

Institute of Natural Resource Management

National Taipei University

Class Handout of the Fall Semester, 2013

Lectures 12: Sewage Systems and Waste Water Treatment

- SEWAGE ENGINEERING
 - Sewage Systems or Sewers: Sanitary Wastewater and Stormwater Runoff
 - Combined vs. Separate Sewage Systems
 - Pipelines vs. Channels: Pipe Flow vs. Open Channel (Open Surface) Flow
 - Sewage Engineering (Works):
Collection and Treatment of Wastewater as well as Disposal of Sludge
 - Sludge and Bio-solid: Integrated Wastewater Treatment Plant; Cogeneration of Heat and Power, Water Reclamation (Recovery) Center => Newwater
 - Treatment of Industrial Wastewater => Obligation of Private Sector

- WASTEWATER TREATMENT ENGINEERING
 - Wastewater Treatment Units
 - ⇒ Physical and Physico-Chemical Mechanisms
 - ⇒ Biological Mechanisms
 - ⇒ Chemical Mechanisms
 - Classification of Wastewater Treatment Plants
 - ⇒ Primary Treatment 一級處理
 - ⇒ Secondary (Biological) Treatment 二級 (生物) 處理
 - ⇒ Tertiary (Advanced) Treatment 三級 (高級) 處理
 - Biological Treatment
 - ⇒ Suspend Growth Treatment: Activated Sludge (活性污泥)、Membrane Bioreactors (MBR)、Aerated Lagoons and Oxidation Ponds (氧化塘)
 - ⇒ Attached Growth Treatment: Trickling Filters (滴濾池)、Rotating Biological Contactor (RBC 生物旋轉盤)
 - ⇒ Hybrid Systems 組合生物處理法 – A/O、兩級 A/O、A2/O、UNITANK
 - ⇒ Constructed Wetland (人工濕地) and Ecological Engineering
 - ⇒ Anaerobic Treatment to Retain Biomass and Water Reclamation
 - Sludge Treatment
 - ⇒ Anaerobic Digestion; Dewatering and Drying => Water Content; Disposal
 - Advanced Wastewater Treatment and Water Reuse
 - ⇒ Nitrogen and Phosphorus Removals; Removal of Heavy Metals
 - ⇒ Removal of Dissolved Solid and Sea Water Desalination