

# 50MW Photovoltaic Power Plant Risha, Jordan



Volume 1: Environmental and  
Social Impact Assessment  
Non-Technical Summary

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## LIST OF ABBREVIATIONS

Abbreviation	Meaning
As	Arsenic
BAT	Best Available Techniques
BMP	Best Management Practice
BOOT	Build, Own, Operate and Transfer
BOP	Balance of Plant
BS	British Standards
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
CCR	Central Control Room
CCCW	Closed Circuit Cooling water
Cd	Cadmium
CESMP	Construction Environmental Social Management Plan
CN	Cyanide
CO	Carbon Monoxide
CO <sub>2</sub>	Carbon Dioxide
Cr	Chromium
Cu	Copper
DA	Degraded Airshed
dB(A)	A-weighted decibels
dB( C )	C-weighted decibels
ESMP	Environmental and Social Management Plan
EMS	Environmental and Social Management System
EPs	Equator Principles
EPC	Engineering, Procurement and Construction
EPFIs	The Equator Principle Financial Institutions
Hg	Mercury
IFC	International Finance Corporation
L <sub>aeq</sub>	A-weighted Equivalent Continuous Sound Level
L <sub>amax</sub>	A-weighted Maximum Sound Level
MSDS	Material Safety Data Sheet
NEXI	Nippon Export & Investment Insurance
Ni	Nickel
NO <sub>x</sub>	Nitrogen Oxides
NO <sub>2</sub>	Nitrogen Dioxide
O <sub>2</sub>	Oxygen
OECD	The Organisation for Economic Co-operation and Development

Abbreviation	Meaning
OESMP	Operational Environmental and Social Management Plan
O&M	Operation and Maintenance
PAH	Polycyclic Aromatic Hydrocarbons
Pb	Lead
PM <sub>10</sub>	Particulate matter with an aerodynamic diameter of less than 10 micrometers.
PM <sub>2.5</sub>	Particulate matter with an aerodynamic diameter of less than 2.5 micrometers.
RT	Radiographic Testing
Se	Selenium
ESIA	Environmental and Social Impact Assessment
SO <sub>2</sub>	Sulphur Dioxide
TPH	Total Petroleum Hydrocarbons
VOC	Volatile Organic Compounds
WHO	World Health Organisation
WWTP	Wastewater Treatment Plant
Zn	Zinc
5 Capitals	5 Capitals Environmental and Management Consulting

# 1 PROJECT DESCRIPTION

## 1.1 Introduction

ACWA Power intends to develop a 50MW (61.3MWp) Photovoltaic (PV) Power Plant (the 'Project') on land adjacent to the existing Risha Gas Power Plant in Mafraq Governorate, Risha, Jordan. The Project will generate 50MW of renewable electric power to be connected to the national electrical grid in Jordan.

The following document comprises the Environmental and Social Impact Assessment (ESIA) specific to the proposed Project pursuant to the EIA requirements of the Jordanian Ministry of Environment (MoEnv) and international lenders who will provide project financing, including the European Bank for Reconstruction and Development (EBRD). It is recognised that The International Finance Corporation (IFC) is a shareholder in ACWA Power and as such, this ESIA has also been prepared with consistency to IFC environmental and social requirements.

## 1.2 Project Location

The Proposed Project is to be located adjacent to the existing Risha Gas Power Plant, approximately 370km east of Amman in the Mafraq Governorate. The site location is 4km away from the Jordanian/Iraqi border. The site is isolated and at least 15km away from the nearest semi-permanent residences located to the north on highway 10 (Amman to Baghdad Road).

**Figure 1-1 Project Location within Jordan**



The location of the project in the northern extent of Jordan is key for the proposed PV Plant due to the high levels of solar radiation in this region. As such, the development of this technology provides an opportunity for maximising natural renewable resources that can contribute to Jordan's energy diversification and sustainable development.

The Project will be developed in response to the increasing demand for electricity in Jordan, which is rising at an annual rate of 7.4% and reduce dependency on imported fossil fuels.

### 1.3 ESIA Works to Date

This ESIA has been prepared in accordance with the requirements of the Jordanian "Environmental Protection Law No. 52 of 2006", the "Environmental Impact Assessment Regulation No. (37) of 2005" and the EBRD Performance Requirements (2014).

A Terms of Reference/Environmental Scoping Report was prepared and submitted to the Jordanian MoEnv on the 11<sup>th</sup> of April 2017, approval on the intended scope of the ESIA was received on the 19<sup>th</sup> of April 2017. The topics scoped in for the ESIA included water quality and drainage, ecology, social and economic issues, and cultural heritage.

The ESIA, identifies the outcomes of site surveys, detailed assessment, consultation and suitable mitigation for each of these topics. The ESIA also includes consideration of suitable best practice to minimise potential impacts associated with air quality, noise and vibration, waste management community health safety and security, worker conditions and occupational health and safety. The ESIA has also considered potential cumulative impacts associated with other developments in the area.

A scoping session was undertaken on the 29<sup>th</sup> of March 2017 to discuss, and identify suitable topics for assessment (as part of the ESIA process in Jordan). Attendees included regulatory authorities (including the MoEnv), national government agencies, local government agencies, NGOs and project representatives.

A consultation exercise was undertaken as part of the ESIA with consultation undertaken through bilateral meetings on the 11<sup>th</sup> of April 2017 and 2<sup>nd</sup> of May 2017. The consultation exercise included 13 community representatives (undertaken at associated local government offices) and 4 members of Local NGOs (also community members).

A hydrological study and drainage assessment of the project site was undertaken in February 2017 in order to confirm site drainage characteristics and confirm the extents of the wadis located within the project boundaries.

A site visit and ecological survey were conducted on the 2<sup>nd</sup> of May 2017. The site visit was undertaken to ratify site condition as identified in the scoping report. The ecological survey was conducted to confirm habitat value at the site and identify associated flora and fauna.

## 1.4 Description of Local Environment

The proposed project site is located within a military controlled zone. It is adjacent to the Risha Gas Power Plant which includes onsite accommodation for CEGCO shift employees.

The majority of the project site is located on barren, open land with a slight gradient from the northeast to the southwest. Areas of wadi are located within the western and central areas of the plot. Soils in the remainder of the site is made up of unconsolidated sands overlain by gravel deposits.

There is an existing 132kV overhead transmission line that originates from the existing Risha Power Plant Substation and passes through the proposed site. The OHTL is in place to transmit electrical energy generated from the existing Risha Gas Power Plant to the national grid.

There are no settlements or residential areas within close proximity to the project. The nearest population centre is over 15km from the site.

## 2 SUMMARY OF IMPACTS

During the baseline study undertaken as part of the Scoping / ToR Phase of the project, it was found that potential impacts for air quality, noise and vibration, soils geology and groundwater, landscape and visual effects, resource requirements and waste management during the construction and operational phases of the project were negligible, predominantly due to the relatively isolated nature of the site, minimal environmental value and no associated requirements for industrial discharge or emissions being required from a solar PV site. The only residential receptor identified from the ESIA process is the CEGCO accommodation area associated with the existing Gas Power Plant. The ESIA includes associated best practice measures for each of the above topics that can subsequently be incorporated within the projects CESMP and OEMSP.

The ESIA considers potential impacts associated with community, health safety and security as well as, labour and working conditions and occupational health and safety. Associated risks are not dissimilar to any other small scale on-shore construction project and commitments have been established as part of the ESIA to ensure on-site compliance to EBRD Performance Requirements, IFC Performance Standards and relevant ILO guidelines (as part of the project's Environmental and Social and Operational Health and Safety management systems).

Identified potential impacts and proposed mitigation efforts for each topic scoped in during the Scoping / ToR Phase of the project are summarised below:

### Surface Water and Drainage

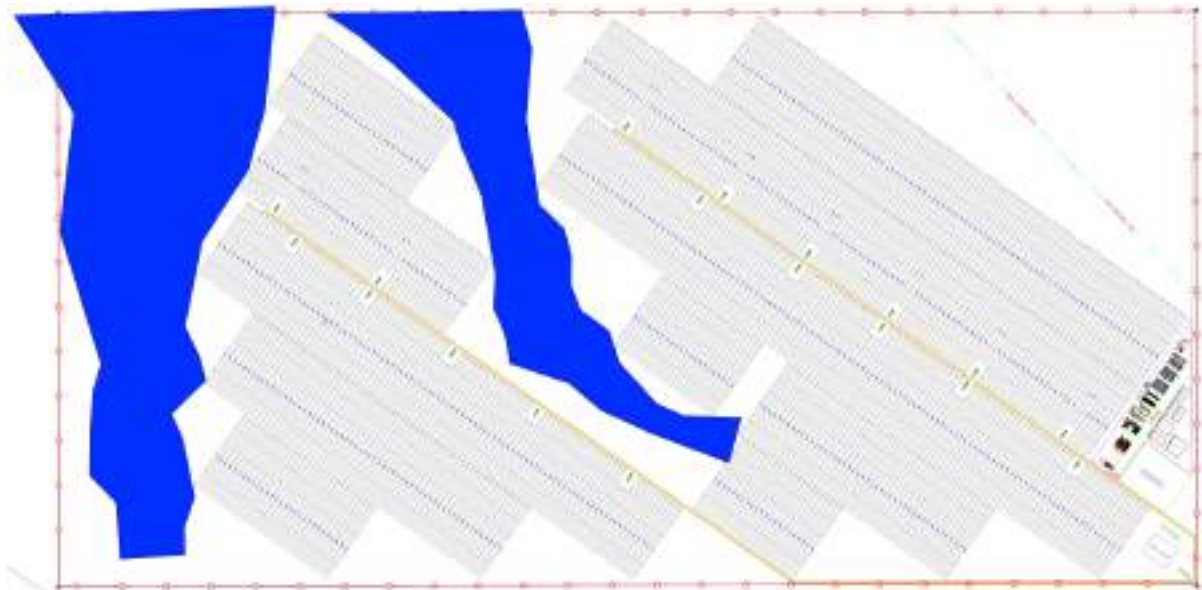
During the baseline study in the Scoping / ToR Phase of the project it was noted that 2 wadi areas are located within the project boundary. Fluvial deposits and onsite vegetation do not suggest that these Wadis maintain any long term open bodies of water but are likely to receive runoff during short periodic bouts of rainfall.



A hydrology assessment was undertaken to confirm the profile of each of the wadi areas within the project boundary according to local meteorological conditions and site topography. The project layout has subsequently been amended to avoid these wadis and ensure against any long-term variations to current natural surface water drainage condition.

The proposed alignment of the solar arrays in relation to the identified extent of each area of wadi are shown below.

**Figure 2-1 Project Layout**



In addition, the CESMP will also include requirements for site control of wastewater, restricted traffic movements and management of construction materials to ensure against any adverse impact to wadi areas.

### Ecology

Ecology at the project site is consistent with that of the local area and the Saharo- Arabian Biogeographic Region. The majority of the site consists of expansive open gravel plain with little to no ecological value. The only areas with any substantial vegetation were associated with 2 areas of wadis located within the project boundary.

A total of 5 common floral and 1 crop species were identified. No tracks or foraging remains were found however a small active rodent burrow was identified.

The areas of wadi were completely dry (despite recent rainfall) and there were no remnants of any aquatic or wetland species identified anywhere within the site.

Consultation with the Royal Society for the Conservation of Nature (RSCN) in Jordan did not identify any sites or species of conservation concern that could be influenced by the project. As identified

above, the project layout has been amended to avoid any wadi areas and therefore avoid any long-term loss of the vegetated areas within the project boundary.

### **Archaeology and Cultural Heritage**

The Jordanian Department of Antiquities (DoA) was consulted during the ESIA process during which it was confirmed by the DoA that there are no known artefacts within the project area. The DoA subsequently issued a No Objection Letter for the Project on March 27<sup>th</sup> 2017.

The CESMP shall include a chance finds procedure identifying required action in the instance that any artefacts are uncovered during construction.

### **Social and Economic Issues**

The project is anticipated to provide national social and economic benefits attributable to the increased availability of a renewable energy source. The construction phase will also introduce local opportunities for employment, dissemination of skills, education and increased sales for local retail and service industries. Such impacts will also be attributable to the operational phase.

Wadis within the area are periodically used for grazing small herds of sheep during the rainy season. The project will not have any associated impacts regarding the availability of grazing areas as there are large expanses of wadi distributed throughout the local landscape. Also, as the project is located within a Military Zone, access is already restricted. Consultation with local communities of the Al-Rwaished district has raised no concerns regarding the use of the project site for grazing.

Consultation with local community representatives identified general support for the project with the expectation that the development may include job opportunities, capacity building and training programs.

The CESMP and OESMP for the project shall identify opportunity for employment and engagement with the local community. The project is intended to provide opportunities for employment for locals in the region. During operations and maintenance, it is planned for the majority of employees to be Jordanian.

## **3 POTENTIAL FOR CUMULATIVE IMPACTS**

There are no known, planned or confirmed developments within the vicinity of the project site, therefore potential cumulative impacts associated with the construction phase are unlikely.

Operationally, the project will not result in any emissions, discharges or interference with natural cycles. Therefore, no discernible combined impacts with the Risha Gas Power Plant (adjacent to the site) are anticipated.

## 4 MONITORING

Volume 3 of the ESIA (Outline ESMMP) includes a framework for monitoring during the construction and operational phases. This framework recommends specific monitoring activities to be undertaken for the various environmental parameters outlined previously.

The project will be subject to periodic independent monitoring as per the requirements of the lenders. The independent audits will cover on-site activities as well as reviews of ESMMP's and compliance documentation that has been recorded from regular monitoring activities by the EPC Contractor and O&M Company on-site.

## 5 CONCLUSIONS

Following the mitigation efforts already undertaken as part of the design to avoid wadi areas within the project site, potential environment and social impacts are considered manageable in order to meet the required standards of Jordanian Legislation, EBRD Performance Requirement and IFC Performance Requirements. Provided that robust CESMP and OESMP are implemented, no significant impacts are anticipated to be associated with the proposed project.