CERTIFICATION AND FINANCING PROPOSAL

REHABILITATION AND UPGRADE OF THE WASTEWATER TREATMENT PLANTS IN CHIHUAHUA, CHIHUAHUA

Revised: October 28, 2019
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EXECUTIVE SUMMARY

REHABILITATION AND UPGRADE OF THE WASTEWATER TREATMENT PLANTS IN CHIHUAHUA, CHIHUAHUA

Project: The proposed project consists of (i) rehabilitating and upgrading the North and South Wastewater Treatment Plants (WWTPs), which together will treat an average flow of 2,375 liters per second (lps) or 54.2 million gallons per day (mgd) in the city of Chihuahua, and (ii) designing, installing, operating and maintaining a cogeneration power facility in the South WWTP (together, the “Project”).\(^1\) The Project will be carried out under an 11-year build-operate-transfer agreement (the “BOT Contract”).\(^2\)

The equipment at both plants has reached the end of its useful life, and a major upgrade is required to ensure that the plants continue to meet environmental and reuse requirements.

Objective: The main purpose of the Project is to:

1. Continue providing adequate and sustainable wastewater treatment services in compliance with current environmental and reuse requirements.

2. Produce electricity through cogeneration using the biogas from the sludge to reduce power consumption from conventional fossil fuel sources, which will contribute to the reduction of greenhouse gas emissions.

3. Support increased reuse of treated wastewater for irrigation and industry, by providing more consistent and reliable effluent quality.

Expected Project Outcomes: The estimated environmental and human health benefits from rehabilitating and upgrading both WWTPs and installing 1.25 MW of renewable energy generation capacity are:\(^3\)

- Adequately treat a current average flow of 1,750 lps (39.95 mgd) of wastewater in compliance with the applicable federal standards and be prepared to treat future flows of up to 2,375 lps (54.2 mgd), thus reducing the risk of inadequately treated discharges.

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\(^1\) Currently, the North and South WWTPs treat 1,750 lps (39.9 mgd) of wastewater. This project will provide 625 lps (14.3 mgd) in additional treatment capacity to address future treatment requirements.

\(^2\) The agreement covers one year for investment and 10 years for operation.

\(^3\) Final generation capacity will be determined during final design of the cogeneration facility.
• Reduce the volume of sludge, from approximately 65,700 m³ per year (85,932 yds³ /year) to approximately 43,800 m³ per year (57,288 yds³ /year).

• Generate 8.52 gigawatt-hours (GWh)/year of electricity, which will offset the energy consumed from the public grid by the South WWTP and thus help prevent the emission of approximately 9,583 metric tons/year of carbon dioxide (CO₂), 6 metric tons/year of nitrogen oxides (NOx) and 7 metric tons/year of sulfur dioxide (SO₂).4

Population to Benefit: 809,232 residents of the city of Chihuahua.5

Sponsor: Aguas de Reúso y Energía Renovable, S.A. de C.V. (ARERSA or the “BOT Contractor), the special-purpose company created by the consortium formed by La Peninsular Compañía Constructora, S.A. de C.V., Suez Medio Ambiente México, S.A. de C.V., Suez International, S.A.S., and Grupo Acuanovus, S.A. de C.V., which was awarded the BOT Contract by the municipal water utility, Junta Municipal de Agua y Saneamiento de Chihuahua (JIMAS).

Borrower: ARERSA.

Project Cost: $292.4 million pesos (US$14.7 million).6

NADB Loan: Up to $223.4 million pesos (US$11.2 million).

• Tranche A: Up to $159.7 million pesos (US$8.0 million); and

• Tranche B: Up to $63.7 million (US$3.2 million).

4 Source: NADB. CO₂, NOx and SO₂ calculations are based on the potential emissions avoided as a result of reducing the future consumption of electricity from conventional fossil fuel-based generation, through cogeneration equivalent to 8.52 GWh/year and the emission factors for the state of Chihuahua. The emission factors are calculated based on the power generation portfolio of the state of Chihuahua and on the factors reported per technology in the 2018 Mexican National Power System Development Program (PRODESEN).

5 Source: Based on the total number of residential wastewater connections as indicated in the JMAS report, Programa de Indicadores de Gestión de Organismos Operadores [Water Utility Management Indicator Program], June 2019.

6 Unless otherwise noted, all U.S. dollar figures are quoted at an exchange rate of $19.90 pesos per dollar, according to Bloomberg.com on August 26, 2019.
In the event of early termination of the BOT Contract for any cause, where by the BOT Contractor would be obligated to remove the cogeneration equipment from the South WWTP and reimburse JMAS for all payments made as of the date of termination, the remaining balance of the T1 proceeds, once the debt service of Tranche A has been paid, will be used to cover the debt service payments of Tranche B. If the remaining balance is not sufficient to cover the debt service payments of Tranche B, the cogeneration equipment will be sold at its salvage value and the sale proceeds will be applied to the outstanding balance of Tranche B.

### Uses and Sources of Funds:

#### (Millions of pesos)

<table>
<thead>
<tr>
<th>Uses</th>
<th>Amount*</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical costs**</td>
<td>$231.1</td>
<td>79.0</td>
</tr>
<tr>
<td>Financial and administrative costs***</td>
<td>$61.3</td>
<td>21.0</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$292.4</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sources</th>
<th>Amount</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>NADB loan</td>
<td>$223.4</td>
<td>76.4</td>
</tr>
<tr>
<td>BOT Contractor equity</td>
<td>$69.0</td>
<td>23.6</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$292.4</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

* March 2019 figures have been adjusted for inflation by NADB, as agreed under the BOT Contract.

** Includes design, construction, equipment and other related costs.

*** Includes capitalized interest, value-added-taxes (VAT), trust fees and other related financial expenses.

### Repayment Period:

**Tranche A**: Up to one hundred thirty-two (132) months, including a sixteen (16) month grace period on principal payments.

**Tranche B**: Up to one hundred twenty (120) months, including a sixteen (16) month grace period on principal payments.

### Grace Period:

Up to sixteen (16) months on principal payments, computed as of the date of the first disbursement.

### Interest Rate:

A fixed and/or variable market-rate in Mexican pesos.

### Repayment Sources:

**Tranche A**: (i) The fee designated to pay the fixed amortization costs of investments funded with loan proceeds and equity (“T1”) under the BOT Contract; and (ii) a debt service reserve fund (DSR).

**Tranche B**: (i) The fee designated to pay the fixed operation and maintenance costs (“T2”) under the BOT Contract, and (ii) the DSR.  

### Debt Service Reserve (DSR):

The DSR requirement will at all times be equal to one (1) month of principal and interest payments and shall be maintained in the irrevocable administration trust created by the BOT Contractor (the “Administration Trust”) throughout the term of the loan.

### Debt Service Coverage Ratio (DSCR):

A DSCR equal to or greater than 1.20 times the debt service for each fiscal year must be maintained in the Administration Trust.

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7 In the event of early termination of the BOT Contract for any cause, whereby the BOT Contractor would be obligated to remove the cogeneration equipment from the South WWTP and reimburse JMAS for all payments made as of the date of termination, the remaining balance of the T1 proceeds, once the debt service of Tranche A has been paid, will be used to cover the debt service payments of Tranche B. If the remaining balance is not sufficient to cover the debt service payments of Tranche B, the cogeneration equipment will be sold at its salvage value and the sale proceeds will be applied to the outstanding balance of Tranche B.
CERTIFICATION AND FINANCING PROPOSAL

REHABILITATION AND UPGRADE OF THE WASTEWATER TREATMENT PLANTS IN CHIHUAHUA, CHIHUAHUA

1. PROJECT OBJECTIVE AND EXPECTED OUTCOMES

The proposed project consists of rehabilitating and upgrading the North and South Wastewater Treatment Plants (WWTPs), as well as designing, installing and operating a cogeneration facility in the South WWTP in the city of Chihuahua, Chihuahua (the “Project”). The main objectives of the Project are to continue providing adequate and sustainable wastewater treatment services in compliance with environmental and reuse requirements and to produce electricity through cogeneration to reduce power consumption from conventional fossil fuel sources, which will help prevent the emission of greenhouse gas emissions. Specifically, the rehabilitated and upgraded WWTPs will improve effluent quality and provide treatment for a total of 2,375 liters per second (lps) or 54.2 million gallons a day (mgd) in compliance with federal standards, as well as produce 33% less sludge. Moreover, by using the biogas from the sludge to generate electricity, the utility expects to supply close to 71% of the electricity required to operate the South WWTP. By installing 1.25-megawatts (MW) of new renewable energy generation capacity, the Project is expected to generate an estimated 8.52 gigawatt-hours (GWh)/year of electricity, which will help prevent the emission of approximately 9,583 metric tons/year of carbon dioxide (CO₂), 6 metric tons/year of nitrogen oxides (NOx) and 7 metric tons/year of sulfur dioxide (SO₂) from other fossil-fuel based generation sources.⁸

2. ELIGIBILITY

2.1. Project Type

The Project falls within the eligible category of wastewater.

2.2. Project Location

The Project will be implemented in the city of Chihuahua, which is located approximately 112 miles (180 kilometers) south of the U.S.-Mexico border. The city of Chihuahua is the capital of the state of Chihuahua.

⁸ Actual generation capacity will be determined during final design.
The North WWTP is located northeast of the urban area at geographical coordinates: 28° 41’ 51.09” latitude north and 106° 04’ 60” longitude west. The South WWTP is in the eastern area of the city at geographical coordinates: 28° 40’ 08” latitude north and 106° 00’ 18” longitude west. Figure 1 shows the location of the Project.

![Figure 1](PROJECT LOCATION MAP)

2.3. Project Sponsor and Legal Authority

On August 30, 2018, the State Congress of Chihuahua issued decree No. LXV/AUPIP/0881/2018 XVIII P.E. authorizing the local utility, Junta Municipal de Agua y Saneamiento de Chihuahua (JMAS or the “Utility”), to enter into a long-term agreement for the rehabilitation of the North and South WWTPs in compliance with the Chihuahua Long-term Public Investment Law. On February 27, 2019, the Acquisitions, Leasing and Services Committee of JMAS authorized the bidding process for the proposed Project. On March 9, 2019, JMAS carried out competitive procurement process No. 025-2019-JMAS-IPLP-RP-P, in accordance with the aforementioned state law. Subsequently in May 2019, JMAS awarded a build-operate-transfer contract for the rehabilitation and operation of the North and South WWTPs in the city of Chihuahua to the consortium formed by La Peninsular Compañía Constructora, S.A. de C.V., Suez Medio Ambiente México, S.A. de C.V., Suez International, S.A.S., and Grupo Acuanovus, S.A. de C.V.

The consortium created a special-purpose company, Aguas de Reúso y Energía Renovable, S.A. de C.V. (ARERSA or the “Sponsor”), to execute the BOT Contract and carry out the Project. ARERSA is a Mexican company established on June 12, 2019. Its contact representative is Richard Féret.
3. CERTIFICATION CRITERIA

3.1. Technical Criteria

3.1.1. General Community Profile

According to the 2015 intercensal survey performed by the Mexican National Institute for Statistics (INEGI), the state of Chihuahua has a population of 3.57 million, and approximately 24.6% of the state population (878,062) lives in the municipality of Chihuahua. Likewise, the city of Chihuahua is home to 92.2% of the population of the municipality (approximately 809,232 residents), which grew 1.5% between 2005 and 2010 and 1.3% between 2010 and 2015.9

According to the latest Mexican economic census, the municipality of Chihuahua represents 28.7% of the gross domestic product (GDP) of the state,10 with the commerce sector generating 44.03% of GDP, services (27.85%) and manufacturing (8.85%).

The city of Chihuahua, through JMAS, provides water and wastewater services. Table 1 summarizes the status of those services and the related infrastructure in 2019.

Table 1
WATER AND WASTEWATER INFRASTRUCTURE AND SERVICES

<table>
<thead>
<tr>
<th>Water System</th>
<th>Coverage</th>
<th>98 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply source</td>
<td>Type</td>
<td>Source</td>
</tr>
<tr>
<td>Groundwater</td>
<td>154 wells</td>
<td></td>
</tr>
<tr>
<td>Surface water</td>
<td>1 water treatment plant</td>
<td></td>
</tr>
<tr>
<td>Number of hookups</td>
<td>334,436</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wastewater Collection</th>
<th>Coverage</th>
<th>94%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of connections</td>
<td>321,316</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wastewater Treatment</th>
<th>Coverage</th>
<th>100% of the wastewater collected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment facilities</td>
<td>Plant</td>
<td>Type</td>
</tr>
<tr>
<td>North</td>
<td>Activated sludge</td>
<td>400 lps (9.1 mgd)</td>
</tr>
<tr>
<td>South</td>
<td>Activated sludge</td>
<td>1,350 lps (30.8 mgd)</td>
</tr>
</tbody>
</table>

Ips = liters per second; mgd = million gallons a day.

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Current Wastewater Management

The wastewater collection system provides service to 321,316 connections, of which 93% (298,300) are residential. Currently, wastewater is collected and conveyed through approximately 3,000 kilometers (1,864 miles) of sewer lines and mains to the North and South WWTPs. Wastewater collection services cover approximately 94% of the population of the city.11

The North and South WWTPs began operations in 1995 and 2006, respectively, under a 10-year BOT contract with the company ATLATEC. Currently, both plants are operated by JMAS and together treat all the wastewater collected by the sewer system, which has an average flow of 1,750 lps (39.9 mgd). Approximately 23% of this flow is treated in the North plant, and the remaining flow is treated in the South plant. The North WWTP receives an average flow of 500 lps (11.4 mgd) and treats 400 lps (9.1 mgd). The remaining 100 lps (2.3 mgd) is diverted to the South WWTP through the Sacramento and Plomeros Interceptors for treatment (Figure 2).12

![GRAVITY CONVEYANCE SYSTEM](image)

The North WWTP supplies 350 lps (8 mgd) of treated effluent to the reclaimed water distribution system, and the remaining 50 lps (1.1 mgd) are discharged to the Sacramento River. The effluent in the reclaimed water distribution system, also known as the “Purple Line,” is used to irrigate green areas and for industrial purposes. The Purple Line consists of 317 km (197 miles) of pipeline

11 Source: JMAS, Programa de Indicadores de Gestión de Organismos Operadores [Water Utilities Management Indicators Program], June 2019. The Project will continue providing 100% wastewater treatment coverage to users connected to the sewage system.

12 The Sacramento and Plomeros Interceptors are reinforced concrete lines in the city sewer system, which are also used by JMAS to convey untreated wastewater and sludge by gravity from the North plant to the South plant. The Sacramento Interceptor is 30-inch (76 cm) wide and approximately 5 km (3.1 miles) long and the Plomeros Interceptor is 84-inch (213 cm) wide and approximately 6 km (3.8 miles) long. According to JMAS, both lines have sufficient capacity to convey untreated wastewater and activated sludge, along with urban wastewater. Operation and maintenance of these interceptors and the city sewer system are provided by JMAS and are not part of the scope of this Project.
and has a total flow capacity of 500 lps (11.4 mgd). The activated sludge from the North WWTP is conveyed to the South WWTP, along with the remaining 100 lps (2.3 mgd) wastewater flows.

The South WWTP treats an average flow of 1,350 lps (30.8 mgd). Approximately 850 lps (19.4 mgd) of the treated effluent from the South plant are used for agricultural irrigation purposes, and 150 lps (3.4 mgd) are conveyed to the Purple Line. The remaining 350 lps (8.0 mgd) of treated effluent are discharged to the Chuviscar River. The South WWTP has a sludge conditioning and treatment process that produces approximately 65,700 m³/year (85,932 yards³/year) of dehydrated sludge, which is used as an agricultural soil enhancer by local farmers. Biogas generated from the sludge digestion process is currently captured, stored and flared on site.

Except for the sludge treatment process at the South WWTP, both plants currently operate with similar processes consisting of: (i) preliminary treatment, which includes coarse screens and grit removal tanks; (ii) primary treatment, including the sedimentation tanks; (iii) secondary treatment in activated sludge bioreactors and clarifiers; and (iv) disinfection with chlorine gas (Figures 3 and 4).

Figure 3
NORTH WWTP TREATMENT PROCESS
The equipment at both plants has reached the end of its useful life, and a major upgrade is required to ensure that the plants continue to meet environmental and reuse requirements in compliance with official Mexican standards NOM-001-SEMARNAT-1996, NOM-003-SEMARNAT-1997 and NOM-004-SEMARNAT-2002. Moreover, since the operation of the North and South WWTPs was taken over by JMAS in 2011 and 2016, respectively, a lack of proper maintenance has worsened the operational risks of the plants. In addition, potential gas leaks from the chlorine disinfection systems at both plants pose a risk for neighboring subdivisions.

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13 NOM-001-SEMARNAT-1996 establishes the maximum permissible levels of contaminants for wastewater discharges into national waters and territories. NOM-003-SEMARNAT-1997 establishes the maximum permissible levels of contaminants for treated wastewater used in public services. NOM-004-SEMARNAT-2002 establishes the maximum permissible levels of contaminants for sludge and biosolids for use and final disposal.
3.1.2. Project Scope

The Project will rehabilitate the North and South WWTPs to treat 500 lps (11.4 mgd) and 1,875 lps (42.8 mgd), respectively, in compliance with federal standards. Based on the bid documents for the BOT Contract prepared by JMAS, the Project consists of the following components:

**Rehabilitation Works**

- **North WWTP:**
  - *Preliminary treatment*, which includes the construction of a new lift station, replacement of eight pumps and four coarse screens and the grit removal systems.
  - *Secondary treatment*, which includes the installation of three air blowers, replacement of various water and sludge valves and oxygen and suspended solids sensors.

- **South WWTP**
  - *Preliminary treatment*, which includes the rehabilitation of four coarse screens and the grit removal systems, as well as replacement of five pumps.
  - *Secondary treatment*, which includes the installation of new air blowers; replacement of oxygen and suspended solids sensors, and replacement of 16 valves.

**Upgrade Works**

- **Effluent disinfection for the North and South WWTPs:** The chlorine gas disinfection systems will be replaced with ultraviolet (UV) light systems, which will use low-pressure high output (LPHO) vertical lights. These components will eliminate the risk of a potential chlorine gas leak and related harmful impacts.

- **Tertiary treatment for the North WWTP,** which includes the installation of two filters to remove fine particles. Each filter is comprised of 15 polyester screening discs. These filters will ensure consistent and reliable effluent quality, which should make reuse of the treated wastewater more attractive and thus increase demand.

- **South WWTP**
  - *Secondary treatment*, which includes the installation of a denitrification system.
  - *Sludge management system*, which includes the installation of three centrifuge systems to replace belt presses. It is expected to reduce the volume of sludge by 33%, from 65,700 m³/year (85,932 yds³/year) to 43,800 m³/year (57,288 yds³/year).
  - *Cogeneration plant*, Design, construction, operation and maintenance of a 1.25-MW cogeneration power plant, which is expected to generate the heat required for the sludge digesters and approximately 8.52 GWh/year of electricity or nearly
71% of the electricity required to operate the South WWTP. The remaining electricity needs will continue to be met by the Mexican Federal Electricity Commission (CFE). In order to ensure the optimal quality of the biogas, the system will include:

- **Removal of hydrogen sulfide (H₂S).** Biogas contains a small amount of hydrogen sulfide, which turns into a very corrosive fluid when mixed with water. To protect the generators and related components, the hydrogen sulfide must be removed.

- **Gas dryer.** The biogas produced by the current digesters contains moisture and must go through a drying process to reduce the amount of water.

The cogeneration plant will be connected to the existing substation in the South WWTP. No additional off-site facilities are required.

The Sponsor expects the rehabilitation and upgrade work to take up to 12 months to complete. The Sponsor will coordinate with JMAS to review final designs and project progress, which must be approved by JMAS.

### 3.1.3. Technical Feasibility

JMAS carried out a competitive procurement process for the rehabilitation, upgrade and operation of both WWTPs, as well as the construction of a cogeneration plant. The bid documents established the technical specifications of the equipment to maintain adequate wastewater treatment services. These technical requirements are based on international and national recommendations for wastewater treatment. Three bidders submitted technical and financial proposals, which were evaluated by JMAS taking into consideration such elements as cost, warranties and delivery times. The Sponsor presented the most cost-effective proposal that met the bid requirements and was awarded the contract.

As the wastewater treatment processes at both plants have proven effective in meeting discharge and reuse standards, no major changes in technology were required, except for the replacement of the disinfection systems, sludge treatment improvements and power generation infrastructure.

### 3.1.4. Land Acquisition and Right-of-Way Requirements

The Project will be implemented at the existing sites of the North and South WWTPs, which are owned by JMAS. Under the BOT Contract, JMAS has granted the Sponsor permission to rehabilitate, upgrade and operate both WWTPs, as well as build the cogeneration plant at the South WWTP. JMAS and the Sponsor executed a gratuitous bailment agreement whereby the
Sponsor is allowed to use the facilities of both WWTP during the term of the BOT Contract.¹⁴ No additional land acquisition or rights of way are required for Project implementation.

### 3.1.5. Project Milestones

Under the BOT Contract, construction must begin in January 2020. Therefore, all final designs must be completed before this date. Since the final designs are part of the BOT Contract, the Sponsor requires NADB loan approval no later than November 2019. Table 2 shows a summary of key tasks for the implementation of the Project and their respective status.

#### Table 2

<table>
<thead>
<tr>
<th>Key Milestones</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>JMAS Board approval</td>
<td>Completed (July 2018)</td>
</tr>
<tr>
<td>State of Chihuahua Congress approval</td>
<td>Completed (August 2018)</td>
</tr>
<tr>
<td>Procurement process for BOT Contract</td>
<td>Completed (May 2019)</td>
</tr>
<tr>
<td>BOT Contract execution</td>
<td>Completed (June 2019)</td>
</tr>
<tr>
<td>North WWTP environmental authorization (MIA resolution) from SEDUE (only state approval required).</td>
<td>Completed October 2019</td>
</tr>
<tr>
<td>South WWTP environmental authorization (MIA resolution) from SEMARNAT</td>
<td>Completed (October 2019)</td>
</tr>
<tr>
<td>Financial closing</td>
<td>Pending (required by November 2019)</td>
</tr>
<tr>
<td>CRE authorization for energy generation</td>
<td>Pending (expected November 2019)</td>
</tr>
<tr>
<td>SENER Social Impact Study</td>
<td>Pending (expected November 2019)</td>
</tr>
</tbody>
</table>

NADB procurement policies require that 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.

### 3.1.6. Management and Operation

As previously mentioned, the Project will be implemented and operated by ARERSA, a special-purpose company created by La Peninsular Compañía Constructora, S.A. de C.V., Grupo Acuanovus, S.A. de C.V., Suez Medio Ambiente México, S.A. de C.V. and Suez International, S.A.S. (Suez).

*La Peninsular Compañía Constructora, S.A. de C.V.*, is a Mexican construction company established in 1978 and headquartered in Mexico City. As part of the Hermes Group, it specializes in industrial

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¹⁴ Bailment is the loan of property to a person or entity (bailee) for a particular purpose, which is to be returned undamaged to the lender (bailor). Gratuitous bailment is a type of bailment in which neither the bailor nor the bailee is entitled to any remuneration.
construction, concrete structures and civil and electromechanical works, among other fields. Relevant hydraulic projects include: 1) El Zapotillo Dam in Jalisco, and 2) El Caracol Pumping Plant in the State of Mexico.

Grupo Acuanovus, S.A. de C.V., is a Mexican company with over 10 years of experience implementing turnkey water and wastewater projects. It has installed more than 75 wastewater treatment plants for the Walmart Group in Mexico.

Suez is one of the world’s leading environmental companies. With more than 88,500 employees around the world, it provides operation and maintenance services in several private and public sectors, including wastewater treatment, waste management and recycling, water resource management, electricity, mining, chemical and pharmaceutical. Suez supplies clean drinking water to 92 million people across 70 countries and five continents. In Mexico, Suez operates nine WWTPs with a total treatment capacity of over 7,100 lps. NADB has worked with Suez (formerly Degrémont S.A. de C.V.) on three WWTPs built in Ciudad Juárez (North, South and South-South) and a cogeneration project at the South WWTP in Ciudad Juárez. Suez is the technical leader of the Project.

Servicios Integrales en Reúso de Agua S.A. de C.V., the operating company formed by Suez and La Peninsular Compañía Constructora, S.A. de C.V., will be responsible for the operation and maintenance of the two WWTPs and for maintaining the quality of the effluent for the reclaimed water system and discharge to the receiving water bodies, as well as for transporting sludge. If the operator fails to comply with the operational parameters established in the BOT Contract, the operator will be responsible for paying any potential damages.

3.2. Environmental Criteria

3.2.1. Environmental and Health Effects/Impacts

A. Existing Conditions

The North and South WWTPs have been in operation for 24 and 13 years, respectively, with the original equipment. Even though the mechanical and electrical equipment of both WWTPs has reached the end of its useful life, the effluent conveyed to the reclaimed water system and discharged to the Sacramento and Chuviscar Rivers continues to comply with the parameters established in Official Mexican Standard NOM-003-SEMARNAT-1997 and NOM-001-SEMARNAT-1996. The effluent is also in compliance with the parameters established in Discharge Permit No. 2CHH100310/24HMSG94 issued by CONAGUA for both WWTPs.

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16 Currently, sludge is transported to agricultural parcels where farmers use it as fertilizer. Once the Project is implemented, the sludge is expected to continue being used for agricultural purposes.
17 The discharge permit authorizes the North and South plants to discharge 600 lps (13.7 mgd) to the Sacramento River and 2,000 lps (45.6 mgd) to the Chuviscar River, respectively. The permit also includes limits for parameters, such as BOD₅ (30 mg/l), TSS (30 mg/l) and coliforms (less than 1,000 MPN/100 milliliter).
Based on an analysis performed in February 2019, JMAS reported that the effluent from the North plant had 9.33 milligrams per liter (mg/l) of total suspended solids (TSS). Biological oxygen demand (BOD$_5$) and coliforms were not reported. The effluent from the South plant had 8.3 mg/l of BOD$_5$, 16.35 mg/l of TSS and coliforms of less than 3.0 most probable number (MPN)/100 milliliter. These values meet the limits established by NOM-003-SEMARNAT-1997.\textsuperscript{18}

Even though the treatment plants are in compliance, they need to be rehabilitated due to their age and operating conditions in order to minimize the risk of inadequately treated discharges that would pose an environmental and health risk.

According to the Mexican Ministry of Environment and Natural Resources (SEMARNAT), the Chuviscar River is experiencing high levels of TSS, which could be associated with untreated wastewater discharges in areas not yet connected to the city sewer system.\textsuperscript{19}

**B. Project Impacts**

Rehabilitating and upgrading both WWTPs will improve the quality of the effluent produced and minimize the risk of untreated or inadequately treated wastewater discharges. Moreover, installing a co-generation facility at the South plant provides an opportunity to displace greenhouse gases (GHG) and other pollutants produced by conventional fossil fuel-based power generation, while providing the South WWTP with a safe and reliable energy alternative.

Specifically, the improvements to the treatment process and installation of 1.25 MW of renewable energy generation capacity is expected to generate environmental and human health benefits related to the following Project outcomes:\textsuperscript{20}

- Adequately treat a current average flow of 1,750 lps (39.95 mgd) of wastewater in compliance with the applicable federal standards and be prepared to treat future flows of up to 2,375 lps (54.2 mgd), thus reducing the risk of inadequately treated discharges.
- Reduce the volume of sludge, from approximately 65,700 m$^3$ per year (85,932 yds$^3$/year) to approximately 43,800 m$^3$ per year (57,288 yds$^3$/year).
- Generate 8.52 GWh/year of electricity, which will offset energy consumed from the public grid by the South WWTP and thus help prevent the emission of approximately 9,583 metric tons/year of CO$_2$, 6 metric tons/year of NOx and 7 metric tons/year of SO$_2$.\textsuperscript{21}

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\textsuperscript{18} This standard establishes a monthly maximum average of 20 mg/l of BOD$_5$, 20 mg/l of TSS and 240 MPN/100 ml of coliforms.

\textsuperscript{19} Source: The Conchos River Basin: A Look from the Sciences to Climate Change, 2017, by Montero Martínez y Ibáñez Hernández, with the collaboration of SEMARNAT, the National Council of Science and Technology [Consejo Nacional de Ciencia y Tecnología (CONACYT)] and the Mexican Instituto of water Technology [Instituto Mexicano de Tecnología del Agua (IMTA)]. [https://www.imta.gob.mx/biblioteca/libros_html/rio-conchos/files/assets/basic-html/index.html#1](https://www.imta.gob.mx/biblioteca/libros_html/rio-conchos/files/assets/basic-html/index.html#1)

\textsuperscript{20} Final generation capacity will be determined during final design.

\textsuperscript{21} Source: NADB. CO$_2$, NOx and SO$_2$ calculations are based on the potential emissions avoided as a result of reducing future demand on fossil fuel-based electricity for the South WWTP, through cogeneration equivalent to 8.52 GWh/year and the emission factors for the state of Chihuahua. The emission factors are calculated by NADB based on the power generation portfolio of the state of Chihuahua and on the factors reported per technology in the 2018 Mexican National Power System Development Program (PRODESEN).
Additionally, replacing the disinfection systems in both plants will eliminate the risk associated with handling chlorine gas. Likewise, the quality of the effluent produced by the plants will be more consistent and reliable, which will support increased demand for treated water for reuse in the irrigation of green areas and for industrial purposes.

C. Transboundary Impacts

No transboundary impacts are anticipated as a result of this Project.

3.2.2. Compliance with Applicable Environmental Laws and Regulations

A. Environmental Clearance

The North and South WWTPs obtained their original environmental authorizations on September 20, 1993, and December 8, 2004, respectively. On July 23, 2019, the Sponsor sent a letter to the SEMARNAT asking if a new environmental clearance process was required for the two WWTPs. On July 24, 2019, SEMARNAT responded through Official Letter No. SG.IR.08-2019/240 indicating that: i) an Environmental Impact Assessment (MIA) for the North WWTP needed to be submitted to the Chihuahua State Ministry of Urban Development and Ecology (SEDUE), and ii) a MIA for the South WWTP needed to be submitted to SEMARNAT at the federal level.

On September 6, 2019, the Sponsor submitted the corresponding MIA for the North WWTP to SEDUE and the corresponding MIA for the South WWTP to SEMARNAT. MIA authorization No. SG.IR.08-2019/304 for the South WWTP was issued by SEMARNAT on October 16, 2019. Similarly, MIA authorization No. SDUE.DE.IA.ARE190612742 was issued by SEDUE for the North WWTP on October 25, 2019.

Both MIAs identify, describe and evaluate the potential environmental impacts associated with the Project—such as soil erosion and contamination, waste production, and impacts to air and water—and include the proposed mitigation measures to prevent or minimize any negative effect or impacts. According to the MIAs, the Project will be developed in previously impacted sites, and since no significant adverse impacts were detected, the construction and operation activities of the Project will not affect the local environment.

B. Mitigation Measures

Measures will be implemented to mitigate the temporary effects of Project construction, as well as to minimize negative impacts during its operation. The following mitigation measures are included in both MIAs:

- **Air quality**: Vehicles will receive tune-ups to reduce emissions.

- **Hazardous waste**:
  - Hazardous waste must be stored in closed containers to avoid spills. In the event of accidental spills, waste must be collected, stored in plastic bags and disposed of at an authorized site.
Vehicle maintenance is prohibited on the premises of the WWTPs.

- **Solid waste**: The different types of waste generated in the Project area will be collected and disposed of in accordance with applicable regulations.

Additional mitigation measures are required in the South WWTP MIA authorization:

- **Flora and fauna**:
  - The Sponsor shall establish internal procedures to protect all flora and fauna, especially those listed in Federal Standard NOM-059-SEMARNAT-2010. In the event that protected species are found, the Sponsor shall prepare a Rescue Plan in accordance to the NOM-059-SEMARNAT-2010.
  - The Sponsor shall not capture, hunt, affect or commercialize flora and fauna species present within the Project area.

- **Air quality**: During the different stages of the Project, the Sponsor shall comply with the emission levels established in Federal Standard NOM-041-SEMARNAT-2015 and NOM-045-SEMARNAT-2017.

- **Noise**: During the different stages of the Project, the Sponsor shall comply with the noise levels established in Federal Standard NOM-080-SEMARNAT-1994.

- **Hazardous waste**:
  - The Sponsor shall avoid spillage of oils, solvents and any other toxic substance into water bodies and soil.
  - Hazardous waste shall be collected and transported to authorized disposal sites or for reuse.

C. **Pending Environmental Tasks and Authorizations**

There are no pending environmental authorizations for the Project.

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22 Federal Standard NOM-059-SEMARNAT-2010 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.


24 Federal Standard NOM-080-SEMARNAT-1994 establishes the maximum levels of noise emissions from motor vehicles, motorcycles, and three-wheel motor vehicles, as well as noise measuring methods.

25 Federal Standard NOM-052-SEMARNAT-2005 establishes the characteristics, identification procedures and classification of hazardous solid waste, as well as a list of such materials. Federal Standard NOM-053-SEMARNAT-1993 establishes the procedures to carry out the extraction test to determine the components that make a waste hazardous due to its toxicity to the environment.
3.3. Financial Criteria

3.3.1. Sources and Uses of Funds

The total cost of the Project is estimated at $292.4 million pesos (US$14.7 million) and includes: (i) technical costs related to design, construction and equipment and cost adjustments for inflation; and (ii) financial and administrative costs related to the trust to be created by the BOT Contractor, value-added taxes (VAT) and capitalized interest.

The Project costs will be partially covered by equity contributions from the BOT Contractor, who has requested a loan from NADB for up to $223.4 million pesos (US$11.2 million) to complete the financing of the Project. Table 3 presents a breakdown of the sources of funds to cover the Project costs.

Table 3
SOURCES AND USES OF FUNDS*
(Millions of Pesos)

<table>
<thead>
<tr>
<th>Uses</th>
<th>Amount</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical costs**</td>
<td>$231.1</td>
<td>79.0</td>
</tr>
<tr>
<td>Financial and administrative costs***</td>
<td>61.3</td>
<td>21.0</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>$292.4</td>
<td>100.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sources</th>
<th>Amount</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>NADB loan</td>
<td>$223.4</td>
<td>76.4</td>
</tr>
<tr>
<td>BOT Contractor equity</td>
<td>69.0</td>
<td>23.6</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>$292.4</td>
<td>100.0</td>
</tr>
</tbody>
</table>

* March 2019 figures have been adjusted for inflation by NADB, as agreed under the BOT Contract.
** Includes design, construction, equipment and other related costs.
*** Includes capitalized interest, value-added-taxes (VAT), trust fees and other related financial expenses.

Under the BOT Contract, the uses and sources of funds are quantified at constant prices as of March 2019. As of that date, actual Project costs and expenses are adjusted for inflation as the Project is constructed and expensed in accordance with the agreed schedule. The loan and equity contributions are determined based on projected construction costs in accordance with terms set forth under the BOT Contract.

The NADB loan will be for an aggregate amount of up to $223.4 million pesos (US$11.2 million) split into two tranches:

- **Tranche A** is for up to $159.7 million pesos (US$8.0 million) and will be used to finance: (i) a portion of the rehabilitation works of the North and South WWTPs; (ii) interest payments during the 12-month construction period; (iii) a portion of the VAT charged against the Project; and (iv) the legal, technical and financial expenses associated with the loan. This tranche will be for a term of up to 132 months, including a 16-month grace
period on principal payments. The source of payment will be the fee designated to pay the fixed amortization costs of investments funded with loan proceeds and equity (“T1”) under the BOT Contract, as well as a Debt Service Reserve Fund (DSR).

The T1 fee is comprised of: (i) “T1C” designated to cover the BOT Contractor’s monthly debt service; and (ii) “T1R” designated to cover the BOT Contractor’s monthly return on investment.

Under the BOT Contract, in the event of early termination or cancellation of the BOT Contract for causes attributable to the BOT Contractor, JMAS is obligated to pay the T1C fee, thus mitigating the risk of default on Tranche A of the NADB loan.

- **Tranche B** is for up to $63.7 million pesos (US$3.2 million) and will be used to finance: (i) the construction and equipment of the cogeneration facility at the South WWTP; (ii) interest payments during construction; and (iii) the legal, technical and financial expenses associated with the loan. This tranche will be for a term of up to 120 months, including a 16-month grace period on principal payments. The source of payment will be the fee designated to pay the fixed operation and maintenance costs (“T2”) under the BOT Contract, as well as the DSR.

Under the BOT Contract, JMAS is obliged to pay the T2 fee to the BOT Contractor upon submission of an invoice, thus mitigating the risk of default on Tranche B of the NADB loan since no review or approval from JMAS for payment is required. Moreover, the T2 fee includes a fixed monthly amount to cover the amortization costs of the cogeneration facility.\(^{26}\)

In the event of early termination of the BOT Contract for any cause, JMAS and the BOT Contractor shall agree on one of the following options, in the following order of preference: (i) JMAS will acquire the cogeneration facility for an amount equal to the amount pending amortization adjusted for inflation; (ii) JMAS will continue making the remaining amortization payments related to cogeneration facility for the rest of the original term agreed between the parties; or (iii) the BOT Contractor will remove the cogeneration equipment from the South WWTP and reimburse JMAS for all payments made up to the date of termination, adjusted for inflation, from the original date of payment to the date of reimbursement. If the parties fail to reach an agreement, they will submit to a mediation process. If no agreement is reached within a certain time period, arbitration will take place.

Options (i) and (ii) described above present an acceptable level of risk, since the NADB loan would be repaid in either case. However, option (iii) represents a higher risk. In order to mitigate this risk, the BOT Contractor has agreed to: (a) use the remaining balance of the T1 proceeds, once the debt service of Tranche A has been paid, to cover debt service payments of Tranche B; and (b) if the remaining balance of the T1 fee is not sufficient to cover the debt service payments of Tranche B, sell the equipment of the cogeneration facility.

\(^{26}\) Under the T2 fee, the fixed amount to cover monthly amortization costs is $1.0 million pesos (US$50,974) at March 2019 prices.
facility at its salvage value and apply the sale proceeds to the outstanding balance of Tranche B. Furthermore, the equipment supplier has formally committed to support and cooperate with the BOT Contractor in the sale of the equipment, should the BOT Contractor decide, at its sole discretion, to sell the equipment, thus mitigating the risk of non-payment of Tranche B.

3.3.2. Loan Payment Mechanism

The payment mechanism for the proposed NADB loan consists of two irrevocable trusts. According to the procurement documents for the BOT Contract, JMAS must pledge all monthly revenue deriving from its service fees to an irrevocable payment trust (the “Payment Trust”).

The BOT Contractor will create an irrevocable administration trust (the “Administration Trust”) to receive the monthly payments for the services it provides under the BOT Contract. The monthly payments will be transferred from the Payment Trust to the Administration Trust. The amounts received by the Administration Trust will be enough to cover the monthly debt service payments (“T1C”), return on equity investment (“T1R”), fixed operation and maintenance costs (“T2”) and variable operation and maintenance costs (“T3”). The BOT Contractor will bill JMAS for an amount equal to fees T1+T2+T3.

The Administration Trust will manage, among other activities: (i) the disbursement of the equity funds contributed by the BOT Contractor, as well as the loan proceeds provided by NADB, for implementation of the Project; and (ii) the repayment of the NADB loan. The loan payment mechanism is outlined below.
1. All revenue deriving from the monthly service fees collected by JMAS will be deposited into the Payment Trust.

2. The Payment Trust will deposit into the Administration Trust the monthly payments for the services provided by the BOT Contractor under the BOT Contract.

3. In the case of Tranche A, the Administration Trust will retain all the proceeds of the T1 fee to secure the monthly payment of NADB debt service. Once NADB debt service is paid, the remaining balance will be transferred to the BOT Contractor.

   In the case of Tranche B, the Administration Trust will retain all the proceeds of the T2 fee to secure the monthly payment of NADB debt service. Once NADB debt service is paid, the remaining balance will be transferred to the BOT Contractor.

The Debt Service Reserve Fund will be created within the Administration Trust. In the event that the amounts pledged by JMAS are insufficient or not deposited into this trust, the proceeds of the reserve fund will automatically be drawn down by the trustee to cover the corresponding monthly payment of Tranche A and/or Tranche B, thus mitigating the risk of default on the NADB loan.

The loan payment mechanism described above is a common structure used for BOT Contracts in Mexico, where water service revenue pledged to a trust is used as the source of payment. NADB
has successfully used this structure in previous transactions, such as (i) a wastewater collection and treatment project in Mexicali, B.C. that was partially financed with a loan for up to $200.0 million pesos; and (ii) the expansion of a wastewater collection system in Tijuana, B.C. for areas in the Tijuana River basin, which was partially financed with a loan for up to $31.3 million pesos and has already been repaid in full. With this mechanism, monthly payments are managed by a trust, thus mitigating the risk of non-payment by the BOT Contractor.

3.3.3. Financial Analysis of the Source of Payment

The purpose of the section is to evaluate the financial viability of the Project by conducting a thorough analysis of: (i) the financial performance of JMAS; and (ii) its projected cash flows, which will serve as primary source of payment for the BOT Contract.

A. Historical Analysis of JMAS

The annual financial statements of JMAS are prepared based on accounting principles for public entities in Mexico. The financial statements from 2014 through 2018 are presented in Table 4 to provide an overview of the Utility’s financial and operational evolution.

Table 4
JMAS FINANCIAL STATEMENTS
(Millions of Pesos)

<table>
<thead>
<tr>
<th>BALANCE SHEETS</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current assets</td>
<td>$ 260.52</td>
<td>$ 262.14</td>
<td>$ 159.47</td>
<td>$ 2,848.01</td>
<td>$ 3,152.31</td>
</tr>
<tr>
<td>Fixed assets</td>
<td>1,909.75</td>
<td>1,980.96</td>
<td>1,989.37</td>
<td>1,896.58</td>
<td>2,088.34</td>
</tr>
<tr>
<td>Total assets</td>
<td>$ 2,170.27</td>
<td>$ 2,243.10</td>
<td>$ 2,148.85</td>
<td>$ 4,744.58</td>
<td>$ 5,240.65</td>
</tr>
<tr>
<td>Current liabilities</td>
<td>$ 407.94</td>
<td>$ 536.07</td>
<td>$ 520.62</td>
<td>$ 3,077.01</td>
<td>$ 3,251.29</td>
</tr>
<tr>
<td>Non-current liabilities</td>
<td>52.03</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total liabilities</td>
<td>459.97</td>
<td>536.07</td>
<td>520.62</td>
<td>3,077.01</td>
<td>3,251.29</td>
</tr>
<tr>
<td>Total equity</td>
<td>1,710.29</td>
<td>1,707.04</td>
<td>1,628.22</td>
<td>1,667.58</td>
<td>1,989.36</td>
</tr>
<tr>
<td>Total liabilities &amp; equity</td>
<td>$ 2,170.27</td>
<td>$ 2,243.10</td>
<td>$ 2,148.85</td>
<td>$ 4,744.58</td>
<td>$ 5,240.65</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INCOME STATEMENTS</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating revenue</td>
<td>$ 801.14</td>
<td>$ 941.44</td>
<td>$ 887.65</td>
<td>$ 987.95</td>
<td>$ 1,106.20</td>
</tr>
<tr>
<td>Operating expenses</td>
<td>965.22</td>
<td>887.99</td>
<td>878.48</td>
<td>932.20</td>
<td>925.74</td>
</tr>
<tr>
<td>Net operating income (loss)</td>
<td>(164.08)</td>
<td>53.45</td>
<td>9.17</td>
<td>55.75</td>
<td>180.46</td>
</tr>
<tr>
<td>Depreciation expense</td>
<td>128.14</td>
<td>139.86</td>
<td>148.79</td>
<td>155.91</td>
<td>205.09</td>
</tr>
<tr>
<td>Financing and other costs</td>
<td>4.32</td>
<td>4.91</td>
<td>8.54</td>
<td>9.96</td>
<td>3.36</td>
</tr>
<tr>
<td>Other products</td>
<td>218.93</td>
<td>123.62</td>
<td>43.73</td>
<td>94.62</td>
<td>50.65</td>
</tr>
<tr>
<td>Net income (loss)</td>
<td>$ (77.61)</td>
<td>$ 32.30</td>
<td>$ (104.43)</td>
<td>$ (15.51)</td>
<td>$ 22.66</td>
</tr>
</tbody>
</table>

CASH FLOW STATEMENTS

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash from operating activities</td>
<td>$38.86</td>
<td>$148.88</td>
<td>$125.69</td>
<td>$68.80</td>
<td>$158.15</td>
</tr>
<tr>
<td>Cash from investment activities</td>
<td>(156.14)</td>
<td>(211.19)</td>
<td>(157.21)</td>
<td>(63.11)</td>
<td>(396.85)</td>
</tr>
<tr>
<td>Cash from financing activities</td>
<td>186.94</td>
<td>35.65</td>
<td>29.59</td>
<td>54.86</td>
<td>309.10</td>
</tr>
<tr>
<td>Net cash flow</td>
<td>$ 69.66</td>
<td>$(26.67)</td>
<td>$(1.93)</td>
<td>$60.54</td>
<td>$70.40</td>
</tr>
</tbody>
</table>

Beginning cash balance $3.47 $73.12 $46.45 $44.53 $105.07
Ending cash balance $73.12 $46.45 $44.53 $105.07 $175.46

Source: JMAS’ audited financial statements.

Table 5

JMAS FINANCIAL RATIOS

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current ratio</td>
<td>0.64</td>
<td>0.49</td>
<td>0.31</td>
<td>0.93</td>
<td>0.97</td>
</tr>
<tr>
<td>Commercial efficiency (%)</td>
<td>N.A.</td>
<td>74.1</td>
<td>77.5</td>
<td>73.6</td>
<td>75.5</td>
</tr>
<tr>
<td>Long-Term debt / Equity (%)</td>
<td>3.04</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Fixed assets / Total assets (%)</td>
<td>88.00</td>
<td>88.31</td>
<td>92.58</td>
<td>39.97</td>
<td>39.85</td>
</tr>
<tr>
<td>Operating margin (%)</td>
<td>(20.5)</td>
<td>5.7</td>
<td>1.0</td>
<td>5.6</td>
<td>16.3</td>
</tr>
</tbody>
</table>

Source: JMAS’ audited financial statements.

At the close of 2018, accounts receivable totaled $2,935.6 million pesos, an increase of 8.9% over the previous year. The balance owed by service users was $2,888.7 million pesos, representing 56% of total assets. The likelihood of recovery is minimal, but no provision for uncollectible accounts has been recognized. In 2018, JMAS’ collection efficiency was 75.5%, and physical efficiency (ratio of volume produced / volume sold) was 50.04%. The national average of these indicators is currently 69.6% and 35.0%-45.0%, respectively. Other current assets at the close of 2018 included $47.0 million pesos in accounts receivable related to VAT paid for goods and services and $41.2 million pesos in supply inventory.

Fixed assets totaled $2,088.3 million pesos in 2018 and since 2014 have increased at a compound annual growth rate (CAGR) of 2.3% including depreciation. The Utility has invested in infrastructure in order to improve water and wastewater coverage in Chihuahua. It has financed most of its capital investment program with cash flows from operations and with state and federal grant funding.

During 2014 and 2015, JMAS received state funding totaling $186.2 million and $106.0 million pesos, respectively, which was invested in water and sewer infrastructure projects. Between 2014 and 2016, JMAS also received federal grants totaling $34.4 million pesos, which were invested in water reuse projects. The Utility has not received any additional state or federal funds since 2016.

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27 In 2017, JMAS began recording service receivables on its balance sheet, which were previously recorded as off-balance accounts.
As of December 31, 2018, short-term liabilities totaled $3,251.3 million pesos, an increase of 5.7% over 2017 figures. Short-term liabilities mainly consisted of $28.3 million owed to suppliers; $293.9 million to creditors; $17.6 million to construction companies; $10.0 million for VAT and taxes; $12.7 million in water rights; and $2,888.7 million in accounts payable, which is a mirror account of the accounts receivable for services recorded in current assets.

In 2014, the Utility recognized $52.0 million pesos in long-term debt obligations, which were paid in full during 2015. Since then, JMAS has not contracted any long-term debt obligations.

During 2018, operating revenue totaled $1,106.2 million pesos and has increased at a CAGR of 11.97% since 2014 as a result of increases in user fees and a growing customer base. In 2018, JMAS registered 331,578 active accounts, of which 92.9% correspond to domestic users, 5.9% to commercial users and the remainder to industrial and public-sector users. During the period analyzed, user accounts grew at a CAGR of 1.9%. The current service fee structure reflects a higher cost per cubic meter for commercial and industrial users vis-à-vis residential users, and higher prices per unit for higher levels of consumption across the board.

In 2018, operating expenses totaled $925.7 million pesos, resulting in $180.5 million pesos in net operating income, the highest reported during the period analyzed. The Utility has made significant efforts to reduce its operating expenses. General services reported a -5.8% CAGR over the period analyzed, and personnel costs decreased 4.4% and 3.9% during 2017 and 2018, respectively. The Utility only registered an operating deficit in 2014.

In terms of cash generating capacity, the Utility registered positive cash flows throughout the period analyzed, which demonstrates good operational practices and cash flow management. Cash from operating activities has been sufficient to cover a portion the Utility’s investment activities. Cash balances as of December 31, 2017 and 2018 totaled $105.7 million and $175.5 million pesos, respectively.

In August 2019, Fitch ratified JMAS’ AA- (mex) credit rating on the national scale, which denotes very good credit quality with respect to other public entities, as defined by the rating agency. The rating reflects the strength of its services, with a stable and diversified client base; no operational support provided by the local government; and no long-term debt obligations. The rating also reflects the infrastructure limitations of JMAS, as well as the low level of its physical and global efficiencies.

Overall, JMAS presents a sound financial position. NADB’s financial analysis shows that the Utility has significant revenue capacity that exceeds operating expenditures and a sustained level of collection efficiency, which have been key to the performance of its cash flows from operations. Annual operating revenue has grown consistently, and the Utility has sound operating margins. Its cost controls have given JMAS the flexibility to finance its ongoing operations and capital investment requirements without debt financing and by using some complementary state and federal funding, as in the case of other utilities of this size and scale.
B. Financial Projections of JMAS

To determine whether the JMAS can meet its obligations associated with the Project, NADB performed a financial analysis based on the Utility’s financial plan, which includes increases in user fees in the coming years. Projections were developed based on historical figures and current efficiency levels, as well as the current economic outlook. The main assumptions include:

- **Basis for projections**: Historical financial statements of JMAS.
- **BOT Contract Obligations**: In accordance with the provisions set forth in the contract and its amendments.
- **Revenue**: Based on the current customer base and rate structure with increases 0.3% in real terms for the period projected. New accounts are estimated using official population growth projections.
- **Operation and maintenance (O&M) expenses**: Based on the financial statements of JMAS.

Table 6 shows projected cash flows for the duration of the NADB loan, including the new BOT Contract obligations.

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue (Millions of Pesos)</th>
<th>Expenses (Millions of Pesos)</th>
<th>Cash Flow from Operations (Millions of Pesos)</th>
<th>BOT Contract Payment (Millions of Pesos)</th>
<th>Cash Available for Capital Expenditures (Millions of Pesos)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>$1,158.63</td>
<td>$971.71</td>
<td>$186.92</td>
<td>$33.21</td>
<td>$153.71</td>
</tr>
<tr>
<td>2020</td>
<td>$1,242.14</td>
<td>$1,012.50</td>
<td>$229.64</td>
<td>$94.27</td>
<td>$135.37</td>
</tr>
<tr>
<td>2021</td>
<td>$1,296.51</td>
<td>$1,054.25</td>
<td>$242.69</td>
<td>$123.29</td>
<td>$118.97</td>
</tr>
<tr>
<td>2022</td>
<td>$1,352.83</td>
<td>$1,097.14</td>
<td>$255.69</td>
<td>$127.85</td>
<td>$127.84</td>
</tr>
<tr>
<td>2023</td>
<td>$1,411.24</td>
<td>$1,141.38</td>
<td>$269.86</td>
<td>$132.58</td>
<td>$137.28</td>
</tr>
<tr>
<td>2024</td>
<td>$1,471.79</td>
<td>$1,186.90</td>
<td>$284.89</td>
<td>$137.49</td>
<td>$147.40</td>
</tr>
<tr>
<td>2025</td>
<td>$1,534.61</td>
<td>$1,233.76</td>
<td>$300.85</td>
<td>$142.57</td>
<td>$158.28</td>
</tr>
<tr>
<td>2026</td>
<td>$1,599.79</td>
<td>$1,281.96</td>
<td>$317.83</td>
<td>$147.85</td>
<td>$169.98</td>
</tr>
<tr>
<td>2027</td>
<td>$1,667.45</td>
<td>$1,331.61</td>
<td>$335.84</td>
<td>$153.32</td>
<td>$182.52</td>
</tr>
<tr>
<td>2028</td>
<td>$1,737.74</td>
<td>$1,382.82</td>
<td>$354.91</td>
<td>$158.99</td>
<td>$195.92</td>
</tr>
<tr>
<td>2029</td>
<td>$1,810.76</td>
<td>$1,435.65</td>
<td>$375.11</td>
<td>$164.88</td>
<td>$210.23</td>
</tr>
<tr>
<td>2030</td>
<td>$1,886.64</td>
<td>$1,490.13</td>
<td>$396.51</td>
<td>$113.29</td>
<td>$283.22</td>
</tr>
</tbody>
</table>

The projected cash flows remain positive throughout the planning period. As indicated in Table 6, JMAS’ financial margins are sufficient to cover Project-related obligations throughout the loan period. NADB is, therefore, confident that JMAS will have sufficient funds to cover the cost of its operations, capital investments and the monthly payments associated with the BOT Contract, which includes the debt service on the NADB loan. Nonetheless, the Utility will need to maintain its operational efficiencies at their current levels, continue to apply cost control measures and increase revenue in order to properly operate the Utility.
C. Project Debt Service Coverage Ratio (DSCR)

In accordance with NADB loan policies, the formula for calculating the DSCR for a proposed loan shall be based on the characteristics of the transaction and/or borrower and payment mechanism.

**DSCR for Tranche A of the NADB Loan**

For this particular tranche, the DSCR is defined as the ratio of inflation-indexed monthly T1 (T1C+T1R) payments from the Payment Trust to the Administration Trust divided by the monthly nominal debt service (principal and interest) payments to NADB. The DSCR ratio must be at least 1.20x throughout the term of the loan, based on the following formula:

\[
DSCR = \frac{(T1C + T1R) \times (INPC_t \div INPC_0)}{(Interest_t + principal_t)} \geq 1.20x
\]

Where:

- \(INPC_t\) = Monthly Mexican Nacional Consumer Price Index in period \(t\)
- \(INPC_0\) = Mexican National Consumer Price Index for March 2019.

Figure 6 shows the projected DSCR for Tranche A of the NADB loan.

![Projected DSCR for Tranche A of the NADB Loan](image)

T1 Fee to pay loan and equity investments under the BOT Contract.

The minimum coverage ratio for Tranche A is projected to be 1.40 times the debt service in 2030. Based on these estimates, NADB considers the pledged cash flows to be more than sufficient to
cover the financial obligations under the BOT Contract, which in turn will support the monthly debt service payments to NADB.

**DSCR for Tranche B of the NADB Loan**

For this particular tranche, the DSCR is defined as the ratio of inflation-indexed monthly $T_2$ ($T_2$ North + $T_2$ South) payments from the Payment Trust to the Administration Trust divided by the monthly nominal debt service (principal and interest) payments to NADB. The DSCR ratio must be at least 1.20x throughout the term of the loan, based on the following formula:

$$DSCR = \frac{(T_2 North + T_2 South) \times (INPC_t / INPC_0)}{(Interest_t + principal_t)} \geq 1.20x$$

Where:
- $INPC_t$ = Monthly Mexican Nacional Consumer Price Index in period $t$
- $INPC_0$ = Mexican National Consumer Price Index for March 2019.

Figure 7 shows the projected DSCR for Tranche B of the NADB loan.

The minimum coverage ratio for Tranche B is projected to be 4.67 times the debt service in 2028. Based on these estimates, NADB considers the pledged cash flows to be more than sufficient to cover the financial obligations under the BOT Contract, which in turn will support the monthly debt service payments to NADB.
3.3.4. Risk Analysis

The purpose of this section is to assess the ability of JMAS to address any adverse changes to the base-case scenario that could negatively affect its cash flows. As part of this process, a sensitivity analysis with various scenarios is performed to evaluate the Utility’s payment capacity with respect to its annual financial obligations under the BOT Contract.

A. Quantitative Project Risks

1. Increase in Total Cost: The Project is being developed under a BOT Contract. Any unexpected increase in the construction costs not agreed with JMAS will have to be covered by the BOT Contractor.

2. Increase in Expenses: JMAS can afford a 1.0% annual increase above the projected increase in its administrative expenses and still maintain a positive operating margin. JMAS has been able to maintain a stable margin through adequate working capital management, which is reflected in its recent operating performance. Should expenses go up more than projected, the Utility will have to increase revenue or reduce costs to meet its financial obligations under the BOT Contract.

3. Decrease in Revenue: JMAS could experience an average decrease of up to 9.1% in projected revenue and still have sufficient resources to meet its financial obligations under the BOT Contract. In the event of such a decrease, the Utility would have to make the necessary adjustments to continue its operations while meeting all its obligations.

B. Qualitative Project Risks

1. Financial/Administrative: Based on the financial analysis, it can be concluded that JMAS has a solid and captive customer base with a stable growth trend. JMAS has been able to successfully carry out its operational activities and meet its financial obligations, demonstrating its ability to maintain adequate operating and net margins over time. As shown in the sensitivity analysis, JMAS can withstand decreases in revenue or increases in operating expenses, without defaulting on its contractual obligations.

   Moreover, JMAS has a strong balance sheet with no debt, which indicates that the Utility can contract the proposed obligations without any risk of financial hardship. Finally, it is reasonable to expect positive cash generation during the life of the Project, which will allow the repayment of the BOT Contract obligations and ultimately the NADB loan.

2. Economic: JMAS’ operating revenue is directly affected by the ability of its customers to meet the monthly fees charged for services, which, in turn, is affected by changes in the local economy. Chihuahua has a dynamic economy that is primarily focused on manufacturing and the automotive industry. This growing and diversified economy will ultimately provide the economic support the Utility needs to implement the Project successfully.

3. Political/Legal: Changes in the management of JMAS are not expected to result in the nonpayment of the NADB loan, since the monthly payments for the services provided by the
BOT Contractor under the BOT Contract will be pledged to an irrevocable trust, which will make the monthly payments.

4. Technical: The technical risk related to the Project is minimal because it entails the use of conventional materials and proven technology. Moreover, the BOT Contractor has the experience and human resources required to implement the Project.

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4. PUBLIC ACCESS TO INFORMATION

4.1. Public Consultation

NADB released the Draft Certification and Financing Proposal for a 30-day public comment period beginning on September 20, 2019. The following Project documentation is available upon request:

- Environmental Impact Assessment (MIA) for the North WWTP submitted to SEDUE on September 6, 2019.
- MIA for the South WWTP submitted to SEMARNAT on September 6, 2019.
- MIA authorization No. SDUE.DE.IA.ARE190612742 for the North WWTP issued by SEDUE on October 25, 2019.

The public comment period ended on October 20, 2019, with no comments received.

4.2. Outreach Activities

Pursuant to the Chihuahua State Procurement, Leasing and Service Contracting Law, a social witness must review all state procurement processes exceeding $15 million pesos. On October 26, 2018, the Government of Chihuahua designated a member of Karewa as the social witness for the procurement process of the North and South WWTPs.

On October 31, 2018, JMAS initiated Procurement Process No. 082-2018-JMAS-IPLP-RP-P to select a company to rehabilitate, upgrade and operate the North and South WWTPs and install a cogeneration facility under a BOT contract. In February 2019 the procurement process was declared void because the proposals submitted by participating companies were incomplete. On March 9, 2019, JMAS initiated a second competitive bid process, Procurement Process No. 025-2019-JMAS-IPLP-RP-P 2019. On May 24, 2019, JMAS awarded the BOT Contract to the consortium

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28 Karewa is a non-profit social association established in August 2016 to prevent acts of government corruption (http://karewa.org/).

NADB conducted a media search to identify potential public opinion about the Project. References to the Project were found on the websites listed below:

- **Net Noticias** (August 23, 2018), “Proponen contrato para rehabilitar las plantas de tratamiento de Chihuahua” [Contract for rehabilitating Chihuahua treatment plants proposed].
  

- **Chihuahua Gobierno del Estado** (September 7, 2019), “Amplía JMAS red de agua tratada en beneficio de 95 mil Chihuahuenses” [JMAS extends reclaimed water system benefitting 95,000 Chihuahua residents].
  
  http://www.chihuahua.gob.mx/contenidos/amplia-jmas-red-de-agua-tratada-en-beneficio-de-95-mil-chihuahuenses

  
  http://elpuntero.com.mx/n/98829

  
  http://www.chihuahua.gob.mx/contenidos/adjudica-jmas-chihuahua-contrato-para-modernizar-plantas-de-tratamiento-de-aguas

- **Tiempo** (September 4, 2019) “Piden controversia contra topillazo hidráulico” [Constitutional challenge requested against mega water loan].
  
  http://www.tiempo.com.mx/noticia/congreso_de_la_union_porfirio_munoz_ledo_chihuahua_maru_campos_galvanCambios_en_el_gabinete_armando_herrera_miguel_riggs_secretaria_del_trabajo/

In summary, these publications highlight the scope of the Project. It is important to note that a publication in the *Tiempo* website, states that a congressman from the Institutional Revolutionary Party (PRI) had the State Congress issue an action for constitutional dispute against the Project. This initiative is pending to be resolved by the Congress. No further information on this topic was identified.

Finally, the Project Sponsor has followed all public consultation requirements in order to comply with applicable environmental clearance and permitting processes.
5. RECOMMENDATION

Certification Criteria Compliance
The Project falls within the eligible sector of wastewater and is located within the border region, as required under the NADB Charter. The 30-day public comment period ended on October 20, with no comments received. The Project review performed by the NADB Chief Environmental Officer confirms that the Project complies with the certification requirements, and there are no pending activities required for compliance.

Funding Criteria Compliance
Considering the Project’s characteristics and based on the financial and risk analysis performed by NADB, the proposed Project is financially feasible and presents an acceptable level of risk. Therefore, NADB proposes providing a market-rate loan for up to $223.4 million pesos, in accordance with the terms and conditions proposed in Annex B.

Accordingly, based on the foregoing conclusions as supported and presented in detail in the corresponding certification and financing proposal, the Chief Environmental Officer and Acting Managing Director of NADB hereby recommend the certification of the project and approval of the proposed loan.
ANNEXES

REHABILITATION AND UPGRADE OF THE WASTEWATER TREATMENT PLANTS IN CHIHUAHUA, CHIHUAHUA
# ANNEX A
## RESULTS MATRIX
### REHABILITATION AND UPGRADE OF THE WASTEWATER TREATMENT PLANTS IN CHIHUAHUA, CHIHUAHUA

**Project Objective:**

The main purpose of the Project is to: 1) Continue providing adequate and sustainable wastewater treatment services in compliance with current environmental and reuse requirements; 2) Produce electricity through cogeneration to reduce power consumption from conventional fossil fuel sources, and 3) Support increased demand of treated wastewater reuse for irrigation and industry, by providing more consistent and reliable effluent quality.

### Results Measurement | Indicators and Targets | Baseline Value | Measurement Methodology |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 Treat wastewater in compliance with federal standards, and reducing the risk of inadequately treated discharges</strong></td>
<td>Adequate wastewater treatment (Current WW Treatment Target 39.9 mgd (1,750 lps))</td>
<td>1,750 lps (39.9 mgd)</td>
<td>Risk of failure</td>
</tr>
<tr>
<td><strong>2 Reduce volume of sludge generated</strong></td>
<td>Volume of sludge generated by year (Target 43,800 m³ per year (57,288 yds³/year))</td>
<td>65,700 m³/year (85,932 yds³/year)</td>
<td></td>
</tr>
<tr>
<td><strong>3 Reduce demands on traditional fossil-fuel based energy generation</strong></td>
<td>Energy capacity produced 1.25 MW (Target generation = 6.52 GWh)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>4 Displace harmful emissions</strong></td>
<td>Quantity of CO₂ emissions avoided (Target ≥ 9,583 metric tons/year)</td>
<td>15.054 metric tons</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quantity of NOx emissions avoided (Target ≥ 6 metric tons/year)</td>
<td>11 metric tons</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Quantity of SO₂ emissions avoided (Target ≥ 7 metric tons/year)</td>
<td>13 metric tons</td>
<td></td>
</tr>
</tbody>
</table>

**Outputs:** Goods and services that the project will deliver.

**Technical:**

**Rehabilitation works**

- **North and South WWTPs:** Combined treatment capacity of 54.2 mgd (2,375 lps)
- **Preliminary treatment:** Construction of new lift station in North WWTP, replacement of pumps, coarse screening and grit removal systems.
- **Secondary treatment:** Installation of air blowers, replacement of water/sludge valves and sensors.
### Upgrade works

<table>
<thead>
<tr>
<th>North and South WWTPs</th>
<th>Effluent disinfection</th>
<th>Replacement of the chlorine gas disinfection systems with ultraviolet (UV) light systems.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available Expendable</td>
<td>Tertiary treatment</td>
<td>Installation of polyester screening discs</td>
</tr>
<tr>
<td>South WWTPs</td>
<td>Secondary treatment</td>
<td>Installation of a denitrification system</td>
</tr>
<tr>
<td></td>
<td>Sludge management</td>
<td>Installation of centrifuge systems to replace belt presses</td>
</tr>
<tr>
<td></td>
<td>Cogeneration plant</td>
<td>Construction of a cogeneration power plant, which includes a) Removal of hydrogen sulfide, b) gas drying</td>
</tr>
</tbody>
</table>

### Implementation

**Inputs and Activities:**

<table>
<thead>
<tr>
<th>Technical:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NADB Implementation Activities</td>
</tr>
<tr>
<td>Construction and equipment</td>
</tr>
<tr>
<td>Project closeout</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Financial:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inputs</td>
</tr>
<tr>
<td>NADB Loan</td>
</tr>
<tr>
<td>Equity</td>
</tr>
</tbody>
</table>

*Baseline emissions are calculated with the power generation portfolio of the state of Chihuahua and on the factors reported per technology in the Mexican National Power System Development Program (PRODESEN) 2018. The resulting emission factors are: 0.429 metric tons/megawatt-hour (MWh) for CO2; 0.001 metric tons/MWh for NOx, and 0.002 metric tons/MWh for SO2.*
ANNEX B
PROPOSED LOAN TERMS AND CONDITIONS

REHABILITATION AND UPGRADE OF THE WASTEWATER TREATMENT PLANTS IN CHIHUAHUA, CHIHUAHUA

Project: The project consists of rehabilitating and upgrading the North and South Wastewater Treatment Plants (WWTPs), as well as designing, installing and operating a cogeneration facility in the South WWTP in the city of Chihuahua, Chihuahua.

Sponsor: Aguas de Reúso y Energía Renovable, S.A. de C.V. (ARERSA or the “BOT Contractor”), the special-purpose vehicle created by the consortium formed by La Peninsular Compañía Constructora, S.A. de C.V., Suez Medio Ambiente México, S.A. de C.V., Suez International, S.A.S., and Grupo Acuanovus, S.A. de C.V., which was awarded the contract for the design, construction, financing and operation of the Project (the “BOT Contract”) by the municipal water utility, Junta Municipal de Agua y Saneamiento de Chihuahua (JUMAS).

Borrower: ARERSA.

Lender: North American Development Bank (NADB).

Project Cost: $292.4 million pesos (US$14.7 million).

LOAN TERMS

NADB Loan Amount: Up to $223.4 million pesos (US$11.2 million):
  • Tranche A for up to $159.7 million pesos (US$8.0 million); and
  • Tranche B for up to $63.7 million (US$3.2 million).

Loan Uses:
  • Tranche A.- The Loan proceeds will be used to finance: (i) a portion of the rehabilitation works of the North and South WWTPs; (ii) interest payments during the 12-month construction period; (iii) a portion of the value-added tax (VAT) charged against the Project; and (iv) the legal, technical and financial expenses associated with the Loan.
  • Tranche B.- The Loan proceeds will be used to finance: (i) the construction and equipment of the cogeneration facility at the South
Repayment Sources:

**Tranche A.** - (i) The fee designated to pay the fixed amortization costs of investments funded with loan proceeds and equity ("T1") under the BOT Contract; and (ii) a debt service reserve fund (DSR).

**Tranche B.** - (i) The fee designated to pay the fixed operation and maintenance costs ("T2") under the BOT Contract, and (ii) the DSR.  

### Interest Rate:
A fixed and/or variable market-rate in Mexican pesos.

### Currency:
Mexican pesos.

### Exchange Rate Hedge:
NADB mechanism.

### Disbursement Period:
Up to twelve (12) months computed as of the date of the first disbursement.

### Repayment Period:
**Tranche A.** - Up to one hundred thirty-two (132) months, including a sixteen (16) month grace period on principal payments.

**Tranche B.** - Up to one hundred twenty (120) months, including a sixteen (16) month grace period on principal payments.

### Grace Period:
Up to sixteen (16) months on principal payments, computed as of the date of the first disbursement.

### Principal and Interest Payments:
Monthly.

### Prepayment:
The Borrower may prepay the Loan when authorized by NADB, provided that any costs incurred by NADB have been paid.

### Penalty Interest:
In the event that NADB has not received the full amount of any principal payment due on the payment date, penalty interest of 1.5 (one point five) times the ordinary interest rate shall be applied on such amount until that principal payment has been received in full by NADB.

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29 In the event of early termination of the BOT Contract for any cause, whereby the BOT Contractor would be obligated to remove the cogeneration equipment from the South WWTP and reimburse JMAS for all payments made as of the date of termination, the remaining balance of the T1 proceeds, once the debt service of Tranche A has been paid, will be used to cover the debt service payments of Tranche B. If the remaining balance is not sufficient to cover the debt service payments of Tranche B, the cogeneration equipment will be sold at its salvage value and the sale proceeds will be applied to the outstanding balance of Tranche B.
Fees and Expenses: Commitment fee: In accordance with NADB’s Loan Policies and Procedures.

Expenses: The Borrower shall pay NADB the legal, technical, and financial expenses of this transaction.

Applicable Taxes: The Borrower is responsible for paying all applicable taxes. No withholding taxes are assessed by the Government of Mexico on interest payments made by the Borrower to NADB under the Loan Agreement.

Exchange Rate Hedge: Any expenses resulting from the execution, termination or substitution of the hedge mechanism shall be covered by the Borrower.

Disbursement of Loan: The Loan proceeds will be disbursed into a trust account and drawn down in accordance with NADB disbursement policies and procedures.

LOAN CONDITIONS

Closing: Prior to signing the Loan Agreement, the Borrower must provide the following information:

a) Certified copy of the official documentation authorizing JMAS to execute the BOT Contract for the Project, including, among others, the approval of the JMAS Board, the Chihuahua State Water Agency, and the State Congress;

b) Certified copy of the signed BOT Contract and any amendments;

c) Certified copies of the documents evidencing the legal status of its representatives; and

d) Copy of the letter from the cogeneration equipment supplier stating its commitment to support and cooperate with the BOT Contractor regarding the sale of the equipment in the event that the BOT Contractor decides, at its sole discretion, to sell the equipment.
Disbursement: Prior to the first disbursement of the Loan proceeds the Borrower, must provide:

a) A certified copy of the irrevocable trust created by JMAS, to which it will pledge all monthly revenue deriving from the services provided to its users;

b) A certified copy of the irrevocable administration trust (the “Administration Trust”) created by the BOT Contractor, in which NADB is designated as beneficiary;

c) An executed legal opinion for the Loan Agreement issued by its legal representative, in terms satisfactory to NADB;

d) The construction and disbursement schedules, in terms satisfactory to NADB;

e) Evidence that it has secured all the required sources of funding for the Project and complied with all requirements for entry into force of the BOT Contract; and

f) Evidence, in terms satisfactory to NADB, that the Borrower has obtained all applicable environmental permits.

COVENANTS

Project Completion: The Borrower will be responsible for covering any costs in excess of the Loan amount needed to complete the Project in accordance with the provisions set forth in the Loan Agreement.

Debt Service Coverage Ratio (DSCR): A DSCR equal to or greater than 1.20 times the debt service for each fiscal year must be maintained in the Administration Trust.

Debt Service Reserve (DSR): The DSR requirement will at all times be equal to one (1) month of principal and interest payments and shall be maintained in the Administration Trust throughout the term of the Loan.

Limitation on Additional Indebtedness: The Borrower shall not contract any additional debt if the DSCR falls below 1.20, without the prior written authorization of NADB.

Compliance with Laws and Regulations: The Borrower must operate the Project in compliance with all the laws, rules, regulations, orders and directives applicable to the Project or the Borrower, enacted by any legislative, executive, administrative or judicial body having lawful jurisdiction (whether federal, state or local).
Audits of Project Operations: The Borrower shall notify NADB of all audits that are performed on the Borrower and provide copies of those audits to NADB upon request. NADB reserves the right to conduct spot financial and technical audits of the Project.

Reports: The Borrower will submit the following reports to NADB:

a) Within forty-five (45) days following the end of each quarter, a certificate, signed by its legal representatives, as to the debt service coverage ratio for the fiscal year ending.

b) No later than one hundred and eighty (180) days following the end of each fiscal year, a copy of its audited financial statements.

c) Within forty-five (45) days following the end of each quarter, the unaudited financial statements.

d) Promptly upon the occurrence of an event which is material to the financial condition or operating effectiveness of the Project, notice of such event and its expected impact on the Project.

e) Notice of any litigation or proceeding filed against the Borrower, as well as any anomaly or circumstance which may compromise the operation of the Project.

Limitation on Liens: The Borrower may not contract any liens on the Project equity without the prior written authorization of NADB, with the exception of liens related to the Loan Agreement.

Sale, Lease or Encumbrance: The Borrower may not sell, lease or encumber all or any part of the Project, without the prior written authorization of NADB.

Insurance and Bonds: The Borrower shall verify that the contractor/suppliers have secured and are maintaining all the insurance policies and bonds necessary for all the Project components. The Borrower may cover Acts of God and force majeure events on its own account.

EVENTS OF DEFAULT AND REMEDIES

Events of Default: The following situations shall constitute events of default:

a) Failure to make payment when due of any principal, interest or fees under the Loan Agreement in accordance with the
established schedule, which continues unremedied for thirty (30) or more days; or

b) Any representation or warranty made by the Borrower in the Loan Agreement and/or Administration Trust Agreement proves to have been incorrect or false in any material respect; or

c) The validity of the Loan Agreement between NADB and the Borrower and/or the Administration Trust Agreement is contested by the Borrower, the United Mexican States or any government authority thereof, or the Borrower denies liability under the Loan Agreement and/or Administration Trust Agreement, or any part of the Loan Agreement and/or Administration Trust Agreement is, for any reason whatsoever, deemed invalid and unenforceable; or

d) Failure of the Borrower to perform any of the obligations or covenants contained in the Loan Agreement and/or Administration Trust Agreement, which continues unremedied for a period of thirty (30) days from the date the Borrower receives written notice of such failure from NADB; or

e) Bankruptcy, suspension of payment, or reorganization of the Borrower, or any proceeding is instituted by the Borrower under bankruptcy, suspension of payment, insolvency or other law for relief of debtors and any such proceeding shall continue undismissed, or any such proceeding is instituted against the Borrower, or an order judgment or decree approving or ordering any of the foregoing shall be entered and continued unstayed and in effect, for a period of thirty (30) or more days; or

f) Significant adverse changes in the legal and financial position of the Borrower that jeopardize its capacity to fulfill its obligations in the manner and under the terms agreed in the Loan Agreement and/or Administration Trust Agreement; or

g) Any change in applicable legislation or regulations that could prevent the Borrower from meeting its payment obligations in the manner and under the terms agreed in the Loan Agreement and/or Administration Trust Agreement.

Remedies: Upon occurrence and continuance of an Event of Default, NADB may exercise any or all of the following remedies:

a) Refuse to advance any funds to the Borrower.

b) Accelerate the Loan.
c) Exercise such other rights and remedies as may be available at law.

**Waiver of an Event of Default:**
NADB may waive any Event of Default. Such waiver will not release the Borrower from any of its obligations under the terms of the Loan Agreement.

**Law:**
This Agreement shall be governed by, and construed in accordance with, the laws of the United Mexican States.

**Jurisdiction:**
For any controversy or conflict regarding the Loan documentation, the parties will irrevocably submit to (i) the jurisdiction of the U.S. federal court in San Antonio, Texas, in respect of actions brought against NADB, and (ii) to the jurisdiction of the federal court in Mexico City, in respect of actions where the acting party is NADB, and in both cases the parties hereby waive the right to any other jurisdiction to which they may be entitled by reason of their present or future domicile.

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**EFFECTIVE DATE OF THE PROPOSAL**

**Effective Date:**
The terms and conditions of this Loan proposal will be valid upon approval of the corresponding resolutions by the NADB Board of Directors.