Umm Al Hayman Wastewater Treatment Plant (UAH WWTP)

Securing long-term supply for a growing population

wte
EVN Group

The Project at a Glance

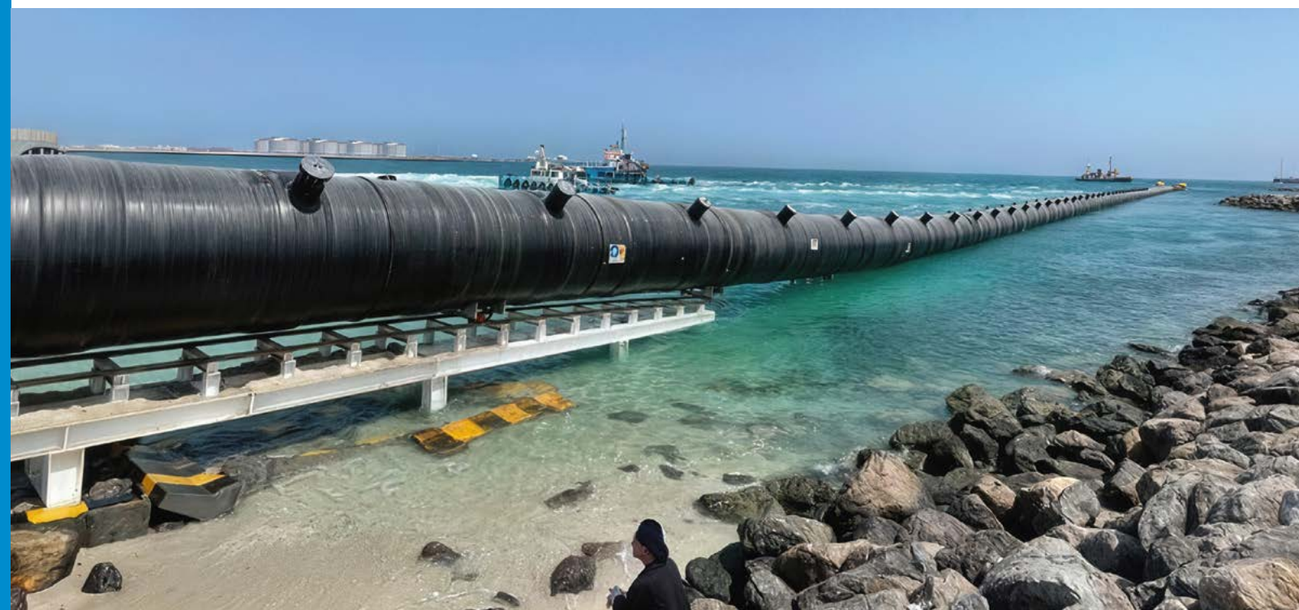
The construction of the Umm Al Hayman Wastewater Treatment Plant (UAH WWTP) is one of Kuwait's most significant infrastructure projects for modernizing wastewater treatment. The facility sets new technological standards and makes a major contribution to the sustainable development of the region. The Project is designed to meet the rising demands driven by both population growth and expanding infrastructure by delivering reliable, long-term service through the construction of advanced facilities and the implementation of innovative technologies. Aligned with the global sustainability goals, the project is designed to treat wastewater of the entire southern region of Kuwait, transforms sludge into high quality compost, and generates a significant portion of the plant's power from the biogas produced during the treatment process.

- → **Location:** Southern region of Kuwait
- → **Purpose:** Wastewater treatment
- → **Capacity:**
  Initial: 500,000 m^3/day
  Potential (after expansion): 700,000 m^3/day
- → **Use of treated water:**
  Agriculture and landscape irrigation
- → **Investment volume:** Approx. USD 1.8 billion (excluding operating costs)
- → **Contract model:** Combination of Build-Operate-Transfer (BOT) and Design-Build-Operate (DBO)
- → **PPP model:** Developed under Kuwait's Public-Private-Partnership laws

Key Technical Components

At the core of the project was the construction of a **state-of-the-art wastewater treatment plant** at Umm Al Hayman area, along with the development of a **450 km network for wastewater collection and water distribution**. Other components included the expansion of existing **wastewater pumping stations** and construction of new ones.
This included a wastewater pumping station for transferring treated sewage effluent (TSE) to reservoirs along with **seven (7) strategic reservoirs** with capacities ranging from 40,000 to 160,000 m^3, and **32 secondary reservoirs** equipped with associated pumping stations to deliver TSE that is required for irrigation purposes.
In addition, the works included the construction of an approximately **6 km Emergency Sea Outfall (ESO)** that extends offshore, along with two substations: a **300/132/11 kV substation** and 132/11 kV, which are required to support the plant and pumping station.

TSE = Treated Sewage Effluent
ESO = Emergency Sea Outfall



Project Participants and Stakeholders

WTE Wassertechnik GmbH led the project as the general contractor for the planning, construction, and operation of the wastewater treatment plant and the associated distribution network. The **Umm Al Hayman Wastewater Treatment Project Company (UAHPC)** was established as the project company. The official client was the **Ministry of Public Works of the State of Kuwait**. In addition, the following institutions were involved as partners:

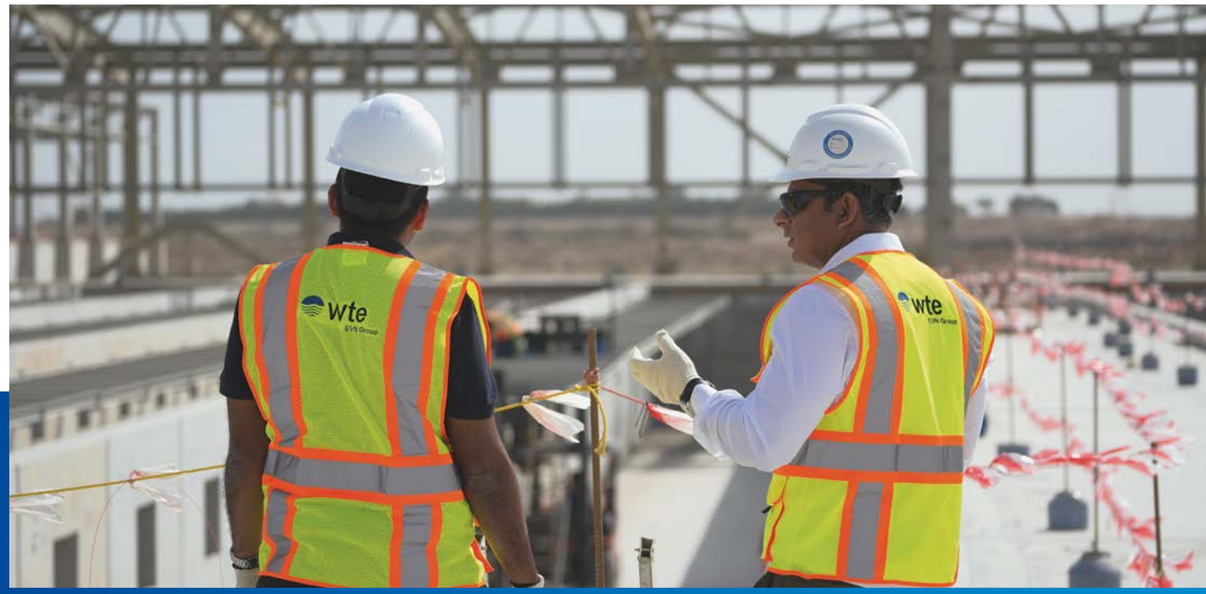
- **Kuwait Investment Authority (KIA) |** State-owned financing institution
- **International Financial Advisors Holding (IFA) |** Financial partner in the consortium
- **Kuwait Authority for Partnership Projects (KAPP) |** Regulatory authority for PPP projects

PPP = Public Private Partnership

Key Milestones

- **January 2020 |** Contract signing and project launch
- **July 2020 |** Financial close with banks and the Ministry of Public Works
- **April 2021 |** Delivery of 300 kV cable reels (20 km)
- **September 2021 |** Installation of the first tunnel boring machine for the Emergency Sea Outfall (total length approx. 6 km, including 2.2 km offshore via microtunneling)
- **April 2022 |** Commissioning of the ESF substation
- **September 2022 |** Completion of the Emergency Sea Outfall
- **January 2024 |** Start of commissioning

ESF = Electrical Special Facility



Technical Infrastructure

Wastewater Treatment Plant (BOT)

The plant covers **more than 100 hectares** and has a capacity of 500,000 m^3 of treated wastewater per day, serving 1.7 million inhabitants. This capacity can be expanded to 700,000 m^3 per day. The treated wastewater can be reused **100% for irrigation** purposes.

Processes applied in the treatment plant include **advanced nutrient removal** and **tertiary treatment such as cloth filtration**, UV disinfection, and chlorination. **Thermophilic-mesophilic digestion** ensures optimized biogas yield and stabilization, with digesters of 50,000 m^3 each. The biogas is used for **in-house power generation**.

Additional highlights include:

- 100,000 m^3 reservoir for treated wastewater
- Production of 70,000 t of compost per year (Class A)
- SCADA system for optimized plant control
- Operation of the plant for 25 years by WTE

SCADA = Supervisory Control and Data Acquisition

Pipeline Networks (DBO)

The pipeline network comprises **195 km of wastewater collectors** (diameter: DN 1,100 to DN 1,600) and a **250 km TSE network** (DN 200 to DN 1,400). It includes manholes for wastewater and TSE systems for pressure relief, pipe crossings, cleaning, and maintenance. **More than 100 pipe jacking sections** were completed. The total weight of the pipeline materials **exceeds 250,000 tons**.

Pumping Stations (DBO)

As part of the project, an existing pumping station was expanded and several new ones were built:

- **Egailah WWPS |** Expansion of flow capacity from 2.8 to 8.3 m³/s and head to approx. 140 m
- **Sabah Al Ahmed WWPS |** New station with a flow capacity of 2.18 m³/s and a head of approx. 30.7 m
- **TSE-Pumpstation |** 4 new stations with flow capacities ranging from 0.47 to 4.95 m³/s and heads from 47 m to 155 m

WWPS = Wastewater Pumping Station

Reservoire (DBO)

A total of 39 reservoirs were created:

- 7 strategic reservoirs (capacity: 40,000–160,000 m³)
- 32 secondary reservoirs (27 with 2,000 m³ capacity, 5 with 3,000 m³ capacity)

Other Components

- **Wastewater and TSE transmission/distribution systems:**
  total length of 450 km, including 21 km installed by microtunneling
- **Emergency Sea Outfall:**
  system discharges treated water into the sea in case of overcapacity, built via open excavation (onshore) and microtunneling (offshore, 2 km)
- **Electrical facilities:**
  a new 300/132/11 kV substation supplies the WWTP and surrounding consumers, connected via underground 300 kV cables and overhead lines. Additionally, a 132/11 kV substation was built for the Egailah pumping station. The Ministry of Electricity and Water (MEW) of Kuwait is responsible for operations.

PROJECT DOSSIER

Project Goals

Long-term supply security, resource and climate protection, and safe working conditions: in the largest project in WTE Group's history, we contribute to achieving all sustainability goals defined so far, helping shape the future of a growing nation.

The implementation of the complex pursued several objectives:

Improvement of wastewater infrastructure
particularly in the growing residential areas of southern Kuwait, ensuring capacity meets rising demand.

Resource conservation
TSE enables reuse for agricultural irrigation and landscaping, preserving freshwater for drinking and households, and protecting sensitive ecosystems.

Promotion of circular economy
hygienically treated sludge is converted into Class A compost, a high-quality organic soil improver, used locally in agriculture, municipalities, and private gardens.

Strengthening local agriculture
farmers gain access to affordable, nutrient-rich compost.

Public health and hygiene
the modern plant reduces the spread of pathogens, especially in TSE, which is released under hygienic control.

Job creation and know-how transfer
ongoing operation, monitoring, and maintenance require skilled staff in environmental engineering and logistics.

You can find out more about the WTE Group's sustainability goals and measures in our sustainability report (PDF document):

Awards

The project has already received various prizes:

IJGlobal MENA Award 2020 | Best Wastewater Project in the MENA Region

PFI Award 2020 | PPP Deal of the Year
The PFI Awards are the leading industry benchmark for everyone involved in project finance worldwide. Winning one is considered the highest distinction in the global project finance sector. The award is presented by Project Finance International, the financial magazine that has been at the forefront of project finance reporting for 25 years.

Asian Water Awards 2024 | Water Company Excellence Award – Kuwait + Sustainable Water Infrastructure Award – Kuwait
The Asian Water Awards are a prestigious program that recognizes outstanding achievements in the water sector across Asia. They provide a platform to showcase innovative projects, initiatives, and companies that have made significant contributions to water management, environmental protection, and sustainability in the region. The awards are intended to inspire and promote best practices, encourage knowledge sharing, and foster collaboration among water professionals, organizations, and communities.

MENA = Middle East and North Africa

MEED Projects Awards 2024 | Best National Wastewater Project
This prestigious award honors the best projects and professionals in the Middle East and North Africa, with a focus on innovation, sustainability, and social impact. The MEED Projects Awards, which have been celebrating groundbreaking projects and leaders since 2007, remain the gold standard for recognizing excellence in the MENA region. MEED Projects is the largest platform for project tracking in the Middle East and Africa.

ESG = Environmental, Social and Governance

The Energy Year Kuwait 2024 | ESG Project of the Year
The ESG awards recognize outstanding achievements in Environmental, Social, and Governance practices, celebrating organizations that lead in sustainability and responsible business practices.

Scan the QR code now and download our sustainability report as a PDF document.

The construction of the **Umm Al Hayman Wastewater Treatment Plant (UAH WWTP)** is a flagship project for modern wastewater infrastructure in the MENA region. With a carefully developed sustainability strategy implemented through advanced technologies, numerous long-term benefits have been created – for the economy, society, and the environment alike.

For additional information on this large-scale project, please visit the websites of WTE Wassertechnik GmbH and the Umm Al Hayman Wastewater Treatment Project Company (UAHPC):
www.wte.de | uahpc.com

Contact details for project representatives are available upon request.

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EVN Group

WTE Wassertechnik GmbH
Ruhrallee 185 | 45136 Essen | Germany
T +49 201 8968-500
info@wte.de | www.wte.de