

## Environmental and Social Review Summary

### Aqualyng Caofeidian Seawater Desalination Project – China

*This Environmental and Social Review Summary (ESRS) is prepared by MIGA staff and disclosed in advance of the MIGA Board consideration of the proposed issuance of a Contract of Guarantee. Its purpose is to enhance the transparency of MIGA's activities. This document should not be construed as presuming the outcome of the decision by the MIGA Board of Directors. Board dates are estimates only.*

*Any documentation which is attached to this ESRS has been prepared by the project sponsor, and authorization has been given for public release. MIGA has reviewed the attached documentation as provided by the applicant, and considers it of adequate quality to be released to the public, but does not endorse the content.*

Country:	<b>China</b>
Sector:	Infrastructure
Project Enterprise:	Aqualyng Caofeidian Seawater Desalination Co. Ltd.
Environmental Category:	B
Date ESRS Disclosed:	April 19, 2010
Status:	Due Diligence

#### **A. Project Description**

The proposed project is to build, own, and operate (under a 30-year BOOT contractual structure) a reverse osmosis seawater desalination plant in the Caofeidian Industrial Zone, Tangshan Municipality, Hebei Province, People's Republic of China. The Caofeidian Industrial Zone is a 310 square kilometer island created primarily of engineered reclaimed land designated for port and industrial use, located in the tidal flat directly off the southern sea coast of Tangshan. The project site is located directly adjacent the Huarun Power Plant to the north and approximately 1 kilometer from No. 1 Basin Wharf to the west.

The operation will consist of five single pass reverse osmosis seawater desalination trains and associated infrastructure to provide a net production capacity of 50,000 cubic meters per day of potable desalinated water meeting Chinese drinking water standards. The desalination plant and associated structures will have a total area of approximately 11,298 square meters and include: a main process building (arranged with control room, dosing room, filtration room, pump room, distribution room, warehouse, etc.); clean water tank; clarification tank; and auxiliary facilities. Seawater will be delivered through an intake pipe fed from a pump station connected to a dual submerged intake piping in No. 1 Basin Wharf. An 18 month construction period is expected, with completion scheduled by the end of September 2011.

Pressurized product water will be delivered to the site boundary limit, where the offtaker, Tangshan Caofeidian Infrastructure Construction Investment Co. Ltd. ("IIC"), will be

responsible for installing pipelines to transport the water to the distribution system. Project enterprise (a 50:50 joint venture of Aqualyng China (HK) Ltd. and IIC) has a 30 year Water Purchase Contract (“WPC”) with the offtaker to supply 50,000 cubic meters per day of desalinated water. Additional offtaker obligations pursuant to the WPC include responsibility for disposing of brine discharge.

## **B. Environmental and Social Categorization**

The project is a Category B under MIGA’s Environmental and Social Review procedures. Key impacts include wastewater, sludge, solid and hazardous wastes, dust, noise and workers’ health and safety.

## **C. Applicable Standards**

While all Performance Standards are applicable to this investment, our current information indicates that the investment will have impacts which must be managed in a manner consistent with the following Performance Standards:

- PS1: Social and Environmental Assessment and Management System
- PS2: Labor and Working Conditions
- PS3: Pollution Prevention and Abatement
- PS6: Biodiversity Conservation and Sustainable Natural Resource Management

PS4 is not applicable because this project is located on an island designated for industrial land use with no current residents. If residential communities are later constructed that are impacted by the project, then PS4 will apply. PS5 is not applicable to this project because the land is a state-owned industrial zone artificially constructed on former tidal flat or salt marsh, with rights of use assigned to project enterprise and no prior or current inhabitants or land uses. PS7 is not applicable to this project as no indigenous people live in the project affected area. PS8 is not applicable because the project will be constructed on reclaimed land with effects on archeological and cultural resources not expected.

## **D. Key Documents and Scope of MIGA Review**

The primary document reviewed by MIGA was the November 2008 *Construction Project Environmental Impact Assessment Report* (EIA), prepared by Hebei Qizheng Environmental Technology Co., Ltd. for Norway Aqualyng A.S. MIGA’s social and environmental review of this project also included a site visit (March 11-13, 2010) by MIGA staff.

## **E. Key Issues and Mitigation**

### PS1: Social and Environmental Assessment and Management Systems

Aqualyng Caofeidian Seawater Desalination Co. Ltd. has appointed the Hangzhou Development Center of Water Treatment Technology Co Ltd. as EPC contractor to

design, engineer, procure, construct and commission the seawater desalination plant. Ultimate control will remain with Aqualyng Caofeidian Seawater Desalination Co. Ltd., who will be responsible for overseeing contractor performance with the assistance of Aker Solutions China, who have been appointed to act as Owners Engineer. Oversight of construction will be performed by an appointed Project Construction Manager, Owners Engineer who in turn will also have in the team a Construction Manager and Environmental Health & Safety Manager who will be responsible for monitoring and enforcing contractor implementation of the Environmental and Social Management Plan (ESMP), inspections, reporting and training. Prior to commissioning, an Operations Manager and Supervisor will be appointed and responsible for implementing the ESMP for plant operations. And Independent Local Environmental and Social Consultant will also be contracted to audit environmental and social performance on a periodic basis.

An EIA was prepared that assessed the environmental impacts of the project and included some mitigation measures consistent with an Environmental Management Plan (EMP). Aqualyng Caofeidian Seawater Desalination Co. Ltd. has presented MIGA with an abbreviated draft ESMP that establishes a management program and provides an action plan, including monitoring, to mitigate some environmental and social impacts consistent with an EMP. The EPC contractor is responsible for developing their own ESMP as a contract deliverable that will be incorporated into the final ESMP. The final ESMP shall include the following environmental and social action plans covering both construction and operation of the plant: a comprehensive Environmental Management Plan (EMP), including monitoring plan, an Occupational Health and Safety (OHS) plan, a waste management plan, emergency response program and Human Resource policy. The final ESMP will be disclosed by project enterprise and MIGA.

### PS2: Labor and Working Conditions

The majority of the construction work force will be engaged by contractors; project enterprise will ensure relevant requirements of PS2 will be applied to all non-employee workers. All project contractors are required to give preference to employing locally when hiring unskilled and semi-skilled employees. During operations, the project will have 41 employees; all are expected to be locally hired, with 6 in senior management. The ESMP shall include a Human Resources policy and an OHS plan, consistent with World Bank Group (WBG) EHS Guidelines. The OHS plan will provide procedures for eliminating, controlling or minimizing work place hazards; provision of appropriate personal protective equipment; proper training; detailed recordkeeping of accidents, incidents, and injuries; and monitoring and control by company safety inspectors. The Human Resources policy will reflect transparent worker relations, terms of employment, non-discrimination, retrenchment and a grievance mechanism.

### PS3: Pollution Prevention and Abatement

The key impacts from construction and operation of the plant are from wastewater, solid and hazardous wastes, dust and noise are expected to affect air quality, surface and ground water quality and soil. These impacts will be avoided, reduced or mitigated

through measures identified in the EIA, compliance with national legislation, as well as through the development of a comprehensive ESMP consistent with WBG EHS Guidelines.

**Wastewater:** Wastewater generated by construction activities, including an estimated 4.8 cubic meters per day of sanitary wastewater and wastewater from construction equipment. Measures identified in the EIA to mitigate liquid effluent impacts include the construction of a temporary pit latrine designed to prevent seepage for sanitary waste and discharge of construction equipment wastewater into a sedimentation tank to be reused for dust suppression at the site. The ESMP shall identify cleaning and collection schedules, as well as requirements for the appropriate transport and final treatment or disposal of the sediments from the sedimentation tank and the fecal sludge from the pit latrine consistent with WBG EHS Guidelines and in consideration of the intended sludge end use as fertilizer.

Plant operations will generate about 76,000 cubic meters per day of wastewater. Membrane cleaning wastewater will account for about 0.6 cubic meters per day, domestic wastewater about 1.3 cubic meters per day, with the remaining overwhelming majority of wastewater concentrated brine. As a result of mitigation measures identified in the EIA and incorporated in project design, wastewater is expected to have limited impact on the marine environment. Project enterprise will discharge all effluent wastes to the site boundary limit, where the offtaker is obligated under the WPC to provide the works for transport of the liquid effluents to the municipal wastewater collection network, or in the case of the brine discharge bear ultimate responsibility for disposal. Both the domestic and membrane cleaning wastewater will be delivered to a wastewater treatment plant where they will be treated to national effluent standards prior to discharge to sea or reuse as grey water. The domestic wastewater will be pre-treated in a septic tank, while the pH of membrane cleaning wastewater will be adjusted in a neutralization basin before mixing with domestic wastewater and discharged to the collection network. The concentrated brine will be delivered to the site boundary limit where the offtaker is intending to direct the brine, via a channel, to the Nanpu Salt Factory as feedstock for salt production. Rain water will be collected and discharged to the municipal rain water drainage system.

**Solid and hazardous waste:** Debris and domestic refuse generated by construction personnel are the main solid waste streams during construction. Management of construction-based solid wastes will be conducted according to waste management measures identified in the EIA and consistent with national legislation, WBG EHS Guidelines and the ESMP, including disposing of construction wastes and debris in a refuse dump and transporting domestic wastes to a waste transfer station, with final treatment or disposal the responsibility of the relevant government authority.

Solid wastes generated during project operation include: sludge, waste membrane elements, used filter elements, quartz sand, chemical package and domestic wastes. Each of the waste streams will be managed separately, according to the EIA, with segregated on-site storage followed by disposal using licensed companies. Sludge will be delivered to sludge collection tank and equipment for sludge storage, handling, and transported to

an appropriate treatment system for dewatering followed by final disposal in a landfill. The filter cartridges will be offered to the supplier for recycling, otherwise will be disposed off to a licensed disposal company.. Domestic wastes will be collected for disposal via the relevant government authority. The waste membrane elements and chemical reagent packages will be categorized, handled, stored and disposed as hazardous waste. Hazardous wastes generated outside systems designs for such will be segregated and maintained in an anti-seepage and corrosion-resistant temporary storeroom to contain potential spills prior to disposal using licensed companies.

The ESMP shall include a waste management plan, including prevention, reduction, reuse, recovery, recycling, removal and disposal of construction and operations wastes, including a plan for collecting, categorizing, handling, storing and disposing of wastes consistent with national legislation and WBG EHS Guidelines. The ESMP shall also include an emergency response program to respond to fires, major accidents and hazardous materials/waste leaks, accidental releases and spills.

**Dust:** Ambient air quality is expected to be affected up to 150 meters downwind from construction site as a result of dust emissions from construction activities. The major sources of dust emissions during construction are: grading, excavation and earthworks; loading/unloading, handling, storage and transport of materials or wastes; and vehicle movements. These impacts are not considered significant because the nearest potential sensitive receptor is 2.5 kilometers from the project site. Dust suppression measures will be implemented, as identified in the EIA, including: suspending earthworks in high winds, covering payloads, appropriate storage of loose friable materials, covering excavated piles and watering using collected rainwater and construction wastewater.

**Noise:** During construction, the major noise sources include vehicles and machinery. Noise impacts are not expected to be significant, is expected to exceed national standards up to 40 meters from the site. During project operation, noise sources include production equipment and pumps. This impact is not considered significant during construction or operation because the nearest potential sensitive receptor is 2.5 kilometers from the project site. The EIA has identified the following measures to reduce noise impacts: use of low-noise equipment and shields; use of sound insulating materials for walls; and mounting equipment in the workshop on shock absorption bases. The ESMP shall incorporate best practices consistent with WBG EHS Guidelines for noise attenuation and monitoring during construction and operation.

#### PS6: Biodiversity and Resource Management

Significant impacts on marine resources are not expected in the construction or operation of the proposed project. The plant will intake 126,000 cubic meters of seawater daily through an intake in No. 1 Basin Wharf. An air burst system will be used to backwash the intake screens and remove any biota that may have attached. Although 76,000 cubic meters of wastewater will be generated daily, only 1.9 cubic meters per day has the potential to be released into the sea, but only after pre-treatment from project enterprise

and final treatment at a wastewater treatment plant. The 76,000 cubic meters per day of concentrated brine will be discharged into evaporation ponds at an existing salt field.

#### **F. Environmental Permitting Process and Community Engagement**

The EIA for the proposed project was reviewed and approved by the Hebei Environmental Protection Bureau in November 2008. This plant is located on an island designated as an industrial zone. Seawater desalination is an industry that has been officially promoted by the Caofeidian Industrial Zone, with information available to the public on the municipal governments' web site.

#### **G. Availability of Documentation**

The [\*Construction Project Environmental Impact Assessment Report\*](#) (November 2008) has been disclosed as an attachment to this ESRS. The final ESMP will be disclosed by MIGA and the project sponsor when available. Disclosure of this document by MIGA will not restart the 30 day disclosure period.