

...together for sustainable Water & Wastewater services...
...معاً لتحقيق الاستدامة في خدمات المياه والصرف الصحي...



WASTEWATER SLUDGE TREATMENT AND DISPOSAL IN KSA

OUTLINE



- * Objective
- * Current and Future sludge production in KSA
- * Current Methods of Treatment and Disposal
- * Better Sludge Treatment and Recycling Options for KSA
- * Case Study: Solar Drying of Sludge in Jeddah
- * Conclusion & Recommendation

OBJECTIVE



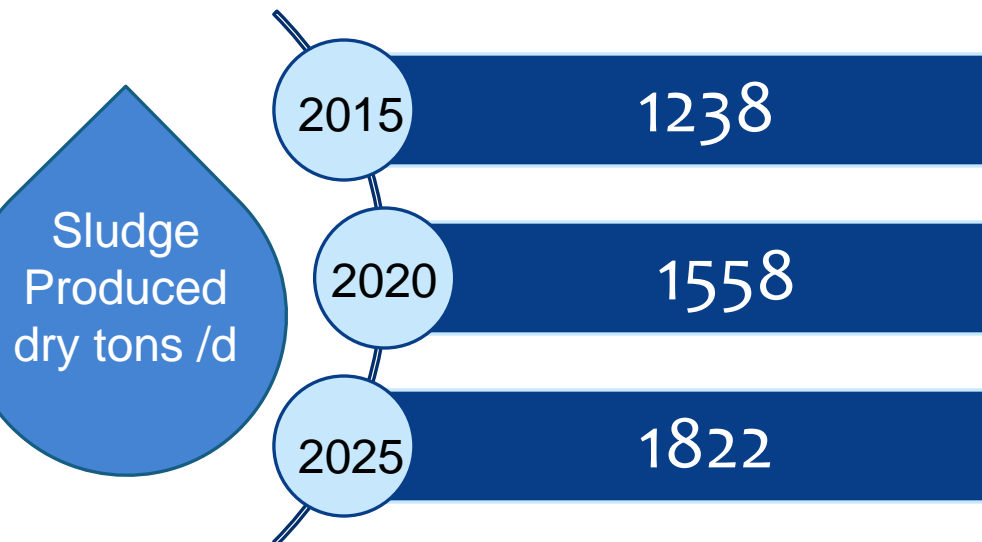
- * The objective of this study is to highlight the current problems in KSA for safe and environmentally friendly disposal of wastewater sludge or bio-solids.
- * It focuses on present disposal methods and new technologies that if introduced could benefit the whole Kingdom by recycling and re-using the bio-solids as opposed to the present method of disposal at landfill.

CURRENT AND FUTURE SLUDGE PRODUCTION IN KSA



Sludge entering a Treatment Plant from a sewer is between 1 and 3 % Dry Solids. After treatment the sludge or bio- solids can be between 15 and 35 % Dry Solids.

FORECASTED AMOUNTS IN THE WHOLE OF THE KINGDOM



A study done in Jeddah in 2011 assessed the amount of sludge being produced as 120 tons per day Dry Solids.

Current production figures in Riyadh in 2013 are calculated at 200 Dry Tons per day.

The amount in Jeddah in 5 years' time with the build of new Wastewater Treatment Works is going to be 360 tons per day. The amount is going to be tripled.

CURRENT METHODS OF TREATMENT AND DISPOSAL



- * Current method of thickening the sludge utilizes gravity settling followed by Belt Presses or Centrifuges and at some Plants old static drying beds.
- * Most of the sludge after treatment is disposed of to a nearby Landfill site without any proper controlled Environmental Policy or proper mechanism in use to safeguard against underground infiltration, vector problems or risk of bacterial or virus infection.



LANDFILL SITE
TRENCH BEING
FILLED WITH SLUDGE
NEAR JEDDAH

BETTER SLUDGE TREATMENT AND RECYCLING OPTIONS FOR KSA



- ✓ Drying by Using Thermal Driers or Modern Solar Drying Technology and re-using the dried sludge as a fertilizer or additive fuel in Cement Factories or future Power Plants.
- ✓ Use of Anaerobic Digestion producing methane gas for generating electricity utilizing CHP technology .
- ✓ Eco-Cycling of sludge with Domestic Waste to produce a soil or aggregate encouraging TOTAL_ waste recycling and producing a viable usable end product- particularly soil for Agricultural re-use.

Case Study: Solar Drying of Sludge in Jeddah



- * The study is looking at open-air solar drying with windrow formation and turning using a compost type turning machine.
- * The objective is to assess the methodology in terms of agronomic value of the sludge for P:K:N values, dry solids reduction, metal content , and bacterial reduction .
- * Trials are currently on going at Al-Khomra Wastewater Treatment Works in Jeddah but early results are positive.

Continued

Studies of continuous solar drying techniques across the world have indicated that utilising solar energy is a lot more cost effective than thermal drying and the end result is a class A sludge that can be used as a fertiliser for Agricultural use or as a supplementary fuel for use in Cement Factories.



CONCLUSION & RECOMMENDATION



- * With the inevitable increase in Sludge or Bio-solids production over the coming years, the use of more modern technologies needs to be considered.
- * More and better co-ordination is required between the Ministries of Power, Ministry of Agriculture, The National Water Company, MoWE & Government Ministers.

THANK YOU