



# **CERTIFICATION AND FINANCING PROPOSAL**

## **DESALINATION PLANT IN SAN QUINTÍN, BAJA CALIFORNIA**

*Submitted: October 30, 2017*



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## DESALINATION PLANT IN SAN QUINTÍN, BAJA CALIFORNIA

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## EXECUTIVE SUMMARY

### DESALINATION PLANT IN SAN QUINTÍN, BAJA CALIFORNIA

- Project:** The proposed project consists of the design, construction and operation of a desalination plant with a production capacity of 250 liters per second (lps) or 5.7 million gallons per day (mgd) (the “Project”). The Project includes an arrangement of seven wells for seawater intake (6 for operation, 1 reserve), an 8.4-kilometer (5.22-mile) seawater pipeline, a 2.44-kilometer (1.51-mile) brine discharge pipeline, a 1.74-km (1.08-mile) desalinated water transmission line, a 2,000-cubic-meter (528,344-gallon) master tank, approximately an 11-km (6.9-mile) power line and two electric substations in San Quintín, Ensenada, Baja California.
- The Project will be implemented under a public-private partnership (PPP), and the drinking water produced by the Project will be supplied for public use in the San Quintín Valley.
- Project Objective:** The purpose of the Project is to increase access to reliable drinking water service through the development of an additional water supply source in compliance with applicable quality standards for drinking water, contributing to the preservation of human health.
- Expected Project Outcomes:** The outcomes as a result of the Project include supplying a reliable drinking water supply of 250 lps (5.7 mgd) in compliance with drinking water quality standards.
- Population to Benefit:** Approximately 86,414 residents of the San Quintín Valley.<sup>1</sup>
- Sponsor:** Desaladora Kenton, S.A. de C.V. (DK or the “PPP Contractor”), the special-purpose vehicle created by the consortium formed by Libra Ingenieros Civiles, S.A. de C.V., RWL Water, LLC and R.J. Ingeniería, S.A. de C.V., which was awarded a PPP contract for the design, construction, financing and operation of the Project (“the PPP Contract”) by the state water commission, (CEA).
- Borrower:** Desaladora Kenton, S.A. de C.V.

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<sup>1</sup> Source: Baja California State Government.  
2019 Assistance Program for the San Quintín Region).

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**Project Cost:** \$ 875.35 million pesos (US\$ 48.20 million).<sup>2</sup>

**NADB Loan Amount:** Up to US\$36.61 million or its equivalent in Mexican pesos (\$664.77 million pesos).

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<sup>2</sup> Unless otherwise noted, all U.S. dollar figures are quoted at an exchange rate of \$18.16 pesos to the dollar for September 29, 2017 according to Mexico's Central Bank, Banco de México.

# CERTIFICATION AND FINANCING PROPOSAL

## DESALINATION PLANT IN SAN QUINTIN, BAJA CALIFORNIA

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### 1. ELIGIBILITY

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#### ***Project Type***

The Project falls in the category of drinking water.

#### ***Project Location***

The Project is located in the San Quintín Valley in the municipality of Ensenada, Baja California and within 300 kilometers of the U.S.-Mexico border. The desalination plant will be built approximately 232 km (144.2 miles) south of the border.

#### ***Project Sponsor and Legal Authority***

The Project sponsor is the special-purpose company, Desaladora Kenton, S.A. de C.V. (DK or the “Sponsor” or the “PPP Contractor” or the “Borrower”), which was created by the consortium formed by Libra Ingenieros Civiles, S.A. de C.V., RWL Water, LLC and R.J. Ingeniería, S.A. de C.V. On September 28, 2015, the consortium was awarded the public-private partnership agreement for the construction, financing and operation of the Project (the “PPP Contract”) by the state water commission, (CEA) through a competitive bidding process.<sup>3</sup> DK is a Mexican company established on December 18, 2015. Its contact representative is Manuel Paredes.

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<sup>3</sup> Contract award following a procurement process carried out by the State of Baja California under the Public-Private Partnership Law. <http://www-2.baja.gob.mx/apps/comnetbc.nsf/3a679c2bb1506634882570af005bef43/38b8e4dbe648a41d88257e700066cf4a?OpenDocument&Highlight=0,desaladora>

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## 2. CERTIFICATION CRITERIA

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### 2.1. TECHNICAL CRITERIA

#### 2.1.1. Project Description

##### Geographic Location

The Project will be developed in the community of San Quintín in the municipality of Ensenada, Baja California. The desalination plant will be constructed on a 1.25-hectare (3.1-acre) site, roughly centered at the following coordinates: latitude 30°31'45.91" north and longitude 116°02'15.78" west. The delivery point (master tank) will be located 8.5 kilometers west of the community of San Quintín at approximately latitude 30°31'40.69" north and longitude 116°01'12.75" west. Figure 1, below, shows the approximate geographical location of the Project.

**Figure 1**  
**PROJECT VICINITY MAP**



##### General Profile of the Region

The Project is expected to benefit the communities in San Quintín Valley, which includes Camalú, Colonia Lomas de San Ramón, Colonia Nueva Era, Ejido el Papalote, Emiliano Zapata, Lázaro Cárdenas, San Quintín, Vicente Guerrero and other smaller communities. Figure 2 shows the region benefitted.

**Figure 2**  
**BENEFITTED COMMUNITIES**



The region is divided into three delegations known as San Quintín, Camalú and Vicente Guerrero (the San Quintín Area). In 2015, the estimated population of the San Quintín Area, was 86,414, which represents 17.7% of the municipality's total population.<sup>4</sup> The population is expected to grow to 124,749 by 2037.

The San Quintín Area is one of the most economically dynamic zones in Baja California because of its agriculture industry, which uses state-of-the-art irrigation systems due to water scarcity. As reported by the Baja California State Government, in 2010, approximately 34.17% of the economically active population in San Quintín worked in the agricultural sector.<sup>5</sup>

The Ensenada water utility, (CESPE), is responsible for providing water and wastewater services in the municipality, including the San Quintín Valley. The following table summarizes the status of water and wastewater infrastructure in the valley.

<sup>4</sup> Source: Ensenada water utility,

(CESPE).

<sup>5</sup> Source: State of Baja California Government, 2019 Assistance Program for the San Quintín Region).

(2015-

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There are no fresh water bodies in the region. The only available source of fresh surface water is the Colorado River, located approximately 168 miles northeast of the San Quintín region. Water from this source would require extensive pumping, as well as additional concessions for its use.

As a result, the water supply is insufficient to meet residential demand in the region, which is approximately 208 liters/second (lps) or 4.75 million gallons a day (mgd).<sup>8</sup> The water distribution system currently supplies 62 lps (1.42 mgd), without prior treatment other than chlorination. It is estimated that an average of 37 lps (0.84 mgd) is supplied by truck.

**Table 2**  
**WATER SUPPLIED BY TRUCKS IN THE SAN QUINTIN VALLEY**

Community	% of population served by trucks
Camalú	4.0%
Licenciado Gustavo Díaz Ordaz	18.0%
Lázaro Cárdenas	89.0%
Vicente Guerrero	48.0%
San Quintín	7.0%
Poblado Héroes de Chapultepec	100.0%
La Providencia	37.0%
Emiliano Zapata	36.0%
Ejido Papalote	84.0%
Colonia Nueva Era	10.0%
Colonia Lomas de San Ramón (Triquis)	19.0%
Luis Rodríguez (El Vergel)	100.0%
Santa María (Los Pinos)	100.0%
Other communities	100.0%

Source: Libra Ingenieros Civiles, S.A. de C.V. Estudio de Rentabilidad Social.

As indicated in Table 2, there is high dependence on water supplied by trucks. Private trucks provide water at a cost of \$60 pesos per cubic meter. Water provided through the distribution system is \$6.47 pesos per cubic meter. In comparison, water supplied through the trucks is approximately eight times more expensive than that supplied through the distribution system and represents an economic burden on the population.<sup>9</sup> Furthermore, given the poor quality of these water sources, it is very likely that the population uses bottled water for its drinking water needs, which is even more expensive and represents an additional expense for household budgets.

According to CESPE, the drinking water distribution system covers only about 61% of the population. Moreover, the service is intermittent due to insufficient water availability, with the population receiving water an average of 13 hours/day. While a few communities have water

<sup>8</sup> Calculation based on 200 liters per capita a day for rural communities.

<sup>9</sup> Source: Libra Ingenieros Civiles, S.A. de C.V.,

(Study of Social Benefits).

service 24 hours a day, the majority receive water 12 hours/day or less, as shown in Table 3. Therefore, residents store water in plastic containers or underground tanks, which may also compromise water quality.<sup>10</sup>

**Table 3**  
**WATER RATIONING PERIODS IN THE SAN QUINTIN VALLEY**  
 (Hours/day)

Community	Water Supply
Díaz Ordaz	12
La Providencia	12
Camalú	12
Elpidio Berlanga	12
Vicente Guerrero 1	12
Vicente Guerrero 2	12
Graciano Sánchez	24
San Quintín	3
Las Flores	3
Popular San Quintín	3
Lázaro Cárdenas	6
Nueva Era	24
El Papalote 1	24
El Papalote 2	24
Leandro Valle	12
Francisco Villa	12

Source: CESPE. Interview with the CESPE Managing Director.

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The State of Baja California has recorded periods of severe drought in recent years. Low levels of precipitation make surface water scarce and prevent adequate recharge of the aquifers, which has led to their overexploitation. Consequently, the State of Baja California, CONAGUA and the communities have developed studies to assess water availability and have evaluated various water supply alternatives.

The 2008-2013 State Water Program proposed desalination as an option for supplying water in the coastal areas of the state and indicated that water rights from conventional surface water sources are insufficient to meet water demand or that the authorized volumes have been reached.

In 2008, the Municipal Research and Planning Institute of Ensenada (IMIP) developed a Comprehensive Water Plan for the Municipality of Ensenada. The plan analyzed water supply alternatives based on surface and groundwater availability, reuse, desalination and inter-basin water transfers. The plan concluded that surface water is not sufficient and that the aquifers are

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<sup>10</sup> Source: CESPE.

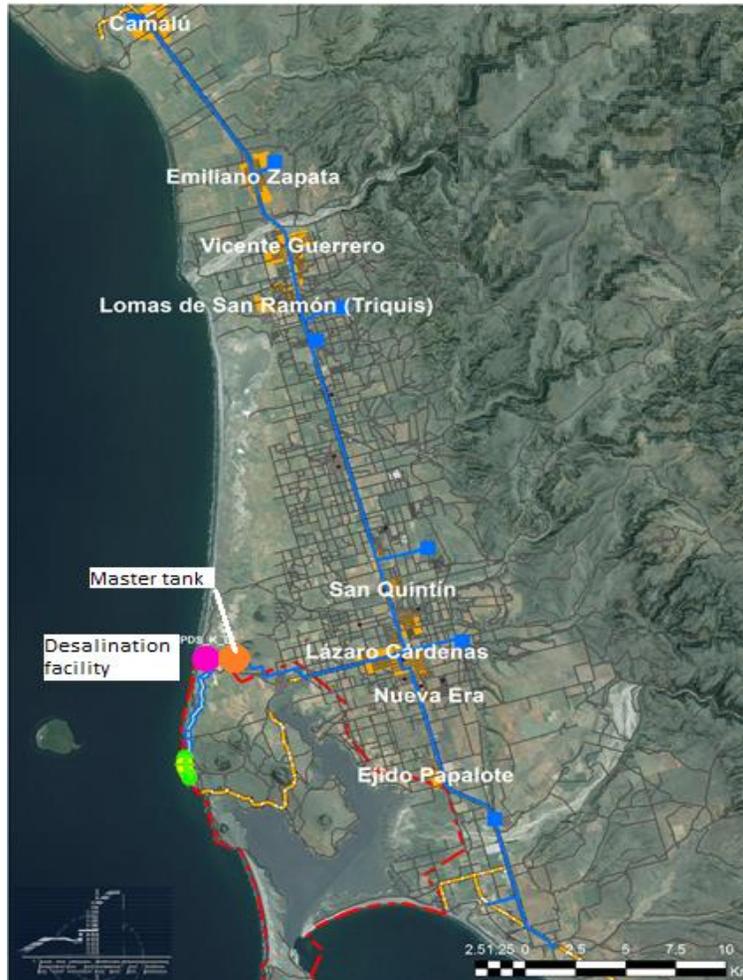
being depleted. Therefore, desalination and improved groundwater management are the alternatives to be implemented.

In March 2014, because of persistent drought and low water availability, the Government of Baja California declared a state of emergency in Ensenada and made the implementation of mitigation actions a priority to prevent potential negative impacts to human health and the environment. That same year, the State Government presented the 2013-2014 Strategic Plan, which included a project called the “San Quintín Water Plan,” for the construction of a desalination plant.<sup>11</sup>

The State of Baja California also presented the State Development Plan 2014-2019 (SDP), which was prepared with proposals and information from the government, panels of experts, and local residents, through workshops.<sup>12</sup> The SDP describes the projects needed to improve water and wastewater infrastructure in San Quintín, including this Project.

In 2015, the State Government presented the 2015-2019 Assistance Program for the San Quintín Region (PARSQ), which lists the projects to be developed in the region in the following years (with its associated costs), including the proposed desalination plant and other complementary actions not considered as part of this proposal , such as a regional distribution system with seven water tanks and 60 km (37.3 miles) of pipelines to distribute the water produced by the desalination plant.<sup>13</sup> The regional distribution system is in the initial

**Figure 3**  
**REGIONAL DISTRIBUTION SYSTEM**



According to CESPE, there is no wastewater collection and treatment infrastructure in the region. Approximately 42% of the population discharges wastewater into septic tanks and the rest into cesspools. The PARSQ considers the construction of three wastewater treatment plants (WWTP) in Camalú, San Quintín and Vicente Guerrero, respectively, which are expected to address the treatment needs of the region. According to CESPE, proposals from private companies are under evaluation to develop the WWTPs within two years. The PARSQ also includes the development of a wastewater system in the region.

CONAGUA has indicated that construction of the wastewater collection and treatment system is a priority for the federal government, and that its construction will follow the implementation of the desalination plant. Furthermore, according to CONAGUA, the procurement process is expected to begin no later than December 2017 for the development of a Master Water and wastewater Plan in Ensenada, Baja California. The plan will allow the Municipality to begin

preparing final designs to address its water and wastewater needs, including those in the area of San Quintín.

**Project Scope and Design**

The Project consists of the design, construction and operation of a desalination plant with a production capacity of 250 lps (5.7 mgd) in San Quintín, Baja California. The main components of the Project include:

- A series of seven (7) wells (6 for operation and 1 in reserve) for seawater intake, 60 meters deep and 150 meters apart from each other;
- An 8.4-kilometer (5.2-mile) seawater pipeline (24" in diameter);
- A 2.44-kilometer (1.51-mile) brine discharge pipeline (24" in diameter);
- A 1.74-kilometer (1.08-mile) desalinated water pipeline (24" in diameter);
- A master tank with a capacity of 2,000 cubic meters (0.52 million gallons) (delivery point),
- A power line extending approximately 11 km (6.9 miles); and
- Two substations for the desalination plant and the seawater pipeline.

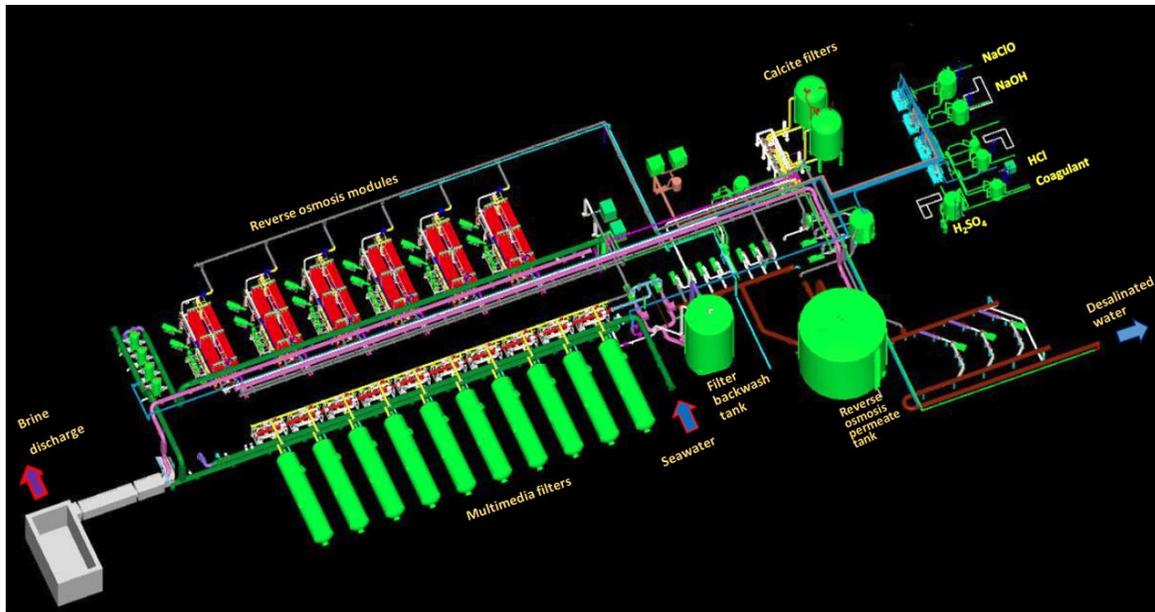
**Figure 4  
MAIN COMPONENTS OF THE PROJECT**



A total water flow of 600 lps (13.7 mgd) of seawater will be supplied by six wells. The seawater will be conveyed to the desalination plant through an 8.4 km (5.2-mile) pipeline for treatment through a reverse osmosis (RO) process, which will produce approximately 250 lps (5.6 mgd) of desalinated water. An estimated 350 lps (8.0 mgd) of reject water will be discharged into the Pacific Ocean through the 2.44-km (1.51-mile) brine discharge pipeline.<sup>14</sup> The desalinated water will be conveyed to the master tank through a 1.74 km (1.08 mile) pipeline for final storage and delivery to the distribution system. The Project will be connected to the regional distribution system described the previous section (Water Management Profile)

The desalination facility will be constructed on 1.25 hectares (3.1 acres) of land located approximately 10.2 km (6.3 miles) southwest of the community of San Quintín, Baja California. The technical requirements of the desalination plant were established in the bid documents published by the State of Baja California.<sup>15</sup> The general layout of the plant is shown in Figure 5.

**Figure 5**  
**PROJECT LAYOUT**



A 11-km (6.9-mile) power line will be connected to an existing power line of the Federal Electricity Commission (CFE) to convey energy to the plant and seawater pipeline substations. On January 30, 2017, the Sponsor submitted a request to CFE for the interconnection of the Project to an

<sup>14</sup> More details regarding discharge characteristics and authorization are provided in Section 2.2.2.

<sup>15</sup> Bid documents from the procurement process carried out under the Public Private Partnership Law by Baja California, <http://www-2.baja.gob.mx/apps/comnetbc.nsf/3a679c2bb1506634882570af005bef43/38b8e4dbe648a41d88257e700066cf4a?OpenDocument&Highlight=0,desaladora>

existing CFE power line near the Project site. On February 8, 2017, CFE issued two letters notifying the Sponsor that, based on the information submitted about the Project, the interconnection of the desalination plant and the water extraction infrastructure to the power grid was feasible. The related authorization is expected to be issued by November 2017.

According to the bid documents, the Sponsor is responsible for obtaining all necessary permits and authorizations (wells perforation, water extraction and discharge, construction, change of land use from the Municipality), as well as for designing, constructing, equipping, testing, operating and maintaining the Project over a 30-year period. CEA is assisting the Sponsor in obtaining the well perforation, water extraction and discharge permits. An application for these permits was submitted on April 18, 2017, and CONAGUA is expected to issue them by December 2017.

Construction activities are expected to begin in February 2018, and the plant will begin operations no later than October 2019. The following table shows the proposed schedule for Project implementation.

**Table 4  
 PROJECT MILESTONES**

<b>Key Milestones</b>	<b>Status</b>
PPP Contract signing	January 2016
Environmental authorization from SEMARNAT for the Project	Issued in March 2017
Temporary permits issued by SEMARNAT to conduct preliminary studies on federal land.	Issued in January 2017
Permits issued by SEMARNAT for construction and operation activities on federal land.	Pending
CONAGUA well perforation, water supply and discharge permits	In process
Land purchase for the desalination facility	Completed in October 2016
Rights of ways for the seawater, brine discharge, desalinated water pipelines and power line	In process
CFE power interconnection	In process
Authorization from INAH	Issued in August 2017
Commercial operation date	October 2019

CFE = Federal Electricity Commission; INAH= National Institute of Anthropology and History; SEMARNAT= Mexican Ministry of Environment and Natural Resources

NADB's procurement policies require that borrowers/sponsors use appropriate procurement methods to ensure a sound selection of goods, works and services at fair market prices and that their capital investments are made in a cost-effective manner. As part of its due-diligence process, NADB will review compliance with this policy.

## 2.1.2. Technical Feasibility

As previously mentioned, the Government of Baja California developed programs that evaluated and proposed the necessary infrastructure to address potable water needs in the region. Among the alternatives proposed is the San Quintín desalination plant aimed at increasing available water sources and meeting current and future demand.

### Selected Technology

The technology specified for the facility is reverse osmosis (RO).<sup>16</sup> CEA established requirements for the construction of the desalination plant aimed at guaranteeing a minimum flow of 250 lps of drinking water that complies with existing Mexican water quality standards. The bid evaluation process considered elements such as contract terms, warranties and delivery times. The Sponsor presented the most cost-effective proposal that complied with the bid evaluation criteria and selection requirements for contract award.

The Sponsor also performed a geological analysis to determine the best location to install the extraction wells. The best hydrogeological location for the extraction wells was determined to be within a protected area designated as a Ramsar site.<sup>17</sup> Therefore the Sponsor requested authorization from the Ministry of Environment and Natural Resources (SEMARNAT) and CONAGUA to conduct tests. As part of the environmental clearance, the Sponsor obtained authorization to install the wells, substation for seawater extraction and water conveyance line to the desalination plant within the Ramsar site. The remaining components of the infrastructure will be constructed outside the protected area.

The main components of the Project are described below.<sup>18</sup>

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- \_\_\_\_\_ . The Sponsor will drill seven seawater wells, 60 meters deep and with 32" diameters. Six wells will be in operation and one will be in reserve until required to substitute any operating well during maintenance activities.
  - \_\_\_\_\_ . A 24" pipeline will be installed to convey seawater to the desalination plant located 8.4 km (5.22 miles) north of the extraction infrastructure, outside the Ramsar site.
  - \_\_\_\_\_ . The seawater will pass through a reverse osmosis process to obtain 250 lps of desalinated water.
  - \_\_\_\_\_ A 24" pipeline extending 2.44 km (1.51 miles) will be installed to discharge 350 lps of reject water from the desalination process into the Pacific Ocean. The pipeline will be built along a system of dunes to avoid negative impacts.

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<sup>16</sup> Reverse osmosis involves forcing seawater through a semi-permeable membrane, while the salts, microorganisms and other impurities are retained in the form of a concentrated solution.

<sup>17</sup> Sites designated as Ramsar are protected under the Convention on Wetlands (Ramsar Convention) signed in Ramsar, Iran in 1971, which provides the framework for national action and international cooperation for the conservation and use of wetlands and their resources (<http://www.ramsar.org/>).

<sup>18</sup> Source: Environmental impact statement,

(MIA).

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- \_\_\_\_\_ . A 1.74-km (1.08 mile) pipeline with a diameter of 24" will be installed to convey water from the desalination plant to the master tank.
  - \_\_\_\_\_ . One pump station will be constructed with three pumps (131 kW each), which will operate continuously to guarantee water delivery to the master tank.
  - \_\_\_\_\_ . The tank will be built with a maximum capacity of 2,000 cubic meters (528,344 gallons) on a concrete base at an elevation of 65 meters above the sea level to store and deliver desalinated water to the regional water distribution system in the San Quintín Valley.

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- \_\_\_\_\_ . The 11-km (6.9-mile) transmission line for the desalination plant and wells will be interconnected with the existing CFE system in the San Quintín urban area.
  - \_\_\_\_\_ . The substation will have two transformers (34.5/0.48 kV) to supply energy to operate
  - \_\_\_\_\_ . A 34.5/0.48 V transformer mounted on a 10-meter (32.8-foot) high concrete pole will provide the energy required to operate the seawater intake infrastructure.

### 2.1.3. Land Acquisition and Right-of-way Requirements

The desalination plant will be constructed on 1.25 hectares (3.1 acres) of land owned by the Sponsor, who finalized the purchase of the site in October 2016. Some Project components, such as the seawater extraction infrastructure and a portion of the brine discharge pipeline, will be constructed on federal land, which requires authorization from SEMARNAT and/or CONAGUA. The necessary construction and operation permits are expected to be obtained by April 2018.

To determine hydrogeological conditions, the Sponsor submitted a request to CONAGUA to drill exploration wells on federal land and obtained authorization on November 9, 2015. On January 18, 2017, the Sponsor also obtained temporary permits from SEMARNAT to conduct investigative activities, such as soil studies.<sup>19</sup>

The Project requires permits from CONAGUA for the wells perforation, water extraction and water discharge. The permits were requested on April 18, 2017 and expected to be issued by the end of December 2017. The Project will require a land use change authorization from SEMARNAT. The Sponsor is currently preparing a technical support study, which is expected to be submitted to SEMARNAT by November 2017.

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<sup>19</sup> Permit Registry No. DFBC/SGPA/UEAC/113/2017 and No. DFBC/SGPA/UEAC/120/2017.

Rights of way for the seawater pipeline, desalinated water pipeline and power line are currently under negotiations with the private landowners and are expected to be secured no later than January 2018. A change of land use from the Municipality of Ensenada will be obtained prior to start construction activities.

As part of the due-diligence review, an independent consultant will review all legal documentation and information related to land ownership and rights of way that must be secured prior to loan disbursement.

#### **2.1.4. Management and Operations**

The Sponsor will be responsible for operating the system from the water intake to the delivery point, and CESPE will be responsible for water distribution. The consortium that will implement the Project is formed by Libra Ingenieros Civiles, S.A. de C.V., R.J. Ingeniería, S.A. de C.V. and RWL Water, LLC.<sup>20</sup> These companies have more than 20 years of experience in the design, construction and operation of large water supply and desalinization infrastructure projects round the world, including Mexico, Chile, Colombia, Australia, France, Cyprus and Dubai.

Libra Ingenieros Civiles, S.A. de C.V. specializes in water projects and has participated in joint strategic projects to support urban development in Mexico, including the construction of the first municipal desalination facility in Baja California Sur.

RWL Water, LLC Water is recognized as one of the fastest growing companies in the water industry in the world and has established joint ventures to expand operations. With more than 7,000 projects around the world, it has extensive experience in designing, building, and operating water treatment plants in full compliance with environmental regulations.

R.J. Ingeniería, S.A. de C.V. (RJ) provides construction services and has developed projects in Mexico for both the public and private sectors. RJ focuses primarily on commercial and industrial projects, providing design, planning and programming, general contracting and project management services.

The Sponsor has developed an Operation & Maintenance (O&M) Plan that is being evaluated as part of the due-diligence review. The plan specifies the tasks to be performed for regular equipment maintenance and optimum plant operation. The scope of the plan includes industry standard O&M management tasks, scheduled maintenance activities, reporting and keeping logs and records.

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<sup>20</sup> In May 2016, RWL Water LLC and Emefcy Group Limited announced a merger intended to create a global provider of innovative, decentralized water and wastewater treatment solutions for both municipal and industrial applications. More information: <https://www.rwlwater.com/emefcy-and-rwl-water-announce-binding-sale-and-purchase-agreement/>

## 2.2. ENVIRONMENTAL CRITERIA

### 2.2.1. Compliance with Applicable Environmental Laws and Regulations

#### **Applicable Laws and Regulations**

According to the Environmental Impact Assessment (MIA) Resolution issued by SEMARNAT for the desalination plant on March 30, 2017, the following laws and standards apply to the Project:

- \_\_\_\_\_ which establishes the environmental regulatory framework, expands the strategic vision, and conveys specific powers and duties to the states and municipalities, so that environmental problems can be addressed directly.
- \_\_\_\_\_, which establishes the maximum permissible levels of pollutants emitted from gasoline-fueled vehicles.
- \_\_\_\_\_, which establishes the maximum permissible levels of total hydrocarbons, non-methane hydrocarbons, carbon monoxide, nitrogen oxides, particulate matter and opacity emitted from diesel-fueled vehicles.
- \_\_\_\_\_, which establishes the maximum levels of exhaust fume opacity from diesel-fueled vehicles, as well as testing procedures and the technical characteristics of measurement equipment.
- \_\_\_\_\_, which establishes the characteristics, identification procedures and classification of hazardous solid waste, as well as a list of such materials.
- \_\_\_\_\_ which identifies and lists endangered species or clusters of wildlife in Mexico and establishes the criteria for inclusion, exclusion or change in risk status for different species, based on a method for assessing the risk of extinction.
- \_\_\_\_\_, which establishes the permissible quality levels and treatments for drinking water.

According to the LGEEPA provisions, when flora and fauna species designated as protected in the Mexican standard NOM-059-SEMARNAT-2010 are found at sites where projects are intended to be developed, SEMARNAT may require insurance to guaranty the conditions, the mitigation measures and programs established in the corresponding environmental authorizations are met or carried out.

#### **Environmental Studies and Compliance Activities**

In accordance with the environmental impact regulations established under the LGEEPA, the Sponsor prepared and submitted a MIA for the construction and operation of the Project in San Quintín, Baja California. The MIA was submitted on July 26, 2016 and identified, described and evaluated the potential environmental impacts associated with the Project, as well as the proposed mitigation measures to avoid or minimize any negative effects or impacts.

On March 30, 2017, SEMARNAT issued the MIA Resolution No. SGPA/DGIRA/DG/02393 authorizing the Project. The ruling included the main environmental impacts and the proposed mitigation measures that must be implemented by the Sponsor to minimize any potential negative effects. The main environmental impacts that could potentially occur include modifications to the dune system, impacts to sea life due to brine discharges and effects on the area known as San Quintín Bay, which is a designated Ramsar site. The seawater intake infrastructure and seawater pipeline will be constructed within the Ramsar site. Additional information on the mitigation measures and conditions included in the MIA Resolution is described in Section 2.2.2.

The legless lizard ( ), a protected species under Mexican standard NOM-059-SEMARNAT-2010, may be present in the Project site. Therefore, in the MIA resolution, SEMARNAT is requiring that the Sponsor prepare a Technical-Economic Study to determine the amount of the guaranty or insurance required to ensure compliance with the mitigation measures for wildlife. If the mitigation measures specified in the MIA and its resolution are not implemented, the guaranty will be enforced.

On August 9, 2017, the Sponsor submitted to SEMARNAT a modification to the original scope of the Project to add one more well (for a total of seven wells) and two tanks to change the flow regime. On September 6, 2017, SEMARNAT issued Authorization No. SGPA/DGIRA/DG/06643 for the Project modification, which also includes the submittal of the Technical-Economic Study described above and the environmental programs described below in the section on as conditions of the MIA Resolution.

The Mexican National Institute of Anthropology and History (INAH) conducted two site visits to verify the presence of archaeological and paleontological features in the Project site. INAH confirmed the presence of recorded archaeological features and artifacts requiring proper cataloging and protection activities prior to initiating any construction activity. In November 2016, INAH and the Sponsor signed an agreement to perform the activities required to safeguard the archaeological sites identified on the land owned by the Sponsor. Work started on April 10, 2017 and was completed on July 14, 2017. INAH issued an authorization for the construction of the Project on August 2, 2017.

The Sponsor developed a Geological Study to determine the location of wells for seawater extraction based on subsurface characteristics. The study recommended drilling an exploratory well to confirm water availability at the proposed site. In November 2015, the Sponsor obtained Permit No. B00.2.216 issued by CONAGUA for the exploratory well. The results of the exploratory activities confirmed the feasibility of drilling the extraction wells at the selected site. The study was also reviewed by CONAGUA.

#### **Compliance Documentation**

- Environmental Impact Statement (MIA) for the Project submitted to SEMARNAT.
- MIA Resolution No. SGPA/DGIRA/DG/02393 issued by SEMARNAT for the Project.

- Temporary Permits No. DFBC/SGPA/UEAC/113/2017 and No. DFBC/SGPA/UEAC/120/2017 to conduct investigative activities on federal land, issued by the SEMARNAT Delegation in Baja California.
- Authorization No. SGPA/DGIRA/DG/06643 issued by SEMARNAT regarding the Project modifications.
- Authorization Letter No. 401.2C.6.2017/64 issued by INAH.

### **Pending Environmental Tasks and Authorizations**

The following environmental authorizations are pending:

- Wells perforation, extraction and discharge permits from CONAGUA.
- SEMARNAT permits for construction and operation activities on federal land.

All environmental authorizations must be secured prior to loan disbursement.

## **2.2.2. Environmental Effects / Impacts**

### **Existing Conditions and Project Impact – Environment**

Water in the San Quintin Valley is currently supplied by four aquifers that are insufficient to meet demand, are being depleted by over-pumping and have experienced seawater intrusion. The need to provide a reliable water supply for the San Quintín Valley is a priority. An acceptable desalination plant is expected to meet environmental regulations and be cost-effective in terms of construction, operation and management, as well as those associated with monitoring and permit fees.

The main environmental concerns include issues related to the location of the desalination plant and water intake structures, concentrate management and disposal, solid waste generation from maintenance, and potential effects during the construction activities. Potential minor impacts associated to the Project are anticipated during the construction process, including deterioration of landscape features, impacts to the dune system, noise and pollutant emissions from motor vehicles, earthworks and building machinery. Some minor impacts during operation are also expected, such as the modification of the landscape and effects to marine life due to brine discharge.

As part of the environmental review, SEMARNAT evaluated the MIA. In addition to implementing the mitigation measures proposed in the MIA, SEMARNAT also required certain changes to project design and other actions that must be met for the construction and operation of the plant. For example, in order to preserve the original conditions of the dune system, the alignment of the brine discharge pipeline must avoid the dunes.

As part of the MIA, the Sponsor conducted a study to estimate the final salinity levels of the ocean as a result of the brine discharges from the desalination plant. The salinity level of the brine is estimated to be 65 parts per thousand upon discharge from the plant. As soon as the brine is dispersed into the ocean, the average salinity at a distance of 200 meters from the discharge point

was estimated at 36 parts per thousand. The salinity levels beyond 200 meters is estimated to be the same as that measured in the ocean (34 parts per thousand). This process of salinity dilution minimizes potential ecological impacts. The Sponsor will also implement a program to monitor the conditions of marine life.

Additionally, CEA required the Sponsor to change the location of the desalination facility, which was originally within a Ramsar site. The desalination facility will be constructed outside the Ramsar site as required. SEMARNAT authorized the Project and determined that the components within the Ramsar site are compatible provided that mitigation measures are implemented.

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During the construction and operation of the Project, measures will be implemented to mitigate the temporary effects of construction, as well as to minimize negative impacts during operation. The following mitigation measures and programs are included in the MIA and the authorizations:

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  - Water will be sprayed on roads and removed soil to avoid particulate matter emission.
  - Existing roads will be covered with gravel to minimize dust emission.
  - Any material transported in trucks will be covered.
  - Perform vehicle and heavy machinery tune ups to reduce emissions.
  
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  - The Sponsor will carry out the activities necessary for managing the solid waste in compliance with Mexican standard NOM-061-SEMARNAT-2011 throughout the life cycle of the Project.
  - A specialized contractor will manage the solid waste.
  
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  - During the life cycle of the Project, the Sponsor will ensure proper separation, handling and disposal of solid and liquid waste in compliance with the provisions of Mexican standard NOM-052-SEMARNAT-2005.
  - A specialized company will dispose of hazardous waste in accordance with the applicable regulations.
  
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  - Prior to performing ground disturbing activities, the Sponsor will relocate species listed in the NOM-059-SEMARNAT-2010 to a site with similar conditions.
  - The Sponsor prepared a Reforestation Program that includes native species so as to integrate the completed Project into the landscape.

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  - A Wildlife Rescue Program was prepared and will be implemented to protect species present in the site.
  - Wildlife species will be relocated to areas with similar conditions, which will be determined by specialized biologists.
  - The Sponsor will keep records of critical areas within the Project site as well as rescued and relocated species.
  - Relocation of species will be performed with support of specialists from the Federal Attorney's Office for Environmental Protection (PROFEPA).<sup>21</sup>
- \_\_\_\_\_: A Program for Monitoring Brine Discharges into the Ocean and its Effects was prepared to monitor conditions for marine life.
- \_\_\_\_\_: The Sponsor prepared a Dune Restoration Program to preserve the system.
- \_\_\_\_\_
  - Vehicles and heavy machinery will be maintained in optimal operating conditions to keep low noise levels pursuant to the Mexican standard NOM-081-SEMARNAT-1994.
  - Physical barriers will be installed in critical areas to minimize noise.
  - A noise monitoring program will be implemented.
- \_\_\_\_\_
  - The Sponsor prepared an Environmental Contingency Prevention, Mitigation and Management Program, which includes an estimate of greenhouse gases emissions, as well as the potential impact of climate change and natural disasters on the Project.
  - An Environmental Management Program was prepared and submitted to SEMARNAT.

As a condition for loan disbursement, NADB includes compliance with the requirements established by the regulatory agencies, including SEMARNAT. Disbursement conditions are reviewed by NADB and independent parties.

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The objective of the Project is to increase access to reliable drinking water service through the development of an alternative water supply source. Having an alternative water source provides an important benefit in conserving natural resources, since the aquifers that supply water to the region are being depleted by over-pumping.

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<sup>21</sup>

(PROFEPA).

As previously mentioned, to avoid impacts to the dune system, the Sponsor modified the alignment of the brine discharge pipeline to go around the dunes. The water extraction infrastructure will be constructed within the Ramsar site. The MIA clearance determined that the Project is compatible with the Ramsar site conditions provided that the proposed mitigation measures are implemented to minimize negative impacts to the environmental setting.

The Sponsor is also preparing several programs: a Monitoring Program for Brine Discharges into the Ocean and its Effects; a Dune Restoration Program; an Environmental Contingency Prevention, Mitigation and Management Program; a Reforestation Program; an Environmental Management Program; and a Wildlife Rescue Program. The programs will be implemented to minimize any negative environmental effects as required by the ruling.

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The no-action alternative was not considered viable since water sources in the San Quintín Valley are scarce, and no fresh water from underground or surface sources is available. The communities are vulnerable to water shortages, which pose a health risk in the region.

***Existing Conditions and Project Impact – Health***

Water scarcity in the San Quintín Valley also signifies negative impacts to human health and productivity. As explained previously, the aquifers are being depleted by over-pumping, which has allowed seawater intrusion. According to CONAGUA, the salinity levels of the water ranges from 3,000 to 15,000 ppm, while the limit permitted by Mexican standard NOM-127-SSA1-1994 is 1,000 ppm. Drinking water typically contains less than 20 ppm of sodium salt, although this concentration may be exceeded in some water systems. Sodium may affect the taste of drinking water at levels above 200 ppm; however, based on available data, no conclusions can be drawn concerning the association between sodium in drinking-water and the occurrence of health-related concerns such as hypertension.<sup>22</sup>

Moreover, CESPE supplies water to only about 61% of the population through its distribution system, while the remainder rely on trucked water. However, due to insufficient water availability, CESPE's service is intermittent with many customers receiving water an average of 13 hours/day. Intermittent service can compromise water quality in the distribution system through cross-contamination from backflows and filtration through line joints or cracks, while periods of low pressure and stagnation can promote microbial growth in the lines. Many households rely on tanks and plastic containers to store water for use when the system is shutoff or for water delivered by truck. These receptacles may also be subject to contamination and microbial proliferation if not properly maintained.

Based on the cost-benefit study developed by the Sponsor, it is estimated that approximately 24,309 residents per year are affected by gastrointestinal diseases that could be related to water scarcity or water pollution. The total estimated cost to address gastrointestinal diseases in the population is \$11.9 million pesos/year, as shown in Table 5.<sup>23</sup>

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<sup>22</sup> Source: World Health Organization.  
[http://www.who.int/water\\_sanitation\\_health/dwg/chemicals/sodium.pdf](http://www.who.int/water_sanitation_health/dwg/chemicals/sodium.pdf)

<sup>23</sup> Source: Libra Ingenieros Civiles, S.A. de C.V.

**Table 5**  
**ESTIMATED POPULATION AFFECTED BY GASTROINTESTINAL DISEASES**

Type of Population	Affected Population	Labor Costs (Pesos/hab-year)	Medical Costs (Pesos/hab-year)	Total Costs (Pesos/year)
Laborer	4,606	\$ 289.16	\$ 351.46	\$ 2,950,095
Non-laborer, economically active population	5,438	385.55	351.46	4,007,860
Remaining population	14,265	–	351.46	5,013,576
<b>TOTAL</b>				<b>\$11,971,531</b>

Source: CESPE. Libra Ingenieros Civiles, S.A. de C.V. Estudio de Rentabilidad Social.

Inadequate water quality and low availability in Valle de San Quintín has motivated the utility to develop additional water sources to address demands in the region. The Project will provide access to a reliable water source that will comply with the applicable quality standard for human consumption.

**Transboundary Effects**

No negative transboundary impacts are anticipated because of the implementation of the Project.

**Other Local Benefits**

The Project will promote the social and economic development of the San Quintín Valley in Baja California. During construction, the Project is expected to generate 50 temporary jobs during construction and 23 permanent jobs during operation. Employment of construction personnel will provide a temporary beneficial impact on local businesses and the regional economy through increased expenditure of wages for goods and services. Local personnel for construction would be considered to the extent feasible.

**2.3. FINANCIAL CRITERIA**

The NADB’s participation in the financing of the Project will be through a loan in pesos of worth up to \$664.77 million that will complement the equity financing required to fund the Project’s 20-month construction period.

The repayment source for the NADB loan will come from CEA’s monthly revenue derived from the Water Delivery Agreement (WDA) contracted with CESPE. Administration and Payment Trust No. 18325 was formalized by DK with Banco del Bajío (Trust) will serve as the loan payment mechanism for the NADB loan in accordance with the Contract. The amounts pledged by DK to the Trust will cover the Project’s debt service and the company’s return on investment (T1), fixed operation and maintenance costs (T2), and variable operation costs (T3). DK will bill CEA for an amount equal to T1+T2+T3 on a monthly basis. CEA’s obligations deriving from the Contract will

be guaranteed by a CESPE contingent and revolving line of credit (CRLC) provided by a commercial or development bank. The rights to execute the CRLC, which is backed by the State of Baja California through a pledge of a percentage of its payroll tax (Guaranty Mechanism), will be transferred to the Administration and Payment Trust. In the event that CESPE revenues are insufficient or unavailable, the Administration and Payment Trust will repay the Project loan automatically by executing the CRLC, thus ensuring that payments are made in full and timely manner.

NADB performed a financial analysis of CESPE and the Guaranty Mechanism. The cash flow projections indicate that CESPE can undertake the financial obligations under the WDA which mirror CEA's obligations with DK under the service Contract. However, the analysis reveals that CESPE needs to improve its operating results by increasing its service revenue and keeping operating costs growth levels significantly below revenue growth; otherwise, the contingent and revolving line of credit may be executed by the Trustee in order to cover the WDA monthly obligations with CEA. According to FitchRatings, CESPE BBB (mx) Rating indicates good credit quality which is supported by CESPE's low indebtedness. The Rating also coincides with the findings of the historical financial analysis which show that CESPE presents limited financial flexibility with good operational indicators.

Considering the Project's characteristics and based on the foregoing financial and risk analysis, the proposed Project is financially feasible and presents an acceptable level of risk. Therefore, NADB proposes providing a market-rate loan in pesos for up to \$664.77 million to Desaladora Kenton, S.A. de C.V.

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### **3. PUBLIC ACCESS TO INFORMATION**

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#### **3.1. PUBLIC CONSULTATION**

BECC released the Draft Project Certification and Financing Proposal for a 30-day public comment period beginning on May 12, 2017. The following Project documentation was made available upon request:

- (MIA) for the desalination plant submitted to SEMARNAT.
- MIA Resolution No. SGPA/DGIRA/DG/02393 issued by SEMARNAT for the desalination plant.

The public comment period ended on June 11, 2017 with no comments received.

#### **3.2. OUTREACH ACTIVITIES**

In November 2015, CEA initiated a competitive bidding process for the construction, financing and operation of the Project under a public-private partnership agreement. The process included

several meetings where the participants could clarify doubts and provide comments. The Project contract was awarded on September 28, 2015. The Baja California State Government made all bidding documents available on its website.<sup>24</sup>

As part of the environmental authorization process, on September 15, 2016, SEMARNAT published the request for environmental authorization of the desalination plant and the aqueduct in its weekly publication ( ).<sup>25</sup> Under the law, any private citizen can request access to information or a public consultation. According to the MIA resolution, there were nine requests for a public consultation, which was held from October 25, 2016 to November 23, 2016.<sup>26</sup> During this period, the community provided comments related to the Project, such as the development of studies to assess impact of Project operation on sea life and the seabed. The programs to be developed by the Sponsor as part of the requirements under the MIA Resolution, already address this topic. In accordance with the applicable environmental regulations and the information presented by the Sponsor, SEMARNAT determined that the proposed mitigation measures by the Sponsor are feasible and must be implemented. Additionally, on October 31, 2016, the Sponsor published an extract of the MIA under review by SEMARNAT in the local newspaper, .

BECC conducted a media search to assess potential public opinion about the Project. References to the Project were found on several Internet sites, such as and . These articles can be found at the following links:

- \_\_\_\_\_ (June 25, 2015) “ (Desalination plant to be built in San Quintín)  
<http://www.frontera.info/EdicionLinea/Notas/Noticias/25062015/984053-Instalacion-desaladora-en-San-Quintin.html>
- \_\_\_\_\_ (June 25, 2015) “ (Bidding underway to build a desalination plant in San Quintín)  
<http://www.sandiegored.com/noticias/64878/Comienza-licitacion-para-construir-planta-desaladora-en-San-Quintin/>
- \_\_\_\_\_ (March 6, 2016) “ (Construction begins on desalination plant in San Quintín)  
<http://www.plexmx.info/2016/03/06/inicia-construccion-de-la-desalinizadora-de-san-quintin/>
- \_\_\_\_\_ (March 6, 2016) “ (Construction begins on desalination plant in San Quintín)  
<http://sanquintinaldia.com/uncategorized/inicia-construccion-de-planta-desalinizadora-en-san-quintin/>

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<sup>24</sup> Source: Procurement process under the Public Private Partnership Law in Baja California. Bidding documents available at: <http://www-baja.gob.mx/apps/comnetbc.nsf/3cdc6c4f759fe0bc88256e7c000608da/35e0bb6866f074da88257ef60000786b>

<sup>25</sup> Source: SEMARNAT, [http://sinat.semarnat.gob.mx/Gacetatas/archivos2016/gaceta\\_47-16.pdf](http://sinat.semarnat.gob.mx/Gacetatas/archivos2016/gaceta_47-16.pdf)

<sup>26</sup> Source: SEMARNAT, [http://sinat.semarnat.gob.mx/Gacetatas/archivos2016/gaceta\\_55-16.pdf](http://sinat.semarnat.gob.mx/Gacetatas/archivos2016/gaceta_55-16.pdf)

- \_\_\_\_\_(September 22, 2016) “  
(Desalination plant under construction in San Quintín)  
<http://eleconomista.com.mx/estados/baja-california/2016/09/22/construyen-desalinizadora-san-quintin>
- \_\_\_\_\_(March 6, 2016) “  
(Construction begins on desalination plant in San Quintín)  
<http://www.elvigia.net/general/2016/3/6/inicia-construccion-desaladora-quintin-229345.html>
- \_\_\_\_\_(February 17, 2017) “ (CESPE reports on construction progress)  
<http://www.elvigia.net/el-valle/2017/2/17/informa-cespe-avances-obras-264143.html>
- \_\_\_\_\_(February 21, 2017) “  
(CONAGUA to fund water distribution system)  
<http://www.elvigia.net/el-valle/2017/2/21/usara-hidraulica-recursos-conagua-264500.html>
- \_\_\_\_\_(March 28, 2017) “ (Aquifers in the south are depleted)  
<http://www.elvigia.net/el-valle/2017/3/28/agotados-mantos-acuiferos-zona-267534.html>

In summary, these publications highlight the scope of the Project and the regional distribution system administered by CEA. Opposition to the Project was not detected from the available media coverage.

The Project Sponsor has met all public consultation requirements in order to comply with applicable environmental clearance and permitting processes.