



الوثبة فيوليا بيسكس للصرف الصحي
Al Wathba Veolia Besix Waste Water

Our Story

ISTP2 – Building and operating Al Wathba 2 and Allahamah
wastewater treatment plants



Our story began in December 2008.

The ISTP2 (Independent Sewage Treatment Plant) project is a BOOT project (build-own-operate-transfer) which consists in the design, construction, financing and operation of two wastewater treatment plants in the Emirate of Abu Dhabi: Al Wathba 2 and Allahamah.



These plants, which were commissioned in January 2012 for Al Wathba 2 and April 2013 for Allahamah, serve two main purposes:

- To treat the growing amount of wastewater produced in Abu Dhabi and Al Ain following the demographic growth
- To recycle treated water for irrigation of the green areas (farms, parks, green spaces, etc.) of Abu Dhabi and Al Ain.

The owner of these two plants is Al Wathba Veolia Besix Waste Water PJSC, a Special Purpose Company which was incorporated in 2008 for this specific project. It is a joint-venture between the government of Abu Dhabi, represented by ADWEA, and two private companies – Veolia and Besix.



Allahamah



Al Wathba 2

Facts & Figures

Allahamah plant: Water treatment capacity

Average flow	Population equivalent	Tolerance capacity	Peak flow to pre-treatment
130,000 m ³ /day	650,000 (Al Ain)	149,500 m ³ /day	10,834 m ³ /h

Quantity of sludge produced at full capacity: 24,000kg DS/day (average)

Al Wathba 2 plant: Water treatment capacity

Average flow	Population equivalent	Tolerance capacity	Peak flow to pre-treatment
300,000 m ³ /day	1 million (Abu Dhabi)	345,000 m ³ /day	25,000 m ³ /h

Quantity of sludge produced at full capacity: 32,000kg DS/day (average)

Contract duration

2.5

years for the design and construction phases

25

years of operation

Construction: The Al Wathba 2 & Allahamah Plants

3,000
people contributing
to the construction

35
local partners

10,000,000
man-hours
without accident

Al Wathba 2:
32
months in construction

Allahamah:
27
months in construction

15
months of cocooning





Water Stream

Inlet Pumping Station

Submersible pumps lift the sewage approx. 23m into the headwork from where the sewage gravitates through the plants.



Preliminary Treatment

Fine screens remove all particles with a size larger than 6mm. In the next step, sand, grit, stones and broken glass settle down in the tanks. Lastly, surface skimmers remove oil and grease from the sewage.



Primary Treatment

Veolia's patented Multiflo™ treatment system removes 60 to 65% of suspended solids (SS) and 30 to 35% of the BOD₅ from the sewage. The collected sludge is continually moved to the sludge treatment building.



Secondary Treatment

Removing the majority of BOD5 and ammonia from the wastewater through two processes:

Activated Sludge Process:

The activated sludge process is a biological process that utilizes microorganisms to convert organic and certain inorganic matter from wastewater into cell mass. It aims at removing dissolved organic matter and nitrogen from the sewage. This is achieved by the use of specific microorganisms which operate in sequential aerobic and anoxic conditions to eat up the organic matter in the wastewater. Powerful turbo blowers inject air in fine bubbles at the bottom of the activated sludge tanks to expedite the biological process by providing oxygen to the microorganisms. The wastewater is then passed to the de-aerator/ splitter tank, where it is degasified by removing the air bubbles. From there the wastewater is delivered to the clarifiers.



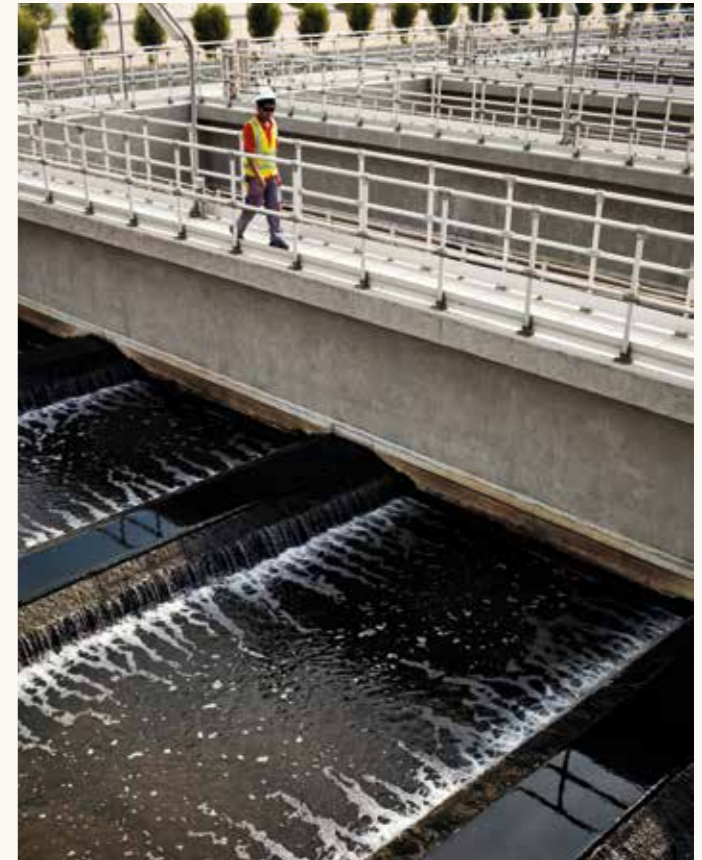
Clarification:

Secondary clarifiers help to separate the solids from the liquid phase of the mixed liquor, and remove biological sludge from the floor. The biological sludge is collected at the bottom of the clarifiers and re-circulated back to the inlet of the activated sludge tanks. This stabilizes the concentration of the microorganisms in the activated sludge process.



Tertiary Treatment

The tertiary treatment ensures that the effluent complies with regulatory standards for irrigation purposes. Dual media filters (pumice stone and sand) are used for the filtration process. Then, the water is disinfected by injecting sodium hypochlorite produced on site. Finally, the recycled water is pumped to a reservoir with a capacity of 50,000m³ from where it is distributed to consumers to be used as water for irrigation purposes in Abu Dhabi and Al Ain.



Sludge Stream

Thickening

Primary sludge coming from the primary settlers and excess biological sludge coming from the clarifiers undergo a thickening process. The water content of the sludge is reduced by adding polymers.



Anaerobic digestion

In the digesters, volatile organic matter is reduced by utilizing anaerobic bacteria in the absence of oxygen. The sludge is fermented in digesters at a temperature of approx. 36°C for a minimum period of 15 days. The biogas that is generated has a high proportion of methane and is partly used to heat the digester during the cooler season.



Dewatering

The digested sludge passes through centrifuges in order to achieve a dry solids content of 24%. Polymer is injected to the sludge upstream of the centrifuges to create flocculated particles and improve drainage.



Drying

The dewatered sludge is transported by trucks to the open sludge solar drying beds. Subject to the weather condition, this process takes around 30 days.



Odour Stream

Nitrogenous and sulphurous compounds cause odorous nuisance and have to be treated. The hydrogen sulphide gas (H_2S) is the main odorous gas to be treated in the STPs.

The fouled air is collected from each structure where H_2S is generated and conveyed through ventilation pipes to the odour treatment building.

The odour treatment consists of both biological and chemical treatments. The fouled air flows from the bottom to the top of each biological and chemical scrubber to be treated. Chemical treatment consists of spraying consecutively acid and alkaline solutions (a mix of soda and bleach) to remove nitrogenous and sulphurous compounds.



The plants have been designed to limit the environmental impact by reducing the carbon and water footprints.

Water

Re-use of treated sewage effluent: Water is a precious resource and the emirate of Abu Dhabi is clearly committed to making the most of the available water. Veolia supports this policy by proposing a solution to “slow down the water cycle” and re-use water. The Treated Sewage Effluent (TSE) produced by the plant is effectively entirely re-used for green spaces watering purposes.

Sludge

On-going pilot in Allahamah demonstrating that bio-solids can be re-used in forestation as fertilizers but also as efficient water absorbent allowing to save irrigation water consumption.

Energy

30% less than foreseen in design, sludge dries naturally, re-use of biogas under study.

Chemicals

Biological treatment for odour treatment added to the chemical odour treatment and to save on chemical consumption.

Emiratization

Awareness campaign for schools and universities

To educate the youth about the water cycle and attract talents, specific actions adapted to different age ranges are planned in the emirate of Abu Dhabi:

- 6-12 years: visits in schools
- 12-18 years: plant on-site visits
- 18+ years: internship programs.



VeBes O&M, AD Poly and Veolia sign a MOU to develop a new program supporting Emiratization

This 3-year program aims at diversifying the economy by contributing to the education and development of UAE human resources and talent development through a tailor-made and innovative apprenticeship solution.

This agreement directly subscribes to the Human Development Pillar of the UAE Vision 2021, which deems innovation, research, science and technology as the key pillars of a knowledge-based, highly productive and competitive economy.

Objectives:

- Develop a pool of skilled technicians in the field of water services to accompany Emiratization process
- Ensure the highest standard of technical knowledge and competences by aligning the program on European certification process.

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