

AL HENKIYAH 2 _ 400 MW SOLAR PV POWER

NON-TECHNICAL SUMMARY (NTS) IN ENGLISH



March 2025

REV 0

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1 INTRODUCTION

In the Kingdom of Saudi Arabia (KSA), the production of electricity is predominantly dependent on natural gas and petroleum as its principal sources. In 2022, natural gas played a major role in the energy sector, accounting for almost 67% of the total electricity generation. Concurrently, oil constituted approximately 33% of the total, while renewable energy sources remained a negligible portion, providing less than 1%.

In the months with higher temperatures, there was a clear 9% rise in the production of electricity from oil, reaching a maximum of 1.1 million barrels per day in the year 2022. This surge was intended to supplement the current supply from natural gas in order to fulfill the increased seasonal demand. However, Saudi Arabia is committed to decreasing carbon dioxide emissions and transitioning to a more sustainable energy framework.

The National Renewable Energy Program (NREP) is a key component of Vision 2030 for the Kingdom of Saudi Arabia (KSA). It is a comprehensive and long-term plan aimed at diversifying the country's power sources by incorporating renewable energy. The ultimate goal of this program is to achieve economic stability in the long run. One of the main goals of the NREP is to broaden the range of energy sources used in generating electricity, with the aim of raising the proportion of renewable energy to around 50% by 2030.

In accordance with the above, based on a Build, Own, Operate (BOO) Scheme, EDF Renewables (hereafter referred to as the 'Developer') signed a Memorandum of Understanding (MoU) with the Ministry of Energy (MoE) to develop a 400 Mega Watt (MW) solar photovoltaic (PV) project to be located in Madina Province within an area of around 10 km² (hereafter referred to as the 'Project').

The Saudi Power Procurement Company (SPPC) has signed a Power Purchase Agreement (PPA) with the Developer for the 400 MW AHK 2 PV Project. The Developer signed a 30-year Power Purchase Agreement (PPA) with the MoE (as the off-taker of the electricity) with an agreed fixed tariff.

This NTS provides a summary in non-technical language of the findings contained in the ESIA Report. The ESIA Report contains more detailed information on the Project and the environmental and social issues considered. It includes a description of the need for the Project; details of the Project and the main alternatives considered; the assessment of the potential effects from the proposed development upon the environment and community; and details of any required procedures to mitigate significantly adverse environmental effects. It includes an Environmental and Social Management Plan (ESMP) which describes the monitoring and mitigation requirements for the duration of the project, including responsibilities and any legal requirements. The Developer commits to the ESMP.

A Stakeholder Engagement Plan (SEP) has also been developed for the Project, which describes the planned stakeholder consultation activities and engagement process as well as a grievance mechanism to ensure that it is responsive to any concerns and complaints particularly from affected stakeholders and communities.

2 PROJECT DESCRIPTION

2.1 Project Setting

KSA is administratively divided into 13 regions. These are further divided into governorates, sub-governorates, administrative centers, and districts. The Law of Provinces (Royal Decree No. A/92 of 1992) classifies these areas into Class A and Class B based on factors like population, urban development, demographics, geography, housing, security, transport, environment, and history.

The Project site is located in the Madina Region (or Province), more specifically, the Project is located within Al Henakiyah Governorate around 42 km to the southeast of Al Henakiyah City (the administrative capital of Al Henakiyah Governorate), around 115 east of Al Madina al Munawwarah City (the administrative capital of the Madina Region), and around 600 km to the west from the capital city of Riyadh as shown in the figures below.

The Madina Region is further subdivided into eight (8) governorates. As previously mentioned, the Project site is located in Al Henakiyah Governorate which neighbors Al Madina Governorate to the east and Al Mahd Governorate to the south. Moreover, there are 11 administrative centers (cities, villages and towns) under Al Henakiyah Governorate. The closest administrative center to the Project site is Al Henakiyah City which is

located around 42 km to the southeast of the Project site. The Project site has a total area of 10 km² and is located within government-owned land approximately 460 m to 2,200 m west of Highway 8258.

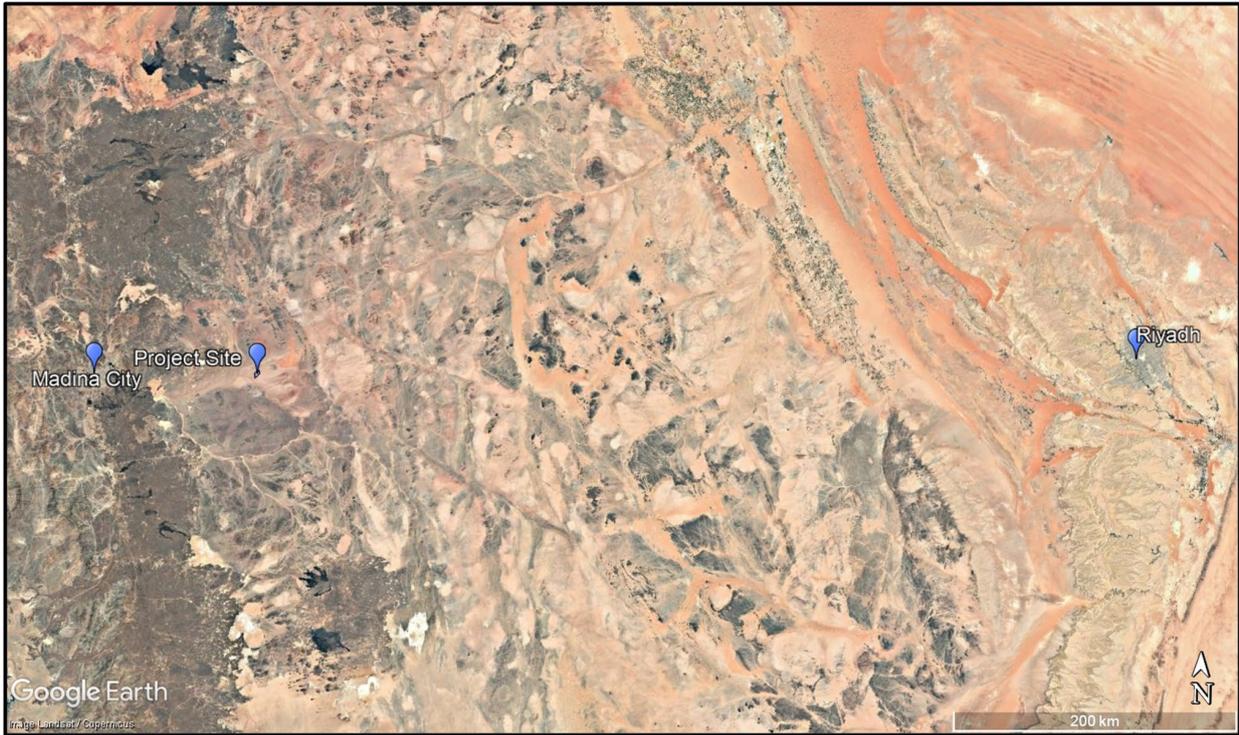


Figure 1: Project Site in Relation with the Capital City of Riyadh



Figure 2: Location of Al Henakiyah City from Project Site

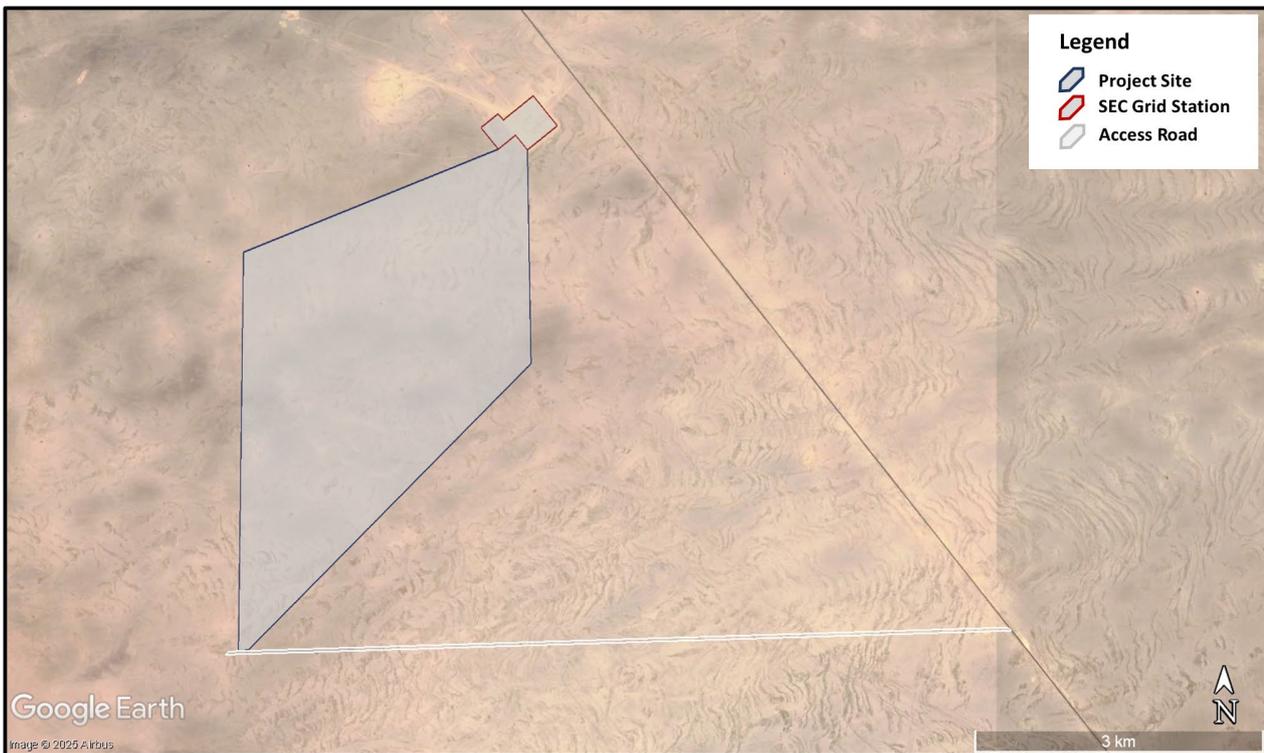


Figure 3: AHK 2 PV Project Site

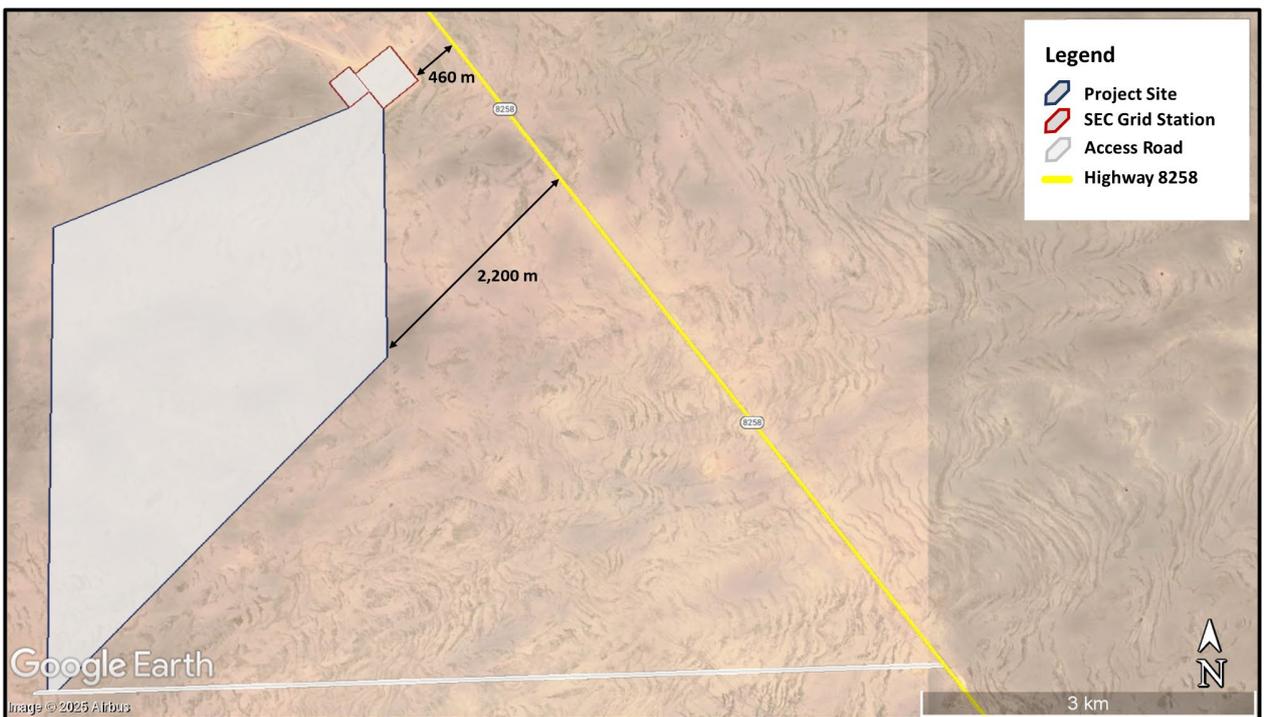


Figure 4: Project Site Relative to Highway 8258

The Project will result in crucial positive environmental and economic impacts on the national level. Such positive impacts underpin the rationale for the Project. These include the following:

- Commitment of the Government to meeting the set targets for renewable energy sources;
- Contribute to increasing energy security through reliance on an inexhaustible and independent energy resources. The Project will serve the annual electricity needs of more than 68,915 household in KSA;
- Generating electricity through PV power is pollution-free during operation and will help in reducing greenhouse gas emissions as well as air pollutant emissions. The Project is expected to offset more than 708,400 metric tons of CO₂ emissions annually.

2.2 Project Components

The key components of the Project are the power arrays which are composed of PV panels which convert solar energy (radiation from the sun) into electricity (figure below). Each array is equipped with a horizontal single-axis beam tracker which carries the array and orients it towards the sun throughout the day to maximize the amount of energy produced.



Figure 5: Typical Power Arrays Composed of PV Panels

Other buildings and infrastructure needed onsite include:

- Central inverter stations which convert electricity from the panels from Direct Current (DC) to Alternating Current (AC). Inverter stations connect to a substation through underground cables;
- Substation which converts voltage to an appropriate level for connection with High Voltage National Grid;
- Building Infrastructure will mostly include offices for normal daily operational related work, as well as a warehouse for storage of equipment and machinery;
- Road network to include an internal road network for ease of access to the arrays for operation and maintenance purposes as well as security road around the perimeter of the Project site for security patrolling; and
- Fencing around the entire facility and security will be required to ensure safety from criminal activity and trespassing of unauthorized personnel.

Around 900 job opportunities at peak during the construction phase for a duration of approximately 24 months. This will mainly include around 600 skilled job opportunities (to include engineers, technicians, consultants, surveyors, etc.) and 300 semi-skilled and unskilled job opportunities (mainly laborers but will also include a number of security personnel).

A workforce of around 16 will be required to carry out the operational activities.

2.3 Project Phases

- Planning and Construction Phase: This phase includes planning and preparation of a detailed design for the Project, transportation of the various Project components to the site (e.g., PV modules), on-site preparation activities for installation of the PV arrays, and various other components. Site preparation activities could include excavations, grading, and land-clearing activities. Commissioning tests are done at the end of the construction phase to determine if the PV plant is operating satisfactorily. Such tests involve standard electrical tests for electrical infrastructure and the panels and inspection of routine civil engineering quality records;

- **Operations Phase:** This phase involves installing and maintaining the PV Power Arrays and various electrical equipment. This includes, for example, regular PV module cleaning to prevent dust build-up, which could affect their performance. Maintenance can be divided into preventive and corrective maintenance. The preventive maintenance follows a routine service schedule to prevent faults from occurring and keep the plant operating at its optimum level. The corrective maintenance is carried out in response to failures, for example, the repair/ exchange of damaged equipment or inverter faults; and
- **Decommissioning Phase:** The lifetime of the PV plant is 30 years, after which the plant is decommissioned and the panels are dismantled. Decommissioning activities could include the disconnection of the various Project components (PV array, central inverter stations, delivery station, etc.) for final disposal. In addition, the internal road network will be restored, and gates and fences will be removed.

3 SUMMARY OF ENVIRONMENTAL AND SOCIAL BASELINE CONDITIONS & IMPACTS

3.1 Introduction

The ESIA comprised of environmental and social baseline studies and an assessment of impacts. Mitigation measures, which are included in the ESMP, were identified for potential significant effects and the significance of residual effects determined. The impact assessment followed an assessment methodology developed to reflect current best practice.

The ESIA has provided the engineers and designers with important information regarding the sensitivities of baseline environmental and social resources that could be affected by the proposed development. The resulting design proposal has been developed to take account of these sensitivities and avoid negative environmental effects wherever possible. The key baseline and impact assessment findings are further discussed below.

3.2 Environmental & Social Baseline Conditions & Impacts

(i) *Landscape and Visual*

The project area is characterized by a predominantly flat and undeveloped landscape, with minimal variations in topography. The elevation ranges from 815 m in the west to 821 m in the east above sea level. The site is classified as a desert-like habitat, arid and barren, with little natural vegetation coverage and is completely vacant, with no visible key structures or above-ground man-made features, such as roads, electricity lines, pipelines, transmission lines, or tracks. A geotechnical study conducted in 2020 confirmed that no underground utilities were encountered at the project site. Also, there are no permanent settlements within a 1 km radius of the project area, with the nearest urban center, Al Henakiyah City, located over 42 km away. The project site is bordered to the north and west by open, undeveloped land, while an SEC substation is located to the northeast and the AHK1 PV Project, which is currently under construction, lies to the east and south.

The primary visual receptors include road users of Highway 8258, informal grazers, herders, and construction workers at SEC substation and AHK1 PV project. However, these receptors are temporary or transient, and no key sensitive visual receptors, such as recreational areas, cultural sites, or environmental reserves, are present in the project vicinity.

Therefore, the key potential visual impacts from the Project development for both the construction and operation phases are discussed below, all of which have a minor or no significance rating:

- **Construction Phase-** the presence of elements typical of construction sites, such as equipment and machinery, including excavators, trucks, front-end loaders, compactors, etc., can cause visual impacts. The impacts are considered to be **not significant**.
- **Operation Phase-** potential impacts include (i) project visibility, (ii) potential impacts from glare, and (iii) potential island effects.

Given the maximum height of the PV arrays (2 - 3m only), the Project is expected to be visible within the immediate vicinity and up to some hundred meters around the Project site, thus likely to create visual impacts. However, given that no key sensitive visual receptors are within the surrounding vicinity, such impacts are considered of **minor significance**.

There is potential for glare caused by sunlight being reflected off the PV panel modules and the metal mounting structure. The amount of sun reflected depends on several factors, such as the amount of sunlight hitting the surface of the panels, surface reflectivity, geographic location, time of year, cloud cover, and solar panel orientation. However, glare is likely to occur when the sun is not perpendicular to the panel or is low on the horizon (during sunrise and sunset) because the solar panels absorb much less of the incoming light. The figure below shows the typical glare from PV Panels. PV modules reflect much less light and have a lower potential for glare when compared to other materials widely used in other human developments, such as steel, standard glass, and plastic, and even when compared to snow and smooth water. To reduce the potential impacts from glare, the PV modules for this Project are designed with anti-reflective coatings to capture maximum sunlight and minimize reflections, thus reducing the potential for glare. Potential receptors of the impacts of glare are the desert dirt road users, who will temporarily be affected during sunrise and sunset hours when solar absorption is minimal. However, the potential impacts are considered **insignificant** because of their low magnitude and the low sensitivity of the receiving environment.



Figure 6: Typical Glare from PV Panels

Lastly, recent concerns about the Photovoltaic Heat Island Effect (PVHI) with solar PV developments exist. All available studies and work (most of which is conflicting) on the PVHI effect have been theoretical or based on simulated models. The available studies show the potential for PV power plants to create warmer environments; however, the lateral or vertical extent of such PVHI effects is unknown due to a lack of data. If the PVHI effects are real, they may be constrained to a small area within the PV installation that quickly dissipates within the surrounding areas. Given the available information on the PVHI effect, the impacts are considered **insignificant** due to their low magnitude and low sensitivity of the receiving environment.

(ii) Land Use

History of Land Ownership

The land plot where the Project site is located is under the ownership of the Ministry of Municipal, Rural Affairs and Housing (MoMRAH). MoMRAH has entered into a head land lease agreement with Saudi Power Procurement Company (SPPC). In turn, SPPC entered into a sublease agreement with the Special Purpose Vehicle (SPV) Company for the entire Project duration period.

Current Land Use

Informal herding activities were observed at the project site and surrounding areas during the February 2025 site survey. No camps or temporary / permanent structures were found within the project site itself. Consultations with herders revealed that they originate from Al Henakiyah, the Western Region, and Al-Madina, primarily engaging in grazing as their main livelihood, with some involved in agriculture. Livestock numbers range from 10 to 50 animals, including camels, sheep, and goats. While some herders use mobile shelters or caravans, all indicated that alternative grazing lands are available in the surrounding areas. Herders stated they plan to leave within a specific timeframe, such as two months, or when the project starts.

The Municipality of Al Henakiyah Governorate confirmed that the project site is government-owned and designated for renewable energy development, with no ongoing land use, infrastructure, or recorded land disputes. Also, grazing and herding activities in the Project site and surrounding areas is prohibited and illegal. While some informal grazing continues in the wider region, the project site does not provide a unique or critical habitat for grazing. The surrounding land consists of vast, undeveloped areas with similar characteristics, allowing alternative grazing opportunities. Given the low sensitivity of the receiving environment and the availability of extensive alternative grazing lands, no economic displacement impacts are expected, and the impact is considered of minor significance.

During the planning phase, the Developer will implement several measures, including conducting a socio-economic and asset inventory census for displaced persons. Engagement activities will be carried out with grazers to inform them about the Project, its schedule, and restrictions on grazing within the site due to safety and operational constraints. However, it will be explained in detail that such grazing activities can continue within the extensive available land and areas surrounding the Project site. Also, collaboration with the Al Henakiyah Governorate Municipality will ensure the relocation of grazers to a suitable alternative location with access to grazing lands and necessary resources. The Developer bears all expenses related to the smooth relocation process, covering livestock, equipment, shelters, and other essential belongings of the grazers. This comprehensive approach aims to mitigate any adverse impacts resulting from the Project, and after implementation, residual impacts are deemed not significant.

Considering the above, the Project development will not result in any significant land use issues. However, as part of the Stakeholder Engagement Plan (SEP), during the construction and operation phase the Community Liaison Officer (CLO) of the Developer team should aim to document grazers should they visit the area. In this case they are encountered, engagement activities should be undertaken with the objective of providing information on the project, activities, footprint etc. In addition, it should be emphasized that any grazing activities (if any) can continue within the surrounding areas of the Project.

(iii) Hydrology and Hydrogeology (Soil and Groundwater)

Key impacts related to the Project are mainly from improper housekeeping practices during construction and operation (such as illegal/improper disposal of solid waste, hazardous waste and/or wastewater), which could contaminate and pollute the soil and groundwater resources. Construction activities could disturb the soil, exposing it to increased erosion during rainfall, leading to siltation. Implementing general best practice housekeeping measures can also adequately control such impacts. The ESIA has identified adequate mitigation and monitoring measures to reduce these potential impacts and implement proper housekeeping practices. With such mitigation measures in place, the effects of improper management of waste streams and erosion on soil and groundwater are considered not significant.

(iv) Biodiversity

The biodiversity baseline assessment concludes that the Project site is barren and of low ecological significance and sensitivity. The Project site is not located within or near areas of critical environmental concern, such as protected areas (PAs), Key Biodiversity Areas (KBAs), and Important Bird Areas (IBAs).

The Project site in general is barren and of low ecological significance and sensitivity in terms of flora and fauna. The assessment identified several flora and fauna species within the Project site most of which are considered of Least Concern. In addition, there are no sensitive habitats recorded within the Project site and the site is not located within or near areas of critical environment concern, such as protected areas and/or KBAs/IBAs. With regards to avifauna in particular, the assessment states that the Project site is of medium sensitivity mainly due

to its potential to host a small number of soaring and migratory birds based on the outcomes of the IBAT Migratory Soaring Bird Sensitivity Mapping Tool.

Potential impacts include (i) the ‘lake effect’ that can disorient migratory birds, (ii) improper conduct of workers, including the hunting of animals and birds, (iii) improper management of hazardous waste by workers, and (iv) health and safety risks due to the potential presence of snakes on some parts of the site. The ESIA has identified adequate mitigation measures to control such impacts and ensure proper conduct and housekeeping practices are implemented. With the implementation of such measures, the impacts are considered of minor significance.

(v) Archaeology and Cultural Heritage

An archaeology and cultural survey was carried out in February 2025 to ascertain the presence of any surface archaeological or cultural heritage remains within the Project site. No records of any sites of interest or significance were found within the Project area, nor were any archaeological or cultural heritage sites located within a 1 km radius of the Project.

The main impact anticipated is during the construction phase from site preparation activities. As noted earlier, there are no archaeological remains on the surface of the Project site, and therefore there are no anticipated impacts. However, there is a chance that throughout such construction activities, archaeological remains buried in the ground are discovered. In such cases, the ESIA recommends the ‘chance find procedure,’ which entails immediately stopping construction activities and fencing out the area until the Ministry of Culture and Heritage Commission of Al Madina Province and Saudi Arabia's Heritage Commission has assessed it. With the implementation of such measures, the impact is considered not significant.

(vi) Air Quality and Noise

Construction and operation activities of solar PV Projects are passive in nature and do not result in any adverse air emissions or significant noise sources. However, construction activities may increase dust and particulate matter emissions, temporarily impacting ambient air quality. Moreover, machinery and equipment use are expected to be a source of noise and vibration within the Project site and its surroundings.

As part of the ESIA, appropriate mitigation measures have been identified for dust suppression and noise control, and these will be implemented during the construction phase. This includes regular watering of all active construction areas, proper stockpile management, and use of well-maintained mufflers and noise suppressants for high noise generating equipment and machinery. With the implementation of such measures, the impacts are considered of minor significance.

(vii) Infrastructures and Utilities

Water Resources and Utilities – Consultations were undertaken with the National Water Company (NWC) where it was indicated that the main water supply for the Al Henakiyah Governorate comes from a desalination plant operated by the Saline Water Conversion Corporation located in Yanbu Governorate in Al Madina Province through a 400 km pipeline from Yanbu to Al Henakiyah. The NWC stated that the Project can be supplied with its water requirements through water tankers delivering the water needs to the Project site from an integrated station that purifies and distributes water in Al Henakiyah Governorate;

Wastewater and Solid Waste – Wastewater and solid waste generated during the construction and operation phase will be minimal and are expected to be easily handled by the closest Wastewater Treatment Plant (WWTP) and Landfill. However, it should be noted that there that there is only one (1) landfill that is located near the Al Henakiyah City center and is around 45 km to the northwest of the Project site. Wastewater is carried out through the transportation of sewage through the sewage network that is connected to the Central Treatment Plant for Al Henakiyah Governorate that is managed by the NWC. The Central Treatment Plant is located around 33 km to the north of the Project site;

Hazardous Waste Utilities: There are no hazardous waste facilities in Al Madina Province in general. However, where there are currently seven (7) licensed hazardous waste transportation companies in Al Madina Province that are qualified to handle the transportation of hazardous wastes to the nearest hazardous waste disposal facility; and

Road Networks: A traffic and Transport Plan will be developed before the commencement of any transportation activities to ensure that the transportation process for all project components is appropriately and adequately managed. In addition, the plan will also identify appropriate traffic management procedures (both on-site and offsite).

(viii) Socio-economic Conditions

The main impacts anticipated on socio-economic conditions are related to potential job opportunities from the Project. These are positive impacts that are expected to benefit the local communities primarily. However, most jobs will only last until construction is done. The Project will create the following job opportunities:

- Approximately 900 job opportunities are expected during the construction phase (at peak) for roughly 24 months. This will include skilled job opportunities (e.g., engineers, technicians, consultants, surveyors, etc.) and semi-skilled and unskilled job opportunities (mostly laborers and security personnel).
- Approximately 16 jobs will be created during the operation phase for 30 years. This will include skilled job opportunities (such as technicians) and unskilled job opportunities (such as security personnel and drivers).

The Developer aims to hire local community members for skilled and unskilled jobs to the greatest extent possible throughout the construction and operation phases. The Developer is also committed to adhering to transparent recruitment and procurement procedures that will be developed and implemented in coordination with local authorities.

(ix) Occupational Health and Safety

Throughout the construction and operation phases, there will be generic occupational health and safety risks to workers that can be minor or severe. Such risks may include working under dusty and hot conditions, exposure to electric shock hazards during maintenance activities, etc. The ESIA requires that the contractor and operator of the Project prepare an Occupational Health and Safety Plan (OHSP) tailored to the Project’s site and activities. Such plans aim to ensure the health and safety of all personnel to maintain a smooth and proper progress of work at the site and prevent accidents. With the implementation of appropriate mitigation measures, the potential OHS risks can be of minor significance.

(x) Community Health, Safety, and Security

During the construction and operation phases, there could be potential impacts mainly limited to the following:

- Trespassing of unauthorized personnel into the Project site resulting in more people being exposed to the construction site hazards. It is expected that a detailed Security Risk Assessment (SRA) and Security Management Plan (SMP) will be provided by the EPC Contractor. The SMP is expected to include security measures to prevent unauthorized access to the Project site, such as fencing around the entire perimeter of the Project site and using several security guards on-site. With the implementation of such measures, the impact is considered of minor significance;
- The potential influx of workers during construction could increase the risk of diseases, social vices, inappropriate conduct by workers toward local communities, and increased pressure on infrastructure, services, and utilities. The ESIA recommends the following mitigation measures: (i) medical examination of all workers, (ii) development of a code of conduct and associated disciplinary procedures for workers, (iii) provision of details and procedures for ensuring and maintaining hygienic conditions on-site and conducting training and awareness campaigns for workers. With the implementation of such measures, the residual impacts are considered of minor significance; and
- Potential impacts from security guards related to inappropriate management of security issues and incidents by security personnel towards local communities could result in resentment, distrust, and escalation of events. The ESIA requires developing a security management plan that addresses such issues. With the implantation of such measures, the residual impacts are considered insignificant.

(xi) Climate Change Risk Assessment

A high-level Climate Change Risk Assessment (CCRA) related to the Project’s development was undertaken, and key physical risks that have been investigated which are relevant for the Project development that include

floods, sand and dust storms, volcanic eruptions, water scarcity and drought, temperature increase and heat waves, and lastly strong winds. This section also provides a high-level estimation of the GHG emissions and avoidance rates from the Project activities. The Project is expected to provide around 1,288-Gigawatt Hour (GWh) of electricity annually. The Project will likely displace more than 708,400 million tons of CO₂ annually.

The proposed Project aligns with Saudi Arabia's climate change commitments, as outlined in various national programs and strategies. It supports the objectives of Saudi Vision 2030, aiming for 50% renewable energy in the total energy mix by 2030. Additionally, it adheres to the National Environmental Strategy, emphasizing climate change adaptation, private sector participation, and national capability strengthening. The Project's compatibility is further reinforced by Saudi Arabia's Updated Nationally Determined Contribution to the UNFCCC, aiming to reduce greenhouse gas emissions by 278 million tons of CO_{2eq} by 2030.

Saudi Arabia faces multiple climate change risks, including floods, sand and dust storms, volcanic eruptions, water scarcity, and heatwaves. The Kingdom, with a predominantly arid climate, experiences frequent floods and is vulnerable to the impacts of climate change, such as decreased precipitation and increased temperatures. KSA's water scarcity, dependence on desalination, and susceptibility to sand and dust storms pose significant challenges. Furthermore, the region is at risk of extreme heatwaves, impacting both project efficiency and the health and safety of outdoor workers. Despite these risks, the project site in Al Madina Region is assessed to have manageable water scarcity concerns and is not affected by volcanic hazards. A flood risk assessment conducted for the Al Henakiyah Solar CSP/PV Park in 2020 concluded that while no significant flow paths enter the central parts of the project site, localized areas, particularly in the southwest, are prone to shallow expansive flooding and deeper flow depths during extreme flood events. However, the overall flood hazard rating remains low, provided that recommended mitigation measures, such as re-grading, diversion channels, and bund walls, are implemented. Once these measures are in place, flood-related impacts are expected to be minor. Also, the Project must continue to address the high risk of sand and dust storms and extreme heat, emphasizing worker safety and considering long-term climate change projections.

(xii) Human Rights and Gender Assessment

Saudi Arabia presents a dual narrative in human rights, with a commendable Human Development Index (HDI) ranking of 40 out of 193 countries, yet ongoing restrictions on civil liberties. The Freedom House Global Freedom Status rates the country poorly at 8 out of 100, highlighting limitations on political rights, freedom of expression, and labor rights, despite recent reforms.

While Saudi labor laws provide worker protections, challenges persist, particularly regarding independent labor unions, migrant worker rights, and wage security. The sponsorship (Kafala) system has undergone reforms yet concerns remain regarding enforcement and the vulnerability of low-wage workers to exploitation. Gender disparities persist, as reflected in the Global Gender Gap Index ranking of 126 out of 146 countries. However, workforce participation for women has improved, exceeding the Vision 2030 goal of 30% by reaching 37% in 2022. Despite legal strides, social norms continue to shape career advancement, and gender pay gaps remain.

To mitigate potential human rights and gender-related risks, the EPC Contractor will implement several management plans, as outlined in the ESIA. These include a Labor and Working Conditions Management Plan (LWCMP) to ensure compliance with Saudi labor laws and IFC PS 2, a Worker Code of Conduct addressing labor rights and non-discrimination, and a Grievance Mechanism for both workers and external stakeholders to address concerns, Worker Influx Plan and Worker Accommodation Management Plan. In addition, an Occupational Health and Safety (OHS) Plan to safeguard worker welfare.

(xiii) Ecosystem Services

The ecosystem services assessment for the project site identified key provisioning and regulating services. Provisioning services primarily include livestock grazing, with informal herding observed in the area. However, its significance is limited due to sparse vegetation and the availability of alternative grazing lands. Regulating services include air quality regulation, as the limited vegetation helps trap dust and pollutants, and water flow regulation, with wadi channels contributing to surface runoff and minor groundwater recharge, though recharge potential remains low due to the arid climate.

Cultural and supporting services were not identified as significant, as the site lacks historical, cultural, or ecologically critical features. Potential impacts from the project include the permanent loss of grazing areas due to development of project and site fencing, minor disruption to air quality regulation from vegetation clearance, and localized alterations to surface water flow patterns.

To mitigate these impacts, the project will implement hydrological management measures, ensure construction activities remain strictly within the project site, and engage with local herders through a structured grievance mechanism. Given these mitigation measures, residual impacts on ecosystem services are expected to be minimal and not significant

4 ENVIRONMENTAL & SOCIAL MANAGEMENT & MONITORING

The ESIA includes an Environmental and Social Management Plan (ESMP), which outlines adequate measures and controls to minimize and mitigate the potential environmental and social risks and impacts identified for the construction, operation, and decommissioning phases of the Project. To address all the potential risks and impacts of a project, the ESMP utilizes the mitigation hierarchy. After managing impacts, there is a need to monitor for compliance. Monitoring may include observation and recording or data gathering and sampling. Monitoring reports will be required from the Contractor and Operator during the construction and operational phases. The monitoring results will help assess compliance and the long-term cumulative effects, if any. If ongoing problems occur, adaptive mitigation measures can be developed and implemented.

5 ASSOCIATED FACILITIES

The SPPC will be responsible for offsite connection works from the onsite substation to the National Grid. SPPC will be responsible for preparing the detailed design (including identification of the OHTL route), construction activities as well operation and maintenance activities. The SEC substation that will be developed by the SPPC is located adjacent to the Project site to the Northeast. Therefore, associated facilities such as OHTL or underground cables will be developed within the Project site boundary. The specific details regarding the type of connection to the grid substation will be developed during the detailed design stage.

Two 110 kV OHTL lines will be constructed for evacuating the plant generated power and connecting the plant to SEC substation. A total of almost 0.4 km OHTL will be installed containing 2 double circuit towers of 2×400 mm² GTACSR conductors, conductor fittings, insulators and concrete for towers foundations

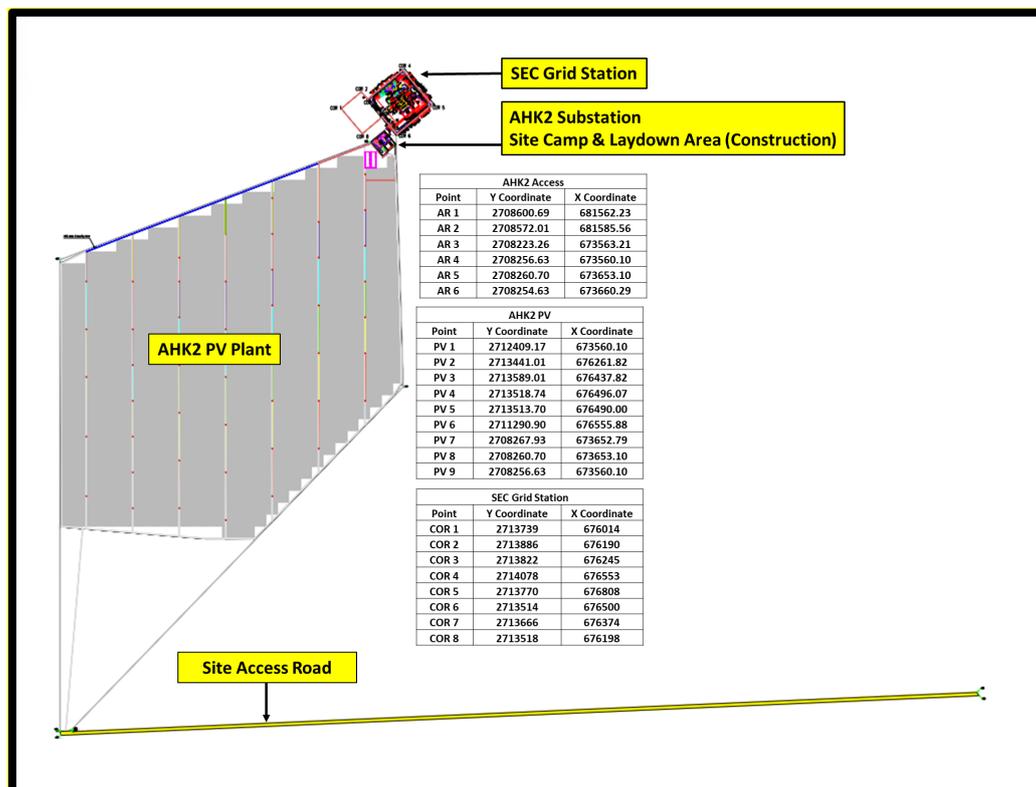


Figure 7: Project Site in Relation to SEC Substation