Salalah Independent Water Project
Sultanate of Oman

Environmental & Social Impact Assessment
Volume 1: Non-Technical Summary (NTS)

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1 INTRODUCTION

This document presents a 'non-technical summary' of the Environmental and Social Impact Assessment (ESIA) for the proposed Salalah Independent Water Project (Salalah IWP) in Salalah, Oman (the Project).

The primary aim of the ESIA is to identify and categorise predicted impacts that may occur as a result of the projects construction and operational phases, and to specify mitigation and management measures to avoid or minimize these impacts wherever possible.

The process of completing the ESIA is comprised of the following key stages:

- Collation of baseline information through desk-top review, and compilation of relevant environmental and social data for the project site.
- Design, execution and analysis of scientifically robust field survey data and modeling of proposed project emissions and effluent discharges.
- Identification, assessment and categorisation of impacts.
- Identification of appropriate mitigation, management and monitoring measures to appropriately control identified impacts.
- Identification of any residual significant effects.

2 PROJECT SUMMARY

The Oman Power & Water Procurement Company (OPWP) has awarded the Salalah Independent Water Project (Salalah IWP) to the consortium of ACWA Power, Veolia and DIDIC (The Project Sponsors). The Project is structured as an Independent Water Project (IWP) with OPWP purchasing the Potable Water produced by the operator under a Water Purchase Agreement with a term of 20 years.

The proposed project has a footprint area of approximately 5.83 hectares and is located approximately 30km east of Salalah, on land that is immediately to the east of the existing Sembcorp Salalah IWPP.

The scope of the project includes the design, construction, ownership, financing, operation and maintenance of high efficiency desalination facilities based on seawater reverse osmosis technology with a capacity of 25 MIGD of Potable Water output (113,650 m^3 per day of Potable Water output in nominal conditions, and 120,000m^3 per day during exigency periods). The project also includes potable water storage facilities (located on-site, but which will link to the potable water storage tanks within the adjacent Sembcorp Salalah IWPP.

The Salalah IWP project includes the following key facilities:

- Sea water intake system;
- Sea water discharge system;
- Pumping station, including screening equipment;
- Chlorination facilities (pre-chlorination and disinfection);
- Pre-treatment system;
- SWRO system;
- Post treatment system;
- Potable Water Storage Facilities;
- Waste water treatment system;
- Instrument and service air system;
- Fire protection and detection system;
- Ventilation and air conditioning;
- General buildings (e.g. security gate house and administration buildings)

Figure 2-1 Salalah IWP Main Entrance View

Figure 2-2 Salalah IWP Overview

Project associated facilities include the water forwarding connections from the potable water storage tank on-site to the existing tanks located in the Sembcorp Salalah IWPP boundary. The project will also include an electrical connection to/from the Dhofar power grid and a new paved access road. The access road and the water forwarding pipeline will both be aligned directly to the north of the project and will be approximately 1km and 600m in length respectively.

Commercial operation of the project is planned for early 2019.

3 Overview of Local Environment

The project's land is owned by the Ministry of Housing. The project will use this land under a Land Lease Agreement to be arranged with the Ministry of Housing for the duration of construction and operations. The land is currently unused, but was previously used as the construction laydown, staging and administration area for the adjacent Salalah Sembcorp IWPP project; since being restored.

The project site comprises sandy beach, sloped rocky cliff (with minimal vegetation coverage) and open cliff top plain free of vegetation coverage of any kind. The main project facilities will be located on a cliff top plain (as shown in the overview figure above). A temporary area of land to the east has been dedicated for the construction laydown. The adjacent Salalah IWPP, located to the west, is the most notable feature within the immediate landscape, which includes two rock groynes extending southward into the Arabian Sea to protect the existing intake and outfall pipelines.

Although the land for the project footprint is unused, the ESIA has identified and assessed project impacts at/upon local receptors. These include (but are not limited to) the Salalah IWPP, Scout Camp, Temporary Worker Accommodation area and the seasonal camel shelters which are present during the Khareef season. Besides the adjacent Salalah IWPP, these receptors are located at least 1km to the west of the project site.

Figure 3-1 Location of Local Facilities and Receptors

4 CONTENT OF ESIA

The ESIA follows on from the Environmental & Social Scoping (ESS) study for the project that was approved by the environmental regulator in Oman (MECA – Ministry of Environment & Climate Affairs) in summer 2017. The ESS identified potential impacts associated with the project and defined the level of assessment required during the ESIA. The outcome of the ESS identified the primary assessment requirements for the ESIA as follows:

- Air Quality: to assess potential impacts associated with gaseous and dust emissions during construction of the plant.
- Noise and Vibration: to establish baseline noise levels in the project area and at identified receptors. To assess potential impacts associated with construction activities and operation of the project; including impacts relating to the construction access road.
- Terrestrial Ecology: to define any sensitive terrestrial habitats at or within the vicinity of the project and to assess potential impacts associated with respect to construction and operation of the project.
- Geology, Soils and Groundwater: to undertake a preliminary land contamination survey and as a precautionary approach to analyse baseline soil quality to identify any historical impacts of past land use as the Sembcorp Salalah IWPP construction laydown area. Including the proposed access road alignment.
- Marine Environment: to identify any sensitive marine habitats within the vicinity of the project, including areas in the project marine footprint that may be subject to construction and operational impacts. Assess potential impacts associated with offshore construction works and to define the saline mixing zone of brine discharge during operation.
- Surface Water Environment: To consider and assess potential impacts of runoff to the nearby wadi north of the project site. Including the development of mitigation and management measures; as applicable.
- Waste and Wastewater Management: To identify the types of waste and wastewater that will likely be generated during the construction and operational phases of the project. To set out mitigation and management measures that can filter into the construction and operational phase Environmental & Social Management Systems (ESMS) to effectively manage waste and wastewater.
- Archaeology and Cultural Heritage: To identify any existing baseline features related to archaeology or other cultural features. To assess impacts upon such features (if identified) and to outline appropriate mitigation and management measures related to such features.
- Landscape and Visual impacts: To identify the baseline and assess the anticipated change to the current landscape condition and likely visual impacts for nearby receptors.
- Socio-Economic Effects: To consider the local socio-economic context and identify how changes in current land-use condition may result in impacts for any existing land users.
- Community Health Safety and Security: To provide an overview of the risks relating to community health, safety and security and identify suitable mitigation measures to avoid/minimise such risks.

- Labour and Working Conditions: To provide an overview of the risks relating to Labour & Working Conditions and to identify suitable mitigation measures to avoid/minimise such risks.
- Cumulative Impacts: To consider cumulative impacts relating to project impacts in combination with existing environmental & social conditions, as well as any known and confirmed future developments in the projects areas of influence.

Applicable mitigation and management measures have been included in all sections of the ESIA to ensure appropriate risk management, avoidance of potential impacts and good practice through the development of the future Construction and Operational Environmental & Social Management Plans (i.e. CESMP and OESMP).

In order to present the ESIA in a logical format, it has been divided into several Volumes:

- **Volume 1**: Non-Technical Summary
- **Volume 2**: Main Text, Tables, Figure and Plates
- **Volume 3**: Outline Environmental and Social Management & Monitoring Plan
- **Volume 4**: Appendices

5 CONSULTATION

To further support the requirements of the ESIA and to gain an understanding of the project site condition consultation was undertaken with:

- Sembcorp Salalah IWPP;
- Omani Ministry of Heritage and Culture;
- Scout Camp (approximately 1km from the project site);
- Galfar Construction Temporary Worker Camp (approximately 1km from the project site).

Key consultation topics related around the use of the land in the local area by local populations and the seasonal use of local land by camel herders. It was also pertinent that future emergency planning and response plans would need to be co-ordinated with the Salalah IWPP. A formal consultation letter was sent to the Ministry of Heritage and Culture in Salalah in regard to the presence of any known archaeology or cultural features, however to date a response has not been received.

6 SUMMARY OF MAIN ENVIRONMENTAL IMPACTS

6.1 Air Quality

Temporary construction impacts as a result of the project may result in increased dust generation, but will unlikely impact receptors besides the Salalah IWPP, adjacent to the project site. Such impacts are common for construction activities in dry environments and can be appropriately managed through the implementation of a robust CESMP. The operation of the project is not expected to result in any impacts to air quality.

6.2 Noise & Vibration

Temporary noise impacts will result from the construction phase of the project and will primarily be associated with heavy plant/equipment and construction vehicle movements. Temporary impacts related to construction processes on the site are not expected to be discernible at receptors besides the adjacent Salalah IWPP. The ESIA has predicted that any temporary noise impacts due to increased construction traffic, would likely remain below 3dB(A).

The project is not expected to be a significant source of noise during operations, although certain components such as pumps may generate noise. As all identified human receptors are to the west of the project, noise impacts will likely be screened by the intervening structures of the Salalah IWP. In addition, any noise from the project (which would be lo in magnitude) will unlikely be discernible over the existing noise emanating from the Salalah IWPP, or result in cumulative noise impacts.

6.3 Terrestrial Ecology

Following past use of the project site as a laydown area for the construction of the Salalah IWPP, it was subsequently restored and resembles a barren open plain. The sandy beach habitat is free of flora however, a number of ghost crabs were identified along the shoreline. The sloped cliff has limited vegetation and no specific habitats or species of conservation significance have been identified, or are associated with the project site.

The project footprint is not located in any designated ecological areas, such as Omani nature reserves, RAMSAR sites, Important Bird Areas (IBA). The nearest designated site is the Khawr Rawi Nature Reserve and IBA located approximately 5 km west of the project site. The Wadi Darbat and Khawr Hassan IBAs are located approximately 4 & 10km away from the site respectively. It is noted that the project site does not share habitat characteristics with these designated IBAs and impacts to these designated areas or species which frequent them are not expected during construction or operation.

6.4 Geology, Soils and Groundwater

During the initial project site visit in 2016, the Salalah IWPP construction laydown areas (location of the project site) was in the process of being demobilised and remediated. During the follow up site visit on 10th July 2017 it was observed that the site was fully demobilised, but that site soils appear to have been largely mixed and graded. Following restoration, the soils within the projects cliff top plain area are unconsolidated, with a mix of cobbles, gravels, sandy silt and small boulders. The soil surface presents little evidence of any organic material and appears to be free draining.

It is identified in the ESIA that the previous Salalah IWPP laydown areas may have introduced some spills and leaks to soils; potentially associated with the storage of fuels, oils, chemicals, hazardous wastes and wastewater. As a precautionary approach topsoil samples were taken from the site area and proposed access road alignment to analyse quality. The results of the soil analysis presented above indicate that there is no soil contamination detected in any of the samples for any of the parameters analysed. In spite of this, mitigation and management measures have been outlined in the ESIA to protect against any cross-contamination of soils in the event of identified pollutants during construction.

Based on geotechnical survey reports groundwater is located at approximately 35m depth, and as such is not expected to be impacted during construction or operation.

6.5 Marine Environment

The baseline marine environment was referenced from the 2016 study undertaken on behalf of OPWP, which was issued to the projects bidders in the Request for Proposal. The referenced survey conducted spot dives and transects in the marine footprint of the project area, to identify existing baseline conditions for benthic habitats & species, marine fauna and ambient water quality.

Marine habitats primarily comprise of sandy seabed with areas of rock outcrops closer to the shoreline and deeper rocky areas further out to sea. The identified rocky areas include algal mats and low-density coral species.

A total of 29 faunal species and 11 coral species were recorded within the project area during the survey, including some species that are endemic to the local area. The most important marine habitat for fish and corals at the project site was on/around a man-made object in an area of sandy seabed.

Ambient water quality in the project area has relatively few influences, however one primary source of discharge is the adjacent Salalah IWPP, which discharges a mixture of warm water, brine and other treated wastewater streams. The water quality analysis referenced in the ESIA is consistent with typical marine waters, with no specific elevated parameters noted in ambient analysis data. During the Khareef season it is however expected that turbidity and suspended solids will increase due to strong wave action in the local area.

The projects proposed intake and outfall locations are within the sandy seabed areas, but will require an amount of dredging through the rocky outcrops from the shoreline, which will permanently impact some of the identified corals and will temporarily degrade water quality as a result of suspended sediments in the water column. Specific impacts to fish will be minimal, as they will likely avoid the area during construction, however any benthic sessile and possibly motile species present may be affected.

Predictive modelling of the projects brine dispersion has been conducted in the ESIA which confirms that a differential salinity of less than 2 parts per thousand (ppt) will be achieved within 60m of the outfall diffuser, which is compliant with the required Omani mixing zone standards. As the projects point of brine discharge is within an area of sandy seabed the impact to benthic ecology has been shown to be minimal, as the projects mixing zone is almost entirely within the sandy seabed habitat. However, during summer conditions there may be a partial overlap of the mixing zone with deeper rocky habitats; although the differential salinity in these areas is predicted to be 0.1ppt and well within annual salinity fluctuations for comparable latitudes in the Indian Ocean (which can range up to 2ppt depending on the season).

The clarified water produce in the effluent treatment plant will fulfil the effluent discharge limits as defined in Ministerial Decision 159/2005, except for: Fluorides and Boron whose concentrations in the raw water are similar and higher respectively than the required standards. An in-principle non-objection was provided by MECA to OPWP (the project Proponent) in regard to these expected elevated parameters and is included to the appendices of the ESIA.

6.6 Surface Water Environment

Impacts to the adjacent wadi from the project are not expected, however as a precautionary approach the ESIA recommends that appropriate erosion controls are implemented along the proposed site access road and any storm water drainage that may discharge or route to the wadi.

6.7 Waste and Wastewater Management

Construction of the project may result in the generation of rubble waste due to excavations, packaging wastes, unused materials and small quantities of hazardous wastes (such as paint and oil cans). During operations, there will be relatively few waste streams, although wastewater sludge, used reverse osmosis filters and other maintenance wastes may be generated in small quantities on a continued basis. Other wastes will be minimal and varied, but ay contain small quantities of hazardous components.

The ESIA outlines appropriate mitigation and management measures that can be implemented to suitably manage waste during both project phases.

6.8 Archaeology and Cultural Heritage

Site visits to the project have not identified any above ground visible features or areas that may have archaeology or cultural significance. A response to the consultation letter issued to the Ministry of Cultural Heritage (MOHC) is pending regarding the presence of any known archaeological sites or cultural features within the proposed project area. Any features identified by the MOHC would need to be suitably managed in a 'Cultural Heritage Management Plan'.

The closest know archeologically site is located is the Sumhuram Archaeological Park, part of the UNESCO World Heritage List, 'Land of Frankincense' designation. This area is located adjacent to the Khawr Rawi Nature Reserve approximately 5km for the project site. As this site is over 5km from the proposed project footprint, it will not be affected and it is not within direct line of sight to the project.

The project will require a 'Chance Finds Procedure' in the construction phase ESMS in the event that any unknown buried archaeology is uncovered during construction.

6.9 Landscape and Visual Impacts

The visual envelope of any receptors overlooking the site will be impacted by the introduction of vertical intrusions to the landscape, as a result of project infrastructure. However, given the height of the proposed plant in relation to the adjacent IWPP and lack of any tall structures, it is anticipated that the IWPP will remain the most prominent landscape feature in the vicinity. The site area will be visible at night due to the requirement for security lighting and the on-going continuous operations of the project.

Mitigation measures related to the use of lighting have bene included to the ESIA to minimise potential visual impact at night due to the introduction of lighting to this area.

6.10 Socio-Economic Effects

The project site is owned by the Ministry of Housing and will be leased under a Land Lease Agreement for the duration of the construction and operational phases. Therefore, no land acquisition or compensation will be required. There are no permanent residential settlements or community provisions

within or adjacent to the proposed project area, the only facility being the Salalah IWPP and the nearby Scout camp. Other features such as a temporary worker accommodation area and camel shelters are temporary, or are used seasonally.

Several temporary shelters were identified close to the existing access road leading to the Salalah IWPP, approximately 2km from the proposed project site. Consultation with the Salalah IWPP and other informal discussions with local people has indicated that the presence of the camels at these shelters (and their herders) in the local area is a seasonal activity during the Khareef. During the consultation, Salalah IWPP staff indicated that herders are permitted access to accessible land in the area for grazing. As such, during construction, the project will need to ensure that a safe and accessible route for camels (and their herders) is maintained along the proposed access road alignment. This shall enable herders to move freely to the east and west of the project along the cliff top plain without severance, or hindrance to movement. Local access to land to the east of the project will not be unduly affected during operations.

As a major infrastructure project in the Dhofar region the project has various positive social and economic benefits. A primary economic impact during construction is likely to result in employment creation. 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. In addition to the direct monetary impact of employment created during construction, there also exists the potential for the project to promote the dissemination of construction and construction support skills from expatriate workers into the local labour force.

A secondary impact that is likely to arise from spending on local and foreign goods and services during the construction process. The nature of the development, and specialised nature of required materials, suggests that these will be sourced internationally, apart from construction materials (e.g. concrete, cabling, etc.).

6.11 Community Health, Safety & Security

All construction projects have potential risks relating to public safety that could arise, particularly in regard to the use of high powered equipment, heavy construction plant, excavations, transportation amongst others, including fire and pollution releases. Public risks during construction have the potential to result in isolated incidents, which could be of a devastating magnitude to a person or group of people in the wrong place at the wrong time. Risks that could be experienced include worker influx and disease and transportation incidents. Risks will be appropriately assessed and prepared in the construction phase 'Emergency Preparedness and Response Plan' and training. Furthermore, security staff will be onsite during both the operation and construction phase.

6.12 Labour and Working Conditions

In the operation and construction phases, ACWA Power's HR Policy will provide the basis for upon which the projects HR Policy will be developed. Omani Labour Law as well as International ILO and UN conventions requirements will additionally be met in regard to Labour and Working Conditions. Factors such as occupational health and safety will be addressed.

6.13 Cumulative Impacts

The ESIA has assessed cumulative impacts of several environmental parameters. For instance, construction road noise and operational marine discharges have considered the measured baseline conditions in combination with the predicted process contributions.

There is no available information regarding confirmed future development plans in the local project area, so a future cumulative impact scenario has not been undertaken in the ESIA.

7 Environmental & Social Management & Monitoring

Volume 3 of the ESIA provides a framework for the development of the Environmental and Social Management System (ESMS) for the construction and operational phases of the project. The framework has been developed to ensure that all Environmental and Social Impacts associated with both the construction and operational phases are appropriately identified and controlled through the development of a robust construction and operational phase ESMS.

Both the construction and operational phase ESMS will need to incorporate mitigation and monitoring requirements established within Volume 2 of the ESIA as well as any and all future requirements defined by the Statutory Environmental Body (MECA) and the project lenders.

The primary documents guiding the environmental and social management of the construction and operational phases will be the Construction Environmental & Social Management Plan (CESMP) and the Operational Environmental & Social Management Plan (OESMP) respectively.

7.1 Independent Monitoring

The project will be subject to periodic independent monitoring in accordance with the requirements of the lenders, as per Equator Principle 9. The scope of the independent audits will include the implementation of the projects ESMS and will evaluate on-site activities and documented controls and monitoring efforts, with respect to the projects compliance obligations.

8 Significance of Residual Impacts

Following the implementation of the design based and additional recommended mitigation measures as identified in the ESIA, there are not assessed to be residual impacts of either moderate of major significance.