Luxembourg, 15.03.2018

Environmental and Social Data Sheet

Stage 1

Overview

Project Name:	**RED SEA DEAD SEA WATER PPP PHASE 1**
Project Number:	2015-0559
Country:	*Hashemite Kingdom of Jordan*
Project Description:	Construction and operation of: (i) a desalination plant in the Gulf of Aqaba producing 65 million cubic meters (MCM)/year of desalinated water for Aqaba, Jordan and Eilat, Israel; (ii) a brine and seawater pipeline linking the Red Sea with the Dead Sea discharging 235 MCM/year of mixed brine and seawater to the Dead Sea; and (iii) hydropower plants at the Dead Sea

EIA required:	yes
Project included in Carbon Footprint Exercise[1]:	yes

Environmental and Social Assessment

The key objective of the Red Sea Dead Sea Project is to increase drinking water supply to Jordan and the Southern region of the State of Israel. Phase I of the Red Sea Dead Sea Project (RSDS Phase 1, the Project) comprises abstracting 300 million cubic metres (MCM) per year from the Red Sea, desalinating a portion of this (65 MCM) and then conveying a mix of the waste brine from the desalination process and the remaining seawater balance (235 MCM) to the Dead Sea through a so-called “environmental pipeline”. Freshwater from the desalination plant will be supplied to Aqaba and the southern part of Israel respectively. The RSDS Phase 1 Project includes the construction of a water delivery point at the Israeli border, but not any required water distribution infrastructure on Israeli territory which will be Israel’s sole responsibility. This Project will also be used as a pilot to determine the impacts on the Red Sea and Dead Sea prior to the final design of the next phases.

The Project will support a high priority water supply infrastructure in one of the world’s most water-stressed countries and will allow Jordan to meet the growing demand, which is exacerbated by the number of Syrian refugees in the area. The project will improve the resilience of the communities to extreme droughts and the impacts of climate change, as reliance on the current overexploited fragile local sources can be mitigated. The project will also contribute to slowing down the fall of the water levels in the Dead Sea and its surrounding aquifers.

[1] Only projects that meet the scope of the Pilot Exercise, as defined in the EIB draft Carbon Footprint Methodologies, are included, provided estimated emissions exceed the methodology thresholds: above 100,000 tons CO2e/year absolute (gross) or 20,000 tons CO2e/year relative (net) – both increases and savings.

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Environmental Assessment

The Ministry of Environment is the competent environmental authority for the Kingdom of Jordan. A full ESIA is being finalised in compliance with the Jordanian Environment Protection Law No. 52 of 2006, the Environmental Impact Assessment Regulation No. 37 of 2005 and the EIB Environmental and Social Standards. The ESIA is being carried out by an international consultant and it is based on prior comprehensive environmental and social assessment work carried out by the World Bank in line with its own Operational Policies between 2010 and 2016. The assessment takes into account all Project aspects that may have changed over that period relative to the original Red Sea Dead Sea studies.

In line with Jordanian ESIA regulation, a scoping session was carried out in order to clearly identify all the valued environmental and social components (VECs) to be addressed in the Study with relevant project stakeholders. This scoping was held in the city of Aqaba in April 2017. Once the Study is completed a consultation will be carried out with the documents made available to the public. As part of the ESIA study and requirements, a comprehensive Environmental and Social Management Plan (ESMP) will also be developed.

In order for the Project to meet EIB Environmental and Social Standards and to be in line with international best practice, the following complementary and supplementary studies and activities were carried out:

- Additional walkover surveys along the entire pipeline route to establish any environmental and/or social constraints that might affect the construction and operation of the Project and to identify any adverse environmental and/or social impacts specifically with regards to the topography, land use practices and habitats and species.
- A Marine ecology survey in order to establish the presence/absence of critical habitats and species at the proposed Red Sea intake location. Engagement with fishermen and marine experts (e.g. Marine Science Station (MSS)) were carried out in Aqaba and with the Interuniversity Institute for Marine Sciences in Eilat.
- Terrestrial ecological surveys were carried out during the months of February and March 2017 so as to validate the baselines and conclusions and to extend the assessments to the areas that were not covered as a result of change in alignment and Project components. The focus of these surveys was specifically on Important Bird Areas (IBAs), soaring birds, and seasonal avifauna.
- The cultural heritage surveys consisted of a desk based analysis, re-validation of previous findings, collaboration with the Jordanian Department of Antiquities and detailed site walkovers to confirm the presence/absence of areas of cultural importance.
- Land use and socio-economic surveys of settlements/activities within the Project footprint.

Environmental impacts:

a) Construction impacts:

During the construction of the project, most of the environmental impacts will be temporary and can be mitigated with standard environmental management procedures for construction complemented by specific construction methods for river crossings, restoration of sensitive marine and terrestrial ecological areas, and other specific procedures for the protection of endangered and vulnerable species. Adequate management plans following international standards for these activities are being developed and are in the process of being finalised. These plans are a requirement for the Project and will be included in the overarching Environmental and Social Management Plan.

Land and visual impacts will relate to the permanent project facilities and daily traffic related to the operations. In this respect it has been advised to realise a buffer zone of 10 - 20 meters including a natural visual barrier, for instance consisting of (palm) trees and vegetation around the desalination Plant, the pumping station, the high level reservoir, the three hydropower plants and the Dead Sea discharge point.

b) Operational impacts:

With respect to the operational phase, besides unavoidable energy and chemical requirements for the treatment of the water, there are three key components that will affect the environmental performance of the Project: a) the intake, b) the potential of leaks in the environmental pipeline, and c) the discharge of Red Sea water mixed with brine into the Dead Sea. All three issues have been comprehensively assessed and reviewed over the past years:

i. **Intake:** The intake will be located about 2000 m offshore and 140 m below sea level. An additional study on alternative depths for the intake has been carried out. The results suggest that a shallower intake could be acceptable from an environmental point of view provided that additional marine surveys confirmed the initial results.

ii. **Environmental Pipeline:** The pipeline will be laid in a trench that has lining and controlled drainage. Additionally sophisticated and very sensitive leakage monitoring systems will be installed. The pipeline will be sectionalised in order to limit the volumes of saline water spilled in case of a major pipe burst (as discussed above). Risks in terms of seawater and brine leakages are among the major potential impacts of the project. It will be of utmost importance to minimise risks of groundwater pollution due to seawater leakage, incidental or as result of for instance earthquakes. Several means to eliminate, reduce and control leakage of seawater from the conveyance and environmental pipeline have already been incorporated into the preliminary scheme design. In addition, the provision of emergency butterfly valves, which close automatically in case of pressure drop, as part of an overall emergency leakage control system have been proposed. The spacing of valves for the northern pipeline section would be 9 km, and for the southern section this would be 6.8 km. In total 12 valves have been suggested, some of which could also serve as isolation valves on either side of a sensitive geological fault line crossing. An Emergency Response Plan will be prepared in conjunction with the final design and operational procedures of the Scheme.

iii. **Discharge into the Dead Sea:** One of the key Dead Sea related impacts, separate from the overall positive project impact in terms of potable water supply and the restoration of the Dead Sea water level, relates to potential chemical and biological alterations of the Dead Sea water due to Red Sea water and brine discharge. This could change the unique chemical composition of the Dead Sea, and could cause biological blooming and increased turbidity. This may change the appearance of the Dead Sea as well as its heat balance with impacts on tourism and the Dead Sea potassium and bromine production industries. Recommendations to monitor the Dead Sea during phase I have been elaborated, including a monitoring program that has been developed with support from and close cooperation of the Geological Survey of Israel (GSI). Furthermore, the establishment of an international research centre (IRC) in Jordan is proposed, to complement the activities of the Israeli partners. Various studies carried out so far (ref. Dead Sea Studies, GSI) state that a discharge from the enviormental pipeline below 400 MCM/ year is environmentally acceptable. The monitoring programme and the proposed research centre will continue to investigate this aspect.

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c) Biodiversity impacts:

With regard to the intake Project component, potential impacts relate to the sediment dynamics and marine ecology, including the sensitive issue of coral larvae circulation. It has been recommended to consider reducing seawater flow velocities from 0.3 m/s to 0.15 m/s in line with IFC guidance at the mouths of the intake facilities, and use advanced / BATNEEC technologies at the intake to diffuse the effect of the intake on water circulation.

Key impacts with regard to the terrestrial ecology along the route (also known as Wadi Araba) relate to the proximity of the Aqaba Bird Observatory and sensitive flora and fauna along the pipeline route. To minimise disruptions and anticipate any required changes to the alignment, a monitoring program will be set up prior to the construction of 10km-sections of pipeline, in order to implement controlled ecological clearance ahead of works, and if the need is confirmed during such prior observations, to change the pipeline route along the two sections where the threats to vulnerable trees and important desert breeding bird's nests may require this.

Climate Change: The project area is subject to increasing droughts and flooding risks. Vulnerability to floods has been identified in the Northern part of Aqaba. The Aqaba Special Economic Zone Authority (ASEZA) has committed to address and manage the risk of floods.
Various adaptation measures are proposed also within the project, as well as mitigation measures including the use of sustainable non-fossil energy resources, such as the use of solar parks to meet part of the project's power demand. Feasibility studies for those solar parks are ongoing. Three hydropower plants with about 33 MW capacity along the environmental pipeline will generate about 45% of the total energy requirements.

Residual Impacts:

As described above risks have been assessed and mitigated to a level fully in line with other major infrastructure projects. In fact much of the mitigation goes beyond that level. The depth of the proposed intake for instance is much deeper than any other intake structure for a water supply project. The onoing studies on whether a shallower intake would be environmentally feasible use the environmental impact of the deep intake as a benchmark (the Base Case) and will only lead to a revised design if residual impacts are equal or smaller.

Residual impacts of the RSDS Phase I Project after mitigants include: impacts on the Red Sea marine environment as result of the seawater abstraction; the possible effect of mixing Dead Sea water with Red Sea waters, the permanent land take and land use changes caused by the project facilities, and the GHG and climate change related impacts caused by the fossil-fuel generated power consumption during operation of the project.

Final decommissioning of the project would require dismantling and removal of the surface and subsurface structures, reuse or recycling of waste materials, rehabilitation of any soil or groundwater pollution and landscaping and replanting after decommissioning. An Environmental and Social Management Plan for the pre-design, construction and operational phases of the project, including monitoring will be developed.

The ministry of Water and Irrigation, Environment, Antiquities shall ensure that sufficient staff, capabilities and operational budgets are available to ensure monitoring, enforcement and co-operation with the BOT contractor for the implementation of the ESMP related requirements. This implementation will be supported through technical assistance.

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Cultural heritage

The archaeological survey carried out as part of the ESIA identified 187 potential sites along the project footprint that are located within 50m from the pipeline route. An archaeological site monitoring and clearance programme for each section of 10 km in advance and 50 m wide of the actual construction works will be set up. The promoter will put in place a chance find procedure during construction.

EIB Carbon Footprint

For the RSDS Phase I project, the purchased electricity represents one of the largest sources of GHG emissions and the most significant opportunity to reduce these emissions. The key source of GHG emissions of the project during operations relates to the net power demand of the project, and to what extent the power will be generated by fossil energy sources.

RSDS Project Component	Annual Water Flow	Power Demand
Intake pumping station	300 MCM / yr	17.0 MW
Booster pumping station	235 MCM / yr	20.0 MW
Desalination Plant	90 MCM / yr	32.0 MW
Power recovery HHPs (3x)	675,600 m3 / day	(minus) 33 MW
Total RSDS Phase I		**36 MW**

The national electricity company (NEPCO) will provide the power through the national grid, which is generated by a series of gas and oil fuelled power plants. Assuming full time (100%) operations of the above facilities against the national grid “specific emissions” of 703 gr CO2 / KWh, this leads to a total emission of 220 Kilo ton CO_{2eq}/a in terms of GHG emission for the RSDS Phase I project.

Social Assessment

The project will have short and long term positive social impacts in terms of enhancing water security, access to water, creating economic opportunities (during works and after) and indirectly contributing to the sustainable economic growth of the beneficiary countries..

The project will be implemented in the Wadi Araba and Southern Ghores area, along the strip of land comprised between Aqaba (intake point) and the Al Assan area (discharge point). The infrastructure will be located (to the extent possible) in and along the right of way of existing infrastructure corridors, in order to limit the need for land acquisition and displacement.

The socio-economic assessment carried out as part of the ESIA study, which has been informed by the Jordan Valley Authority (JVA) experts, estimates that a total of 565 residential plots and 206 agricultural plots will be impacted, assuming a buffer zone of 150 meters wide along the pipe alignment.

Overall the key expected adverse social impacts include the physical resettlement of about 52 households, as well as the economic displacement of agricultural plots mainly located along the project alignment. During the construction period, the project may cause temporary economic loss, disruption of economic activities and reduced access to resources in relation to land use and reserved right of way.

It is expected that the project will impact tribal communities (Bedouins) and vulnerable groups, among the nine villages included in the project footprint.

To address these impacts JVA, supported by international consultants, will prepare a Resettlement Action Plan (RAP) informed by a vulnerability assessment. The assessment will also determine the need for (and in this case will prepare) an Indigenous people plan (IPP). The plans are expected to be developed in consultation with all project-affected persons (including application of Free Prior and Informed Consent), to ensure acceptance of the proposed mitigation measures and to facilitate the involuntary resettlement process. The final plans will be disclosed on the website of the Promoter and the EIB. The international consultant will monitor the implementation of the plans and their alignment with International standards (IFC and EIB). The RAP will be implemented in a manner consistent with the handover of site to works contractors.

Labour standards: The Republic of Jordan has ratified 7 of the 8 ILO labours standards. In order to ensure the application of relevant labour standards related to employees' working conditions during construction and operation, these will be addressed primarily through the inclusion of contractual obligations for the first tier suppliers and contractors, and enforced by the Promoter's supervision team.

Furthermore, as the project foresees an influx of workers external to the project area during the preparation and construction phases, the promoter will develop a worker influx management plan as part of the ESMP.

Public Consultation and Stakeholder Engagement

The consultation process has been carried out at different stages of the project preparation and as part of the ESIA (and related studies) preparation process. These consultations were started already in 2008-9 with the initial project scoping, continued in 2010, 2011, 2013 and 2015 and more recently in April 20017. They involved representatives of a variety of stakeholders including Ministries and public authorities, communities' representatives, NGOs, academia and private sector representatives.

Overall, the main recurrent points of concern were related to the project impact on coral reef (intake point); fear of potential reduction of fish stock used for artisanal fishing, as well as economic displacement; presence of workforce related to the construction in camps located close to the existing communities; potential impacts on cultural heritage sites and natural habitat. Clarifications as to the employment opportunities for locals were also requested.

A Stakeholder Engagement Plan, including a grievance mechanism has been prepared as part of the ESIA and will be updated to integrate findings and activities related to the Resettlement action plan and the Indigenous people plan. Evidence of SEP implementation, stakeholders' consultation, grievance management and project information disclosure by the promoter will be required.

Conclusions and Recommendations

With the following conditions in place, the Project is acceptable for financing in environmental and social terms.

Disbursement conditions

Prior to Signature:

- The promoter to provide confirmation from the relevant national competent authorities that no protected areas nor sites of conservation importance will be significantly impacted by the Project;

- The promoter shall submit the full ESIA (including all relevant annexes), to the satisfaction of the Bank, completed and approved by the relevant competent authority. The Promoter shall send the NTS of the ESIA and the ESIA to the EIB for publication on its website.

Prior to disbursement:

- Shall finalise to the satisfaction of the Bank the Resettlement Action Plan, Indigenous people plan, and Stakeholder engagement plan as required;

- Shall finalise Environmental and Social Management Plan (ESMP) including external monitoring obligations to the satisfaction of the Bank. The ESMP shall become a contractually biding part of the concession contract;

Undertakings

- The promoter shall comply with the applicable laws, ILO labour standards and international best practices and that relevant contracts financed under the Project include specific clauses on these undertakings;
- The Promoter shall ensure that the Project (including all works performed by the contractors) is carried out in accordance with the provisions contained in the ESIA documents, the ESMP and associated management and action plans;
- The Promoter shall maintain independent third-party monitoring firms, with staffing and terms of reference satisfactory to the Bank, to independently monitor the Project's implementation progress and compliance with the terms of the ESIA package, and to report regularly to the Bank;
- The Promoter shall notify the Bank, within 2 days after its occurrence, of any significant environmental, occupational health and safety relevant event; and within 30 days provide to Bank with a summary report that includes a description of such significant event, and the measures that the promoteris taking or plans to take to address the event and prevent any future similar events;

- The Promoter shall maintain a grievance redress mechanism and include an independent Appeal Grievance Redress Committee for addressing complaints not resolved by the Project's internal grievance mechanism related to the implementation of the ESIA package including RAP;

- Update the Environmental and Social Monitoring System (ESMS), ESMP and relevant plans, policies and procedures for the operations phase satisfactory to the Bank – no later than 3 months prior to commencement of the operation phase;

- Provide to the Bank an impact evaluation study on the outcome of the RAP activities carried out by the promoter no later than one year following completion of all resettlement and compensation activities.