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Dubai Wastewater Treatment and Reuse Comprehensive Sustainable , Social and Economic benefits

Eng. Mohammed AbdulAziz Najem
Director of Sewage Treatment Plant Department
Dubai Municipality
Email: manajem@dm.gov.ae



Dubai Municipality under the aegis of the pragmatic Government of Dubai persistently perused ambitious policies of making the City of Dubai, located in the Arabian Desert a Major International City, a competitive player in the World Livability Index and a major Tourist attraction. Management of water resources is one of the most influential factors or the back bone of development for this region, which is among the lowest average annual rain fall. The potable water is produced by desalination of Seawater and costs around US \$ 3.0 per Cubic Meter. The cost of Treating Sewage is only 14 Cents per Cubic Meter. Recycling of treated waste water is the key to meet the horticultural needs.



Realizing this with foresight, Dubai Municipality embarked on proactive planning and implementation of the Sewage Treatment Plants projects , operated and maintained by Dubai Municipality to irrigate the greenery and wonderful Public parks in the city for the last 25 years.



In the process two major Wastewater Treatment Plants were constructed and commissioned to treat and recycle the waste water one in 1990 and another in 2009 having capacity of 260,000 Cubic Meter per day and 300,000 Cubic Meter per day respectively. At present all the Plants provide around 700,000 Cubic Meter per day Treated Effluent for Irrigation to the city and played major role in transforming the arid region in to a beautiful , thriving Tourist haven.

If the same quantity of fresh water is used for irrigation the expenditure will be over 2.0 Million US Dollars per day on the Public exchequer, where as the Treatment cost is around US Dollars 100,000 per day only. This amounts to a saving of around 1.9 Million US Dollars per day. Yearly saving is estimated at 690 Million US dollars.

In line with the strategy of Energy conservation & Sustainability of Government of Dubai , the Plants are designed with rationalized Energy consuming processes and components like using gravity to exclude avoidable pumping, Bio trickling Filters for Ammonia reduction instead of Aeration, Biological Scrubbers for Odor removal , Variable Speed drives for selected pumping needs , Advanced Process Automation systems etc.

In addition to Irrigation, these Treatment Plants greatly contribute to the reputed sanitation of Dubai Sea water Creek and thereby to the Public Health and Environment of the Dubai City at large.

Dubai Municipality – Sewage Treatment Plants Department – Over view of 300,000 M3 / day Plant - A Completed Project



The by products 65 % Methane Gas 30 Million Cubic Meters per year and manure 6000 Tons are produced from sewage Sludge. Manure is used for Soil enrichment and Methane Gas is planned to be in Power Generation.

Despite the severely challenging environmental and climatic conditions of Desert, Dust, high temperature, Low rain fall, Scarcity of fresh water sources, Dubai Municipality developed a sustainable role model of Wastewater management by tackling multiple livability factors in the region as explained above.

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The Strategy of Dubai City stems from the following policy initiatives:

De-coupled Economy from the traditional dependence on fossil fuels a strategy that started over 20 years ago.

- Among the first to try, adapt, modify and fine tune to the local conditions, the Technologies from USA, Europe, Australia, Japan etc.
- Emphasis on happiness and tolerance among Multi cultural society and high rate of floating population.
- All past and current investments consider sustainability and efficient and effective Energy utilization as first priority.

Dubai Municipality's strong commitment and investment in the Environment Sector and implemented quality reflect in the achieved International status of the city in the comity of developed cities



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Environmental social benefits:

Treated Sewage Effluent is recycled to irrigate public parks and green areas of Dubai City:

- Raw Sewage Treated in the Treatment Plants: 2010 to 2016: From 179 to 248 Million Cubic meters.
- Treated water used for Irrigation 2010 to 2016: From 139 to 220 Million Cubic meters
- Fertilizer produced in Sewage Treatment plants: 2010 to 2016: 2457 to 5568 Tons
- Increase in Green area of City: 2010 to 2015 Around 145 Million Square meters green areas including Trees, Plants, Bushes, Flower plants and Grass are added since 2010.

All the achievements of this green cover are due to the treated water from the Sewage Treatment plants. Green cover and Flowers and parks adding to the beauty of the city, turned as a pleasure to the visiting tourists.

Conservation of Potable water in large quantity. By such rationalized Desalination, the Arabian Gulf is spared of the possible discharge of high saline content Brine, which is already a concern to the region.

Economic benefits :

Economic benefit from Sewage Treatment and Recycling of treated water for Irrigation of Public parks , Green cover ,Trees and Flowers plantation of Dubai is immense.

Treated water used for Irrigation , conserving the same quantity of potable water. The cost is valued at US \$ 690 Million.

Water benefits Certificates program: A Water Benefit Certificate represents a volume of water sustainably supplied, purified, or conserved. Once issued, Water Benefit Certificates can be sold to earn income that supports further water project activity.

- Projects are issued Water Benefit Certificates (WBCs) according to the volume of water benefits they generate per year.
- Depending on the project size the WBC's issued changes according to the following logic:

1. For the first 40,000 m³ of water saved per year, 1 WBC = 1 m³
2. For additional savings between 40,000 m³ and 1,300,000 m³ per year, 1 WBC = 10 m³
3. Savings beyond 1,300,000 m³ per year are awarded with 1 WBC = 100 m³ of water saved.



Investments :

1. Warsan Plant

- Capacity : 260,000 Cubic Meter per day
- Commissioned in 1989 with 130,000 Cubic Meter per day and extended to 260,000 Cubic Meter / day in 2000.
- High rate Plant with Biological trickling Filters for de nitrification.
- Saving Energy that was otherwise required for extended aeration.
- Rotating Drum driers for Sewage Sludge producing A Grade manure for Soil enrichment.
- Bio scrubbers added for Primary operation to remove odors.
- Extension Project for another 65000 Cubic Meter / day is completed in 2015
- Total Cost of Project : US \$ 300 Million



2. Jabel Ali Sewage Treatment Plant - Phase - I

- Capacity : 300,000 Cubic Meter per day
- Extended Aeration process with out Bio Trickling Filters.
- Primary Dis-infection by UV and post by Chlorine.
- Odor removal by Bio scrubbers with stand by Chemical scrubbers
- Sludge Drying by Belt Driers using Digester's Gas.
- Commissioned in 2009
- Project Cost : USD 435 Million
- Application of UV Disinfection instead of Chlorine aids the environment.
- The quality of Effluent from this Plant is superior due to extended aeration.
- Effluent analysis data is provided.

3. New Project under Construction : Jabel Ali STP Phase - 2

New Project of 375,000 Cubic Meter capacity is under Construction. This Project is envisaged to meet the rapid growth of Dubai city due to the EXPO 2020 being organized in Dubai with an investment of US \$ 430 Million. Scheduled to be commissioned in year 2019

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