

國立臺北大學自然資源與環境管理研究所  
110 學年度第一學期『環境工程科學概論』

課程講義(11)：土壤與地下水污染概要  
Introduction to Soil Contamination and Groundwater Pollution

- GROUNDWATER CONTAMINATION/POLLUTION
  - Groundwater: the water that flows or stays under the surface of the land  
指流動或停滯於地面以下之水
  - Porous Media – Solid Matrix, Pore, and Multiple-Phase Fluids  
⇒ Porosity vs. Permeability; Hydraulic Conductivity
  - Groundwater Pressure and Piezometric Heads  
⇒ Unsaturated Zone or Vadose Zone => Soil Layer (?)  
⇒ Saturated Zone and Aquifers => Confined and Unconfined Aquifers  
⇒ Hydraulic Gradient => Water Table, Hydraulic Head, Flowing Artesian Wells
  - Darcy's Law: The Theory Governing Fluid Flow in Porous Media  
⇒ [A brief historic remark](#): Henry Darcy, Les Fontaines Publiques de la Ville de Dijon (1856).
  - Groundwater Contaminants and Pollution Transport  
⇒ Contaminants vs. pollutants; contamination vs. Pollution  
⇒ Diffusion and Dispersion: Plume  
⇒ Retardation: Adsorption (Absorption)  
⇒ NAPL (Non-Aqueous Phase Liquid): DNAPL and LNAPL
  - Groundwater as a Source of Water Supply  
⇒ Drawdown and Cone of Depression; Capture Zone; Well Head Protection Area
  - Remediation Technologies => [整治\(預防\)技術參考手冊](#)  
⇒ Hydraulic Control; Pump-and-Treat; Soil Vapor Extraction  
⇒ In-Situ Bioremediation; Permeable Reactive Barriers  
⇒ Managed Natural Attenuation or Monitored Natural Attenuation
- SOIL CONTAMINATION
  - Contamination in the Unsaturated Zone
  - Reaction with the Saturated Zone and Ground Surface
  - [土壤及地下水污染整治法](#) => [概述](#)
  - 污染場址：控制場址、整治場址、污染管制區=>監測標準、管制標準  
⇒ [污染場址判定流程](#)  
⇒ [土壤及地下水污染物](#)及其監測、管制標準
  - 場址類別：農地、加油站、儲槽、工廠、非法棄置場址、其他  
⇒ [場址查詢](#) => [污染場址完成整治技術證明](#)
  - [土壤及地下水污染場址健康風險評估](#) => [手冊](#)
  - Reclamation of Contaminated Land => Renewable Energy Development  
⇒ [受污染土地設置太陽光電](#)