Operational Phase

The proposed monitoring and auditing plan for operational phase is presented in the following table.

#	Aspect	Scope of Monitoring / Auditing	Frequency	Monitoring Responsibility	Analysis and Evaluation
1	Air	Ambient dust levels which to be recorded for 15 - 20 min at each location using a direct reading particulate matter (PM_{10}) monitor, Personnel Data Ram (pDR) 1000 AN.	Monthly monitoring and Quarterly reporting to Environmental Authority.	HSSE/HSE Manager	Out sourced

9.6 Social Management Plans

Additional assessment and management plans would be required to develop within the ESIA in compliance with IFC PS 2: Labour and Working Conditions. Performance Standard 2 recognizes that the pursuit of economic growth through employment creation and income generation should be accompanied by protection of the fundamental rights of workers.

As part of this ESIA, several detailed social management plans consisting influx management [plan, Worker Accommodation plan, Grievance Management Plan, Occupational Health and Safety Management Plan and Labour Management Plan are developed and to be acted upon in the following sections.

All the social management plans are subject to involve of each's management plan whilst each address different theme, and all are designed to be designed as a complimentary social management.

9.6.1 Social Mitigation and Management Measures

The social impacts and mitigation measures for this project are discussed in the table below:

Impact	Potential Impacts	Impact rating	Mitigation and management measures
Impact on the Employment and Economy	Employment Opportunities	Positive	• Contractor should seek to employ local workers where possible. • The contractor and Sub-Contractors HR Policy will be prepared to ensure consistency in line with local labour laws. • All project workers will receive induction training at the project, as well as vocational specific training for onsite construction works.
	Purchase of construction materials locally	Positive	• Contractor to purchase goods and materials from the local/regional economy where possible
Workers Health and Safety	Ambient and Workplace noise	Medium	• The Contractor will, at all times, carry out all work in such a manner as to keep any disturbance from noise to a minimum (by phasing noisy works). • All mechanically powered plant, diesel engine vehicles and compression equipment will be fitted with noise control equipment (exhaust silencers, mufflers) as available from the manufacturer. • Consideration shall be given to hours of

			works during normal day time working hours or during official holidays. • Where appropriate, noise barriers /attenuation to be employed (e.g. for generators) to ensure that the maximum noise level at 1 m distance from a single source will not exceed 85 dB(A). • Where noise levels exceeds 85 dB(A) noise protection devices shall be provided to personnel on-site and the area marked as a high-noise zone where ear protection is mandatory.
	Movement of construction activities	Low	• Limit unnecessary usage of vehicles/equipment – No idling – Equipment to be shut or throttled down when in intermittent use. • The movement of heavy vehicles during the night will be avoided wherever practical.
Impact on Traffic and Transportation	Using of access road to connect with the site	Low	• Minimize the number of construction road movements as much as practicable. E.g. maximize the capacity of vehicles - Buses should be used and carpooling should be encouraged. • Staggering deliveries to the site will ensure that congestion on local and site roads is minimized, whilst reducing waiting times for drivers and over demand on receiving staff at the site. • Drivers to be fully competent and authorized to drive heavy loads vehicles and to receive specific training. • A traffic management plan will be developed by the contractor to further mitigate travel impacts.
	The accidents due to livestock crossing the roads	Medium	• Drivers to be fully competent and authorized to drive heavy loads vehicles with safety precautions
Impact on Local Community (including Bedouins)	Nuisance to the Local Community	Low	• Actively involving community representatives in consultations, where their perspectives, concerns, and aspirations are heard and
	Conflict with Localcommunity	Medium	

			incorporated into decision-making. • Install appropriate fencing or enclosures to separate project infrastructure from sensitives • Stakeholder engagement plan (in appendices) and grievance management plan have been developed to further mitigate potential impacts
Impact on Land Use	Using land previously used by local communities and livestock	Low	• Recognize and respect the cultural heritage associated with the land and grazing areas • Install appropriate fencing or enclosures to separate project infrastructure or sensitive areas from grazing areas • and developing plans to manage livestock movements within solar panels such as designates path or corridors for livestock movements near the Solar PVs
Worker's health and safety	Risks of accidents and injuries	Low	• Ensure all workers wear relevant personal protective equipment (PPE) and must be worn at all times at work. • Ensure and check all construction equipment are in good conditions and are all safety certified requirements
	Spread of diseases	Low	• Adhere to follow all local labour force

9.6.2 Influx Management plan

Influx is simply movement of people towards an area for project implementation purposes. Project-induced influx will lead to a combination of conditions to sending areas and adjacent location. Development of projects is an essential element of economic opportunities that cause influx project-induced.

This framework of Influx Management Plan (IMP) will identify the potential impacts for human population influx, also referred to as in-migration, to occur because of transit of jobseekers and squatters coming to the area in pursuit of employment or to sell goods or services to the construction

workforce. Influx can negatively affect public infrastructure, utilities, housing, sustainable resource management and social dynamics.

The purpose of this IMP is to:

- Highlight the characteristics of project-induced impact.
- Minimize/Set control measures for the potential impacts of influx to occur.
- Monitor any residual project-induced influx.

9.6.2.1 Standards and Regulatory Requirements

9.6.2.1.1 National Requirements

- RD 35/2003 provides the framework for labor law in Oman which applies to all Omani or expatriate employers and employees, public and private establishments, organizations, and their subsidiaries, which practice their activities in the Sultanate of Oman.
- MD 286/2008: Regulating Occupational Health & Safety in Organizations consists of several chapters which are focused on medical care, the health of the workers, the specifications of worker's cloths and others.

9.6.2.1.2 International Requirements

There are applicable IFC Performance Standards and Human rights guidelines aim to identify and ensure that social and economic impacts of a project are addressed in the relevant areas.

Human Rights

Inalienable rights based upon the recognition of dignity, freedom, and equality of human beings according to the Universal Declaration of Human Rights and the fundamental conventions of the International Labor Organization. Those rights consist of three main categories; civil and political rights, Economic, social, and cultural rights, and solidarity rights.

World Bank Group (IFC)

PS 1 – Assessment and Management of Environmental and Social Risks and Impacts: Influx management contributes to the objective of minimising project or project-induced impacts on workers and affected communities.

PS 2 – Labour and Working Conditions: Influx management should address access to jobs and procurement, ensuring non-discrimination and equal access. It should also uphold company commitment to local recruitment.

PS4 – Community Health, Safety and Security: Influx management should contribute to the reduction of influx-related threats to community health and safety.

9.6.2.1.3 Population

By the end of 2021, the total population in the Sultanate of Oman is 4,527,446 which increased by 1.04% compared to same period of 2020. According to the Nation Center of Statistics an Information (2022, Year Edition Book), the Ad Dakhiliyah governorate had a population density of 15.3 person per km^2 which make it the third largest government of population density in Oman. Wiliayat Manah is located Ad Dakhiliyah and have a total population of 25,688. Population distribution in Manah is presented in Table 9-3~~Table 9-3~~.

Table 9-3 Population distribution in Manah (NCIS,2022)

		Omani Population			Expatriate Population			Total Population		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Ad Dakhiliyah Governorate	Manah	9,649	9,477	19,126	5,728	834	6,562	15,377	10,311	25,688

9.6.2.1.4 Employment

According to the National Statistical Yearbook (NCSI, 2022), 2.1 million people were employed in Oman, a 0.95% decrease compared to the previous year. Although no specific information was provided regarding the employment status in Manah, NCSI reported that a grand total of 195,529 individuals were employed in economically gainful activities from the Ad Dakhiliyah Governorate. Omani and expatriate workers were as follows; 97,308 were Omani and 98,221 were expatriates.

9.6.2.1.5 Infrastructure

The landscape characteristics around the project area are mostly arid region along several wadi channels happen to be observed as mentioned in the baseline chapter. Although the harsh environment of area, Infrastructure, amenities are fairly available and fit the needs of local people in the area. The reason for that is simply Manah's important location, near Nizwa city which is one of grand cities and famous cities in Oman. Infrastructure such as Health services, education and roads systems are available near the project area. Table 9-4~~Table 9-4~~ shows local health and education statistics in Manah as per NCSI 2022.

Table 9-4 Health services and education in Ad Dakhilyah Governorate

	Health services								Education			
	Government sector				Private sector							
	hospital	Health clinics	Extended Health care	Health centers	hospital	Health clinics	Extended Health care	Pharmacies	government schools	Private schools	International schools	Special education school
Ad Dakhilyah Governorate	6	-	4	22	1	92	26	72	158	113	2	-

9.6.2.2 Potential Impacts

Skilled and unskilled labor will be employed from Oman and outside-Oman. The workforce will involve national (Omani) personnel and expatriate personnel. As a result, mitigation of workers to the project site will create positive and negative impacts for local communities. Migration of individuals to the region of project does not necessary mean all of them are the project-induced jobs within the project operation.

Many reasons will attract different groups of migrations around to vicinity of the project and may identify this region as providing opportunities for the market. When developing the project at all stages, multiple consequences are always expected to affect regional and local social-economics of the area including the positive and negative impacts. Nuisance to local communities due to increased stress on the local infrastructure through use of local roads, health services and natural resources, etc. are likely to impact the local communities. Other adverse impacts could include increased demand and competition for local social and health services, as well as for goods and services. This could lead to the following; Increased demands on the ecosystem and natural resources, risk of social conflict and risk of illicit behavior and crime. Besides the unwanted and disturbance impacts for local communities, project-induced influx can also cause positive and create several positive outcomes such as new markets and economic activities (Rental market, food supply…etc.), Improved services and enhanced infrastructure, and Increased labor pool and skills base.

9.6.2.3 Mitigation and Management Measures

Table shows a summary of the projected in-migration impacts and its mitigations measures:

Category	Impact	Description	Mitigation measures
Environmental	Increased pressure on natural resources	The movement of people into the project area will result in increased pressure for natural resources.	• Mitigation measures include policies concerning energy, transportation, food and agriculture, and land use that will reduce GHG emissions. • Training on reduce energy, instruction, and information poster it can rise the knowledge of the employee. • Avoiding contamination of fresh water sources
Social	Cultural heritage	increased movement of in-migrants with different cultures and belief systems within the project areas will result in the potential breakdown of traditional institutions, leadership structures and cultural norms(nomads), religious believes	• Raise public awareness about the cultural heritage both in the country and abroad; Develop training courses for law enforcement services, customs, and judicial authorities, with the support of cultural institutions. • Deliver all the relevant information and instruction related to respect of other religions, develop spaces and time for religion practices for different religions, etc in different languages and maintain Training courses to the employee with different languages. • Respect and support the preservation of these cultural elements, as they are vital to the well-being and cultural integrity of the Bedouin community.

Category	Impact	Description	Mitigation measures
			• Actively involving community representatives in consultations, where their perspectives, concerns, and aspirations are heard and incorporated into decision-making.
	Conflict	feasible to consider the likelihood that conflict might arise, particularly around the allocation of employment and associated opportunities. Risk of social conflict	The Project management should focus on the following point to avoid the Conflicts in the Projects: • Anticipate future HR needs • evaluates activity in the extent of selecting potential candidates, their development in relation with the workplace, and retaining the employees by planning their career, respectively by the development within the company. • Behavior Code / Code of Conduct of Conduct for all employees and reference to Grievance Mechanism • Consultations with and involvement of local communities in project planning and implementation; • Awareness-raising among local community and workers.
	Food and nutrition security	In-migration may also take up land that could be used for agriculture production.	Solutions to Food Insecurity • Reduce Food Waste

Category	Impact	Description	Mitigation measures
		Consequently, immigration is likely to increase the pressure on food demand and supply, consequently triggering food inflation, which may result in serious health consequences for vulnerable populations.	• Reduce the Risk of Commercializing. • Trained employees on the food security. • Participate in the local and international Activities related to food security.
	Increased pressure on existing infrastructure	Any additional influx of jobseekers will place substantial pressure on local infrastructure such as roads, clinics, schools, sanitation and water access, and housing.	• Identify where government is needed and areas where the private sector is better positioned. • The company will provide there on clinic to the employees except for those which need Hight treatments in the hospital. • Company will follow the insurance standard and regulation to the employees, asset, property in case any things happen.
	Safety and security	Increased economic activities, and the anticipated commercial traffic within the project area will expose the locals to social risks such as crime and road accidents. The movement of all employees to project area will be required, Accommodation Camp, transport and food and other facilities.	• Hazard mapping. • Adoption and enforcement of land use and zoning practices. • Flood plain mapping. • Reinforced tornado safe rooms. • Raising of homes in flood-prone areas. • Training on Traffic Security

Category	Impact	Description	Mitigation measures
			• A detailed security forces management plans should be developed by the EPC contractor.
	crime (Including Prostitution, illicit behavior, theft and substance abuse)	Access to disposable income may result in the increased incidences of crime	• Sourcing of local workforce; • Creation of supervised leisure areas in workers' camp; • Cooperation with local law enforcement; • Paying adequate salaries for workers to reduce incentive for theft • Training and raised awareness to the staff on the sexually transmitted infections. • The company should put Legislation that eliminate incidences of prostitution and cause sex relations. • compliance the company policies with Local Law.

9.6.3 Worker Accommodation Management plan

This plan aims to discuss producers and specifications for worker accommodation on the project during operations stages of this projects. It includes the specifications for design and management of the camp infrastructure, sleeping accommodation to which client shall follow to mitigate/prevent associated consequences of the health and safety aspects of workplace and workers.

The objectives of worker accommodation management plan is;

a) To provide safe and safe accommodation environment for workers that meet the minimum and basic needs of workers
b) Minimize the harmful impacts on the vicinity and communities

These objectives can only be valid and achieved by fully complying with requirements of the regulations and standards for nationally and globally.

9.6.3.1 Standards and Regulatory Requirements

It is important to ensure equal and fair employment procedures and the systems for managing this plan. To do so, the application of the various acts and procedures that are relevant to human resources is required to the success of this plan.

9.6.3.1.1 International requirements

a) In accordance with IFC and EBRD, Workers' accommodation: processes and standards publication (IFC and EBRD, 2009) was develop that highlight the provisions of housing or accommodation for workers by employers and issues arise from construction and management of accommodation facilities.

IFC	IFC Performance Standard 2
EPRD	Environmental and Social policy addressing workers' accommodation; paragraph 16 of Performance Requirement 2(PR2)

This publication highlights the key standards and practical guidelines to IFC and EBRD specialists, consultants and clients which need to be taken in consideration. These may include the following;

- Building construction: for example, quality of material, construction methods, resistance to earthquakes.

- Housing and public housing: in some countries regulations for housing and public housing contain requirements on issues such as the basic amenities, and standards of repair.
- General health, safety and security: requirements on health and safety are often an important part of building standards and might include provisions on occupation density, minimal air volumes, ventilation, the quality of the flooring (slip-resistant) or security against intrusion.
- Fire safety: requirements on fire safety are common and are likely to apply to housing facilities of any type. This can include provision on fire extinguishers, fire alarms, number and size of staircases and emergency exits, restrictions on the use of certain building materials.
- Electricity, plumbing, water and sanitation: national design and construction standards often include very detailed provisions on electricity or plumbing fixtures/fittings, water and sanitation connection equipment.

b) Occupational health and safety Management systems requirements (OHSAS 1800;2007)

9.6.3.1.2 Camp Location

The camp location shall ensure that risks to occupant, impacts to local environmental sensitivities and neighboring communities are controlled to a level that is as low as reasonably practicable. The camp location shall be selected in accordance with Environmental and Social Impact Assessment provided by the Operator prior to camp construction project ensuring reasonable safe distance from the worksite.

9.6.3.1.3 General Requirements

- Include residential accommodation units of sufficient number to accommodate occupant.
- Provide for the impact of the presence of occupant with different lifestyles or cultural backgrounds in particular issues such as religious or other cultural prescriptions, local traditions, and Community structure.
- Provide amenities and recreational facilities to suit the camp population needs.
- Accommodation is protected against moisture, wind, and sand and adequately screened against insects.
- Ensure each Living Unit contains adequate lighting, ventilation, air conditioning and heating systems.
- Prohibit food preparation/cooking in sleeping accommodation.
- Accommodation has bathroom/shower unit. The toilets shall have sufficient hot and cold running water supplies.

- Sanitary and toilet facilities are kept in working condition. Cleaning schedule reflecting daily cleaning cycles for toilet, kitchen, and accommodation.

9.6.3.1.4 Security

- The contractor shall provide a policy to protect camp staff and workers against any theft and attack. This policy to be managed by a qualified individual and it shall cover:
    a. Address contingences of impacts may result from camp regard to security and possible civil and security risks.
    b. Develop a protocol for the employment of security staff which include:
        1. Number of staff required
        2. Background checks and suitability for work (language, working experience in Oman, fitness…etc)
        3. Training requirements for staff regarding expected duties risks, community human rights in Oman and how to act in case of violence.

9.6.3.1.5 Landscape Area

- Minimum landscape area to be 30% of total site area (including soft and Hardscape).
- Softscape to be minimum of 15% of the total site area.
- Ensure built up area or Hardscape shall equal 40% as maximum.
- Provide outdoor landscape space shall be 1.5m^2 per person.
- Prohibit gravel for walkways in open and access routes.

9.6.3.1.6 Building location and access

- All living facilities are built with adequate materials kept in good repair and kept clean and free from rubbish and other refuse.
- Modular construction of accommodation blocks is the preferred method.
- Consideration of local climate and seasonal variations to take advantage of light, ventilation, and heat gain or loss opportunities while designing and orienting buildings and windows.
- Covered circulation routes for camp accommodation and communal facilities.
- Living Unit is constructed in unregimented and varied layout to promote aesthetics and social interaction.
- Layout of access routes must provide for least disturbance to the sleeping or resting occupant.

- Creating a minimum distance in between the facades of living blocks depending on the PACDA fire codes.
- Creating access routes between the accommodations with hard surface to prevent dust arising.
- Entrance to accommodation fitted with an exterior weather-proofed door and door closure.
- Provide sufficient lighting inside the camp.

9.6.3.1.7 Design

- Meet all applicable Omani Laws on health, safety, and environment.
- Ensure submission of drawings to Operator/ Company for approval prior to commencing procurement and/or construction activities.
- Ensure materials are fire-resistant, where applicable as per PACDA.
- Provide for all aspects of the camp design, materials, and form of construction as suitable for intended lifespan.

9.6.3.1.8 Room/dormitory facilities

The standards of the rooms or dormitory facilities are important to allow workers to rest properly and to maintain good standards of hygiene. Overcrowding should be avoided particularly. This also has an impact on workers' productivity and reduces work-related accidents. It is generally acknowledged that rooms/dormitories should be kept clean and in a good condition. Exposure to noise and odor should be minimized. In addition, room/dormitory design and equipment should strive to offer workers a maximum of privacy. Resorting to dormitories should be minimized and single or double rooms are preferred. Dormitories and rooms must be single sex.

- Rooms/dormitories are kept in good condition.
- Rooms/dormitories are aired and cleaned at regular intervals.
- Rooms/dormitories are built with easily cleanable flooring material.
- Sanitary facilities are located within the same buildings and provided separately for men and women.
- Density standards are expressed either in terms of minimal volume per resident or of minimal floor space. Usual standards range from 10 to 12.5 cubic meters (volume) or 4 to 5.5 square meter (surface).
- A minimum ceiling height of 2.10 meters is provided.

- In collective rooms, which are minimized, in order to provide workers with some privacy, only a reasonable number of workers are allowed to share the same room. Standards range from 2 to workers.
- All doors and windows should be lockable and provided with mosquito screens where conditions warrant.
- There should be mobile partitions or curtains to ensure privacy.
- Every resident is provided with adequate furniture such as a table, a chair, a mirror, and a bedside light.
- Separate sleeping areas are provided for men and women, except in family accommodation.

9.6.3.1.9 Sleeping and Living Unit requirements

- Separate Living Unit for men and women.
- The surface height of the building's floor is not less than 20cm from the level of the exterior surroundings of accommodation place.
- Minimum total area of 4m2 per person and a minimum separation distance of 1 meter between beds.
- A minimum unobstructed ceiling height to be 2.4m, excluding ceiling fans, if any.
- A separate bed for each Occupant during the day/night shift cycle; the practice of "hot-bedding" is not allowed.
- Each Occupant shall be provided with a comfortable mattress, pillow, cover and clean bedding.
- Bed linen be washed at least once every two weeks and if indicated treated with repellents and disinfectants
- A full-length wardrobe shall be provided for each Occupant per person.
- Sufficient natural and artificial light (a minimum 150 Lux intensity) be provided in all rooms.
- All doors and windows shall be lockable.
- Windows be fixed on opposite sides to provide through-ventilation. Window be fitted with blinds and insect screens.
- Air conditioning shall be provided and include cooling and heating system.
- Separate storage for work boots and other personal protection equipment, as well as drying/airing areas to be provided.

- The floor shall be covered with a suitable interior flooring material such as tile or linoleum in living areas, rubber (or similar to deaden objectionable noises). Construction shall be such that it prevents ingress of insects and pests.
- Living Unit shall be built with easily cleanable flooring material.
- Living Unit shall be aired and cleaned at regular intervals and kept in good condition.

9.6.3.1.10 Camp Rules

Following are some important accommodation rules which staff and labors have to follow.

- Maintain the cleanliness inside the accommodation premises at all times.
- Main door should be closed at all times and key taken out of the cylinder lock.
- It is prohibited to lock the bedrooms at any time.
- All bedroom keys should be handed over back to the compound security.
- All rooms should be organized and furnished as per company standards. Whereby bedrooms and sitting room arrangement is to be respected at all times.
- Bedroom's layout must be as per the standard; no partitions allowed.
- Each room shall occupy a maximum of three staff.
- It is not allowed to keep, store and or consume any food items inside the bedrooms.
- For hygiene purpose carpets are strictly forbidden in the accommodation.
- Shisha and lighting charcoal are strictly prohibited inside the accommodation.
- Smoking and group gathering in the accommodation main entrance, passage halls, elevators & common areas is prohibited.
- Company's assets have to be kept always in good condition; any intentional misuse will lead into sanctions and monetary reclamations.
- It is strictly forbidden to enter/exit any asset from & to the accommodation without prior approval from the HR Manager.
- Any extra assets / furniture not in accordance to standards must be removed immediately from the accommodation.
- It is not allowed to keep extra items / cartons in the accommodation.
- A/C, lightings, electronic devices & exhaust fans (kitchen & bathrooms) should be switched off when it's not in use.
- It is strictly prohibited to open the air-conditioning system and the windows at the same time.

- No items, garbage, old shoes are to be kept in the flat or balcony as it must be clean all the time.
- All shoes must be stored / kept in a proper location using the shoe rack and not to be in the rooms.
- Sticking or posting of pictures or any other forms of paper materials on any area of the flat is not allowed.
- All cables (e.g. Internet, TV) must be pulled on, in a proper way.
- Staff must report to HRD all maintenance requirements using the standard form.
- Staff wishing to change flats must obtain a written approval prior to any move.
- Security Guard has the right to spot check the bags & other belongings entering and exiting the Staff Accommodation.
- Staff is not allowed to stop or block maintenance and pest-control crew from conducting their required tasks inside the flats, HR will inform the staff beforehand with the regular visits, and urgent matters will be managed instantly.
- Littering times in the common areas and from the windows is strictly prohibited and punishable.

9.6.3.2 Monitoring and audit

The development and implementation of a rigorous and regular monitoring and evaluation framework should be considered. The main purpose of this framework will be to track progress and identify issues related to the rate, scale, and social characteristics of project-induced in-migration.

The contractor shall conduct audits on daily, monthly annually basis to confirm that standards are being adhered to. Areas where needs to be check are but not limited to:

- Food hygiene
- House keeping
- Security
- Fire and evacuation
- Medical care
- Pest control
- Sanitary
- Air condition

Daily audits	Housekeeping Sanitary system	• Toilets • Washroom • Shower room areas
Weekly audits	Housekeeping Security	• Kitchen and food preparation • Housekeeping • Worker conditions • Recreational areas • General care and Maintenance
Monthly	Medical care Fire systems and evacuation alarm Pest control	-
Annual audits	Electrical system	• Fittings inspection

All audits and monitoring procedures shall be recorded and kept for further verification by HSE department

It is advised to refer to checklist on workers' accommodation (IFC and EBRD, 2009) in Annex I in order to maintain an effective management of this plan.

9.6.4 Grievance Management Plan

9.6.4.1 Scope and Objectives

This plan is designed to outline the procedure for accepting, assessing, resolving and monitoring grievances from those affected by the Project. The aim is to identify and manage grievances from individual stakeholders or stakeholder groups. Timely redress or resolution of such grievances is vital to ensure successful implementation of the Project. EPC will be required to develop Grievance Management procedures that are aligned with this Procedure and track and report EPC-related grievances to EPC.

Grievances can encompass minor concerns as well as serious or long-term issues. They might be felt and expressed by a variety of parties including individuals, groups, communities, or other parties affected or likely to be affected by the social or environmental impacts of the Project. It is essential to have a robust mechanism to systematically handle and resolve any complaints that might arise in order that they do not escalate and present a risk to operations. If well-handled, an effective grievance mechanism can help develop positive relationships and build trust with stakeholders.

EPC has placed a high priority on establishing a permanent dialogue and communicating with communities and stakeholders. This plan provides a simple means for stakeholders to express their

concerns and for EPC to take corrective actions as required to ensure project commitments are effectively implemented.

The specific objectives of the grievance mechanism include:

- Establishing a mechanism for responding to grievances in an understanding, transparent and culturally suitable manner.
- Developing an easy access, no cost and efficient grievance procedure for project affected peoples and other stakeholders.
- Ensuring effective dialogue and open lines of communication with the public.
- Helping to prevent unrealistic expectations and/or negative perceptions from the local population towards the Project.
- Establishing a system of investigation, response and quick grievance resolution.
- Reducing the number of grievances received over time.
- Improving social performance through the analysis of grievances and refinement of work practices.
- Ensuring that non-compliances with project environmental and social commitments are
- Adequately corrected in a timely fashion and are subsequently monitored.
- To maximise the effectiveness of the Grievance Procedure, EPC will apply the following factors during implementation and operation of the system:
- Commitment to fairness in both process and outcomes.
- Clear grievance management rules and accountability.
- Validity of all complaints submitted.
- Confidentiality if requested.

The GMP is expected to help improve the Project's environmental and social performance over time as the number and nature of grievances received is an indicator of the behaviour of our employees, EPC, and the overall effectiveness of our Project execution. This GMP has been considered in parallel to the Stakeholder Engagement Plan (SEP) due to the inter- relationship between the two. It has been designed to meet the legal requirements of Oman and the requirements of the International Finance Corporation (IFC) in relation to grievance management.

9.6.4.2 Policy and Legislation

The GMP is expected to help improve the Project's environmental and social performance over time as the number and nature of grievances received is an indicator of the behaviour of our employees, EPC,

and the overall effectiveness of our Project execution. This GMP has been considered in parallel to the Stakeholder Engagement Plan (SEP) due to the inter- relationship between the two. It has been designed to meet the legal requirements of Oman and the requirements of the International Finance Corporation (IFC) in relation to grievance management

9.6.4.3 International Guidelines

The main international guidelines applicable to Grievance Management are the Equator Principles IV and those from the International Finance Corporation (IFC, Performance Standard (PS) 1 and 2).

EP6 and IFC PS1 require that a grievance mechanism be established by the project "designed to receive and facilitate resolution of concerns and grievances about the Project's environmental and social performance". The procedure should be geared towards Affected Communities as its primary user and should be tailored to be culturally appropriate and without retribution to the party that raises the concern. The procedure should be disseminated to the Affected Communities through the stakeholder engagement process. The process should not impede access to any judicial or administrative remedies.

PS2, Labor and Working Condition also requires that EPC provides a grievance mechanism for workers (and their organizations where they exist) to raise workplace concerns. This procedure should be made available to the worker during recruitment and make it easily accessible to them, with no retribution and it should not restrict access to judicial or administrative remedies through the law, or substitute any grievance mechanism through collective agreements.

9.6.4.4 Roles and Responsibilities

In addition to EPC, the Project may involve a number of third parties (e.g. EPC, government authorities, employment agencies, etc.). Following best practice guidelines, responsibility for the management and resolution of grievances ultimately rests with EPC, even in situations where a EPC fails to reach an acceptable resolution. client and their EPC (including EPC) must specifically address grievance management, resolution and respective responsibilities.

Guidelines to EPC for the development of their own Grievance Management procedures (and responsibilities) are included in contract documentation that defines minimum requirements and specific responsibilities.

<u>EPC responsibility</u>

EPC shall ensure that sufficient and qualified resources are allocated on an ongoing basis to achieve effective implementation of the Grievance Procedure and its monitoring. EPC responsibilities in Grievance Management are:

- Final Approval of the Grievance Procedure.
- Publicizing the EPC grievance mechanisms on client website.

- Allocation of a dedicated budget for the management of Grievance Mechanism and addressing grievances through financial or in-kind compensation where appropriate.
- Implementing and overseeing the Grievance Procedure and all other social plans and programs.
- Providing accurate and timely information to stakeholders about the GMP as needed through website and planned or scheduled engagement sessions
- Obtaining, organizing and documenting feedback from the project stakeholders regarding perceptions, concerns and requests.
- Taking appropriate actions to address major Non-Conformities by the EPC based on audit reports, performance monitoring reports and on proposed approach and actions.
- Coordinating with client Project Management team in the resolution of a complaint where applicable.
- Evaluating and transmitting feedback obtained from stakeholder's grievances to client's project management team and EPC if relevant to project decision-making.
- Centralizing grievance tracking and monitoring.
- Reviewing and approving EPC' Grievance Management Procedures.
- Overseeing the effectiveness of the EPC Grievance Procedures.
- Reporting KPIs applicable to this Procedure based on information from EPC and client.

Implementation of the EPC Project Grievance Mechanism will be the ultimate responsibility of client, EPC HSSE Supervisor, supported by the wider client Project team when required.

EPC Management will:

- Ensure that this Grievance Management procedure is applied through all EPC departments and levels that are undertaking activities related to the client project. The Management will apply necessary controls to minimize risks that could result in stakeholder grievances.
- Contribute to the resolution and sign off of any grievances which have international repercussion

9.6.4.5 Grievance Management Procedure

This Grievance Management Procedure is designed to facilitate the lodging, acceptance and closure of grievances coming primarily from Affected Communities, but also from other interested stakeholders and project workers.

Grievances may arise from local hiring, unplanned impacts and infrastructure damage as they relate to the Project's environmental and social commitments. The GMP is available to any party that wishes to

communicate a grievance to EPC whether it be an individual, non- governmental organization, community based organization, other community group, local or national employee. A grievance will be considered genuine and evaluated if a party considers itself genuinely impacted due poor environmental and social performance.

The GMP is available on a voluntary and non-excluding basis. It does not affect anyone's rights to use the Omani judiciary system in any way, nor does it replace the public mechanisms of grievance and conflict resolution. However, EPC believes most grievances can be quickly resolved by discussing the issues and agreeing mutually acceptable solutions in a less official setting.

Grievances will be handled through the EPC HSSE Supervisor. These specialists will be trained and shall receive, centralize and process all grievances for their area of responsibility. They will deliver grievances to the appropriate departments in client or EPC organizations, implement systems to organize, track and document all responses and deliver summary reports to management.

The EPC HSSE team will propose means to resolve grievances, monitor the Procedure, and hold meetings as needed for grievances raised on site. Grievances may also be raised during formal stakeholder meetings which will be handled through this procedure.

EPC will inform the local communities, its workers and EPC about the Grievance Mechanism and provide (on posters) contact details how people can launch a complaint via:

- The EPC HSSE Team - verbally;
- Telephone;
- Email;
- Grievance boxes onsite at main entrances and accommodation facilities, as well as contact details being placed on site notice board.
- Letter; or
- Website.

All contact details and means of submitting a complaint will be widely and regularly publicized, throughout the duration of the project, through posters at key locations (e.g. outside a local market, etc.), advertisements in local papers/radio and verbally by EPC employees.

A summary of the grievance procedure is illustrated in the chart below and described in subsequent sections. This is used for both EPC and the main O&M EPC. If the grievance is unable to be resolved at the EPC level, then it will be forwarded to EPC and the client executive management will be involved in the Grievance Review Committee (GRC) to close-out.

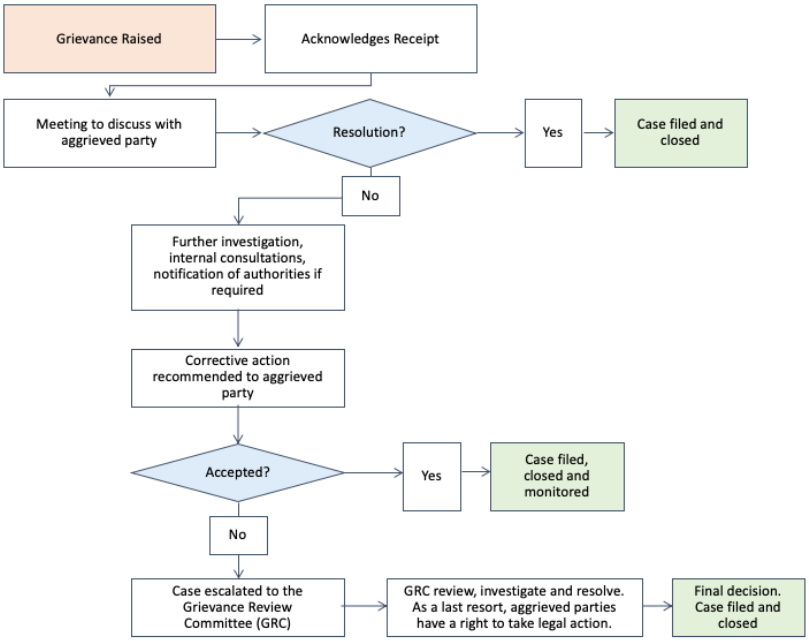


Figure 9-1 Grievance Procedure Flow Chart

9.6.4.6 **Contact details**

Valid anonymous responses will be posted on bulletin boards located in the office as appropriate. Anonymous grievances are not expected to be common due to the community structure in the area.

All forms will be in Arabic and English. For EPC, forms should be in the language understood by its workforce as well as Arabic and English. The EPC HSSE team will speak both Arabic and English. The EPC website can be viewed in both languages.

9.6.4.7 Grievance Handling and Resolution

Grievances should be handled according to the following steps:

1. The HSSE team will learn as much as possible about the case, including:
    - Who?
    - What?
    - Where?
    - When?
    - Why?
2. EPC shall acknowledge receipt of any grievance as soon as possible, but up to seven days from the date it was submitted and shall inform the complainant about the timeframe in which a response can be expected. For reasons of confidentiality and to protect the safety and security

of EPC personnel, the contact details of individual staff members will not be released to external parties/complainants.

3. The findings of the all investigations will be entered into the grievance file and used to determine eligibility (see above Grievances to be Directed Outside of the EPC Grievance Procedure). If the Grievance is considered to be ineligible the Government and Community Relations team will contact the complainant within 3 working days and explain that the complaint was not recognized as eligible.
4. For all types of Grievances, the HSSE team will listen attentively to the person while he/she expresses his/her grievance. In many cases, simply listening with empathy helps to calm the situation.
5. During this first meeting if the grievance is resolved, the case is considered closed and it is registered as such.
6. If a grievance is more complex, EPC and/or the EPC conduct an investigation to verify whether the grievance is genuine as related to project commitments. This is done in the presence of the person or the representatives of the local community lodging the grievance. EPC will investigate fully all grievances submitted, and will involve other departments, EPC and senior management as required in the process in order to fully understand the circumstances that led to the grievance being raised. This should be performed in a timely manner to avoid delaying the resolution of a grievance. EPC will aim to resolve any grievances within 30 days from the date that it was received. This timeframe can be extended to 60 days for more complex grievances, if required.
7. The local authorities and/or representatives may be invited to attend the investigation if the grievance warrants their involvement.
8. The HSSE team will communicate and explain the grievance to the appropriate person in in the EPC organization.
9. The HSSE team will consult other departments to determine the practical corrective action(s) or mitigation of the grievance.
    - nature of the corrective action;
    - time in which it must be implemented;
    - person responsible for implementation; and,
    - log information in the Grievance Registry.
10. If the complainant accepts the corrective actions, they sign a letter of acceptance and the grievance is closed subject to a 15 days monitoring period.

11. If the proposed solution or executed solution is not accepted by the complainant, the grievance is elevated to a Grievance Review Committee.
12. EPC and/or the HSSE Relations team will consider if refinements to procedures or practices could reduce the probability of recurrence. EPC coordinates any changes to plans, procedures and methods with the EPC within contractual restrictions.

9.6.4.8 Grievance Review Committee (GRC)

The GRC will be set up by EPC to address complaints as a result of the project implementation. The GRC will include the Government and Community Relations team leader, representatives from client, and the EPC HSSE Supervisor.

All grievances shall be dealt with on a case by case basis. However, all will require further discussions with complainants and community members to mitigate perceptions that resolutions unfairly benefit client.

If attempts to resolve a grievance through the steps above do not result in an acceptable grievance resolution, the grievance may be elevated by the HSSE team to a specially-formed grievance committee. The committee may include local representation from the Wali and / or authorities, with a defined chair.

Documentation pertaining to an unresolved grievance will be given to the Chair of the Committee, who will seek and give opinion about how to resolve the case and who will attempt to resolve the case through conciliation.

As a last resort, aggrieved parties have a right to take legal action. This is a more formal rights based approach that shall only be taken if all other approaches have failed or when there are serious conflicts about facts and data. The final decision will be taken by the arbitrator or courts based on compliance with laws, policies, standards, rules, regulations, procedures, past agreements or common practice.

9.6.4.9 Grievance Tracking

Once a verbal or written grievance is received, it will be screened for validity (e.g. to ensure that nothing is blatantly false) and logged into a central grievance mechanism database within 3 business days. Grievances shall be assigned a case number and records of communication/consultation shall all be attached with the relevant entry and filed. The database shall be monitored regularly for recurring grievances so that appropriate mitigation can be developed.

Grievances will be categorized into the aspect it relates to such as the type of activity, geographical area, HSES Management System Element, or overall Project Environmental and Social Performance.

EPC anticipates that the following direct impact grievances could be categorized as follows:

- Possible impacts on marine life
- Possible impacts on fish and fisheries catch

- Job issues
- Local EPC issues
- Third party injuries or conflicts
- Damages to infrastructure
- Loss of livestock (goats, camels)
- Nuisance caused by noise or dust
- Environmental issues (soil and water contamination, erosion, damage to wildlife or vegetation, hunting and fishing, improper right of way restoration etc.)
- Behavior of personnel
- Community health and safety
- Cultural issues.

Categorizing grievances will allow EPC to establish trends and adapt its own, and EPC's management system where needed to improve environmental and social performance and reduce the overall number of grievances resolved.

If a grievance is the result of a non-compliance to project environmental and social project commitments and could result in harm to people or serious environmental impact, the HSSE team will consult directly the executive team and may recommend a temporary suspension of an activity. Any member of staff or EPC has the right to refuse or stop work that is unsafe.

Should EPC receive a grievance that is not related to EPC-executed projects, it will be forwarded to the Wali/appropriate government authority for them to coordinate a response with the appropriate third party. The complainant will be informed accordingly. These grievances will not be tracked.

In addition to categorizing a grievance, the following information will also be collected in a standards format:

- Name, address, contact number, place or community of residence.
- When and where the grievance was received.
- Name of the HSSE team members who received the grievance.
- Basic information about the party making the grievance for providing feedback.
- Corrective actions and dates when they were initiated and completed;
- Dates when the required notifications and feedback were given to the affected party
- Date when all parties agreed the grievance was closed-out.

It is voluntary for the individual making the grievance to provide personal information.

9.6.4.10 Grievances Outside of the EPC Grievance Procedure

Following best practice, all grievances and claims from local communities should be accepted and no judgment made prior to investigation, even if complaints are minor. However, several types of grievances deserve special consideration and possible redirection to other grievance resolutions channels, such as:

- Complaints clearly not related to the Project: It is sometimes difficult to determine which issues are related to the project and which are not. If in doubt, employees designated to receive grievances should accept the complaint and assess its legitimacy. Making upfront agreements with communities as to which types of claims are and are not project-related will help avoid misunderstandings in individual cases.
- Complaints constituting criminal activity and violence: In these cases, complainants should be referred to the formal justice system.
- Commercial disputes (i.e. EPC not paying to third parties): Commercial matters should be stipulated for in contractual agreements and issues should be resolved through a variety of commercial dispute resolution mechanisms or civil courts.
- Issues related to Governmental policy and Government institutions: It is not uncommon for communities to use company grievance mechanisms to bring complaints related to aspects of project implementation that are a responsibility of, and implemented by, public institutions and their officials. The private sector is not obliged to address such complaints. Communicating clearly to local communities about the role, responsibilities, and limitations of the EPC Grievance Mechanism is a must, but it may not suffice in practice. Governments may not have enough capacity (either resources or processes) to handle grievances or they may be inaccessible to affected communities. At a minimum, such grievances can be captured through the SP|V system, and then EPC may choose to pass the grievances to authorities and let the communities know how to follow up.

9.6.4.11 Consultation and Disclosure

The disclosure of this procedure is done through the corporate website. A simplified summary procedure will be documented in the Project Offices and the Government and Community Relations team will be well versed and trained in the Grievance Procedure. EPC should train their personnel on how the EPC grievance procedure must be followed. The procedure and forms should also be easily accessible, and the same forms will be used by all EPC to ensure consistency of collecting and analyzing received grievances.

During Stakeholder Engagement sessions and community engagement meetings, the grievance process will also be explained.

9.6.4.12 Verification and Monitoring

EPC will carry out monitoring to ensure that EPC and EPC are adhering to the requirements and commitments contained in the EPC's Management Plans and EPC Implementation Plans. All monitoring requirements shall be established within the EPC Plans with details of resources, monitoring, and assurance methods included within the EPC's ESMS.

This entails good record keeping of complaints raised throughout the life of the Project. On receipt of grievances, electronic notification to management must be distributed. Grievance records must be made available to management at all times.

Monthly internal reports will be compiled by the EPC HSSE Supervisor, supported by EPC team as required and distributed to the management team. These grievance reports will include:

- The number of grievances logged in the proceeding period by level and type (with further details of the location of the incident/issue).
- The number of stakeholders that have come back after 15 days of monitoring period stating they are not satisfied with the resolution.
- The number of grievances unresolved – by type – after 30 days for relatively straightforward grievances and 60 days for complicated cases.
- The number of grievances resolved after 30 days, without accessing legal or third party mediators, by level and type
- The number of grievances of the same or similar issue
- EPC responses to the concerns raised by the various stakeholders.
- The measures taken to incorporate these responses into project implementation.

These reports and other records will be made available for external review if required. EPC shall also submit monthly reports aligned to the EPC reports. An appropriate grievance report should be part of EPC's annual reporting. Annual reports will be made available to the public (through the EPC website). A grievance mechanism will be adopted as presented below. A grievance/ complaint can be submitted either via a grievance form or through Wali verbally.

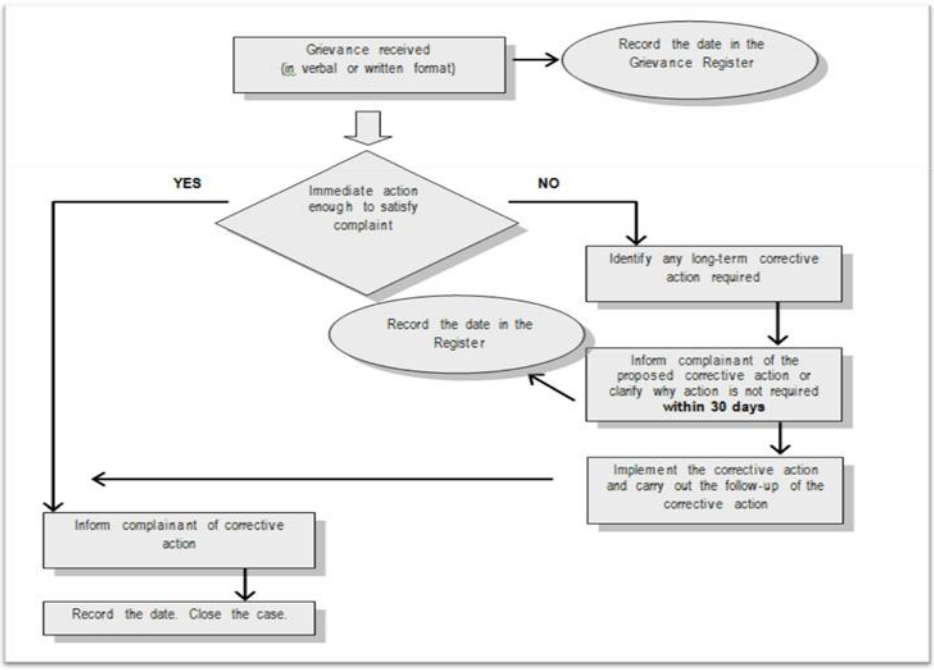


Figure 9-2 Grievance complaint submission Flow Chart

A grievance can be submitted in the following ways:

- By communicating the grievance/ complaint to the local Authority/ commune (using the official grievance form, via letter/note or verbally) who will be responsible for reporting the issue to the company
- By submitting the grievance directly to the company (either verbally or via the grievance form)
- By submitting the grievance to the contractor who will then be responsible for informing the company

All grievances received will be forwarded to the Administration Department of the company who will be responsible for recording them in a grievance/complaints register and for implementing the grievance response mechanism.

Grievance Response Mechanism

- When a grievance is received, the mechanism for dealing with it will be as follows:
- Grievance received;
- Grievance recorded in the grievance/ complaints register;
- For an immediate action to satisfy the complaint, the complainant will be informed of corrective action;
- Implement corrective action, record the date and close case;

- For a long corrective action, the complainant will be informed of proposed action; and
- Implement corrective action, record the date and close case.

Public Grievance Form

These reports and other records will be made available for external review if required. EPC shall also submit monthly reports aligned to the EPC reports.

9.6.5 Occupational Health and Safety Management Plan

The Community Health and Safety Management Plan (CHSMP) is implemented by the project stakeholders to protect health and safety from a community perspective only and to provide an important procedures and actions for overall management of community health and safety within the project area during construction stage. This plan will mainly focus on project activities during construction phase. Another plan will be developed at operational and decommissioned stages prior project operation. The CHSMP guide stakeholders to comply with local, internationals legislations and standards regarding management of impacts on community health and safety during construction and operational phase. This Management Plan covers activities related to the implementation of the Project to avoid and reduce community health, safety and security risks that may arise as the result of the project.

9.6.5.1 Standards and Regulatory Requirements

9.6.5.1.1 National Requirements

Sultanate of Oman has established three royal decrees in order to ensure the protection of the community health and safety during the construction phase, which are:

- MD 286/2008 amended by MD 322/2011; Regulating Occupational Health & Safety in Organizations.
- MD 325/2019; Amendments on the Provisions of the Health Conditions Regulations for Activities Related to Public Health.
- MD 286/2008: Regulating Occupational Health & Safety in Organizations consists of several chapters which are focused on medical care, the health of the workers, the specifications of worker's cloths and others.

9.6.5.1.2 International Standards

Performance Standard 4 (IFC) recognizes that project activities, equipment, and infrastructure can increase community exposure to risks and impacts. The objective of performance standard 4 is to:

1. To anticipate and avoid adverse impacts on the health and safety of the Affected Community during the project life from both routine and non-routine circumstances.

2. To ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the Affected Communities.

9.6.5.2 Potential Impacts

Project related activities might result in the increase of risks associated with those who live near the Project site or may visit areas in and around active Project sites. The construction phase of the Project will require additional workforce around the site. Hence there will be an increase in the population of the local area. As such, there is a potential for both workers accommodated in the EPC Contractor camps and those in the local Project area to come into contact with local populations. In addition, there will be higher chances for spread of diseases to local communities.

Project activities like heavy construction machinery, excavations, transportation amongst others, including electrification, fire and pollution releases have the potential to result in accidents/injuries of various magnitude. In addition, a fall hazard is possible since the site located in fluctuated level and higher than the nearby wadi channels and massive sizes of rocks in the area.

9.6.5.3 Mitigation measures

Effective actions are developed that meet with relevant requirements of the EIA and CHSMP legislations and standards. Management actions will be required and applied by stakeholders to mitigate negative impacts.

General actions are developed by HMR include, but not limited to the following:

Introduction of new staff as a guarantee of Health and safety in order to avoid conflicts, accidents or other forms of disturbance of public peace and healthy social local climate (Stakeholders Engagement Plan, in particular with regards to training and briefing the workers;

- Prevent, avoid or minimize exposure of communities to diseases caused by noise, water and soil pollution (Pollution Prevention Plan);
- Improve / raise the response level of authorized institutions (police, hospitals, SMURD, etc.) to emergencies (Emergency Response Plan, especially in terms of responding to accidents and off-site incidents);
- Contractors will develop appropriate Emergency Response Plans for off-site activities in line with the Emergency Response Plan and Contractor Management Plan (Emergency Response Plan);
- Perform simulations regarding the emergency situations in case an accidental pollution is caused, having impact on the water resources (Emergency Response Plan);

- The HSE Manager will co-ordinate with the line managers to ensure that safe work practices are followed with regard to working at height, confined space entry, work permit procedures including:
    a. The access to site will be restricted to employees, authorized sub-contractors and visitors.
    b. All workers at the site will be provided with an identity badge, as a mark of authorization to work on the site.
    c. The visitors' access to the site will be controlled through gate passes. The main entrances to the site will have a notice indicating the work being carried out, the names of companies present and the people responsible for the site.
- The contractor shall provide a provide to separate site boundary from the nearby settlement to protect workers and avoid escalation with local people. This policy shall also cover:
    c. Address contingences of impacts may result from site/camp regard to security and possible civil and security risks.
    d. Develop a protocol for the employment of security staff which include:
        4. Number of staff required
        5. Background checks and suitability for work (language, working experience in Oman, fitness…etc)
        6. Training requirements for staff regarding expected duties risks, community human rights in Oman and how to act in case of violence
- Wastewater should be prevented from entering surface water bodies without prior assessment and treatment if necessary (Water Management Plan);
- Communicate transport route(s) and predicted schedule to communities where the transport route(s) run close to or through villages (Roads and Traffic Management Plan);
- A road safety and traffic awareness program will be implemented with local communities along heavily used transport routes (Roads and Traffic Management Plan);
- An Air quality monitoring program shall be implemented, especially close to the residential areas having the impact significance determined to be "high", in the surroundings of the GCS and site organizations areas (Air Quality Management Plan);

- Store incompatible materials in separate areas, and with containment facilities separating material storage areas. The storage and use of hazardous substances will be performed in conditions of maximum security, in order to avoid the possibility of their accidental spill (Hazardous Materials Management Plan);
- Investigate any complaints in relation to cultural heritage (desecration, disturbance, removal, trafficking of artefacts) and take appropriate action (Cultural Heritage Management Plan);
- Wires will need to be secured and rising cables armoured to avoid being disturbed by livestock;
- halting or reducing grazing activities within solar plants is recommended prior internal consultation and stakeholder engagement
- In case of utility disruption (planned or unplanned) Contractor(s) will cooperate in an efficient manner with the utility provider (s) and local authorities and take all necessary measure to timely announce the community (whenever possible) and keep this disruption as short as possible.

Envisaged measures to protect the local community

Workers' living facilities have various on-going impacts on adjacent communities. In order to manage these, the Contractors have to promote a thorough Community Relations Management Plan, in compliance with the socio-economic conditions of neighboring settlements during the construction phase.

This plan will contain the processes to implement the findings of the preliminary community impact assessment and to identify, manage, mitigate or enhance on-going impacts of the workers' accommodation on the surrounding communities.

Issues to be taken into consideration, according with Stakeholders Engagement Plan, Roads and Traffic Management Plan, Health and Safety Measures Plan, Community Health and Safety Management Plan and Emergency Responds Plan, include:

- Community development – impact of workers' camp on local employment, possibility of enhancing local employment and income generation through local sourcing of goods and services. Contractors should develop a Manpower study to identify the workforce needed during the project implementation period, the type and number of skilled, semi-skilled and unskilled labor force expected to be recruited in each stage of the project implementation period and the retrenchment period and conditions. Based on this study, and the results of the community needs, the contractors will try to maximize local employment.
- Community needs – ways to identify and address community needs related to the arrival of specific infrastructures such as telecommunications, water sanitation, roads, health care, education, housing.

- Community health and safety – addressing and reducing the risk in the increase in communicable diseases, corruption, trade in illegal substances such as drugs, alcohol, petty crimes and other sorts of violence, road accidents
- Community social and cultural cohesion – ways to mitigate the impact of the presence of large numbers of foreign workers, often males, with different cultural and religious background, ways to mitigate the possible shift in social, economic and political structures due to changes in access to income generation opportunities

9.6.6 Labor Management Plan

The Labor Management Plan (LMP) has been developed to manage labor risks during the implementation of the project. The LMP is in line with national requirements as well as the objectives of the World Bank's Environmental and Social Framework, specifically objectives of Environmental and Socials Standard 2: Labor and Working Conditions (ESS2) and Standard 4: Community Health and Safety (ESS4)

9.6.6.1 Standards and Regulatory Requirements

It is important to ensure equal and fair employment procedures and the systems for managing this plan. To do so, the application of the various acts and procedures that are relevant to human resources is required to the success of this plan.

9.6.6.1.1 National requirements

Oman Labor Law

RD 35/2003 provides the framework for labor law in Oman which applies to all Omani or expatriate employers and employees, public and private establishments, organizations, and their subsidiaries, which practice their activities in the Sultanate of Oman.

9.6.6.1.2 Omanization

Based on article 11 of RD 35/2003, employer is obligated to commit to the Omanisation policy as widely as possible. Number of Omanis relatively to non-Omani is determined by ministerial decisions in accordance with the sector and type of activities. Hence all workers shall be treated equally if the nature and condition of the word are agreed upon.

9.6.6.1.3 International requirements

In addition, several acts are highlighted below in accordance with best managing relationships and engagement between the client (employees) and workers. These include:

- IFC Performance Standard 2. (IFC, 2012)
- The employment Relations

- The Privacy act 1993

9.6.6.2 Framework for Compliance- Labor and Working Conditions

The EPC require ensuring compliance with IFC PS2 as it pertains to Labor and Working Conditions. Specific information and details are not available from the EPC at this stage; however, the guidelines provided below would be followed by the EPC to comply with IFC PS2 requirements including aspects relating to working hours, minimum wage, child labor, gender discrimination, overtime, retrenchment and forced labor. The EPC would prepare specific policies in accordance with these requirements prior to the start of construction.

EPC will establish procedures for managing and monitoring the performance of EPC, in relation to the requirements of IFC PS2. This will also be included in the contractual agreement with the EPC to legally enforce implementation of these requirements.

9.6.6.3 Oman and the International Labor Organization (ILO)

Oman has been a member state of the ILO since 1994, all of which are one of the eight fundamental conventions. In 2010, the ILO launched the 2010-2013 Decent Work Country Program (DWCP). During that period, ILO in Oman built the capacity of tripartite constituents in areas such as social security, employment, skills development, International Labor Standards, labor inspection, social dialogue, and the promotion of entrepreneurship.

In 2014, the Government of Oman has agreed to extend the DWCP until the end of 2016. The main focus areas of the 2014-2016 DWCP were:

- Omanisation of the workforce;
- Social dialogue;
- Labor administration;
- International Labor Standards; and
- Social protection.

All projects are requirement to comply with the Omani Labor Law, which in turns requires compliance with the ratified ILO convention

9.6.6.4 Managements and Control Measures

9.6.6.4.1 Recruitment and Demobilization

Recruitment

1. Client is legally not able to employ people directly and therefore will assist with the facilitation of employee administration on behalf of home organizations
2. Client is responsible for their workforce planning and recruitment.

3. Alliance partners will take care of employment and secondment along with following their own employment process, yet the following to be included as a minimum;
    - Referee checks
    - Medical testing including fitness test
- Drug testing and issuing of contracts.
- Consider pre-employment/secondment checks of unfavorable precedents.

Demobilisation

client plan for demobilization has been in place to ensure;

- All team members shall adhere to the client leave scheme.
- Individuals shall be supported and be transited throughout the process and they are intentional.
- Leave records shall be maintained by HR team.

9.6.6.4.2 Compensation and Benefits

The Company management are to set a sequential system for the administrative and financial jobs in accordance with the commercial activity.

The Company shall promote the employee from his/her current job to a higher position according to the regulatory sequence of job categories or financial grade of the company, according to a specific time frame to make the employee gets all career and financial benefits promotion.

The employee shall be promoted as:

- An administrative promotion which requires the employee to be transferred from a one job category to a higher job category with different responsibilities and competences.
- A financial promotion which provides a financial increment in the employee's salary with continued affiliation to the same job occupied.
- An exceptional promotion which subjected to the Company's regulations in this regard.

The employee shall be eligible for the promotion to a higher position if he/she fulfils the following conditions:

- Availability of vacancies in the higher positions.
- Possessing the necessary qualifications for filling the position to which he is being nominated.
- Having a periodic report qualifies for the promotion.
- Practical experience and individual skills.

- Not have been convicted to a felony or misdemeanour involving moral turpitude or dishonesty committed in the workplace or while doing it.
- In case the absence of a vacancy in the higher administrative position, the employee shall be promoted to a financial grade which commensurate with the next administrative position of his/her current one.

If the promotion conditions met for a higher position in more than one employee, the selectivity for the promotion as follows:

- Who achieved the highest ratings?
- Who obtained the highest educational certificate?
- Who obtained more training courses?
- Seniority.

If more than one employee got the same promotion conditions, the Company shall put a test for the competitors, who obtained a higher grade shall be promoted.

9.6.6.4.3 Grievance

Grievance Mechanism is further discussed in the Stakeholder Engagement Plan.

9.6.6.4.4 Drug and Alcohol

Client and contractor team members are permitted to commence work if they show signs of drug and alcohol use.

9.6.6.4.5 Fitness for duty

Agreement to work for this project, is a condition of secondment that all team members shall comply with client procedures regarding fitness of duty.

9.6.6.4.6 Working Hours and Overtime

<u>Working Hours</u>

a) The standard working hours shall be nine hours a day and forty-five (45) hours in a week, for all Employees or as stated in the individual Employment Contract.

b) During the month of Ramadan, the regular working hours shall be reduced to six (6) hours per day or a maximum of thirty hours per week or as per the Ministerial order issued for Ramadan. This arrangement is only for Muslim Employees.

c) The Project Manager shall have the discretion to change the working hours / days aligned with the Labor Law requirements.

d) The Company shall display at the main gates used by Employees, clear to read schedules denoting working hours, rest hours and weekly rest timings and send a copy of such schedule to the relevant department.

Overtime

Employees in the Sultanate of Oman are entitled to two consecutive days of rest per week after working continuously for five days.

Employees are entitled for monetary compensation for additional hours when required if in the interest of work to do so following the instructions of company management.

The rate of pay for the additional period worked will be as specified as in the Labor Law.

- If an Employee is required to work for more than the prescribed working hours, then the total number of normal and additional working hours shall not exceed maximum twelve (12) hours in a day.
- The Company shall pay such an Employee overtime equal to the basic wage calculated on the basis of the additional working hours plus at least 25% for the day working hours and/or 50% for the night working hours or to grant him leave from work in lieu of the additional hours during which he has performed work, provided that the Employee agrees in writing to work for such additional hours and the consideration therefor.

If an Employee is required to perform overtime on an official holiday or weekly rest day, then the Employee shall be compensated by client and contractors by paying him/her, double wages for that day unless the Employee agrees for another day as leave in lieu of the afforested wages with client and contractors**.**

9.6.6.4.7 Applicable for Females

a) Without prejudice to the provisions set out in this Chapter, all provisions regulating the employment of workers shall be applicable to women workers without discrimination between them in the same work.

b) Females shall not be required to work between nine p.m. and six a.m. save in cases, works, and occasions specified by a decision by the Minister.

9.6.6.4.8 Shift/Night Shift

Depending on the work requirements at site, the line Manager or Project Management shall notify HRD in advance that some employees might be needed to work on shift/night shift basis, wherein the working hours shall not exceed the Labor Law requirements.

9.6.6.4.9 Salaries

- Salaries shall be paid on the first working day of the following month through the Bank Transfer (WPS).
- In case an employee is new or his/her salary bank account is not ready, the company will pay him/her salary by cash or check
- If the pay day coincides with the weekly holiday or with a public holiday, salary shall be paid on the first working day.
- The employee shall be entitled to his/her total salary including the public holidays and the occasions for which a decision is issued by the Ministry of Labor. If a public holiday coincides with a weekly day off, the employer and employee shall make an agreement to compensate, if necessity arises to work. But if the public holiday falls within the period of the annual vacation, the employee shall not be entitled for any compensation for the same.

9.6.6.4.10 Performance Appraisal

Performance appraisals play an important role in determining the professional development of the employees and used for determination of training requirements, planning, allowances, promotions, and determination of potential responsibilities, etc.

- Ability to work and level of efficiency.
- Behavior of the employee and his/her dealings and transactions with his supervisors, colleagues, and the Clients of Company.
- Punctuality.
- Adherence to the instructions of Company.
- Knowledge.
- Personal skills

9.6.6.4.11 Monitoring and Evaluation

Monitoring shall consist of structured inspections, and audits protocols in order to secure a performance excellence environment. Techniques followed by project management team shall be evaluated to confirm if these approaches are contributing to the success of this plan.

9.6.6.4.12 Records and Reporting

Periodical reports are encouraged will be undertaken to monitor compliance with HRMP. Various audits shall cover learning and development, grievance guidelines adherence, operational resourcing and training performance, employee relations, and recruitment activity.

9.7 ESMS Review

The ESMS (including the CESMP and OESMP documents and complimentary plans & procedures) would be regularly reviewed according to changes in construction or operational activities and in response to results from monitoring, audits and inspection. Reviews would be undertaken at a frequency to ensure adequacy of the ESMS and to ensure that all potentially significant adverse impacts are identified and that associated control measures are appropriate to the project.

9.7.1 Social Monitoring during Construction Phase

The proposed monitoring and auditing plan for construction phase is presented in the following table.

Table 9-5 Environmental Monitoring and Auditing Plan for construction Phase

Aspect	Scope of Monitoring / Auditing	Frequency	Monitoring Responsibility	Analysis and Evaluation
Health & Safety	Hygiene, use of PPE, signboards, first aid kit and fire-fighting devices, site HSE procedures and traffic management	Monthly logging and Quarterly reporting to Environmental Authority	HSSE/HSE Manager	Out sourced
	Community Health, Safety and Security	Quarterly	HSSE/HSE Manager	Out sourced

9.8 Management of Data

Monitoring results should be compared against relevant standards, permit requirements, required thresholds, received complaints, audit findings, CESMP and OESMP requirements. The Environmental and Social Management team for the EPC Contractor or O&M Company will define appropriate action to follow in the instance that any exceedances in monitoring limits are confirmed or adverse impacts identified, including:

- Communication protocol in the event that an exceedance is identified.
- Internal review process of recently performed maintenance and inspection.
- Review of previous monitoring data to identify any potential associated variations or trends in results.
- Recommendations for quarantine of equipment or change in work practices.
- Review of monitoring frequency to ensure the issue does not re-occur.

Records of any incoming communications (such as grievances) received regarding environmental & social condition must also be thoroughly investigated (note: by the established grievance process for any grievances). The repetition of measurements is an essential part of monitoring as it detects changes over time and should alert to potentially positive or negative effects of an activity. Adverse effects should trigger a review of mitigation measures and determination of the likely source of the impact. Should no effect be detected it may demonstrate a lack of effect, success of mitigation measures or the requirement to continue monitoring over a longer period of time.

Data from the monitoring for comparison against baseline and all previous monitoring efforts to identify trends in condition and make inferences on the success of implemented mitigation measures.

Data and associated interpretation will be recorded in a report or format suitable to present to auditors, or be suitable for submission to lenders and Statutory Authorities (should submittal of monitoring data be required), making clear any adverse impacts identified and actions taken to investigate and rectify, including any corresponding updates to in the ESMS and associated documentation.

9.9 Record Keeping

The appropriate management of records is a requirement of any successful ESMS and can be used to track progress, review effectiveness and demonstrate compliance. The ESMS relevant to both the construction and operational phases should include the collation of the records including (but not limited to) the following:

- Environmental and Social induction and training records.
- Relevant records of competence/qualifications.
- Accident Investigation Reports.
- Grievance register.
- Internal Audits reports (including close-out).
- Non-Conformance Reports
- Environmental Inspection & Audit Reports (including close-out).
- Environmental Monitoring Results.
- Waste Manifest Forms and Chain of Custodies.
- Environmental Risk Assessments and Method statements.

- Equipment Inspections/Certifications.
- Independent Audit Reports for Lenders (including close-out).

Such records will need to be included on the ESMS register and updated as applicable.

9.10 Audit Programme

Auditing is an integral requirement of any monitoring strategy and should be considered as a continual process to be undertaken by a range of site staff to ensure the successful implementation of mitigation/management measures.

9.10.1 Internal Audits

The ESMS will establish, implement and maintain an internal audit programme that identifies the frequency, methods, responsibilities, planning requirements and reporting of audits and inspections. When establishing an audit and inspection programme, the organisation should consider the potential frequency and significance of environmental and social risks relative to the construction and operational phase and adjust the audit scope and frequency accordingly.

When developing and undertaking audits the following will need to be established:

- Define scope, audit criteria and the objective of each audit.
- Select audit staff competent in the audit process and subject matter.
- Ensure that audit results are reported to relevant senior management.

The frequency of audits will be undertaken on a level commensurate to the risks and impacts of the Project, whilst the frequency will be subject to review according to the identified level of compliance and anticipated risks attributable to specific construction stage/activities. During operations, the frequency shall be bi-annual as a minimum (depending on risks attributable to specific operational activities), and the audit criteria may also vary depending on any external certification that may be linked to the ESMS.

9.10.2 Lenders Monitoring and Reporting

Quarterly monitoring reports (during construction) by the lenders Engineers Independent Environmental & Social Consultant will need to be provided and reported to the lenders. These reports are likely to be based upon site visits to evaluate the implementation of both the ESAP, and the suitability & effective of the established ESMS in practice.

9.11 Non-Conformity, Corrective Action and Preventative Action

All non-conformances identified during audits, inspections and monitoring activities will be recorded and followed up as non-conformity. Non-conformances are instances where Project criteria (such as a legal requirement, or EMS requirement) are not being fulfilled, or cannot be evidenced. examples of non-conformity include, but are not limited to:

- Commencement of works without an approved risk assessment and method statement that covers environmental issues identified herein.
- No review of risk assessment and method statements following any significant changes in requirements that could adversely impact the environment;
- Appointment of a waste transport/disposal service provider that is not appropriately licensed;
- Breach of environmental standards.
- Failure to comply with waste storage/disposal requirements as identified by risk assessment and/or method statement.
- Failure to comply with chemical storage and/or handling requirements.
- Un-containable or uncontrollable spills of fuels or chemicals.
- Undertaken works outside the scope defined within the risk assessment and method statement; and,
- Discharge of untreated, contaminated waste water to the Marine Environment.

Any situation or condition that poses an imminent risk to the environment should be immediately resolved. If the situation or condition cannot be corrected immediately, temporary measures as necessary for the protection of the environment should be implemented. Each non-conformance and near miss will be recorded utilising a developed reporting process. All NCRs and near misses shall include the following information:

- Location and description of the Non-conformance and the criteria/requirement that has been breached;
- The proposed corrective action including who holds responsibility for undertaking this action.

• The proposed preventative action to ensure against reoccurrence of the noncompliance.

• Any required monitoring and follow up; and,

• Key performance indicators and a deadline for the successful completion of the corrective and preventive action.

10 Environmental Framework

The environmental framework is developed based on the recent guidelines of draft environmental conditions issued by EA on the 3rd of December, 2020 requesting that the ESIA include recommendations for environmental permit conditions. For this project, permit conditions are presented for the solar power plant project.

The table below summarizes the suggested project-specific conditions based on the impacts assessed in this ESIA and the relevant mitigation and management measures to ensure the adverse impacts are either avoided or reduced as far as practicable.

#	Permits Conditions
General Compliance Conditions	
1	The ESIA is developed for Solar PV plant and the design is based on the project information provided by EDF Renewables and Korean Western Power Company (KOWEPO) and they shall ensure the implementation of the project design as highlighted in Chapter 3. If there are any significant changes in the plant project design that could change the impacts or the project boundary/area of influence, EDF Renewables and Korean Western Power Company (KOWEPO) should inform the EA and update the EIA.
2	EDF Renewables and Korean Western Power Company (KOWEPO) shall provide the EA with all required technical information and explanations after obtaining the environmental permit and during its validity. Any obligation, commitment or agreement on the part of the company with the Authority and any requirements registered or to be registered in future by the Authority through correspondences, meeting minutes or any other means shall be considered as an integral part of the conditions of the environmental permit once obtained by EA.
3	EDF Renewables and Korean Western Power Company (KOWEPO) shall bear all and full responsibilities and consequences for any environmental impacts, damages, waste or distortions that may occur during the project including costs, mitigation and treatment, compensations and dues settlement if any as per the laws, regulations, basics and controls defined by EA and other competent authorities in this regard.
4	Implement all necessary mitigation and adjustment plans, measures and actions mentioned in the ESIA in chapter 9 along with implementing appropriate climate change adaptation measures to mitigate potential damages resulting from natural disasters.
5	Remove any environmental pollution resulting from project activities at the company`s own expense. EA has the right to stop the project in such a case.
6	Company shall nominate focal points who shall be responsible for the implementation of the ESIA addendum study, the enforcement of the environmental laws, regulations and this proposed compliance conditions as well as the implementation of project hazard and environmental incidents plan. Company shall provide EA the reference and the names and qualifications of the focal points for ensuring ESIA implementation during the validity period of the environmental permit.
7	All mitigation measures recommended as part of the ESIA addendum are to be implemented.
Waste	
8	Get the approval from the EA for discharging any wastes.

#	Permits Conditions
9	Take necessary measures regarding the treatment and disposal of hazardous waste either by coordinating with the Oman Environmental Services Holding Company in the facilities approved by the Authority or by providing EA with an initial agreement with one of the overseas entities certified for recycling, treating or discharging waste to transfer such waste there on a regular basis and to avoid piling in the company`s site. Storing such waste is not allowed in the company`s site or any other sites for more than two months from date of production of each quantity.
10	Submit a comprehensive plan to manage all kinds of hazardous and non-hazardous waste (liquid or solid), to EA, including all details on the measures to reduce, recycle or treat them. Apply to the department of inspection and environmental control at the Authority for obtaining relevant permits.
11	Company have to fully adhere at all times to the laws and regulations, including the regulation for the re-use and discharge of wastewater issued by MD 145/1993.
12	Company have to fully adhere at all times to the laws and regulations, including the regulation for hazardous waste management issued by Ministerial decree no. 18/93.
13	Company have to fully adhere at all times to the laws and regulations, including the regulation for non-hazardous solid waste management issued by Ministerial decree no. 17/93.
14	Hazardous and non-hazardous waste inventory is to be maintained and included in the environmental performance reports submitted to the EA.
Noise quality	
15	Control noise resulting from project activities using mitigating measures.
16	Company have to fully adhere at all times to the laws and regulations, including the regulation for Noise pollution control in Public Environment issued by MD 79/1994.
17	Company have to fully adhere at all times to the laws and regulations, including the regulation for Noise Pollution control in Working Environment issued by MD 80/1994
Air Quality and Climate Affairs	
18	Apply to the Civil Aviation Authority formerly with Directorate General of Climate Affairs (now to the Civil Aviation Authority) to get a climate affairs permit which will be renewed annually.
19	Periodically monitor air emissions during the operation of the plant and report to the EA monthly or quarterly basis.
20	Upon servicing ODS equipment, qualified and trained technicians must perform the service. It is necessary to use gas retrieving and recycling equipment.
21	Company may emit greenhouse gases resulting from the project in accordance with the estimates submitted to the Authority. If exceeded, the D.G. of Climate Affairs must be notified.
22	Notify the Directorate General by email and by mail of any environmental incident such as the emission of air pollutants, dust, smoke, noise or odours from the project units and facilities. Repair the damage at earliest. Provide the EA with a detailed incident report on the causes and justifications including an action plan adopted to prevent the recurrence or reduction of such incidents in the future as per the Authority`s basics and controls in this regard.
21	Conduct an air dispersion modelling for the operational stakes including the furnace to verify the compliance of the emissions

#	Permits Conditions
	Hazardous Waste
22	Identifying environmental hazards and incidents expected from the plant area on the medium and long runs, the terms of reference of the company specialists in dealing with them and the response aimed to reduce their environmental impacts.
23	Identifying the activities and measures that the company ought to undertake before and during the emergence of hazards and environmental incidents so as to prevent their recurrence in the future or reduce their damages.
24	Setting forth a regular program for applied training regarding the measures taken to respond to emergency environmental hazards and incidents expected from the project units and facilities with the participation of specialists from the company, the Authority and government agencies.

11 Conclusion

EDF Renewables and Korean Western Power CO., Ltd. (KOWEPO) have formed a consortium to develop, finance, design, engineer, construct, own, operate and maintain the 500MW Manah I Solar PV Plant. The project will have a minimum installed DC capacity of 500 MW at Standard Test Conditions (STC). The power plant will be connected to the licensed transmission system operator's new transmission substation at the connection point at a voltage level of 400kV with the OETC sub-station located adjacent to the project site.

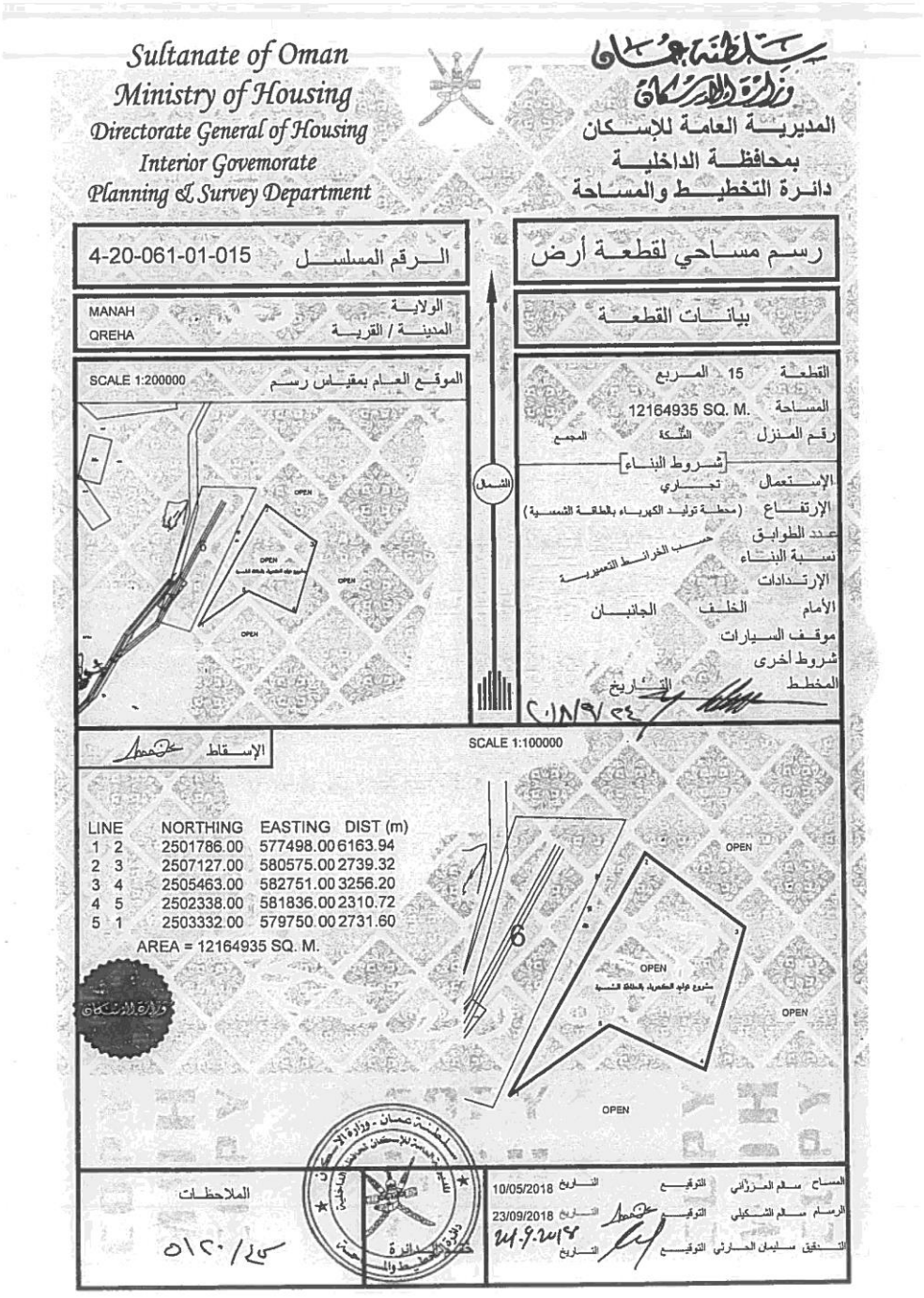
The site for the development of the Manah I project is adjacent to the Manah II planned project site and is located 30 km south from the town of Manah and covers an area of approximately 775ha.

This environmental and social impact assessment is conducted by HMR to assess the impacts from the project construction and operation activities which is being developed by EDF and KOWEPO to develop Solar PV plant in Manah I. The project has been assessed in terms of the location, process design, and proposed the mitigations measures. The ESIA also details the environmental and social management plans for construction and operation phases for the PV plant. The assessment is based on information and data available from EDF and KOWEPO. The main findings of the study that there are no major impacts during construction and operation phases and are considered expected for projects of this size, nature and duration.

Appropriate control and mitigation measures have been recommended in Chapter 9 of this report with applicable mitigation, monitoring plans.

Appendices

Appendix A Krookie



Appendix B List of protected species in Oman [40]

Species	Common Name	Category
Mammals:		
Oryx leucoryx	Arabian Oryx, White Oryx	IUCN: endangered
Panthera pardus nimr	Arabian Leopard	IUCN: critically endangered; CITES 1
Meriones arimalius	Arabian Jird	IUCN endangered
Crocidura somalica dhofarensis	Dhofar White-toothed Shrew	IUCN: critically endangered
Rhinolophus blassii blassii	Blasius' Horseshoe Bat	IUCN: near threatened
Felis margarita harrisoni	Sand Cat	IUCN: near threatened
Reptiles:		
Caretta caretta	Loggerhead	IUCN: endangered; CITES 1
Chelonia mydas	Green Turtle	IUCN: endangered; CITES 1
Eretmochelys imbricata	Hawksbill	IUCN: critically endangered; CITES 1
Lepidochelys olivacea	Olive Ridley, Pacific Ridley	IUCN: vulnerable, CITES 1
Dermochelys coriacea	Leatherback	IUCN: critically endangered; CITES 1
Birds:		
Geronticus eremita	Northern Bald Ibis	IUCN critically endangered
Aythya fuligula	Ferruginous Duck	IUCN endangered
Aquila heliaca	Eastern Imperial Eagle	IUCN endangered
Elanus caeruleus	Black-winged Kite	GCC 2002 Conv. App. 1
Gyps rueppelli	Ruppel's Vulture	IUCN near threatened
Milkvus migrans	Black Kite	GCC 2002 Conv. App. 2
Falco naumani	Lesser Kestrel	IUCN endangered
Chettusia gregaria	Sociable Lapwing	IUCN endangered
Numenius tenuirostris	Slender-billed Curlew	IUCN critically endangered
Larus leucophthalmus	White-eyed Gull	IUCN endangered
Halcyon chloris kalbaensis	White-collared Kingfisher	Globally threatened
Rhynchostruthus socotranus	Golden-winged Grosbeak	IUCN endangered
Fish:		
Anoxypristis cuspidata	Narrow Sawfish	IUCN: critically endangered
Pristis zijsron	Olive Sawfish	IUCN: critically endangered
Sphyrna lewini	Scalloped Hammerhead Shark	IUCN: endangered
Sphyrna mokarran	Great Hammerhead Shark	IUCN: endangered
Stegostoma fasciatum	Zebra Shark	IUCN: threatened

Plants:		
Pancratium maximum	Lily	GCC 2002 Conv. App.1
Dracaena serrulata	Dracaena	GCC 2002 Conv. App. 1; IUCN 2006 endangered
Sansevieria ehrenbergii	Blue Sansevieria	GCC 2002 Conv. App. 1
Aloe whitcombei	Aloe	IUCN 2002 endangered
Monechma debile		GCC 2002 Conv. App 1
Caralluma sp.		GCC 2002 Conv. App. 1
Ceratonia oreothauma somalensis		IUCN 2008 endangered
Dorstenia foetida		GCC 2002 Conv. App. 1
Daphne mucronata		GCC 2002 Conv. App. 1

Appendix C Stakeholder Engagement Plan

Purpose of the SEP

This plan outlines tools for initiating, building and maintaining long term positive relationships with local stakeholders and to manage and monitor its social environment.

Goals and Objectives

The project owners intend to maintain an effective engagement programme with key stakeholders. The goals are to understand the social dynamics of project affected communities, maintain channels of communication to update on project progress and impacts and provide opportunities for stakeholders to voice opinions and concerns, thereby strengthening relationships with Project Affected Parties.

The objectives of this SEP are to map and identify key project stakeholders, identify and assess issues of importance, identify and utilise effective channels of communications with stakeholders, build and maintain relationships, enable informed responses to issues raised by stakeholders, and monitor the affected communities' response to project.

Principles of Stakeholder Engagement

As per the recommendations of the international IFC Performance Standards, the company commits to a stakeholder engagement process that is free, prior and informed and will facilitate informed participation. Informed participation will involve organized and iterative consultation, to incorporate the views of the affected communities into the decision-making process at the Company, and address matters that affect them directly. These matters could include proposed mitigation measures, the sharing of development benefits and opportunities, and implementation issues. The company will document the process, in particular the measures taken to avoid or minimize risks to and adverse impacts on the affected communities.

The company will undertake the consultation free of manipulation and coercion, based on the principles of openness and transparent two-way communication, be accessible and inclusive (including the views of under-represented groups such as women and vulnerable).

Scope of the SEP

The scope of the SEP includes the Project Areas of Influence around the Project Area and associated facilities. As per the IFC Performance Standards (PS1), the project area of influences encompasses, as appropriate:

- The area likely to be affected by: (i) the project and the activities and facilities that are directly owned, operated or management (including by contractors) and that are a component of the project (ii) impacts from unplanned but predictable developments caused by the project that may occur later or at a different location; or (iii) indirect project impacts on biodiversity or on ecosystem services upon which Affected Communities' livelihoods are dependent.

- Associate facilities, which are facilities that are not funded as part of the project and that would not have been constructed or expanded if the project did not exist and without which the project would not be viable.
- Cumulative impacts that results from the incremental impact, on areas of resources used or directly impacted by the project, from other existing, planned of reasonably defined developments at the time the risks and impacts identification process is conducted.

Policy & legislative requirements

Omani Legislative Requirements

The main national regulatory instruments relating to Stakeholder Engagement come through the Environment Authority (EA) Guidelines on Environmental Impact Assessment which states "Public Information is an important component of an open and balanced EIA process". It goes further on to say that during scoping "the proponent in consultation with the Ministry should determine who is interested in the project, what their concerns are, and how the concerned parties should be involved in the EIA. Interested parties may include government authorities, municipal organizations, local planning committees, nongovernmental organizations, private sector and the public. The proponent should develop and implement an efficient public information program that would continue throughout the duration of the project".

Among the legally binding conditions, are environmental aspects, as well as Omani Content and Omanization requirements. These are described in the Social Management Plan and include the requirements for recruitment, retention and training of Omani nationals.

There is no institutional requirement to publish notification of a project under Omani law; however, the company publishes project updates as needed in the company website.

International Guidelines

The main international guidelines applicable to Stakeholder Engagement are the IFC Performance Standards and Equator Principles (EP) for responsible lending. Specifically, the following guidelines apply:

1- **IFC Performance Standard 1 (PS1):** underscores the importance of managing environmental and social performance throughout the life of a project. A key aspect of this is stakeholder engagement, wherein PS1 specifies the requirement to develop and implement a Stakeholder Engagement Plan that is scaled to the project risks and impacts and development stage, and be tailored to the characteristics and interests of the Affected Communities.
2- **EP principle #5**: requires that the project demonstrates effective Stakeholder Engagement as an on-going process in a structured and culturally appropriate manner with Affected Communities and, where relevant, Other Stakeholders.

The IFC's PS1 also states that effective consultation:

- Should be based on the prior disclosure of relevant and adequate information, including draft documents and plans;
- Should begin early in the ESIA process;
- Must focus on the social and environmental risks and adverse impacts, and the proposed measures and actions to address these; and
- Must be conducted on an ongoing basis as risks and impacts arise. The consultation process must be undertaken in a manner that is inclusive and culturally appropriate. The consultation process must be tailored to the language preferences of the affected communities, their decision-making process, and the needs of disadvantaged or vulnerable groups.

The IFC has also published "Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets" which has been consulted in developing this plan.

Roles and Responsibilities

The company will act as the main responsible party for the implementation of the project SEP activities except where it falls under each Contractor's execution strategy and responsibilities (e.g. training and hiring, permitting etc.). Where needed, Community Relations activities regarding CONTRACTORS are required, they will be conducted through collaboration between COMPANY's and the CONTRACTOR's Community Relations Officers, following the guidelines established by COMPANY's Stakeholder Engagement Plan.

Company Responsibilities

The HSSE Supervisor is responsible for leading the SEP and associated activities. This includes the following key responsibilities:

- Provide accurate and timely information to the stakeholders about community relations programs and adequately consolidated information provided by other departments and CONTRACTORS.
- Obtain, organize and document feedback from the project stakeholders regarding perceptions, concerns and requests.
- Transmit the feedback obtained from stakeholders to the company's Corporate Team, Project Management and CONTRACTORS, as appropriate, so that this information can be addressed in project decision-making and design.

Engagement Process

There are various levels of engagement and types of engagement that can often involve a combination of approaches and the table below describes the key types of engagement that can be used by the project.

Engagement Type

Type of engagement	Description
Information disclosure	Disclosure means making information accessible to interested and affected parties. Communicating such information in a manner that is understandable to the interested stakeholders is an important first (and ongoing) step in the process of stakeholder engagement.
Stakeholder engagement and consultation	Stakeholder engagement and consultation includes engaging stakeholders using participatory methodologies throughout the project lifecycle. The feedback from such consultations will feed the management process. Consultation is also important for identification and analysis of stakeholders and ensures that no relevant groups are excluded.
Consultation with vulnerable groups	Typically, vulnerable people could include individuals or social groups who are potentially disadvantaged compared to the rest of the population - vulnerability may be based on, among other things: age, gender, income/poverty level, physical and/or mental disabilities, etc.

The main purpose of this plan is to lay out the processes needed to build and maintain over time a constructive relationship with all stakeholders. It is expected that implementation of this plan will help the company to eliminate any potential adverse impact resulting from any actions or omissions of any of the stakeholders. This plan presents processes which are free of external manipulation, interference, or coercion, and intimidation, which will be conducted on the basis of timely, relevant, understandable and accessible information. Disclosure of project information also helps stakeholders understand the risks, impacts and opportunities of the project and allows stakeholder buy–in to the development.

This plan addresses issues relating directly to the company activities including:

- Identification of project stakeholders and mechanisms for stakeholder feedback and information sharing.
- An outline for consultation at the local and national levels throughout operation and decommissioning of the Project; and
- Mechanisms for ongoing consultation and grievance processes.

Various activities/steps have been undertaken and are planned as part of this stakeholder engagement planning process on the project. These include:

- Development of SEP to guide the engagement process during the Project's lifetime;
- Update of SEP throughout the life of the project;
- Facilitating ongoing stakeholder input into Project design and implementation;
- Ongoing engagement of stakeholders throughout project lifecycle.

Stakeholder Mapping

External project stakeholders are those groups or individuals who may:

- Be directly or indirectly impacted by the project;

- Have a role in approving or endorsing an aspect of the project;
- Have influence over the success of the project or public perception of the project, or; and
- Be interested in the project.

The initial identification of stakeholder for the project has been conducted through a series of desktop studies, reviewing information from existing sources (such as the project ESIA, GIS imagery, national center for statistics and information, etc.). Furthermore, stakeholder mapping was conducted to prioritize the list of identified stakeholders according to their interest and power in the project which is further described in Section 4.7 of this report.

International Stakeholders

International level stakeholders tend to have a global reach and while they may not be directly or indirectly impacted by the project, their interests determine them as stakeholders. They may include (but not be limited to) any international level organizations with a particular interest in the area or project. For example:

- Investors;
- Financiers / lender organizations; and
- Special interest groups that actively follow the status of protected or other vulnerable species (turtles, whales etc.) located in the site vicinity (IUCN, UNESCO and smaller interest groups).

National Stakeholders

National level stakeholders tend to have a focus within Oman. As with international level stakeholders, they may not be directly or indirectly affected by the project, but their authority or interests determine them as stakeholders. Typically, they may include (but not be limited to):

- National Ministries and Authorities which have a role in approving, supporting or endorsing aspects of the project. Specifically Ministries and Licensing Authorities responsible for:
  - Customs and importation of goods;
  - Immigration, employment, manpower;
  - Energy;
  - Security;
  - Environmental and water resource management; and
  - Social development, education, health.
- Any national level wildlife / coastal interest groups (i.e. important bird areas, protected species, turtles, whales etc.);
- National level NGOs with an interest in the area or agendas which lend themselves to helping mitigate / managing impacts (i.e. health and education, environment etc.);
- Chambers of Commerce or worker associations (representatives of pools of potential workers); and
- Industry associations.

Regional / Local Stakeholders

Regional or local level stakeholders may include (but not be limited to):

- Any communities, businesses or organizations (schools, hospitals, aged care facilities, disable care facilities) which reside nearby or adjacent to transportation corridors (roads, rail, port, airport).
- Any communities, business or organizations which reside nearby product lines (oil gas, fuel) and electricity lines supporting the Project. Specifically, also consider any livelihood activities in these areas.
- Any existing tourism or recreational tour operators in the area.
- Any groups which may be affected by water usage, wastewater treatment or the use of other natural resources.
- Any research parties (archaeological / paleontological) or universities which may have existing (or planning) studies in the area.
- Regional and / or local government and authority representatives which have a role in approving, supporting or endorsing aspects of the project.
- Chambers of Commerce or worker associations (representatives of pools of potential workers).
- Any local NGOs, community based organizations or civil society groups which are active in the local area.
- Any stakeholders in regional or local towns which may be impacted (positively or negatively) by an influx of workers (local businesses, hospitals, schools, landlords).

Local Communities

The project area is located in Manah, Ad Dakhiliyah governonate, with a total project area is 775.33 ha. There are no local communities within the direct vicinity of the project area (5km radius). However, there are numerous private farmlands scattered within the project area of influence. Their locations are presented in the map below:

List of private farmlands within 5km radius of the project

List	UTM Coordinates		Distance from the proposed project boundary (km)	Direction
	Easting (m E)	Northing (m N)		
Farmlands	572854.00	2499510.00	1.70	SE
	568994.00	2496890.00	2.31	S

Stakeholder Identification

Stakeholders were mapped and identified based on whether they are directly and/or indirectly affected by the project (or company operations); have interests in the project of parent company; and/or have

the potential to influence project outcomes or company operations. The table below summarizes the initial identified project stakeholders per group for each segment of the project.

Project Stakeholders

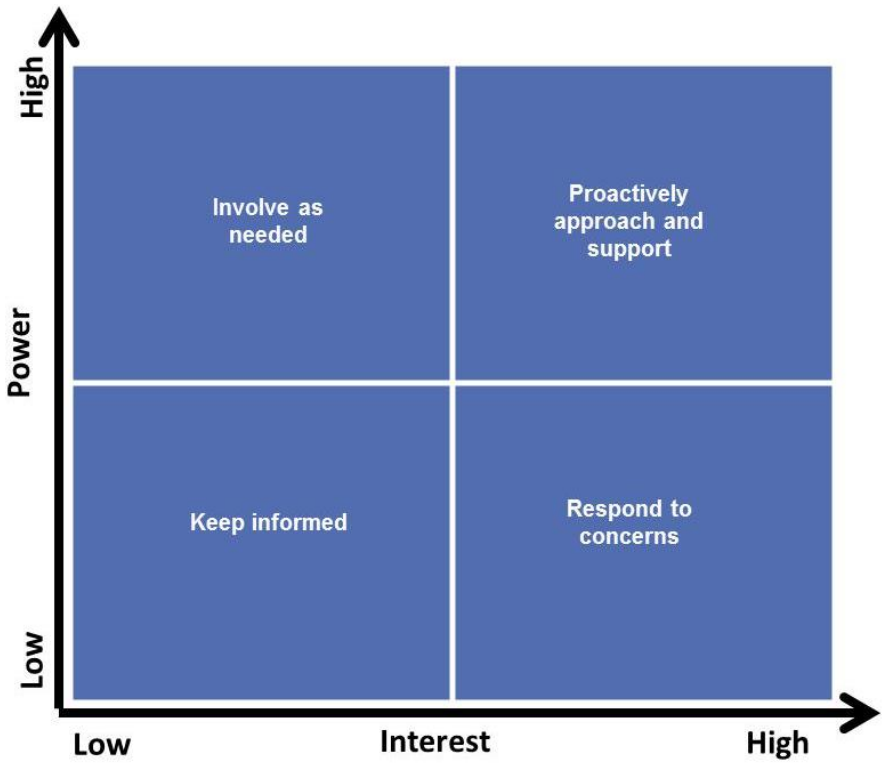
Stakeholder Group	THE COMPANY Stakeholder	Interests/Concerns	Interest (H/M/L)	Power/ Influence (H/M/L)
Communities	1. Wali of Manah	• Community health and safety (including Bedouins) • Local business development (procurement) • Local hiring/employment • Concern over foreign workers	H	H
	2. Local Farm Owners	• Impacts from the project on their agricultural activities (soil and groundwater quality)	M	L
Shareholders	3. EDF Renewables 4. Korean Western Power CO., Ltd. (KOWEPO)	• Overall success of the project • Financial performance and returns • Reputational risks/damages • Environmental review and social consultation	H	H
Media	5. Local Radio	• Relevant project updates, timelines, and progress • Advertising for jobs • Tender announcements • Social event organization/contribution • Sponsorship	L	L
	6. Social Media accounts		L	L
	7. Local Newspapers		M	L
Government/ Authorities	8. Ministry of Housing and Urban Planning	• Land allocation • Usufruct agreement	M	H
	9. Environment Authority	• Environmental permitting for the project • Impact on surrounding environment	H	H
	10. Manah Municipality	• Waste management (hazardous and non-hazardous) • Business licenses approval • Business regulations by the municipality	H	H
	11. Ministry of Labor	• Oman Labor laws • Omanisation	M	H
	12. Ministry of Commerce and Industry	• Commercial registration • Legal license to operate in Oman • Import & import licenses • Foreign capital comity	M	H
	13. Ministry of Defense	• Safety and Security	M	H
Industry	14. Insurers	• Insurance providers • Plant scheduled maintenance, • Business interruptions	L	L
	15. Oman Electricity Transmission	• Distribution of Electricity	H	H

Stakeholder Group	THE COMPANY Stakeholder	Interests/Concerns	Interest (H/M/L)	Power/ Influence (H/M/L)
	Company (OETC)			
	16. Oman Power and Water Procurement Company SAOC (OPWP)	• Sole buyer of electricity and water output	H	H
Academic Institutions	17. Sultan Qaboos University	• Scholarships • Student training • Academic studies, end-of-studies projects	L	L
NGOs	18. Environmental Society Oman (ESO)	• Sponsorships • Environmental aspects of regional or national importance • Donations	L	L
	19. Health and Safety association	• Reduce health and safety risks in industrial business	L	L
Internal stakeholders	20. The Company Employees	• Overall company performance • Compensation • Health and safety	H	H
	21. Contractor employees	• Health and safety • Regular reports on operation conditions of the plant	H	M
	22. Subcontractors/suppliers	• Health and safety • Renewal of contract	M	L
International stakeholders	23. Lender Technical Advisors	• Environmental and social due diligence • Financial performance, returns on investment	H	H
	24. International Banks	• Environmental and social due diligence • Financial performance, returns on investment	H	H

Stakeholder Prioritization

A stakeholder prioritization matrix was used to map stakeholders according to their interests and power/influence over the project. Stakeholders were categorized according to their geographic focus: international, national, and regional / local, and then in to sub-groups such as Ministries, Authorities, Industry Associations, and Non- Governmental Organizations etc. and mapped on a stakeholder prioritization matrix[15], illustrated below. The prioritization is intended to drive the stakeholder engagement strategy.

[15] Source: IFC Stakeholder Engagement, ESMS Toolkit

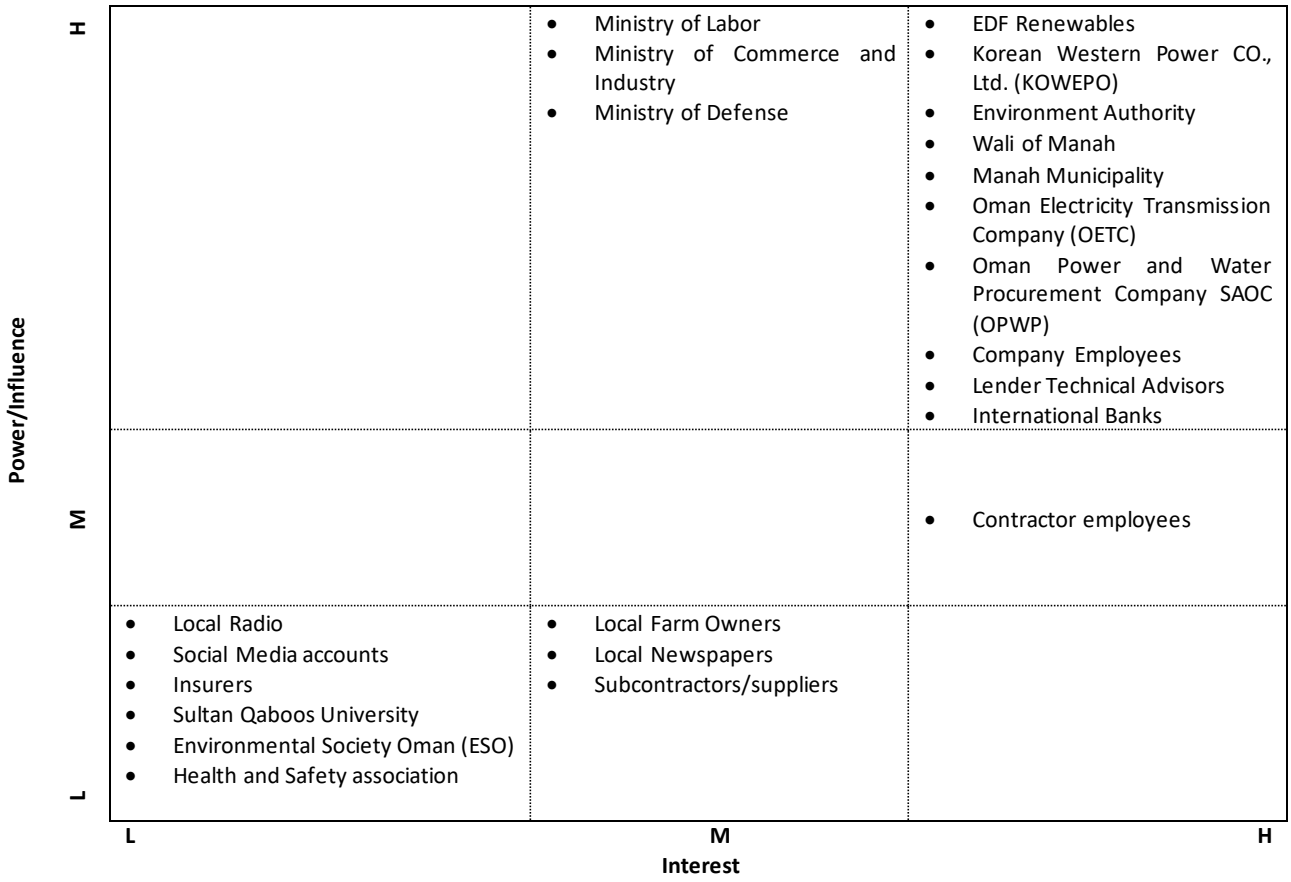


Stakeholder Prioritization Matrix

The following framing questions were used as a guide to support the prioritization process recognizing that these priority stakeholders may change as the project moves through all phases:

- Who will be adversely affected by environmental and social impacts within the Project's area of influence?
- Who is it critical to engage with first (and regularly) and why?
- Who are the most vulnerable?
- What are the interests of the group and how can this influence the project?
- Which stakeholders could help enhance project design or reduce costs?
- Which stakeholders have a good understanding of local issues?
- Who strongly supports or opposes the project?
- Whose opposition could prove detrimental to the project?
- At which stage of the project will stakeholders be most affected?

Each stakeholder group was classified by interest using high/medium/low criteria and plotted on the matrix. The stakeholder mapping process is meant to be a dynamic exercise conducted through all phases of the project. The matrix below maps the stakeholders according to their categories (Local, Regional, National, International, Internal, Shareholders). The stakeholders have been mapped based on their Interest and Power in the project (high to low).



Stakeholder Prioritization Matrix for the project

As a result of the mapping exercise, the following types of engagement will be followed for each stakeholder group/category.

Stakeholder Mapping Outcome

Stakeholder Category	Prioritization (Power/Interest)	Type of Engagement
• Local Stakeholders (Local Community and Local Government) • Shareholders • International Lenders • Industry interfaces • Internal Stakeholders	High Power High Interest	Proactively approach and support
• Regional Stakeholders (Regional Government)	High Power Medium Interest	Involve as needed
• National Level Stakeholders (Media)	Low Power Medium Interest	Respond to concerns
• NGOs • Academic Institutions	Low Power Low Interest	Keep informed

Stakeholder Register

A stakeholder register for the THE COMPANY project will be developed as a "living document" in that it will be updated through the stakeholder engagement process. A sample of the stakeholder register document can be found in Appendix B.

The communication register will be updated regularly throughout the project lifetime. Significant concerns and comments raised during consultations will be taken into account and reflected in updated management plans.

Stakeholder Engagement Program

It should be noted that there is no mandated regulatory requirement for public consultation, however this has been developed as part of the Project's compliance with international guidelines, best practices, and commitment as a socially responsible operator. The stakeholder engagement program is described below.

Engagement Mechanisms

The company has selected engagement mechanisms which are familiar to the affected and interested stakeholders identified in section 4.6 of this report. Therefore, the company uses a range of tools to communicate with its stakeholders such as in person meetings, website notifications, and local representative (Wali/Governor) office. The stakeholder engagement program is summarized in the table below.

Stakeholder Engagement Program

Stakeholder Group	Tools to communicate	Frequency
Local Communities	- Face-to-face meetings with community representatives - Newspapers - Radio - Company website - Flyers distributed by hand - Annual Townhall Meeting	- Site visits by request - Annual Townhall Meeting - As required
Local Government	- In person meetings - As requested, or required (such as permit renewals)	- As required
Regional Government	- Meetings as requested - Legal requirements (such as permits)	- As needed for major updates
National Government	- Reporting as requested or legally required	- Annually
Shareholders	- Board meetings and email circular - Quarterly and annual reports	- Monthly and as contractually obliged
Media	- One-to-one meetings - Press releases	- Event based or as required
Industry	- In person meetings - Email circulars - Contractual correspondence (if any)	- As requested, or needed
Academic Institutions	- In person meetings - Training and learning programs	- As requested, or needed
NGOs	- In person meetings - Email communications - Flyers	- As requested, or needed
Internal	- Internal correspondence emails for staff - Correspondence with contractors - Annual staff meetings - Grievance mechanism	- Bi-weekly - Monthly - As needed
International	- International circulars and updates	- Annually

The views of women and other relevant sub-groups (e.g. minorities, elderly, youth etc.) will be taken into account through awareness sessions and by highlighting the importance of the difference in opinion during engagement session. The awareness sessions will include tailored focus group discussions to encourage participation as needed during stakeholder engagement. The company leadership stress the importance of diversity and inclusion which influences the organizational culture and attitude towards consultation sessions. Tools used to promote inclusivity involve including women (or other sub-groups as relevant) during the session; using active facilitation to draw out minority opinions; and, where needed, conducting separate meetings for women/sub-groups.

Construction Phase

Ongoing Stakeholder Engagement during the construction phase has the following key objectives:

- Identify all stakeholders likely to be affected by construction activities and keep aware/abreast of any changes to stakeholder base;
- Keep stakeholders regularly informed of construction activities and schedule, and progress in implementing environmental and social management program;
- Anticipate, receive and quickly respond to grievances; and
- Identify responsible contractors, and carefully manage and oversee contractors' interactions with stakeholders.

In order to meet these objectives a number of key activities will be undertaken.

Regular update of the stakeholder registers and stakeholder risk analysis

In order to ensure all stakeholders affected by construction are identified and engaged, both the EPC Contractor Community Liaison Officer (CLO) and the company's Government and Community Relations team will be responsible for regularly updating the stakeholder register and re-evaluating risks associated with stakeholders based on information revealed through interactions, engagement and grievance mechanism. Any new stakeholders that may have arrived in the Project area or developed an interest in the Project should be monitored, and strategies developed for engaging with them.

Regularly engage and inform stakeholders of construction activities and schedule

The company's Government and Community Relations focal point (GCR) will be responsible for implementing regular and structured engagement with stakeholders through appropriate methods or forums. This engagement will be focused on informing and updating community members and relevant authorities about the Project construction activities and schedule including anticipated delays or changes for every given month, and on the potential impacts that can be expected to occur along with the measures planned to mitigate these.

These engagements may include:

- Face to face information dissemination meetings with local leadership and other key authorities;

- Community/group meetings or information sharing on topics of community concern such as community health and community safety awareness sessions.

All engagements will be documented (written Minutes of the Meetings or MoMs, or in the case of informal ad hoc meetings in meeting notes) and attendance recorded. MoMs will be shared with and approved by participants. Any issues and or grievances raised during engagements will be logged in the Grievance Mechanism log. Grievances raised in these engagements will be dealt with according to the steps described below (see "Receive, track and respond to Grievances").

Site presence and Contact Details

In order to ensure the GCR focal point is known and accessible to the identified stakeholder base, they will be introduced by the company and their name and contact details will be publicized at a location where information about the Project construction activities and schedule is displayed, and also where grievances could be registered.

A schedule of GCR visits at a regular pre-agreed time/ location will be made available to stakeholders and the rest of EPC Contractors (for coordination of community liaison activities). The need for this engagement will be monitored and if required this frequency will be maintained into the operational phase of the Project. This visiting schedule could be modified over time (changed to every other week or monthly) after the schedule of activities is well established and has been communicated.

Receive, track and respond to grievances

Unresolved stakeholder grievances can quickly escalate, often leading to unforeseen work stoppages and delay. It will therefore be imperative during the construction phase to respond quickly and effectively to grievances raised, and work closely through regularly engaging with stakeholders to try and anticipate where stakeholder issues or concerns may arise before they do. The company will prepare a "Grievance Procedure" which will be communicated to all EPC Contractors and monitored throughout the lifetime of the Project.

Monitoring Contractor Stakeholder Engagement

Unmanaged or poorly documented contractor-stakeholder interaction or engagement can also present risks to the Project. It may result in inconsistent or contradictory messages or conflicting commitments from the EPC contractor/Project representatives to stakeholders which can give rise to unmet expectations.

The company's GCR will liaise with and oversee EPC Contractors to ensure that any interaction taking place between contractor workforce and stakeholders is consistent with the standards, core principles and procedures for undertaking, recording and documenting stakeholder engagements, as is outlined in this SEP.

Operation Phase

Ongoing Stakeholder Engagement during the operation phase has the following key objectives:

- Achieve a smooth transition from construction to operations including the integration of social and environmental commitments into the operational management system;
- Maintain visibility (albeit a reduced presence) and continuity of stakeholder relationships;
- Continue with regular engagement and disclosure to stakeholders as required;
- Continue to review and update stakeholder information; and
- Continue to receive, track and respond to grievances.

The operation phase will consist of a continuation of many of the same Stakeholder Engagement activities that have been undertaken during construction, but at a reduced frequency. These are described below.

Continue Regular Engagements

Regular direct engagement will continue between the company's GCR and key project stakeholders, and will be aimed primarily at maintaining continuity of relationships, monitoring the effects of project impacts on stakeholders, and demonstrating long term organizational commitment to delivering on social and environmental mitigations or to resolving outstanding issues and grievances.

As done during at Construction Phase, the company's GCR will be responsible for designing and implementing this engagement with stakeholders through appropriate methods. This engagement will be focused on continuing to inform and update community members about the Project operation activities and schedule including anticipated delays or changes for every given month, and on the potential impacts that can be expected to occur along with the measures planned to mitigate these.

These engagements may include:

- Face to face information dissemination meetings with local leadership and other key authorities;
- Community group meetings or information sharing on topics of community concern such as community health and community safety awareness sessions; and
- Focus group meetings with special interest groups with particular concerns.

Design engagements to manage stakeholder expectations around the transition to operation

Operations phase engagement activities will be designed to clearly communicate anticipated changes brought by the transition from construction to operations and to manage community expectations around the associated impacts e.g., a reduction in migration/presence of migrant workers in the area, and potential changes in Project staff.

Ensure continuity of community liaison staff or sufficient handover period

The loss of people whose faces were familiar to the representatives of local communities, can impact on established stakeholder relationships and cause a loss of institutional knowledge and sometimes a breakdown in trust. If possible, Community Liaison Officers/other staff employed during the construction phase will be retained and/or an adequate handover period shall take place in order for any new personnel to be introduced and to establish relationships before taking over key liaison roles.

Regular update of the stakeholder registers and stakeholder risk analysis

In order to ensure all stakeholders affected by operations are identified and engaged, the GCR will be responsible for ensuring the stakeholder register is regularly updated and risks associated with stakeholders are re-evaluated as necessary based on information revealed through interactions, engagement and grievance mechanism. Any new stakeholders that may have arrived in the Project area or developed an interest in the Project should be monitored and strategies developed for engaging them.

Specific changes in the Project design and economics, affecting Project demands and plans (e.g., change of suppliers, modifications of plans and procedures, etc.) will be monitored, and the stakeholder mapping adapted as necessary, as these can result in new stakeholders arising or lead to a change of stakeholder interest in the Project.

Continue documenting engagements and responding to grievances

Engagements will continue to be recorded and documented in minutes, and all stakeholder issues and grievances logged and managed according to the given procedure ("Grievance Procedure").

Consultation and Disclosure

Information Tools

The project related information is available at all times on the company's website.

Additionally, different mechanisms will be used to relay updated project information to various stakeholder groups such as information boards, pamphlets and local meetings.

Disclosure Methods

Depending on the stakeholder / audience, engagement will be undertaken primarily through:

- Phone /email
- One-on-one interviews
- Workshop/focus group discussions
- Distribution of pamphlets and newsletters
- Public meetings

- CSR Projects
- Newspaper/magazines/radio.

Feedback and Grievance Mechanism

A grievance mechanism is a process that enables a project developer and/or its EPC Contractors to handle and resolve grievances or concerns expressed by stakeholders. The company will prepare and implement the "Grievance Procedure", which will:

- Provide a context-specific process which respects the confidentiality of all parties, protect all parties from retaliation and builds trust as an integral component of broader community relations activities;
- Provide a predictable, accessible, transparent, and legitimate process to all parties, resulting in outcomes that are seen as fair, rights compatible, effective, and lasting; and
- Enable more systematic identification of emerging issues and trends, facilitating corrective action and pro-active engagement.

The company's Grievance Mechanisms will include:

- A dedicated address, email and phone number;
- A bilingual form to register an online/written complaint
- Drop boxes / forms that will be established/available at the EPC Contractor offices/sites;
- Continuous engagement throughout the life of the project, and
- Workforce grievances or feedback to be handled through anonymous locked drop boxes in worker accommodation.

Verification and Monitoring of stakeholder engagement process

The company will carry out monitoring to ensure compliance with the commitments set out in the SEP. All monitoring requirements shall be established with details of resources, monitoring, and assurance methods. Suggested monitoring and evaluation activities can include the following:

- Monitor the grievance register in terms of response times to address complaints logged as well as the recurrence of complaints over time;
- Regular update of the stakeholder register;
- Keep records of all engagement activities including meetings attended, open-house events, focus group discussions, etc., and
- Revise plans and activities as necessary.

Attachment 1: Stakeholder identification and issues scoping

Identification and Issues scoping should be implemented to assess prevailing issues and the perceptions of stakeholders as well as the capacity of the company to effectively respond (i.e. clarifying whether the response is THE COMPANY responsibility).

The Stakeholder and Issues scoping can be presented in a table and should identify the KEY stakeholders and the AFFECTED STAKEHOLDERS as summarized in the tables below.

Key Stakeholder	Interests	Interest (H/M/L)	Power (H/M/L)	Goal, motivation and interests	Potential role in project

Affected Stakeholder	Ways affected by the project	Key issues/concerns to be addressed	Potential role in project

Attachment 2: Stakeholder Register Sample

Stakeholder	Organization Name	Area of Interest	Priority	Name	Position	Email	Contact Number